Oracle® HTML DB

User's Guide

Release 2.0

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Oracle HTML DB User’s Guide, Release 2.0

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Oracle HTML DB User's Guide, Release 2.0

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Preface

Oracle HTML DB User's Guide describes how to use the Oracle HTML DB development environment to build and deploy database-centric Web applications. Oracle HTML DB turns a single Oracle database into a shared service by enabling multiple workgroups to build and access applications as if they were running in separate databases.

This preface contains these topics:

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

Oracle HTML DB User's Guide is intended for application developers who are building database-centric Web applications using Oracle HTML DB. The guide describes how to use the Oracle HTML DB development environment to build, debug, manage, and deploy applications.

To use this guide, you need to have a general understanding of relational database concepts as well as an understanding of the operating system environment under which you are running Oracle HTML DB.

Documentation Accessibility

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Related Documents

For more information, see the following documents in the Oracle Database 10*g* Release 2 (10.2) and Oracle HTML DB Release 2.0 documentation set:

- *Oracle HTML DB 2 Day Developer*
- *Oracle Database Concepts*
- *Oracle Database Application Developer's Guide - Fundamentals*
- *Oracle Database Administrator's Guide*
- *Oracle Database SQL Reference*
- *SQL*Plus User's Guide and Reference*

For information about Oracle error messages, see *Oracle Database Error Messages*. Oracle error message documentation is available only in HTML. If you only have access to the Oracle Database 10*g* Release 2 (10.2) Online Documentation Library, you can browse the error messages by range. Once you find the specific range, use your browser's "find in page" feature to locate the specific message. When connected to the Internet, you can search for a specific error message using the error message search feature of the Oracle online documentation.

Many books in the documentation set use the sample schemas of the seed database, which is installed by default when you install Oracle. Refer to *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New in Oracle HTML DB?

This section describes new features of Oracle HTML DB release 2.0 and provides pointers to additional information.

New Features in Oracle HTML DB Release 2.0

In release 2.0, Oracle HTML DB includes a great number of new features and enhancements to Application Builder and SQL Workshop.

This section contains the following topics:

- New Features in Application Builder
- New Features in SQL Workshop

New Features in Application Builder

Application Builder includes a number of new features and some changes in navigation. The list of applications has been moved from the Oracle HTML DB home page to a subordinate page, the Applications page. Also, user interface defaults have moved from SQL Workshop to Application Builder.

- **Create Application Wizard**. In release 2.0, the Create Application Wizard combines the functionality of two previous wizards, the Create Application from Scratch Wizard and the Create Application on a Table Wizard. In release 2.0, you can create query, update, and analysis pages on multiple tables, thus lifting the one table limit imposed in previous releases. The Create Application Wizard also features the following enhancements:
  - **Page Organization**. As you add pages, you can organize them sequentially and hierarchically.
  - **Drill-down Reporting**. As you add pages in the wizard, you can create links from one report to another, thus creating drill-down reporting.
  - **Application Models**. Use application models to re-create an application starting with a previous application definition. If you spend time defining your application in the Create Application Wizard, but you are not completely satisfied with the results, you can create another application starting with a previous application definition.

  See Also: "About the Create Application Wizard" on page 6-2

- **Context Sensitive Help**. The help icon on each page now links to a context sensitive help topic. In previous releases, the help icon displayed the help table of contents.

See Also: "Accessing Online Help" on page 2-6

- **Pull-down Menu Navigation**. Large graphical icons in the Oracle HTML DB user interface now feature pull-down menus, making it even easier link to a specific task. Simply click the down arrow on the right side of the icon to view the pull-down menu. Pull-down menus reduce screen clutter, improve the speed of navigation by reducing page views, and provide greater context since you can learn about what a subsystem does by browsing the options in the pull-down menu.

  See Also: "Navigation Alternatives" on page 2-5

- **Hierarchal Lists and Hierarchal List Templates**. Release 2.0 includes support for hierarchal lists. You create list entries as in previous releases. Now each list entry has an extra parent attribute. You define hierarchal lists by specifying that one list entry be the parent of another list entry. Release 2.0 also includes new template attributes to enable templates to be level specific. Additionally, each supplied theme ships with three new list templates to support various types of hierarchal lists.

  See Also: "Creating Lists" on page 8-13

- **Session State Protection**. Use new Session State Protection functionality to protect your application from URL tampering by hackers. URL tampering can adversely affect program logic, session state contents, and information privacy.

  See Also: "Understanding Session State Protection" on page 13-3

- **Improved Templates**. Each supplied theme in release 2.0 features new and improved templates. Page footers now float to the bottom of the page and HTML has been improved. Each theme also includes a report template capable of rendering report regions using partial page refresh. With partial page refresh, paginating the report does not refresh any page attributes or other reports, just the report part of a single region.

  See Also: "Customizing Templates" on page 7-17

- **Icon Views**. You can view Oracle HTML DB applications, pages, and components in either an icon or list view. For example, the Application Builder home page displays applications as icons. You can change the default icon view by making a selection from the View list. Once you change the view mode, Oracle HTML DB remembers your selection for all subsequent views and sessions. The Icon view reduce screen clutter and provide a consistent visual clue as to your context within Application Builder.

  See Also: "Page Display Alternatives" on page 5-4

- **Improved Reporting Using Partial Page Refresh**. Reports in Application Builder now utilize a rendering technology called partial page refresh. Partial page refresh improves the performance of paginating and sorting reports since the entire page is not refreshed, only the report content.

  See Also: "Creating Reports" on page 6-17

- **New Date Picker Item Types**. HTML DB 2.0 includes a complete set of declarative Date Picker item types, covering the majority of all commonly used date formats. Date Picker item types also fully conform to the localization attributes of the application language or user's language preference.

  See Also: "Creating Items" on page 6-51

- **Automatic CSV Encoding**. A new application attribute, Automatic CSV Encoding, has been added in Oracle HTML DB release 2.0. This attribute controls the character encoding of all report CSV download files. In previous versions of Oracle HTML DB, the character encoding of the CSV files was determined by the character set of the Database Access Descriptor. In release 2.0, you can use the Automatic CSV Encoding attribute to alter the character encoding of CSV download files to be compatible with the user's client character set, as determined by the application language preference.

  See Also: "Configuring Globalization Attributes" on page 5-14

New Features in SQL Workshop

SQL Workshop has been totally redesigned. Additionally, Data Workshop has also been combined with the SQL Workshop.

- **SQL, SQL Script, and PL/SQL Editor**. A text editor has been added to the SQL Workshop to make it more efficient to write and edit SQL scripts and PL/SQL. You can use the editor when you edit a PL/SQL program unit, or when you create or edit a SQL script. The editor features line numbers, find, search and replace, and supports text larger then 32K.
- **Query Builder**. Use Query Builder's graphical user interface to search and filter database objects, select objects and columns, create relationships between objects, view formatted query results, and save queries with little or no SQL knowledge.

  See Also: "Building Queries with Query Builder" on page 17-1

- **Object Browser**. Use Object Browser to browse, create, and edit objects in multiple schemas in a single database. Object Browser includes a new PL/SQL editor. You can use this editor to edit and compile packages, procedures, functions, and triggers while taking advantage of syntax highlighting and error reporting.

  See Also: "Managing Database Objects Using Object Browser" on page 18-1

- **Database Link Tester**. Object Browser includes a new and improved interface for creating database links. In the Object Details view, you can view information about a database link as well as test it.

  See Also: "Managing Database Links" on page 18-26

- **SQL Command Processor**. The SQL Command Processor now supports bind variables and a much more robust explain plan capability. The SQL Command Processor features a split screen for greater control of screen real estate. You can also run highlighted text by using the new **Ctrl + Enter** keyboard shortcut.

  See Also: "Using SQL Command Processor" on page 20-1

- **SQL Scripts**. The SQL Command Processor now understands SQL*Plus scripts. Note that SQL*Plus commands, such as `CONNECT`, are not permitted. Commands not supported are flagged and reported. The SQL Command Processor more efficiently parses and executes SQL scripts. Plus, you can archive executed scripts and view them in a summary or detail mode. Additionally, you view and delete script results on the Manage Script Results page.

  See Also: "Using the SQL Script Repository" on page 19-1

- **Database Monitor**. A Database Session and Top SQL Monitor has been added. To use the monitor you need to supply additional credentials since it reports on the entire database. The monitor identifies what SQL is currently executing in your database as well as reporting on top SQL. Drill down to robust explain plans are also included.

  See Also: "Monitoring the Database" on page 21-10

- **SQL Injection Analysis Tool**. Utilize new SQL Injection reports to evaluate your applications for potential security vulnerabilities.

  See Also: "Evaluating an Application for SQL Injection Vulnerability" on page 21-8

Part I

Getting Started with Oracle HTML DB

Part I provides an introduction to Oracle HTML DB. These chapters introduce you to basic Oracle HTML DB concepts.

Part I contains the following chapters:

1 What Is Oracle HTML DB?

The section offers a general description of Oracle HTML DB and the components you can use to develop database-centric Web applications.

This section contains the following topics:

- About Oracle HTML DB
- About Application Builder
- About SQL Workshop
- About Oracle HTML DB Administration

> **See Also:** "Quick Start" on page 2-1 and "Accessing Online Help" on page 2-6

About Oracle HTML DB

Oracle HTML DB is a hosted declarative development environment for developing and deploying database-centric Web applications. Oracle HTML DB turns a single Oracle database into a shared service by enabling multiple workgroups to build and access applications as if they were running in separate databases. Thanks to built-in features such as design themes, navigational controls, form handlers, and flexible reports, Oracle HTML DB accelerates the application development process.

The HTML DB engine renders applications in real time from data stored in database tables. When you create or extend your application, Oracle HTML DB creates or modifies metadata stored in database tables. When the application is run, the HTML DB engine then reads the metadata and displays the application.

Oracle HTML DB automatically maintains session state without requiring any coding. To provide stateful behavior within an application, Oracle HTML DB transparently manages session state in the database. Application developers can get and set session state using simple substitutions as well as standard SQL bind variable syntax.

The Oracle HTML DB development platform consists of the following components:

- Application Builder
- SQL Workshop
- Administration

About Application Builder

You use Application Builder to assemble an HTML interface (or application) on top of database objects such as tables and procedures. An application is a collection of database-driven Web pages linked together using tabs, buttons, or hypertext links. Once you create an application, the HTML DB engine renders the application using the templates and user interface elements you specify.

A page is the basic building block of an application. Each page can have buttons and fields, and can include application logic (or processes). You can branch from one page to the next using conditional navigation; perform calculations; run validations (such as edit checks); and display reports, forms, and charts.

See Also: "Application Builder Concepts" on page 4-1 and "Using Application Builder" on page 5-1

About SQL Workshop

Use SQL Workshop to view and manage database objects from a Web browser. SQL Workshop includes the following tools:

- **Object Browser**. View, create, modify, browse, and drop database objects. Use the PL/SQL editor to edit and compile packages, procedures, functions, and triggers while taking advantage of error reporting. See "Managing Database Objects Using Object Browser" on page 18-1.
- **Query Builder**. Use Query Builder's graphical user interface to search and filter database objects, select objects and columns, create relationships between objects, view formatted query results, and save queries with little or no SQL knowledge. See "Building Queries with Query Builder" on page 17-1.
- **SQL Commands**. Run SQL commands and anonymous PL/SQL, scripts, and saved queries. See "Using SQL Command Processor" on page 20-1.
- **SQL Scripts**. Use the SQL Script Repository to create, edit, view, run, and delete script files. You can also upload and download scripts from your local file system. See "Using the SQL Script Repository" on page 19-1.
- **Utilities**. Use SQL Workshop Utilities to import and export data from the database, generate DDL, view object reports, monitor the database, and restore dropped database objects See "Using SQL Workshop Utilities" on page 21-1.

About Oracle HTML DB Administration

In the Oracle HTML DB development environment, developers log in to a shared work area called a workspace. Users are divided into two primary roles: *developer* and *workspace administrator*. Developers can create and edit applications as well as view reports. Workspace administrators use HTML DB Workspace Administration to create and edit user accounts, manage groups, manage development services.

See Also: "Managing a Development Workspace" on page 12-1

2 Quick Start

This section offers a quick introduction to using Oracle HTML DB. It is assumed you have already completed the installation process.

This section contains the following topics:

- Understanding Oracle HTML DB User Roles
- Logging In to Oracle HTML DB
- About the Oracle HTML DB User Interface
- Creating an Application Using a Wizard

> **See Also:** "Running a Demonstration Application" on page 3-1, "Accessing Online Help" on page 2-6, "Application Builder Concepts" on page 4-1, and "Application Builder Concepts" on page 4-1

Understanding Oracle HTML DB User Roles

To access the Oracle HTML DB development environment, users log in to a shared work area called a workspace. Users are divided into three primary roles:

- **Developers** create and edit applications
- **Workspace administrators** perform administrator tasks specific to a workspace such as managing user accounts, monitoring workspace activity, and viewing log files
- **Oracle HTML DB administrators** are superusers that manage an entire hosted instance using the Oracle HTML DB Administration Services application

> **See Also:** "Managing a Development Workspace" on page 12-1 and "Managing an Oracle HTML DB Hosted Service" on page 22-1

Logging In to Oracle HTML DB

When you log in to Oracle HTML DB you log in to a workspace. A workspace is an area within the Oracle HTML DB development environment where developers can create applications.

How you log into Oracle HTML DB depends upon whether you have configured your development environment:

- If you have recently installed Oracle HTML DB, you need to configure your development environment

- If you are a developer logging into a previously configured development environment, an administrator must grant you access to a workspace

Topics in this section include:

- About Browser Requirements
- Configuring Your Oracle HTML DB Environment
- Logging In to Oracle HTML DB as a Developer

About Browser Requirements

You open the Oracle HTML DB home page in a Web browser. To view or develop Oracle HTML DB applications, the Web browser must support Java Script and the HTML 4.0 and CSS 1.0 standards. The following browsers meet this requirement:

- Netscape Communicator 7.0 or higher
- Microsoft Internet Explorer 5.5 or higher
- Mozilla 1.2 or higher
- Mozilla Firefox 1.0 or higher

Configuring Your Oracle HTML DB Environment

Once you have successfully installed Oracle HTML DB, you need to configure your development environment as follows:

- **Log into Oracle HTML DB Administration Services.** Oracle HTML DB Administration Services is a separate application for managing an entire Oracle HTML DB instance. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
- **Specify a provisioning mode.** In Oracle HTML DB Administration Services you need to determine how the process of creating (or provisioning) a workspace will work. See "About Workspace Provisioning" on page 22-6 and "Specifying a Provisioning Mode" on page 22-6.
- **Create a Workspace.** A workspace is a shared work area within the Oracle HTML DB development environment that has a unique ID and name. An Oracle HTML DB administrator can create a workspace manually or have users submit requests. See "Creating a Workspace Manually" on page 22-7 and "Viewing a Pending Change Request" on page 22-11.
- **Log in to a Workspace.** Once you create a workspace in Oracle HTML DB Administration Services, return to the Oracle HTML DB Login page and log in to that workspace. See "Logging In to Oracle HTML DB as a Developer" on page 2-2.

Note: Before performing any of the previous steps, please review "Managing an Oracle HTML DB Hosted Service" on page 22-1

Logging In to Oracle HTML DB as a Developer

When you log in to Oracle HTML DB, you log in to a workspace. If you are a developer, an administrator must grant you access to a workspace.

Note: Before users can request a workspace or change their passwords, an Oracle HTML DB administrator must configure Oracle HTML DB environment preferences.

See Also: "Managing Environment Settings" on page 22-22

Topics in this section include:

- Requesting a Workspace
- Logging in to a Workspace
- Resetting Your Password
- Logging Out of a Workspace

Requesting a Workspace

Note: This section applies only if your Oracle HTML DB administrator has configured Oracle HTML DB to support workspace requests.

See Also: "Specifying a Provisioning Mode" on page 22-6 and "Configuring Oracle HTML DB to Send Mail" on page 22-23

Before you can log in to Oracle HTML DB, an administrator must grant you access to a workspace. Each workspace has a unique ID and name.

To request a workspace:

1. In a Web browser, navigate to the Oracle HTML DB Login page. By default, Oracle HTML DB installs to the following location:

   ```
   http://hostname:port/pls/database_access_descriptor
   ```

   Where:

   - `hostname` is the name of the system where Oracle HTTP Server is installed.
   - `port` is the is the port number assigned to Oracle HTTP Server.

     In a default installation, this number is 7777. You can find information about your Oracle HTTP Server installation's port number from the `httpd.conf` file, located in `ORACLE_BASE\ORACLE_HOME\Apache\Apache\conf`, by searching for Port.

     You can also find the port number in the `portlist.ini` file, located in `ORACLE_BASE\ORACLE_HOME\install`. However, be aware that if you change a port number, it is not updated in the portlist.ini file, so you can only rely on this file immediately after installation.
   - `database_access_descriptor` describes how Oracle HTTP Server connects to the database server so that it can fulfill an HTTP request. The default value is `htmldb`.

   See Also: `ORACLE_BASE\ORACLE_HOME\Apache\modplsql\conf\dads.readme` for more information on database access descriptors

The Login page appears.

2. Under Tasks, click **Request a Workspace**.

   The Request Service Wizard appears.

3. Click **Continue** and follow the on-screen instructions.

   See Also: "Provisioning Workspaces" on page 22-6

Logging in to a Workspace

After an Oracle HTML DB administrator approves a workspace request and an e-mail arrives with your login credentials (the workspace name, user name, and password).

See Also: "Specifying a Provisioning Mode" on page 22-6 and "Configuring Oracle HTML DB to Send Mail" on page 22-23

To log in to Oracle HTML DB:

1. In a Web browser, navigate to the Oracle HTML DB Login page. By default, Oracle HTML DB installs to the following location:

   ```
   http://hostname:port/pls/htmldb/htmldb
   ```

   The Login page appears.

2. Under Login, enter the following:

   - In the Workspace field, enter the name of your workspace.
   - In the Username field, enter your user name.
   - In the Password field, enter your case-sensitive password.

3. Click **Login**.

Resetting Your Password

You can reset your password by clicking the Change Password link on the Oracle HTML DB home page.

To reset your password:

1. Log in to Oracle HTML DB. See "Logging In to Oracle HTML DB" on page 2-1.
2. Click the **Administration** icon.
3. Select **Change Password** from the Tasks list.
4. In Change Password, enter the following:

   - In the Password field, enter your new password.
   - In the Confirm Password field, enter your new password again.
   - Click **Apply Changes**.

   See Also: "Changing a User Password" on page 12-5

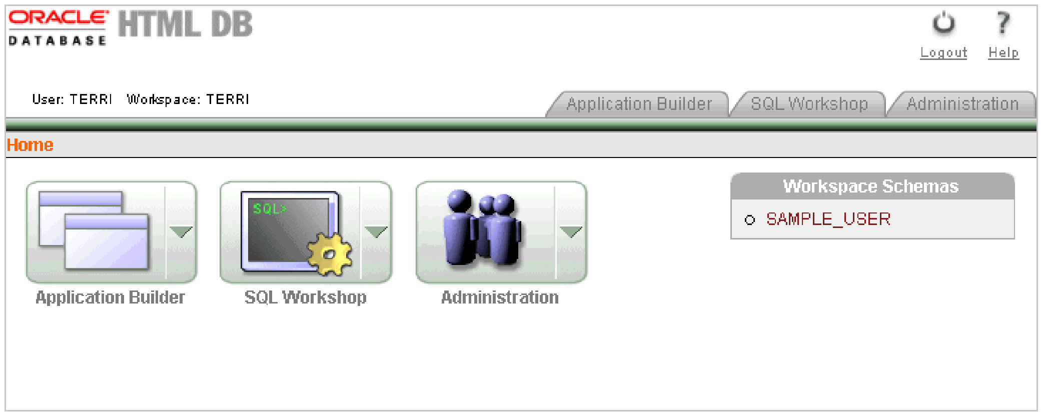
Logging Out of a Workspace

To log out of Oracle HTML DB, click the **Logout** icon in the upper right corner of the window.

About the Oracle HTML DB User Interface

Once you log in to Oracle HTML DB, the Workspace home page appears.

Figure 2–1 Workspace Home Page



The Workspace home page contains three components:

- **Application Builder**. Use Application Builder to assemble an HTML interface (or application) on top of database objects such as tables and procedures.
- **SQL Workshop**. Use SQL Workshop to create and view database objects, create SQL queries, import and export data, edit and compile packages, procedures, functions, and triggers, and run SQL scripts.r.
- **Administration**. Use Administration to manage user accounts, manage your Oracle HTML DB service, change passwords, monitor workspace activity, and view schema and application reports.

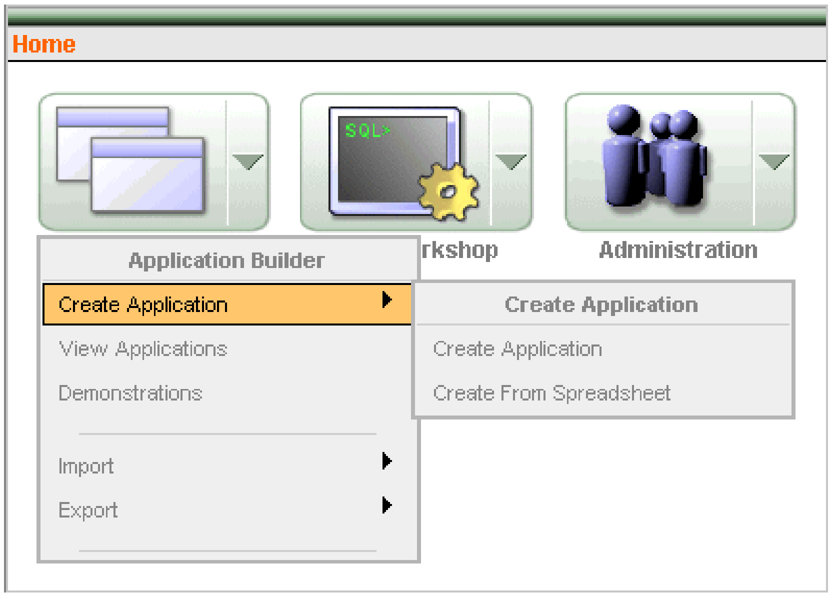
Navigation Alternatives

You can move between pages in Oracle HTML DB by clicking large graphical icons such as the Application Builder icon, SQL Workshop icon, or Workspace Administration icon on the Workspace home page. When using these icons, you have two navigation options:

- **Primary Navigation (drill-down).** Click the large icons in the center of the page to drill-down to the appropriate page.
- **Secondary Navigation (pull-down menus).** Click the down arrow on the right side of the icon to view a pull-down menu. Select an option from the menu.

Note: For the purposes of consistency, this document uses the primary navigation path (or dill-down approach) when explaining navigation.

Figure 2–2 Pull-down Menu



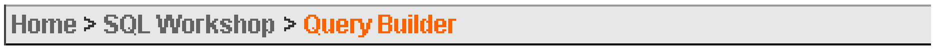
See Also:

- "Using Application Builder" on page 5-1
- "About SQL Workshop" on page 1-2
- "About the Workspace Administration Page" on page 12-2

Navigating Using Breadcrumbs

Breadcrumbs (also called locator links) appear at the top of every page in Oracle HTML DB. Each breadcrumb entry indicates where the current page is relative to other pages within the Oracle HTML DB development environment. You can use breadcrumbs to instantly link to a previous page. For example, clicking on **Home** takes you to the Workspace home page.

Figure 2–3 Breadcrumbs



Accessing Online Help

Oracle HTML DB feature three types of online help:

- Page-level Help
- Procedural online Help
- Field-level Help

Page-Level Help

Many pages in Oracle HTML DB include page-level Help. Page-level Help displays in a text box on the right side of the page and offers a brief description of the page functionality.

Procedural Online Help

You can access an HTML-based online Help system by clicking the Help icon in the upper right corner of the window. Context sensitive help that describes the current page appears. If a context-sensitive topic is not available, the Contents window appears.

The top of the window features a gray bar. Click **Find** to perform a keyword search of the entire help system. When the search field appears, enter a case insensitive query in the field provided and click **Find**. To search for an exact phrase, enclose the phrase in double quotation marks.

Field Level Help

Most select lists, check boxes, and fields in Oracle HTML DB include item help. When item help is available, the item label changes to red when you pass your cursor over it. Click the item label to display a description in a separate window.

Creating an Application Using a Wizard

A quick way to make data in the Oracle database accessible to end users is to run the Create Application Wizard. You can access the wizard by clicking the **Create** button on the Application Builder home page. The procedure that follows describes how to create an application based on an the `EMP` table.

> **See Also:** "Creating an Application" on page 6-1

To create an application based on an existing table:

1. Log in to Oracle HTML DB. See "Logging In to Oracle HTML DB" on page 2-1.

   The Workspace home page appears.

2. Click the **Application Builder** icon.
3. Click the **Create** button.
4. Select **Create Application** and click **Next**.

   Next, specify a name and select a schema.

5. For Name:

   a. In Name, enter `MyApp`.

   b. From Schema, select the appropriate schema.

   c. Accept the remaining defaults and click **Next**.

   Next, add pages to your application.

6. Under Add Page:

   a. For Select Page Type, select **Report**.

      Notice that **Action** describes the type of page you are adding.

   b. From Table or View, select `EMP`.

   c. (Optional) To create additional summary reports and charts, select the **Include Analysis Pages** check box and follow the wizard prompts.

   d. Click **Add Page**.

      The new page (or pages) appears at the top of the page. To delete a page, click **[delete]**.

   e. Click **Next**.

7. For Tabs, accept the default and click **Next**.
8. For Shared Components, accept the default and click **Next**.

   This option enables you to import shared components from another application. Shared components are common elements that can display or be applied on any page within an application.
9. For Authentication Scheme, Language, and User Language Preference Derived From, accept the defaults and click **Next**.
10. Select a theme and click **Next**.

    Themes are collections of templates that can be used to define the layout and style of an entire application.
11. Confirm your selections. To return to a previous wizard page, click **Previous**. To accept your selections, click **Create**.

Running an Application

To view a rendered version of an application, you run or submit it to the HTML DB engine. As you create new pages you can run them individually, or run an entire application. You can run a page from numerous locations within Application Builder by clicking the Run Application icon. The Run Application icon resembles a traffic light.

> **See Also:** "Running a Page or Application" on page 6-10

To run an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.

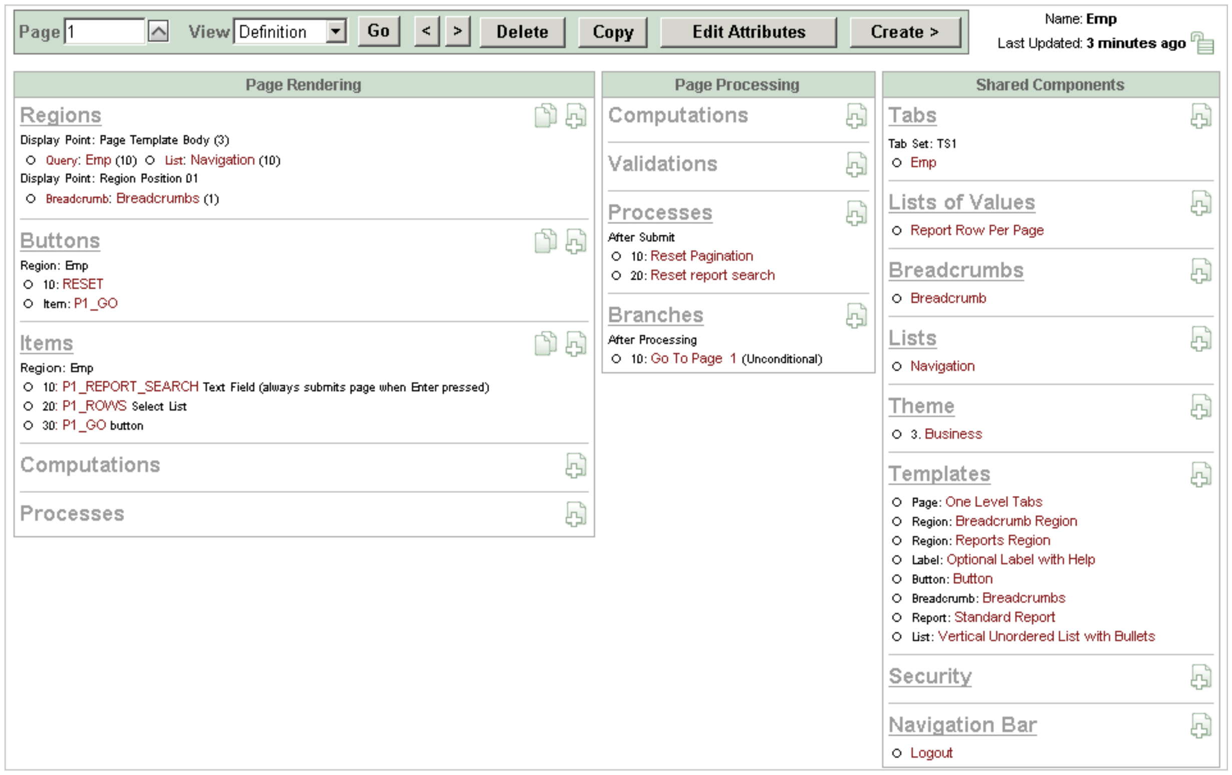
   The Application Builder home page appears.
3. Select an application (for example, **MyApp**).
4. Click the **Run Application** icon.

   The Login page appears.
5. Log in to your application by enter your workspace username and password and click **Login**.

   Your application appears. Note the Developer toolbar at the bottom on the page. The Developer toolbar offers a quick way to edit the current page, create a new page, control, or component, view session state, or toggle edit links on an off.
6. Explore your application.
7. To exit your application and return to Application Builder, click **Edit Page** on the Developer toolbar.

   The Page Definition appears.

Figure 2–4 Page Definition



Name: Emp
Last Updated: 3 minutes ago

Page Rendering

Regions
Display Point: Page Template Body (3)
- Query: Emp (10)
- List: Navigation (10)

Display Point: Region Position 01
- Breadcrumb: Breadcrumbs (1)

Buttons
Region: Emp
- 10: RESET
- Item: P1_GO

Items
Region: Emp
- 10: P1_REPORT_SEARCH Text Field (always submits page when Enter pressed)
- 20: P1_ROWS Select List
- 30: P1_GO button

Computations

Processes

Page Processing

Computations

Validations

Processes
After Submit
- 10: Reset Pagination
- 20: Reset report search

Branches
After Processing
- 10: Go To Page 1 (Unconditional)

Shared Components

Tabs
Tab Set: TS1
- Emp

Lists of Values
- Report Row Per Page

Breadcrumbs
- Breadcrumb

Lists
- Navigation

Theme
- 3. Business

Templates
- Page: One Level Tabs
- Region: Breadcrumb Region
- Region: Reports Region
- Label: Optional Label with Help
- Button: Button
- Breadcrumb: Breadcrumbs
- Report: Standard Report
- List: Vertical Unordered List with Bullets

Security

Navigation Bar
- Logout

A page is the basic building block of an application. You use the Page Definition to view, create, and edit the controls and components that define a page.

8. To return to the Application Builder home page, select the **Application Builder** breadcrumb.

> **See Also:** "Application Builder Concepts" on page 4-1, "Accessing Application Builder" on page 5-1, and "About the Page Definition" on page 5-15

3

Running a Demonstration Application

This section describes how to run and modify the demonstration applications that install with Oracle HTML DB. Running and analyzing how an application works is an effective way to better understand how you can use Oracle HTML DB to build your own applications.

This section contains the following topics:

- Viewing and Installing a Demonstration Application
- Running a Demonstration Application
- Understanding Sample Application
- Modifying a Demonstration Application
- Viewing Underlying Database Objects

See Also:

- "What Is Oracle HTML DB?" on page 1-1
- "Quick Start" on page 2-1
- "Application Builder Concepts" on page 4-1
- "Using Application Builder" on page 5-1

Viewing and Installing a Demonstration Application

Oracle HTML DB includes a number of demonstration applications you can install. Use these applications to learn more about the different types of functionality you can include in your applications.

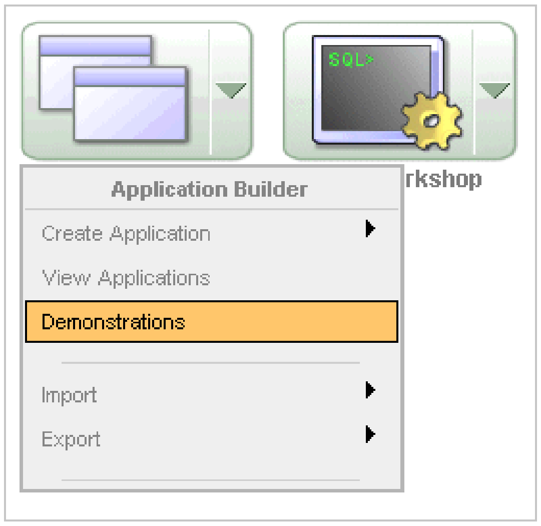
To install the demonstration applications included with Oracle HTML DB:

1. Log in to Oracle HTML DB as described in "Logging In to Oracle HTML DB" on page 2-1.

   The Workspace home page appears.

2. Click the down arrow on the right side of the Application Builder icon.
3. From the menu, select **Demonstrations**.

Figure 3–1 Application Builder Menu



The Demonstration Applications page appears, displaying links to the following applications:

- *Sample Application* offers a working demonstration that highlights basic design concepts.
- *Collection Showcase* demonstrates shopping cart concepts.
- *Web Services* serves an example of how you can use Web Services.
- *Presidential Inaugural Addresses* demonstrates Oracle Text.

4. To install a demonstration application, scroll down to the application you want to install and click **Install**.

   Installed appears in the Status column.
5. To edit an installed demonstration application, click **Edit**.
6. To run an installed demonstration application, click **Run**.
7. To reinstall a demonstration application, click **Re-Install**.

Note: Alternatively, you can also access demonstration applications page running the Create Application Wizard.

See Also: "About Demonstration Applications" on page 6-6

Running a Demonstration Application

Oracle HTML DB installs with a number of demonstration applications. Once you have installed a demonstration application you can run it from the Demonstration Applications page or from the Application Builder home page.

Topics in this section include:

- Running an Application from Demonstration Applications
- Running an Application from the Application Home Page

See Also: "Running a Page or Application" on page 6-10

Running an Application from Demonstration Applications

The simplest way to run a demonstration application is to navigate to the Demonstration Applications page.

To run a demonstration application from the Demonstration Applications page:

1. Log in to Oracle HTML DB as described in "Logging In to Oracle HTML DB" on page 2-1.

   The Workspace home page appears.
2. Click the down arrow on the right side of the Application Builder icon.
3. From the menu, select **Demonstrations**.
4. On the Demonstration Applications page, locate the application you want to run.
5. In the Action column, click **Run**.
6. Enter the appropriate username and password and click **Login**.

   For Sample Application, enter either `demo` or `admin` for the user name and enter the current workspace name in lowercase letters for the password.

   For other demonstration applications, enter your workspace user name and password.

Running an Application from the Application Home Page

Once you have installed a demonstration application, you can run it from the Application Builder home page.

To run a demonstration application from the Application Builder home page:

1. Log in to Oracle HTML DB as described in "Logging In to Oracle HTML DB" on page 2-1.

   The Workspace home page appears.
2. Click the **Application Builder** icon.
3. Select an application.

   The Applications home page appears.
4. From the View list, select **Details** and click **Go**.
5. From the Pages list, locate the page you want to run and click the **Run** icon in the far right column.
6. Enter the appropriate username and password and click **Login**.

   For the demonstration application *Sample Application*, enter either `demo` or `admin` for the user name and enter the current workspace name in lowercase letters for the password.

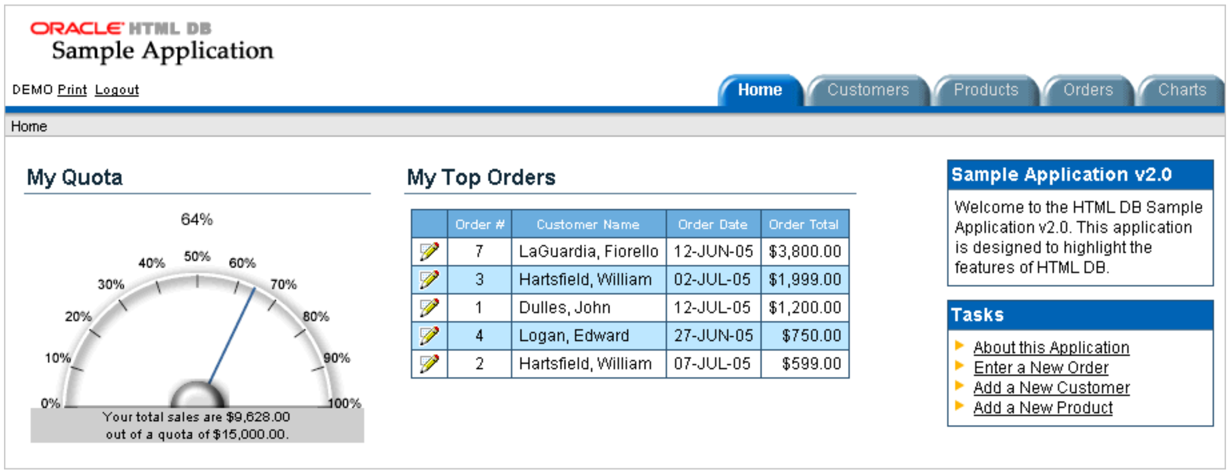
   For other demonstration applications, enter your workspace user name and password.

Understanding Sample Application

Each demonstration application shows a different set of features. This section describes the demonstration application, *Sample Application*.

Sample Application shows an easy-to-use interface for viewing, updating, and searching order and customer information for electronic and computer products. Users can navigate among the pages using the Home, Customers, Products, Orders, and Charts tabs.

Figure 3–2 Sample Application, Home Page



Your total sales are $9,628.00 out of a quota of $15,000.00.

	Order #	Customer Name	Order Date	Order Total
	7	LaGuardia, Fiorello	12-JUN-05	$3,800.00
	3	Hartsfield, William	02-JUL-05	$1,999.00
	1	Dulles, John	12-JUL-05	$1,200.00
	4	Logan, Edward	27-JUN-05	$750.00
	2	Hartsfield, William	07-JUL-05	$599.00

Welcome to the HTML DB Sample Application v2.0. This application is designed to highlight the features of HTML DB.

Sample Application demonstrates the following functionality:

- Examples of ways to display summary information, including a dial chart and summary reports
- Reports for viewing, updating, and adding customers, products, and orders
- A Calendar report
- SVG charts available in Oracle HTML DB including cluster bar, pie chart, and stacked bar
- Printer friendly mode

The following sections describe specific functionality available on each page.

> **See Also:** "What Is a Page?" on page 4-2

About the Home Page

The Home page contains four regions:

- My Quota
- My Top Orders
- Sample Application 1.6
- Tasks

My Quota demonstrates the use of a new SVG chart called a Dial Chart. This chart displays a value based on an underlying SQL statement. Although not demonstrated in this example, you can enable an asynchronous refresh by editing the attributes of any SVG chart.

My Top Orders is a simple report based on a SQL query. This report displays a subset of the information that appears on the Orders page. Users can link to order details by selecting the **Edit** icon.

Sample Application 1.6 is a simple HTML region that displays static text. You can create this type of region to display explanatory information to users.

Tasks contains an Oracle HTML DB list with links to other pages in *Sample Application*. Links available on the Home page Tasks list include:

- **About this Application** links to an informational page that describes this application.
- **Enter a New Order** links to a wizard for creating a new order.
- **Add a New Customer** links to a form for entering new customer information.
- **Add a New Product** links to a form for adding new products.

See Also:

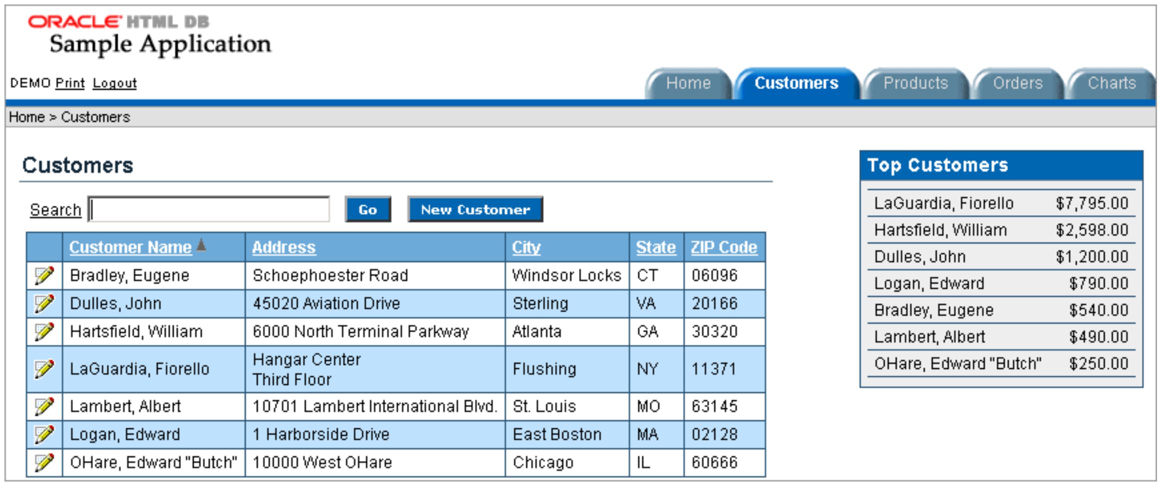
- "Creating Charts" on page 6-40
- "Creating a Report Using a Wizard" on page 6-18
- "Creating a Region" on page 7-2
- "Creating Lists" on page 8-13

About the Customers Page

The Customers page enables users to view and edit customer information. The Customers page consists of two main regions:

- Customers
- Top Customers

Figure 3–3 Sample Application, Customers Page



Customers

	Customer Name	Address	City	State	ZIP Code
✎	Bradley, Eugene	Schoephoester Road	Windsor Locks	CT	06096
✎	Dulles, John	45020 Aviation Drive	Sterling	VA	20166
✎	Hartsfield, William	6000 North Terminal Parkway	Atlanta	GA	30320
✎	LaGuardia, Fiorello	Hangar Center Third Floor	Flushing	NY	11371
✎	Lambert, Albert	10701 Lambert International Blvd.	St. Louis	MO	63145
✎	Logan, Edward	1 Harborside Drive	East Boston	MA	02128
✎	OHare, Edward "Butch"	10000 West OHare	Chicago	IL	60666

Top Customers

LaGuardia, Fiorello	$7,795.00
Hartsfield, William	$2,598.00
Dulles, John	$1,200.00
Logan, Edward	$790.00
Bradley, Eugene	$540.00
Lambert, Albert	$490.00
OHare, Edward "Butch"	$250.00

Customers is an updatable report for tracking customer information. This region is also based on a SQL query. To search for a customer, enter a customer name in the Search field and click **Go**. To sort by customer name, click the column heading. A Sort icon appears to the right of the heading, Customer Name. To update existing customer information, click the **Edit** icon.

Top Customers ranks customers by order amount. This report is based on a SQL query that returns top customers based on their orders.

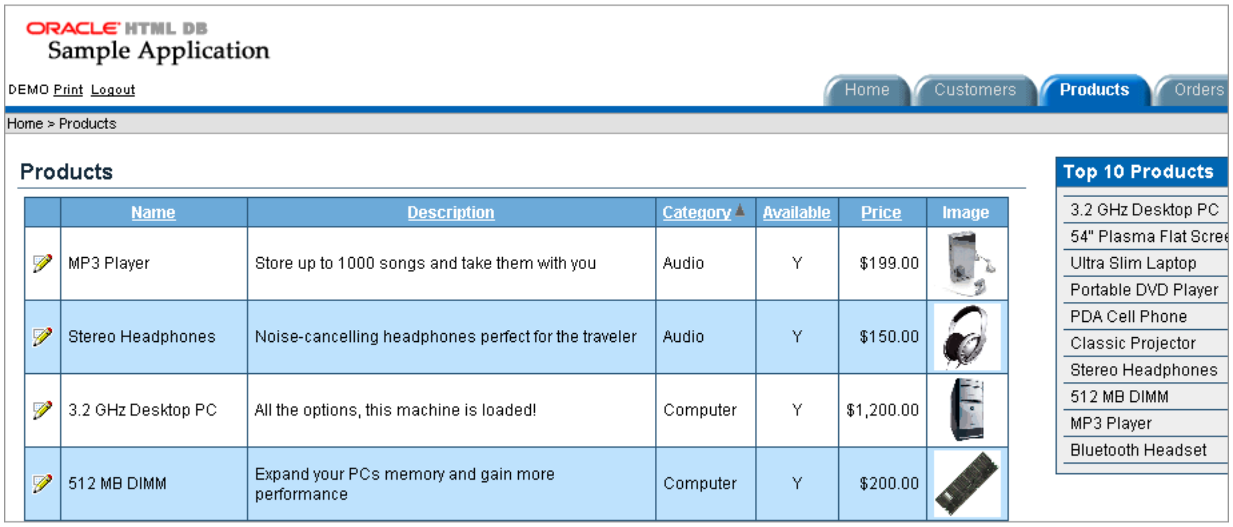
See Also: "Creating Reports" on page 6-17

About the Products Page

The Products page enables users to view and edit product information. The Products page consists of two main regions:

- Products
- Top 10 Products

Figure 3–4 Sample Application, Products Page



Products

	Name	Description	Category	Available	Price	Image
✎	MP3 Player	Store up to 1000 songs and take them with you	Audio	Y	$199.00	
✎	Stereo Headphones	Noise-cancelling headphones perfect for the traveler	Audio	Y	$150.00	
✎	3.2 GHz Desktop PC	All the options, this machine is loaded!	Computer	Y	$1,200.00	
✎	512 MB DIMM	Expand your PCs memory and gain more performance	Computer	Y	$200.00	

Top 10 Products

3.2 GHz Desktop PC
54" Plasma Flat Scree
Ultra Slim Laptop
Portable DVD Player
PDA Cell Phone
Classic Projector
Stereo Headphones
512 MB DIMM
MP3 Player
Bluetooth Headset

Products displays an updatable report for tracking product information. This region is based on a SQL query that uses of a custom function for displaying images stored in the database. To sort by product category, click the column heading. A Sort icon appears to the right of the heading. To edit a product description, click the **Edit** icon. To add a new product, click the **Create Product** button at the bottom of the page. Users can export the data in the Products report to a spreadsheet, by clicking **Export to Spreadsheet**.

Top 10 Products is also a SQL report. This report outlines the top ten products based on quantities sold.

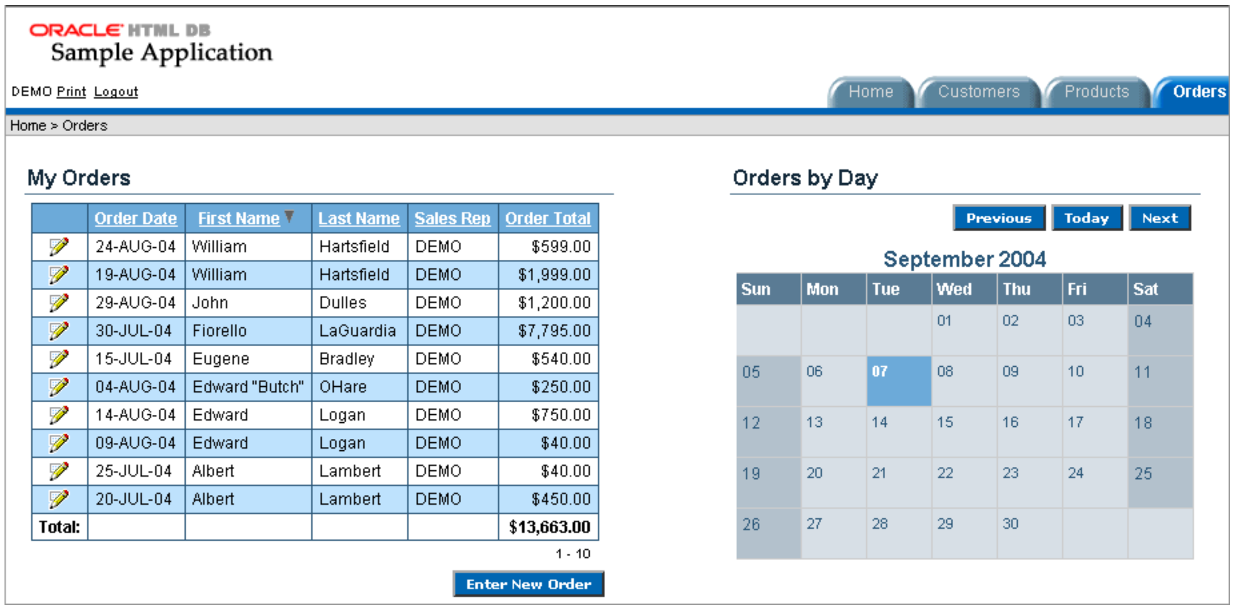
> **See Also:** "Creating Reports" on page 6-17

About the Orders Page

The Orders page enables users to view and edit customer orders. The Orders page contains two regions:

- My Orders
- Order by Day

Figure 3–5 Sample Application, Orders Page



My Orders

	Order Date	First Name	Last Name	Sales Rep	Order Total
	24-AUG-04	William	Hartsfield	DEMO	$599.00
	19-AUG-04	William	Hartsfield	DEMO	$1,999.00
	29-AUG-04	John	Dulles	DEMO	$1,200.00
	30-JUL-04	Fiorello	LaGuardia	DEMO	$7,795.00
	15-JUL-04	Eugene	Bradley	DEMO	$540.00
	04-AUG-04	Edward "Butch"	OHare	DEMO	$250.00
	14-AUG-04	Edward	Logan	DEMO	$750.00
	09-AUG-04	Edward	Logan	DEMO	$40.00
	25-JUL-04	Albert	Lambert	DEMO	$40.00
	20-JUL-04	Albert	Lambert	DEMO	$450.00
Total:					$13,663.00

1 - 10

Orders by Day

September 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			01	02	03	04
05	06	07	08	09	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

My Orders is an wizard report which summarizes the current orders in the system. To sort a column, click the column heading. A Sort icon appears next to column heading. To edit an existing order, click the Edit icon. To add a new order, click the **Enter New Order** button.

Order by Day is a Calendar report. This report displays the amount of an order on its corresponding date in a calendar. Users can select a calendar entry to view order details.

See Also: "Creating Calendars" on page 6-35 and "Creating Reports" on page 6-17

About the Charts Page

The Charts page illustrates three of the several types of SVG charts available in Oracle HTML DB: cluster bar, pie chart, and stacked bar. To view a chart, select a chart type.

See Also: "Creating Charts" on page 6-40

About the Admin Page

The Admin page displays only if you log in to *Sample Application* using the user name `admin`. Sample Application makes use of a custom authentication scheme that stores user names and obfuscated passwords in a table. The Manage Users page enables you to manage additional users.

Note the this custom authentication scheme does not use any user names or passwords associated with Oracle HTML DB developers.

Viewing Pages in Printer Friendly Mode

Clicking Print in the upper right corner of the page displays the current page in Printer Friendly mode. When in Printer Friendly mode, the HTML DB engine displays all text within the HTML form fields as text.

To enable your application to display in Printer Friendly mode, you need to create and then specify a Print Mode Page Template on the Edit Application Attributes page.

See Also: "Optimizing a Page for Printing" on page 7-43

Modifying a Demonstration Application

Once you understand the type of functionality available in a demonstration application, the next step is to learn more about how each page is constructed. You edit an application using Application Builder. Using Application Builder you can edit existing pages in an application, add pages to an application, or create entirely new applications.

Topics in this section include:

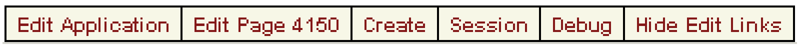
- About the Developer Toolbar
- Editing a Demonstration Application

About the Developer Toolbar

The Developer toolbar is a quick way to edit the current application, the current running page, create a new page, control, or component, view session state, or turn edit links on or off.

See Also: "Using the Developer Toolbar" on page 5-18

Figure 3–6 Developer Toolbar in Sample Application



The Developer toolbar consists of the following links:

- **Edit Application** links you to the Application Builder home page. See "About the Page Definition" on page 5-15.
- **Edit Page** accesses the Page Definition for the current running page. See "About the Page Definition" on page 5-15.
- **Create** links to a wizard for creating a new page, region, page control (item, button, branch, computation, process, or validation), or a shared control (navigation bar icon, tab, list of values, list, or breadcrumb). See "Creating an Application" on page 6-1
- **Session** links you to session state information for the current page. See "Viewing Session State" on page 4-9.
- **Debug** toggles the page between Debug and No Debug mode. See "Accessing Debug Mode" on page 10-2.
- **Show Edit Links** toggles between **Show Edit Links** and **Hide Edit Links**. Clicking **Show Edit Links** displays edit links next to each object on the page that can be edited. Each edit link resembles two colons (::) and appears to the right of navigation bar items, tabs, region titles, buttons, and items. Clicking on the link displays another window in which to edit the object.

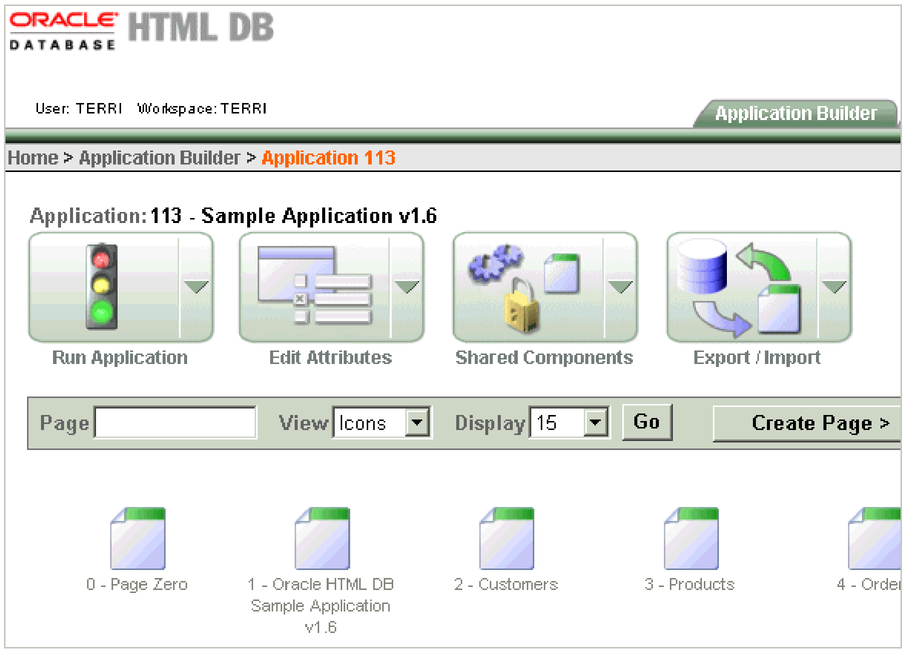
Editing a Demonstration Application

There are two ways to edit a demonstration application:

- From Demonstration Applications page, click **Edit** next to the desired application.
- If you are running an application, click **Edit Page** on the Developer toolbar.

The Application Builder appears. The application ID and application name display at the top of the page.

Figure 3–7 Application Builder



You can run the current application, edit application attributes, create shared components, export and import information, or create a new page by clicking one of the following:

- **Run Application** submits the pages in the current application to the HTML DB engine to render viewable HTML.
- **Edit Attributes** displays the Edit Application Attributes page.
- **Shared Components** links to a new page for building shared application components and user interface controls.
- **Export/Install** links you to the Export/Import Wizard.
- **Create Page** links to a wizard for creating a new page.

The Pages that make up the application display at the bottom of the page. To access a specific page, select it. To search for a specific page, enter a case insensitive query for the page title or page ID in the Find field and click **Go**.

> **See Also:** "About the Application Home Page" on page 5-1 and "About the Page Definition" on page 5-15

Viewing Underlying Database Objects

The HTML DB engine renders applications in real time based on data stored in database tables. You can view the database objects for any demonstration application in Object Browser.

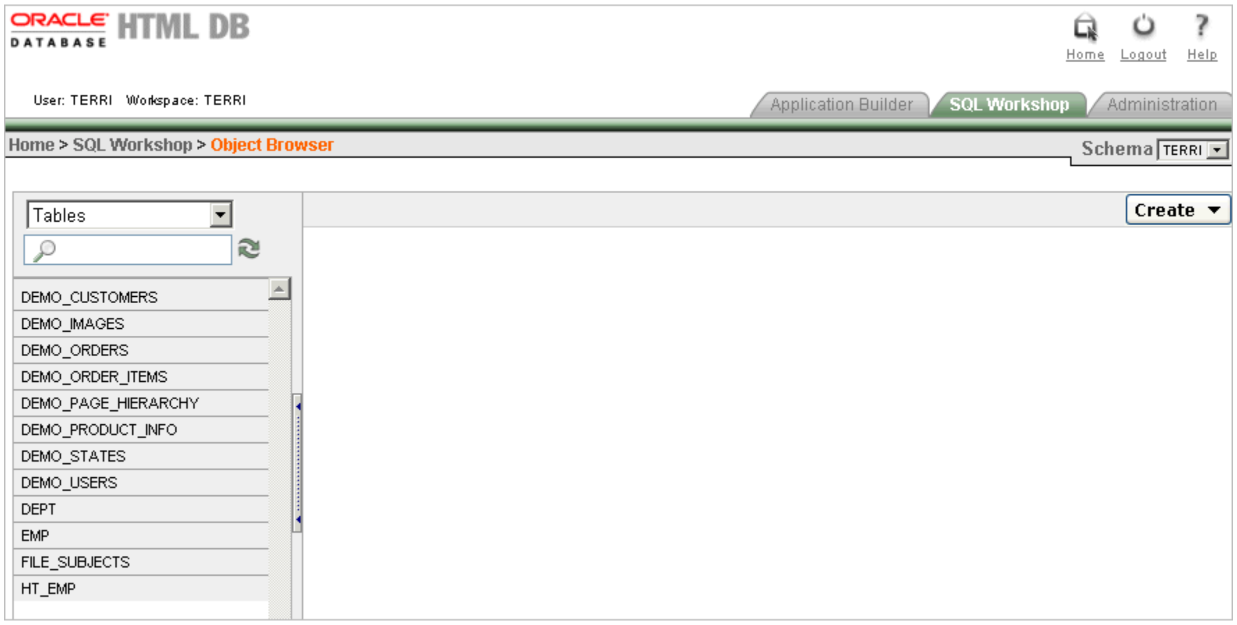
See Also: "Using SQL Command Processor" on page 20-1

To view the database objects used for an application:

1. Navigate to the Workspace home page.
2. Click **SQL Workshop**.
3. Click **Object Browser**.

   Object Browser appears.

Figure 3–8 Object Browser

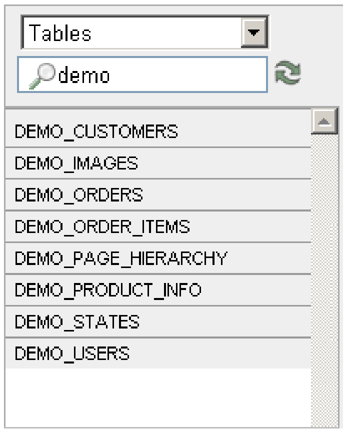


DEMO_CUSTOMERS
DEMO_IMAGES
DEMO_ORDERS
DEMO_ORDER_ITEMS
DEMO_PAGE_HIERARCHY
DEMO_PRODUCT_INFO
DEMO_STATES
DEMO_USERS
DEPT
EMP
FILE_SUBJECTS
HT_EMP

4. Select an object type from the Object list in the upper left corner of the page. For example, to view tables, select **Tables**.
5. To search for an object name, enter keywords in the search field beneath the Object list.

   A list of matching objects appears.

Figure 3–9 Object Browser Search



demo

DEMO_CUSTOMERS
DEMO_IMAGES
DEMO_ORDERS
DEMO_ORDER_ITEMS
DEMO_PAGE_HIERARCHY
DEMO_PRODUCT_INFO
DEMO_STATES
DEMO_USERS

6. To perform a specific task related to the selected object, select the object and the the appropriate task button.

   For example, to modify a column in the `DEMO_CUSTOMERS` table:

   a. From the Objects list, select **Tables**.

   b. From the Tables list, select `DEMO_CUSTOMERS`.

   c. Click **Modify Column**.

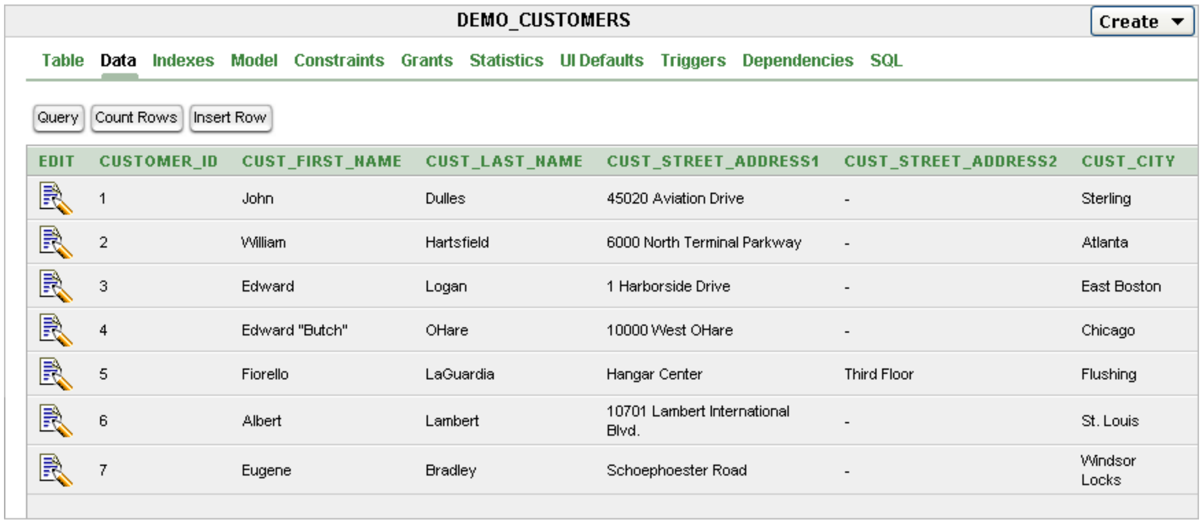
7. To view additional object details, select a tab beneath the object name. For example, to view the data in the `DEMO_CUSTOMERS` table:

   a. From the Tables list, select `DEMO_CUSTOMERS`.

   b. Select the **Data** tab.

      A report appears that displays the data in the `DEMO_CUSTOMERS` table appears.

Figure 3–10 Data Report on DEMO_CUSTOMERS



EDIT	CUSTOMER_ID	CUST_FIRST_NAME	CUST_LAST_NAME	CUST_STREET_ADDRESS1	CUST_STREET_ADDRESS2	CUST_CITY
	1	John	Dulles	45020 Aviation Drive	-	Sterling
	2	William	Hartsfield	6000 North Terminal Parkway	-	Atlanta
	3	Edward	Logan	1 Harborside Drive	-	East Boston
	4	Edward "Butch"	OHare	10000 West OHare	-	Chicago
	5	Fiorello	LaGuardia	Hangar Center	Third Floor	Flushing
	6	Albert	Lambert	10701 Lambert International Blvd.	-	St. Louis
	7	Eugene	Bradley	Schoephoester Road	-	Windsor Locks

See Also: "Managing Database Objects Using Object Browser" on page 18-1

Part II

Application Development

Part II describes how to use Application Builder to develop database-driven applications.

Part II contains the following chapters:

4 Application Builder Concepts

This section provides basic conceptual information about Application Builder. Application Builder is the core component within Oracle HTML DB that enables you to build database-centric Web applications.

This section contains the following topics:

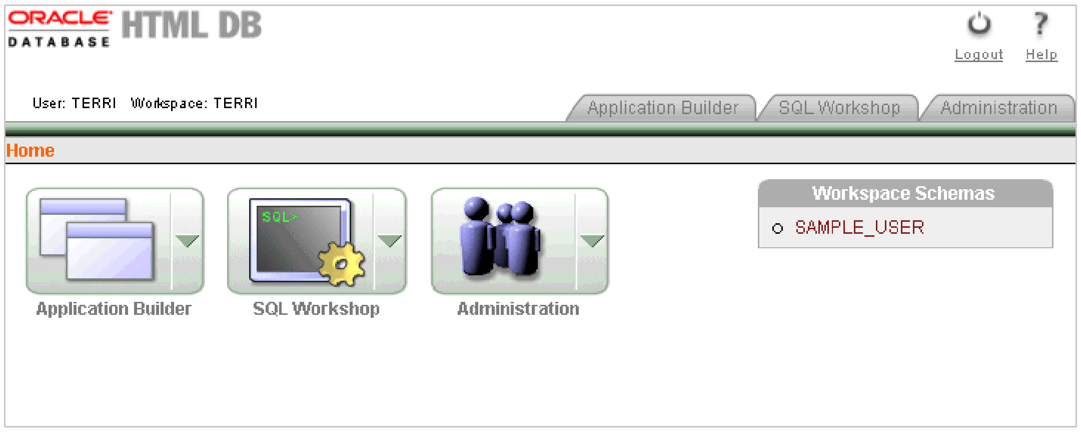
See Also:

- "What Is Oracle HTML DB?" on page 1-1
- "Using Application Builder" on page 5-1
- "Building an Application" on page 6-1

About the Workspace Home Page

When you log in to Oracle HTML DB the Workspace home page appears. A workspace is a shared work area within the Oracle HTML DB development environment where multiple developers can create applications.

Figure 4–1 Workspace Home Page



Your user name and workspace name display in the upper left corner of the page. The following three large icons display in the center of the page:

- **Application Builder**. Use Application Builder to assemble an HTML interface (or application) on top of a database objects such as tables and procedures.
- **SQL Workshop**. Use SQL Workshop to create and view database objects, create SQL queries, import and export data, edit and compile packages, procedures, functions, and triggers, and run SQL scripts.
- **Administration**. Use Administration to change your password, monitor workspace activity, and view workspace application reports. Additionally, workspace administrators use this page to manage user accounts and workspace service.

See Also: "Using Application Builder" on page 5-1, "About SQL Workshop" on page 1-2, and "About the Workspace Administration Page"

What Is Application Builder?

In Oracle HTML DB you use Application Builder to build dynamically rendered applications. Each application is a collection of pages linked together using tabs, buttons, or hypertext links.

To access Application Builder:

1. Log in to an Oracle HTML DB workspace.

   The Workspace home page appears.
2. Click the **Application Builder** icon.

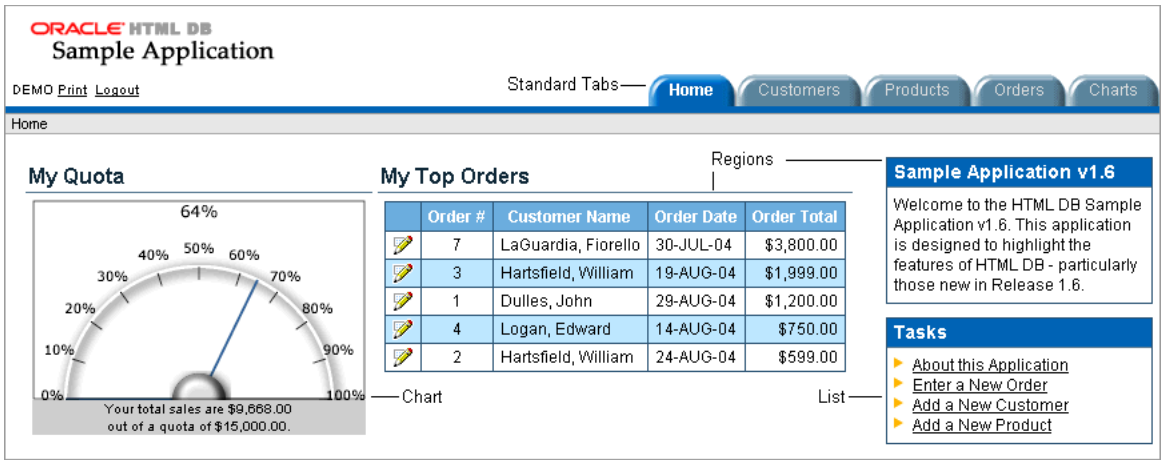
   Application Builder appears.

See Also: "Logging In to Oracle HTML DB" on page 2-1 and "About the Application Builder Home Page" on page 5-2

What Is a Page?

A page is the basic building block of an application. When you build an application in Application Builder, you create pages that contain user interface elements, such as tabs, lists, buttons, items, and regions.

Figure 4–2 Sample Application



Your total sales are $9,668.00 out of a quota of $15,000.00.

	Order #	Customer Name	Order Date	Order Total
	7	LaGuardia, Fiorello	30-JUL-04	$3,800.00
	3	Hartsfield, William	19-AUG-04	$1,999.00
	1	Dulles, John	29-AUG-04	$1,200.00
	4	Logan, Edward	14-AUG-04	$750.00
	2	Hartsfield, William	24-AUG-04	$599.00

Sample Application v1.6

Welcome to the HTML DB Sample Application v1.6. This application is designed to highlight the features of HTML DB - particularly those new in Release 1.6.

Tasks

- About this Application
- Enter a New Order
- Add a New Customer
- Add a New Product

Topics in this section include:

- About the Page Definition
- About Page Rendering
- About Shared Components

About the Page Definition

You add controls to a page on the Page Definition.

To view the Page Definition of an existing page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.

The Page Definition is divided into three sections:

- **Page Rendering** lists user interface controls and logic that is executed when the page is rendered.
- **Page Processing** lists logic controls (such as computations and processes) that are evaluated and executed when the page is processed.
- **Shared Components** lists common components that can display or be applied on every page within an application.

> **See Also:** "Editing a Page Definition" on page 5-18 and "About Shared Components" on page 4-4

About Page Rendering

The following list briefly describes Page Rendering section on the Page Definition:

- **Regions**. Lists regions on the current page. A region is a area on a page that serves as a container for content. Each page can have any number of regions. You control the appearance of a region through a specific region template. You can use regions to group page controls (such as items or buttons). You can also create simple regions that do not generate additional HTML, or create elaborate regions that frame content within HTML tables or images.

- **Buttons**. Lists buttons on the current page. Buttons are used to submit a page. When you submit a page, the HTML DB engine processes it, or redirects users to another page without any processing. A button can be implemented as an HTML button, an image, or by using a template.
- **Items**. Lists items on the current page grouped by region. Items are HTML form elements such as text fields, select lists, and check boxes with an associated session state.
- **Computations**. Lists the computations that are executed at the time the page is rendered. Computations are units of logic used to assign session state to items.
- **Processes**. Lists the processes that are executed at the time the page is rendered. Processes are logic controls used to execute data manipulation language (DML) or PL/SQL. For example, you can use a process to populate session state at the time the page is rendered.

See Also: "Customizing Regions" on page 7-2, "Creating Buttons" on page 6-48, "Creating Items" on page 6-51, "Understanding Page Computations" on page 5-28, and "Understanding Page Processes" on page 5-31

About Page Processing

The following list describes Page Processing section on the Page Definition:

- **Computations**. Lists the computations that are executed at the time the page is processed. Computations are units of logic used to assign session state to items.
- **Validations**. Enables you to create logic controls to verify whether user input is valid. For example, a validation can check whether or not a value has been entered into a mandatory field.
- **Processes**. Lists the processes that are executed after the page is submitted. Processes are logic controls used to execute data manipulation language (DML) or PL/SQL.
- **Branches**. Enables you to create logic controls that determine how the user navigates through the application.

See Also: "Understanding Page Computations" on page 5-28, "Understanding Validations" on page 5-24, "Understanding Page Processes" on page 5-31, and "Understanding Branches" on page 5-27

About Shared Components

Shared components are common elements that can display or be applied on any page within an application. The following section briefly describes the Shared Components section of the Page Definition.

Tabs

Tabs are an effective way to navigate between pages of an application. Application Builder includes two different types of tabs: standard tabs and parent tabs

An application having only one level of tabs uses a standard tab set. A standard tab set is associated with a specific page. You can use standard tabs to link users to other pages within your application. A parent tab set functions as a container to hold a group of standard tabs. Parent tabs give users another level of navigation as well as context (or sense of place) within the application.

See Also: "Creating Tabs" on page 8-5

Lists of Values

A list of values (LOV) is a static or dynamic definition used to display a specific type of page item, such as a radio group, check box, or select list. LOVs can be static (that is, based on a set of predefined display and return values) or dynamic (based on SQL queries that select values from tables). Once created, a LOV can then be referenced by one or more page items.

You define LOVs at the application level by running the LOV Wizard and adding them to the List of Values repository.

See Also: "Creating Lists of Values" on page 6-60

Breadcrumbs

A breadcrumb is a hierarchical list of links that is rendered using a template. For example, you can display breadcrumbs as a list of links or as a breadcrumb path.

See Also: "Creating Breadcrumbs" on page 8-9

Lists

A list is a collection of links that is rendered using a template. For each list entry, you specify display text, a target URL, and other attributes that control when and how the list entry displays. You control the display of the list and the appearance of all list entries by linking the list to a template.

See Also: "Creating Lists" on page 8-13

Theme

A theme is a named collection of templates that defines the application user interface. Each theme contains templates for every type of application component and page control, including individual pages, regions, reports, lists, labels, menus, buttons, and list of values.

See Also: "Managing Themes" on page 7-8

Templates

Templates control the look and feel of the pages in your application. As you create your application, you specify templates for pages, regions, reports, lists, labels, menus, buttons, and popup list of values. Groups of templates are organized into named collections called themes.

See Also: "Customizing Templates" on page 7-17

Security

You can provide security for your application by specifying an authorization scheme. Authorization is a broad term for controlling access to resources based on user privileges.

See Also: "Providing Security Through Authorization" on page 13-20

Navigation Bar

Use a navigation bar to link users to various pages within an application. Typically a navigation bar is used to enable users to log in and log out or link to Help text. The location of a navigation bar depends upon the associated page template. A navigation bar icon enables you to display a link from an image or text. When you create a navigation bar icon you can specify an image name, text, a display sequence, and a target location (a URL or page).

See Also: "Creating a Navigation Bar Entry" on page 8-1

Understanding Page Processing and Page Rendering

When you create an application in Oracle HTML DB, you link pages together using tabs, buttons, or hypertext links. Each page can have buttons and items and can include application logic. You can branch from one page to the next using conditional navigation, perform calculations, validations, and display reports, calendars, and charts. You can generate reports, charts, and forms using built-in wizards, static HTML, or deliver more custom rendering with PL/SQL programming.

Topics in this section include:

- How the HTML DB Engine Renders and Processes Pages
- Understanding Conditional Rendering and Processing
- Verifying User Identity
- Controlling Access to Controls and Components

How the HTML DB Engine Renders and Processes Pages

The HTML DB engine dynamically renders and processes pages based on data stored in Oracle database tables. To view a rendered version of your application, you request it from the HTML DB engine. When you run an application, the HTML DB engine relies on two processes:

- **Show Page** is the page rendering process. It assembles all the page attributes (including regions, items, and buttons) into a viewable HTML page.
- **Accept Page** performs page processing. It performs any computations, validations, processes, and branching.

When you request a page using a URL, the engine is runs the Show Page. When you submit a page, the HTML DB engine is running Accept Page or performing page processing during which it saves the submitted values in the session cache and then performs any computations, validations, or processes.

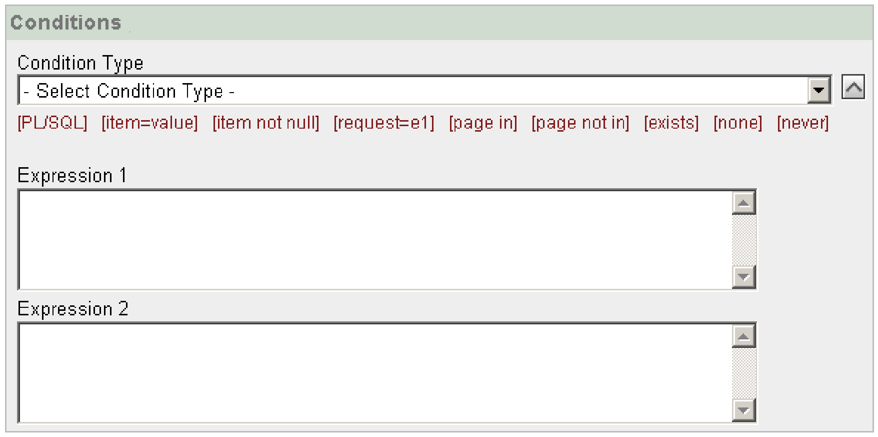
Understanding Conditional Rendering and Processing

A condition is a small unit of logic that helps you control the display of regions, items, buttons, and tabs as well as the execution of processes, computations, and validations. For example, when you apply a condition to a button, the rendering engine evaluates the condition during the rendering (or Show page) process. Whether the condition passes or fails determines if the page control (such as a button) displays.

You specify a condition by selecting a condition type when you create the control or component (for example, the region, item, button, or tab) or by making a selection from the Condition Type attribute. Depending upon the Condition Type you select, enter the appropriate values in the Expressions fields. The condition evaluates to true or false based on the values you enter in the Expression fields.

Note: Whether you use the Expressions fields depends upon the selected condition type. Some condition types require values in neither field, others require a value only for Expression 1, and other condition types require values in both fields. Although these fields are labeled "Expression 1" and "Expression 2", the values for a given condition type do not necessarily conform to any formal definition of the term **expression**. They are simply text values appropriate for the selected condition type.

Figure 4–3 Condition Attribute


Conditions
Condition Type
- Select Condition Type -
[PL/SQL] [item=value] [item not null] [request=e1] [page in] [page not in] [exists] [none] [never]
Expression 1
Expression 2

To view a complete listing of all available conditions for a given component or control click the **View** icon to the right of the Condition Type list. Shortcuts to common selections appear directly beneath the list. If your condition requires an expression, enter it in the appropriate field.

The following sections offer examples of some commonly used condition types.

See Also: Appendix A, "Available Conditions" on page A-1 for a detailed listing of condition types available in Oracle HTML DB

Current Page in Expression 1

Current page in Expression 1 evaluates to true if the current page ID is contained within the comma-delimited list of pages in Expression 1. For example:

```
100
```

If the current page is 100, then this condition evaluates to true and the condition passes.

Exists

Exists (SQL query returns at least one row) is expressed as a SQL query. If the query returns at least one row, then the condition evaluates as true. For example:

```
SELECT 1 FROM emp WHERE deptno = :P101_DEPTNO
```

This example references item `P101_DEPTNO` as a bind variable. You can use bind variables within application processes and SQL query regions to reference item session state. If one or more employees are in the department identified by the value of `P101_DEPTNO`, then the condition evaluates as true.

See Also: "About Bind Variables" on page 4-13

PL/SQL Expression

Use **PL/SQL Expression** to specify an expression in valid PL/SQL syntax that evaluates to true or false. For example:

```
NVL(:MY_ITEM,'NO') = 'YES'
```

If the value of `:MY_ITEM` is Yes, then the condition evaluates as true. Otherwise, it evaluates as false.

Verifying User Identity

Authentication is the process of establishing users' identities before they can access an application. Authentication may require a user enter a user name and password, or may involve the use of a digital certificate or a secure key.

Oracle HTML DB supports modular authentication, making it easy to switch authentication methods when needed. You can establish a user's identity by selecting from a number of built-in authentication methods, or by using a wizard to create your own custom authentication approach.

See Also: "Establishing User Identity Through Authentication" on page 13-13 for more information

Controlling Access to Controls and Components

While conditions control the rendering and processing of specific controls or components on a page, authorization schemes control user access. Authorization is a broad term for controlling access to resources based on user privileges.

Authorization schemes extend the security of your application's authentication scheme. You can specify an authorization scheme for an entire application, a page, or specific page control such as a region, item, or button. For example, you could use an authorization scheme to selectively determine which tabs, regions, or navigations bar entries a user sees.

See Also: "Providing Security Through Authorization" on page 13-20

Understanding Session State Management

HTTP, the protocol over which HTML pages are most often delivered, is a stateless protocol. A Web browser is only connected to the server for as long as it takes to download a complete page. In addition, each page request is treated by the server as an independent event, unrelated to any page requests that happened previously or may occur in the future. This means that to access form values entered on one page on a subsequent page, some form of session state management needs to occur. Typically, when a user enters values into a form on one page, those values are not accessible on later pages. Oracle HTML DB transparently maintains session state and provides developers with the ability to get and set session state values from any page in the application.

Topics in this section include:

- What Is a Session?
- Understanding Session IDs
- Referencing Session State

What Is a Session?

A **session** is a logical construct that establishes persistence (or stateful behavior) across page views. Each session is assigned a unique identifier within Oracle HTML DB. The HTML DB engine uses this identifier (or session ID) to store and retrieve an application's working set of data (or session state) before and after each page view.

Because sessions are entirely independent of one another, any number of sessions can exist in the database at the same time. Because sessions persist in the database until purged by an administrator, a user can return to an old session and continue running an application long after first launching it. A user can also run multiple instances of an application simultaneously in different browser sessions.

Oracle HTML DB sessions are logically and physically distinct from Oracle database sessions used to service page requests. A user runs an application in a single Oracle HTML DB session from log in to log out with a typical duration measured in minutes or hours. Each page requested during that session results in the HTML DB engine creating or reusing an Oracle database session to access database resources. Often these database sessions last just a fraction of a second.

Understanding Session IDs

The HTML DB engine establishes the identity (or anonymity) of the user for each page request and the session ID to fetch session state from the database. The most visible location of the session ID is in the URL for a page request. Another visible location is in the page's HTML POST data and indirectly in the contents of a session cookie. This cookie is sent by the HTML DB engine during authentication and is maintained for the life of the application (or browser) session.

POST structures or in a session cookie sent by the HTML DB engine during authentication and maintained for the life of the application (or browser) session.

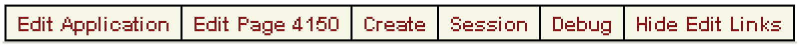
Oracle HTML DB assigns new session IDs during authentication processing, records the authenticated user's identity with the session ID, and continually checks the session ID in each page request's URL or POST data with the session cookie and the session record in the database. These checks provide users with flexibility and security.

While the session ID is the key to session state, the session cookie (where applicable) and the session record safeguard the integrity of the session ID and the authentication status of the user.

Viewing Session State

The behavior of an HTML DB application is usually driven by values in session state. For example, a button may display conditionally based on the value of an item session state. You can view the session state for a page by clicking **Session** on the Developer toolbar.

Figure 4–4 Developer Toolbar



See Also: "Using the Developer Toolbar" on page 5-18 for more information about the Developer toolbar

About the Session State Page

The Session State page provides valuable information about the current page. To locate a specific page, enter the page ID in the page field and click **Go**. Table 4–1 describes the various types of information available on the Session State page.

Table 4–1 Information Available on the Session State Page

Heading	Description
Application	Identifies the application name, session ID, current user, workspace ID, and browser language.
Page Items	Identify attributes of the page item, including the application and page IDs, item name, how the item displays (hidden, popup, button, display only HTML), the item value in session state, and status. The Status column indicates the status of the session state. Available values include: ■ I - Inserted ■ U - Updated ■ R - Reset
Application Items	Application items are items that do not reside on a page. Application items are session state variables without the associated user interface properties. **See Also**: "Creating an Application-Level Item" on page 6-58 and "Using Substitution Strings" on page 4-16 for information about referencing item values
Session State	Summarizes session state for the current session. Lists applicable application IDs, page IDs, item names, display type, item values, and display labels.

See Also: "Managing Session State Values" on page 4-10

Managing Session State Values

When building interactive, data driven Web applications, the ability to access and manage session state values is critical. In Oracle HTML DB, session state is automatically managed for every page and easily referenced in static HTML or logic controls such as processes or validations.

Topics in this section include:

- Referencing Session State
- Setting Session State
- Clearing Session State
- About Bind Variables

See Also: "Items" on page 5-23 and "Referencing Item Values" on page 6-55

Referencing Session State

Referencing the value of an item is one of the most common examples of referencing session state. In Oracle HTML DB, an item can be a field, a text area, a password, a select list, or check box. Table 4–2 describes the supported syntax for referencing item values.

Table 4–2 Syntax for Referencing Item Values

Type	Syntax	Description
SQL	`:MY_ITEM`	Standard bind variable syntax for items whose names are no longer than 30 characters. Use this syntax for references within a SQL query and within PL/SQL.
PL/SQL	`V('MY_ITEM')`	PL/SQL syntax referencing the item value using the `V` function. **See Also:** "Oracle HTML DB APIs" on page 16-1
PL/SQL	`NV('MY_NUMERIC_ITEM')`	Standard PL/SQL syntax referencing the numeric item value using the `NV` function. **See Also:** "Oracle HTML DB APIs" on page 16-1
Static text (exact)	`&MY_ITEM.`	Static text. Exact substitution.

Setting Session State

When a user submits a page in Oracle HTML DB, the HTML DB engine automatically stores values typed into fields (items) in session state. For example, suppose you have an application containing two pages. The first page of the application contains a form in which a user can enter a phone number. You defined this form by creating an item named *`P2_PhoneNo`*. On the second page, you want to display the information the user enters in the form.

When the page is submitted, Oracle HTML DB captures the value entered in the phone number field and stores the value for future use. The phone number entered by the user can then be retrieved from session state by referencing the item associated with the field on the page.

Clearing Session State

As you develop your applications, you may find it useful to clear the cached value for specific items, all items on a page, all pages in an application, or the current user session. Clearing a cached value resets the value to null. The topics that follow offer specific examples of clearing session state.

Topics in this section include:

- Clearing Cache by Item
- Clearing Cache by Page
- Clearing Cache for an Entire Application
- Clearing Cache for the Current User Session

Clearing Cache by Item

Clearing cache for a single item resets the value of the item to null. For example, you might use this approach to make sure a specific item's value is null when a page is prepared for rendering.

The following example uses standard `f?p` syntax to clear the cache for an item. This example calls page 5 of application 100. Placing `MY_ITEM` in the `ClearCache` position of the `f?p` syntax resets the value of `MY_ITEM` to `NULL`.

```
f?p=100:5:&SESSION.::NO:MY_ITEM
```

The following example resets the value of the items *`THE_EMPNO`* and *`THE_DEPTNO`*.

```
f?p=100:5:&SESSION.::NO:THE_EMPNO,THE_DEPTNO
```

Clearing Cache by Page

Caching application items provides an effective way to maintain session state. However, there are occasions when you may want to clear the cache for all items on a page. For example, suppose you needed to clear all fields on page when a user clicks a link that creates a new order. By clearing the cache for an entire page, you set the value of all items on the page to null.

Clearing Session Cache for Two Pages While Resetting Pagination This example clears the session cache for two pages and resets pagination.

```
f?p=6000:6003:&SESSION.::NO:RP,6004,6014
```

This example:

- Runs page 6003 of application 6000 and uses the current session ID
- Indicates to not show debug information (`NO`)
- Clears all values maintained by the current session's cache for items of pages 6004 and 6014
- Resets region pagination (`RP`) on page 6003 (the requested page)

See Also: "Controlling Report Pagination" on page 6-19

Clearing Session Cache on a Page and Passing an Item Value This example shows how to implement an update form. It clears existing information and sets the item's value (typically a primary key).

```
f?p=6000:6003:&SESSION.::NO:6003:MY_ITEM:1234
```

This example:

- Runs page 6003 of application 6000 and use the current session ID
- Indicates to not show debug information (`NO`)
- Clears all values maintained by the current session's cache for items on page 6003
- Sets the session state of an item called `MY_ITEM` to the value `1234`

Clearing Session Cache on a Page and Passing Values to Multiple Items This example is similar to the previous example, except it passes values to multiple items.

```
f?p=6000:6004:&SESSION.::NO:6003:MY_ITEM1,MY_ITEM2,MY_ITEM3:1234,,5678
```

This example:

- Runs page 6004 of application 6000 and use the current session ID
- Clears the current session's cache for items on page 6003

- Indicates debug information should be hidden (NO)
- Sets the value of MY_ITEM1 to 1234, sets the value of MY_ITEM2 to null (indicated by the comma used as placeholder), and sets the value of MY_ITEM3 to 5678

Clearing Cache for an Entire Application

You can clear an application's cache by using f?p syntax by creating a Clear Cache argument using the keyword *APP* using the following syntax:

```
f?p=App:Page:Session::NO:APP
```

Note: Resetting the cache for an entire application does not restore the application to a completely reset state. For example, if an application includes on-new instance computations or on-new instance processes, the HTML DB engine runs these computations and processes when the application session is created. Then, it processes the clear cache request and displays the requested page.

The only way to reset the application completely without a session ID (if no cookie is used to track the session ID) is to request it using a URL without a session ID, or by calling HTMLDB_ APPLICATION.CLEAR_APP_CACHE from another application. If the session ID is tracked using a cookie, you will need to logout to reset the state.

Clearing Cache for the Current User Session

You can also clear an application's cache by using f?p syntax. Create a Clear Cache argument using the keyword SESSION. For example:

```
f?p=6000:6004:12507785108488427528::NO:SESSION
```

About Bind Variables

You can use bind variables within an application process or SQL query to reference session state of a specified item. For example:

```
SELECT * FROM emp WHERE name like '%' || :SEARCH_STRING || '%'
```

In this example, the search string is a page item. If the region type is defined as SQL Query, you can reference the value using standard SQL bind variable syntax. Using bind variables ensures that parsed representations of SQL queries are reused by the database, optimizing memory usage by the server.

When using bind variable syntax, remember the following rules:

- Bind variable names must correspond to an item name.
- Bind variable names are not case-sensitive.
- Bind variable names cannot be longer than 30 characters (that is, they must be a valid Oracle identifier).

  Although page item and application item names can be up to 255 characters, if you intend to use an application item within SQL using bind variable syntax, the item name must be 30 characters or less.

Using Bind Variables in Regions Based on a SQL Query or LOV

If your region type is defined as a SQL Query, SQL Query (plsql function body returning SQL query), or list of values (LOV), you can reference session state using the following syntax:

```
:MY_ITEM
```

One common way to do this is to incorporate a session state variable in a `WHERE` clause. The following example shows how to bind the value of the item `THE_DEPTNO` into a region defined from a SQL Query.

```
SELECT ename, job, sal
FROM emp
WHERE deptno = :THE_DEPTNO
```

See Also: "Customizing Regions" on page 7-2 for information about creating regions

Using Bind Variables in PL/SQL Procedures

For region types defined as a PL/SQL Procedure, regions are constructed using PL/SQL anonymous block syntax. In other words, the beginning and ending are added automatically around the PL/SQL. For example:

```
INSERT INTO emp (empno, ename, job)
VALUES (:P1_empno, :P1_name, :P1_job);
```

In this example, the values of the `empno`, `ename`, and `job` are populated by the values of `P1_empno`, `P1_name`, and `P1_job`.

Understanding URL Syntax

Each application has a number (called an application ID) that uniquely identifies it. Similarly, each page also has a unique number (called a page ID). Applications and pages may also have alphanumeric aliases. Application aliases are unique within the workspace and page aliases are unique within each application. When you run an application, the HTML DB engine generates a session number that serves as a key to the user's session state.

Topics in this section include:

- Understanding the URL that Displays for a Page
- Using f?p Syntax to Link Pages
- Calling a Page Using an Application and Page Alias
- Calling a Page from a Button URL

Understanding the URL that Displays for a Page

The URL that displays for each page indicates the location of Oracle HTML DB and identifies the application ID, page ID, and session ID. For example:

```
http://htmldb.oracle.com/pls/otn/f?p=4350:1:220883407765693447
```

This example indicates:

- The address of Oracle HTML DB is:

  ```
  http://htmldb.oracle.com/pls/otn/
  ```

- The application ID is `4350`.
- The page ID is `1`.
- The session ID is `220883407765693447`.

Using f?p Syntax to Link Pages

You can create links between pages in your application using the following syntax:

```
f?p=App:Page:Session:Request:Debug:ClearCache:itemNames:itemValues:PrinterFriendly
```

Table 4–3 describes the arguments you can pass when using `f?p` syntax.

Table 4–3 f?p Syntax Arguments

Syntax	Description
`App`	Indicates an application ID or alphanumeric alias.
`Page`	Indicates a page ID or alphanumeric alias.
`Session`	Identifies a session ID. You can reference a session ID to create hypertext links to other pages that maintain the same session state by passing the session number. You can reference the session ID using the syntax: ■ Short substitution string: `&SESSION`. ■ PL/SQL: `V('SESSION')` ■ Bind variable: `:APP_SESSION`
`Request`	Sets the value of `REQUEST`. Each application button sets the value of `REQUEST` to the name of the button. This enables accept processing to reference the name of the button when a user clicks it. You can reference `REQUEST` using the syntax: ■ Substitution string: `&REQUEST`. ■ PL/SQL: `V('REQUEST')` ■ Bind variable: `:REQUEST`
`Debug`	Displays application processing details. Valid values for the DEBUG flag are `YES` or `NO`. Setting this flag to `YES` displays details about application processing. You can reference the Debug flag using the following syntax: ■ Short substitution string: `&DEBUG`. ■ PL/SQL: `V('DEBUG')` ■ Bind variable: `:DEBUG`
`ClearCache`	Clears the cache. Clearing the cache for a single item simply sets the value of the list of names to null. To clear cached items, use a comma-delimited list of page IDs. Comma-delimited lists can also contain collections to be reset or the keyword `RP`, which resets region pagination on the requested page.
`itemNames`	Comma-delimited list of item names used to set session state with a URL.
`itemValues`	List of item values used to set session state within a URL. Item values cannot include colons, but can contain commas if enclosed with backslashes. To pass a comma in an item value, enclose the characters with backslashes. For example: `\123,45\`

Table 4–3 (Cont.) f?p Syntax Arguments

Syntax	Description
`PrinterFriendly`	Determines if the page is being rendered in printer friendly mode. If PrinterFriendly is set to Yes, then the page is rendered in printer friendly mode. The value of PrinterFriendly can be used in rendering conditions to remove elements such as regions from the page to optimize printed output.You can reference the printer friendly preference by using the following syntax: `V('PRINTER_FRIENDLY')` When referenced, the HTML DB engine will not display tabs or navigation bars, and all items will be displayed as text and not as form elements.

Although it is important to understand how `f?p` syntax works, you rarely have to construct this syntax yourself. Oracle HTML DB includes many wizards that automatically create these references for you. The following sections describe specific instances that utilize `f?p` syntax to link pages.

Calling a Page Using an Application and Page Alias

Application and page aliases must consist of valid Oracle identifiers, cannot contain any whitespace, and are not case-sensitive. The following example calls a page using an application and a page alias from within an Oracle HTML DB application. It runs the page *home* of the application *myapp* and uses the current session ID.

```
f?p=myapp:home:&SESSION.
```

Application aliases must be unique within a workspace. If applications in different workspaces within the same Oracle HTML DB instance have the same application alias, use the `&c` argument to specify the workspace name. For example:

```
f?p=common_alias:home:&session.&c=WORKSPACE_A
```

Calling a Page from a Button URL

When you create a button, you can specify a URL to redirect to when the user clicks the button. This example runs page 6001 of application 6000 and uses the current session ID.

```
f?p=6000:6001:&SESSION.
```

Note that this is only one approach to using a button in Oracle HTML DB. This method bypasses page submission and acts as a hyperlink on the page. Another method is to submit the page first. In that approach, clicking the button submits the page for processing, allowing forms to be submitted and session state to be saved.

See Also: "Creating Buttons" on page 6-48

Using Substitution Strings

You can use substitution strings within a page template or region source to replace a character string with another value. As you design your application and enable users to edit items, you will need to use substitution strings in order to pass information.

You can use substitution strings in Oracle HTML DB in the following ways.

- Include a substitution string within a template
- Reference page or application items using `&ITEM.` syntax
- Use built-in substitution strings to achieve a specific type of functionality

Substitution strings used within a template are delimited by the number symbol (#). For example:

```
#ABC#
```

To reference page or application items using substitution variables:

1. Precede the item name with an ampersand (&).
2. Append a period (.) to the item name.

For example, you would refer to an application item named `F101_X` in an HTML region, a region title, an item label, or in any of numerous other contexts as:

```
&F101_X.
```

Notice the required trailing period. When the page is rendered, HTML DB engine replaces value the substitution string with the value of item `F101_X`.

Built-in Substitution Strings

Application Builder supports a number of built-in substitution strings. You may need to reference these values to achieve specific types of functionality.

The following sections describe these substitution strings, when to use them, and what supported syntax is currently available. Note that bind variable `:USER` is not used by Oracle HTML DB as it has special meaning within the database.

Topics in this section include:

- APP_ALIAS
- APP_ID
- APP_IMAGES
- APP_PAGE_ID
- APP_SESSION
- APP_UNIQUE_PAGE_ID
- APP_USER
- AUTHENTICATED_URL_PREFIX
- BROWSER_LANGUAGE
- CURRENT_PARENT_TAB_TEXT
- DEBUG
- HOME_LINK
- LOGIN_URL
- IMAGE_PREFIX
- HTML DB SCHEMA OWNER
- PRINTER_FRIENDLY
- LOGOUT_URL

- PROXY SERVER
- PUBLIC_URL_PREFIX
- REQUEST
- SQLERRM
- SYSDATE_YYYYMMDD
- WORKSPACE_IMAGES

See Also:

- "Substitutions" on page 5-9 for information about defining static substitution strings as an application attribute
- "Establishing User Identity Through Authentication" on page 13-13 for information about authentication

APP_ALIAS

APP_ALIAS is an alphanumeric name for the current application. APP_ALIAS is different from the APP_ID in that the APP_ID must be unique over all workspaces and all applications hosted in one database. In contrast, APP_ALIAS must be unique within a workspace. For example, by using the same APP_ALIAS you can create the application, ABC, in two different workspaces. You can use APP_ALIAS almost anywhere APP_ID can be used. For example, f?p syntax can use an APP_ALIAS or an application ID as demonstrated in this example:

```
f?p=ABC:1:&SESSION.
```

This example runs application ABC, page 1 using the current session.

Table 4–4 describes the supported syntax for referencing APP_ALIAS.

Table 4–4 APP_ALIAS Syntax

Reference Type	Syntax
Bind variable	:APP_ALIAS
PL/SQL	V('APP_ALIAS')
Substitution string	&APP_ALIAS.

The following is an HTML example:

```
Click me to go to page 1 <a href="f?p=&APP_ALIAS.:1:&SESSION."> of the current
application</a>
```

APP_ID

APP_ID identifies the application ID of the currently executing application. Table 4–5 describes the supported syntax for referencing APP_ID.

Table 4–5 APP_ID Syntax

Reference Type	Syntax
Bind variable	:APP_ID
Direct PL/SQL	HTMLDB_APPLICATION.G_FLOW_ID (A NUMBER)
PL/SQL	NV('APP_ID')

Table 4–5 (Cont.) APP_ID Syntax

Reference Type	Syntax
Substitution string	`&APP_ID.`

The following is an example of a substitution string reference:

```
f?p=&APP_ID.:40:&SESSION.
```

APP_IMAGES

Use this substitution string to reference uploaded images, JavaScript, and cascading style sheets that are specific to a given application and are not shared over many applications. If you upload a file and make it specific to an application, then you must use this substitution string, or bind variable. Table 4–6 describes the supported syntax for referencing `APP_IMAGES`.

Table 4–6 APP_IMAGES Syntax

Reference Type	Syntax
Bind variable	`:APP_IMAGES`
Direct PL/SQL	Not available.
PL/SQL	`V('APP_IMAGES')`
Substitution string	`&APP_IMAGES.`
Template substitution	`#APP_IMAGES#`

See Also: "IMAGE_PREFIX" on page 4-23, "WORKSPACE_IMAGES" on page 4-27, and "Uploading Images" on page 7-45

APP_PAGE_ID

`APP_PAGE_ID` is the current application ID. For example, if your application were on page 3, then the result would be 3. Using this syntax is useful when writing application components that need to work generically in multiple applications. Table 4–7 describes the supported syntax for referencing `APP_PAGE_ID`.

Table 4–7 APP_PAGE_ID Syntax

Reference Type	Syntax
Bind variable	`:APP_PAGE_ID`
Direct PL/SQL	`HTMLDB_APPLICATION.G_FLOW_STEP_ID (A NUMBER)`
Direct PL/SQL	`:APP_PAGE_ID`
PL/SQL	`NV('APP_PAGE_ID')`
Substitution string	`&APP_PAGE_ID.`

The following is an example of a substitution string reference:

```
f?p=&APP_ID.:&APP_PAGE_ID.:&SESSION.
```

APP_SESSION

`APP_SESSION` is one of the most commonly used built-in substitution strings. You can use this substitution string to create hypertext links between application pages that maintain a session state by passing the session number. Table 4–8 describes the supported syntax for referencing `APP_SESSION`.

Table 4–8 APP_SESSION Syntax

Reference Type	Syntax
Bind variable	`:APP_SESSION`
PL/SQL	`V('APP_SESSION')`
Short PL/SQL	`V('SESSION')`
Short substitution string	`&SESSION.`
Substitution string	`&APP_SESSION.`

Consider the following examples:

- From within an HTML region:

```
<a href="f?p=100:5:&SESSION.">click me</a>
```

- Using PL/SQL:

```
htf.anchor('f?p=100:5:'||V('SESSION'),'click me');
```

- Using a SQL query:

```
SELECT htf.anchor('f?p=100:5:'||:app_session,'clickme') FROM DUAL;
```

APP_UNIQUE_PAGE_ID

`APP_UNIQUE_PAGE_ID` is an integer generated from an Oracle sequence which is unique for each page view. This number is used by applications to prevent duplicate page submissions and can be used for other purposes. For example, if you want to make a unique URL to avoid browser caching issues, you can embed this number in the request or debug column in calls to the `f` procedure. Table 4–9 describes the supported syntax for referencing `APP_UNIQUE_PAGE_ID`.

Table 4–9 APP_UNIQUE_PAGE_ID Syntax

Reference Type	Syntax
Bind variable	`:APP_UNIQUE_PAGE_ID`
PL/SQL	`V('APP_UNIQUE_PAGE_ID')`
Substitution string	`&APP_UNIQUE_PAGE_ID.`

The following is an HTML example:

```
SELECT 'f?p=100:1:'||:APP_SESSION||':'||:APP_UNIQUE_PAGE_ID||
    ':::P1_EMPNO:'||empno,
   ename,
    job
FROM emp
```

Note the use of the `APP_UNIQUE_PAGE_ID` in the request column. This makes this URL unique and may avoid excessive browser caching problems.

APP_USER

`APP_USER` is the current user running the application. Depending upon your authentication model, the value of the user is set differently. If the application is running using database authentication, then the value of the user is the same as the database pseudo column USER. If the application uses an authentication scheme that requires the user to authenticate, the value of `APP_USER` is set by the authentication scheme, usually to the user name used during authentication. Table 4–10 describes the supported syntax for referencing `APP_USER`.

Table 4–10 APP_USER Syntax

Reference Type	Syntax
Bind variable	`:APP_USER`
PL/SQL	`V('APP_USER')`
Short PL/SQL	`V('USER')`
Substitution string	`&USER.`

Consider the following examples:

- From within an HTML region:

```
Hello you are logged in as &USER.
```

- Using PL/SQL:

```
htp.p('Hello you are logged in as'||V('USER'));
```

- As a bind variable:

```
SELECT * FROM some_table WHERE user_id = :app_user
```

> **See Also:** "Authentication" on page 5-12 for information about the Public User attribute

AUTHENTICATED_URL_PREFIX

This application-level attribute identifies a valid authenticated prefix (that is, a logged in URL prefix). You can use a relative path or a full path beginning with `http`. This item is useful if your application can be run in both authenticated (logged in) and public (not logged in) modes. You can use `AUTHENTICATED_URL_PREFIX` to construct a link to an authenticated page. This item is most useful when using basic database authentication because changes to the URL can require authentication. Table 4–11 describes the supported syntax for referencing `AUTHENTICATED_URL_PREFIX`.

Table 4–11 AUTHENTICATED_URL_PREFIX Syntax

Reference Type	Syntax
Bind variable	`:AUTHENTICATED_URL_PREFIX`
PL/SQL	`V('AUTHENTICATED_URL_PREFIX')`
Substitution string	`&AUTHENTICATED_URL_PREFIX.`

BROWSER_LANGUAGE

BROWSER_LANGUAGE refers to the Web browser's current language preference. Table 4–12 describes the supported syntax for referencing BROWSER_LANGUAGE.

Table 4–12 BROWSER_LANGUAGE Syntax

Reference Type	Syntax
Bind variable	`:BROWSER_LANGUAGE`
Direct PL/SQL	`HTMLDB_APPLICATION.G_BROWSER_LANGUAGE`
PL/SQL	`V('BROWSER_LANGUAGE')`
Substitution string	`:BROWSER_LANGUAGE.`
Substitution string	`&BROWSER_LANGUAGE.`

CURRENT_PARENT_TAB_TEXT

CURRENT_PARENT_TAB_TEXT is most useful in page templates, but is only relevant for applications that use two-level tabs (that is, parent and standard tabs). Use this string to reference the parent tab label. This substitution string enables you to repeat the currently selected parent tab within the page template. Table 4–13 describes the supported syntax for referencing CURRENT_PARENT_TAB_TEXT.

Table 4–13 CURRENT_PARENT_TAB_TEXT Syntax

Reference Type	Syntax
Bind variable	Not Available.
Substitution string	`&CURRENT_PARENT_TAB_TEXT.`

DEBUG

Valid values for the DEBUG flag are Yes or No. Turning debug on shows details about application processing. If you write your own custom code, you may want to generate debug information only if the debug mode is set to Yes. Table 4–14 describes the supported syntax for referencing DEBUG.

Table 4–14 DEBUG Syntax

Reference Type	Syntax
Bind variable	`:DEBUG`
Direct PL/SQL	`HTMLDB_APPLICATION.G_DEBUG`
PL/SQL	`V('DEBUG')`
Substitution string	`&DEBUG.`

The following is an example of a substitution string reference that preserves the current value of DEBUG:

```
f?p=100:1:&SESSION.::&DEBUG
```

HOME_LINK

HOME_LINK is the home page of an application. The HTML DB engine will redirect to this location if no page is given and if no alternative page is dictated by the authentication scheme's logic. You define the Home Link on the Application Attributes page.

Table 4–15 describes the supported syntax for referencing HOME_LINK.

Table 4–15 HOME_LINK Syntax

Reference Type	Syntax
Direct PL/SQL	`HTMLDB_APPLICATION.G_HOME_LINK`
PL/SQL	`V('HOME_LINK')`
Template Reference	`#HOME_LINK#`
Substitution String	`&HOME_LINK.`

See Also: "Authentication" on page 5-12 for information about the Home Link attribute

LOGIN_URL

Use `LOGIN_URL` to display a link to a login page for users that are not currently logged in. Table 4–16 describes the supported syntax for `LOGIN_URL`.

See Also: "Authentication" on page 5-12 and "Editing Security Attributes" on page 5-12

Table 4–16 LOGIN_URL Syntax

Reference Type	Syntax
Bind variable	`:LOGIN_URL`
Direct PL/SQL	`HTMLDB_APPLICATION.G_LOGIN_URL`
PL/SQL	`V('LOGIN_URL')`
Substitution string	`&LOGIN_URL.`
Template Substitution	`#LOGIN_URL#`

IMAGE_PREFIX

The value of `IMAGE_PREFIX` determines the virtual path the Web server uses to point to the images directory distributed with Oracle HTML DB. If you want to reference uploaded images, use `WORKSPACE_IMAGES` and `APP_IMAGES`. Table 4–17 describes the supported syntax for referencing `IMAGE_PREFIX`.

See Also: "APP_IMAGES" on page 4-19,"WORKSPACE_IMAGES" on page 4-27, and "Configuring Standard Application Attributes" on page 5-6

Table 4–17 IMAGE_PREFIX Syntax

Reference Type	Syntax
Bind variable	`:IMAGE_PREFIX`
Direct PL/SQL	`HTMLDB_APPLICATION.G_IMAGE_PREFIX`
PL/SQL	`V('IMAGE_PREFIX')`
Substitution string	`&IMAGE_PREFIX.`
Template Substitution	`#IMAGE_PREFIX#`

HTML DB SCHEMA OWNER

If you are generating calls to applications from within your PL/SQL code, you may need to reference the owner of the Oracle HTML DB schema. The following describes the correct syntax for a direct PL/SQL reference:

```
HTMLDB_APPLICATION.G_FLOW_SCHEMA_OWNER
```

You may also use `#FLOW_OWNER#` to reference this value in SQL queries and PL/SQL (for example, in a region or a process).

PRINTER_FRIENDLY

The value of `PRINTER_FRIENDLY` determines if the HTML DB engine is running in print view mode. This setting can be referenced in conditions to eliminate elements not desired in a printed document from a page. Table 4–18 describes the supported syntax for referencing `PRINTER_FRIENDLY`.

Table 4–18 PRINTER_FRIENDLY Syntax

Reference Type	Syntax
Direct PL/SQL	`HTMLDB_APPLICATION.G_PRINTER_FRIENDLY (VARCHAR2 DATATYPE)`
PL/SQL	`V('PRINTER_FRIENDLY')`
Substitution string	`&PRINTER_FRIENDLY.`

LOGOUT_URL

`LOGOUT_URL` is an application-level attribute used to identify the logout URL. This is a URL that navigates the user to a logout page or optionally directly logs out a user. To create a logout navigation bar entry, add a trailing period to `&LOGOUT_URL` (`&LOGOUT_URL.`). If you are coding a page template, use `#LOGOUT_URL#`. Table 4–19 describes the supported syntax for referencing `LOGOUT_URL`.

Table 4–19 LOGOUT_URL Syntax

Reference Type	Syntax
Bind variable	`:LOGOUT_URL`
PL/SQL	`V('LOGOUT_URL')`
Substitution string	`&LOGOUT_URL.`
Template substitution	`#LOGOUT_URL#`

PROXY SERVER

`PROXY SERVER` is an application attribute. The attribute may be used by regions whose source comes from a URL. The following is the correct syntax for a direct PL/SQL reference used when you are writing PL/SQL to access remote Web servers from within the database (for example, when using the `utl_http package` shipped with the database).

```
HTMLDB_APPLICATION.G_PROXY_SERVER
```

PUBLIC_URL_PREFIX

PUBLIC_URL_PREFIX is an application-level attribute that identifies a URL to toggle out of a logged in mode to a public view. Table 4–20 describes the supported syntax for referencing PUBLIC_URL_PREFIX.

Table 4–20 PUBLIC_URL_PREFIX Syntax

Reference Type	Syntax
Bind variable	`:PUBLIC_URL_PREFIX`
PL/SQL	`V('PUBLIC_URL_PREFIX')`
Substitution string	`&PUBLIC_URL_PREFIX.`
Template substitution	`#PUBLIC_URL_PREFIX#`

REQUEST

Each application button sets the value of REQUEST to the name of the button or to the request value attribute associated with the button. This enables accept processing to reference the name of the button when a user clicks it. In the f?p syntax, REQUEST may be set using the fourth argument.

Referencing the Value of REQUEST REQUEST is typically referenced during Accept processing (that is, the processing that occurs when you post a page). Table 4–21 describes the supported syntax for referencing REQUEST.

Table 4–21 REQUEST Syntax

Reference Type	Syntax
Bind variable	`:REQUEST`
Direct PL/SQL	`HTMLDB_APPLICATION.G_REQUEST`
PL/SQL	`V('REQUEST')`
Substitution string	`&REQUEST`
	`&REQUEST.` (exact syntax match)

Scope and Value of REQUEST for Posted Pages When you post a page, you initiate Accept processing. Accept processing consists of computations, validations, processes, and branches. The value of REQUEST is available during each phase of the Accept processing. Once Oracle HTML DB branches to a different page then REQUEST is set to NULL.

The value of REQUEST is the name of the button the user clicks, or the name of the tab the user selects. For example, suppose you have a button with a name of CHANGE, and a label Apply Change. When a user clicks the button, the value of REQUEST will be CHANGE.

Referencing REQUEST Using Declarative Conditions It is common to reference REQUEST using conditions. For example, you may want to reset pagination when a user clicks **Go** on a report page. You can reset pagination by creating an on-submit page process. The page process can be made conditional using the condition Request = Expression 1.

To create an on-submit page process:

1. Under Condition, select the condition type **Request = Expression 1**.

2. In Expression 1, enter **GO**.

Using REQUEST for Show Processing You can also use REQUEST for Show processing when navigating to a page using f?p syntax. For example:

```
f?p=100:1:&SESSION.:GO
```

Remember that the fourth argument in the f?p syntax is REQUEST. This example goes to application 100, page 1 for the current session, and sets the value of REQUEST to GO. Any process or region can reference the value of REQUEST using Show processing.

The following is a similar example using PL/SQL:

```
IF V ('REQUEST') = 'GO' THEN
   htp.p('hello');
END IF;
```

Note that `htp.p('hello')` is a call to a PL/SQL Web Toolkit package to print out the specified text string.

See Also:

- *Oracle Database Application Developer's Guide - Fundamentals* for information about developing Web applications with PL/SQL
- *Oracle Database PL/SQL Packages and Types Reference* for information about htp packages

SQLERRM

SQLERRM is a template substitution only available in the Applications Region Error Message. The following describes the correct syntax for a region template substitution reference:

```
#SQLERRM#
```

SYSDATE_YYYYMMDD

SYSDATE_YYYYMMDD represents the current date on the database server, with the *YYYYMMDD* format mask applied. You may use this value instead of repeated calls to the SYSDATE() function. The following list describes the supported syntax for referencing SYSDATE_YYYYMMDD.

- Bind variable

  ```
  :SYSDATE_YYYYMMDD
  ```

- PL/SQL

  ```
  V('SYSDATE_YYYYMMDD')
  ```

- Direct PL/SQL

  ```
  HTMLDB_APPLICATION.G_SYSDATE (DATE DATATYPE)
  ```

Table 4–22 SYSDATE_YYYYMMDD Syntax

Reference Type	Syntax
Bind variable	`:SYSDATE_YYYYMMDD`
Direct PL/SQL	`HTMLDB_APPLICATION.G_SYSDATE (DATE DATATYPE)`
PL/SQL	`V('SYSDATE_YYYYMMDD')`

WORKSPACE_IMAGES

Use this substitution string to reference uploaded images, JavaScript, and cascading style sheets that are shared over many applications within a workspace. Table 4–23 describes the supported syntax for referencing `WORKSPACE_IMAGES`.

Table 4–23 WORKSPACE_IMAGES Syntax

Reference Type	Syntax
Bind variable	`:WORKSPACE_IMAGES`
Direct PL/SQL	Not available
PL/SQL	`V('WORKSPACE_IMAGES')`
Substitution string	`&WORKSPACE_IMAGES.`
Template substitution	`#WORKSPACE_IMAGES#`

See Also: "APP_IMAGES" on page 4-19 and "IMAGE_PREFIX" on page 4-23

5 Using Application Builder

This section provides important background information about using Application Builder. You use Application Builder to build dynamically rendered applications in Oracle HTML DB.

This section contains the following topics:

- Accessing Application Builder
- About the Application Builder Home Page
- About the Application Home Page
- About Application Attributes
- About the Page Definition
- Using the Developer Toolbar
- Editing a Page Definition
- Accessing Alternate Page Views
- About the Shared Components Page
- Understanding Application Processes
- Understanding Application Computations
- Viewing Application Reports

See Also:

- "Quick Start" on page 2-1
- "Application Builder Concepts" on page 4-1
- "Building an Application" on page 6-1
- "Controlling Page Layout and User Interface" on page 7-1
- "Adding Navigation" on page 8-1

Accessing Application Builder

An application is a collection of database-driven Web pages linked together using tabs, buttons, or hypertext links. The pages within an application share a common session state definition and authentication method. Application Builder is the tool you use to build the pages that comprise an application.

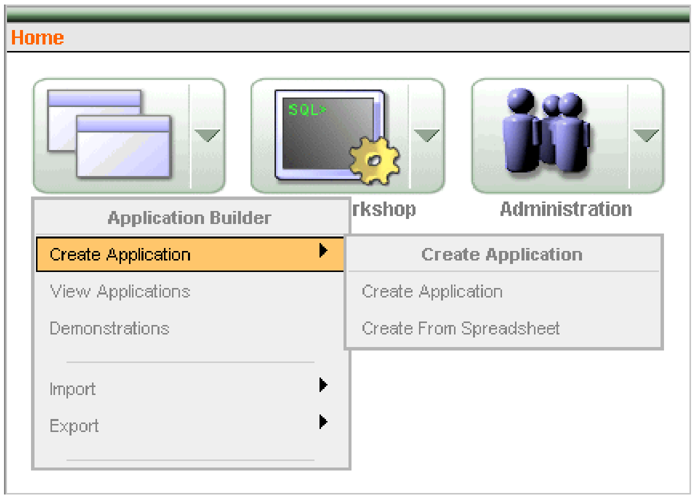
To access Application Builder:

1. Log in to Oracle HTML DB.

The Workspace home page appears.

2. To view the Application Builder home page you can either:
   - Click the Application Builder icon to drill-down to the Application Builder home page.
   - Click the down arrow on the right side of the icon to view a pull-down menu. Then select the appropriate menu option.

Figure 5–1 Application Builder Pull-down Menu

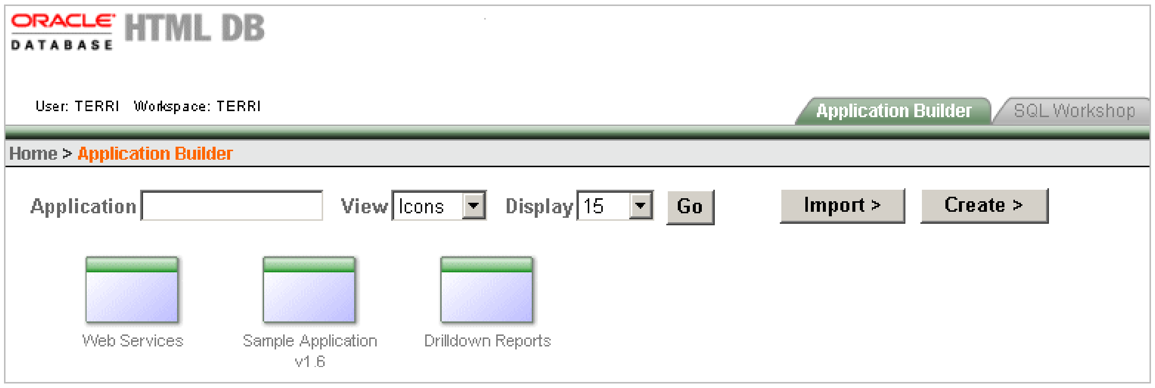


Note: For the purposes of the consistency, this document uses the primary navigation path (or dill-down approach) when explaining navigation.

About the Application Builder Home Page

The Application Builder home page displays all applications you have either installed or created.

Figure 5–2 Application Builder Home Page



You can use the controls at the top of the page to:

- **Search for an application.** Enter keywords in the Application field and click **Go**. To view all applications, leave the Application field blank and click **Go**. You control how many rows display by making a selection from the Display list.
- **Change the View.** By default, each application displays as a large icon. You can change the appearance of the page by making a selection from the View list. Available View options include:
  - **Icons** (the default) displays each application as a large icon identified by the application name.
  - **Details** displays each application as a line in a report. Each line includes the application ID, the application name, when the application was last updated, the page count, and who last updated the application.

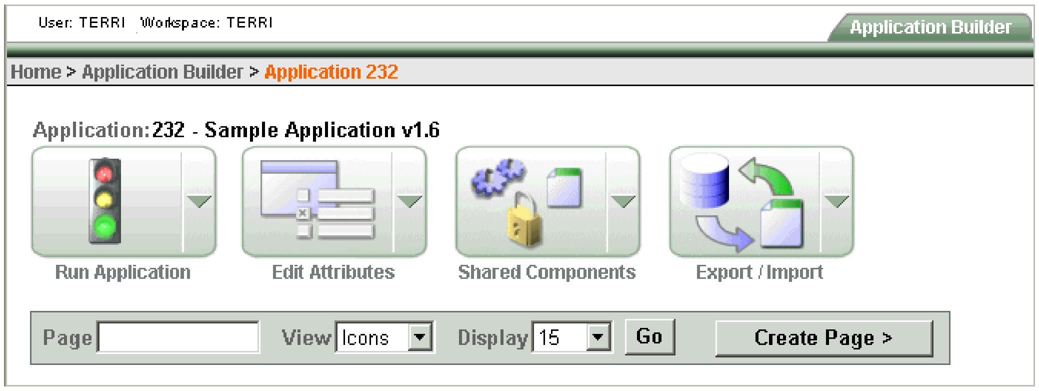
  You can control how many applications display, by making a selection from the Display list.
- **Import an application.** Click **Import** to import an exported application file.
- **Create an application.** Click **Create** to create a new application or install a demonstration application.
- **View an application.** Click the application icon or application name to view a specific application.

See Also: "Importing Export Files" on page 11-11, "Viewing and Installing a Demonstration Application" on page 3-1, and "About Creating an Application Using a Wizard" on page 6-2

About the Application Home Page

To view a specific application, select the application on the Application Builder home page. The Application home page appears. The application ID, the application name, and the parsing schema display at the top of the page.

Figure 5–3 Application Home Page (Top)



User: TERRI Workspace: TERRI

Application Builder

Home > Application Builder > Application 232

Application: 232 - Sample Application v1.6

Page [ ] View Icons Display 15 Go

Create Page >

The following four large icons appear next:

- **Run Application** submits the pages in the current application to the HTML DB engine to render viewable HTML.
- **Edit Attributes** links to the Application Attributes page where you can access Standard Attributes (attributes common to the entire application), Security Attributes, and Globalization Attributes.

- **Shared Components** links to a list of shared components and user interface controls that can display or be applied on every page within an application.
- **Export/Install** links you to the Export Import Wizard. Use this wizard to import and export an entire application as well as related files such as cascading style sheets, images, static files, script files, themes, user interface defaults, and workspaces.

A search bar appears in the center of the page. You can use this search bar to:

- **Search for a page ID or name.** Enter a case insensitive keyword or phrase in the Page field and click **Go**. To view all pages in an application, leave the Page field blank and click **Go**. You control how many rows display by making a selection from the Rows list.
- **Change the Page View.** By default, each page displays as a large icon. You can change the appearance of the page by making a selection from the View list. You can control how many pages display, by making a selection from the Display list.
- **Create a New Page.** Click the **Create Page** button to launch a wizard to create a new page

See Also: "Running a Page or Application" on page 6-10, "Configuring Standard Application Attributes" on page 5-6, "About the Shared Components Page" on page 5-35, "Deploying an Application" on page 11-1, and "Adding Pages to an Application" on page 6-7

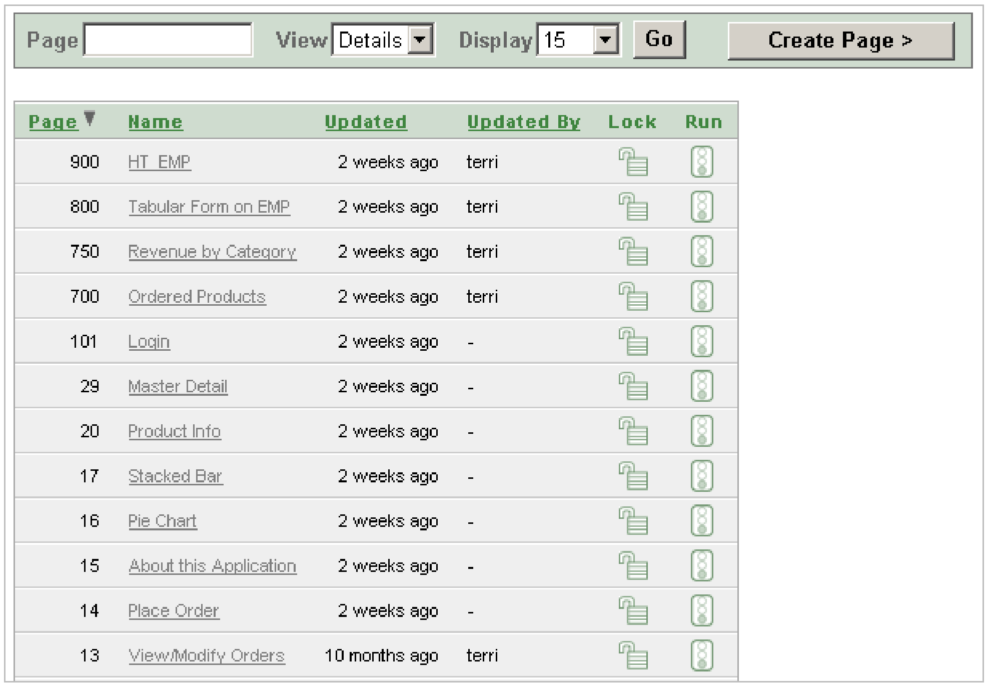
Page Display Alternatives

You can control how the pages display by making a selection from the View list. Available View options include:

- **Icons** (the default) displays each page as a large icon identified by the page name.
- **Details** displays each page as a line in a report. Each line includes the page ID, the page name, when the page was last updated, and who last updated the page.

  This view also includes a Lock and a Run icon. Use the Lock icon to prevent conflicts during application development. Click the **Run** icon to submit a page to the HTML DB engine and render viewable HTML.

Figure 5–4 Application Home Page Details View


Page [ ] View Details Display 15 Go Create Page >

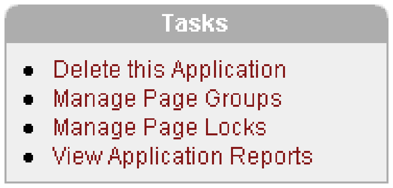
Page	Name	Updated	Updated By	Lock	Run
900	HT_EMP	2 weeks ago	terri		
800	Tabular Form on EMP	2 weeks ago	terri		
750	Revenue by Category	2 weeks ago	terri		
700	Ordered Products	2 weeks ago	terri		
101	Login	2 weeks ago	-		
29	Master Detail	2 weeks ago	-		
20	Product Info	2 weeks ago	-		
17	Stacked Bar	2 weeks ago	-		
16	Pie Chart	2 weeks ago	-		
15	About this Application	2 weeks ago	-		
14	Place Order	2 weeks ago	-		
13	View/Modify Orders	10 months ago	terri		

See Also: "Locking and Unlocking a Page" on page 6-13 and "Running a Page or Application" on page 6-10

About the Tasks List

A Tasks list displays on the right side of the Application home page.

Figure 5–5 Tasks List


Tasks

- Delete this Application
- Manage Page Groups
- Manage Page Locks
- View Application Reports

The Task list contains the following links:

- **Delete this Application** deletes the current application. See "Deleting an Application" on page 6-7.
- **Manage Page Groups** links to the Page Groups page. Make the pages within your application easier to access by organizing them into page groups. See "Grouping Pages" on page 6-12.
- **Manage Page Locks** links to the Locked Pages page. Locking pages in an application prevents conflicts during application development. See "Locking and Unlocking a Page" on page 6-13.
- **View Application Reports** displays links to summary application reports. See "Viewing Application Reports" on page 5-44.

About Application Attributes

Application attributes apply to an entire application. Once you create an application the next logical step is to review and possibly update application attributes.

Topics in this section include:

- Configuring Standard Application Attributes
- Configuring Security Attributes
- Configuring Globalization Attributes

Configuring Standard Application Attributes

Standard Application Attributes display on the Edit Application Attributes page. You use these attributes to control the application name and availability as well as defined substitution strings. Additionally, the Edit Application Attributes page displays defined build options, the associated theme, template defaults, and component defaults. Required values are marked with a red asterisk (*).

Topics in this section include:

- Accessing the Edit Application Attributes Page
- Editing Application Attributes

Accessing the Edit Application Attributes Page

To edit application attributes:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Edit Attributes**.

   The Application Attributes page appears.
4. Click **Edit Standard Attributes**.

   The Edit Application Attributes page appears.

Editing Application Attributes

The following sections describe the attributes available on the Edit Application Attributes page.

Topics in this section include:

- Name
- Availability
- Global Notifications
- Substitutions
- Logo
- Build Options
- Theme
- Template Defaults
- Component Defaults

Name Use Name to define basic characteristics of your application, including the application name, an optional alphanumeric alias, a version number, and the application owner. Table 5–1 describes all Application Definition attributes.

Table 5–1 Application Definition Attributes

Attribute	Description
Name	Provides a short descriptive name for the application to distinguish it from other applications in the Oracle HTML DB development environment.
Application Alias	Assigns an alternate alphanumeric application identifier. You can use this identifier in place of the application ID. For example, suppose you create an alias of `myapp` for application 105. Using `f?p` syntax, you could call application 105 as either: ▪ `f?p=105:1` ▪ `f?p=myapp:1`
Version	Includes the application's version number on a page. You can also automatically tie the version to the date of last modification using the following format masks: ▪ `YYYY.MM.DD` ▪ `MM.DD.YYYY` ▪ `DD.MM.YYYY` If your application version uses YYYY.MM.DD then Oracle HTML DB replaces this format mask with the date of last modification of any application attribute.
Image Prefix	Determines the virtual path the Web server uses to point to the images directory distributed with Oracle HTML DB. During installation, the virtual path is configured as `/i/`. When embedding an image in static text (for example, in page or region headers or footers) you can reference an image using the substitution string `#IMAGE_PREFIX#`. For example, to reference the `image go.gif` you would use the following syntax: `<img src="#IMAGE_PREFIX#go.gif">` **See Also:** "IMAGE_PREFIX" on page 4-23, "Uploading Images" on page 7-45, and "Referencing Images" on page 7-47
Proxy Server	Use this field to specify a proxy server. For example, Application Builder may require a proxy server when using a region source type of URL. The URL region source embeds the results of the URL (that is, the page returned by navigating to the URL) as the region source. If you use a firewall and the target of a URL is outside the firewall relative to Oracle HTML DB, you may need to specify a proxy server. You can reference values entered into this field from PL/SQL using the PL/SQL package variable `HTMLDB_APPLICATION.G_PROXY_SERVER`.
Logging	Determines whether or not user activity is recorded in the Oracle HTML DB activity log. When set to **Yes**, every page view will be logged, allowing a Workspace administrator to monitor user activity for each application. Disabling logging may be advisable for high volume applications.

Table 5–1 (Cont.) Application Definition Attributes

Attribute	Description
Parsing Schema	Specifies the schema that all SQL and PL/SQL in the application will be parsed as. You may use `#OWNER#` to reference this value in SQL queries and PL/SQL (for example, in a region or a process).

Exact Substitutions	Select whether or not only exact substitutions will be supported. For optimal run-time performance, it is recommended you use exact substitutions.
	Exact substitutions use the following sytnax:
	`&ITEM.`
	Non-exact substitutions use the following sytnax:
	`&ITEM`

See Also: "Using Substitution Strings" on page 4-16 and "Using f?p Syntax to Link Pages" on page 4-15

Availability Use Availability attributes to manage your application by defining an application status and build status. For example, if you select the status **Restricted Access**, you can specify which users have access and can run the application. Table 5–2 describes these attributes.

Table 5–2 Application Availability Attributes

Attribute	Description
Status	Specifies whether or not the application is available or unavailable for use. Options include: ■ **Available** - Application is available with no restrictions. ■ **Available with Edit Links** -The application is available for use. For developers, the Developer toolbar displays at the bottom of each page. Requires the developer to be logged in to the Application Builder in the same browser session. ■ **Available to Developers Only** - Application is available to users having developer privileges. ■ **Restricted Access** - Application is available to developers named in **Restrict to comma separated user list**. ■ **Unavailable** - Application cannot be run or edited. The message in **Message for unavailable application** displays. when users attempt to access the application. ■ **Unavailable (Status Shown with PL/SQL)** - Application cannot be run or edited ■ **Unavailable (Redirect to URL)** - Application cannot be run. The user is linked to the URL entered in **Message for unavailable application**.

Table 5–2 (Cont.) Application Availability Attributes

Attribute	Description
Build Status	Identifies the build status of the current application: ■ **Run and Build Application** - Developers can both run and develop the application. ■ **Run Application Only** - Developers can only run the application. **See Also**: "Changing Application Build Status" on page 22-27 for information about managing application build status as an Oracle HTML DB administrator
Message for unavailable application	If you set Status to **Unavailable**, **Unavailable (Status Shown with PL/SQL)**, or **Unavailable (Redirect to URL)**, the text you enter in this attribute displays. If you set Status to **Available**, the text you enter in this attribute does not display.
Restrict to comma separated user list (Status must equal Restricted Access)	Use this attribute in conjunction with the Status **Restricted Access**. If you set Status to **Restricted Access**, only the users listed in this attribute can run the application. To use this attribute: 1. From the Status list, select **Restricted Access**. 2. Enter a comma-delimited list of users who can run the application in the field provided.

Global Notifications You can use the Global Notifications attribute to communicate system status to application users. For example, you can use this attribute to notify users of scheduled downtime, or communicate other messages regarding application availability. If the page templates used in your application contain the `#GLOBAL_NOTIFICATION#` substitution string, the text entered here will display in that string's place.

To create a global notification:

1. Include the `#GLOBAL_NOTIFICATION#` substitution string in your page template.
2. Navigate to the Edit Application Attributes page and enter a message in the Global Notifications attribute.
3. Click **Apply Changes**.

> **See Also:** "Using Substitution Strings" on page 4-16

Substitutions Use these fields to define static substitution strings for your application. You can use static substitution string for phrases or labels that occur in many places within an application. Defining static substitution strings centrally enables you to change text strings in multiple places in your application by making a single change to the Substitution Value defined on this page.

> **See Also:** "Using Substitution Strings" on page 4-16

Logo Use these attributes to identify an image to be used as the logo for this application. In Image, identify the image name. If you identify an image in the Image attribute and include the `#LOGO#` substitution string in your page template, the HTML DB engine generates an image tag. Use Logo Image Attributes to identify specific image attributes for the logo image. For example:

```
width="100" height="20" alt="Company Logo"
```

See Also: "Uploading Images" on page 7-45, "Customizing Templates" on page 7-17, and "Page Templates" on page 7-28

Build Options Displays existing build options. Most application attributes have a build option attribute. Do not specify a build option unless you plan to exclude that object from specific installations. Build Options have two possible values: `INCLUDE` and `EXCLUDE`. If you specify an attribute to be included, then the HTML DB engine considers it at run time. However, if you specify an attribute to be excluded, then the HTML DB engine treats it as if it does not exist.

See Also: "Using Build Options to Control Configuration" on page 11-15

Theme Displays the current theme applied to the application. Themes are collections of templates that can be used to define the layout and style of an entire application. Each theme provides a complete set of templates that accommodate every user interface pattern that may be needed in an application.

See Also: "Managing Themes" on page 7-8

Template Defaults Template Defaults list the default templates for this application. To specify a new template at the application level, you can either:

- Select a new theme
- Select a new default page template on the Define Theme page

You can also override this default by making a selection from the Page Template list on the Page Attributes page.

Table 5–3 describes template defaults for the current application.

Table 5–3 Application Template Defaults Attributes

Attribute	Description
Default Page Template	Indicates the default page template to display pages. You can override this selection by making a selection from the Page Template list on the Page Attributes page. **See Also:** "Editing Page Attributes" on page 5-19
Print Mode Page Template	Identifies the template to be used when the HTML DB engine is in printer friendly mode. When calling the HTML DB engine to render a page, you have the option to specify whether or not the page should be displayed using the Print Mode Page Template specified. If you specify Yes, then the page displays using a printer friendly template. The HTML DB engine displays all text within HTML Form Fields as text. The printer friendly template does not need to have the `#FORM_OPEN#` or `#FORM_CLOSE#` substitution string. **See Also:** "Optimizing a Page for Printing" on page 7-43
Error Page Template	Optional. Specifies a page template to use for errors that display on a separate page, as opposed to those that display inline.

See Also: "Changing Default Templates in a Theme" on page 7-10 and "Customizing Templates" on page 7-17

Component Defaults Component Defaults identify default templates used when running wizards. You can override these settings on the attributes page for each control or component. Table 5–4 describes component defaults for the current application.

Table 5–4 Component Defaults

Attribute	Description
Calendar	Default calendar template used when creating a new calendar.
Label	Default label template used when you create new page items.
Report	Default report template used when you create new report.
List	Default template used when you create a list.
Breadcrumb	Default template used when you create a breadcrumb.
Button	Default template to be used when you create new buttons that are template controlled.
Region	Default region template used when you create a new region.
Chart Region	Default region template used when you create a chart.
Form Region	Default region template used when you create a form.
Report Region	Default region template used when you create a report.
Tabular Form Region	Default region template used when you create a tabular form.
Wizard Region	Default region template used when you create a new wizard component.
Breadcrumb Region	Default region template used when you create a new breadcrumb.
List Region	Default region template used when you create a new list.

See Also: "Changing Default Templates in a Theme" on page 7-10 and "Customizing Templates" on page 7-17

Configuring Security Attributes

You can provide security for your application by configuring attributes on the Edit Security Attributes page. The Security Attributes you choose apply to all pages within an application.

Topics in this section include:

- Accessing the Edit Security Attributes Page
- Editing Security Attributes

See Also: "Managing Security" on page 13-1

Accessing the Edit Security Attributes Page

To access the Edit Security Attributes page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Edit Attributes**.

   The Application Attributes page appears.

5. Click **Edit Security Attributes**.

The Edit Security Attributes page appears.

Editing Security Attributes

The following sections describe the attributes available on the Edit Security Attributes page.

Topics in this section include:

- Authentication
- Authorization
- Database Schema
- Session State Protection
- Virtual Private Database (VPD)

Authentication **Authentication** is the process of establishing users' identities before they can access an application. Although you define multiple authentication schemes for your application, only one scheme can be current at a time. Table 5–5 describes the attributes available under Authentication.

Table 5–5 Authentication Attributes

Attribute	Descriptions
Home Link	Specifies an URL or procedure that should be run when you run the application. For example, Home Link could contain the relative URL used to locate the application home page. For example, `f?p=6000:600` would specify application 6000 with a home page ID of 600. In this example, the value you enter in Home Link replaces the `#HOME_LINK#` substitution string in application templates. You can also use this attribute to name a procedure. For example, you could create a procedure such as `personal_calendar` which calls an HTML page to serve as the application home. **Note:** Do not use the Home Link attribute to determine the page that displays after authentication. The page that displays after authentication is determined by other components within the application's authentication scheme. **See Also:** "HOME_LINK" on page 4-22 and
Login URL	Replaces the substitution strings &LOGIN_URL. in HTML or #LOGIN_URL# in templates. **See Also:** "LOGIN_URL" on page 4-23 and "Creating an Authentication Scheme" on page 13-15

Table 5–5 (Cont.) Authentication Attributes

Attribute	Descriptions
Public User	Identifies the Oracle schema (or user) used to connect to the database through the database access descriptor (DAD). The default value is `HTMLDB_PUBLIC_USER`. Once a user has been identified, the HTML DB engine keeps track of each user by setting the value of the built-in substitution string `APP_USER`. When `APP_USER` equals this value, the HTML DB engine considers the current session to be a public user session. The HTML DB engine supports the following built-in display conditions: ■ USER_IS_PUBLIC_USER ■ USER_IS_NOT_PUBLIC_USER If the current application user (`APP_USER`) equals the value of this attribute, then the user is logged on as a public user. Some applications have public (not logged in) and a private (logged in) modes. By determining if the user is the public user, you can conditionally display or hide information. For example, you can show a login button if the user is the public user and a logout link if the user is not a public user. Reference this value using `HTMLDB_APPLICATION.G_PUBLIC_USER`. The HTML DB engine also has built in condition types `USER_IS_PUBLIC_USER` and `USER_IS_NOT_PUBLIC`. **See Also:** "HOME_LINK" on page 4-22 and "Understanding Conditional Rendering and Processing" on page 4-6
Authentication Scheme	Click this button to define a new authentication scheme. **See Also:** "Understanding How Authentication Works" on page 13-14 and "Creating an Authentication Scheme" on page 13-15

Authorization Authorization controls user access to specific controls or components based on user privileges. You can specify an authorization scheme for your application, by making a selection from the **Authorization Scheme** list. You can assign only one authorization to an entire application. However, you can assign an authorization scheme to individual pages, page controls (such as a region, a button, or an item), or a shared component (such as a menu, a list, or a tab).

To create a new authorization scheme, click **Define Authorization Schemes**.

An authorization scheme is a binary operation that either succeeds (equals true) or fails (equals false). If it succeeds, then the component or control can be viewed. If it fails, then the component or control cannot be viewed or processed. When you attach an authorization scheme to a page and it fails, an error message displays instead of the page. However, when you attach an authorization scheme to a page control (for example, a region, a button, or an item) and it fails, no error page displays. Instead, the control either does not display or is not processed or executed.

> **See Also:** "Providing Security Through Authorization" on page 13-20

Database Schema Use **Parsing Schema** to specify the database scheme for the current application. You can only select schemas that are accessible to the current workspace. Once defined, all SQL and PL/SQL commands issued by the application will be performed with the rights and privileges of the defined database schema.

Session State Protection Enabling Session State Protection can prevent hackers from tampering with URLs within your application. URL tampering can adversely affect program logic, session state contents, and information privacy.

To enable or disable Session State Protection for your application, make a selection from the Session State Protection list. Setting Session State Protection to **Enabled** turns on session state protection controls defined at the page and item level.

To configure Session State Protection, click **Manage Session State Protection.**

> **See Also:** "Understanding Session State Protection" on page 13-3

Virtual Private Database (VPD) A Virtual Private Database (VPD) provides an application programming interface (API) that enables developers to assign security policies to database tables and views. Using PL/SQL, developers can create security policies with stored procedures, and bind the procedures to a table or view by means of a call to an RDBMS package. Such policies are based on the content of application data stored within the database, or are based on context variables provided by the Oracle database. In this way, VPD permits access security mechanisms to be removed from applications and centralized.

The PL/SQL you enter in this field is executed immediately after the user is authenticated. `V('USER')` is accessible from this function. Session state for the current call is not yet initialized when this call is made. If your application does not need to employ VPD to support multiple customers in the same database, leave this attribute null.

> **See Also:** "Providing Security Through Authorization" on page 13-20 and *Oracle Label Security Administrator's Guide*

Configuring Globalization Attributes

In Oracle HTML DB you can develop applications that can run concurrently in different languages. A single Oracle HTML DB application can be translated to support different languages. Use the attributes on the Edit Globalization Attributes page to specify globalization options such as the primary application language.

Topics in this section include:

- Accessing the Globalization Attributes Page
- Accessing the Globalization Attributes Page

> **See Also:** "Managing Oracle HTML DB Globalization" on page 15-1

Accessing the Globalization Attributes Page

To access the Edit Globalization Attributes page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   Application Builder appears.
4. Click **Edit Attributes**.

   The Application Attributes page appears.
5. Click **Edit Globalization Attributes**.

The Edit Globalization Attributes page appears.

Editing Globalization Attributes

The following sections describe the attributes available on the Edit Globalization Attributes page.

Application Primary Language Identifies the language in which an application is developed. This language is the base language from which all translations are made. For example, suppose application 100 was authored in English, translated into French, and published as application 101. English would be the Application Primary Language.

All modifications to the application should be made to the primary language specified here.

Application Language Derived From Specifies how Oracle HTML DB determines or derives the application language. The application primary language can be static, derived from the Web browser language, or determined from a user preference or item. The database language setting also determines how the date is displayed and how certain information is sorted.

This option enables you to disable browser derived language support. You also have the option of having the application language derived from an application preference.

Automatic CSV Encoding Automatic CSV Encoding controls the encoding of all CSV report output in an application. The default value for Automatic CSV Encoding is **No**. If Automatic CSV Encoding is set to **Yes**, CSV report output will be properly converted to a character set compatible with localized desktop applications. The character set for the CSV encoding is determined by the Application Language Derived From setting.

The encoding of pages in Oracle HTML DB is determined by the character set of the Database Access Descriptor (DAD) used to access Oracle HTML DB. For example, if the character set of the Database Access Descriptor is AL32UTF8, all pages in all applications from the instance of Oracle HTML DB will be encoded in UTF-8.

By default, the CSV output from report regions is encoded in the same character set as the Database Access Descriptor. However, some desktop spreadsheet applications require that the data is encoded in the client desktop operating system character set. In the case of multibyte data, the CSV output from report regions will often appear corrupted when opened by a desktop spreadsheet application. This is because the CSV output is encoded differently that what is required by the desktop application. Enabling Automatic CSV Encoding resolves this issue.

For example, if the user’s language preference for an Oracle HTML DB application is `de`, the CSV data will be encoded in `Western European Windows 1252`, regardless of the Database Access Descriptor character set setting. If the user's language preference is `zh-cn`, the CSV data will be encoded in Chinese GBK.

About the Page Definition

A page is the basic building block of an Oracle HTML DB application. Each page can have buttons and fields (called items) and application logic (or processes). You can branch from one page to the next using conditional navigation; perform calculations (called computations); perform validations (such as edit checks); and display reports, calendars, and charts.

Topics in this section include:

- Accessing a Page Definition
- Understanding the Page Definition

Accessing a Page Definition

You can view, create, and edit the controls that define a page by accessing the Page Definition.

To access the Page Definition for an existing page:

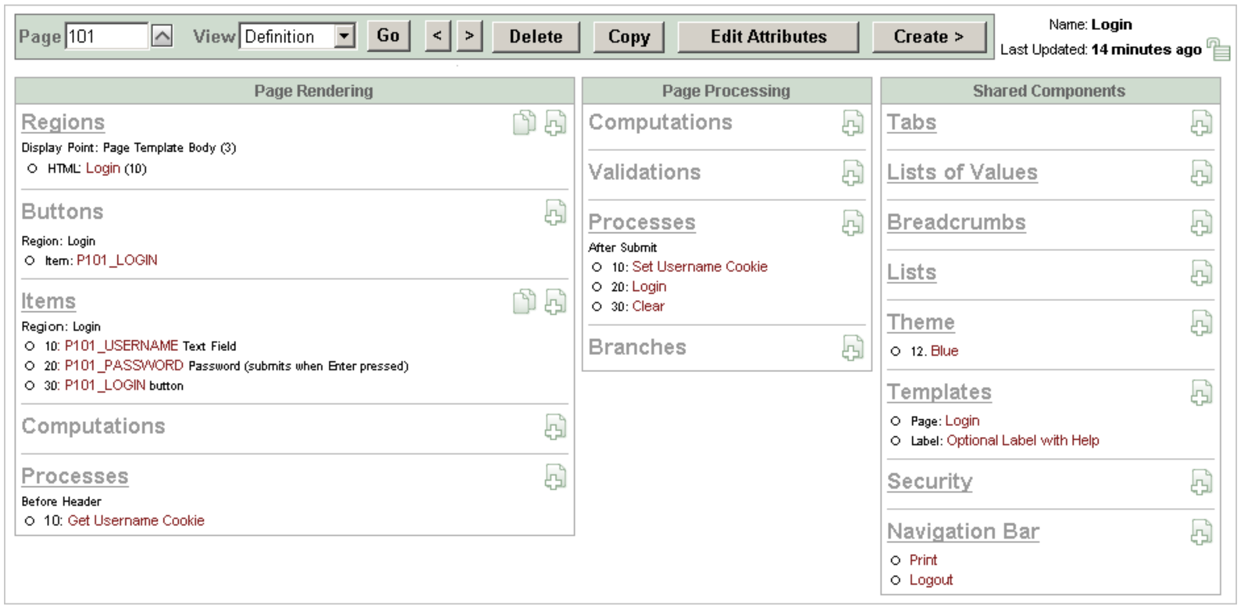
1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.

   Application Builder home page appears.
3. Select an application.

   The Application home page appears.
4. Select a page.

   The Page Definition appears.

Figure 5–6 Page Definition



Name: **Login**
Last Updated: **14 minutes ago**

Regions
Display Point: Page Template Body (3)
- HTML: Login (10)

Buttons
Region: Login
- Item: P101_LOGIN

Items
Region: Login
- 10: P101_USERNAME Text Field
- 20: P101_PASSWORD Password (submits when Enter pressed)
- 30: P101_LOGIN button

Processes
Before Header
- 10: Get Username Cookie

Processes
After Submit
- 10: Set Username Cookie
- 20: Login
- 30: Clear

Theme
- 12. Blue

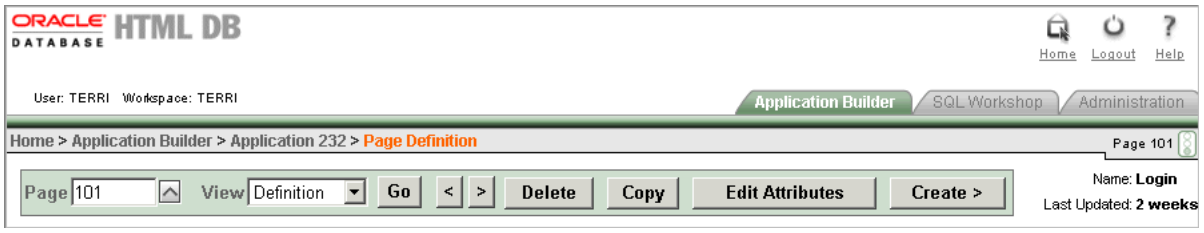
Templates
- Page: Login
- Label: Optional Label with Help

Navigation Bar
- Print
- Logout

Understanding the Page Definition

A breadcrumb trail displays at the top of each Page Definition. Breadcrumb trails appear on every page in Oracle HTML DB. Each breadcrumb entry indicates your location relative to other pages in the current application and functions as an alternate navigation path. You can instantly go to another page by clicking a breadcrumb entry.

Figure 5–7 Page Definition (Top)



The current page identification number (or ID) displays on the far right side of the page, next to a small icon that resembles a traffic light. This icon is called the Run Page icon. Clicking this icon runs the current page and renders it into viewable HTML.

A page navigation bar appears next. Options available on the page navigation bar include:

- **Page.** Displays the current page identification number (ID). To view another page directly, enter the page ID in the Page field and click **Go**. To access the previous or next page, click the arrow buttons.
- **View.** Controls the current page view. To view an alternative report, make a selection from the list and click **Go**. See "Accessing Alternate Page Views" on page 5-33.
- **Previous and Next.** These buttons resemble less than (<) and greater than (>) signs. Click these buttons to move to the previous or next page ID.
- **Delete**. Deletes the current page.
- **Copy**. Creates a copy of the current page. You specify a new page ID and page name.
- **Edit Attributes**. Links to Page Attributes. Use this page to edit high-level page attributes such as the page name, an optional name alias, and view information about defined tab sets, specified templates, and defined authorization schemes. See "Editing Page Attributes" on page 5-19.
- **Create**. Links to a wizard for creating a new page. See "Creating a Page from the Page Definition" on page 6-8.

The page name and last update date display to the right of the page navigation bar.

See Also: "Adding Pages to an Application" on page 6-7 and "Running a Page or Application" on page 6-10

The center of every Page Definition is divided into three sections:

- **Page Rendering** lists user interface controls and logic that execute when the page is rendered.
- **Page Processing** lists list logic controls (such as computations and processes) that are evaluated and executed when the page is processed.
- **Shared Components** lists common components that can be called from multiple pages in an applications.

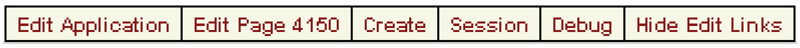
See Also: "Editing a Page Definition" on page 5-18 and "About the Shared Components Page" on page 5-35

Using the Developer Toolbar

The Developer toolbar offers a quick way to edit the current page, create a new page, region, or page control, view session state, or turn edit links on an off. You can control whether the Developer toolbar displays by changing the Availability Status on the Edit Application Attributes page.

> **See Also:** "Editing Application Attributes" on page 5-6 for information on the Status list

Figure 5–8 Developer Toolbar



The Developer toolbar consists of the following links:

- **Edit Application** links you to the Application home page. See "About the Application Builder Home Page" on page 5-2.
- **Edit Page** accesses the Page Definition for the current running page. See "Editing a Page Definition" on page 5-18.
- **Create** links to a wizard for creating a new page, region, page control (item, button, branch, computation, process, or validation), or a shared control (navigation bar icon, tab, list of values, list, or breadcrumb). See "Creating a Page from the Developer Toolbar" on page 6-10.
- **Session** displays a new window containing session state information for the current page. See "Viewing Session State" on page 4-9.
- **Debug** toggles the page between Debug and No Debug mode. See "Accessing Debug Mode" on page 10-2.
- **Show Edit Links** toggles between **Show Edit Links** and **Hide Edit Links**. Clicking **Show Edit Links** displays edit links next to each object on the page that can be edited. Each edit link resembles two colons (::) and appears to the right of navigation bar items, tabs, region titles, buttons, and items. Clicking on the link displays another window in which to edit the object.

Editing a Page Definition

A page is the basic building block of an application. Each page has page ID, a name, and typically some text attributes such as a header, title and footer. You add content to your page by creating page controls (regions, items, and buttons). Page templates and page region templates control the exact look and feel of each page.

Topics in this section include:

- Accessing a Summary View of Controls, Components, and Application Logic
- Copying or Creating a Control or Component
- Editing Page Attributes
- About Page Rendering Controls
- About Page Processing Controls
- Understanding Page Computations
- Understanding Page Processes

See Also: "About the Page Definition" on page 5-15

Accessing a Summary View of Controls, Components, and Application Logic

Each Page Definition serves a a central navigation point for all the controls, components, and application logic that define a page.

You can access a summary view of all defined controls or components by selecting the title (for example, Regions, Button, Items, Computations, Processes, and so on). For example, selecting **Regions** displays a summary report of all currently defined regions on the current page. You can use this summary view to:

- Edit the multiple attributes at once by making new selections from the available fields and select lists.
- Link to a definition page by clicking the **Edit** icon.

You can access additional summary views by clicking the buttons at the top of each page. To save your edits to any summary view, click **Apply Changes**.

You can also view the attributes of a specific control or component by selecting its name on the Page Definition. For example, suppose your Page Definition contains a region named *Customers*. Clicking the region name Customers would display an attributes page for that region.

Copying or Creating a Control or Component

You can copy or create new controls or components by clicking the Copy and Create icons. The Create icon resembles of a plus (+) sign that overlaps a small page. Click the Create icon to create a new control or component.

Figure 5–9 Create Icon on the Page Definition

The Copy icon resembles two small overlapping pages. Click the Copy icon to make a copy of an existing control or component.

Figure 5–10 Copy Icon on the Page Definition

Editing Page Attributes

Page attributes only apply to a specific page. You access page attributes from the Page Definition.

To edit page attributes:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

The Page Definition appears.

2. At the top of the page, click **Edit Attributes**.

   The Page Attributes page appears. Required values are marked with a red asterisk (*).

The topics that follow describe the specific sections of the Page Attributes page.

> **See Also:** "Adding Pages to an Application" on page 6-7 for information about creating a new page

Name

Use these attributes to define general attributes for the current page such as a page name, an optional alphanumeric alias, and associated page groups. Table 5–7 describes these attributes.

Table 5–6 Page Attributes: Name

Attributes	Descriptions
Name	Identifies the name of the current page for application developers. This name is used in numerous Oracle HTML DB pages and reports, along with the page ID and page title.
Page Alias	Enter an alphanumeric alias for this page. This alias must be unique within the current application. For example, if you were working on page 1 of application 100, you could create an alias called `home`. You could then access this page from other pages using the following `f?p` syntax: `f?p=100:home`
Group	Identify the page group you would like to associate with this page. Page groups do not affect functionality, but help developers manage the pages within an application. **See Also:** "Grouping Pages" on page 6-12

Display Attributes

Use these attributes to define general display attributes for the current page such as the selected page template, standard tab set, title, and cursor focus. Table 5–7 describes these attributes.

Table 5–7 Page Attributes: Display Attributes

Attributes	Descriptions
Page Template	Select a page template to control the appearance of this page. Making a selection here overrides the default page template defined within the current theme. **See Also:** "Changing Default Templates in a Theme" on page 7-10
Standard Tab Set	Select a standard tab set to be used for this page. A standard tab set is associated with a specific page and page ID. You can use standard tabs to link users to a specific page. **See Also:** "Creating Tabs" on page 8-5
Title	Enter a title to display in the title bar of the browser window. The HTML DB engine uses the title you specify here in place of the `#TITLE#` substitution string used in the page template. This title is inserted between the HTML tag `<TITLE></TITLE>`.

Table 5–7 (Cont.) Page Attributes: Display Attributes

Attributes	Descriptions
Cursor Focus	Select whether or not you want the cursor focus to be placed in the first field on the page. Select **Do not focus cursor** if you do not want to include JavaScript.

Header and Footer

Use these attributes to define page header, body header, body footer, and page footer text. Table 5–8 describes these attributes.

Table 5–8 Page Header, Footer and Text Attributes

Attribute	Description
Header Text	Enter the text of the HTML to display after the page template header and before page template body.
Body Header	Enter the text of the HTML to display before showing regions. Displays before the page template `#BOX_BODY#` substitution string.
Footer	Enter the text of the HTML to display after page template body and before page template footer.

HTML Header

Use this attributes to replace the `#HEAD#` substitution string in the page template header. The values entered here are inserted after the HTML `<HEAD>` tag. Common uses of these attributes:

- Code page-specific inline cascading style classes
- Add additional style sheets for a specific page
- Code page-specific JavaScript
- Code page-specific meta tag page refresh

On Load

Use this attribute to add events when the page is being loaded, such as calls to JavaScript. In the Page HTML Body Attribute, enter JavaScript or text to be substituted for your page template's `#ONLOAD#` substitution string. To use this feature, your page template must include the `#ONLOAD#` substitution string.

You can use the Page HTML Body attribute to write into the contents of the opening `<BODY>` tag. A typical page template might use `#ONLOAD#` within the opening `<body>` tag as shown in the following example:

```
<html>
<head>
...
</head>
<body #ONLOAD# >
```

See Also: "Incorporating JavaScript into an Application" on page 6-65

Security

Use these attributes to specify an authorization scheme, authentication, and URL access protection for the current page. Table 5–9 describes these attributes

Table 5–9 Page Attributes: Security

Attribute	Description
Authorization Scheme	Select an authorization scheme to be applied to the page. Authorization schemes are defined at the application level and can be applied to many elements within the application. An authorization scheme is evaluated either once for each application session (at session creation), or once for each page view. If the selected authorization scheme evaluates to true, then the page displays and is subject to other defined conditions. If it evaluates to false, then the page will not display and an error message displays. **See Also:** "Providing Security Through Authorization" on page 13-20
Authentication	Specifies whether this page has been defined as public or requires authentication. If a page is identified as public, the page can be viewed before authentication. This attribute only applies if the application uses SCHEME authentication. The application's page sentry function can access this page attribute to identify pages that do not require prior authentication to view. The implementation of the authentication scheme's page sentry function determines if this attribute has any effect. **See Also:** "Establishing User Identity Through Authentication" on page 13-13

Duplicate Submission

Use the **Allow duplicate page submissions** list to specify whether or not Oracle HTML DB users may process a page multiple times in a row. Set this attribute to **No** to prevent duplicate page submissions from being processed multiple times.

Examples of duplicate page submissions include:

- A user clicks the Submit button multiple times.
- You create a branch of type Branch to Page, and the user clicks the browser reload button.

Configuration

Build options allow you to enable or disable functionality. Most application attributes have a build option attribute. Do not specify a build option for the current page unless you plan to exclude the page in certain configurations.

Build options have two possible values: `INCLUDE` and `EXCLUDE`. If you specify an attribute as being included, then the HTML DB engine considers it part of the application definition at run time. Conversely, if you specify an attribute as being excluded, then the HTML DB engine treats it as if it does not exist

See Also: "Using Build Options to Control Configuration" on page 11-15

On Error Text

Use this attribute to specify the error text that displays in the `#NOTIFICATION_MESSAGE#` template substitution string in the event an error occurs on the page.

See Also: "Page Templates" on page 7-28

Help

Use this attribute to enter Help text for the current page.

Help text is displayed using a help system that you must develop. To show the Help for a specific page, call the `HTMLDB_APPLICATION.HELP` procedure from a page that you create for displaying Help text. For example, you could use a navigation bar icon similar to:

```
f?p=4000:4600:&APP_SESSION.::&DEBUG::LAST_STEP:&APP_PAGE_ID
```

Page-level help supports shortcuts using the following syntax:

```
"SHORTCUT_NAME"
```

See Also: "Creating a Help Page" on page 6-68 and "Using Shortcuts" on page 6-63

Comments

Use this attribute to record developer comments about the current page. These comments never display when the application is running.

About Page Rendering Controls

Use the Page Rendering section of the Page Definition to specify attributes for defined regions, buttons, items, page rendering computations, and page processes.

Regions

A region is a section of a page that serves as a container for content within a page. The content of a region is determined by the region source. For example, a region may contain a report based on a SQL query you define, or it may contain static HTML.

See Also:

- "Customizing Regions" on page 7-2 for information about creating specific types of regions
- *Oracle Database Application Developer's Guide - Fundamentals* for information about developing Web applications with PL/SQL
- *Oracle Database PL/SQL Packages and Types Reference* for information about htp packages

Buttons

As you design your application, you can use buttons to direct users to a specific page or URL, or to post or process information. Buttons can be placed in predefined region template positions or among items in a form.

See Also: "Creating Buttons" on page 6-48

Items

An item can be a text field, text area, password, select list, check box, and so on. Item attributes affect the display and behavior of items on a page. For example, these attributes can impact where a label displays, how large an item will be, and whether or not the item will display next to, or below the previous item.

There are two categories of items: page items and application items. Page items are placed on a page and have associated user interface properties, such as Display As, Label, and Label Template. Application items are not associated with a page and therefore have no user interface properties. An application item can be used as a global variable.

> **See Also:** "Creating Items" on page 6-51

Page Computations

You can use computations to assign a value to an identified item when a page is submitted or displayed.

> **See Also:** "Creating a Page Computation" on page 5-28 and "Understanding Application Computations" on page 5-42

Page Processes

You create a page process to execute some type of logic (for example, using PL/SQL), or to make a call to the rendering engine. Typically a process performs an action. For example, a process may be hand coded PL/SQL, or the invocation of a predefined process available within Oracle HTML DB.

> **See Also:** "Understanding Page Processes" on page 5-31 and "Understanding Application Processes" on page 5-39

About Page Processing Controls

Use the Page Processing section of the Page Definition to specify application logic such as computations, validations, processes, and branches. In general, the HTML DB engine runs this logic in the order it appears on the Page Definition.

Topics in this section include:

- Understanding Validations
- Understanding Branches

Understanding Validations

You can define a validation declaratively by selecting a validation method. You enter the actual validation edit check in the Validation Messages field. Be aware that if a validation fails, subsequent page processes or computations will not occur. Also remember that the validation you enter must be consistent with the validation type you selected. For more information about validation types, see online Help.

Creating a Validation To create a new validation:

> **Note:** Text entered for validations may not exceed 3,950 characters.

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

The Page Definition appears.

2. Under Validations, click the **Create** icon.

   The Create Validations Wizard appears.

3. Select a validation level. **Item level validations** are specific to a single item. **Page level validations** do not apply to any single item, but apply to an entire page.

4. If you selected **Item level validation**, select the item to be validated and click **Next**.

5. Select a validation method as described in Table 5–10.

Table 5–10 Validation Methods

Validation Method	Descriptions

SQL	Compares item values to data in the database.
	
	For example, you can use a SQL validation to verify whether a last name typed into a field exists in the database. In the following Exists SQL validation, the field is named `P1_LAST_NAME` and the table is named `customers`.
	
	`SELECT 1 FROM customers`
	`WHERE last_name = :P1_LAST_NAME`

PL/SQL	Useful if you need complex logic to validate entered data.
	
	For example, suppose you need to create a validation for an address form that requires the user enter a province if the address is not in the United States. You could create the validation as a Function Returning Boolean, using the following PL/SQL:
	
	`BEGIN`
	`  IF :P1_COUNTRY = 'US' AND :P1_PROVINCE IS NULL THEN`
	`     RETURN FALSE;`
	`  ELSE`
	`    RETURN TRUE;`
	`  END IF;`
	`END;`
	
	You could also create the same validation implemented as a PL/SQL Expression as follows:
	
	`NOT (:P1_COUNTRY='US' AND  :P1_PROVINCE IS NULL);`

Item Level Null	Checks if an item's value in session state is null. For example, you could validate that the user enters a value in a field by creating an item validation and then selecting the validation method **Item Not Null**.

Item String Comparison	Compares the value of an item to a specific string.
	
	There are several string comparison validations that compare the value of an item to a literal string. For example, you select the validation type **Item in Expression 1 is contained in Expression 2** to validate a user entry in a field against a list of values you provide.
	
	In Expression 1, enter the name of item you want to validate without a colon. For example:
	
	`P1_VALUE`
	
	In Expression 2, enter a string a values you want to validate against For example:
	
	`ABC/DEF/GHI`

Table 5–10 (Cont.) Validation Methods

Validation Method	Descriptions

Regular Expression	Regular expressions provide a method to describe text patterns. Use a Regular Expression validation to perform data validation.
	
	For example, you could use the following regular expression validation to verify that a string of entered data always consists of groups of six numbers separated by commas and followed by a comma:
	
	`^([[:digit:]]{6},)+$`
	
	This regular expression would find the following entries valid:
	
	`123456,654321,`
	
	`123456,`
	
	`123456,123456,654321,`
	
	However, the following would not be valid:
	
	`123456,12345`
	
	`12345`

6. For SQL, PL/SQL, and Item String Comparison validations, select the type of validation you want to create and click **Next**.
7. Specify the sequence and validation name and click **Next**.
8. Depending upon the validation method, enter the validation or message text that displays if the validation fails. Click **Next**.
9. Define conditions that apply to this validation and click **Create**.

See Also: "Validating User Input in Forms" on page 6-33

Defining How Validation Error Messages Display You can choose to have validation error messages display inline (that is, on the page where the validation is performed) or on a separate error page.

To define how a validation error message displays:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

   The Page Definition appears.
2. Under Validations, select the appropriate validation.

   The attributes page for the validation appears.
3. Scroll down to Error Message.
4. In Error Message, enter your error message text.
5. From Error message display location, select a display location.

   This attribute identifies where a validation error message displays. **Validation error messages** can display on an error page or inline within the existing page.

Inline error messages can display in a notification area (defined as part of the page template) or within the field label.

To create a hard error that stops all processing (including validations), you must display the error on an error page.

6. If you select Inline with Field or Inline with Field and in Notification, you need to associate an item with the error message. To associate an item with the error message, select the item from the Associated Item list.
7. Click **Apply Changes**.

Processing Validations Conditionally You can control when and if a validation is performed under Conditions.

To create a condition for an existing validation:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

   The Page Definition appears.
2. Under Validations, select the appropriate validation.

   The attributes page for the validation appears.
3. Scroll down to Conditions.
4. To have a validation performed when a user clicks a particular button, make a selection from the When Button Pressed list.
5. Make a section from the Condition Type list.
6. Depending upon the selected Condition Type, enter values in the Expression attributes. The validation will be rendered or processed if the specified condition is met.
7. Click **Apply Changes**.

Understanding Branches

A branch is an instruction to go to a specific page, procedure, or URL. For example, you can branch from page 1 to page 2 after page 1 is submitted.

You create a new branch by running the Create Page Branch Wizard and specifying Branch Point and Branch Type. The Branch Type defines the type of branch you are creating. For more information about Branch Types, see online Help.

Defining a Branch Point and Action When you click a standard tab in an Oracle HTML DB application, the HTML DB engine sets session state, executes computations, and then links you to the target page. It does not run any processes or explicitly defined branches. In cases where the page is submitted without clicking a tab, the HTML DB engine explicitly defined branches to direct users to a subsequent page.

You can control when a branch executes by making a selection from the Branch Point list. Available options include:

- **On Submit: Before Computation** - Branching occurs before computations, validations, or processing. Use this option for buttons that do not need to invoke any processing, for example, a Cancel button.
- **On Submit: Before Validation** - Branching occurs after computations, but before validations or processing. If a validation fails, page processing stops, a rollback is issued, and the page displays the error. Because of this default behavior, you do not need to create branches to accommodate validations. However, you may want to branch based on the result of a computation (for example, to a previous branch point).
- **On Submit: Before Processing** - Branching occurs after computations and validations, but before processing. Use this option to branch based on a validated session state, but before performing any page processing.
- **On Submit: After Processing** - Branching occurs after computations, validations, and processing. This option branches to a URL or page after performing computations, validations, and processing. When using this option, remember to sequence your branches if you have multiple branches for a given branch point.
- **On Load: Before Header** - Branching occurs before a page is rendered. This option displays another page instead of the current page or redirects the user to another URL or procedure.

Depending upon the Branch Type you select, you can specify the following additional information in the Action attributes:

- The page ID of the page to which you want to branch
- PL/SQL procedure which ultimately renders a branch target page
- A URL address

Branching Conditionally Like other controls, branches can be made conditional. To create a conditional branch, make a selection from the Condition Type list, and enter text in the expression fields to implement the condition type you choose.

See Also: "Controlling Navigation Using Branches" on page 8-8

Understanding Page Computations

Use page computations to assign a value to an identified item when a page is submitted or displayed. You can also use application-level computations to assign values to items. Most application-level computations are performed for every page in an application. In contrast, computations created at the page-level only execute when that page is rendered or processed.

See Also: "Understanding Application Computations" on page 5-42

Topics in this section include:

- Creating a Page Computation
- Understanding Computation Points and Computation Syntax
- Editing Page Computation Attributes

Creating a Page Computation

You create a page computation by running the Create Page Computation Wizard. For each computation, specify the item for which you are creating the computation as well as a computation type.

See Also: "Page Computations" on page 5-24

To create a page computation:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Computations, click the **Create** icon.
3. For Item Location, select the where the computation will execute and click **Next**. Location options include:
   - Item on this Page
   - Item on Another Page
   - Application Level Item
4. For Item, select the item and computation point at which you would like to perform the computation:
   a. Compute Item - Select the item the computation will update.
   b. Sequence - Select the order of evaluation.
   c. Computation Point - Select the point at which the computation executes. The computation point **On New Instance** executes the computation when a new session (or instance) is generated.
   d. Computation Type - Select the method of computation you want to create.
   e. Click **Next**.
5. In Computation, enter a computation which corresponds to the selected computation type and click **Next**.
6. On Condition, you can choose to make the computation conditional. To make a computation conditional, make selection from the Condition Type list and enter text in the expression fields.
7. Click **Create**.

Understanding Computation Points and Computation Syntax

A good example of using computations can be illustrated by a page containing form fields for entering phone numbers. In this example, the phone number is stored in one database column, however the data entry form breaks the phone number into three components; area code, prefix, and line number. In this example, the page items are called `P10_AREA_CODE`, `P10_PREFIX`, and `P10_LINE_NUMBER`.

Next, suppose you need to combine the values stored in these items into a single string. You could accomplish this by using an After Submit computation and store the combined values in an item called `P10_PHONE_NUMBER`.

To create a computation to store the combined values of `P10_AREA_CODE`, `P10_PREFIX`, and `P10_LINE_NUMBER` in new items:

1. Navigate to the appropriate Page Definition:

2. Create a new item named `P10_PHONE_NUMBER` to store the combined values of `P10_AREA_CODE`, `P10_PREFIX`, and `P10_LINE_NUMBER`. See "Creating a Page-Level Item" on page 6-52.
3. Under Computations, click the **Create** icon.
4. For Location, select **Item on this Page** and click **Next**.
5. For Compute Item, select **P10_PHONE_NUMBER.**
6. For Sequence, select the order of evaluation.
7. For Computation, you have the option of creating one of the following computation types:
   a. Static Assignment:
      – For Computation Type, select **Static Assignment** and click **Next**.
      – Enter the following computation:

      ```
      (&P10_AREA_CODE.) &P10_PREFIX.-&P10_LINE_NUMBER.
      ```

      – Click **Next**.

   b. PL/SQL Function Body:
      – For Computation Type, select **PL/SQL Function Body** and click **Next**.
      – Enter the following computation:

      ```
      DECLARE
      l_return_value  VARCHAR2(300) DEFAULT NULL;
      BEGIN
          l_return_value :=
      '('||:P10_AREA_CODE||')'||:P10_PREFIX||'-'||:P10_LINE_NUMBER;
      RETURN l_return_value;
      END;
      ```

      – Click **Next**.

   c. SQL Query:
      – For Computation Type, select **SQL Query** and click **Next**.
      – Enter the following computation:

      ```
      SELECT '('||:P10_AREA_CODE||')'||:P10_PREFIX||'-'||:P10_LINE_NUMBER
      FROM DUAL
      ```

      – Click **Next**.

   d. PLSQL Expression:
      – For Computation Type, select **PLSQL Expression** and click **Next**.
      – Enter the following computation:

      ```
      '('||:P10_AREA_CODE||')'||:P10_PREFIX||'-'||:P10_LINE_NUMBER
      ```

      – Click **Next**.
8. Click **Create**.

Editing Page Computation Attributes

Once you create a computation, you can edit it on the Edit Page Computation page.

To edit a page computation:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Computations, select the computation name.

   Edit Page Computation page appears.
3. Click **Apply Changes**.

Editing the Computation Point and Source You control when a computation executes under the Computation Point attributes by specifying a sequence and a computation point. The computation point **On New Instance** executes the computation when a new session (or instance) is generated.

Under Source, enter an expression or query to compute an item's value. In the event a computation fails, you can optionally define an error message in Computation Error Message field.

Creating Conditional Computations You can make a computation conditional by making a selection from the Condition Type list and entering text in the expression fields.

Understanding Page Processes

A page process performs an action at a specified point during the rendering or submission of the page. For example, you can create a page process to execute logic or to make a call to the HTML DB engine. A page process is a unit of logic that runs when a specific event occurs, such as loading or submitting page.

From a functional perspective, there is no difference between page-level and application-level processes. The difference between these two process types is where the process is defined, that is at the page level or at the application level.

> **See Also:** "Understanding Application Processes" on page 5-39

Topics in this section include:

- Creating a Page Process
- Editing Process Attributes

Creating a Page Process

You create a process by running the Create Process Wizard. During the wizard, you define a process name, specify a sequence, the point at which process will execute, and select a process category. You can change nearly all of these attributes on the Edit Page Process page.

To create a new process:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Processes, click the **Create** icon.
3. Select a category. Table 5–11 describes available page process categories.

Table 5–11 Process Categories

Process Category	Description
Data Manipulation	Data Manipulation process types are frequently used by wizards to support data manipulation language (DML) actions. Oracle HTML DB supports the following declarative data manipulation processes: ▪ Select **Automatic Row Fetch** and **Automatic Row Processing (DML)** to create an automatic data manipulation language (DML) process ▪ Use **Multi Row Update** and **Multi Row Delete** in conjunction with tabular forms. ▪ Use **Add Rows to Tabular Form** in conjunction with a tabular form
Close Popup Window	Upon execution, this process type closes a popup window and refreshes the calling window.
Form Pagination	Implements pagination through the detail records associated with a master detail form. Most often used in master detail forms (such as in the Master Detail Wizard), this process checks the master table to determine which set of detail records you are in and determines what the next detail record should be. **See Also:** "Building a Master Detail Form" on page 6-29
On Demand	Creates an application-level process that can only be executed when called from a specific page. When you create this process type at the page-level, you are creating reference to an existing application-level process. **See Also**: "About On Demand Application Processes" on page 5-39
PL/SQL	Runs the PL/SQL you provide. Use this process type to execute a block of PL/SQL entered directly into the process or to simply call an existing API.
Reset Pagination	In Report regions, resets pagination back to the first result set. The HTML DB engine keeps track of where the user is within a given result set. This process category returns the user to the beginning result set. In other words, this category resets the counters associated with the report region to return the first part of the result set the next time the result set displays.
Session State	Sets the values of existing session state items to null. Select this process type to clear the cache for applications, sessions, or items as well as to clear existing user preferences. **See Also:** "Managing Session State Values" on page 4-10 and "Managing User Preferences" on page 14-24
Web Services	Implements a Web Service as a process on a page. Running the process submits a request to the service provider. **See Also:** "Invoking a Web Service as a Process" on page 14-22

4. Follow the on-screen instructions.

Editing Process Attributes

Once you create a process, you can control when the process executes and what the process does by editing attributes on the Edit Page Process page.

To edit an existing page process:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Select the process name.

   The Edit Page Process page appears.

Changing Processing Points and Source You control when a process executes by specifying a sequence number and a process point under Process Point. You can prevent a process from running during subsequent visits to a page by selecting one of the following options under Run Process:

- Once for each page visit
- Once for each session or when reset

Enter the appropriate code for PL/SQL process types. For PL/SQL anonymous block processes, enter the appropriate code under **Process**. For Clear Cache processes, enter the appropriate code under **Source**. In the event a process fails, you can optionally define an error message in the Process Error Message field.

Creating Conditional Processes You can make a process conditional by selecting a condition type and entering an expression under Conditional Processing.

Additionally, you can also make a selection from the When Button Pressed attribute. When you select a button from this list, the process only executes if a user clicks the selected button.

Accessing Alternate Page Views

Application Builder includes a number of views to help you better manage the components and controls that define a page.

Topics in this section include:

- Accessing Alternative Page Views
- Page Events
- Objects
- History
- Export
- Groups
- Referenced Components

Accessing Alternative Page Views

To access alternate page views:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. From the View list, select a view and click **Go**. Available options include:
   - Events
   - Objects
   - History
   - Export
   - Groups
   - Referenced

The following sections describe each view.

See Also: "About the Page Definition" on page 5-15

Page Events

The Page Events view details all currently defined page controls and processes. It provides a chronological view of how and in what order the HTML DB engine renders the page, invokes logic, and runs processes. You can control the amount of information that displays by selecting one of the following view options:

- **Show All** displays all possible page controls and processes, including those not currently defined.
- **Show Used** displays currently used page controls and processes (Default).

To view details about a specific page control or process, click the appropriate hypertext link. Alternately, you can create new page controls and processes by clicking the small icons to the left of each entry.

To run the current page, click the **Run** icon.

Objects

The **Object References** view displays a list of database objects referenced by the current page.

History

The **History** view displays a history of recent changes to the currently selected page by developer, application, page ID, modification date, component, and action.

Export

Use **Export** to export the current page. Remember that some pages may reference shared components. To export all pages within an application, you need to complete an application export.

See Also: "How to Deploy an Application to Another Oracle HTML DB Instance" on page 11-4 and "Exporting a Page in an Application" on page 11-5

Groups

The **Page Groups** view displays all pages that are part of the same page group as the current page. Click a page ID to edit the page group. Click a page name to view the page definition.

Referenced Components

The **Referenced Components** report lists page components and shared components associated with the current page.

About the Shared Components Page

Shared components are common elements that can display or be applied on any page within an application. Examples of shared components include:

- Logic controls, such as application items, application processes, application computations, Web service references, and build options
- Security controls, such as creating authentication and authorization schemes, enabling session state protection, or configuring Security attributes
- Globalization tasks such as translating an application, translating messages, or configuring globalization attributes
- Navigation controls, such as breadcrumbs, lists, navigation bar entries, tabs, and trees
- User interface elements, such as themes, templates, user interface defaults, lists of values, and shortcuts)
- File management, such as managing cascading style sheets, images, and static files

You can use the tools and wizards on the Shared Components page either at the application-level, or on specific pages.

Topics in this section include:

- Accessing the Shared Components Page
- Understanding the Shared Components Page

Accessing the Shared Components Page

To access the Shared Components page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.
5. To create a shared component, select the appropriate link.

Understanding the Shared Components Page

The following sections describe each link on the Shared Components page.

Application Items

Application level items do not display, but are used as global variables to the application. Commonly, you set the value of a page-level item using an application or page computations.

See Also: "Creating an Application-Level Item" on page 6-58

Application Processes

Use application processes to run PL/SQL logic:

- At specific points for each page in an application
- As defined by the conditions under which the process is set to execute
- Upon the creation of a new session

Note that **On Demand** processes executes only when called from page-level On Demand process.

See Also: "Understanding Application Processes" on page 5-39

Application Computations

Use application-level computations to assign values to application and page-level items for each page displayed or upon the creation of a new application session. You can also create an application-level computation and execute it conditionally on multiple pages.

See Also: "Understanding Application Computations" on page 5-42

Web Service References

Web service references in Oracle HTML DB are based on the Simple Object Access Protocol (SOAP). You can create a reference to a Web service and then incorporate it into an application to process data submitted by a form, or to render output in the form or report.

See Also: "Implementing Web Services" on page 14-15

Build Options

Use build options to conditionally display or process specific functionality within an application. You can use build options to control which features of an application are turned on for each application deployment.

See Also: "Using Build Options to Control Configuration" on page 11-15

Authentication Schemes

Authentication is the process of establishing each user's identify before they can access your application. Authentication may require a user enter a user name and password or may involve verification of a user's identity or use of a secure key

See Also: "Establishing User Identity Through Authentication" on page 13-13

Authorization Schemes

Authorization controls user access to specific controls or components based on predefined user privileges.

> **See Also:** "Providing Security Through Authorization" on page 13-20

Session State Protection

Session State Protection is a built-in functionality that prevents hackers from tampering with the URLs within your application. URL tampering can adversely affect program logic, session state contents, and information privacy.

> **See Also:** "Understanding Session State Protection" on page 13-3

Edit Security Attributes

Use the Edit Security Attributes page to configure general security attributes for all pages within an application.

> **See Also:** "Configuring Security Attributes" on page 5-11

Translate Application

You can develop applications in Oracle HTML DB that can run concurrently in different languages. A single Oracle database and Oracle HTML DB instance can support an application in multiple languages. Translating an application involves multiple steps. Click this link to access the Translate Application page.

> **See Also:** "About Translating an Application and Globalization Support" on page 15-1 and "Understanding the Translation Process" on page 15-6

Text Message

Text messages are named text strings that can be called from PL/SQL code you write. This PL/SQL can be anonymous blocks within page processes and page regions, or in packages and procedures.

> **See Also:** "Translating Messages Used in PL/SQL Procedures" on page 15-10

Edit Globalization Attributes

You can develop applications that can run concurrently in different languages. Click this link to specify globalization options such as the Application Primary Language and Application Language Derived From attributes.

> **See Also:** "Configuring Globalization Attributes" on page 5-14 and "About Translating an Application and Globalization Support" on page 15-1

Breadcrumbs

Breadcrumbs provide users with hierarchical navigation. A breadcrumb is a hierarchical list of links that display using templates. You can display a breadcrumb as a list of links, or as a breadcrumb path.

> **See Also:** "Creating Breadcrumbs" on page 8-9

Lists

A list is a shared collection of links. You control the appearance of a list through list templates. Each list element has a display condition that enables you to control when it displays.

> **See Also:** "Creating Lists" on page 8-13

Navigation Bar Entries

Navigation bars entries offer users a simple navigation path for moving between pages in an application. The location of a navigation bar depends upon the associated page template. Navigation bar entries can display as a link from an image or text. A navigation bar entry can be an image, an image with text beneath it, or text.

> **See Also:** "Creating a Navigation Bar Entry" on page 8-1

Tabs

Tabs are an effective way to navigate users between pages in an application. You can create two types of tabs: standard tabs or parent tabs. A standard tab set is associated with a specific page and page ID. A parent tab set functions as a container to hold a group of standard tabs

> **See Also:** "Creating Tabs" on page 8-5

Trees

A tree is an effective way to communicate hierarchical or multiple level data

> **See Also:** "Creating Trees" on page 8-19

Themes

A theme is a named collection of templates that defines the application user interface.

> **See Also:** "Managing Themes" on page 7-8

Templates

Templates control the look and feel of specific constructs within your application, such as pages, regions, items, and menus.

> **See Also:** "Customizing Templates" on page 7-17

User Interface Defaults

User interface defaults enable you to assign default user interface properties to a table, column, or view within a specified schema. When you create a form or report using a wizard, the wizard uses this information to create default values for region and item properties.

Because user interface defaults are associated with a table, you can use them with applications created using the form and report wizards.

> **See Also:** "Managing User Interface Defaults" on page 9-1

Lists of Values

A list of values (LOV) is a static or dynamic set of values used to display a popup list of values, select list, check box, or radio group.

See Also: "Creating Lists of Values" on page 6-60

Shortcuts

Use shortcuts to avoid repetitive coding of HTML or PL/SQL functions. You can create a shortcut to define a page control such as a button, HTML text, a PL/SQL procedure, or HTML. Once you define a shortcut it is stored in a central repository so you can reference from various locations within your application.

See Also: "Using Shortcuts" on page 6-63

Cascading Style Sheets

Oracle HTML DB includes themes that contain templates that reference their own cascading style sheets (CSS). Use the Cascading Style Sheets link to upload cascading style sheets to your workspace.

See Also: "Using Custom Cascading Style Sheets" on page 7-43

Images

Use the Images link to upload images to your workspace.

See Also: "Uploading Images" on page 7-45

Static Files

Use the Static Files link to upload static files to your workspace.

See Also: "Uploading Static Files" on page 7-47

Understanding Application Processes

Application processes are blocks of PL/SQL logic that are set run at specific points using the processing of multiple pages of an application. By default, application processes execute at the same point for every page in the application. However, you can apply conditions for specific pages to control when the process executes.

Topics in this section include:

- About On Demand Application Processes
- Application Process Example
- Creating an Application Process
- Accessing Application Processes Reports

About On Demand Application Processes

A special type of application process is the **On Demand** process. An On Demand application process has a Process Point of **On Demand** and executes when called from a page-level On Demand process. On Demand processes are useful when you have PL/SQL logic that you would like to run from different execution points across multiple pages.

See Also: "Creating a Page Process" on page 5-31

Running an On Demand Process from a Page Request

You can have an Oracle HTML DB page request run an On Demand process by using the following syntax:

```
f?p=application_id:page_id:session:APPLICATION_PROCESS=process_id
```

Where:

- `application_id` is the application ID or alphanumeric alias
- `page_id` is the page ID or alphanumeric alias
- `session` is the session ID
- `APPLICATION_PROCESS=process_id` is the keyword `APPLICATION_PROCESS=` followed by either the process ID or an alphanumeric name of an application-level process having a Process Point of On Demand

When you use this syntax, the HTML DB engine recognizes the request and processes it using the following rules:

- The page ID in the URL can be any page ID. The page ID is required in the request only as a syntactic placeholder because no specific page is accessed for this type of request.
- The process authorization scheme, the application's authorization scheme, and the process conditions are supported.
- Session state (that is, item names and values) may be set in the URL, but clear cache options are ignored.
- Any failures of authentication, authorization, or process conditions do not result in visible error messages or other indicators of such failures and most often result in a blank page being displayed.
- Specifying the process by name locates the first process with the specified (case-preserved) name.

See Also: "Clearing Session State" on page 4-11

Application Process Example

A shopping cart application is a good example of when you might use an application process. For example, suppose you need to display the contents of a user's shopping cart with each page view. To accomplish this you create a region on page zero of your application that displays the values of the application-level items `TOTAL_CART_ITEMS` and `TOTAL_PURCHASE_PRICE`.

See Also: "Displaying Components on Every Page of an Application" on page 7-2

Instead of writing a process of each page to set the values of `TOTAL_CART_ITEMS` and `TOTAL_PURCHASE_PRICE`, you could write an application process of type **On Load: Before Header** to compute these values. Then, the HTML DB engine would execute the process on each page as it renders the application. As a result, each page, would display the most current values for `TOTAL_CART_ITEMS` and `TOTAL_PURCHASE_PRICE`.

Creating an Application Process

To create an application process:

1. Navigate to the Shared Components page:
   a. Click **Application Builder** on the Workspace home page.
   b. Select an application.
   c. On the Application home page, click **Shared Components**.

      The Shared Components page appears.
2. Under Logic, select **Application Processes**.
3. Click **Create**.
4. For Identification:
   a. Name - Enter a name for the application process.
   b. Sequence Number - Specify the sequence number for this process. The sequence number determines the order in which the process will be evaluated relative to other process.
   c. Point - Identify the point at which this process executes.
   d. Click **Next**.
5. For Source:
   a. Process Text - Enter the text that is to be the source of your process.
   b. Error Message - Enter the error message that displays if the process raises an error.
   c. Click **Next**.
6. For Conditionality:
   a. Condition Type - Select a condition type that must be met in order for this process to execute.
   b. Expression 1 and Expression 2 - Uses these attribute to conditionally control whether or not the process executes. Enter values in this attribute based on the specific condition type you select. The process will execute if the specified condition is met.
   c. Click **Create Process**.

About the Application Process Page

Once you create an application process, it appears on the Application Processes page. You control how the page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each process as a large icon. To edit a process, click the appropriate icon.
- **Details** displays each application process as a line in a report. To edit a process, click the name.

Accessing Application Processes Reports

After you create an application process, you can access the Utilization and History reports.

To access application processes reports:

1. Navigate to the Workspace home page.

2. Click **Application Builder**.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under Logic, select **Application Processes**.
6. Select one of the following tabs at the top of the page:
   - **Utilization**
   - **History**
7. Follow the on-screen instructions.

Utilization

Click **Utilization** to display the Application Process Utilization page. This page displays application processes used in the current application.

History

Click **History** to display the Application Process History page. This page displays a history of recently changed application process by date.

Understanding Application Computations

Application Computations are units of logic that set the value of a single page or application level item and are run at the same point across multiple pages in an application. Like page level computation, application computations can be based on static values, item values, PL/SQL, or SQL.

Topics in this section include:

- About Application Computations
- Creating an Application Computation
- Accessing the Application Computation History Report

About Application Computations

A common use of an application item is to store the value of the last page viewed in the application. By storing the value in an item, you can add a back button and then redirect the user to the page ID captured by the computation. This type of computation works well, for example, when you need to enable users to back out of an error page.

The following is an example of a computation that stores the last page visited. In this example, the computation:

- Stores the last application page visited to an item named `LAST_PAGE`
- Checks that the value of a `CURRENT_PAGE_ITEM` is of type PL/SQL Function Body with a Computation body of:

```
BEGIN
   :LAST_PAGE := nvl(:CURRENT_PAGE,:APP_PAGE_ID);
   :CURRENT_PAGE := :APP_PAGE_ID;
   RETURN :LAST_PAGE;
END;
```

About Application Computations that Execute On New Instance

Typically an application computation runs at the same point across multiple pages in an application. The exception is computations having a Computation Point of **On New Instance**. This type of computation only runs when a user first accesses your application. This type of computation is useful when you need to only retrieve information once within a user's session (for example, to retrieve a user's job title).

Creating an Application Computation

To create an application computation:

1. Navigate to the Shared Components page:
   a. Click **Application Builder** on the Workspace home page.
   b. Select an application.
   c. On the Application home page, click **Shared Components**.
      The Shared Components page appears.
2. Under Logic, select **Application Computation**.
3. Click **Create**.
4. For Computation Item, select the item this computation will affect.
5. For Computation Point, select a process point at which this computation should be performed.
6. For Computation:
   a. For Computation - Enter the computation logic that corresponds to the computation type.
   b. Computation Error Message - Enter the error message that displays if the computation fails.
7. From Authorization Scheme (optional), select an authorization scheme which must evaluate to True in order for this computation to execute.
8. Under Conditions:
   a. Condition Type - Select a condition type that must be met in order for this computation to execute.
   b. Expression 1 and Expression 2 - Uses these attribute to conditionally control whether or not the computation executes. Enter values in this attribute based on the specific condition type you select. The computation will execute if the specified condition is met.
9. From Build Option (optional), select a build option for this component.
10. Click **Create**.

About the Application Computations Page

Once you create an application computation, it appears on the Application Computations page. You control how the page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each computation as a large icon. To edit an computation, click the appropriate icon.

- **Details** displays each application process as a line in a report. To edit a computation process, click the name.

Accessing the Application Computation History Report

Once you create an application computation, you can view the Application Computation History report.

To access the Application Computation History report:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under Logic, select **Application Processes**.
6. Select **History** tab at the top of the page.

   This Application Computation History report displays a history of recently changed application computations by date.

Viewing Application Reports

Application Builder includes over 70 reports which provide a comprehensive view of your application from various perspectives. You can use application reports to achieve consistency among shared components and page components within your application. For example, you can view details about buttons used on all pages within your application. Additionally, many reports are updatable so you can standardize components, such as item and region labels, without navigating to a specific page.

To view reports specific to the currently selected application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   The Applications home page appears.
4. From the Tasks list, select **View Application Reports**.
5. Select a type of report to view:
   - **Shared Components** reports offer information on common elements that can display on every page within an application. Report examples include Application Comments, Breadcrumb Entries, Database Object Dependencies, Lists of Values, Static Entries, and Messages).
   - **Page Components** reports offer detailed information on controls and logic that execute when the page is rendered (for example, branches, buttons, computations, items, and regions).
   - **Activity** reports offer details about developer activity within the current application. Available reports include Changes by Developer, Changes by Developer by Day, Chart of Changes by Developer, and Recent Changes.
   - **Cross Application** reports offer information that apply to multiple applications. Available reports include Application Attributes, Application

Comments, Build Options, Page Component Counts, Security Profiles by Application, and Template Defaults by Application.

See Also: "Creating Custom Activity Reports Using HTMLDB_ACTIVITY_LOG" on page 14-12

About the Database Object Dependencies Report

The Database Object Dependencies report identifies database objects referenced by the current application. Review this report to determine what objects to move when deploying an application.

See Also: "How to Deploy an Application to Another Oracle HTML DB Instance" on page 11-4

To view the Database Object Dependencies report:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks list, select **View Application Reports**.
5. Click **Shared Components**.
6. Select **Database Object Dependencies**.
7. Click **Compute Dependencies**.
8. To view the components that reference a specific database object, select the Reference Count number.

About the Region Source Report

Use the Region Source report to search through all region source in your application.

To view the Region Source report:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks list, select **View Application Reports**.
5. Click **Page Components**.
6. Select **Region Source**.
7. To view the Page Definition for a region, select the page ID.
8. To view region attributes for a region, select the region name.

6 Building an Application

This section describes how to use Application Builder to build an application and application components. It includes instructions for creating an application and adding pages as well as adding components (reports, charts, or forms), page controls (buttons, items, list of values), and shared components (menus, lists, or tabs).

This section contains the following topics:

- Creating an Application
- Adding Pages to an Application
- Creating Reports
- Creating Forms
- Creating Calendars
- Creating Charts
- Creating Buttons
- Creating Items
- Creating Lists of Values
- Using Shortcuts
- Incorporating JavaScript into an Application
- Creating Dependent Select Lists
- Creating a Help Page

See Also:

- "Using Application Builder" on page 5-1
- "Controlling Page Layout and User Interface" on page 7-1
- "Adding Navigation" on page 8-1

Creating an Application

An application is a collection of pages which share a common session state and authentication. You create a new application in Oracle HTML DB using a wizard. You delete an application from the Application Builder home page.

Topics in this section include:

- About Creating an Application Using a Wizard
- About the Create Application Wizard

- About the Create Application from Spreadsheet Wizard
- About Demonstration Applications
- Deleting an Application

About Creating an Application Using a Wizard

When you click **Create** on the Application Builder home page, you must choose one of the following options:

- **Create Application**. Creates an application based on SQL queries or database tables. You can define blank pages or pages that contain reports, forms, tabular forms, or a report with a linked form. See "About the Create Application Wizard" on page 6-2.
- **Create Application from Spreadsheet**. Creates an application based on spreadsheet data. You can upload or paste spreadsheet data to create a table and then add a user interface. In the resulting application, users can create queries, add, insert, or update records, or analyze the data. See "About the Create Application from Spreadsheet Wizard" on page 6-5.
- **Demonstration Application**. Installs or uninstalls demonstration applications. Use demonstration applications to learn how to build applications. See "About Demonstration Applications" on page 6-6.

See Also: "Adding Pages to an Application" on page 6-7 for information about adding reports and forms by creating a new page

About the Create Application Wizard

The Create Application wizard enables you to create a fully functional application based on any number of tables. You can use the Create Application Wizard to create blank pages, or pages based on SQL queries or database tables. You can create SQL queries by manually typing SQL or by using the graphical user interface of Query Builder. Applications based on tables can consist of a simple report, a form and report, or a tabular form. When creating pages on tables, you have the option to generate analysis pages. Analysis pages extend a simple report or a report on a form to include multiple drilldown reports and charts.

Topics in this section include:

- Creating an Application Based on Tables or Queries
- About Application Models and User Interface Defaults

Creating an Application Based on Tables or Queries

You can create an application based on a table, query, or drill-down query by selecting **Create Application** in the Create Application Wizard.

To create an application based on a table, query, or drill-down query:

1. Click the **Application Builder** icon on the Workspace home page.
2. Click the **Create** button.
3. Select **Create Application** and click **Next**.
4. Enter the basic application details and click **Next**:
   a. Name - Enter a name to identify the application.

   b. Application - Enter an unique integer value to identify the application.

   c. Create Application - Select a creation method:

      – **From scratch** enables you to add pages manually

      – **Based on existing application model** enables you to copy page definitions from a previous application model.

        Note that you will still have to define all other application attributes, or you can choose to copy some attributes using by choosing to copy shared components from another application (See step 7).

   d. **Schema** - Your application will obtain its privileges by parsing all SQL as a specific database schema. Identify the database schema owner.

      Note that the list of available schemas is limited to those associated with your workspace.

   Next, add pages to your application.

5. Under Add Pages:

   a. Select the type of page you want to add. Options include:

      – **Blank** creates a page with no built-in functionality.

      – **Report** creates a page the contains the formatted result of a SQL query. You can choose to build a report based on a table you select, or based on a custom SQL SELECT statement or a PL/SQL function returning a SQL SELECT statement that you provide.

      – **Form** creates a form to update a single row in a database table.

      – **Tabular Form** creates a form to perform update, insert, and delete operations on multiple rows in a database table.

      – **Report and Form** builds a two page report and form combination. On the first page, users select a row to update. On the second page users can add a new record or update or delete an existing record.

      Action displays the currently selected page type. For each selection, the wizard prompts you for a variety of different types of information.

      Report pages include the **Include Analysis Pages** check box. Select this option and follow the wizard prompts to extend a simple report or a report on a form to include multiple drilldown reports and charts.

   b. Click **Add Page**.

      The page (or pages) appear at the top of the page. To delete a page, click **Delete** icon.

   c. Repeat the previous steps until all pages have been added.

   d. Click **Next**.

6. Determine whether to include tabs in your application and click **Next**.

7. Determine whether to import shared components from another application. Shared components are common elements that can display or be applied on any page within an application.

   To include shared components:

   a. From Source Application, select the application from which you want to import shared components.

   b. From Select Components to Import, select the components to import.
   c. Click **Next**.
8. Select the following authentication and globalization preferences:
   a. Default Authentication Scheme - Identify an authentication scheme you would like to use by default.

      Authentication is the process of establishing users' identities before they can access an application.
   b. Language - Select the primary language for this application.

      This attribute identifies the language in which an application is developed. This language is the base language from which all translations are made.
   c. User Language Preference Derived From - Specifies how the engine determines the application language. The application primary language can be static (that is, derived from the Web browser language) or determined from a user preference or item. The database language setting determines date display and sorting characteristics.
   d. Click **Next**.
9. Select a theme and click **Next**.

   Themes are collections of templates that can be used to define the layout and style of an entire application.
10. Confirm your selections. To return to a previous wizard page, click **Previous**. To accept your selections, click **Finish**.

See Also: "Managing Application Models" on page 12-13

About Application Models and User Interface Defaults

The Create Application Wizard is designed with the assumption that the developer may run it multiple times. To facilitate this iterative approach to application development, every time you run the wizard it saves the page definitions to an application model.

Consider the following example. You create a new application by running the Create Application Wizard. After viewing the application, you realize it is not quite what you wanted. Instead of altering it, you can run the wizard again and select an application model. By selecting an existing application model when you rerun the wizard, you can quickly improve your application with minimal time and effort.

See Also: "Managing Application Models" on page 12-13

Another way to increase your productivity when creating an application is to specify user interface defaults. User interface defaults are metadata that enable you to assign default user interface properties to a table, column, or view within a specified schema.

See Also: "Managing User Interface Defaults" on page 9-1

Leveraging Application Models and User Interface Defaults

You can increase your productivity when creating applications by leveraging application models and user interface defaults. Consider the following scenario:

1. Create an application based on tables or views by running the Create Application Wizard.

2. Run the generated application. Note any functional deficiencies.
3. Evaluate whether to create or edit user interface defaults.

   For example, you can use user interface defaults to control how form field or report labels display. You can also utilize user interface defaults to display specific columns or have columns display in an alternate order.
4. Navigate to the Application home page and create a new application by clicking **Create**.
5. Select **Create Application**.
6. When prompted to enter application details, specify the following:
   a. Name - Enter a name to identify the application.
   b. Application - Enter an unique integer value to identify the application or accepts the default.
   c. Create Application - Select **Based on existing application model**.
7. Select an application model.

   Note the pages you previously created already appear.
8. Add pages, edit pages, or remove pages.
9. Complete the wizard.
10. Repeat steps 2 through 9 until the application meets your functional requirements.

About the Create Application from Spreadsheet Wizard

You can create an application based on spreadsheet data by selecting **Create Application from Spreadsheet** in the Create Application Wizard.

To create an application from spreadsheet data:

1. Click the **Application Builder** icon on the Workspace home page.
2. Click the **Create** button.
3. Select **Create Application from Spreadsheet**.
4. Specify how spreadsheet data will be uploaded and click **Next**. Options include:
   a. **Upload file** (comma-delimited or tab-delimited)
   b. **Copy and paste** (up to 30KB)
5. Review the preview of how your table will display and click **Next**. You can modify the table name, change the column names or data types, or specify which columns to include.
6. Review the displayed Singular Name and enter a Plural Name.

   Column User Interface Defaults display default label names.
7. (Optional) Under Column User Interface Defaults, edit the displayed Label names and click **Next**.
8. For Summary By Column, select the columns for which data will be summarized in reports and charts and click **Next**.
9. This wizard creates several summary reports. Select columns for which values will be aggregated in summary reports.

   a. **Aggregate by Column** - Choose one or more columns for which you want data summarized or averaged.
   b. **Aggregate Function to Use** - Select the aggregate function to use in the report (Sum or Average).
   c. Click **Next**.

10. Select Application Options:
    a. **Application Name** - Enter an alphanumeric name for this application.
    b. Specify a Create Mode:
       – **Read and Write** includes insert and update pages.
       – **Read Only** does not include insert and update pages.
    c. Select a chart type.
    d. Click **Next**.
11. Select a theme and click **Next**.

    Themes are collections of templates that can be used to define the layout and style of an entire application.
12. Confirm your selections. To return to a previous wizard page, click **Previous**. To accept your selections, click **Create**.

About Demonstration Applications

Oracle HTML DB installs with a number of demonstration applications. Use these applications to learn more about the different types of functionality you can include in your applications.

See Also: "Running a Demonstration Application" on page 3-1

Accessing Demonstration Application

To access demonstration applications:

1. Click the **Application Builder** icon on the Workspace home page.
2. Click the **Create** button.
3. Select **Demonstration Application**.

   The Demonstration Applications page appears, displaying links to the following applications:
   - *Sample Application* offers a working demonstration that highlights basic design concepts
   - *Collection Showcase* demonstrates shopping cart concepts
   - *Web Services* serves an example of how you can use Web Services
   - *Presidential Inaugural Addresses* demonstrates Oracle Text
4. To install a demonstration application, scroll down to the application you want to install, click **Install**.

   Installed appears as the Status.
5. To edit an installed demonstration application, click **Edit**.
6. To run an installed demonstration application, click **Run**.

7. To reinstall a demonstration application, click **Re-Install**.

Deleting an Application

You can delete an application from within Application Builder, or while editing application attributes. If you delete an application you also delete all defined components (reports, charts, or forms), page controls (buttons, items, list of values), and shared components (breadcrumbs, lists, and tabs, but not user interface defaults).

Topics in this section include:

- Deleting an Application from Application Builder
- Deleting an Application from Edit Application Attributes

Deleting an Application from Application Builder

To delete an application from Application Builder:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, verify the application ID and name at the top of the page.
5. From the Tasks list, select **Delete this Application**.
6. Follow the on-screen instructions.

Deleting an Application from Edit Application Attributes

To delete an application from Edit Application Attributes:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Edit Attributes**.
5. Click **Edit Standard Attributes**.
6. Verify the application ID and name.
7. Click **Delete** at the top of the page.

See Also: "Configuring Standard Application Attributes" on page 5-6

Adding Pages to an Application

You can add a new page or add a component to an existing page by running the Create Page Wizard. You can access this wizard by:

- Clicking **Create Page** on the Applications home page
- Clicking **Create** on the Page Definition
- Selecting the **Create** link on the Developer toolbar

Note: You can also add a component (that is, a report, chart, form, wizard, a calendar, or tree) to an existing page using the Create Page Wizard. When prompted, specify an existing page ID.

Topics in this section include:

- Creating a Page from Application Home Page
- Creating a Page from the Page Definition
- Creating a Page from the Developer Toolbar
- Running a Page or Application
- Grouping Pages
- Locking and Unlocking a Page
- Deleting a Page

See Also: "Creating Reports" on page 6-17, "Creating Charts" on page 6-40, "Creating Forms" on page 6-26, "Creating Calendars" on page 6-35, and "Creating Trees" on page 6-35

Creating a Page from Application Home Page

To create a new page from the Application home page:

1. Navigate to Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   The Application home page appears.
4. Click **Create Page**.
5. Select the type of page you want to create:
   - Blank Page
   - Multiple Blank Pages
   - Report
   - Chart
   - Form
   - Wizard
   - Calendar
   - Tree
   - Login Page
6. Follow the on-screen instructions.

Creating a Page from the Page Definition

To create a new page while viewing a Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. From the navigation bar at the top of the page, click the **Create** button.
3. Select the type of page you want to create:
   - New Page
   - Region on this page
   - Page control on this page
   - Shared Control

   Table 6–1 describes the various selections available based on the type of page you select.

Table 6–1 Create Page Options

Create Page Options	Available Selections
New Page	Available page types: ▪ Blank age ▪ Multiple blank pages ▪ Report ▪ Chart ▪ Form ▪ Wizard ▪ Calendar ▪ Tree ▪ Login Page
Region on this page	Regions function as containers for content. Available region types: ▪ HTML ▪ Report ▪ Form ▪ Chart ▪ Breadcrumb ▪ PL/SQL Dynamic Content ▪ Tree ▪ URL ▪ Calendar ▪ Multiple HTML ▪ Help Text

Table 6–1 (Cont.) Create Page Options

Create Page Options	Available Selections
Page control on this page	Page controls: ■ Item ■ Button ■ Branch ■ Computation ■ Process ■ Validation
Shared control	Shared component options: ■ Navigation Bar icon ■ Parent tab ■ Standard tab ■ List of values ■ List ■ Breadcrumb

4. Follow the on-screen instructions.

See Also: Editing a Page Definition on page 5-18

Creating a Page from the Developer Toolbar

Users who log in to Oracle HTML DB having developer privileges have access to the Developer toolbar. The Developer toolbar displays at the bottom every page and offers a quick way create a new page.

To create a new page from the Developer toolbar:

1. On the Developer toolbar, select **Create**.

   The New Component Wizard appears.

2. Select the type of component you want to create and click Next. Available options include:

   - New Page
   - Region on this page
   - Page control on this page
   - Shared control

   Table 6–1 on page 6-9 describes the various selections available based on the type of page you select.

3. Follow the on-screen instructions.

See Also: "Using the Developer Toolbar" on page 5-18

Running a Page or Application

The HTML DB engine dynamically renders and processes pages based on data stored in database tables. To view a rendered version of your application, you run or submit it to the HTML DB engine. As you create new pages you can run them individually, or run an entire application. You can run an application by clicking the Run Application icon.

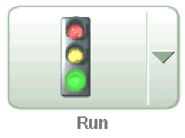
Topics in this section include:

- About the Run Application Icon
- Running an Application from the Application Builder Home Page
- Running an Application from the Application Home Page
- Running a Page from the Pages List on the Application Home Page
- Running a Page from the Page Definition

About the Run Application Icon

The Run Application icon resembles a traffic light. A large colored Run Application icon appears on the Application home page.

Figure 6–1 Run Application Icon



Many pages within Application Builder also feature a smaller, light green version of this icon. Clicking this smaller Run icon runs the current application or individual pages depending upon the context. For example, clicking the Run icon on the Application home page runs the entire application. Clicking the icon on the Page Definition runs the current page.

Figure 6–2 Run Icon

Running an Application from the Application Builder Home Page

To run an entire application from the Application Builder home page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. From the View list, select **Details** and click **Go**.
4. Locate the application in the Applications list.
5. Click the **Run** icon in the far right column.

Running an Application from the Application Home Page

To run an entire application from the Application home page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.

   The Application Builder home page appears.
3. Select on application.
4. Click the **Run** icon.

Running a Page from the Pages List on the Application Home Page

To run a page from the Pages list:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the View list, select **Details** and click **Go**.
5. From the Pages list, locate the page you want to run and click the **Run** icon in the far right column.

Running a Page from the Page Definition

To run a specific page from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. Click the **Run Page** icon in the upper right corner of the page.

Grouping Pages

Use page groups to organize and manage the pages within an application. To use page groups, you create a group and then assign pages to the group. To view existing groups within an application, navigate to

Page groups do not have any function other then to help a developer organize their application pages.

You can make the pages within your application easier to access by organizing them into page groups.

Topics in this section include:

- Viewing the Page Group Report
- Creating a Page Group
- Assigning Pages to a Page Group

Viewing the Page Group Report

The Page Group report offers a comprehensive list of which pages in an application are assigned to a group and which pages are unassigned.

Viewing Page Groups from the Application Home Page To view the Page Group report from the Application home page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. From the Tasks List on the right side of the page, select **Manage Page Groups**.
5. From the Tasks list, select **Report Page Groups**.

Viewing Page Groups from the Page Definition To view page groups from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. From the View list, select **Groups**.

Creating a Page Group

To create a page group:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks List on the right side of the page, select **Manage Page Groups**.
5. On the Page Groups page, click **Create**.
6. Enter a name, a description (optional), and click **Create**.

Assigning Pages to a Page Group

To assign pages to page group:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks List on the right side of the page, select **Manage Page Groups**.
5. From the Tasks list, select **Report Unassigned Pages**.

   The Unassigned Pages page appears.
6. From Page Group, select a group to which you want to assign pages.
7. Select the pages to be assigned.
8. Click **Assigned Checked**.

   Selecting the page ID takes you to the Page Attributes page. Selecting the Page Name links to the Page Definition.

Locking and Unlocking a Page

You can prevent conflicts during application development by locking pages in your application. By locking a page, you prevent other developers from editing it.

Topics in this section include:

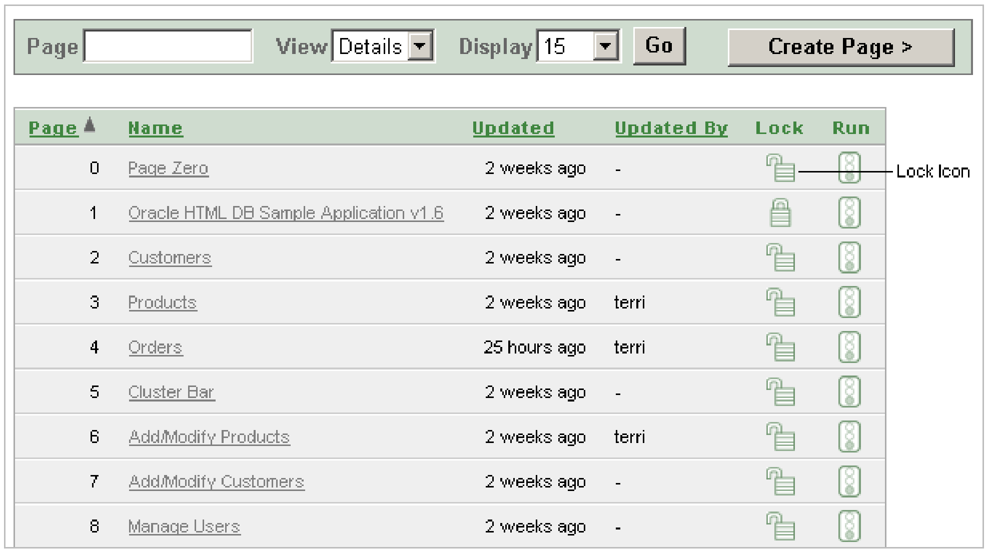
- Determining If a Page Is Locked
- Locking a Page
- Unlocking Pages
- Accessing Alternative Locked Pages Views

Determining If a Page Is Locked

A lock icon indicates whether a page is currently locked. If a page is unlocked, the icon appears as an open padlock. If the page is locked, the icon appears as a locked padlock. A lock icon appears on the following pages:

- **Application home page**. Select **Details** from the Display list. A list of pages appears. The lock icon appears under the Lock column.
- **Page Definition**. The lock icon appears on the far right side of the page across from the breadcrumb menu.

Figure 6–3 Lock Icon



Page	Name	Updated	Updated By	Lock	Run
0	Page Zero	2 weeks ago	-		
1	Oracle HTML DB Sample Application v1.6	2 weeks ago	-		
2	Customers	2 weeks ago	-		
3	Products	2 weeks ago	terri		
4	Orders	25 hours ago	terri		
5	Cluster Bar	2 weeks ago	-		
6	Add/Modify Products	2 weeks ago	terri		
7	Add/Modify Customers	2 weeks ago	-		
8	Manage Users	2 weeks ago	-		

Locking a Page

You can lock pages from the Page Locks page, the Pages list, and from a Page Definition.

Locking a Page the Page Locks Page To lock a page of your application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks List on the right side of the page, select **Manage Page Locks**.
5. Select the appropriate pages and click **Lock Checked**.
6. Enter a comment in the Comment field.
7. Click **Lock Page(s).**

Locking a Page from the Pages List To lock a page from the Pages list:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the View list, select **Details** and click **Go**.

5. In the Pages list, locate the page you want to lock and click the **Lock** icon.
6. Enter a comment in the Comment field.
7. Click **Lock Page(s)**.

Locking a Page from the Page Definition To lock a page from the Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Click the **Lock** icon in the upper right corner above Shared Components.
3. Select the appropriate pages and click **Lock Checked**.
4. Enter a comment in the Comment field.
5. Click **Lock Page(s).**

Unlocking Pages

Only the developer who locked a page can unlock it. However, a developer with administrative privileges can unlock pages locked by other developers.

Unlocking Pages as a Workspace Administrator To unlock a page as a workspace administrator:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. From the Tasks List on the right side of the page, select **Administer Locks**.
5. Select the pages to be unlocked and click Unlock Page(s).

Unlocking Pages from the Page Locks Page To unlock a page from the Page Locks page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. From the Tasks List on the right side of the page, select **Manage Page Locks**.
5. Select the appropriate pages.
6. Click **UnLock Checked**.

Unlocking Pages from the from the Pages List To unlock a page from the Pages list:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the View list, select **Details** and click **Go**.

5. In the Pages list, locate the page you want to unlock and click the **Lock** icon.

   The Edit Lock Comment page appears.
6. Click **UnLock**.

Unlocking Pages from the Page Definition To unlock pages from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. Select the Page you want to unlock in the Pages list.
5. Click the **Lock** icon in the upper right corner above Shared Components.

   The Page Locks page appears.
6. Select the Page you want to unlock and click **Unlock Checked**.

Accessing Alternative Locked Pages Views

You can access a number of different views of Locked Pages on the Locked Pages page.

To access different views of locked pages:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. From the Tasks List on the right side of the page, select **Manage Page Locks**.
5. From the Tasks list, select one of the following:
   - **Show Locked Pages** displays only locked pages within the current application.
   - **Show All Pages** displays all pages within the current application.
   - **Show Unlocked Pages** display only unlocked pages within the current application.
   - **Administer Locks** enables workspace administrators to unlock any pages locked by a developer.

Deleting a Page

You can delete a page from the Page Definition or while editing page attributes.

Topics in this section include:

- Deleting a Page from the Page Definition
- Deleting a Page While Editing Page Attributes

Deleting a Page from the Page Definition

To delete a page from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

4. Select a page.

   The Page Definition appears.

5. Verify the page name.
6. From the navigation bar at the top of the page, click **Delete**.
7. Follow the on-screen instructions.

   See Also: "Editing a Page Definition" on page 5-18 for information about editing page attributes

Deleting a Page While Editing Page Attributes

To delete a page while editing page attributes:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.

5. Click the **Edit Attributes** icon.
6. Click **Edit Standard Attributes**.
7. Verify the application ID and page name.

   The Edit Application Attributes page appears.

8. Click **Delete**.
9. Follow the on-screen instructions.

Creating Reports

In Oracle HTML DB, a report is the formatted result of a SQL query. You can generate reports by selecting and running a built-in query, or by defining a report region based on a SQL query.

Topics in this section include:

- Creating a Report Using a Wizard
- Editing Report Attributes
- Controlling Report Pagination
- Enabling Column Sorting
- Adding a CSV Link to a Report
- Exporting a Report as an XML File or a CSV File
- Creating a Column Link
- Defining an Updatable Column
- Defining a Column as a List of Values
- Controlling When Columns Display
- Controlling Column Breaks

Creating a Report Using a Wizard

Oracle HTML DB includes a number of built-in wizards for generating reports.

To create a report using a wizard:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. Click **Create Page**.
5. Select **Report**.
6. Select one of the following report types:
   - **Wizard Report** - Does not require any SQL knowledge. Select the appropriate schema, table, columns, and result set display.
   - **SQL Report** - Creates a report based on a custom SQL SELECT statement or a PL/SQL function returning a SQL SELECT statement that you provide.
7. Follow the on-screen instructions.

Editing Report Attributes

You can use the Report Attributes and Column Attributes pages to precisely control the definition of report pages. For example, you can use these attributes to alter column heading text, change column positioning, hide a column, create a sum of a column, or select a sort sequence.

On the Page Definition, you can access the Report Attributes page by clicking either **Report** or **RPT,** adjacent to the report region you want to edit. **Report** indicates the report is a regular report, and **RPT** indicates the report is an wizard report. You can also navigate to the Report Attributes page by clicking the region name and then selecting the Report Attributes tab.

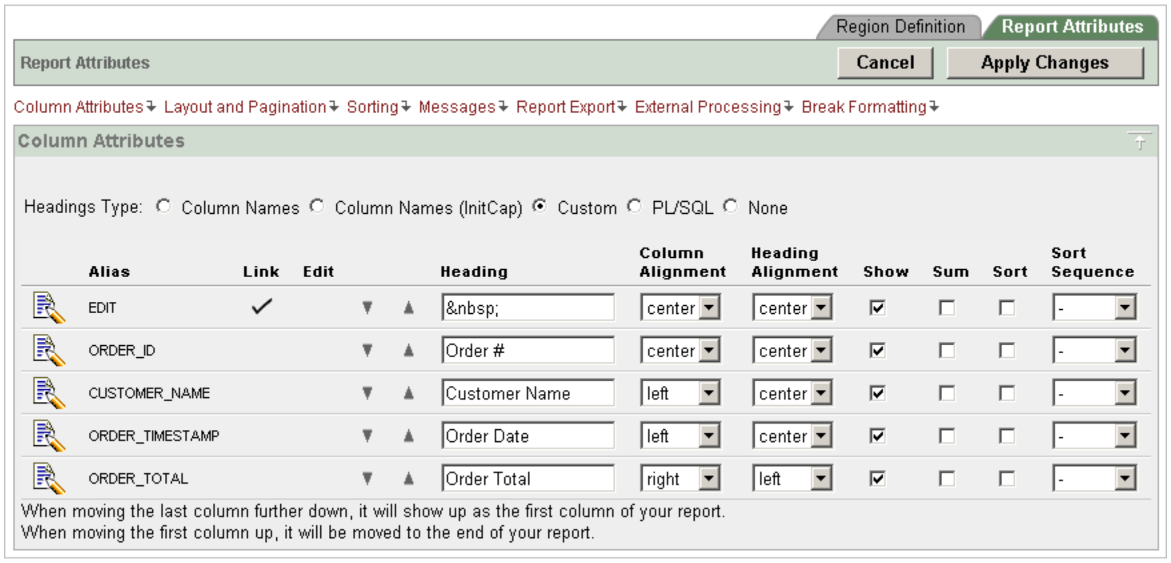
To access the Report Attributes page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select the application.
4. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
5. Under Regions, click **Report** next to the name of the report region you want to edit.

   The Report Attributes page appears.

Figure 6–4 Report Attributes Page



Headings Type: ( ) Column Names ( ) Column Names (InitCap) [✓ Custom] ( ) PL/SQL ( ) None

	Alias	Link	Edit			Heading	Column Alignment	Heading Alignment	Show	Sum	Sort	Sort Sequence
	EDIT	✓		▼	▲		center	center	☑	☐	☐	-
	ORDER_ID			▼	▲	Order #	center	center	☑	☐	☐	-
	CUSTOMER_NAME			▼	▲	Customer Name	left	center	☑	☐	☐	-
	ORDER_TIMESTAMP			▼	▲	Order Date	left	center	☑	☐	☐	-
	ORDER_TOTAL			▼	▲	Order Total	right	left	☑	☐	☐	-

When moving the last column further down, it will show up as the first column of your report.
When moving the first column up, it will be moved to the end of your report.

Heading Type identifies how the heading was generated for the report. Use the Column Attributes section to control report column appearance and functionality. The Link column indicates if a a column link is currently defined. The Edit column indicates whether or not a column is currently updatable.

Table 6–2 describes common report column edits.

Table 6–2 Common Report Column Edits

Description	Developer Action
Alter column display sequence.	Click the up and down arrows.
Alter heading alignment.	Under Column Alignment, select a new column alignment.
Change column heading text.	Under Heading, enter different heading text.
Control which columns display.	Click **Show** to indicate a column should display.
Enable an unique sort sequence.	Click **Sort** and select a sequence number from **Sort Sequence**.
	Any number of columns can be sort enabled. However, at least one column must have a Sort Sequence defined.
Enable the sum of a column.	Click **Sum** to enable the sum of a column.

You can further refine the attributes of a specific column on the Column Attributes page.

6. To access the Column Attributes page, click the **Edit** icon adjacent to the appropriate column Alias.

   See online Help for more information about a specific attribute.

Controlling Report Pagination

You control report pagination by:

- Including a pagination substitution string in the report template
- Making selections from Layout and Pagination on the Report Attributes page

You control how pagination displays by making selections from the Layout and Pagination attributes on the Report Attributes page.

To access the Layout and Pagination section of the Report Attributes page:

1. Create a report. See "Creating a Report Using a Wizard" on page 6-18.
2. Under Regions, click the appropriate report attributes link (**Report** or **RPT**).

   The Report Attributes page appears.
3. Scroll down to Layout and Pagination.

   You use the Layout and Pagination attributes to select a pagination style, determine where pagination displays, and specify the number of rows that display on each page. Table 6–3 describes the most commonly used Layout and Pagination attributes.

Table 6–3 Layout and Pagination Attributes

Attribute	Description
Report Template	Specifies a template to be applied to this report. Report templates provide control over the results of a row from your SQL query. You can choose from a number of default templates, or pick a custom build template.
Pagination Scheme	Specifies a pagination scheme for this report. Pagination provides the user with information about the number of rows and the current position within the result set. Pagination also defines the style of links or buttons used to navigate to the next or previous page. For more information, see the Help for this item.
Display Position	Defines where pagination displays. If you choose to display pagination above a report, the selected report template needs to support that type of display.
Number of Rows	Defines the maximum number of rows to display on each page.
Strip HTML	Specifies whether or not to remove HTML tags from the original column values for HTML expressions and column links. If you select values from the database that already contain HTML tags, then those tags can cause conflicts with the HTML generated for your columns links or HTML expressions. When this option is enabled, only the actual data portion of your column value is used.

Including Pagination After the Rows in a Report

To include pagination after the rows in a report:

1. Create a report. See "Creating a Report Using a Wizard" on page 6-18.

   Next, select the appropriate Layout and Pagination attributes.
2. Navigate to the Report Attributes page:
   a. Navigate to the Page Definition.
   b. Under Regions, click the appropriate report attributes link (**Report** or **RPT**).

      The Report Attributes page appears.
3. Under Layout and Pagination, select the following:
   a. Report Template - Select a report template (optional).

   b. Pagination Scheme - Select a pagination scheme.
   c. Display Position - Select a display position.
   d. Number of Rows - Specify how many rows display on each page.
   e. Click **Apply Changes**.
4. Edit the report template:
   a. Navigate to the Page Definition.
   b. Under Templates, select the report template name.
   c. Include the `#PAGINATION#` substitution string in the After Rows attribute.
   d. Click **Apply Changes**.
5. Run the page.

Including Pagination Before the Rows in a Report

To include pagination before the rows in a report:

1. Create a report. See "Creating a Report Using a Wizard" on page 6-18.

   Next, select the appropriate Layout and Pagination attributes.
2. Navigate to the Report Attributes page:
   a. Navigate to the Page Definition.
   b. Under Regions, click the appropriate report attributes link (**Report** or **RPT**).

      The Report Attributes page appears.
3. Under Layout and Pagination:
   a. Report Template - Select a report template (optional).
   b. Pagination Scheme - Select a pagination scheme.
   c. Display Position - Select a position that contains the word top.
   d. Number of Rows - Specify how many rows display on each page.
   e. Click **Apply Changes**.
4. Edit the report template.
   a. Navigate to the Page Definition.
   b. Under Templates, select the report template name.
   c. Include the `#TOP_PAGINATION#` substitution string in the Before Rows attribute.
   d. Click **Apply Changes**.
5. Run the page.

Enabling Column Sorting

You enable column sorting on the Report Attributes page.

To enable column sorting:

1. Navigate to the Report Attributes page. See "Editing Report Attributes" on page 6-18.

2. Under Report Column Attributes, select the **Sort** check box adjacent to the columns to be sorted.
3. From Sort Sequence, select a sequence number.

   Sort Sequence is optional. However, if there are one or more sort enabled columns, then at least one column needs a defined Sort Sequence.
4. Scroll down to Sorting.
5. Specify ascending and descending image attributes or click **set defaults**.

Adding a CSV Link to a Report

You can create a link within a report that enables users to export the report as a comma-delimited file (.csv) file. To add a CSV link to a report you need to enable the CSV output option. When using the CSV output option, the report template is not important. You can include a CSV link with any report template that has the CSV export substitution string defined.

See Also: "Automatic CSV Encoding" on page 5-15

Enabling the CSV Output Option

To enable the Enable CSV output option:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Scroll down to Report Export.
3. From Enable CSV output, select **Yes**.
4. (Optional) In the Separator and Enclosed By fields, define the separator and delimiter.

   The default Enclosed By by characters are a double quotation marks (" "). The default delimiter is either a comma or a semicolon depending upon your current NLS settings.
5. In the Link Label field, enter link text. This text will display in your report and enable users to invoke a download.
6. (Optional) To specify a default export file name, enter a name in the Filename field.

   By default, the HTML DB engine creates an export file name by taking the region name and adding the appropriate file name extension (`.csv` or `.xml`).
7. Click **Apply Changes**.

Exporting a Report as an XML File or a CSV File

You can export a report as an XML files by selecting a report template.

To export a report as a file:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Scroll down to Layout and Pagination.
3. From the Report Template list, select **export: XML** or **export: CSV**.

Selecting **export: XML** prevents the HTML DB engine from rendering the page and dumps the content to an XML file.

4. Click **Apply Changes**.

Creating a Column Link

Use the Column Link attributes to create a link from a report to another page in your application or to a URL.

To create a column link to another page:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Under Report Column Attributes, locate the column to contain the link.
3. Click the **Edit** icon adjacent to the column name.

   The Column Attributes page appears.
4. Scroll down to Column Link.
5. To create a column link to another page:
   a. From Target, select **Page in this Application**.
   b. (Optional) In Link Attributes, specify additional column link attributes that will be included in the `<a href= >` tag (for example, a link target, classes, or styles).
   c. In Link Text, enter the text to be displayed as a link, specify an image tag, or pick from the list of default images.
   d. In Page, specify the target page ID. To reset the pagination for this page, select **Reset Pagination**.
   e. In Request, specify the request to be used.
   f. In Clear Cache, specify the pages (that is, the page IDs) on which to clear cache. You can specify multiple pages by listing the page IDs in a comma-delimited list.
   g. Use the Name and Value fields to specify session state for a specific item.
6. Click **Apply Changes**.

To create a column link to a URL:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Access the Column Attributes page by clicking the **Edit** icon adjacent to the appropriate column.

   The Column Attributes page appears.
3. Scroll down to Column Link.
4. Under Column Link, make the following selection:
   a. From Target Type, select **URL**.
   b. In Link Text, enter the text to be displayed as a link and select a substitution string.

   c. (Optional) In Link Attributes, specify additional column link attributes that will be included in the `<a href= >` tag (for example, a link target, classes, or styles).
   d. In URL, enter the appropriate address.
5. Click **Apply Changes**.

Defining an Updatable Column

You can make a column updatable by editing Tabular Form Element attributes on the Column Attributes page. Note that the HTML DB engine can only perform updates if:

- A multirow update is defined
- A PL/SQL process is implemented to process updated data
- When using the built-in tabular form elements and display types, then the report has to be defined using the type **SQL Query (updatable report)**

To define updatable column attributes:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Access the Column Attributes page by clicking the **Edit** icon adjacent to the appropriate column.

   The Column Attributes page appears.
3. Scroll down to Tabular Form Element.
4. Under Tabular Form Element, make the following selections:
   a. Display As - Select a type of updatable column.

      Use this option to make a column updatable. Updates can only be performed if a multirow update is defined, or PL/SQL process is implemented to process updated data.
   b. Date Picker Format Mask - Make a selection if you selected the Display As type of **Date Picker**.
   c. Element Width - Specify the width of the form item.
   d. Number of Rows - Specify the height of a form item (applicable to text areas).
   e. Element Attributes - Define a style or standard form element attribute.
   f. Element Option Attributes - Specify form element attributes for items in a radio group or check box.
   g. Primary Key Source Type - Identify the default type.
   h. Primary Key Source - Identify the default source.

      If the current column is part of the primary key defined in an MRU process, only the primary key source type and source appear.

      Otherwise, Default and Default Type appear. Use Default and Default Type to establish a relationship between two master records in a master detail form, or to set the default values for new rows.
   i. Reference Table Owner - Identify the owner of the referenced table. Use this attribute to build User Interface Defaults for reports.

   j. Reference Table Name - Identify the table or view that contains the current report column.
   k. Reference Column Name - Identify the column name that this report column references
5. Click **Apply Changes**.

Defining a Column as a List of Values

Report columns can be rendered as lists of values. For example, a column can be rendered using a select list or a popup list of values. Or, a column can also be rendered as read-only text based on a list of values.

This last approach is an effective strategy when creating display lookup values and is particularly useful in regular, nonupdatable reports. This approach enables you to display the value of a column without having to write a SQL JOIN statement.

To render a report column as a list of values:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Access the Column Attributes page by clicking the **Edit** icon adjacent to the appropriate column.

   The Column Attributes page appears.
3. Scroll down to List of Values.
4. From Named LOV, make a selection from the List of Values repository.
5. To include a null value in a list of values:
   a. In Display Null, select **Yes**.
   b. In Null Text, specify the value that displays.

   A column can also have a value that does not display in its list of values.
6. To define a value that does not display in the list of values:
   a. From Display Extra Value, select **Yes**.

      The extra value is used if the actual column value is not part of the LOV. In that situation, the actual value is shown. If you do not display extra values, you may end up with the wrong value and unintentionally update your data incorrectly.
   b. In Null Value, specify the value that displays.
   c. If you have not selected a Named LOV, enter the query used to display a select list in the LOV Query field.
7. If you have not selected a Named LOV, enter the query used to display a select list in LOV Query.
8. Click **Apply Changes**.

   See Also: "Creating Lists of Values" on page 6-60

Controlling When Columns Display

You can use the Authorization and Condition column attributes to control when a column displays.

Authorization enables you to control access to resources (such as a report column) based on predefined user privileges. For example, you could create an authorization scheme in which only managers can view a specific report column. Before you can select an authorization scheme, you must first create it.

A condition is a small unit of logic that enables you to control the display of a column based on a predefined condition type. The condition evaluates to true or false based on the values you enter in the Expressions fields.

To specify Authorization and Condition attributes:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Access the Column Attributes page by clicking the **Edit** icon adjacent to the appropriate column.

   The Column Attributes page appears.
3. Under Authorization, make a selection from the Authorization Scheme list.
4. Under Conditions, make a selection from the Condition Type list, and depending upon your selection, enter an expression or value in the appropriate Expression fields.

   If the authorization is successful and the condition type display evaluates to true, the column displays.

See Also:

- "Providing Security Through Authorization" on page 13-20
- "Understanding Conditional Rendering and Processing" on page 4-6
- Appendix A, "Available Conditions" on page A-1

Controlling Column Breaks

You can control if a specific column repeats and how column breaks appear when printed using Break Formatting attributes. For example, suppose your report displays employee information by department number. If multiple employees are members of the same department, you can increase the readability by specifying the department number only appears once.

To create this type of column break:

1. Navigate to the appropriate Report Attributes page. See "Editing Report Attributes" on page 6-18.
2. Scroll down to Break Formatting.
3. Make a selection from the Breaks list.

Creating Forms

You can include a variety of different types of forms in your applications. You can include forms that enable users to update just a single row in a table or multiple rows at once. Oracle HTML DB includes a number of wizards you can use to create forms automatically, or you can create forms manually.

Topics in this section include:

- Creating a Form Using a Wizard

- Creating a Tabular Form
- Building a Master Detail Form
- Creating a Form Manually
- Validating User Input in Forms

Creating a Form Using a Wizard

The easiest way to create a form is to use a wizard. For example, the Form on Table or View Wizard creates one item for each column in a table. It also includes the necessary buttons and processes required to insert, update, and delete rows from the table using a primary key. Each region has a defined name and display position; all other attributes are items, buttons, processes, and branches.

To create a form using a wizard:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Form**.
6. Under Forms, select a type of form page as described in Table 6–4.

Table 6–4 Forms Page Types

Form Page Type	Description
Form on a Procedure	Builds a form based on stored procedure arguments. Use this approach when you have implemented logic or data manipulation language (DML) in a stored procedure or package.
Form on a SQL Query	Creates a form based on the columns returned by a SQL query such as an EQUIJOIN.
Form on a Table or View	Creates a form that enables users to update a single row in a database table.
Form on a Table with Report	Creates two pages. One page displays a report. Each row provides a link to the second page to enable users to update each record. **Note:** This wizard does not support tables having more than 127 columns. Selecting more than 127 columns generates an error.
Form on Web Service	Creates a page with items based on a Web service definition. This wizard creates a user input form, a process to call the Web service, and a submit button. **See Also:** "Creating a Form on a Web Service" on page 14-21
Form and Report on Web Service	Creates a page with items based on a Web service definition. This wizard creates a user input form, a process to call the Web service, a submit button, and displays the results returned in a report. **See Also**: "Creating an Input Form and Report on a Web Service" on page 14-19

Table 6–4 (Cont.) Forms Page Types

Form Page Type	Description
Master Detail Form	Creates a form that displays a master row and multiple detail rows within a single HTML form. With this form, users can query, insert, update, and delete values from two tables or views. **See Also:** "Building a Master Detail Form" on page 6-29
Summary Page	Creates a read-only version of a form. Typically used to provide a confirmation page at the end of a wizard.
Tabular Form	Creates a form in which users can update multiple rows in a database. **See Also:** "Creating a Tabular Form" on page 6-28

7. Follow the on-screen instructions.

Creating a Tabular Form

A tabular form enables users to update multiple rows in a table. The Tabular Form Wizard creates a form to perform update, insert, and delete operations on multiple rows in a database table.

To create a tabular form:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Form**.
6. Select **Tabular Form**.

   The Tabular Form Wizard appears.
7. On Identify Table/View Owner:
   a. Specify the table or view owner on which you want to base your tabular form.
   b. Select the operations to be performed on the table (for example, **Update, Insert and Delete**).
8. On Identify Table/View Name, select a table.
9. On Identify Columns to Display:
   a. Specify whether or not to use user interface defaults. Select **Yes** or **No**.

      User interface defaults enable you to assign default user interface properties to a table, column, or view within a specified schema.
   b. Select the columns (updatable and nonupdatable) to include in the form.

      You can modify the column order or your SQL query after you create the page.
10. On Identify Primary Key, select the Primary Key column and a secondary Primary Key column (if applicable).
11. On Defaults for Primary and Foreign Keys, select a source type for the primary key column. Valid options include:

- **Existing trigger** - Select this option if a trigger is already defined for the table. You can also select this option if you plan on specifying the primary key column source later after completing the form.
- **Custom PL/SQL function** - Select this option if you wish to provide a PL/SQL function to generate returning key value.
- **Existing sequence** - Select this option is you wish to pick the sequence from a list of sequences available in the selected schema.

12. On Updatable Columns, select which columns should be updatable.
13. On Identify Page and Region Attributes.
    a. Specify page and region information.
    b. Select a region template.
    c. Select a report template.
14. On Identify Tab, specify a tab implementation for this page.
15. On Button Labels, enter the display text to appear for each button.
16. On Identify Branching, specify the pages to branch to after the user clicks the Submit and Cancel buttons.
17. Click **Finish**.

Note: Do not modify the select list of a SQL statement of a tabular form after it has been generated. Doing so can result in a checksum error when you alter data in the form.

See Also: "Managing User Interface Defaults" on page 9-1

Building a Master Detail Form

A master detail form reflects a one-to-many relationship between two tables in a database. Typically, a master detail form displays a master row and multiple detail rows within a single HTML form. With this form, users can insert, update, and delete values from two tables or views.

To create a master detail form:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Form**.
6. Select **Master Detail Form**.

   The Master Detail Wizard appears.
7. On Define Master Table:
    a. Select a table or view owner.
    b. Select a table or view name.
    c. Select the columns to display.

8. On Define Detail Table:
   a. Specify to show only related tables.
   b. Select the table or view owner.
   c. Select the table or view name.
   d. Select the columns to display.
9. On Define Primary Key, select the primary key column for the master table, and then select the primary key column for the detail table.
10. On Define Master and Detail, define the relationships between master and detail tables.
11. Specify the source for the master table and detail table primary key columns.
12. On Define Master Options, specify whether or not to include master row navigation.

    If you include master row navigation, define navigation order columns. If a navigation order column is not defined, the master update form navigates by the primary key column.
13. On Choose Layout, specify the layout of the master detail pages.

    You can include the master detail as a tabular form on the same page, or add the master detail on a separate page.
14. On Page Attributes, review and edit the master page and detail page information.
15. On Identify Tabs, specify whether or not to include an optional tab set.
16. Click **Create**.

Creating a Form Manually

You can also create a form manually by performing the following steps:

- Create an HTML region (to serve as a container for your page items)
- Create items to display in the region
- Create processes and branches

To create a form manually by creating and HTML region:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Create an HTML region:
   a. Under Regions, click the **Create** icon.
   b. Select the region type **HTML**.
   c. Follow the on-screen instructions.
3. Start adding items to the page:

- Under Items, click the **Create** icon.
- Follow the on-screen instructions.

Processing a Form

Once you create a form, the next step is to process the data a user types by inserting into or updating the underlying database tables or views. There are three ways to process a form:

- Creating an Automatic Row (DML) Processing Process
- Creating a Process that Contains One or More Insert Statements
- Using a PL/SQL API to Process Form Values

Creating an Automatic Row (DML) Processing Process

One common way to implement a form is to manually create an Automatic Row Processing (DML) process. This approach offers three advantages. First, you are not required to provide any SQL coding. Second, Oracle HTML DB performs DML processing for you. Third, this process automatically performs lost update detection. Lost update detection ensures data integrity in applications where data can be accessed concurrently.

To implement this approach you need to:

- Add items, define the Item Source Type as Database Column, and specify a case-sensitive column name.
- Select the option **Always overrides the cache value**.

To create an Automatic Row Processing (DML) process:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Processes, click the **Create** icon.
3. Select the process enter **Data Manipulation**.
4. Select the process category **Automatic Row Processing (DML)**.
5. Specify the following process attributes:
   a. In the Name field, enter a name to identify the process.
   b. In the Sequence field, specify a sequence number.
   c. From the Point list, select the appropriate processing point. In most instances, select **Onload - After Header**.
   d. From the Type list, select **Automated Row Processing (DML)**.
6. Follow the on-screen instructions.

Creating a Process that Contains One or More Insert Statements

In this approach to form handling, you create one or more processes to handle insert, update, and delete actions. Instead of having the HTML DB engine handling everything transparently, you are in complete control.

For example, suppose you have a form with three items:

- `P1_ID` - A hidden item to store the primary key of the currently displayed row in a table.
- `P1_FIRST_NAME` - A text field for user input.
- `P1_LAST_NAME` - A text field for user input.

Assume also there are three buttons labeled Insert, Update, and Delete. Also assume you have a table T that contains the columns `id`, `first_name`, and `last_name`. The table has a trigger that automatically populates the `ID` column when there is no value supplied.

To process the insertion of a new row, you create a conditional process of type PL/SQL that executes when the user clicks the Insert button. For example:

```
BEGIN
  INSERT INTO T ( first_name, last_name )
     VALUES  (:P1_FIRST_NAME, :P1_LAST_NAME);
END;
```

To process the updating of a row, you create another conditional process of type PL/SQL. For example:

```
BEGIN
    UPDATE T
       SET first_name = :P1_FIRST_NAME,
           last_name = :P1_LAST_NAME
    WHERE ID = :P1_ID;
END;
```

To process the deletion of a row, you create a conditional process that executes when the user clicks the Delete button. For example:

```
BEGIN
    DELETE FROM T
    WHERE ID = :P1_ID;
END;
```

Using a PL/SQL API to Process Form Values

For certain types of applications, it is appropriate to centralize all access to tables in a single or a few PL/SQL packages. If you created a package to handle DML operations, you can call procedures and functions within this package from an After Submit PL/SQL process to process insert, updates, and delete requests.

Populating Forms

Oracle HTML DB populates a form on load, or when the HTML DB engine renders the page. You can populate a form in the following ways:

- Create a process and define the type as Automated Row Fetch.
- Populate the form manually by referencing a hidden session state item.

To create an Automated Row Fetch process:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Processes, click **Create**.
3. Select the process type **Data Manipulation**.
4. Select the process category **Automatic Row Fetch**.
5. Specify the following process attributes:
   a. In the Name field, enter a name to identify the process.
   b. In the Sequence field, specify a sequence number.
   c. From the Point list, select the appropriate processing point.
   d. From the Type list, select **Automated Row Fetch**.
6. Follow the on-screen instructions.

You can also populate a form manually by referencing a hidden session state item. For example, the following code in an Oracle HTML DB process of type PL/SQL would set the values of `ename` and `sal`. The example also demonstrates how to manually populate a form by referencing a hidden session state item named `P2_ID`.

```
FOR C1 in (SELECT ename, sal
FROM emp WHERE ID=:P2_ID)
LOOP
     :P2_ENAME := C1.ename;
     :P2_SAL := C1.sal;
END LOOP;
```

In this example:

- `C1` is an implicit cursor.
- The value of `P2_ID` has already been set.
- The process point for this process would be set to execute (or fire) on or before **Onload - Before Regions**.

Validating User Input in Forms

You can use validations to check data a user enters before processing. Once you create a validation and the associated error message, you can associate it with a specific item. You can choose to have validation error messages display inline (that is, on the page where the validation is performed) or on a separate error page.

Creating an inline error message involves these steps:

- Create a new validation and specify error message text.
- Associate the validation with a specific item.

Creating a Validation

To create a new validation:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Validations, click the **Create** icon.
3. When the Create Validations Wizard appears, follow the on-screen instructions.

   Validations Types are divided into two categories:
   - **Item.** These validations start with the term Item and provide common checks you may want to perform on the item with which the validation is associated.
   - **Code.** These validations require you provide either a piece of PL/SQL code or SQL query that defines the validation logic. Use this type of validation to perform custom validations that require verifying values of more than one item or accessing additional database tables.
4. Follow the on-screen instructions.

Note: Validations cannot contain more than 3,950 characters.

Associating a Validation with a Specific Item

To associate an item with a validation and specify error message text:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Validations, select the validation item you want to associate.

   The attributes page for the validation appears.
3. Scroll down to Error Message:
   - In Error message display location, verify the display location.
   - In Associated Item, select the item you want to associate with this validation.
4. Click **Apply Changes**.

About Error Message

Error message display location identifies where a validation error message displays. Validation error messages can display on an error page or inline within the existing page. Inline error messages can display in a notification area (defined as part of the page template) or within the field label.

To create a hard error that stops processes, including any remaining validations, you must display the error on an error page.

Creating Calendars

Oracle HTML DB includes a built-in wizard for generating a calendar. Once you specify the table on which the calendar is based, you can create drill-down links to information stored in specific columns.

Topics in this section include:

- About Creating Calendars
- Creating a New Calendar
- Converting an Easy Calendar to a SQL Calendar
- Editing a Calendar Title
- Editing Calendar Attributes

About Creating Calendars

Oracle HTML DB supports two calendar types:

- **Easy Calendar** creates a calendar based on schema, table, and columns you specify. The wizard prompts you to select a date column and display column.
- **SQL Calendar** creates a calendar based on a SQL query you provide. The SQL SELECT statement you provide must include at least two columns: a date column and display column.

See Also: "Calendar Display" on page 6-38

Supported Calendar Substitution Strings

Oracle HTML DB supports a number of date format substitution strings. You can view a complete list of supported substitution strings on the Calendar Templates page.

To view a list of supported substitution strings for calendars:

1. Navigate to the appropriate calendar template.
2. Expand the Substitution Stings list on the right side of the page.

See Also: See "Viewing Templates" on page 7-19

Creating a New Calendar

How you create a calendar depends upon if you are adding a calendar to an existing page or adding a calendar on a new page. When creating calendars remember:

- You can only create one calendar for each page.
- The **date column** determines which days on the calendar will contain entries.
- The **display column** defines a specific row that will display a calendar date.

See Also: "Editing Calendar Attributes" on page 6-37

Adding a Calendar to an Existing Page

To add a calendar to an existing page:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.

   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Regions, click the **Create** icon.

   The Create Region Wizard appears.

3. Select **Calendar**.
4. Select the type of calendar you want to create:
   - **Easy Calendar** creates a calendar based on the date column and display column you specify.
   - **SQL Calendar** creates a calendar based on a SQL query you provide.
5. Follow the on-screen instructions.

Adding a Calendar to a New Page

To create a calendar on a new page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Calendar**.
6. Select the type of calendar you want to create:
   - **Easy Calendar** creates a calendar based on the date column and display column you specify.
   - **SQL Calendar** creates a calendar based on a SQL query you provide.
7. Follow the on-screen instructions.

Converting an Easy Calendar to a SQL Calendar

Creating an Easy Calendar is the simplest way to create a calendar in Oracle HTML DB. However, if you find the resulting calendar does not meet your needs, you can quickly convert it to a SQL Calendar.

To convert an Easy Calendar to a SQL Calendar:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Regions, click **CAL** next to the region name.

   The Calendar Attributes page appears.

3. From the Tasks list, select **Convert to SQL Based calendar**.

Converting an Easy Calendar to a SQL Calendar, adds a Region Source section to the Region Definition. The Region Source contains the original SQL query that creates the calendar. By having accessing the Region Source, you can edit the query to meet your needs.

Editing a Calendar Title

The title that appears at the top of calendar corresponds to the region title.

To alter the region title:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, select the region name.

   The Region Definition appears.
3. Under Region, enter a new title.
4. Click **Apply Changes**.

Editing Calendar Attributes

Once you have created a calendar, you can alter how it appears by editing its attributes.

Topics in this section include:

- Accessing the Calendar Attributes Page
- Calendar Display
- Calendar Interval
- Column Link
- Day Link

Accessing the Calendar Attributes Page

To access the Calendar Attributes page:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click **CAL** next to the region name.

   The Calendar Attributes page appears. The topics that follow describe the specific sections of the Calendar Attributes page.

Calendar Display

Use Calendar Display to specify a calendar template, date columns, and general calendar formatting.

Calendar Template determines what template is used when the HTML DB engine renders a calendar. **Date Column** defines the column from the table or query containing the dates to be placed on the calendar. **Display Column** defines a specific row that displays on a calendar date.

To select another Display Column:

1. Navigate to the appropriate Calendar Attributes page.
2. Locate the Calendar Display section.
3. To specify another display column, make a selection from the Display Column list.
4. Click **Apply Changes**.

To specify a custom Display Column:

1. Navigate to the appropriate Calendar Attributes page.
2. Locate the Calendar Display section.
3. From Display Type, select **Custom**.
4. In Column Format, enter a custom column format. You can use an HTML expression and supported substitution strings.
5. Click **Apply Changes**.

See Also: "Supported Calendar Substitution Strings" on page 6-35

Calendar Interval

Use Calendar Interval to define the dates that are included in the calendar.

Begin At Start Of Interval determines when the calendar should start. Selecting this option creates a calendar that spans an entire interval (for example, a month). For example:

- If **Begin at start of interval** is selected, the date is June 15th, and the display is monthly, the resulting calendar spans from June 1st to June 30th.
- If **Begin at start of interval** is not selected, the date is June 15th, and the display is monthly, the resulting calendar spans from June 15th to June 30th.

Date Item holds the date on which the calendar is based.

The next two attributes define which items hold the calendar start date and end date. You can use these attributes to create calendars that span multiple months at a time. **Item Containing Start Date** points to an item that holds the start date of the calendar. **Item Containing End Date** points to an item that holds the end date of calendar. Note that format of the date of either item must be `YYYMMDD`.

Start of Week determines the day of the week on which the calendar starts.

Column Link

Use Column link to create a link on the column in the calendar.

To create a column link to another page:

1. Navigate to the appropriate Calendar Attributes page.
2. Scroll down to Column Link.

3. From Target is a, select **Page in this Application**.
4. In Page, specify the target page ID. To reset the pagination for this page, select **reset pagination for this page**.
5. In Request, specify the request to be used.
6. In Clear Cache, specify the pages (that is, the page IDs) on which to clear cache. Specify multiple pages by listing the page IDs in a comma-delimited list.

   You can set session state (that is, give a listed item a value) using the next two attributes: the Set these items attribute and the With these values attribute.
7. To set session state:
   a. Set these items - Enter a comma-delimited list of item names for which you would like to set session state.
   b. With these values - Enter a comma-delimited list of values for the items specified in the previous step.

      You can specify static values or substitution syntax (for example, `&APP_ITEM_NAME.`). Note that item values passed to `f?p=` in the URL cannot contain a colon (:). Additionally, item values cannot contain commas unless you enclose the entire value in backslashes (for example, `\1234,56\`).
8. Click **Apply Changes**.

   See Also: "Supported Calendar Substitution Strings" on page 6-35

To create a column link to a URL:

1. Navigate to the appropriate Calendar Attributes page.
2. Scroll down to Column Link.
3. From Target is a, select **URL**.
4. In URL, enter the appropriate address.
5. Click **Apply Changes**.

Day Link

Use Day link to create a link on a day in the calendar. This attribute creates a link on an actual number (or day) on the calendar.

To create a day link to another page:

1. Navigate to the appropriate Calendar Attributes page.
2. Scroll down to Day Link.
3. From Target is a, select **Page in this Application**.
4. In Page, specify the target page ID.

   To reset the pagination for this page, select **reset pagination for this page**.
5. In Request, specify the request to be used.
6. In Clear Cache, specify the pages (that is, the page IDs) on which to clear cache. Specify multiple pages by listing the page IDs in a comma-delimited list.

   You can set session state (that is, give a listed item a value) using the next two attributes: Set these items and With these values.
7. To set session state:

a. Set these items - Enter a comma-delimited list of item names for which you would like to set session state.

b. With these values - Enter a comma-delimited list of values for the items specified in the previous step.

   You can specify static values or substitution syntax (for example, `&APP_ITEM_NAME.`). Note that item values passed to `f?p=` in the URL cannot contain a colon (:). Additionally, item values cannot contain commas unless you enclose the entire value in backslashes (for example, `\1234,56\`).

8. Click **Apply Changes**.

To create a day link to a URL:

1. Navigate to the appropriate Calendar Attributes page.
2. Scroll down to Day Link.
3. From Target is a, select **URL**.
4. In URL, enter the appropriate address.
5. Click **Apply Changes**.

Creating Charts

Oracle HTML DB includes built-in wizards for generating HTML and Scalable Vector Graphics (SVG) charts. Oracle HTML DB supports two types of graphical charts:

- HTML
- SVG

SVG is an XML-based language for Web graphics from the World Wide Web Consortium (W3C). SVG charts are defined using an embed tag. When evaluating whether or not a SVG chart is the appropriate chart type for your application remember that:

- Some Web browsers do not support SVG charts.
- Most Web browsers that support SVG charts require users download an SVG plug-in.

Topics in this section include:

- About SVG Plug-in Support
- About Creating Charts
- Creating a New Chart
- Editing Chart Attributes
- Understanding Chart Cascading Style Sheet Classes
- Referencing a Custom Cascading Style Sheet
- Specifying Custom CSS Styles Inline
- Enabling Asynchronous Updates
- Displaying Charts in Other Languages

About SVG Plug-in Support

The Adobe SVG plug-in can handle data encoded in UTF-8, UTF-16, ISO-8859-1, and US-ASCII. Encoding of an SVG chart is determined by the database access descriptor (DAD) database character set. If the DAD character set is not UTF8, AL32UTF8, AL16UTF16, WE8ISO8859P1, or US7ASCII, SVG charts may not render properly in the Adobe SVG plug-in.

About Creating Charts

You define a chart in Oracle HTML DB using a wizard. For most chart wizards, you select a chart type and provide a SQL query using the following syntax:

```
SELECT link, label, value
FROM   ...
```

Where:

- `link` is a URL.
- `label` is the text that displays in the bar.
- `value` is the numeric column that defines the bar size.

For example:

```
SELECT null, ename, sal
FROM   scott.emp
WHERE  deptno = :P101_DEPTNO
```

To create a dial chart, select a dial chart type and provide a SQL query using the following syntax:

```
SELECT value , maximum_value [ ,low_value [ ,high_value] ]
FROM   ...
```

Where:

- `value` is the starting point on the dial.
- `maximum_value` is the possible highest point on the dial.
- `low_value` and `high_value` are the historical low and high values.

For example:

```
SELECT dbms_random.value(500, 1200), 1300, dbms_random.value(100, 200)
FROM DUAL
```

Table 6–5 describes the chart types available in Oracle HTML DB.

Table 6–5 Available Chart Types

Chart Type	Description
Bar (HTML)	Bar chart showing one data series with each data point represented by a bar. HTML-based. Does not require a plug-in.
Bar, Horizontal	Single series-based bar chart oriented horizontally with each data point in the series represented by a bar. SVG-based. Requires a SVG plug-in.

Table 6–5 (Cont.) Available Chart Types

Chart Type	Description
Bar, Vertical	Single series-based bar chart oriented vertically with each data point in series represented by a bar. SVG-based. Requires a SVG plug-in.
Cluster Bar, Horizontal	Multiple series-based bar chart oriented horizontally and clustered by a common variable with each data point in the series represented by a bar (for example, *Department sales total clustered by month of year*). SVG-based. Requires a SVG plug-in.
Cluster Bar, Vertical	Multiple series-based bar chart oriented vertically clustered by a common variable with each data point in series represented by a bar (for example, *Department sales total clustered by month of year*). SVG-based. Requires a SVG plug-in.
Dial - Sweep	Also known as an angular gauge; this chart shows either percentage of maximum value or absolute value compared to a maximum value represented as a solid area. SVG-based. Requires a SVG plug-in.
Dial	Also known as angular gauge; this chart shows either percentage of maximum value or absolute value compared to maximum value represented as a line. SVG-based. Requires a SVG plug-in.
Line	Multiple series-based line chart oriented with each line representing all data points in the series. SVG-based. Requires a SVG plug-in.
Pie	Single series-based pie chart with each slice representing a data point in the series. SVG-based. Requires a SVG plug-in.
Stacked Bar, Horizontal	Multiple series-based bar chart oriented horizontally with each data point being an absolute value in the series representing a segment of a single bar. SVG-based. Requires a SVG plug-in.
Stacked Bar, Vertical	Multiple series-based bar chart oriented vertically with each data point being an absolute value in the series representing a segment of a single bar. SVG-based. Requires a SVG plug-in.
Stacked Percentage Bar, Horizontal	Multiple series-based bar chart oriented horizontally with each data point being an percentage of 100% of the series represented by a segment of a single bar. SVG-based. Requires a SVG plug-in.
Stacked Percentage Bar, Vertical	Multiple series-based bar chart oriented vertically with each data point being an percentage of 100% of the series represented by a segment of a single bar SVG-based. Requires a SVG plug-in.

Note: Do not change the type of an existing chart. Instead, delete the existing chart and then re-create it.

Creating a New Chart

How you create a chart depends upon whether you are adding the chart to an existing page, or adding a chart on a new page.

Adding a Chart to an Existing Page

To add a chart to an existing page:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click the **Create** icon.

   The Create Region Wizard appears.
3. Select **Chart**.
4. Select the type of chart you want to create. See Table 6–5 on page 6-41.
5. Follow the on-screen instructions.

See Also: "About Creating Charts" on page 6-41

Adding a Chart to a New Page

To create a chart on a new page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Chart**.
6. Select the type of chart you want to create. See Table 6–5 on page 6-41.
7. Follow the on-screen instructions.

See Also: "About Creating Charts" on page 6-41

Editing Chart Attributes

Once you have created a chart, you can alter its display by editing chart attributes on the Chart Attributes page.

To access the Chart Attributes page:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

The Page Definition appears.

2. Under Regions, click **Chart** next to the name of the chart region you want to edit.

   The Chart Attributes page appears.

   Note that removing the chart title (that is, the Chart Title attribute) may negatively impact the location and display of the chart legend.

Understanding Chart Cascading Style Sheet Classes

When you create a new chart, Oracle HTML DB renders it based on cascading style sheet (CSS) classes associated with the current theme. You can change the appearance of a chart by referencing another CSS or by overriding individual classes in the CSS section of the Edit Attributes page

The following sample contains the CSS classes for the dial chart in *Sample Application*. This example contains all the available CSS classes. Class names appear in boldface.

```
text{font-family:Verdana, Geneva, Arial, Helvetica, sans-serif;fill:#000000;}
tspan{font-family:Verdana, Geneva, Arial, Helvetica, sans-serif;fill:#000000;}
text.title{font-weight:bold;font-size:14;fill:#000000;}
text.moredatafound{font-size:12;}
rect.legend{fill:#EEEEEE;stroke:#000000;stroke-width:1;}
text.legend{font-size:10;}
#background{fill:#FFFFFF;stroke:none;}
rect.chartholderbackground{fill:#ffffff;stroke:#000000;stroke-width:1;}
#timestamp{text-anchor:start;font-size:9;}
text.tic{stroke:none;fill:#000000;font-size:12}
line.tic{stroke:#000000;stroke-width:1px;fill:none;}
#dial{stroke:#336699;stroke-width:2px;fill:#336699;fill-opacity:.5;}
#dial.alert{fill:#FF0000;fill-opacity:.5;}
#dialbackground{stroke:#000000;stroke-width:none;fill:none;filter:url(#MyFilter);}
#dialcenter{stroke:none;fill:#111111;filter:url(#MyFilter);}
#dialbackground-border{stroke:#DDDDDD;stroke-width:2px;fill:none;filter:url
(#MyFilter);}#low{stroke-width:3;stroke:#336699;}
#high{stroke-width:3;stroke:#FF0000;}
#XAxisTitle{letter-spacing:2;kerning:auto;font-size:14;fill:#000000;text-anchor:mi
ddle;}
#YAxisTitle{letter-spacing:2;kerning:auto;font-size:14;fill:#000000;text-anchor:mi
ddle;writing-mode:tb;}
.XAxisValue{font-size:8;fill:#000000;}
.YAxisValue{font-size:8;fill:#000000;text-anchor:end;}
.nodatafound{stroke:#000000;stroke-width:1;font-size:12;}
.AxisLine{stroke:#000000;stroke-width:2;fill:#FFFFFF;}
.GridLine{stroke:#000000;stroke-width:0.3;stroke-dasharray:2,4;fill:none;}
g.dataholder rect{stroke:#000000;stroke-width:0.5;}
.legenditem rect{stroke:#000000;stroke-width:0.5;}
```

Table 6–6 describes all supported CSS classes. Note that certain classes only apply to specific chart types.

Table 6–6 Available Chart CSS Classes

Class	Description
`text`	Defines the appearance of text that displays in a chart.
`tspan`	Defines the appearance of text that displays in a chart. `tspan` should match the definition of `text`.
`text.title`	Overrides the default chart text. Use this class for title text.

Table 6–6 (Cont.) Available Chart CSS Classes

Class	Description
`text.moredatafound`	Defines the appearance of more datafound text.
`rect.legend`	Creates the rectangular box that holds the chart legend. To a remove the legend border, change `rect.legend` to the following: `rect.legend{fill:#CCCC99;stroke:none;}`
`text.legend`	Defines the text that appears in the chart legend.
`#background`	Creates the entire background for the SVG plug-in. For a solid white background with no border, change `#background` to the following: `#background{fill:#FFFFFF;stroke:#FFFFFF;stroke-width:2;}`
`rect.chartholderbackground`	Not applicable to pie and dial charts. Creates the background of the rectangle that holds the chart data. For a clear background, change `rect.chartholderbackground` to the following: `rect.chartholderbackground(display:none;)`
`#timestamp`	Only applicable if the Asynchronous Update chart attribute is set to Yes. Controls the appearance of the update timestamp test. To disable the display of the timestamp, use defines `#timestamp` as follows in the Custom CSS, Inline attribute. `"#timestamp{display:none;}"` **See Also:** "Enabling Asynchronous Updates" on page 6-47
`text.tic`	Dial charts only. Defines the numbers on a dial chart.
`line.tic`	Dial charts only. Defines the graduation mark that displays directly beneath the number on a dial chart.
`#dial`	Dial charts only. Defines the value that displays on the dial chart.
`#dial.alert`	Dial charts only. Defines a value (called an alert value) that renders on in a dial chart using a different display.
`#dialbackground`	Dial charts only. Creates the background of a dial chart.
`#dialcenter`	Dial charts only. Creates the center of the dial on a dial chart.
`#dialbackground-border`	Dial charts only. Works in conjunction with `#dialbackground` to create specific graphic effect.
`#low`	Dial charts only. Defines a historical low watermark of the data being displayed on a chart.
`#high`	Dial charts only. Defines historical high watermark of the data being displayed on a chart.
`#XAxisTitle`	Defines the title that appears on the x-axis
`#YAxisTitle`	Defines the title that appears on the y-axis.
`.XAxisValue`	Defines the value that appears on the x-axis.

Table 6–6 (Cont.) Available Chart CSS Classes

Class	Description
`.YAxisValue`	Defines the value that appears on the y-axis.
`.AxisLabel`	Similar to the axis value.
`.nodatafound`	Defines the text element that displays if no information is available.
`.AxisLine`	Indicates zero on charts that have negative values.
`.GridLine`	Creates the horizontal and vertical lines on the chart.
`g.dataholder rect`	Applies a blanket style to all data that displays in the chart.
`.legenditem rect`	Applies a blanket style to all rectangular items in the legend.

Referencing a Custom Cascading Style Sheet

You can reference a custom cascading style sheet for a chart using the CSS section of the Chart Attributes page. When you reference an external CSS, you can reference it entirely or simply override specific styles.

To reference a custom chart CSS:

1. Upload the CSS to Oracle HTML DB. See "Uploading Cascading Style Sheets" on page 7-44.
2. Create a chart. See "Creating a New Chart" on page 6-43.
3. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
4. Under Regions, click **Chart** next to the region name.

   The Chart Attributes page appears.
5. Scroll down to the CSS section.
6. From Use Custom CSS, select **Yes**.
7. To reference an external CSS exclusively:
   a. In Custom CSS, Link, enter a link to a custom CSS. For example:

      ```
      #IMAGE_PREFIX#themes/theme_4/svg.css
      ```
   b. Specify that the CSS should be used exclusively. In Custom CSS, Inline enter the following:

      ```
      /**/
      ```
8. To reference a custom CSS and override specific styles:
   a. In Custom CSS, Link, enter a link to a custom style sheet. For example:

      ```
      #IMAGE_PREFIX#themes/theme_4/svg.css
      ```

   b. In Custom CSS, Inline, enter the custom CSS styles you want to override.

Specifying Custom CSS Styles Inline

You can override specific styles within the default CSS, using the Custom CSS, Inline attribute on the Chart Attributes page.

To override specific styles within the default CSS:

1. Create a chart. See "Creating a New Chart" on page 6-43.
2. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
3. Under Regions, click **Chart** next to the region name.

   The Chart Attributes page appears.
4. Scroll down to CSS.
5. From Use Custom CSS, select **Yes**.
6. In Custom CSS, Inline, enter the custom CSS styles you want to override.

Enabling Asynchronous Updates

You can create charts that monitor information by enabling the Asynchronous Update attribute on the Chart attributes page. Enabling this attribute updates the chart to reflect changes in the underlying data within a specified time interval.

To enable asynchronous updates:

1. Create a chart. See Creating a New Chart on page 6-43.
2. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
3. Under Regions, click **Chart** next to the region name.

   The Chart Attributes page appears.
4. Scroll down to Refresh.
5. From Asynchronous Update, select **Yes**.
6. In Update Interval (Seconds), enter the interval in seconds between chart updates. For optimal performance, select an interval that is greater than 2 seconds.

When Asynchronous Update is enabled, a timestamp displays on the chart indicating that last update.

To disable the Asynchronous Update timestamp:

1. Navigate to the Chart Attributes page.
2. Locate the CSS section.
3. From Use Custom CSS, select **Yes**.
4. In Custom CSS, Inline edit `#timestamp` as follows:

   ```
   #timestamp{display:none;}
   ```

Displaying Charts in Other Languages

To display a chart in another language, you edit the `text` and `tspan` classes to reflect the correct language.

To display a chart in another language:

1. Navigate to the Chart Attributes page. See "Editing Chart Attributes" on page 6-43.
2. Scroll down to CSS.
3. From Use Custom CSS, select **Yes**.
4. In Custom CSS, Inline, edit the `text` and `tspan` classes to reflect the correct language. The following example demonstrates how to change a chart to Korean:

   ```
   text{font-family:Batang;fill:#000000;}
   tspan{font-family:Batang;fill:#000000;}
   ```

Creating Buttons

As you design your application, you can use buttons to direct users to a specific page or URL, or to post or process information (for example, by creating Create, Cancel, Next, Previous, or Delete buttons).

Buttons can perform two different types of actions. A button can submit a page and then redirect to a URL. Alternately, a button can branch to a URL without submitting the page.

Topics in this section include:

- Creating a Button Using a Wizard
- Creating Multiple Buttons
- Understanding the Relationship Between Button Names and REQUEST
- About Branching with Buttons
- Displaying Buttons Conditionally

Creating a Button Using a Wizard

You create a button by running the Create Button Wizard from the Page Definition. Each button resides in a region. A region is an area on a page that serves as a container for content.

To create a new button:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. If necessary, create an HTML region. See "Customizing Regions" on page 7-2.
3. Under Buttons, click the **Create** icon.

   The Create Button Wizard appears.

4. Select a region to contain the button.
5. Select a position for the button:

   - **Create a button displayed among this region's items**
   - **Create a button in a region position**

   Select **Create a button displayed among this region's items** to add a button to a region as if it was an item (for example, to add a button directly to the right of a form field).

6. If you select **Create a button in a region position**:

   a. Specify the Button Name and Label.
   b. Select a Button Type: **HTML Button (Default)**, **Image**, or **Template Driven**

      Select **Button is Reset** to create an Undo button. When enabled, this type of button resets the page values to the state they were in when the page was initially rendered.

   c. Select an Action.

      Selecting **Submit page and redirect to URL** submits the current page to the HTML DB engine whenever a user clicks the button.

      Selecting **Redirect to URL without submitting page** avoids submitting the page. Choose this action when submitting the page for processing is not necessary (for example, a Cancel button). This action avoids processing in the database and therefore reduces the load.

7. If you select **Create a button displayed among this region's items**:

   a. Specify the Button Name and Sequence.
   b. Specify if the button displays at the beginning of a new line or new field.
   c. Specify a Label.
   d. Enter the value of Request.
   e. Select the Button Style.

8. Follow the on-screen instructions

   See Also: "Understanding the Relationship Between Button Names and REQUEST" on page 6-50

Creating an HTML Button

Buttons can be placed in a predefined region template position or among items in a form. To create an HTML button, select one of the following while running the Create Button Wizard:

- Under Task, select **Create a button in a region position**.
- Under Button Type, select a button type and then **HTML Button (default)**.

Creating Multiple Buttons

You can create multiple buttons within the same region at once using the Create Multiple Buttons Wizard.

To create multiple buttons at once:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. If necessary, create an HTML region. See "Customizing Regions" on page 7-2.
3. Under Buttons, click the **Create** icon.

   The Create Button Wizard appears.
4. Select **Create Multiple Buttons** at the bottom of the page.

   The Create Multiple Button Wizard appears.
5. From Place Buttons in Region, select the region to contain the buttons.
6. From Template, select a template.
7. In HTML Attributes, specify HTML attributes for these buttons. This text will be added to the HTML element definition. For example, you could set the class of a text button as follows:

   ```
   class="myclass"
   ```
8. To quickly populate the remaining fields, make a selection from the Quick Button list on the right side of the page.
9. Click **Create Buttons**.

Understanding the Relationship Between Button Names and REQUEST

The name you give a button determines the value of the built-in attribute `REQUEST`. You can reference the value of `REQUEST` from within PL/SQL using the bind variable `:REQUEST`. By using this bind variable, you can conditionally process, validate, or branch based on which button the user clicks. You can also create processes that execute when the user clicks a button. You can also use a more complex condition as demonstrated in the following examples:

```
If :REQUEST in ('EDIT','DELETE') then ...
If :REQUEST != 'DELETE' then ...
```

These examples assume the existence of buttons named EDIT and DELETE. You can also use this syntax in PL/SQL Expression conditions. Be aware, however, that the button name case is preserved. In other words, if you name a button LOGIN, then a request looking for the name *Login* will fail. For example:

```
<input type="BUTTON" value="Finish" onClick="javascript:doSubmit('Finish');">
```

Note that in this example *Finish* is the name of the `REQUEST` and this example is case-sensitive.

About Branching with Buttons

Each page can include any number of branches. A branch links to another page in your application or to a URL. The HTML DB engine considers branching at different times during page processing. You can choose to branch before processing, before computation, before validation, and after processing. Like any other control in Application Builder, branching can be conditional. For example, you can branch when a user clicks a button. When you create a branch, you associate it with a specific button. The branch will only be considered if a user clicks the button.

See Also: "Controlling Navigation Using Branches" on page 8-8

Displaying Buttons Conditionally

You can choose to have a button display conditionally by editing attributes on the Edit Pages Button page.

To have a button display conditionally:

1. Create the button. See "Creating a Button Using a Wizard" on page 6-48.
2. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
3. Under Buttons, select the button name.

   The attributes page for the button appears.
4. Scroll down to Conditional Button Display.
5. Make a selection from the Condition Type list.
6. Enter an expression in the fields provided.
7. Click **Apply Changes**.

See Also: "About Bind Variables" on page 4-13

Creating Items

An item is part of an HTML form. An item can be a text field, text area, password, select list, check box, and so on. Item attributes affect the display of items on a page. For example, these attributes can impact where a label displays, how large an item will be, and if the item will display next to or below the previous item.

There are two types of items: page items and application items. Page items are placed on a page and have associated user interface properties, such as Display As, Label and Label Template. Application items are not associated with a page and therefore have no user interface properties. You can use an application item as a global variable.

Topics in this section include:

- Creating a Page-Level Item
- Referencing Item Values
- Editing Page Item Attributes
- Displaying Conditional or Read-Only Page Items
- Working with a Multiple Select List Item
- Creating an Application-Level Item
- Populating an Alternative Date Picker Format

> **See Also:** "How Item Attributes Effect Page Layout" on page 7-6 and "Using Substitution Strings" on page 4-16

Creating a Page-Level Item

You create a page-level item by running the Create Item Wizard from the Page Definition.

To create a new page-level item:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. If necessary, create an HTML region. See "Customizing Regions" on page 7-2.
3. Under Items, click the **Create** icon.
4. Select an item type. See "About Item Types" on page 6-52.
5. Follow the on-screen instructions

About Item Naming Conventions

When specifying an item name, remember the following rules. Item names must:

- Not have quotation marks
- Begin with a letter or a number, and subsequent characters can be letters, numbers, or underscore characters,
- Be case-insensitive.
- Should not exceed 30 characters.
- Cannot contain letters outside the base ASCII character set.

About Item Types

When you create an item, you specify an item type. Once you create an item, these types appear on the Display As list on the Edit Page Item page. Table 6–7 describes available item types.

Table 6–7 Available Item Types

Item Type	Description

Check box	Displayed using a list of values. A list of values is required for items displayed as check boxes. The value corresponding to a checked box is returned in a single colon-delimited string.
	
	The following example demonstrates how to create a single check box that returns `YES`. This example would display both a check box and a field label.
	
	`SELECT NULL display_text, 'YES' return_value FROM DUAL;`
	
	This example includes the additional text *Click to select*.
	
	`SELECT 'Click to select' display_text, 'YES' return_value FROM DUAL;`
	
	See Also: "HTMLDB_UTIL" on page 16-1 for information about breaking up returned values

Date Picker	Displays a text field with a Calendar icon next to it. When clicked, this icon displays a small calendar from which the user can select a date and a time (optional). If the format you need is not included in the Display As list, select **Date Picker (use application format mask)**. When using a format mask, your application looks for the format in an item called `PICK_DATE_FORMAT_MASK`. Note that you need to populate this item before this item type will work. **See Also:** "Populating an Alternative Date Picker Format" on page 6-59
Display Only	Oracle HTML DB uses HTML tables to render items. Use this item to control the layout of items in forms by closing a table and starting a new one.
File Browse	Displays a text field with a Browse... button. This enables the user to locate a file on a local file system and upload it. Oracle HTML DB provides a table for these files to be uploaded to as well as an API to retrieve the files.
Hidden	Renders an HTML hidden form element. Session state can be assigned and referenced just like a text field.
List Managers	Based on a list of values. This item enables you to manage a list of items by selecting and adding to a list. The list of values display as a popup.
Multiple Select	Renders as a multiselect HTML form element. When submitted, selected values are returned in a single colon-delimited string. You can break up the values using the `HTMLDB_UTIL API`. **See Also:** "Working with a Multiple Select List Item" on page 6-57
Password	Renders as an HTML password form element.

Table 6–7 (Cont.) Available Item Types

Item Type	Description

Popup List of Values	Renders as a text field with an icon. When the user clicks the icon, a popup window appears with a list of values represented as a series of links. When the user makes a selection from this list, the selected value will be placed in the text field. You control popup LOVs through templates. You can only specify one popup LOV template for each application
	
	Using a popup LOV is a good choice for lists of values that are too large to return on a single page.
	
	There are two types of Popup LOVs: one that fetches a set of rows when the window pops up and one that does not.
	
	Popup LOVs must be based on a query that selects two columns with different column aliases. For example:
	
	`SELECT ename name, empno id`
	`   FROM emp`
	
	If one of the columns is an expression, remember to use an alias. For example:
	
	`SELECT ename||' '||job display_value, empno FROM emp`

Radio	Renders as an HTML radio group form element, based on a list of values. Choose **Radiogroup with Submit** to have the page submitted when the radio button is selected. The following example displays employee names (`ename`), but returns employee numbers (`empno`): `SELECT ename, empno FROM emp`
Select List	Displays using a list of values. A list of values is required for items displayed as a select list. Select lists are rendered using the HTML form element `<select>`. The values in a select list are determined using a named list of values or a list of values defined at the item level. You can specify the NULL display value and NULL return value. The following example would return employee names (`ename`) and employee numbers (`empno`) from the `emp` table. Note that column aliases are not required and are included in this example for clarity. `SELECT ename display_text, empno return_value FROM emp` Oracle HTML DB provides additional enhancements to a standard HTML select list: ■ **Select List with Submit** - Submits the page when the user changes its selected value. Upon submit, the REQUEST will be set to the name of the item that represents the select list, allowing you to execute conditional computations, validations, processes, and branches. ■ **Select List with Redirect** - Redirects the user back to the same page, setting ONLY the newly selected value of the select list in session state. ■ **Select List Returning URL Redirect** - Based on a list of values with URLs as the return values. Changing the value of the select list causes the browser to redirect to the corresponding URL. ■ **Select List with Branch to Page** - Based on list of values with page IDs as return values. Changing the selected value in the select list causes the HTML DB engine to branch to the corresponding page. **Note**: Long select lists can result in error. If you have a long select list that generates an error try using a Popup List of Values instead.

Table 6–7 (Cont.) Available Item Types

Item Type	Description
Stop and Start Table	Forces the close of an HTML table using the `</table>` tag and starts a new HTML table. You can use this item type of reset the column width in the middle of the region. Note that a Stop and Start Table item only displays its label. You can prevent the label from displaying at all by setting it to null. To do this, you simply remove the default label.
Text	Displays as an HTML text field containing a maximum of 30,000 bytes of text. You control the maximum length and display width by editing the Height and Width item attribute. Available Text display options include: ■ **Text Field** - Renders as a text field. ■ **Text Field (Disabled, does not save state)** - Displays a read-only version of a display value from a list of values by using the item's value in session state to look up the corresponding display value in the associated list of values. The value displayed on the screen is not saved in session state upon submit. ■ **Text Field (Disabled, saves state)** - Displays a read-only version of a display value from a list of values by using the item's value in session state to look up the corresponding display value in the associated list of values. ■ **Text Field (always submits page when Enter pressed)** - Displays a read-only version of the value in session state. Upon submit, the value displayed is saved in session state. ■ **Text Field with Calculator Popup** - Renders as a text field with an icon next to. When clicked, the icon displays a small window containing a calculator. Calculations are placed back in the text field.
Text Area	Renders as an HTML text area. There is no maximum length for an item displayed as a text area. You control the height and width by editing the Height and Width item attribute. Additional available Text Area Display As options include: ■ **Text Area (auto height)** - Varies the height based on the amount of text. Use this option to have a large text area if you have a lot of data and a small text area if you have little or no data. ■ **Text Area with Counter** - Includes a counter that displays the number of bytes entered in the field. ■ **Text Area with Spell Checker** - Provides a popup English language spell checker. ■ **Text Area with HTML Editor** - Provides basic text formatting controls. Note that these controls may not work in all Web browsers.

Referencing Item Values

You can reference item values stored in session state in regions, computations, processes, validation, and branches. Table 6–8 describes the supported syntax for referencing item values.

See Also: "Managing Session State Values" on page 4-10

Table 6–8 Syntax for Referencing Item Values

Type	Syntax	Description
SQL	`:MY_ITEM`	Standard bind variable syntax for items whose names are no longer than 30 bytes. Use this syntax for references within a SQL query and within PL/SQL.
PL/SQL	`V('MY_ITEM')`	PL/SQL syntax referencing the item value using the `V` function. **See Also:** "Oracle HTML DB APIs" on page 16-1
PL/SQL	`NV('MY_NUMERIC_ITEM')`	Standard PL/SQL syntax referencing the numeric item value using the `NV` function. **See Also:** "Oracle HTML DB APIs" on page 16-1
Static Text	`&MY_ITEM`	Static text.
Static Text (exact)	`&MY_ITEM.`	Static text. Exact Substitution.

You can set the value of an item in your application using any of the following methods:

- For page items, use the Source Attribute to set the item value.

  From the Page Definition, select the item name to view the Edit Page Item page. Scroll down to Source and edit the appropriate fields.

  You can also set the value of an item in any region based on PL/SQL or a process using the following syntax:

  ```
  BEGIN
   :MY_ITEM :=  'new value';
  END;
  ```

- Pass the value on a URL reference using `f?p` syntax. For example:

  ```
  f?p=100:101:10636547268728380919::NO::MY_ITEM:ABC
  ```

- Set the value using a computation. Computations are designed to set item values. For example:

  ```
  TO_CHAR(SYSDATE,'Day DD Month, YYYY');
  ```

- Use the PL/SQL API to set an item value within a PL/SQL context. For example:

  ```
  HTMLDB_UTIL.SET_SESSION_STATE('MY_ITEM',SYSDATE);
  ```

See Also: "Clearing Session State" on page 4-11, "Oracle HTML DB APIs" on page 16-1, and "About Cross-Site Scripting Protection" on page 13-1

Editing Page Item Attributes

Once you create an item, you can edit it on the Edit Page Item page.

To edit item attributes:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.

   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Items, select the item name.

   The attributes page for the item appears.

3. Edit the appropriate item attributes. For information on a specific attribute, see item Help.
4. Click **Apply Changes**.

   See Also: "About Cross-Site Scripting Protection" on page 13-1

Displaying Conditional or Read-Only Page Items

You can choose to have an item display conditionally or as read-only by editing attributes on the Edit Pages Item page.

To display a conditional or read-only item:

1. Create the item. See "Creating a Page-Level Item" on page 6-52.
2. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

3. Under Items, select the item name.

   The attributes page for the item appears.

4. To display an item conditionally:
   a. Scroll down to Conditions.
   b. Make a selection from the Condition Type list.
   c. Enter an expression in the fields provided.
5. To make an item read-only:
   a. Scroll down to Read Only Display Settings.
   b. Make a selection from the Read Only Condition Type list.
   c. Enter an expression in the fields provided.
6. Click **Apply Changes**.

Working with a Multiple Select List Item

A multiple select item renders as a multiple select list form element. When submitted, selected values are returned in a single colon-delimited string. You can handle values in this format in two ways:

- Using the `INSTR` function
- Using the `HTMLDB_UTIL.STRING_TO_TABLE` function

Using HTMLDB_UTIL.STRING_TO_TABLE to Convert Selected Values

For example, suppose you had a report on the `EMP` and `DEPT` tables that is limited by the departments selected from a Department multiple select list. First, you create the multiple select item, P1_DEPTNO, using the following query:

```
SELECT dname, deptno
FROM dept
```

Second, you return only those employees within the selected departments as follows:

```
SELECT ename, job, sal, comm, dname
FROM emp e, dept d
WHERE d.deptno = e.deptno
AND instr(':'||:P1_DEPTNO||':',':'||e.deptno||':') > 0
```

Next, assume you want to programmatically step through the values selected in the multiple select item, P1_DEPTNO. To accomplish this, you would convert the colon-delimited string into a PL/SQL array using the `HTMLDB_UTIL.STRING_TO_TABLE` function. The following example demonstrates how to insert the selected departments into an audit table containing the date of the query.

```
DECLARE
    l_selected HTMLDB_APPLICATION_GLOBAL.VC_ARR2;
BEGIN
  --
  -- Convert the colon separated string of values into
  -- a PL/SQL array

  l_selected := HTMLDB_UTIL.STRING_TO_TABLE(:P1_DEPTNO);

  --
  -- Loop over array to insert department numbers and sysdate
  --

  FOR i IN 1..l_selected.count
  LOOP
    INSERT INTO report_audit_table (report_date, selected_department)
        VALUES (sysdate, l_selected(i));
  END LOOP;
END;
```

See Also: "STRING_TO_TABLE Function" on page 16-28

Creating an Application-Level Item

Application level items do not display, but are used as global variables to the application.

To create a new application-level item:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under Logic, select **Items**.

   The Application Items page appears.

6. To create a new application item, click **Create**.
7. Follow the on-screen instructions.

About the Application Items Page

Once you create a application item, it appears on the Application Items page. You control how the Application Items page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each application item as a large icon. To edit an application item, click the appropriate icon.
- **Details** displays each application item as a line in a report. To edit an application item, click the name.

Accessing Application Item History

You can view a history of changes to application items by clicking **History** at the top of the Application Items page.

Populating an Alternative Date Picker Format

If you need to create a Date Picker item, but the format you need does not appear in the Display As list, select **Date Picker (use application format mask)**. When an application uses this type of date picker, the HTML DB engine derives the date format from an item named `PICK_DATE_FORMAT_MASK`. You can populate this item in two ways:

- By defining an application substitution string named `PICK_DATE_FORMAT_MASK`
- By creating an application-level item named `PICK_DATE_FORMAT_MASK`

Defining PICK_DATE_FORMAT_MASK as an Application Substitution String

One approach to populating `PICK_DATE_FORMAT_MASK` is to create an application substitution string. You define application-level substitution strings on the Edit Application Attributes page. Remember that an application-level substitution string is a static value and cannot be altered at run time.

To define a new application substitution string named `PICK_DATE_FORMAT_MASK`:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   Application Builder appears.
4. Click the **Edit Attributes** icon.
5. Click **Edit Standard Attributes**.
6. Scroll down to Static Substitution Strings.
7. Create a new static substitution string named `PICK_DATE_FORMAT_MASK`:
   a. In Substitution String, enter the name `PICK_DATE_FORMAT_MASK`.
   b. In Substitution Value, enter a value for your date format (for example, `Month DD, YYYY`).

Defining an Application-Level Item Named PICK_DATE_FORMAT_MASK

Another approach to populating `PICK_DATE_FORMAT_MASK` is to create an application-level item named `PICK_DATE_FORMAT_MASK`. This approach enables you to control any items rendered as **Date Picker (use application format mask)** by simply setting the value of this item. Plus, you can set the value of `PICK_DATE_FORMAT_MASK` using a computation from anywhere within your application.

If you want to provide the user with a list of date formats as preferences, you will need to create an application-level item named `PICK_DATE_FORMAT_MASK` and then use a computation to set the value of this item based upon the user's selection.

See Also: "Creating an Application-Level Item" on page 6-58

Creating Lists of Values

A list of values (LOV) is a static or dynamic set of values used to display a specific type of page item, such as popup lists of values, a select list, a check box, a radio group, or multiple select lists.

Topics in this section include:

- Creating Named LOVs at the Application Level
- About Static LOVs
- Editing an Existing LOV
- Referencing a Null Value in an Item Based on a LOV
- Referencing Session State Within a LOV
- Accessing LOV Reports

See Also: "Creating Items" on page 6-51

Creating Named LOVs at the Application Level

You define named (or shared) LOVs at the application level by running the Create LOV Wizard and adding them to the List of Values repository. All LOVs can be defined as static or dynamic. Static lists are based on predefined pairs of display values and return values. Dynamic lists are based on a SQL query you write that selects values from a table.

To create a named LOV:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   The Application home page appears.
4. Click the **Shared Components** icon.
5. Under User Interface, select **Lists of Values**.
6. To create a new LOV, click **Create**.
7. Follow the on-screen instructions.

   New named LOVs are added to the List of Values repository.

About the List of Values Page

Once you create a LOV, it appears on the List of Values page. You control how the page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each LOV as a large icon. To edit a LOV, click the appropriate icon.
- **Details** displays each LOV as a line in a report. To edit a LOV, click the name.

About Static LOVs

Static LOVs are based on a static list of display values and return values you specify when you run the Create LOV Wizard. To create a static LOV, you run the Create LOV Wizard and select the LOV type **Static**. Oracle HTML DB stores the display values, return values, and sort sequence you specify in the List of Values repository. Once you add a static LOV to the repository, you can create an item and display it as a check box, radio group, select list, or popup list based on this definition.

Editing an Existing LOV

To edit an existing LOV, select the LOV on the Lists of Values page.

To edit a LOV:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Shared Components**.
5. Under User Interface, select **Lists of Values**.
6. Select an LOV.

   The Edit List of Values page appears.
7. Edit the appropriate attributes and click **Apply Changes**.

Bulk Edit of Static LOVs

You can edit the display values of all static LOVs by clicking the Grid Edit button on the Edit List of Values page.

To perform a bulk edit of static LOVs:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Shared Components**.
5. Under User Interface, select **Lists of Values**.

   By default, LOVs display as icons.
6. Change the default display. Select **Details** from the View list and click **Go**.
7. Locate Static LOV and select the LOV name.
8. Click the **Grid Edit** button located under Subscription.
9. Edit the appropriate display values and click **Apply Changes**.

Referencing Session State Within a LOV

You can reference session state by using bind variables. In the following example, this LOV only works if the item called *my_deptno* contains a valid department number.

```
SELECT ename, empno FROM emp WHERE deptno = :my_deptno
```

Referencing a Null Value in an Item Based on a LOV

When you derive an item's source from an LOV and select a null value, if the null value specified by the developer in the item attributes is not a visible non-null text value, the value POSTed when the page is submitted is often the string `%null%` and not an Oracle null value.

Be aware of this behavior when writing code to evaluate submitted values. For example, suppose a page evaluates the submitted item `P1_X` and you need to use the PL/SQL expression `replace(:P1_X,'%'||'null%',null)` to prepare the item for permanent storage in session state or for passing to DML or other APIs.

To avoid problems, be aware of the appropriate way to code `%null%` in expressions that occur in page computations, processes, and validations. You must break up the string so that the application does not replace `%null%` with a null value in the page metadata when it is saved. Consider the following example:

```
'%'||'null%'
```

Accessing LOV Reports

Application Builder includes a number of reports designed to help you better manage LOVs.

To access LOV reports:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under User Interface, select **Lists of Values**.
6. Select one of the following tabs at the top of the page:
   - **Search**
   - **Subscription**
   - **Utilization**
   - **History**
7. Follow the on-screen instructions.

Search

Click **Search** to display the Search Dynamic Lists of Values page. Use this page to search the queries that makes up dynamic LOVs. Enter a query in the Query Contains field and click **Go**.

Subscription

Click **Subscription** to display the List of Values Subscription page. This page displays all subscribed LOVs in your application.

Utilization

Click **Utilization** to display the List of Values Utilization page. This page displays LOVs used in the current application. To edit an LOV, click the LOV name.

History

Click **History** to display the List of Values History page. This page displays a history of recently changed LOVs by date.

Using Shortcuts

By using shortcuts you can avoid repetitive coding of HTML or PL/SQL functions. You can use a shortcut to define a page control such as a button, HTML text, a PL/SQL procedure, or HTML. Once defined, you can invoke a shortcut using specific syntax unique to the location in which the shortcut is used. Shortcuts can be referenced many times, thus reducing code redundancy.

This section contains the following topics:

- About Shortcut Types
- Defining Shortcuts
- Accessing Shortcut Reports

About Shortcut Types

When you create a new shortcut, you must specify the type of shortcut you want to create. Oracle HTML DB supports the following shortcut types:

- PL/SQL Function Body
- HTML Text
- HTML Text with Escaped Special Characters
- Image
- Text with JavaScript Escaped Single Quotes
- Message
- Message with JavaScript Escaped Special Quotes

Text with JavaScript Escaped Single Quotes

Use this type of shortcut to reference a shortcut inside of a JavaScript literal string. This shortcut defines a text string. When the shortcut is referenced, it escapes the single quotation marks required for JavaScript.

Message

Use this type of shortcut to reference a translatable message at run time. Note that since this shortcut does not have a shortcut body, the name of the shortcut must match the corresponding message name. At run time, the name of the shortcut expands to the text of the translatable message for the current language.

Message with JavaScript Escaped Single Quotes

Use this type of shortcut to reference a shortcut inside of JavaScript literal string and reference a translatable message at run time.

> **See Also:** "About Translating an Application and Globalization Support" on page 15-1

Defining Shortcuts

Before you can incorporate a shortcut in your application, you must define it and add it to the Shortcuts repository. You reference new shortcuts using the following syntax:

```
"MY_SHORTCUT"
```

Note that the shortcut name must be capitalized and enclosed in quotation marks.

To define a new shortcut:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under User Interface, select **Shortcuts**.
6. Click **Create**.
7. Select one of the following creation methods:
   - **From Scratch**
   - **As a Copy of an Existing Shortcut**
8. Follow the on-screen instructions.

New shortcuts are added to the Shortcut repository and are available for use within the following locations:

- The Region Source attribute of regions defined as HTML Text (with shortcuts). See "Customizing Regions" on page 7-2.
- Region Header and Footer Text attribute. See "Specifying a Region Header and Footer" on page 7-5.
- Item Label attributes and Default Value attribute. See "Items" on page 5-23.
- Region Templates attributes. See "Editing Templates" on page 7-20.

About the Shortcuts Page

Once you create a shortcut, it appears on the Shortcuts page. You control how the page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each shortcut as a large icon. To edit a shortcut, click the appropriate icon.
- **Details** displays each shortcut as a line in a report. To edit a shortcut, click the name.

Accessing Shortcut Reports

Application Builder includes a number of reports designed to help you better manage LOVs.

To access shortcut reports:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. When Application Builder appears, click **Shared Components**.
5. Under User Interface, select **Shortcuts**.
6. Click one of the following buttons:
   - **Subscription**
   - **History**

Note: The Subscription and History buttons only appear after you create a shortcut.

Subscribed Shortcuts

Click **Subscription** to display the Subscribed Shortcuts page. This page displays all subscribed shortcuts in your application.

Shortcut History

Click **History** to display the Shortcut History page. This page displays a history of recently changed shortcuts by date.

Incorporating JavaScript into an Application

Adding JavaScript to a Web applications is a great way to add features that mimic those found client/server applications without sacrificing all of the benefits of Web deployment. Oracle HTML DB includes multiple built-in interfaces especially designed for adding JavaScript.

Remember that JavaScript is not appropriate for data intensive validations. For example, to verify that a name is contained within a large database table, you would need to pull down every record to the client, creating a huge HTML document. In general, complex operations are much better suited for server-side HTML DB validations instead of JavaScript.

This section contains the following topics:

- Referencing Items Using JavaScript
- Incorporating JavaScript Functions
- Calling JavaScript from a Button

See Also: "Understanding Validations" on page 5-24

Referencing Items Using JavaScript

When you reference an item, the best approach is to reference by ID. If you view the HTML source of an Oracle HTML DB page in a Web browser, you would notice that all items have an ID attribute. This ID corresponds to the name of the item, not the item label. For example, if you create an item with the name `P1_FIRST_NAME` and a label of `First Name`, the ID will be P1_FIRST_NAME.

Knowing the item ID enables you to use the JavaScript function `getElementById` to get and set item attributes and values. The following example demonstrates how to reference an item by ID and display its value in an alert box.

```
<script language="JavaScript1.1" type="text/javascript">
  function firstName(){
    alert('First Name is ' + document.getElementById('P1_FIRST_NAME').value );
  }
 // or a more generic version would be
  function displayValue(id){
    alert('The Value is ' + document.getElementById(id).value );
  }
</script>

  // Then add the following to the "Form Element Attributes" Attribute of the
item:
  onChange="javascript:displayValue('P1_FIRST_NAME');"
```

Incorporating JavaScript Functions

There are two primary places to include JavaScript functions:

- In the HTML Header attribute of the page
- In a .js file in the page template

See Also: "Text with JavaScript Escaped Single Quotes" on page 6-63 for information about referencing a shortcut inside of a JavaScript literal string

Incorporating JavaScript in the HTML Header Attribute

One way to include JavaScript into your application is to add it to the HTML Header attribute of the page. This is a good approach for functions that are very specific to a page as well as a convenient way to test a function before you include it in the `.js` file.

You can add JavaScript functions to a page by simply entering the code into the HTML Header attribute of the Page Attributes page. For example, adding the following would make the `test` function accessible from anywhere on the current page:

```
<script language="JavaScript1.1" type="text/javascript">
  function test(){
    alert('This is a test.');
  }
</script>
```

See Also: "HTML Header" on page 5-21

Including JavaScript in a .js File in the Page Template

In Oracle HTML DB you can reference a `.js` file in the page template. This approach makes all the JavaScript in that file accessible to the application. This is the most efficient approach since a `.js` file loads on the first page view of your application and is then cached by the browser.

The following demonstrates how to include a .js file in the header section of a page template:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
    <title>#TITLE#</title>
    #HEAD#
    <script src="#APP_IMAGES#custom.js" type="text/javascript"></script>
</head>
<body #ONLOAD#>#FORM_OPEN#
```

See Also: "Page Templates" on page 7-28

Calling JavaScript from a Button

Calling a JavaScript from a button is a great way to confirm a request. Oracle HTML DB uses this technique for the delete operation of most objects. For example, when you delete a button, a JavaScript message appears asking you to confirm your request. Consider the following example:

```
<script language="JavaScript1.1" type="text/javascript">
  function deleteConfirm(msg)
  {
var confDel = msg;
if(confDel ==null)
  confDel= confirm("Would you like to perform this delete action?");
else
  confDel= confirm(msg);

if (confDel== true)
  doSubmit('Delete');
  }
</script>
```

This example creates a function to confirm a delete action and then calls that function from a button. Note that the function optionally submits the page and sets the value of the internal variable `:REQUEST` to `Delete`, thus performing the delete using a process that conditionally executes based on the value of request.

Note that when you create the button you would need to select **Action Redirect to URL without submitting page**. Then, you would specify a URL target such as the following:

```
javascript:confirmDelete('Would you like to perform this delete action?');
```

See Also: "Creating a Button Using a Wizard" on page 6-48

Creating Dependent Select Lists

You can use a select list to determine the range of values of another select list on the same page. You can achieve this functionality by having a driving select list submit values to a subsequent select list. You incorporate these values in the subsequent select list as a bind variable in the WHERE clause of its query.

You can have one LOV drive another LOV by:

- Creating a basic form.

- Defining two list of values. Note that the driving LOV must submit the page after a value is chosen.
- Defining a branch that branches back to the current page.

Consider the following example. The first LOV enables the user to pick a state.

```
SELECT state_name d, state_id v
FROM states
```

The second LOV selects the country name and country ID based on the state selected in the first LOV.

```
SELECT county_name d, county_id v
  FROM counties
WHERE state_id = :Px_STATE_ID
```

See Also:

- "Creating Forms" on page 6-26
- "Creating Lists of Values" on page 6-26
- "Controlling Navigation Using Branches" on page 8-8

Creating a Help Page

Oracle HTML DB includes built-in attributes to create Help for your application. Creating Help for your application involves the following steps:

- Create a dedicated Help page and Help region
- Define page Help text
- Define item Help text
- Create a navigation bar icon to link to your Help page

Help created in Oracle HTML DB displays on a dedicated Help page. To access Help, users click a link that takes them to a dedicated Help page. This Help page displays page and item Help topics specific to the page they are viewing.

Topics in this section include:

- Creating a Help Page and Region
- Defining Help Text
- Creating a Help Navigation Bar Entry

Creating a Help Page and Region

The first step in creating Help for your application it to create a dedicated page and Help Text region.

To create a new Help Text region:

1. Create new page for your Help. See "Adding Pages to an Application" on page 6-7.
2. Navigate to the Page Definition of your Help page. See "Accessing a Page Definition" on page 5-16.
3. Under Regions, the **Create** icon.
4. When prompted to select a region type, select **Help Text**.
5. Follow the on-screen instructions.

Defining Help Text

You define Help text for a page or single item by editing attributes. Ideally, you would define these attributes as you create your application. For simplicity, however, the following procedures describe how to define this text after the fact.

To define page Help text:

1. Navigate to the Page Definition for the page for which you want to add page Help.
2. Click **Edit Attributes** to view the existing page attributes.
3. Scroll down to **Page Help Text**.
4. Enter your Help text in the field provided.
5. Click **Apply Changes**.

Repeat the previous procedure for each page requiring page Help text.

To define item Help text for each page:

1. Navigate to the Page Definition for the page for which you want to add item Help.
2. Under Items, click name of the item you want to edit.
3. Scroll down to **Help Text**.
4. Enter your Help text in the field provided.
5. Click **Apply Change**.

Repeat the previous procedure for each item requiring Help text.

Editing Multiple Item Help Topics at Once

If you are including item Help in your application, you can edit multiple item Help topics at once using the Bulk Edit Item Help report.

Accessing the Bulk Edit Item Help Report To view the Bulk Edit Item Help report:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks list, select **View Application Reports**.
5. Click **Page Components**.
6. Select **Item Help Text**.

   A report displays at the bottom on the page.
7. In Bulk Item Help Report you can:
   - Update existing Help topics. Edit the Help text that appears and click **Apply Changes**.
   - Link to the Page Definition containing the item by clicking the page ID.
   - Link to the Page Item by clicking the item name.

Seeding Item Help Topics If you application does not yet contain item Help, you perform a mass update of default Help text.

To seed item Help topics:

1. Access the Bulk Edit Item Help report.
2. Click **Seed Item Help Text**.
3. In Default Help Text, enter the default text to appear in all Help topics.
4. Click **Apply Changes**.

Searching for Existing Item Help Topics You can search for existing Help text, or for an item label.

To search for existing item Help topic:

1. In Help Contains, enter keywords.
2. Click **Go**.

Searching for an Item Label To search for an item label:

1. In Help Contains, enter keywords.
2. Click **Go**.

See Also: "Viewing Application Reports" on page 5-44

Creating a Help Navigation Bar Entry

Once you have created your Help, the next step is to create a navigation bar entry so users can link to it.

To create a navigation bar entry:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Navigation Bar, click the **Create** icon.
3. Specify the appropriate navigation bar entry attributes:
   - Sequence
   - Alt Tag Text
   - Icon Image Name
   - Image Height and Image Width
   - Text

   Specify the target location.
4. To specify the target location:
   - From Target type, select **Page in this application**.
   - In Page, specify the page ID.
   - In Request, type:

     ```
     &APP_PAGE_ID.
     ```

By specifying substitution string *`&APP_PAGE_ID`* as the Request, you are instructing the HTML DB engine to display Help text for the current page when the user clicks this icon.

7

Controlling Page Layout and User Interface

This section describes different ways you can customize your application's user interface and page layout including customizing regions, editing item attributes, customizing templates, and incorporating cascading style sheets and images.

This section contains the following topics:

See Also: "Adding Navigation" on page 8-1 for information about creating navigation bars, tabs, breadcrumbs, lists, and trees

Understanding Page Layout

Oracle HTML DB renders pages by combining templates with application components defined by the developer and data in the database.

The overall framework (or structure of a page) is determined by the page template. For example, the page templates controls if a page uses tabs and a navigation bar. It can also define if a page includes a bar on the left side that serves as a placeholder for navigation or secondary content. Finally, a page template can include definitions of region positions, which enable precise control over placement of regions using HTML tables or style sheet definitions. The page template itself is composed of HTML combined with substitution strings which will be substituted with the appropriate Oracle HTML DB components at run time.

As a developer, you add content on a page by creating a region. A region is an area of a page that serves as a container for content. Each region contains a different type of content such as HTML, a report, a form, a chart, a list, a breadcumb, PL/SQL, a tree, a URL, or a calendar. You position a region either relative to other regions (that is, based on its sequence number and column), or by using a region position defined in the page template. The style of the region is also controlled by the region template. Like the page template, the region template defines the structure of the area that the region takes up on a page. It defines if the region title is displayed and where it is displayed relative to the main content, or the body. A region can also define absolute positions for buttons.

> **See Also:** "Creating a Region" on page 7-2

Displaying Components on Every Page of an Application

Page zero of your application functions as a master page. The HTML DB engine renders all components you add to page zero on every page within your application. You can further control whether or not the HTML DB engine renders a component or runs a computation, validation, or process by defining conditions.

To create a page zero:

1. Create a new page.
2. Specify the page ID as zero (0).

> **See Also:** "Adding Pages to an Application" on page 6-7, "Understanding Conditional Rendering and Processing" on page 4-6, and "Available Conditions" on page A-1

Customizing Regions

A region is a area on a page that serves as a container for content. Each page can have any number of regions. You control the appearance of a region through a specific region template. The region template controls the look of the region, the size, determines whether or not there will be a border or a background color, and what type of fonts display. A region template also determines the standard placement for any buttons placed in region positions.

You can use regions to group page controls (such as items or buttons). You can create simple regions that do not generate additional HTML, or create elaborate regions that frame content within HTML tables or images.

Regions display in sequence within HTML table columns. You can also explicitly place regions in positions defined in the page template. You can also choose to display regions conditionally.

Topics in this section include:

- Creating a Region
- How Region Attributes Affect Page Layout
- Incorporating Content from Other Web Sites
- Rendering HTML Using Custom PL/SQL

Creating a Region

You create new regions by running the Create Region Wizard.

To create a new region:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click the **Create** icon.

   The Create Region Wizard appears.
3. Select a region type and follow the on-screen instructions.

When you create a region you select a region type. The HTML DB engine interprets a region differently based on the type you select. Table 7–1 describes the available region types.

Table 7–1 Region Types

Region Type	Description
HTML	When you select HTML, the wizard prompts you to select one of the following: ▪ **HTML** - Functions as containers for items and contain the HTML you provide. Any HTML you type may contain substitution strings. ▪ **HTML Text (escape special characters)** - Same as HTML region, but the HTML DB engine escapes special characters before they are rendered. ▪ **HTML Text (with shortcuts)** - Same as HTML region, but with support for shortcuts. **See Also:** "Using Shortcuts" on page 6-63
Report	Report regions can be defined by a SQL query you write, or by using a wizard to guide you through the steps needed to write a query. **See Also:** "Creating Reports" on page 6-17
Form	Form regions are used to contain a form. **See Also:** "Creating Forms" on page 6-26
Chart	Chart regions contain line, bar, or pie charts based on SQL queries. **See Also:** "Creating Charts" on page 6-40
List	List regions contain a shared collection of links called list. **See Also:** "Creating Lists" on page 8-13
Breadcrumb	Breadcrumb regions contain a hierarchical list of links called a breadcrumb. **See Also:** "Creating Breadcrumbs" on page 8-9
PL/SQL Dynamic Content	Regions based on PL/SQL enable you to render any HTML or text using the PL/SQL Web Toolkit.

Table 7–1 (Cont.) Region Types

Region Type	Description
Tree	Trees are a hierarchical navigational control based on a SQL query executed at run time. It enables the user to expand an collapse nodes. **See Also:** "Creating Trees" on page 8-19
URL	URL based regions obtain their content by calling a Web server using a predefined URL. **See Also:** "Incorporating Content from Other Web Sites" on page 7-8
Calendar	Calendar regions are used to contain a monthly calendar. **See Also:** "Creating Calendars" on page 6-35
Multiple HTML	Use this option to create multiple HTML regions at once. In the fields provided, specify the Sequence, Title, Display Point, Report Template, and Column for each region.
Help Text	Help Text regions enable you to provide page-level help. **See Also:** "Creating a Help Page" on page 6-68

See Also:

- *Oracle Database Application Developer's Guide - Fundamentals* for information about developing Web applications with PL/SQL
- *Oracle Database PL/SQL Packages and Types Reference* for information about htp packages

How Region Attributes Affect Page Layout

You can alter the appearance of a page by changing the region attributes.

To edit region attributes:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, select the region name.

   The Region Definition appears.

Table 7–2 describes region attributes that affect the layout of a page.

Table 7–2 Region Attributes Affecting Page Layout

Attribute	Description
Conditions	Defines conditions and appropriate expressions that determine if the region displays. Conditions can reference session state, the currently logged in user, or Oracle HTML DB environment preferences (such as whether or not a page is in Print View mode). **See Also:** "Understanding Conditional Rendering and Processing" on page 4-6 and "Optimizing a Page for Printing" on page 7-43
Header and Footer	Specifies HTML text to be displayed at the top of the region (just before the `#BODY#` content).
Customization	Enables end user customization. To utilize this feature, you must include the `#CUSTOMIZE#` substitution string in the Header, Body, or Footer section of the page template. **See Also:** "Enabling Users to Customize a Page" on page 7-17
User Interface, Column	Determines the column in which the region displays. If two regions are in the same display point, you can place them next to one another by setting the second region to display in column 2. Many regions can display in each column and the display order of the regions within the region display point and column is controlled by the region display sequence number.
User Interface, Template	Determines the look of the region. Select from the region templates defined in the application. To view template attributes, click the template name on the Page Definition. **See Also:** "Customizing Templates" on page 7-17 and "Region Templates" on page 7-34
User Interface, Sequence	Specifies the display order of the regions within the page.
User Interface, Display Point	Identifies where within the page the region displays. Regions are rendered in order of sequence number within a Display Point. Click the View icon to see the page layout and select a position. The possible display points for a region are determined by the page-level template (which is a page attribute). If no page-level template is selected, the default page-level template, defined in the Application Definition is used.
User Interface, Region HTML table cell attributes	Defines additional attributes to be used in the HTML table cells when regions display in multiple columns. The attributes control the cells in the table used to lay out a region in multiple columns.

Controlling Region Positioning

When you create a region, you must specify its position (or Display Point) on the page. You can choose either a default position (such as Page Template Body) or a user-defined position in the template (such as Page Template Region Position 1.)

In addition to Display Point, you can specify the column in which the region will be placed. When you place regions in multiple columns, Oracle HTML DB automatically renders the necessary HTML to produce a multiple column layout.

Specifying a Region Header and Footer

In addition to the body content of a region (which can be a report, a chart, or HTML with form elements), you can specify additional HTML to be placed above and below a region or in its header and footer. The region footer supports the following substitution strings:

- `#TIMING#` shows the elapsed time in seconds used when rendering a region. You cab use this substitution string for debugging purposes.

- #ROWS_FETCHED# shows the number of rows fetched by the Oracle HTML DB reporting engine (the page size). You can use these substitution strings to display customized messages to the user. For example:

  ```
  Fetched #ROWS_FETCHED# rows in #TIMING# seconds.
  ```

- #TOTAL_ROWS# displays the total number of rows that satisfy a SQL query used for a report.
- #FIRST_ROW_FETCHED# and #LAST_ROW_FETCHED# displays the range of rows displayed. For example:

  ```
  Row(s) #FIRST_ROW_FETCHED# through #LAST_ROW_FETCHED# of #ROWS_FETCHED#
  displayed
  ```

Enabling Users to Customize a Page

You can use the Customization attribute to enable users to turn regions on and off in a running application.

To enable end user customization:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click the region name.

   The Region Definition appears.
3. Scroll down to Customization and select one of the following:
   - Customizable and Not Shown By Default
   - Customizable and Shown By Default
4. In Customized Option Name, enter the label that represents this region on the page to the user.
5. Include the #CUSTOMIZE# substitution string in the Header, Body, or Footer section of the page template.

To utilize this feature, you must include the #CUSTOMIZE# substitution string in the Header, Body, or Footer section of the page template.

If at least one region supports end user customization, a link called Customize appears wherever you include the #CUSTOMIZE# substitution string in the page template. When users click this link, a window displays enabling them to turn on and off regions on the page.

See Also: "Customizing Templates" on page 7-17

How Item Attributes Effect Page Layout

An item is part of an HTML form and can be a text field, text area, password, select list, check box, and so on. You can alter the appearance of a page by changing the item attributes. For example, these attributes can effect where a label displays, how large an item will be, if the item will display next to or below the previous item.

> **See Also:** "Creating Items" on page 6-51

To edit item attributes:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Items, click the item name.

   The Item Definition appears.

Table 7–3 describes how item attributes affect the layout of a page.

Table 7–3 Item Attributes Effecting Page Layout

Heading	Attribute	Description
Displayed	Sequence	Determines the order in which items are rendered within a region.
Displayed	Region	Defines the region in which the item displays. All items must be in a region.
Displayed	Begin On New Line	Determines if this item displays on the same line as the previous item or if it displays on the next line.
Displayed	Begin On New Field	Determines if this item displays in the next column or in the same column as the previous item.
Displayed	ColSpan	Items are laid out in HTML tables. Defines the value to be used for the COLSPAN attribute of the table cell containing an item.
Displayed	RowSpan	Items are laid out in HTML tables. Defines the value to be used for the ROWSPAN attribute in the table cell in which that the item displays.
Label	Label	Enter the label for this item. You can include HTML, JavaScript, and shortcuts. You can also use the substitution string `#CURRENT_ITEM_NAME#` to obtain the name of the item associated with this label.
Label	Horizontal/Vertical Alignment	Controls the placement as well as the horizontal and vertical alignment of the label. Labels can be displayed above, below, or to the left of the item.
Label	Template	Specifies the label template. Use label templates to apply a consistent appearance to labels in your application.
Label	HTML Table Cell Attributes	Defines additional attributes for the cell containing this item's label (for example, `nowrap="nowrap"`).
Label	Post Element Texts	Specifies additional attributes for the HTML table cell used to display each individual option in a radio group or set of check boxes. Can include HTML, JavaScript, and shortcuts. You can reference the following substitution strings: ▪ `#CURRENT_FORM_ELEMENT#` obtains the name of the HTML form element with which this post element text is associated. ▪ `#CURRENT_ITEM_NAME#` obtains the name of the item with which this post element text is associated.

Table 7–3 (Cont.) Item Attributes Effecting Page Layout

Heading	Attribute	Description
List of Values	Columns	Applies to radio groups and check boxes. Defines the number of columns to use to display the values defined in the List of Values. By default, all values display in one column.
Conditions	Condition Type and Expressions	Defines conditions and appropriate expressions that determine if an item displays. **See Also:** "Understanding Conditional Rendering and Processing" on page 4-6
Read Only Display Settings	Read Only Condition Type	Defines conditions and expressions that determine if the item will display as read-only. Use this attribute to display certain items to a set of users as updatable, while displaying that same set of items to others users as nonupdatable. Reduces the need to code duplicate interfaces for different users.

Incorporating Content from Other Web Sites

Typically, pages in an application are based on data stored in an Oracle database. To incorporate content from other servers, you can create a region based on a URL to display content. For example, suppose you wanted to reference the current Oracle stock price. You could create a region of type URL based on a URL such as the following:

```
http://quote.yahoo.com/q?d=b&s=ORCL
```

You could then create a item called STOCK_SYMBOL and base your region on a stock price entered by the user. For example:

```
http://quote.yahoo.com/q?d=b&s=&STOCK_SYMBOL.
```

Sometimes (as is the case with the previous example) the HTML returned to the region is more than is needed. To restrict the HTML displayed you can use the following region attributes:

- URL (discard until but not including this text)
- URL (discard after and including this text)

Note that the previous example may require that you set the Proxy Server application attribute. If you do not set the Proxy Server application attribute, you will get an error message. Oracle HTML DB uses the Oracle `utl_http.request_pieces` function to obtain the HTML generated from the given URL.

> **See Also:** "Configuring Standard Application Attributes" on page 5-6 for information about setting the Proxy Server application attribute

Managing Themes

Themes are collections of templates that can be used to define the layout and style of an entire application. The idea behind a theme is to provide a complete set of templates that accommodate every UI pattern that may be needed in an application. Templates are organized first by type (button, calendar, label, list, breadcrumb, page, popup LOV, region, and report) and then by template classes, identifying the purpose of the each template within that type. Each template type provides a group of standard classes and eight custom classes. These classifications enable Oracle HTML DB to map templates among themes, making it easy to quickly change the entire look and feel of an application.

Topics in this section include:

- Accessing the Themes Page
- Changing Default Templates in a Theme
- Creating a New Theme
- Switching an Active Theme
- Copying a Theme
- Deleting a Theme
- About Exporting and Importing Themes
- Changing a Theme Identification Number
- Viewing Theme Reports

See Also: "Customizing Templates" on page 7-17

Accessing the Themes Page

You manage themes on the Themes page.

To access the Themes page from Shared Components:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.
4. Under User Interface, select **Themes**.

   The Themes page appears.
5. To access the Details view, select **Details** from the View list.

   The currently selected theme displays a check mark in the current column.

To access the Themes page from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. Select the theme name.

About the Themes Page

Once you create a theme, it appears on the Themes page. You control how the page displays by selecting the following options from the View list:

- **Icons** (the default) displays each theme as a large icon. To edit a theme, click the appropriate icon.
- **Details** displays each theme as a line in a report. To change the theme name or default templates, click the theme name.

In Details view, you can select the following options from the Display list:

– **Summary View** displays the theme ID, name, and current status.

– **Detailed View** displays the theme ID, name, current status, and the number of templates in each template type.

Changing Default Templates in a Theme

Standard theme contains templates for every type of application component and region type. You can change the selected default templates for a theme on the Define Theme page.

You can override these defaults, by either selecting another template when you create new components or regions, or by changing the template on the component or region attributes page.

To review or change the default templates in a theme:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Access the Details view. From the View list, select **Details**.
3. Select the appropriate theme name.

   Create/Edit Theme page appears.

   The top of the page displays the associated application ID and the Theme Identification Number.
4. To change the theme name, enter a new name in the Name field.
5. To change a default template, make a new selection from the appropriate list.

Table 7–4 describes the default templates available under the section Default Templates by Component.

Table 7–4 Default Templates by Component

Attribute	Description
Page	Identifies the default template for displaying pages. If a developer does not explicitly choose a template, then the HTML DB engine uses the template specified here. Once defined, this default template appears on the Edit Application Attributes page under the heading Application Template Defaults. **See Also:** "Display Attributes" on page 5-20 for information about overriding the page template on the Page Attributes page
Error Page	Optional. Specifies a page template to use for errors that display on a separate page as opposed to those that display inline. Leave this attribute blank if you do not want to use a template designed to display errors. Once defined, this default template appears on the Edit Application Attributes page under the heading Application Template Defaults.

Table 7–4 (Cont.) Default Templates by Component

Attribute	Description
Printer Friendly Page	Identifies the template to be used when the HTML DB engine is in printer friendly mode. When calling the HTML DB to render a page, you have the option to identify a printer friendly attribute with values of YES or NO. If you select `YES`, then the page displays using a printer friendly template. The HTML DB engine displays all text within HTML form fields as text. The printer friendly template does not need to have the `#FORM_OPEN#` or `#FORM_CLOSE#` tags. The objective is to be able to display information with few tables and in a format suitable for printing. Once defined, this default template appears on the Edit Application Attributes page under the heading Application Template Defaults. **See Also:** "Optimizing a Page for Printing" on page 7-43
Breadcrumb	Identifies the default breadcrumb template used when you create new breadcrumb.
Button	Identifies the default button template used when creating a new button.
Calendar	Specifies the default calendar template used when you create new calendar.
Label	Identifies the default label template used when you create new label.
List	Specifies the default list template used when you create new list.
Region	Specifies the default region template used when you create new region.
Report	Identifies the default region template used when you create a report.

Table 7–5 describes the default templates available under the section Default Templates by Region Type.

Table 7–5 Region Templates by Region Type

Attribute	Description
Breadcrumbs	Default region template used when creating a breadcrumb.
Charts	Default chart template used when creating a chart.
Forms	Default form template used when creating a form.
Lists	Default region template used when creating a list.
Reports	Default region template used when creating a report.
Tabular Forms	Default region template used when creating a tabular form.
Wizards	Default region template used when creating a new wizard component.

Creating a New Theme

You can create a new theme from scratch or select an existing theme from the HTML DB repository.

To create a new theme:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.

   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Create Theme**.
3. Specify whether to select a theme from the HTML DB repository, or create a theme from scratch.
4. If you select **From the HTML DB Repository**:
   a. Select a theme from the repository.
   b. Click **Create**.
5. If you select **From Scratch**:
   a. Specify a name.
   b. Click **Create**.

      Themes page appears.
   c. Define the default templates for the new theme:
      – Click the **Edit** icon adjacent to the new theme name.
      – To change the theme name, enter a new name in the Name field.
      – When the Define Theme page appears, select default templates for the new theme.

Switching an Active Theme

When you switch to a new theme, all components that are assigned a template are assigned to a corresponding template in the new theme. Application Builder accomplishes template mapping through the assignment of template class identifiers.

Note: You can only switch to a new theme if another theme already exists.

To apply a theme to an application:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Switch Theme**.

   The Switch Theme page appears.
3. From the Switch to Theme list, select a new theme and click **Next**.
4. Review the Status column to identify problematic mappings:
   - **Check** indicates the mapping was successful.

- **Warning** indicates there are more than one template in the theme you are switching to with the identified class. The warning provides a select list from which to choose the appropriate template.
- **Error** indicates that Application Builder was unable to map the class among the themes. Ensure that a class is identified for the templates in both themes.

5. Click **Next** to continue.
6. Click **Switch Theme**.

See Also: "Creating a New Theme" on page 7-11

Copying a Theme

Each theme is identified by a numeric identification number (ID). When you copy a theme you specify a new theme ID. Copying a theme is useful if you want to experiment with editing a theme or to export a theme with a different ID.

To copy a theme:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. From the Tasks list, select **Copy Theme**.
3. On Copy Theme:
   a. Copy From Theme - Select the theme you want to copy.
   b. Copy to this Theme Identification Number - Enter a new ID for the theme.
   c. Click **Next**.
4. Click **Copy Theme ID**.

Deleting a Theme

You can only delete inactive themes. When you delete a theme, Application Builder only removes inactive templates.

To delete a theme:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. From the Tasks list, select **Delete Theme**.
3. From Remove Theme, select the theme you want to delete and click **Next**.
4. Click **Remove Theme**.

About Exporting and Importing Themes

You export a theme in the same way you export any related application file. Exporting a theme from one Oracle HTML DB development instance to another involves the following steps:

1. Export the theme using the Export Theme utility.
2. Import the exported file into the target Oracle HTML DB instance.
3. Install the exported file from the Export Repository.

See Also: "Exporting Themes" on page 11-9 and "Importing Export Files" on page 11-11

Changing a Theme Identification Number

Each theme has an identification number (ID). You can use the Change Theme ID utility to change a theme ID to another number. Changing a theme ID is useful when you want to export a theme with a different number and then import it into another application.

To change a theme identification number:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. From the Tasks list, select **Change Identification Number**.
3. On the Change Theme ID page:
   a. Select a theme.
   b. Specify a new identification number.
   c. Click **Next**.
   d. Confirm your changes and click **Change Theme ID**.

Viewing Theme Reports

Application Builder includes a number of reports designed to help you manage themes and templates.

Topics in this section include:

- Viewing All Templates in a Theme
- Viewing Theme Template Counts
- Viewing File References
- Viewing Class References
- Viewing Template Substitution Strings

Viewing All Templates in a Theme

To view all templates that comprise a theme:

1. Navigate to the Themes page:

   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Reports**.
3. On the Theme Reports page:
   a. From Report, select **Application Templates**.
   b. From Theme, select a theme.
   c. Click **Go**.

   A listing of templates displays listing the template type, template name, the associated theme, and template class.
4. To edit a template, select the template name.

Viewing Theme Template Counts

The Theme Template Count report lists which template classes currently have templates created for them.

To view the Theme Template Count report:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Reports**.
3. On the Theme Reports page:
   a. From Report, select **Theme Template Counts**.
   b. From Theme, select a theme.
   c. Click **Go**.
4. If you are using custom classifications, select **Show Custom** and click **Go**.

Viewing File References

The File References report displays a listing of all files associated with templates, shared components, or page components in the current application.

To view the File References report:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. On the Themes page, click **Reports**.

3. On the Theme Reports page:
   a. From Report, select **File References**.
   b. From Theme, select a theme.
   c. Click **Go**.
4. On the File References page:
   a. From Show, select the type of component to include in the report. If you do not make a selection, no results are returned.
   b. From Show Files, select one of the following:
      – **With context** displays the component, the theme identification number, the component name, the image (if applicable), and the page ID. Select the page ID to link to a Page Definition.
      – **Without context** displays only the file name and the image (if applicable).
   c. From File Extensions, select the type of extensions for which to search.
   d. Click **Go**.
5. To download a comma-delimited file (.csv) version of this report, click **Download CSV** at the bottom of the page.

Viewing Class References

Accessing the Class References report displays a listing of classes associated with templates, shared components, or page components in the current application.

To view the Class References report:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Reports**.
3. On the Theme Reports page:
   a. From Report, select **Class References**.
   b. From Theme, select a theme.
   c. Click **Go**.
4. On the Class References page:
   a. From Show, select the components to check for a class reference. If you do not make a selection, no results are returned.
   b. From Show Class Names, select one of the following:
      – **With context** displays the component, the theme identification number, the component name, the image (if applicable), and the page ID.
      – **Without context** displays only the referenced class.
   c. Click **Go**.

5. To download a comma-delimited file (.csv) version of this report, click **Download CSV** at the bottom of the page.

Viewing Template Substitution Strings

Use the Template Substitution Strings report to view all supported substitution strings by component.

To view the Substitution String report:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Themes**.
2. Click **Reports**.
3. On the Theme Reports page:
   a. From the Report list, select **Template Substitution Strings**.
   b. From the Theme list, select which themes to include in the report.
   c. Click **Go**.
4. To link to a template definition, select the component name.

   See Also: "Using Substitution Strings" on page 4-16

Customizing Templates

The HTML DB engine creates the user interface of an application based on a named collection of templates called a theme. Templates control the look and feel of the components in your application. If you need to create a custom template, it is generally simplest to start with an existing template and then modify it. Once you have created one or more default templates, you can modify those templates to fit your specific needs.

Topics in this section include:

- About Cascading Style Sheets
- Selecting a Default Page Template
- Viewing Templates
- Creating a New Template
- Viewing Template Reports
- Editing Templates
- Breadcrumb Templates
- Button Templates
- Calendar Templates
- Label Templates
- List Templates
- Page Templates

- Popup LOV Templates
- Region Templates
- Report Templates

See Also: Managing Themes on page 7-8

About Cascading Style Sheets

A cascading style sheet (CSS) provides a way to control the style of a Web page without changing its structure. When used properly, a CSS separates visual attributes such as color, margins, and fonts from the structure of the HTML document. Oracle HTML DB includes themes that contain templates that reference their own CSS. The style rules defined in each CSS for a particular theme also determine the way reports and regions display.

See Also: "Using Custom Cascading Style Sheets" on page 7-43

Selecting a Default Page Template

You can specify a default page template in two ways:

- Select a default page template within a specific theme.
- Select a specific page template on a page by page basis.

By default, the HTML DB engine uses the Page template specified on the Themes page.

Selecting a Page-level Template Within a Theme

To specify a default page template within a theme:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.
4. Under User Interface, select **Themes**.

   The Themes page appears.
5. Change the View. From View, select **Details**.
6. In the Themes list, select the theme name.
7. Under Default Templates by Component, make a selection from the Page list.

See Also: "Changing Default Templates in a Theme" on page 7-10

Selecting a Page-level Template for a Specific Page

To specify an page-level template for a specific page:

1. Navigate to the Workspace home page
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.
5. Click **Edit Attributes**.
6. Locate the section Primary Display Attributes.

7. Make a selection from the Page Template list.

Viewing Templates

You can view all available templates on the Templates page. Alternatively, you can view the templates used on a specific page on the Page Definition.

> **See Also:** "Viewing All Templates in a Theme" on page 7-14

Viewing Templates on the Templates Page

To view existing templates:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.
4. Under User Interface, select **Templates**.

   The Templates page appears.
5. You can narrow the display by making a selections from the following lists and clicking **Go**.
   - Theme - View only templates in a specific theme.
   - Show - View a specific type of template.
   - View - View all templates, those currently referenced, or those not referenced.
6. To view a template definition, click the template name.
7. To see a preview of a template, click the **Run** icon in the Preview column.

> **Note:** Not all template types have the preview capability.

Viewing Templates from the Page Definition

To view existing templates from the Page Definition:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears. Templates associated with the current page display under the Templates heading in the far right column.
5. To view attributes of an existing template, click the template name.

Creating a New Template

If you need to create a custom template, it is generally simplest to start with an existing template and then modify it. Once you have created one or more default templates, you can modify those templates to fit your specific needs.

To create a custom template:

1. Navigate to the Templates page.

   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Templates**.
2. Click **Create**.
3. Select the type of template you want to create.
4. Select a creation method:
   - **From Scratch**
   - **As a Copy of an Existing Template**
5. Follow the on-screen instructions. Be careful to associate your template with the correct theme.

Viewing Template Reports

Oracle HTML DB includes reports describing template utilization, subscription, and edit history.

To view template reports for the current application:

1. Navigate to the Themes page:
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under User Interface, select **Templates**.
2. You can narrow the display by making a selections from the following lists and clicking **Go**.
   - Theme - View only templates in a specific theme.
   - Show - View a specific type of template.
   - View - View all templates, those currently referenced, or those not referenced.
3. To view template reports, click the following buttons:
   - **Utilization** displays template utilization in the current application for all template types (page, report, region, label and list).
   - **Subscription** displays subscribed templates in your application.
   - **History** details recent changes to templates by developer and last update date.

Editing Templates

Once you create a custom template, you can quickly edit it from either the Templates page or from the Page Definition.

To edit an existing template from the Templates page:

1. Navigate to the Templates page.
   a. Navigate to the Workspace home page and click the **Application Builder** icon.
   b. Select an application.

   c. Click **Shared Components**.
   d. Under User Interface, select **Templates**.
2. You can narrow the display by making a selections from the following lists and clicking **Go**.
   - Theme - View only templates in a specific theme.
   - Show - View a specific type of template.
   - View - View all templates, those currently referenced, or those not referenced.
3. Locate the template you want to edit and select the template name.
4. Follow the on-screen instructions.

As you edit templates, you can make changes in one window and run your application in another by selecting **Return to Page**. Selecting this check box, keeps the page you are editing current after you click **Apply Changes**.

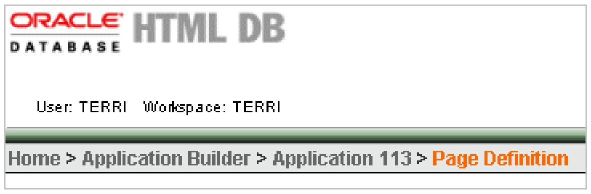
Breadcrumb Templates

A breadcrumb template controls the display of breadcrumb entries. You select a breadcrumb template when you create a region.

About Breadcrumb Style Navigation

Breadcrumbs usually indicate where the current page is relative to other pages in the application. In addition, users can click a specific page to instantly view it. Oracle HTML DB includes breadcrumb paths beneath the standard tabs (or second level navigation tabs) at the top of each page.

Figure 7–1 Breadcrumb


ORACLE DATABASE HTML DB
User: TERRI Workspace: TERRI
Home > Application Builder > Application 113 > Page Definition

See Also:

- Online help for information about using specific sections of the Edit Breadcrumb Template page
- "Creating Breadcrumbs" on page 8-9

Breadcrumb Template Attributes

This section describes specific sections of the Breadcrumb Template page.

Identification **Name** identifies the name of the template. Use the **Translatable** check box to indicate that the template contains text strings that require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Breadcrumb Template Subscription Use Template Subscription to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Breadcrumb Template Style) Select one of the following template styles:

- **Child Breadcrumb Entries** displays all breadcrumb entries that are children of the current page parent breadcrumb (that is, peers of the current breadcrumb).
- **Current Breadcrumb** displays all breadcrumb entries in sequence with a common parent.
- **Parent Breadcrumb Entries** displays all breadcrumb entries for the current pages parent breadcrumb (that is, one level up from current breadcrumb entry).
- **Parent to Leaf (breadcrumb style)** displays the current page breadcrumb entry, its parent to the left, and so on until the root node is reached.

Breadcrumb Entry Control Table 7–6 describes available breadcrumb Entry attributes.

Table 7–6 Breadcrumb Entry Control attributes

Attribute	Description
Before First	Defines text that displays before the first breadcrumb entry.
Current Page Breadcrumb Option	Defines the look of a breadcrumb entry that corresponds to the current page. This attribute supports the following substitution strings: ▪ `#NAME#` specifies the short name of the breadcrumb entry. ▪ `#LINK#` specifies the anchor target of the breadcrumb entry. ▪ `#LONG_NAME#` specifies the long name of the breadcrumb entry.
Non Current Page Breadcrumb Option	Defines the look of a breadcrumb entry that does not correspond to the current page. This attribute supports the following substitution strings: ▪ `#NAME#` specifies the short name of the breadcrumb entry ▪ `#LINK#` specifies the anchor target of the breadcrumb entry ▪ `#LONG_NAME#` specifies the long name of the breadcrumb entry
After Last	Defines text that displays after the last breadcrumb entry.

Template Attributes Use **Breadcrumb Link Attributes** to specify hypertext link attributes for a breadcrumb entry.

Use **Between Levels** to specify text that displays between each level of a breadcrumb breadcrumb. For example, if your breadcrumb has three levels, this text would display at the "X" in the example that follows:

```
main X cars X porsche X 911
```

In **Max Levels** specify the number of levels when displaying breadcrumbs.

Comments Use this attribute to record developer comments.

Button Templates

Button templates enable application developers to customize the look and feel of a button. To build a button, you can use multiple images or HTML tags. Using button templates is optional.

Button Template Attributes

This section describes specific sections of the Button Template page.

Button Template **Template Name** identifies the name of the template. Use the **Translatable** check box to indicate if the template contains text strings which require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use Template Subscription to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Template Text Defines the button template that displays. You have the option of including standard application substitutions. For example, `&ITEM_NAME` values can be substituted at rendering time. Button templates support the following substitution strings:

- `#LABEL#` is replaced with a button label.
- `#LINK#` is replaced with a URL. The URL then calls a `#doSubmit#` or a redirect JavaScript which submits the page (that is, setting the request value), or simply redirects it to the supplied URL.

Comments Use this attribute to record developer comments.

Calendar Templates

Calendar templates control the appearance and placement of a calendar. Calendar templates frequently use HTML tables to arrange dates. You place calendar attributes using substitution strings such as `#DD#` and `#MONTH#`. A list of supported substitution strings appears on the right side of the Calendar Template Attributes page. Note that template substitution strings must be in uppercase letters and begin and end with a number sign (#).

See Also: "Creating Calendars" on page 6-35

Calendar Template Attributes

This section describes specific sections of the Calendar Template page.

Calendar Template Identification **Name** identifies the name of the template. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use Template Subscription to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Month Attributes In **Month Title Format** enter the format for the monthly title that appears at the top of each month. This is the first part of a calendar which prints on the page. For example:

```
<table>
 <tr>
   <td>#MONTH#</td>
 </tr>
```

In **Day of Week Format** enter the format for the week day names which displays as the column header for that day of the week. For example:

```
<th width="14%">#IDAY#</th>
```

In **Month Open Format** enter HTML to be used to open a month. This displays immediately after the Month Title Format. Typically this attribute contains an HTML tag that functions as a container (such as a table). For example:

```
<table  border="0" cellpadding="0" cellspacing="0" class="htmldbRowWithBorders"
width="100%"><tr>
```

In **Close Month Format** enter HTML to be used to close a month. Since this is the last part printed, this attribute should contain HTML that closes the HTML tags used in the Month Open Format. For example:

```
</table>
```

Week Attributes Enter HTML to open and close a week.

In **Week Open Format** enter HTML to be used to open a week. This is printed for each week. Typically this attribute contains an HTML tag which functions as a container. For example:

```
<tr>
```

In **Week Close Format** enter HTML to be used to close the week. Since this is the last part printed, this attribute should contain HTML that closes HTML tags used in Week Open Format.

```
</tr>
```

Weekday Attributes Enter HTML to format the days that occur during the work week (that is, Monday through Friday).

In **Day Title Format** enter HTML to be used the title of each day. This title displays after the Day Open Format. For example:

```
#DD#
```

In **Day Open Format** enter HTML to used to open a day. This displays on each day in the calendar. Typically this attribute contains an HTML tag that functions as a container. For example:

```
<td>
```

In **Day Close Format** enter HTML used to close a day. Since this is the last part printed, this attribute should close any HTML tags used in Day Open Format. For example:

```
</td>
```

In **Today Open Format** enter HTML used to open today. Typically this attribute contains an HTML tag which functions as a container (such as `<td>`) and would be different from the Day Open Format. For example:

```
<td style="background:#c5d5c5">
```

Non-Day Attributes A non-day is not part of the current month. For example, suppose the first of a month is a Monday, but the week starts on a Sunday. Because Sunday is not part of the current month, Sunday would be a non-day. Use these attributes to format non-days.

In **Non-Day Title Format** enter a non-day title. For example:

```
#DD#
```

In **Non-Day Open Format** enter HTML to open a non-day. Typically this attribute would contain an HTML tag that functions as a container. For example:

```
<td>
```

In **Non-Day Close Format** enter HTML to close a non-day. Typically this attribute would contain an HTML tag that closes the tag used in Non-Day Open Format. For example:

```
</td>
```

Weekend Attributes Enter HTML used to format days that occur on the weekend. Include substitution strings to include dynamic content. To view a list of supported substitution strings, see the Substitution Strings list on the right side of the Calendar Template page.

In **Weekend Title Format,** enter HTML to be used for a day occurring on a weekend. For example:

```
#DD#
```

In **Weekend Open Format**, enter HTML to open a day which is on a weekend. Typically this attribute would contain an HTML tag that functions as a container. For example:

```
<td>
```

In **Weekend Close Format,** enter HTML to close a day which is in a weekend. Since this is the last part printed, this attribute should close any HTML tags used in Weekend Open Format.For example:

```
</td>
```

Comments Use this attribute to record developer comments.

Label Templates

Label templates are designed to centrally manage HTML markup of page item labels. Each item can have an optional label. You can control how these labels display using label templates. For example, you could create a label template called Required Field that references an image (such as an asterisk) to indicate to the user that the field is required.

Label templates enable you to define a before-and-after text string that gets prepended and appended to the item.

Label Template Attributes

This section describes specific sections of the Label Template page.

Label Template Attributes **Template Name** identifies the name of the template. Use the **Translatable** check box to indicate that the template contains text strings that require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use **Template Subscription** to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Template Definition (normal display) In **Before Label**, enter HTML to display before the item label. Before Label supports the substitution strings #CURRENT_FORM_ELEMENT#; #CURRENT_FORM_ID#, and #CURRENT_ITEM_NAME#. For example:

```
<label for="#CURRENT_ITEM_NAME#">
<a href="javascript:popupFieldHelp('#CURRENT_ITEM_ID#',
  '&SESSION.','&CLOSE.')" >
```

In **After Label**, enter HTML to display after the item label. Since the label will be automatically display before the HTML in this region, any open HTML tags in the Before Label region should be closed here. For example:

```
</a></label>
```

Label Template Attributes (error display) In **On Error Before Label**, enter HTML to precede the item label when an application displays an inline validation error message for the item. For example:

```
<font class="fieldtitleleft">#ERROR_MESSAGE#</font>
```

In **On Error After Label** enter HTML to be appended to the item label when a application displays an inline validation error message for the item. This attribute supports the substitution strings #CURRENT_FORM_ELEMENT#, #CURRENT_FORM_ID#, and #CURRENT_ITEM_NAME#. The following example would append a space and a closing bracket to the displayed item label with the error.

```
&nbsp;]</font>
```

Template Comments Use this attribute to record developer comments.

List Templates

A list is a shared collection of links. You control the appearance of a list through list templates. Using template attributes, you can also define a list element to be either current or non current for a specific page.

About Hierarchical Lists

Oracle HTML DB supports hierarchical lists. To create a hierarchical list, you must:

- Select a list template that supports hierarchical lists. To determine which list templates support hierarchical lists, look for templates having the naming convention "with Sublist."
- Select a Parent List Entry when you create each list entry.

See Also:

- Online Help for information about using specific sections of the Edit List Template page
- "Creating Lists" on page 8-13

List Template Attributes

This section describes specific sections of the List Template page.

Template Identification **Name** identifies the name of the template. Use the **Translatable** check box to indicate that the template contains text strings that require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use **Template Subscription** to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Before List Elements Enter HTML that displays before any list elements. You can use this attribute to open an HTML table or HTML table row.

List Element Display Defines current and noncurrent list templates. Supported substitution strings include `#LINK#`, `#TEXT#`, `#IMAGE_PREFIX#`, `#IMAGE#`, `#IMAGE_ATTR#`, and `#A01#` to `#A10#`.

- **List Template Current.** Enter HTML or text to be substituted for the selected (or current) list template.
- **List Template Current with Sub List Items.** Enter HTML or text to be substituted for the selected (or current) list template when an item has sublist items. If not specified, the current list item template will be used.

- **List Template Noncurrent.** Enter HTML or text to be substituted for the unselected (or noncurrent) list template.
- **List Template Noncurrent with Sub List Items.** Enter HTML or text to be substituted for the unselected (or noncurrent) list template used when an item has sublist items. If not specified, the current list item template will be used.
- **Between List Elements.** Enter HTML that displays between list elements. This attribute will be ignored if no HTML is specified.

Before Sub List Elements Enter HTML that displays before any sublist elements.

Sub List Elements Defines current and noncurrent list templates. Supported substitution strings include `#LINK#`, `#TEXT#`, `#IMAGE_PREFIX#`, `#IMAGE#`, `#IMAGE_ATTR#`, and `#A01#` to `#A10#`.

- **Sub List Template Current.** Enter HTML or text to be substituted for the selected (or current) list template.
- **Sub List Template Current with Sub List Items.** Enter HTML or text to be substituted for the selected (or current) list template when an item has sublist items. If not specified, the current list item template will be used.
- **Sub List Template Noncurrent.** Enter HTML or text to be substituted for the unselected (or noncurrent) list template.
- **Sub List Template Noncurrent with Sub List Items.** Enter HTML or text to be substituted for the unselected (or noncurrent) list template used when an item has sublist items. If not specified, the current list item template will be used.
- **Between Sub List Elements.** Enter HTML that displays between list elements. This attribute will be ignored if no HTML is specified.

After Sub List Elements Enter HTML that displays after displaying sublist elements.

After List Elements Enter HTML that displays after displaying all list elements. You can use this attribute to close a HTML table opened in the Before List Elements attribute.

Comments Use this attribute to record developer comments.

Page Templates

Page templates define the appearance of a page. Each template consists of a header template, a body template, a footer template, and a number of subtemplates. If you do not specify a page template as a page-level attribute, then the HTML DB engine uses the default page template defined on the Define Theme page.

Page templates combine static HTML with substitution strings that are replaced at run time. You use substitution strings to indicate the existence and placement of a component within a page template. You can further specify how a component should display using subtemplates.

Topics in this section include:

- Supported Page Template Substitution Strings
- Page Template Attributes

Supported Page Template Substitution Strings

Table 7–7 describes the available page template substitution strings. Note that all template substitution strings must be in uppercase letters and begin and end with a number sign (#).

Table 7–7 Page Template Substitution Strings

Substitution String	Description
`#APP_VERSION#`	Can be used in the Header or Footer sections of the page template. You define the value of `#APP_VERSION#` in the Version attribute on the Edit Application Attributes page **See Also:** "Name" on page 5-7
`#BOX_BODY#`	Identifies where the Body displays. If the Body is null, then `#BOX_BODY#` will be used instead.
`#CUSTOMIZE#`	Can be used in the Header, Body, or Footer sections of the page template. The Customization section of the Region Definition enables you to turn on end user customization. To utilize this feature, you must also include the `#CUSTOMIZE#` substitution string in the page template. If at least one region supports end user customization, a link called **Customize** appears wherever the `#CUSTOMIZE#` substitution string appears in the page template. When users click this link, a window displays enabling them to turn on and off regions on the page. **See Also:** "How Region Attributes Affect Page Layout" on page 7-4
`#FORM_CLOSE#`	If a `#FORM_OPEN#` is included, then you must include a `#FORM_CLOSE#` in the header, body, or footer template. `#FORM_OPEN#` must appear before the `#BOX_BODY#` and `#FORM_CLOSE#` must appear after the `#BOX_BODY#` substitution string.
`#FORM_OPEN#`	Specifies where the HTML open form tag `<form>` is placed. You must include this substitution string in order to submit a form. You do not need to code your own form open, the HTML DB engine does it for you.
`#GLOBAL_NOTIFICATION#`	Displays the Global Notification attribute. Global notifications are intended to communicate system status, such as pending system downtime. You can also use `HTMLDB_APPLICATION.G_GLOBAL_NOTIFICATION` to set this value if you want to set it programmatically. **See Also:** "Global Notifications" on page 5-9 for information about the Global Notification attribute
`#HEAD#`	Used after the `<head>` open tag, but before the `</head>` close tag. You can optionally define the contents of `#HEAD#` for each page (for example, to reference additional style sheets or JavaScript libraries).
`#LOGO#`	Identifies an application logo. In the Logo section of the Edit Application Attributes page, you can identify an image and image attributes for an application logo. To utilize this feature, you must also include the `#LOGO#` substitution string in the Header or Body page template. **See Also:** "Logo" on page 5-9

Table 7–7 (Cont.) Page Template Substitution Strings

Substitution String	Description
`#NAVIGATION_BAR#`	Defines the existence of navigation bar entries. A navigation bar will appear on every page in your application that uses a template that includes this substitution string.You can expand this substitution string using the Navigation bar subtemplate. **See Also:** "Subtemplate" on page 7-31 for information about Navigation Bar subtemplate
`#NOTIFICATION_MESSAGE#`	Enables developers to communicate messages to the user. Defines where a summary of inline error messages is displayed. Inline error messages can be displayed next to a field, inline in the notification area, or both.
`#ONLOAD#`	Can be used in the Header and Footer section of the page template and should be placed inside the <body> html tag. For example: `<body #ONLOAD#>` Use this string as a substitute in a JavaScript call to be executed when a page is loaded by the Web browser. The JavaScript to be called can vary for each page.
`#PARENT_TAB_CELLS#`	Identifies the display of parent tabs. Parent tabs require standard tabs. If your application only has one of level tabs, you do not need this substitution string. **See Also:** "Standard Tab Attributes" on page 7-32 for information about defining Parent Tab Attributes
`#REGION_POSITION_NN#`	Identifies the exact placement of regions within a page. If no region is specified (for example, `#REGION_POSITION_01#`), then `#REGION_POSITION_01#` will be replaced with nothing.
`#SUCCESS_MESSAGE#`	Defines where in the page success and error messages appear. If the page process runs without raising errors, then this text displays. You can customize the display of the success message for each template by adding HTML to be displayed before and after the success message.
`#TAB_CELLS#`	Identifies the display of standard tabs. **See Also:** "Standard Tab Attributes" on page 7-32
`#TITLE#`	Defines the page title. Typically included within HTML title tags.

See Also:

- "Using Substitution Strings" on page 4-16
- "Adding Pages to an Application" on page 6-7

Page Template Attributes

This section describes specific sections of the Page Template page.

Name **Name** identifies the name of the template. Use the **Translatable** check box to indicate that the template contains text strings that require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Subscription Use **Subscription** to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, select **Refresh**.

Definitions Each template consists of a header, a body, a footer, and subtemplates. Use substitution strings to include dynamic content. All template substitution strings must be in uppercase letters and begin and end with a number sign (#). See item Help for information about supported substitution strings.

Header is the first section of the page template. Enter HTML that defines the `<Head>` section of the HTML document. Regions that display or processes and computations that execute AFTER HEADER will display or execute immediately after this section in the template is rendered. For example:

```
<html>
 <head>
   <title>#TITLE#</title>
   #HEAD#
 </head>
```

Body is the second section in the page template and is rendered after the header section, but before the footer section. Enter HTML that defines the `<Body>` section of the HTML document. At a minimum, you must include the `#BOX_BODY#` substitution string. It is recommended that you also include the `#FORM_OPEN#` and `#FORM_CLOSE#` substitution strings. For example:

```
<body #ONLOAD#>
   #FORM_OPEN#
   #BOX_BODY#
   #FORM_CLOSE#
</body>
```

Footer is the third section in the page template that displays after the body.

Display Points **Breadcrumb Display Point** applies to generated components that use breadcrumbs and defines where the breadcrumbs are placed on the page. **Sidebar Display Point** applies to generated components that use Sidebars and defines where sidebars are placed on the page.

Subtemplate Use **Subtemplate** to specify how a component should display. Available subtemplates include:

- **Success Message.** Expands the `#SUCCESS_MESSAGE#` substitution string. You can define a success message either programmatically or as an attribute of a process. If a success message exists and if the page template includes the `#SUCCESS_MESSAGE#` substitution string, then this subtemplate is used to render the message.
- **Navigation Bar.** Controls the display of navigation bar entries. Enter HTML or text to be substituted when the `#NAVIGATION_BAR#` substitution string is referenced in the template header, body, or footer. Use the `#BAR_BODY#` substitution string to identify where each navigation bar icon should display.

- **Navigation Bar Entry.** Enter HTML or text that to be substituted into the navigation bar #BAR_BODY# substitution string for each navigation bar entry. Use the following substitution strings to create the navigation bar entry subtemplate.
- **Notification.** Enter HTML or text to be substituted when the #NOTIFICATION_MESSAGE# substitution string is referenced in the template header, body or footer. Use the substitution string #MESSAGE# to indicate where in the Notification Message the body of the message will appear.

Standard Tab Attributes You must populate this attribute if your application includes standard tabs. Standard tabs can be placed in the header, body, or footer sections of the page template using the #TAB_CELLS# substitution string. The page template Header/Body/Footer defines the HTML table and rows. This subtemplate defines how these tabs display by defining the specific cell. Available attributes include:

- **Current Tab.** Enter HTML or text to be substituted for the currently selected standard tab. Whether or not a tab is current is determined by standard tab attributes. For example:

  ```
  <td>#TAB_LABEL#</td>
  ```

- **Non Current Standard Tab.** Enter HTML or text that will be substituted for the unselected standard tabs. Use the #TAB_TEXT# substitution string to position a tab's label and link within the template. For example:

  ```
  <td><a href="#TAB_LINK#">#TAB_LABEL#</a></td>
  ```

See Also: "Creating Tabs" on page 8-5

Parent Tab Attributes You must populate this attribute if your application includes two levels of tabs. Enter HTML or text that will be substituted for the selected parent tabs. Parent tabs may be placed in the header, body, or footer section of the page template using the #PARENT_TAB_CELLS# substitution string. Parent tabs only display in conjunction with standard tabs. Available attributes include:

- **Current Parent Tab.** Enter HTML or text that will be substituted for the selected parent tabs. Whether or not a tab is current is determined by the page that displays and the standard tab set the page uses. Use #TAB_TEXT# to position a tab's label and link within the template. For example:

  ```
  <td><a href="#TAB_LINK#">#TAB_LABEL#</a></td>
  ```

- **Non Current Parent Tab.** Enter HTML or text that will be substituted for the unselected parent tabs. Use #TAB_TEXT# to position a tab's label and link within the template. For example

  ```
  <td><a href="#TAB_LINK#">#TAB_LABEL#</a></td>
  ```

See Also: "Creating Tabs" on page 8-5

Image Based Tab Attributes Use this subtemplate for tabs that are entirely based on images. Available attributes include:

- **Current Image Tab.** Enter HTML to be used to indicate that an image based tab is currently selected. Include the #TAB_TEXT# substitution string to show the displayed name of the tab.

- **Non Current Image Tab.** Enter the HTML to be used to indicate that an image tab is not currently selected. Include the `#TAB_TEXT#` substitution string to show the displayed name of the tab.

Multi Column Region Table Attribute If the HTML DB engine displays regions in multiple columns in the same region position then HTML DB will render an HTML table. This attribute enables you to control the attributes of the `<table>` tag.

Error Page Template Control Use this attribute only when a page template will be designated as an error template. Use `#MESSAGE#` to place the error message and `#BACK_LINK#` to display a link back to the previous page. A template can be designated as an error template by editing the application attributes. For example:

```
#MESSAGE#

<br>

<a href="#BACK_LINK#">back</a>
```

Comments Use this attribute to record developer comments.

Popup LOV Templates

Popup LOV template controls how popup lists display for all items defined as POPUP. You can only specify one popup LOV template for each theme.

See Also: "Creating Lists of Values" on page 6-60

Popup List of Values Template Attributes

This section describes specific sections of the Popup List of Values Template page.

Application Identification **Theme** indicates the theme to which the template is a member. **Template Class** identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class. Use the **Translatable** check box to indicate that the template contains text strings which require translation.

Template Subscription Use **Template Subscription** to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Form Icon Use **Popup Icon** to specify an icon to display to the right of a form field for items of type POPUP. By default, the HTML DB engine uses a `list.gif` image. Use **Popup Icon Attr** to defines image attributes (such as height and width) for the Popup Icon

Search Field Use these attributes to specify how a Search field displays. Table 7–8 describes available Search Field attributes.

Table 7–8 Search Field Attributes

Attribute	Description
Before Field Text	Defines text to display before the popup list of values search field displays.
Filter Width	Display the text field using this width.
Filter Max Width	Display the text field widget using this maximum width.
Filter Text Attribute	Display the text field using these attributes. This will be included within the HTML input tag.
After Field Text	Display this text after displaying the search field, the search button, and the close button.

Buttons Use these attributes to define the button name and attributes for Find, Close, Next, and Previous buttons.

Window Popup lists of values are executed using JavaScript. Use these attribute to control the values of `scrollbars=`, `resizable=`, `width=`, and `height=`. for information about default values see item help.

Pagination Defines how row count results display.

Result Set Use these attributes to define text or HTML to display before and after a result set.

Page Attributes Use these attributes to define popup pages. For more information see item help.

Region Templates

Region templates control the appearance and placement of region attributes. Region templates frequently use HTML tables to arrange content.

Region templates apply style elements to regions. Region templates display substitution strings. The only required substitution string, `#BODY#`, identifies where the source of the region should be placed. All other substitution strings are optional. You can use these substitution strings to indicate the existence and placement of a page control (such as a button) within the region.

Region Template Attributes

This section describes specific sections of the Region Template page.

Region Template Identification **Name** identifies the name of the template. Use the **Translatable** check box to indicate that the template contains text strings which require translation. **Theme** indicates the theme to which the template is a member.

Template Class identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use **Template Subscription** to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Region Template `##BODY#` is the only required substitution string. It identifies where the source of the region should be placed. All other substitution strings are optional. The following are valid substitution strings:

- `#TITLE#`
- `#EXPAND#`
- `#CHANGE#`
- `#BODY#`
- `#FORM_OPEN#`
- `#FORM_CLOSE#`

When you create a button in a region position, the positions you have defined will appear in a select list. Use the following substitution strings to define positions for placement of buttons in a region:

- `#EDIT#`
- `#CLOSE#`
- `#CREATE#`
- `#EXPAND#`
- `#HELP#`
- `#DELETE#`
- `#COPY#`
- `#NEXT#`
- `#PREVIOUS#`

See Also: "Using Substitution Strings" on page 4-16

Form Table Attributes Page items display within regions. Items are rendered as HTML form elements in an HTML table. With this template property, you can define attributes that will be placed in the `<table>` tag. For example:

```
class="instructiontext"
```

Comments Use this attribute to record developer comments.

Report Templates

Report column templates provide you with control over the results of a row from a SQL query. This type of template defines a cell not an entire row

Each report template identifies column names using the syntax `#1#, #2#, #3#` and so on. You can also name columns using column name substitution syntax such as `#ENAME#` or `#EMPNO#`. You can reference any item from your application within your template. For example, to reference an item called *`ABC.`* in your template, you could include the exact substitution string *`&ABC.`*. The actual value of ABC. would be provided by an end user editing an item in your application named *`ABC`*.

Topics in this section include:

- About Generic Column Templates and Named Column Templates
- Report Column Template Attributes for Generic Column Templates
- Report Column Template Attributes for Named Column Templates
- About Using JavaScript in Column Templates

About Generic Column Templates and Named Column Templates

Oracle HTML DB includes two types of report templates:

- Generic column templates
- Named column templates

Generic Column Templates A generic column template determines the appearance of a report by defining the look of the column once. This look is then repeated as many times as is necessary based on the number of columns specified in the report's definition. This type of templates is limited to reports that have a standard row and column structure. Additional style may be applied to a report using this type of template through use of conditions.

The following example demonstrates how to have each column use a specific style:

```
<td class="tabledata" align="#ALIGN#">#COLUMN_VALUE#</td>
```

This example assumes your page template includes a CSS containing the class `tabledata`. This example also demonstrates the use the substitution strings `#ALIGN#` and `#COLUMN_VALUE#`. If you actually ran this report, these substitution strings would be replaced with values generated by the results of a SQL query.

If your query uses an expression in the select list, it is a good idea to create an alias for the columns to avoid run time errors. For example, suppose your query was as follows:

```
SELECT ename, (sal + comm) * 12 FROM emp
```

You could rewrite the query to alias the columns as follows:

```
SELECT ename, (sal + comm) * 12 yearly_comp FROM emp
```

Named Column Templates Named column templates allow for more flexibility in report design. However, because they reference columns by name, they can only be used by reports that are based on those columns. For example:

```
<tr><td>#ENAME#</td><td>#SAL#</td></tr>
```

Although named column templates offer a great deal of flexibility, you may need to create a new template for each query. You can also include a position notation. The following example demonstrates how to use following HTML and substitution strings:

```
<tr><td>#ENAME#</td><td>#SAL#</td></tr>

<tr><td>#1#</td><td>#2#</td></tr>
```

Report Column Template Attributes for Generic Column Templates

This section describes specific sections of the Report Column Template page for Generic Column Templates.

Report Template Identification **Template Name** identifies the name of the template. Use the **Translatable** check box to indicate the template contains text strings which require translation. **Template Type** indicates the type of template. Named Column templates reference column names in the template. Generic Column Templates reference `#COLUMN_VALUE#` in the template.

Theme indicates the theme to which the template is a member. **Template Class** identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Template Subscription Use Template Subscription to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Before Rows In **Before Rows** enter HTML that displays once at the beginning of a report template. Opening an HTML table is a common use of this attribute as shown in the following example:

```
<table>
```

You can identify column headers using the syntax `#1#`, `#2#`, `#3#`. For example:

```
<th>#1#</th><th>#2#</th><th>#3#</th>
```

You can include pagination above a report by including the substitution string `#TOP_PAGINATION#`. This substitution string generates HTML which starts with an opening `<tr>` tag and ends with a closing `</tr>` tag. For example, to include an open table tag and `#TOP_PAGINATION#` substitution string you would enter the following:

```
<table>#TOP_PAGINATION#
```

You can also include the substitution string `#CSV_LINK#` to include support for exporting your report to CSV format, a format compatible with most spreadsheet programs.

Column Headings Use **Column Heading Template** to colorize each column header cell. Note that the text of this attribute must indicate where the cell heading text will be colorized. For example:

```
 <th #ALIGNMENT#>#COLUMN_HEADER#</th>
```

If you do not want any column headings, enter the following:

```
OMIT
```

If you do use this attribute, HTML DB engine applies the default column heading template.

Before Each Row In **Before Each Row** enter text to display before all columns in the report. Use this attribute to open a new HTML row. Before Each Row supports the following substitution strings:

- `#ROWNUM#`

  Use this substitution strings to specify the current row
- `#COLCOUNT#`

Use this substitution strings to specify the number of columns

- `#HIGHLIGHT_ROW#`

  Use this substitution strings to specify the number of highlighted rows.

Column Templates Column templates define the look of each column. You can define up to four column templates, each of which can conditional. For example, you can have different background colors for even and odd rows, or highlight rows which meet a PL/SQL defined condition.

In each Column Template, you define the look of each column. Column Templates support the substitution strings described in Table 7–9.

Table 7–9 Column Template Substitution Strings

Substitution String	Description
`#ALIGNMENT#`	Determines the column alignment. Specified by the user.
`#COLCOUNT#`	Count of the number of columns.
`#COLNUM#`	Defines the current column number.
`#COLUMN_HEADER#`	Defines the column header.
`#COLUMN_VALUE#`	Replaced with the value of the column.
`#ROWNUM#`	Specifies the current row number.

Consider the following example:

```
<td #ALIGNMENT#>#COLUMN_VALUE#</td>
```

If you actually ran this report, these substitution strings would be replaced with values generated by the results of a SQL query.

By creating conditions, you can create a report that displays columns differently depending on whether the specified condition is met. To specify a column template be used conditionally, select a condition type from the Column Template Condition list. Valid values include:

- **Use Based on PL/SQL Expression.** Conditionally format columns based on data in that row.
- **Use for Even Numbered Rows.** Conditionally format even numbered rows.
- **Use for Odd Numbered Rows.** Conditionally format odd numbered row.

If you select **Use Based on PL/SQL Expression**, the next step is to enter a PL/SQL expression in Column Template Expression field. For example, the following expression displays a value in bold if the value is greater than 2000:

```
#SAL# > 2000
```

Note that you could also use the substitution string `#ROWNUM#`. For example:

```
#ROWNUM# > 2000
```

After Each Row In **After Each Row** enter HTML that displays after all columns in the report display. This attribute is often used to close an HTML table row. For example:

```
</tr>
```

After Rows Use **After Rows** to specify text that should display after the last row. A common use of this attribute is to close the HTML table tag. For example:

```
</table>
```

The After Rows attribute supports the following substitution strings:

- `#PAGINATION#`

  Replaced with a pagination attribute.
- `#COLCOUNT#`

  Substituted at run time with the number of columns defined in the report.

Row Highlighting Use **Background color for checked row** to control the background color of a report row when the row selector is checked. Use **Background color for current row** to control the background color of a report row when the user moves the mouse over the row.

Pagination Subtemplate The Pagination Subtemplate section contains attributes for editing the Pagination Template, Next Page Template, Previous Page Template, Next Set Template, and Previous Template. Pagination Subtemplates support the substitution strings `#PAGINATION_NEXT#`, `#PAGINATION_NEXT_SET#`, `#PAGINATION_PREVIOUS#` and `#PAGINATION_PREVIOUS_SET#`. Table 7–12 describes these templates.

Table 7–10 Pagination Subtemplate Attribute

Pagination Subtemplate Attribute	Description
Pagination Template	Applies to the entire pagination subtemplate. For example: `<span class="instructiontext">#TEXT#</span>` You can use the substitution string `#TEXT#` to specify where you want the pagination subtemplate to display. Use the other Pagination Subtemplate attributes to modify individual items.
Next Page Template	Enter HTML to modify how the Next Page portion of the pagination subtemplate appears. For example: `<a href="#LINK#">next</a>`
Previous Page Template	Enter HTML to modify how the Previous Page portion of the pagination subtemplate appears. For example: `<a href="#LINK#">previous</a>`
Next Set Template	Enter HTML to modify how the Next Set portion of the pagination subtemplate appears. For example: `<a href="#LINK#">next set</a>`
Previous Set Template	Enter HTML to modify how the Previous Set portion of the pagination subtemplate appears. For example: `<a href="#LINK#">previous set</a>`

Comments Use this attribute to record developer comments.

Report Column Template Attributes for Named Column Templates

This section describes specific sections of the Report Column Template page for Named Column Templates.

Identification **Template Name** identifies the name of the template. Use the **Translatable** check box to indicate the template contains text strings which require translation. **Template Type** indicates the type of template. Named Column templates reference column names in the template. Generic Column Templates reference `#COLUMN_VALUE#` in the template.

Theme indicates the theme to which the template is a member. **Template Class** identifies a specific use for the template. When you switch to a new theme, all templates in one theme are mapped to corresponding templates in another theme. Application Builder accomplishes this template mapping through the assignment of a template class.

Subscription Use Subscription to apply an existing template to the current application. When you select an existing template, you become a subscriber to that template.

To load a new copy of a master template, click **Refresh**.

Row Templates Row templates define the look of each column. You can define up to four row templates, each of which can conditional.

In each Row Template, you define the look of each row. Row Templates support the substitution strings described in Table 7–11.

Table 7–11 Row Template Substitution Strings

Substitution String	Description
`#ALIGNMENT#`	Determines the row alignment. Specified by the user.
`#COLCOUNT#`	Count of the number of columns.
`#COLNUM#`	Defines the current column number.
`#COLUMN_HEADER#`	Defines the column header.
`#COLUMN_VALUE#`	Replaced with the value of the column.
`#ROWNUM#`	Specifies the current row number.

By creating conditions, you can create a report that displays rows differently depending on whether the specified condition is met. To specify a row template be used conditionally, select a condition type from the Column Template Condition list. Valid values include:

- **Use Based on PL/SQL Expression.** Conditionally format columns based on data in that row.
- **Use for Even Numbered Rows.** Conditionally format even numbered rows.
- **Use for Odd Numbered Rows.** Conditionally format odd numbered row.

If you select **Use Based on PL/SQL Expression**, the next step is to enter a PL/SQL expression in Column Template Expression field. For example, the following expression displays a value in bold if the value is greater than 2000:

```
#SAL# > 2000
```

Note that you could also use the substitution string `#ROWNUM#`. For example:

```
#ROWNUM# > 2000
```

Column Headings Use this template to colorize each column header cell. The text of this attribute must include help to indicate where the cell heading text should be colorized. If you do not enter a Column Heading Template, then a default column header template is applied. If you do not want any column headings, then enter `OMIT`.

For example:

```
<th #ALIGNMENT#>#COLUMN_HEADER#</th>
```

Before first and after last row text In **Before Rows** enter HTML that displays once at the beginning of a report template. Opening an HTML table is a common use of this attribute as shown in the following example:

```
<table>
```

You can identify column headers using the syntax `#1#`, `#2#`, `#3#`. For example:

```
<th>#1#</th><th>#2#</th><th>#3#</th>
```

You can include pagination above a report by including the substitution string `#TOP_PAGINATION#`. This substitution string generates HTML which starts with an opening `<tr>` tag and ends with a closing `</tr>` tag. For example, to include an open table tag and `#TOP_PAGINATION#` substitution string you would enter the following:

```
<table>#TOP_PAGINATION#
```

You can also include the substitution string `#CSV_LINK#` to include support for exporting your report to CSV format, a format compatible with most spreadsheet programs.

Use **After Rows** to specify text that should display after the last row. A common use of this attribute is to close the HTML table tag. For example:

```
</table>
```

The After Rows attribute supports the following substitution strings:

- `#PAGINATION#`

  Replaced with a pagination attribute.

- `#COLCOUNT#`

  Substituted at run time with the number of columns defined in the report.

Row Highlighting Use **Background color for checked row** to control the background color of a report row when the row selector is checked. Use **Background color for current row** to control the background color of a report row when the user moves the mouse over the row.

Pagination The Pagination section contains attributes for editing the Pagination Template, Next Page Template, Previous Page Template, Next Set Template, and Previous Template. Pagination Subtemplates support the substitution strings `#PAGINATION_NEXT#`, `#PAGINATION_NEXT_SET#`, `#PAGINATION_PREVIOUS#` and `#PAGINATION_PREVIOUS_SET#`. Table 7–12 describes these templates.

Table 7–12 Pagination Subtemplate Attribute

Pagination Subtemplate Attribute	Description
Pagination Template	Applies to the entire pagination subtemplate. For example: `<span class="instructiontext">#TEXT#</span>` You can use the substitution string `#TEXT#` to specify where you want the pagination subtemplate to display. Use the other Pagination Subtemplate attributes to modify individual items.
Next Page Template	Enter HTML to modify how the Next Page portion of the pagination subtemplate appears. For example: `<a href="#LINK#">next</a>`
Previous Page Template	Enter HTML to modify how the Previous Page portion of the pagination subtemplate appears. For example: `<a href="#LINK#">previous</a>`
Next Set Template	Enter HTML to modify how the Next Set portion of the pagination subtemplate appears. For example: `<a href="#LINK#">next set</a>`
Previous Set Template	Enter HTML to modify how the Previous Set portion of the pagination subtemplate appears. For example: `<a href="#LINK#">previous set</a>`

Comments Use this attribute to record developer comments.

About Using JavaScript in Column Templates

You can conditionally display HTML depending upon values in the database using JavaScript. The following example displays an HTML row only if the `GROUP_DESC` query column is not null.

```
<script language="javascript">
IF ( "#GROUP_DESC#" != "" )
document.writeln( "<TR>;
<TD BGCOLOR=#336699>;</TD>
</TR>
</TR>
<TD>#GROUP_DESC#</TD>
          </TR>" );
</TR>" );
```

See Also:

- Online help for information about using specific sections of the Edit Report Template page
- "Customizing Regions" on page 7-2

Optimizing a Page for Printing

You can optimize a page for printing by creating a specific Print Mode template and specifying that template in the User Template Defaults section of the Edit Application Attributes page. Generally, a Print Mode template optimizes a page for printing. For example, this template might:

- Not display tabs or navigation bars
- Have items display as text instead of form elements

If the theme you select does not include a printer friendly template, you can create a Print Mode template by creating a new page template.

See Also: "Creating a New Template" on page 7-19

Setting a Print Mode Template for an Application

You enable your Print Mode template by selecting it in Default Templates by Component section of Define Theme page.

To enable Print Mode mode:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.
4. Under User Interface, select **Themes**.

   The Themes page appears.
5. In the Themes list, click the theme name.
6. Make a new selection from Printer Friendly Page.
7. Click **Apply Changes**.

See Also: "Changing Default Templates in a Theme" on page 7-10

Using f?p Syntax to Toggle to Print Mode

Once you create a Print Mode template and select it as an application attribute, you can use `f?p` syntax to toggle to Print Mode. Including the ninth `f?p` syntax argument (`PrinterFriendly`) renders the page in printer friendly mode (optimize printed output). For example, you could include this argument when coding a link, or creating navigation bar icon.

See Also: "Using f?p Syntax to Link Pages" on page 4-15

Using Custom Cascading Style Sheets

A cascading style sheet (CSS) provides a way to control the style of a Web page without changing its structure. When used properly, a CSS separates visual attributes such as color, margins, and fonts from the structure of the HTML document. Oracle HTML DB includes themes that contain templates that reference their own CSS. The style rules defined in each CSS for a particular theme also determine the way reports and regions display.

Topics in this section include:

- Uploading Cascading Style Sheets

- Referencing an Uploaded Cascading Style Sheet in the Page Template

Uploading Cascading Style Sheets

You upload cascading style sheets to your workspace using the Cascading Style Sheet (CSS) Repository. Uploaded cascading style sheets (CSS) are available to any application created in your workspace. The cascading style sheets are written to the file system, so you can reference them in your HTML source code.

To upload cascading style sheets to your workspace:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Cascading Style Sheets**.

   The CSS Repository appears.
5. To upload a new CSS, click **Create** and follow the on-screen instructions.
6. To edit an existing CSS, select the name.
7. To download an existing CSS, click the **Download** icon.

About the Cascading Style Sheets Page

Once you upload a CSS to the CSS Repository, you control how the page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each CSS as a large icon. To edit a CSS, click the appropriate icon.
- **Details** displays each CSS as a line in a report. To edit a CSS, click the appropriate name.

Referencing an Uploaded Cascading Style Sheet in the Page Template

You can reference an uploaded cascading style sheets within the Header section of the page template. You use the Header section to enter the HTML that makes up the <HEAD> section of the HTML document.

To reference an uploaded cascading style sheets:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.
4. Under User Interface, select **Themes**.

   The Themes page appears.
5. From the Tasks list, select **View Templates**.
6. Select the name of the page template you want to edit.
7. The Header, use a `<link>` tag within the head section to reference the appropriate style sheet.

   To reference an uploaded file that is associated with a specific application, you would use the substitution string `#APP_IMAGES#`. For example:

```
<html>
<head>
    <title>#TITLE#</title>
    #HEAD#
    <link rel="stylesheet" href="#APP_IMAGES#sample2.css" type="text/css">
</head>
...
```

To reference an uploaded file that is associated with a specific workspace, you would use the substitution string `#WORKSPACE_IMAGES#`. For example:

```
<html>
<head>
    <title>#TITLE#</title>
    #HEAD#
    <link rel="stylesheet" href="#WORKSPACE_IMAGES#sample3.css"
type="text/css">
</head>
...
```

See Also: "Creating a New Template" on page 7-19, "Editing Templates" on page 7-20, "Page Templates" on page 7-28, "APP_IMAGES" on page 4-19, and "WORKSPACE_IMAGES" on page 4-27

Uploading Images

You can upload images to your workspace using the Image Repository.

To upload images to your workspace:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Images**.

   The Image Repository appears.
5. To upload a new image, click **Create**.
6. Follow the on-screen instructions.

Topics in this section include:

- Editing Image Attributes
- Deleting an Image
- Referencing Images

Editing Image Attributes

When you edit image attributes you can add notes that describe an image or change the associated application. However, you cannot change the actual image. To change an image, delete it and then upload it again.

To edit images attributes to your workspace:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.

3. Click **Shared Components**.

   The Shared Components page appears.

4. Under Files, select **Images**.

   The Image Repository appears.

5. Use the following to filter the view:

   a. Image - Enter text to search for an image name or notes describing the image. Select whether to search for All Images, Workspace Images, or Application Images.

   b. View - Select one of the following:

      – **Icons** (the default) displays each image as a large icon.

      – **Details** displays each image as a line in a report.

   c. Click **Go**.

6. Select an image.

7. To associate the image with a new application, make a selection from the Application list.

8. To edit or add notes, edit the Notes field.

9. Click **Apply Changes**.

Deleting an Image

To delete an image:

1. Navigate to the Workspace home page and click the **Application Builder** icon.

2. Select an application.

3. Click **Shared Components**.

   The Shared Components page appears.

4. Under Files, select **Images**.

   The Image Repository appears.

5. Use the following to filter the view:

   a. Image - Enter text to search for an image name or notes describing the image. Select whether to search for All Images, Workspace Images, or Application Images.

   b. View - Select one of the following:

      – **Icons** (the default) displays each image as a large icon.

      – **Details** displays each image as a line in a report.

   c. Click **Go**.

6. Select an image.

7. Click **Delete**.

Referencing Images

When you install Oracle HTML DB, the installer creates a virtual directory for images. This virtual directory points to the actual path on the file system that contains uploaded images. By default, you reference this virtual directory using the prefix:

```
/i/
```

When you create an application, you need to verify this prefix on the Edit Application Attributes page:

To verify the Image Prefix for an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Edit Attributes**.
5. Click **Edit Standard Attributes**.
6. When the Edit Application Attributes page appears, locate the Image Prefix field.

   By default, this attribute is defined as `/i/`. Contact your administrator for information about the name of this virtual directory for your installation.

When you embed an image in static text (for example, in page or region headers or footers) you can reference the image using the substitution string `#IMAGE_PREFIX#`. For example, to reference the image `go.gif` you would use the following syntax:

```
<img src="#IMAGE_PREFIX#go.gif">
```

Alternatively, you can also reference an image using a fully qualified URL. For example:

```
<img
src="http://g-images.amazon.com/images/G/01/associates/navbar2000/logo-no-border(1
).gif">
```

See Also: "Built-in Substitution Strings" on page 4-17, "IMAGE_PREFIX" on page 4-23, "APP_IMAGES" on page 4-19, and "WORKSPACE_IMAGES" on page 4-27

Uploading Static Files

You can upload static files to your workspace using the Static File Repository.

To upload static files to your workspace:

1. Navigate to the Workspace home page and click the Application Builder icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Static Files**.

   The Static Files Repository appears.
5. To upload a file, click **Create**.
6. Follow the on-screen instructions.

Topics in this section include:

- Editing an Uploaded File
- Downloading an Uploaded File
- Deleting an Uploaded File

Editing an Uploaded File

You may edit static files smaller than 30,000 bytes by selecting the file name. Otherwise, you must edit the file offline and upload it again.

To edit a static file smaller than 30,000 bytes:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Static Files**.

   The Static Files Repository appears.
5. Use the following to filter the view:
   a. Static File - Enter text to search for a file name or notes describing the file.
   b. View - Select one of the following:
      – **Icons** (the default) displays each file as a large icon.
      – **Details** displays each file as a line in a report.
   c. Click **Go**.
6. Select a file.
7. To edit or add notes, edit the Notes field.
8. Click **Apply Changes**.

Downloading an Uploaded File

To download an uploaded file:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Static Files**.

   The Static Files Repository appears.
5. From View, select **Details** and click **Go**.
6. Select the **Download** icon adjacent to the appropriate file.

Deleting an Uploaded File

To delete an uploaded static file:

1. Navigate to the Workspace home page and click the **Application Builder** icon.
2. Select an application.
3. Click **Shared Components**.

   The Shared Components page appears.
4. Under Files, select **Static Files**.

   The Static Files Repository appears.
5. Use the following to filter the view:
   a. Static File - Enter text to search for a file name or notes describing the file.
   b. View - Select one of the following:
      – **Icons** (the default) displays each file as a large icon.
      – **Details** displays each file as a line in a report.
   c. Click **Go**.
6. Select a file.
7. Click **Delete**.

Creating a Multiple Column Layout

A region is an area of a page that uses a specific template to format HTML content. You use regions to group page controls. To create a multiple column layout, you create two regions that display in adjacent cells of the same table.

You can create a multiple column layout by either:

- Manually creating the two adjacent regions
- Defining a page template that contains a multiple column table

Creating Regions in Multiple Columns

You create new regions using the Create Region Wizard. To create a two column page, you create two regions. Oracle HTML DB replaces `#BOX_BODY#` within a two column table and displays the regions in two separate cells.

To create a two column page by creating regions:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. Create the first region:
   - Under Regions, click **Create**.

     The Create Region Wizard appears.
   - Select a region type.
   - From the Column field, select **1**.
   - Follow the on-screen instructions.

6. Create the second region:
   - Under Regions, click **Create**.

     The Create Region Wizard appears.
   - Select a region type.
   - From the Column field, select **2**.
   - Follow the on-screen instructions.

Creating a Multiple Column Page Template

Page templates define the appearance of individual pages, including the placement of page controls and components. Each page template is divided into three sections: Header, Body, and Footer. The most basic template must include the substitution string `#BOX_BODY#` in the Body attribute. When the page is rendered, the HTML DB engine replaces `#BOX_BODY#` with HTML to display the regions on that page.

You can create a multiple column page by defining a page template that contains a multiple column table. You then explicitly place regions within specific table cells.

The following example demonstrates how to create a two column page and specify a region position using the `#REGION_POSITION_XX#` substitution string in each column. You would enter this code in the Body section of the page-level template.

```
<body #ONLOAD#>
  #FORM_OPEN#
  <table style="width:100%">
    <tr>
      <td style="width:50%;padding:5px;">#REGION_POSITION_01#</td>
      <td style="width:50%; border-left:2px #bbbbbb dashed; padding:5px;">#REGION_
POSITION_02#</td>
    </tr>
  <br />
  #BOX_BODY#
  #FORM_CLOSE#
</body>
```

Once you create this page-level template, the newly defined positions would be available as Display Point options when you run the Create Region Wizard.

Rendering HTML Using Custom PL/SQL

If you need to generate specific HTML content not handled by Oracle HTML DB forms, reports, and charts, you can use the region type PL/SQL. To generate HTML in this type of region, you need to use the PL/SQL Web Toolkit. You can reference session state using bind variable syntax. Keep in mind that when you generate HTML in this way you do not get the same consistency and control provided with templates.

See Also:

- *Oracle Database Application Developer's Guide - Fundamentals* for information about developing Web applications with PL/SQL
- *Oracle Database PL/SQL Packages and Types Reference* for information about htp packages

To give you more control over HTML dynamically generated within a region, you can use PL/SQL. For example, to print the current date you could create a region with the following source:

```
htp.p(TO_CHAR(SYSDATE,'Day Month DD, YYYY'));
```

This next example accesses tables:

```
DECLARE
   l_max_sal NUMBER;
BEGIN
   SELECT max(sal) INTO l_max_sal FROM emp;
   htp.p('The maximum salary is: '||TO_CHAR(l_max_sal,'999,999.00'));
END;
```

8 Adding Navigation

When you build an application you can include different types of navigation controls, including navigation bar entries, tabs, breadcrumbs, lists, and trees. This section describes how to implement navigation in your application.

Navigation controls are shared components. Once you create them, you can add them to any page within your application. You add a specific type of navigation control at the application level on the Shared Components page.

This section contains the following topics:

See Also:

- "About the Shared Components Page" on page 5-35
- "About the Page Definition" on page 5-15
- "Controlling Page Layout and User Interface" on page 7-1

Creating a Navigation Bar Entry

Navigation bar entries offer an easy way to move users between pages in an application. The location of a navigation bar depends upon the associated page template. A navigation bar entry enables you to display a link from an image or text.

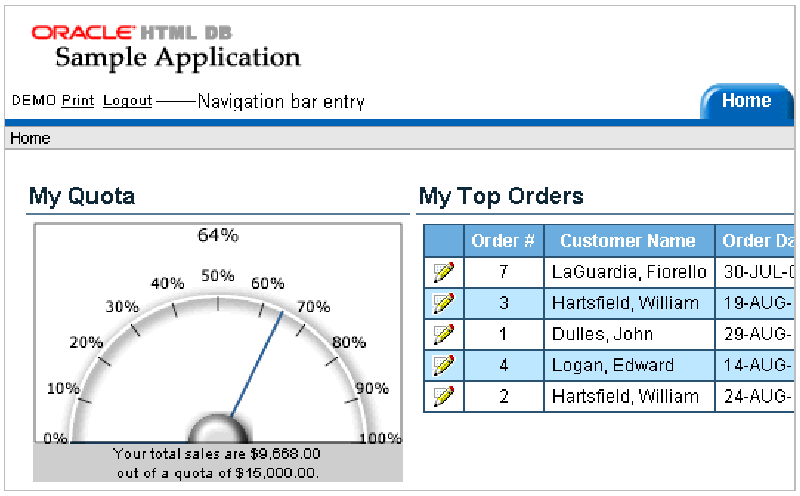
Topics in this section include:

See Also: Customizing Templates on page 7-17

About Navigation Bars

A navigation bar entry can be an image, an image with text beneath it, or text. You must supply navigation bar entry images and text. When you create a navigation bar entry, you can specify an image, text, a display sequence, or a URL.

Figure 8–1 Navigation Bar Entries



Your total sales are $9,668.00 out of a quota of $15,000.00.

	Order #	Customer Name	Order Da
	7	LaGuardia, Fiorello	30-JUL-
	3	Hartsfield, William	19-AUG-
	1	Dulles, John	29-AUG-
	4	Logan, Edward	14-AUG-
	2	Hartsfield, William	24-AUG-

Navigation bars are different from other shared components in that you not need to reference them on a page by page basis. If your page template includes the `#NAVIGATION_BAR#` substitution string, the HTML DB engine automatically includes any defined navigation bars when it renders the page.

> **See Also:** "Supported Page Template Substitution Strings" on page 7-29 on using the `#NAVIGATION_BAR#` substitution string

Creating a Navigation Bar Entry

Before you can add a navigation bar, you must create a navigation bar entry on the Navigation Bar page. You can access the Navigation Bar page from either the Page Definition or from the Shared Components page.

> **See Also:** "About the Shared Components Page" on page 5-35

Creating a Navigation Bar Entry Referencing an Icon

To create a navigation bar entry referencing an icon:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Shared Components, scroll down to **Navigation Bar**.
3. Under Navigation Bar, click the **Create** icon.

   The Create Navigation Bar Entry Wizard appears.

4. Specify the following Navigation Bar Entry attributes:
   a. Sequence - Specify the order of evaluation for this component.
   b. Alt Tag Text - Enter ALT text for navigation icons that are images. If you do not specify an image name, then this text displays.
   c. Icon Image Name - Defines the name of the image that displays.
   d. Image Height - Defines the height of the image.
   e. Image Width - Defines the width of the image.
   f. Text - Enter additional text to display with the image. You can include text or use icons with no text. This attribute is optional and can be translated.
5. Specify the target location.
   a. If the target location is a URL:
      – From Target is a, select **URL**.
      – In URL Target, type a URL.
   b. If the target location is a page:
      – From Target is a, select **Page in this Application**.
      – In Page, specify the page ID.
6. If the navigation bar entry will display conditionally, specify the appropriate conditional information and click **Create**.

Creating a Navigation Bar Entry without an Icon

To create a navigation bar entry without icons:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Shared Components, scroll down to **Navigation Bar**.
3. Under Navigation Bar, click the **Create** icon.

   The Create Navigation Bar Entry Wizard appears.
4. Specify the following icon attributes:
   a. Sequence - Specify the order of evaluation for this component.
   b. Text - Enter additional text to display with the image. You can include text or use icons with no text. This attribute is optional and can be translated.
5. Specify the target location.
   a. If the target location is a URL:
      – From Target is a, select **URL**.
      – In URL Target, type a URL. For example:

        ```
        http://www.yahoo.com
        ```

   b. If the target location is a page:
      – From Target is a, select **Page in this Application**.
      – In Page, specify the page ID.
6. If the navigation bar entry will display conditionally, specify the appropriate conditional information and click **Create**.

Editing a Navigation Bar Entry

Once you create a navigation bar entry you can edit it on the Navigation Bar Entries page.

To edit a navigation bar entry:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Applications home page, click **Shared Components**.
5. Under Navigation, select **Navigation Bar Entries**.

   The Navigation Bar Entries page appears.
6. You can change the appearance of the page by making a selection from the View list and clicking **Go**. Available options include:
   - **Icons** (the default) displays each navigation bar entry as a large icon. To edit a navigation bar entry, click the icon.
   - **Details** displays each navigation bar as a line in a report. To edit a navigation bar, click the appropriate sequence number.

     The Edit Navigation Bar Entry page appears.
7. Make the appropriate edits and click **Apply Changes**.

Editing Multiple Navigation Bar Entries Simultaneously

To edit multiple navigation bar entries at once:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Applications home page, click **Shared Components**.
5. Under Navigation, select **Navigation Bar Entries**.

   The Navigation Bar Entries page appears.
6. C lick **Grid Edit**.
7. Edit the appropriate attributes and click **Apply Changes**.

Accessing Navigation Bar Entry Reports

You can view the Navigation Bar Entry Subscription and Navigation Bar Entry History reports by clicking the appropriate tab at the top of the Navigation Bar Entries page.

Note: The Subscription and History buttons only appear after you create a navigation bar.

Navigation Bar Entry Subscription Report

Click **Subscription** to access the Subscribed NavBars report. This report displays subscribed navigation bar entries in your application.

Navigation Bar Entry History

Click **History** to view the Navigation Bar History report. This report lists recent changes to navigation bars.

Creating Tabs

Tabs are an effective way to navigate users between pages of an application. You can create a tabbed application look by using parent tabs, standard tabs, and Oracle HTML DB lists.

Application Builder includes two different types of tabs:

- Standard tabs
- Parent tabs

An application having only one level of tabs uses a standard tab set. A standard tab set is associated with a specific page and page ID. You can use standard tabs to link users to a specific page. A parent tab set functions as a container to hold a group of standard tabs. Parent tabs give users another level of navigation as well as a context (or sense of place) within the application. You can use parent tabs link users to a specific URL associated with a specific page.

Topics in this section include:

- About Template Support
- About the Tabs Page
- Editing Multiple Tabs at Once
- Accessing Tab Reports

Note: When running the Create Application Wizard, you have the option of creating an application with tabs. The following procedures assume you have already created an application that does not have any tabs.

See Also: "Creating an Application" on page 6-1

About Template Support

Before you can create parent and standard tabs, you need to check that your default template has positions defined for both standard and parent tabs using the appropriate substitution strings. You also need to make sure you do not override this template at the page-level.

See Also:

- "Template Defaults" on page 5-10 for information about setting a default page template at the application level
- "Display Attributes" on page 5-20 for information about setting a template at the page-level

About the Tabs Page

The Tabs page displays a graphical representation of the tabs defined in your application. You access the Tabs page from the Shared Components page, or by clicking the heading Tabs on the Page Definition.

Topics in this section include:

- Accessing the Tabs Page from Shared Components
- Accessing the Tabs Page from a Page Definition
- Creating a New Tab from the Page Definition
- Using the Standard Tab Task List

Accessing the Tabs Page from Shared Components

To access the Tabs page from the Shared Components page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under Navigation, select **Tabs**.

   The Tabs page appears displaying a graphical representation of the tabs defined in your application.
6. To make another tab current, click the tab.

   Notice the two Add buttons. Use the Add button on the upper right side of the graphic to add Parent tabs. Use the Add button at the lower left side of the graphic to add standard tabs.
7. To add a new tab, click **Add** adjacent to the appropriate tab type.

   Think of parent tabs as a container to hold standard tabs. For example, in order to add two levels of tabs you first create a parent tab and then add standard tabs to it.

Accessing the Tabs Page from a Page Definition

To access Tab Manager from the Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Shared Components, select the heading **Tabs**.

   The Tabs page appears displaying a graphical representation of the tabs defined in your application. The currently selected standard or parent tab is highlighted.

3. To make another tab current, click the tab.

   Notice the two Add buttons. Use the Add button on the upper right side of the graphic to add Parent tabs. Use the Add button at the lower left side of the graphic to add standard tabs.

4. To add a new tab, click **Add** adjacent to the appropriate tab type.

   Think of parent tabs as a container to hold standard tabs. For example, in order to add two levels of tabs you first create a parent tab and then add standard tabs to it.

Creating a New Tab from the Page Definition

To create a new tab from the Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Tabs, click the **Create** icon.

   The Create Tab Wizard appears.
3. Follow the on-screen instructions.

Using the Standard Tab Task List

The Standard Tab Task list displays on the right side of the Tabs page. You can access the links on this list to rename a standard tab set, resequence the display order, associate pages with a tab set, create a new standard tab, or create a new standard tab set.

To access the Standard Tab Task list:

1. Navigate to the Tabs page:
   a. Click the **Application Builder** icon on the Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Navigation, select **Tabs**.
2. Make a selection from the Standard Tab Task list. Available options include:
   - **Rename Standard Tab Set**
   - **Resequence Display Order**
   - **Associate Page(s) with Selected Standard Tab**
   - **Create New Standard Tab**
   - **Create New Standard Tab Set**

Editing Multiple Tabs at Once

You can edit multiple tabs at once by clicking **Edit Standard Tabs** and **Edit Parent Tabs** on the Tabs page.

To edit multiple tabs at once:

1. Navigate to Tab Manager. See "About the Tabs Page" on page 8-6.
2. Click one of the following buttons:
   - **Edit Standard Tabs**
   - **Edit Parent Tabs**

Accessing Tab Reports

You can view the Tab Utilization and Tab History reports by clicking the appropriate tab at the top of the Tab Manager page.

Standard Tab Utilization

Click **Utilization** to access the Standard Tab Utilization report. This report lists the standard tabs used in the current application.

Standard and Parent Tab History

Click **History** to view the Standard Tab History and Parent Tab History reports. These reports display a history of changes to tab attributes for the current application.

Controlling Navigation Using Branches

A branch is an instruction to link to a specific page, procedure, or URL. For example you can branch from page 1 to page 2 after page 1 is submitted.

Note: If a page has a select list and a submit button, it can submit itself. However, you must create a branch to call the page or the submit will fail.

You create a new branch by running the Create Branch Wizard and specifying a Branch Point and Branch Type. The Branch Type defines the type of branch you are creating.

To create a branch:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Branches, click the **Create** icon.
3. Select a Branch Point:
   - **On Submit: Before Computation** - Occurs before computations, validations, or processing. Use this option for a Cancel button.

- **On Submit: Before Validation** - Occurs after computations, but before validations or processing. Typically not used. If a validation fails, page processing stops, a rollback is issued, and the page displays the error. Because of this default behavior, you do not need to create branches to accommodate validations. However, you might want to branch based on the result of a computation (for example, to the previous branch point).
- **On Submit: Before Processing** - Occurs after computations and validations, but before processing. Use this option to branch based on a validated session state, but before performing any page processing.
- **On Submit: After Processing** - Occurs after computations, validations, and processing. This option branches to a URL or page after performing computations, validations, and processing. When using this option, remember to sequence your branches if you have multiple branches for a given branch point.
- **On Load: Before Header** - Occurs before a page rendered. This option displays another page instead of the current page or redirects the user to another URL or procedure.

4. Select a Branch Type.

   Depending upon the Branch Type, specify the following types of information on the pages that follows:

   - A page ID of the page you want to branch to
   - PL/SQL code
   - A URL address

5. Follow the on-screen instructions.

Creating Breadcrumbs

Breadcrumbs provide users with hierarchical navigation. A breadcrumb is a hierarchical list of links that display using templates. You can display a breadcrumb as a list of links, or as a breadcrumb path.

Topics in this section include:

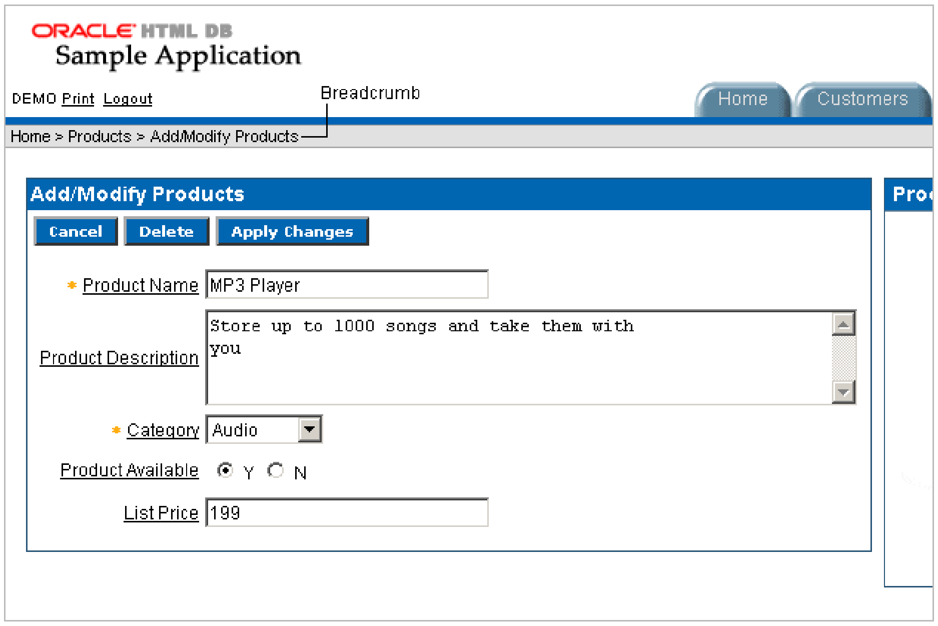
- About Breadcrumbs
- Creating Breadcrumbs
- Editing Breadcrumbs
- Accessing Breadcrumb Reports

See Also: "Creating a New Template" on page 7-19 and "Breadcrumb Templates" on page 7-21 for information about changing menu display

About Breadcrumbs

A breadcrumb trail indicates where the user is within the application from a hierarchical perspective. In addition, users can click a specific page to instantly view it. You can include a breadcrumb that functions as second level of navigation and displays beneath the standard tabs at the top of each page.

Figure 8–2 Breadcrumb



Product Name: MP3 Player

Product Description: Store up to 1000 songs and take them with you

Category: Audio

Product Available: [✓ Y] N

List Price: 199

Creating Breadcrumbs

To add a breadcrumb to a page in your application you must:

- Create the breadcrumb by running the Create Breadcrumb Wizard.
- Add entries to it
- Add the breadcrumb to a page by creating a region

Creating Breadcrumbs from the Shared Components Page

To create breadcrumbs from the Shared Components page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under Navigation, select **Breadcrumbs**.

   The Breadcrumbs page appears.
6. Click **Create**.
7. Enter a name and click **Create**.

Creating Breadcrumbs from a Page Definition

To create breadcrumbs from a Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.

   d. Select a page.

      The Page Definition appears.

2. Under Shared Components, scroll down to **Breadcrumbs** and click the **Create** icon.
3. Enter a name and click **Create**.

After you create a breadcrumb, you add entries to it.

Adding Breadcrumb Entries

To add a breadcrumb entry:

1. Navigate to the Breadcrumbs page:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. On the Application Builder home page, click **Shared Components**.
   e. Under Navigation, select **Breadcrumbs**.

      The Breadcrumbs page appears.
2. Select a breadcrumb to add entries to.
3. Click **Create Breadcrumb Entry**.
4. Under Breadcrumb Identification, specify the page on which this menu will be current
5. Under Entry:
   a. Sequence - Indicate the order in which breadcrumb entries appear.
   b. Parent Bread Entry - Identify the parent of this entry.
   c. Short Name - Specify the short name of this entry (referenced in the breadcrumb template).
   d. Long Name - Specify the long name of this entry (referenced in the breadcrumb template).
6. Under Target:

   If the target location is a URL:
   a. From Target is a, select **URL**.
   b. In URL Target, type a URL.

   If the target location is a page:
   a. From Target is a, select **Page in this Application**
   b. In Page, specify the page ID
7. You can make a breadcrumb conditional by making selections under Conditions.

   To make the breadcrumb conditional:
   a. Make a selection from the Condition Type list.
   b. Enter an expression in the fields provided.

8. When you are finished defining menu attributes, click **Create** at the top of the page.

Repeat these procedures for each breadcrumb entry you need to create.

Adding a Breadcrumb Region

A region is a area on a page that serves as a container for content. Once you create a breadcrumb and a breadcrumb template, the next step is to create a region. Once you create a region you can add a breadcrumb to page.

> **See Also:** "Creating a New Template" on page 7-19 and "Breadcrumb Templates" on page 7-21 for information about changing menu display

To create a breadcrumb region:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click the **Create** icon.

   The Create Region Wizard appears.
3. For the region type, select **Breadcrumb**.
4. Enter a title and select a region template.
5. Select a breadcrumb and a breadcrumb template.
6. Optional. Identify the breadcrumb entry used to identify this page:
   a. Breadcrumb Entry Label - Enter a label for the breadcrumb entry.
   b. Parent Breadcrumb Entry - Select the appropriate hierarchical parent.
7. Click **Finish**.

Repeat these procedures for each page where you would like to add breadcrumb navigation.

About Creating a Dynamic Breadcrumbs

To give users a more exact context, you may include session state in breadcrumbs, making your breadcrumbs dynamic. For example, suppose a page in your application displays a list of orders for a particular company and you want to include the following breadcrumb:

```
Home > Orders > Orders for ACME Inc
```

In this example, `ACME Inc` not only indicates the page a user is on and the navigation path. The HTML DB engine stores the value of ACME Inc. in session state.

To create this type of dynamic menu, you must include a reference to a session state item in the breadcrumb's short name or long name, for example:

```
&COMPANY_NAME.
```

Editing Breadcrumbs

Once you create a breadcrumb you can edit it on the Breadcrumbs page.

To edit a breadcrumb:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under Navigation, select **Breadcrumbs**.

   The Breadcrumbs page appears.

   You can change the appearance of the page by making a selection from the View list. Available options include:

   - **Icons** (the default) displays each breadcrumb as a large icon. To edit a breadcrumb, click the icon.
   - **Details** displays each breadcrumb as a line in a report. To edit a breadcrumb, select the appropriate name.

Accessing Breadcrumb Reports

You can view the Breadcrumb Utilization and Breadcrumb History reports by clicking the appropriate tab at the top of the Breadcrumbs page.

Note: The Utilization and History buttons only appear after you create a breadcrumb.

Breadcrumb Utilization Report

Click **Utilization** to access the Breadcrumb Utilization report. This report lists breadcrumbs by page. Click the page ID to link to a specific page.

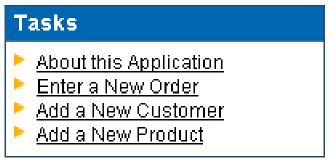
Breadcrumb History Report

Click **History** to view the Breadcrumb History report. This report lists recent changes to breadcrumbs.

Creating Lists

A list is a shared collection of links. You control the appearance of a list through list templates. Each list element has a display condition which enables you to control when it displays. You can define a list element to be either current or non current for a specific page. You further specify what current looks like using template attributes. You add a list to a page by creating a region and specifying the region type as List.

Figure 8–3 List



Topics in this section include:

- Creating a List
- Adding a List to a Page
- Editing Multiple List Entries Simultaneously
- Accessing List Reports

> **See Also:** "Creating a New Template" on page 7-19 and "List Templates" on page 7-27 for information about altering list display

Creating a List

To add a list to a page in your application you must:

1. Create the list by running the Create Lists Wizard.
2. Add items to the list.
3. Add the list to a page by creating a List region.

Creating a List from the Shared Components Page

To create a list from the Shared Components page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Applications home page, click **Shared Components**.
5. Under Navigation, select **Lists**.

   The Lists page appears.
6. To create a new list, click **Create**.
7. In the fields provided:
   a. Enter a name for the list.
   b. Select a list template.
   c. If applicable, select a build option for this component. Build options are predefined settings that determine whether or not components within an application are enabled.
8. Click **Create**.

Creating a List from a Page Definition

To create a list from a Page Definition:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Shared Components, scroll down to Lists and click the **Create** icon.
3. In the fields provided:
   a. Enter a name for the list.
   b. Select a list template.
   c. If applicable, select a build option for this component. Build options are predefined settings that determine whether or not components within an application are enabled.
4. Click **Create**.

Once your list has been created, you need to add entries to it.

Adding List Entries

You can create hierarchical lists that contain sublists. To create a hierarchical list, you must:

- Select a list template that supports hierarchical lists. To determine which list templates support hierarchical lists, look for templates having the naming convention "with Sublist."
- Select a Parent List Item when you create each list entry.

See Also: "Viewing Templates" on page 7-19 and "List Templates" on page 7-27

To add an entry to a list:

1. Navigate to the Lists page.
2. Select a list.
3. Click **Create List Entry**.

   The Create / Edit List Entry page appears.
4. Under Label and Sequence:
   a. Parent List Item - Identify the parent for this list entry. Use this attribute if you are creating a hierarchical list that will contain a sublist.
   b. Sequence - Indicate the order in which list entries appear.
   c. Image - Identify the file name for the image used to display this list entry. Control over this attribute is provided by list templates.
   d. Image Attributes - Identify the image attributes (such as width="12" height="12") for the list element image.

      Use the `#LIST_LABEL#` substitution string to reference the list label text. This substitution string allows for the title image attribute to be automatically set based on the value of the list label text. For example:

      ```
      title="#LIST_LABEL#"
      ```
   e. List Entry Label (required) - Enter the label text for this link (required).
5. Specify a target location.

   If the target location is a page:

   a. From Target Type, select **Page in this Application**.

   b. In Page, specify the target page ID.

      To reset pagination for this page, select **reset pagination for this page**.

   c. In Request, specify the request to be used.

   d. In Clear Cache, specify the pages (that is, the page IDs) on which to clear cache. Specify multiple pages by listing the page IDs in a comma-delimited list.

      You can set session state (that is, give a listed item a value) using the next two attributes:

   e. To set session state:

      – In Set these items, enter a comma-delimited list of item names for which you would like to set session state.

      – In With these values, enter a comma-delimited list of values for the items specified in the previous step.

        You can specify static values, or substitution syntax (for example, `&APP_ITEM_NAME.`). Note that item values passed to `f?p=` in the URL may not contain a colon (:). Additionally, item values may not contain commas unless you enclose the entire value in backslash characters (for example, `\1234,56\`).

   If the target location is a URL:

   a. From Target type, select **URL**.

   b. In URL Target, type a URL.

6. Under Current List Entry Identification:

   a. List Entry Current for Pages Type - Specify when this list entry should be current based on the page type.

      List items can be current or non-current. Current list items use the current template, non current list items use the non current list item template. The actual condition and templates are defined in subsequent attributes.

   b. List Entry Current for Condition - Based on the selection above, define a condition to evaluate. When this condition is true then the list item becomes current.

7. To make the list entry conditional:

   a. Make a selection from the Condition Type list.

   b. Enter an expression in the fields provided.

8. When you are finished defining list attributes, click **Create** or **Create and Create Another**.

Adding a List to a Page

Once you created a list, the next step is to add it a page by creating a region and specifying the region type as List.

> **See Also:** "Creating a New Template" on page 7-19"List Templates" on page 7-27 for information about altering list display

To add a list to a page:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Regions, click the **Create** icon.
3. Select **List** as the region type.
4. Specify the following display attributes:
   - Title - Enter a title for the region. This title will display if the region template you choose displays the region title.
   - Region Template - Choose a template to control the look of the region.
   - Display Point - Identify a display point for this region.

     Two types of display points exist: page template positions and page body positions. **Page template positions** are controlled by page template substitution strings (#REGION_POSITION_01#..#REGION_POSITION_08#). **Page template positions** allow for exact placement of a region within a page template. Page body positions are displayed where the #BODY# substitution string in the page template indicates.
   - Sequence - Specify the sequence for this component. The sequence determines the order of evaluation.
   - Column - Indicate the column in which this region is to be displayed. A page can have multiple regions, these regions can be displayed in different columns. Please note that this attribute only applies to regions that are displayed in a Page Template Body position.
5. From List, select the list you want to add.
6. Click **Create List Region**.

Repeat these procedures for each page on which you would like to add a list.

Editing Lists

Once you create a list you can edit it on the Lists page.

To edit a list:

1. Navigate to the Lists page.

   From the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.
   e. Under Shared Components, select the title **Lists**.

   From the Shared Components page:
   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.
   c. Select an application.
   d. On the Applications home page, click **Shared Components**.
   e. Under Navigation, select **Lists**.

      The Lists page appears.

2. You can change the appearance of the page by making a selection from the View list. Available options include:
   - **Icons** (the default) displays each list as a large icon. To edit a list, click the appropriate icon.
   - **Details** displays each list as a line in a report. To edit a list, click the list name.

Editing Multiple List Entries Simultaneously

You can edit multiple list entries at once by clicking **Grid Edit** on the List Entries page.

To edit multiple list entries at once:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under Navigation, select **Lists**.

   The Lists page appears.
6. Select a list name.

   The List Entries page appears.
7. Click **Grid Edit**.
8. Edit the appropriate items and click **Apply Changes**.

Accessing List Reports

You can view the List Utilization by Page, Unused Lists, and List History reports by clicking the appropriate tab at the top of the Lists page.

Note: The List Utilization, Unused Lists, and History buttons only appear after you create a list.

Utilization

Click **List Utilization** to access the Lists Utilization report. This report displays all lists included in the current application. To edit list entries, select the list name. To view the pages on which the list appears, click the number in the Pages column.

Unused

Click **Unused** to identify lists that are not used in the current application.

History

Click **History** to view changes to list definitions and list entries by developer and date.

Creating Trees

You can use a tree in your application to effectively communicate hierarchical or multiple level data.

Topics in this section include:

- Creating a Tree
- Editing a Tree
- Accessing Tree Reports

Creating a Tree

To create a tree:

1. Navigate to the Shared Components page:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. On the Application Builder home page, click **Shared Components**.
2. Under Navigation, select **Trees**.

   The Trees page appears.
3. To create a new tree, click **Create**.
4. Enter basic page information.
5. Specify how tabs should be implemented.
6. Enter a Tree Name and specify number of default expanded levels.
7. Select a tree template.
8. To display a tree, you need to specify a starting point. Depending on your Start Tree selection, enter either a query or a single value.
9. Identify whether to include Collapse All, Expand All, or Reset Tree buttons.
10. Specify the owner and name of the table on which the tree will be based.
11. A tree is based on a query and returns data that can be represented in a hierarchy. Identify the column you want to use as the ID, the Parent ID, and specify the text that should appear on the leaf nodes.
    a. I D - Enter the column you want to use as the ID.
    b. Parent ID - Enter the Parent ID.
    c. Leaf Node Text - Specify the text that should appear on the leaf nodes.
    d. Link Option - Select **Existing Application Item** to make the leaf node text a link. If you select this option, specify a page to link to.
12. Optional. Identify an optional where and order by clause to add to your query.
13. Specify the display text for the Go button.
14. Identify the page you want to branch to when the user clicks a button.
15. Click **Finish**.

Editing a Tree

Once you create a tree you can edit it on the Trees page.

To edit a tree:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Applications home page, click **Shared Components**.
5. Under Navigation, select **Trees**.

   The Trees page appears.
6. You can change the appearance of the page by making a selection from the View list. Available options include:
   - **Icons** (the default) displays each tree as a large icon. To edit a tree, click the icon.
   - **Details** displays each tree as a line in a report. To edit a tree, click the **appropriate name**.

Accessing Tree Reports

You can view the Trees Utilization and Tree History reports by clicking the appropriate tab at the top of the Trees page.

Note: The Utilization and History buttons only appear after you have created a tree.

Tree Utilization

Click **Utilization** to access the Tree Utilization report. This report displays all trees included in the current application. To edit a tree, select the tree name.

Tree History

Click **History** to view changes to trees by developer and date.

9

Managing User Interface Defaults

User interface defaults enables you to assign default user interface properties to a table, column, or view within a specified schema. When you create a form or report using a wizard, the wizard uses this information to create default values for region and item properties. Utilizing user interface defaults can save you valuable development time and has the added benefit of providing consistency across multiple pages in an application.

Because user interface defaults are associated with a table, you can use them with applications created using the form and report wizards.

Topics in this section include:

- Viewing Tables or Views Utilizing User Interface Defaults
- Editing Column Attributes
- Comparing User Interface Defaults Across Applications
- About Exporting and Importing User Interface Defaults

See Also: "Leveraging Application Models and User Interface Defaults" on page 6-4

Viewing Tables or Views Utilizing User Interface Defaults

You can view tables or views utilizing user interface defaults by either navigating to the User Interface Defaults page or viewing the UI Defaults report in Object Browser.

Topics in this section include:

- Navigating to the User Interface Defaults Page
- Viewing the UI Defaults Report in Object Browser

See Also: "Managing Database Objects Using Object Browser" on page 18-1

Navigating to the User Interface Defaults Page

You can access the User Interface Defaults page:

1. Click the **Application Builder** icon on the Workspace home page.
2. Select an application.
3. On the Application home page, click **Shared Components**.

   The Shared Components page appears.

4. Under User Interface, select **User Interface Defaults**.

   The User Interface Defaults page appears.

   The current schema displays to the right of the breadcrumb menu.

5. To select a new schema, make a selection from the Schema list.

6. To narrow the display, use the following controls at the top of the page and click **Go**:

   - **Table/View** - Enter a case insensitive query for a table or view name within the current schema.
   - **View** - Make a selection to filter the view:
     - **Icons** (default) displays each table or view as large icon.
     - **Details** displays each table or view as a line in a report, identifying the table or view name, the object type, and whether or not user interface defaults currently exist.
     - **Display** determines the number of items that display in the report.

7. Select a specific table or view by selecting the name.

   The Table Defaults page appears.

8. If no user interface defaults exist, click **Create User Interface Defaults**.

Viewing the UI Defaults Report in Object Browser

To view the User Interface Details Report in Object Browser:

1. Navigate to Object Browser:

   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Object Browser**.

      Object Browser appears.

2. From the Object list, select either **Tables** or **Views**.

3. From the Object Selection pane, select an object.

4. Select the **UI Defaults** tab.

   The User Interface Defaults report appears displaying the following information:

   - Column Name - Indicates the name of the column.
   - Label - Specifies the default label text for items in a form and the heading for columns in reports.
   - Report Sequence - Specifies the sequence of items in a report.
   - Report Display - Specifies how the column should be displayed in a report.
   - Tabular Form Display - Specifies how an item should display in a tabular form.
   - Form Sequence - Specifies the sequence of items in a form.
   - Form Display - Specifies how items in a form display.

5. To edit the user interface defaults, click **Edit**.

   The Table Defaults page appears.

6. If no user interface defaults exist, click **Create Defaults**.

Editing Column Attributes

You define user interface defaults for a specific column by editing column attributes.

To edit column attributes:

1. Navigate to the Table Defaults page as described in "Viewing Tables or Views Utilizing User Interface Defaults" on page 9-1.

   The Table Defaults page appears. The following information displays at the top of the page:

   - **Table/View Name** identifies the name of the selected table or view.
   - **Report Region Title** and **Form Region Title** become the default title for all report or form regions. These names are modified versions of Table/View Name in which the first letter is capitalized and any underscores are replaced with spaces.

   Column-level User Interface Defaults appear next. By default, a short report displays.

2. To view a complete report, click **Detailed Report**.
3. To edit select attributes for all displayed columns, click **Grid Edit**.
4. To edit a specific column, select the column name.

   The column defaults appear. Column defaults are divided into two pages:

   - Column Definition
   - List of Values

   The topics that follow describes how to edit specific attributes on these pages.

About the Column Definition

Column Definition is the default page that displays when you edit column attributes. The top of the page displays the selected schema, table or view name, and column name. Click **View Database Column Definition** to view details about a specific column.

Label Default

This attribute is used in report and forms. Use **Label** to specify default label text for items in a form and the heading for columns in reports.

Report Defaults

Available attributes include:

- **Display** - Indicates if the column displays in a report. The default is **Yes**.
- **Display Sequence** - Specifies the display sequence of items in a report. The default value is based on the column ID, which is based on the order of the columns in the table.
- **Display As** - Specifies how the column should be displayed in a report.
- **Mask** - Indicates if a mask should be applied against the data. This attribute is not applicable for character- based items.

- **Alignment** - Specifies report alignment (left, center, or right). If the column is a number, the default is **Right**. Otherwise, the default is **Left**.
- **Searchable** - Indicates whether or not the column should be searchable in reports. If the column is `VARCHAR2` or `CHAR`, the default is **Yes**. If not, the default is **No**.
- **Group By** - Indicates whether or not the column should be used for Group By and then the sequence of the grouping. The default is **Yes**.
- **Aggregate By** - Indicates whether or not the column should be used for aggregation in reports and charts.

Tabular Form Default

Use **Display As** to specify how an item should display in a tabular form.

Form Defaults

Available attributes include:

- **Display** - Indicates if the column displays in a form. The default is **Yes**.
- **Display Sequence** - Specifies the sequence of items in a form. The default is based on the column ID, which is based on the order of the columns in the table.
- **Display As** - Indicates how items in a form display. The default selection is **Text Field**.
- **Mask** - Indicates if a mask should be applied against the data in a form. Not used for character-based items.
- **Default Value** - Specifies the default value associated with this column.
- **Width** - Specifies the display width.
- **maxWidth** - Specifies the maximum string length a user is allowed to enter in this item.
- **Height** - Specifies the display height of an item.
- **Required** - Used to generate a validation in which the resulting item must not be null. If resulting item is not null, select **Yes**.
- **Help Text** - Becomes Item help. By default, this text is pulled from the column hint (if applicable).

About List of Values

You access the List of Values page by clicking the **List of Values** tab. The top of the page displays the selected schema, table or view name, and column name. Click **View Database Column Definition** to view details about a specific column.

The top of the page displays the selected schema, table or view name, and column name. Use the List of Values Type list to specify if the selected column will include a static or dynamic list of values. Once you select the type, you are prompted to enter either display value and return value pairs, or a list of values query.

About the Database Column Definition Report

You can view details about a specific column by accessing the Column Definition report. The Column Definition report displays the schema, table name, column name, data type, data length, and nullable, as well as any check constraints, primary and unique keys, and foreign keys that reference the column. A link to this report appears on both the Column Definition and List of Values pages.

To view the Column Definition report:

1. Navigate to the Table Defaults page as described in "Viewing Tables or Views Utilizing User Interface Defaults" on page 9-1.

   The Table Defaults page appears.

2. Select the column name.
3. Select **View Database Column Definition**.

Comparing User Interface Defaults Across Applications

Use the Compare Defaults report to monitor consistency in user interface design across all pages in a single application or multiple applications in the current workspace. Running the Compare Defaults report compares currently defined user interface defaults (or column attributes) against the item attributes set for forms, reports, and tabular forms.

See Also: "Editing Column Attributes" on page 9-3

To run the Compare Defaults report:

1. Click the **Application Builder** icon on the Workspace home page.
2. Select an application.
3. On the Application home page, click **Shared Components**.

   The Shared Components page appears.

4. Under User Interface, select **User Interface Defaults**.

   The User Interface Defaults page appears.

5. From the Tasks list, select **Comparison Report**.

   The current schema displays to the right of the breadcrumb menu.

6. To select a new schema, make a selection from the Schema list.
7. Make selections from the following lists:
   - **Table/View** - Restricts the comparison to the selected table or view.
   - **Column** - Select a column in which to search for form, reports, and tabular forms.
   - **Display** - Select an attribute category.
   - **Application** - Select an application.
8. Click **Go**.

A report appears containing the following sections:

- Form Pages Referencing the Selected Column
- Report Regions Referencing the Selected Column
- Tabular Form Regions Referencing the Selected Column

About Exporting and Importing User Interface Defaults

You export user interface defaults in the same way you export any related application file. Exporting user interface defaults from one Oracle HTML DB development instance to another involves the following steps:

1. Export the user interface defaults using the Export User Interface Defaults utility.
2. Import the exported file into the target Oracle HTML DB instance.
3. Install the exported file from Export Repository.

When you export user interface defaults, all user interface defaults for the selected schema are exported to a single script. The file contains an API call to create table hints by making calls to the application PL/SQL API. You can use this file to import user interface defaults to another database and Oracle HTML DB instance.

See Also: "Exporting User Interface Defaults" on page 11-10 and "Importing Export Files" on page 11-11

10 Debugging an Application

This section describes approaches to debugging your application including viewing Debug Mode, enabling SQL tracing, viewing page reports, and how to manually remove a control or a component to isolate a problem.

This section contains the following topics:

About Tuning Performance

For applications having a large number of concurrent users, maintaining optimal performance is critical. To optimize your application's performance, remember to utilize the following Oracle HTML DB features:

- Use bind variables within your application whenever possible. You can reference session state values using bind variable syntax in SQL queries and application logic such as PL/SQL executed from processes and validations. Accessing session state using bind variables is the most efficient way to reference session state.
- Include a `#TIMING#` substitution string in the region footer so that you can view the timing of each region.

See Also:

- "About Bind Variables" on page 4-13
- "Using Substitution Strings" on page 4-16

Reviewing Session State

Many applications are based on data contained within application controls. For example, buttons may display conditionally based on a value stored in session state. You can view current session state for your application by clicking the Session link on the Developer Toolbar.

See Also: "Using the Developer Toolbar" on page 5-18, "Viewing Session State" on page 4-9, "Managing Session State Values" on page 4-10, and "Managing Session State and User Preferences" on page 12-8

Accessing Debug Mode

Viewing a page in Debug Mode enables you to track what the HTML DB engine is doing as it renders a page. You access Debug mode by clicking the **Debug** link in the Developer Toolbar.

See Also: "Using the Developer Toolbar" on page 5-18

Debug Mode displays time codes that correspond to specific HTML DB engine actions. This can be useful if you want to determine when the engine is setting session state. The Debug view also shows additional details about item names and computation and processing points. To exit Debug mode, click **No Debug** in the Developer Toolbar.

You can also use `f?p` syntax run an application in Debug mode. Simply call the page and set the Debug argument to `YES`. For example:

```
f?p=100:1:&SESSION::YES
```

See Also: "Using f?p Syntax to Link Pages" on page 4-15

Enabling SQL Tracing and Using TKPROF

Tracing your session can be a very effective way to debug an application. From a database perspective, each page request is a single database session. If you enable SQL tracing, then Oracle HTML DB creates a temporary file you can then analyze using the TKPROF utility.

You enable SQL tracing in Oracle HTML DB by using `f?p` syntax to set the argument `p_trace=YES`. For example, to trace the display of page 1 in application 100 you would use the syntax:

```
http:/.../f?p=100:1&p_trace=YES
```

To use the TKPROF utility:

- Navigate to the directory in which the trace file is created.
- Type the following to view instructions about using TKPROF utility:

  ```
  tkprof help=yes
  ```

See Also: *Oracle Database Performance Tuning Guide* for information about using the TKPROF program or contact your database administrator

Monitoring Application and Page Resource Use

Oracle HTML DB facilitates the monitoring of resources used by applications and pages by calling the package `DBMS_APPLICATION_INFO`. Whenever the HTML DB engine renders or processes a page, the module is set to `HTML DB` and includes the application ID and page ID. Once set, you can query the `V$SESSION` and `V$SQLAREA` views to monitor transactions.

Viewing Oracle HTML DB Reports

When isolating an issue within a page, it is important to clearly understand the functions it is performing. To accomplish this goal, Oracle HTML DB includes a number of page and application reports.

To view page reports:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Click one of the following buttons at the top of the Page Definition:
   - **Event View** links to a report that details currently defined page controls and processes.
   - **Object References** displays a list of database objects referenced by the current page.
   - **History** displays a history of recently changed pages.

   See Also: "Groups" on page 5-35, "Objects" on page 5-34, and "History" on page 5-34

To view application reports:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. From the Tasks list, select **View Application Reports**.
5. Select the type of reports to view:
   - **Shared Components** reports offer information on common elements that can display or be applied on every page within an application. Report examples include Application Comments, Breadcrumb Entries, Database Object Dependencies, Lists of Values, Static Entries, and Messages.
   - **Page Components** reports offer detailed information on controls and logic that execute when the page is rendered (for example, branches, buttons, computations, items, and regions).
   - **Activity** reports offer details about developer activity within the current application. Available reports include Changes by Developer, Changes by Developer by Day, Chart of Changes by Developer, and Recent Changes.

   See Also: "About the Database Object Dependencies Report" on page 5-45 and "About the Region Source Report" on page 5-45

Debugging Problematic SQL Queries

If your query does not seem to be running correctly, try running it in SQL Plus or in SQL Workshop. Either approach will test your query outside of the context of your application, making it easier to determine what the problem is.

Removing Controls and Components to Isolate a Problem

If you have problems running a page, try removing controls and components one at time. Using this approach, you can quickly determine which control or component may be the source of your problem. You can disable a control or component by selecting the Condition attribute Never.

To remove a control or component using conditional attributes:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Select the name of the control or component you want to disable.

   The appropriate attributes page appears.
3. Scroll down to Condition Type and select **Never** from the Condition Type list.
4. Click **Apply Changes** and return to the Page Definition.
5. Try running the page again.
6. Continue to remove controls or components until the page runs correctly.

See Also: "About the Page Definition" on page 5-15, "Editing Page Attributes" on page 5-19, "Understanding Conditional Rendering and Processing" on page 4-6, and "Running a Page or Application" on page 6-10

11 Deploying an Application

This section describes how to deploy an application.

This section contains the following topics:

See Also: "Advanced Programming Techniques" on page 14-1

About the Oracle HTML DB Application Development Life Cycle

When developing applications using Oracle HTML DB, you need to find a balance between two dramatically different development methodologies:

- Iterative, rapid application development
- Planned, linear style development

The first approach offers so much flexibility, you run the risk of never completing your project. In contrast, the second approach can yield applications that do not meet the needs of end users even if they meet the stated requirements on paper.

System Development Life Cycle Methodologies to Consider

The system development life cycle (SDLC) is the overall process of developing software using a series of defined steps. There are a number of SDLC models that work well for developing applications in Oracle HTML DB.

The **SDLC waterfall** is probably the best known model. In this methodology, the development process is broken down into the following stages:

1. Project Planning
2. Requirements Definition
3. Design

4. Development
5. Integration and Testing
6. Installation and Acceptance
7. Maintenance

This methodology is referred to as a waterfall since the output from one stage is the input for the next stage. One of the primary problems with this approach is that it is assumed that all requirements can be established in advanced. Unfortunately, in the real world, requirements often change and evolve during the development process.

The Oracle HTML DB development environment enables developers to take a more iterative approach to development. Unlike many other development environments, creating prototypes is easy. With Oracle HTML DB, developers can:

- Use built-in wizards to quickly design an application user interface
- Easily make protoypes available to users and gather feedback
- Implement changes in real time, creating new prototypes instantly

Other methodologies what work well with Oracle HTML DB include:

- **Spiral** - This approach is actually a series of short waterfall cycles. Each waterfall cycles yields new requirements and enables the development team to create a robust series of prototypes.
- **Rapid application development (RAD) life cycle** - This approach has a heavy emphasis on creating a prototype that closely resembles the final product. Essentially the prototype is an essential part of the requirements phase. One disadvantage of this model is that the emphasis on prototyping can lead to scope creep. Developers can lose sight of their initial goals in the attempt to create the perfect application.

About Deploying an Application in Oracle HTML DB

Deploying an application from one Oracle HTML DB instance to another is a two step process:

- First, you move the supporting database objects. Review the Database Dependencies report to determine what objects to move. See "About the Database Object Dependencies Report" on page 5-45.
- Second, you move the application definition and all associated files. See "How to Deploy an Application to Another Oracle HTML DB Instance" on page 4.

Deployment Options to Consider

When you develop an application in Oracle HTML DB, you create the application within a specific workspace. Each workspace has an unique ID and name. A common scenario is to create the application in a development instance and then deploy it to a production instance.

During the deployment process you would need to decide whether to use the existing application ID, the existing workspace, the existing database, or the existing Oracle HTTP Server, or create new ones. Deployment options to consider include:

1. **Do nothing.** Send the URL and login information to users. This approach works well for applications with a small and tolerant user population.

2. **Same workspace and same schema.** Export and then import the application and install it using a different application ID. The approach works well when there are few changes to the underlying objects, but frequent changes to the application functionality.
3. **Different workspace and same schema.** Export and then import the application into a different workspace. This is an effective way to prevent a production application from being modified by developers.
4. **Different workspace and different schema.** Export and then import the application into a different workspace and install it using a different schema.
5. **Different database with all its variations.** Export and then import the application into a different Oracle HTML DB instance and install it using a different schema and database.

Whether to Copy the Workspace

Whether to copy an existing workspace really is a matter of preference. Keep in mind that the production version must have access to all the appropriate objects. For example, you might want to copy a workspace in the following situations:

- When the application subscribes to other objects within the workspace.
- When the application relies on Oracle HTML DB authentication. Copying the workspace would automatically migrate all the required user data.

Whether to Copy the Database

When determining whether to copy the database, remember that the schema against which the application runs must have access to the same objects as the development instance. The actual name of the schema is unimportant. You can change it during the import process.

See Also: "Importing Export Files" on page 11-11

About the Application ID

It is not necessary to have matching application IDs for a development version and production version of an application. In fact, as a best practice never hard code the application ID into your application. Instead use the application alias (defined on the Edit Application Attributes page), or use a built-in substitution string (such as `APP_ID` and `APP_ALIAS`). Using a substitution string is the best approach since it enables you to change the application ID without impacting any application functionality.

See Also: "Name" on page 5-7 for information about defining an application alias and "Built-in Substitution Strings" on page 4-17 for information about using `APP_ID` and `APP_ALIAS`

Whether to Install a New Oracle HTTP Server

Installing Oracle HTML DB off the Companion CD loads a new Oracle HTTP Server in a separate Oracle home. Additionally, the installer properly configures Oracle HTTP Server with a `mod_plsql` database access descriptor (DAD) and creates all virtual directory mappings.

Using a different Oracle HTTP Server configuration requires additional configuration. For example, you might want to:

- Use a different Oracle HTTP Server from the one that installs with Oracle HTML DB
- Use the Oracle HTTP Server that installs with Oracle Application Server release 10*g*
- Use the Oracle HTTP Server that installs with Oracle9*i* Application Server

All of these scenarios require you manually configure the `mod_plsql` DAD and map the directory from which Oracle HTML DB retrieves images.

You can also have a single Oracle HTTP Server serve pages for multiple Oracle HTML DB instances. In this configuration, all Oracle HTML DB instances must be the same version, map to the same image directory, and have a unique `mod_plsql` DAD.

> **See Also:** *Oracle HTML DB How To Documents* section of Oracle Technology Network for information about implementing these configurations

How to Deploy an Application to Another Oracle HTML DB Instance

Whether you want to move an application to another workspace or just make a copy of it, the deployment process involves the following steps:

1. Move the supporting database objects (if appropriate). Review the Database Dependencies report to determine what objects to move. See "About the Database Object Dependencies Report" on page 5-45.
2. Export the application definition and all related files. See "Exporting an Application and Related Files" on page 11-5.
3. Import the exported files into the target Oracle HTML DB instance. See "Importing Export Files" on page 11-11.

   Note that if the target instance is a different schema, you also need to export and import any required database objects.
4. Install the exported files from Export Repository. See "Installing Export Files" on page 11-12.

You can import an application into your workspace regardless of the workspace in which it was developed.

About Managing Database Objects

Before you export an application and the appropriate related files, you need to determine if you also need to migrate the database objects referenced by the application. If you are unsure of which database objects to move, review the Database Object Dependencies report.

> **See Also:** "About the Database Object Dependencies Report" on page 5-45

If the target Oracle HTML DB schema is different from the schema used in the development environment, you will need to migrate the database objects referenced by the application. In many cases this process can be as simple as using Oracle database export and import utilities to copy the application schema from the development environment to target Oracle HTML DB instance. The following are two common scenarios where this approach will not work:

- When the object development schema refers to tablespaces to which the target instance schema does not have access
- When the development instance schema has sample data that you do not to want migrate to the target instance schema

If a database administrator or an Oracle HTML DB administrator is the person responsible for exporting Oracle HTML DB applications, be sure to clearly communicate if he or she:

- Should include all data when exporting your application
- Should not include data from specific tables you identify

See Also: "Importing Data" on page 21-2 and "Exporting Data" on page 21-4

Exporting an Application and Related Files

You export and import application definitions and all associated files using the Workspace, Application, CSS, Images, Script Files, Themes, and User Interface Defaults buttons located at the top the Export page.

Topics in this section include:

- Exporting an Application
- Exporting a Page in an Application
- Exporting Cascading Style Sheets
- Exporting Images
- Exporting Static Files
- Exporting Script Files
- Exporting Themes
- Exporting User Interface Defaults

See Also: "Importing Export Files" on page 11-11 and "Installing Export Files" on page 11-12

Exporting an Application

When you export a application, Oracle HTML DB generates a text file containing PL/SQL API calls.

To export an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. From File Format, select how rows in the export file will be formatted:
   - Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
   - Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.

7. From Build Status Override, select one of the following:
   - **Run Application Only** - Developers can only run an application
   - **Run and Build Application** - Developers can both run and edit an application

   Selecting **Run Application Only** is an effective way to protect an application from modifications from other developers. Note that if you select **Run Application Only** you cannot set the argument `p_trace` to `Yes`. Also, be aware that once you override the Build Status, you can only change it in Oracle HTML DB Administration Services.

8. Use the **As of** field to export your application as it was previously defined. Specify the number of minutes in the field provided.

   This utility uses the `DBMS_FLASHBACK` package. Because the timestamp to System Change Number (SCN) mapping is refreshed approximately every five minutes, you may have to wait that amount of time to locate the version you are looking for. The time undo information is retained and influenced by the startup parameter `UNDO_RETENTION` (the default is three hours). However, this only influences the size of the undo tablespace. While two databases may have the same `UNDO_RETENTION` parameter, you will be able to go back further in time on a database with fewer transactions since it is not filling the undo tablespace, forcing older data to be archived.

9. Click **Export Application**.

In addition to exporting the actual application file, you may also need to export other related files such cascading style sheets, images, and script files.

> **See Also:** "Changing Application Build Status" on page 22-27 and "Enabling SQL Tracing and Using TKPROF" on page 10-2

Exporting a Page in an Application

You can export a specific page within an application by clicking the Export button on the Page Definition. When exporting a page, remember the following:

- Exported pages can only be imported sucessfully if they have the same application ID and workspace ID.
- Some pages may reference shared components. To export all pages within an application as well as application shared components, you need to export the entire application.

> **See Also:** "Exporting an Application" on page 11-5 and "Importing Export Files" on page 11-11

To export a page in an application:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. On the Page Definition, click **Export** at the top of the page.

3. From Page, select the page to be exported.
4. From File Format, select how rows in the export file will be formatted:
   - Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
   - Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
5. Use the **As of** field to export a page as it was previously defined. Specify the number of minutes in the field provided.

   This utility uses the `DBMS_FLASHBACK` package. Because the timestamp to System Change Number (SCN) mapping is refreshed approximately every five minutes, you may have to wait that amount of time to locate the version you are looking for. The time undo information is retained and influenced by the startup parameter `UNDO_RETENTION` (the default is three hours). However, this only influences the size of the undo tablespace. While two databases may have the same `UNDO_RETENTION` parameter, you will be able to go back further in time on a database with fewer transactions since it is not filling the undo tablespace, forcing older data to be archived.
6. Click **Export Page**.

Exporting Cascading Style Sheets

Use the Export Cascading Style Sheets utility to export cascading style sheets you imported.

To export related cascading style sheets:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. Click **CSS** at the top of the page.
7. On the Export Cascading Style Sheets page:
   a. Select the cascading style sheets
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
8. Click **Export Style Sheets**.

Exporting Images

Use the Export Images utility to export images you have imported.

To export related images:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.

3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. Click **Images** at the top of the page.
7. On the Export Images page:
   a. Select an application from which to export images.

      Be aware that selecting **Workspace Images** only exports those images in your repository that are not associated with a specific application. If all of your images are associated with specific applications then the workspace image export file will be empty.

   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
8. Click **Export Images**.

Exporting Static Files

Use the Export Static Files utility to export static files you have imported.

To export related static files:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. Click **Files** at the top of the page.
7. On Export Static Files:
   a. Select the files to be exported.
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
8. Click **Export File(s)**.

About Importing into Another Oracle HTML DB Instance

Note that you cannot use Web interface described in this section to import exported static files into another Oracle HTML DB instance. To import exported static files into another Oracle HTML DB instance, use SQL*Plus while connected as the Oracle HTML DB database user. Note that you must export from and to a workspace having the same name and workspace ID.

Exporting Script Files

You can transfer selected scripts from your current Script Repository to a Script Repository in a different Workspace by using the Export and Import tasks.

See Also: "Using the SQL Script Repository" on page 19-1

To export script files:

1. Navigate to the Workspace home page.
2. Click **SQL Workshop**.
3. Click **SQL Scripts**.
4. From the Tasks list, select **Export**.
5. Select the appropriate script files and click **Add to Export**.
6. Review the file name and click **Export All**.

   Select the Remove check box to remove the script.

Exporting Themes

Use the Export Theme utility to export themes from one Oracle HTML DB development instance to a file.

To export an application theme from the Export page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. Click **Themes** at the top of the page.
7. On the Export Application Theme page:
   a. Select the theme to be exported.
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
8. Click **Export Theme**.

To export an application theme from the Themes page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under User Interface, select **Themes**.

   The Themes page appears.

6. From the Tasks list, select **Export Theme**.

   The Export page appears.
7. Click **Themes** at the top of the page.
8. On the Export Application Theme page:
   a. Select the theme to be exported.
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
9. Click **Export Theme**.

See Also: "Managing Themes" on page 7-8

Exporting User Interface Defaults

Exporting User Interface Defaults is useful when you plan to develop on the target machine.

When you export User Interface Defaults, all User Interface Defaults for the selected schema are exported to a single SQL*Plus script. When prompted, save this file to your hard drive. The file contains an API call to create table hints by making calls to the application PL/SQL API. You can use this file to import User Interface Defaults to another database and Oracle HTML DB instance.

See Also: "How to Deploy an Application to Another Oracle HTML DB Instance" on page 11-4 and "Managing User Interface Defaults" on page 9-1

To export User Interface Defaults from the Export page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Export** and click **Next**.
6. Click **User Interface Defaults** at the top of the page.
7. On the Export User Interface Defaults page:
   a. From Schema, select the schema that owns the table associated with the User Interface Defaults.
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
8. Click **Export**.

To export User Interface Defaults from the User Interface Defaults page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under User Interface, select **User Interface Defaults**.

   The User Interface Defaults page appears.
6. Click **Export**.

   The Export page appears.
7. Click **Themes** at the top of the page.
8. On the Export User Interface Defaults page:
   a. From Schema, select the schema that owns the table associated with the User Interface Defaults.
   b. From File Format, select how rows in the export file will be formatted:
      – Choose **UNIX** to have the resulting file contain rows delimited by line feeds.
      – Choose **DOS** to have the resulting file contain rows delimited by carriage returns and line feeds.
9. Click **Export**.

See Also: "Managing User Interface Defaults" on page 9-1

Importing Export Files

Once you export an application and any related files, you need to import them into the target Oracle HTML DB instance before you can install them. As a general rule, always import the application first and then the related files.

To import an application and related files:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. When prompted to select a task, select **Import** and click **Next**.
6. On Import File:
   a. In Import file, specify the file you are importing.
   b. From File Type, select the type of file you are importing.

      Once you have imported a file, you have the option to install it. You can also install it later from the Export Repository.
   c. Verify that File Character Set is correct.
   d. Click **Next**.
7. To install an imported file, click **Install**. On the Application Install page:
   a. From Parse As Schema, select a schema.

This is the schema against which all of the application's SQL and PL/SQL will be parsed.

b. From Build Status Override, select one of the following:

   – **Run Application Only** - Users can only run an application.

   – **Run and Build Application** - Users can run an application and developers can both run and edit an application

   Selecting **Run Application Only** is an effective way to protect an application from modifications from other developers. Be aware that once you override the Build Status, you can only change it in Oracle HTML DB Administration Services.

c. From Install As Application, select one of the following:

   – **Auto Assign New Application ID**

   – **Reuse Application ID From Export File**

   – **Change Application ID**

   Use these options to avoid application ID conflicts. These options come in handy when you need to have two versions of the same application in the same instance. For example, you might be migrating an application to a production instance, but still need to maintain development version.

d. Click **Install Application**.

See Also: "Changing Application Build Status" on page 22-27, "Installing Export Files" on page 11-12, and "Enabling SQL Tracing and Using TKPROF" on page 10-2

Installing Export Files

There are two ways to install export files:

- Import the export files into Application Builder and then install the files from the Export Repository
- Install the export files from SQL*Plus

Topics in this section include:

- Installing Files from the Export Repository
- Installing Export Files from SQL*Plus

Installing Files from the Export Repository

After you import files into the target Oracle HTML DB instance, you must install them before they can become active or available in Application Builder.

To install files stored in the Export Repository:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Export/Import**.
5. Select **View Repository** on the bottom of the page.

6. Select the file to be installed and click **Install** in the Action column adjacent to the appropriate file.

   a. From Parse As Schema, select a schema.

      This is the schema against which all of the application's SQL and PL/SQL will be parsed.

   b. From Build Status, select one of the following:

      – **Run Application Only**

      – **Run and Build Application**

      Select **Run Application Only** to run the application in the target instance, but make it inaccessible to developers. See "Changing Application Build Status" on page 22-27.

   c. From Install As Application, select one of the following:

      – **Reuse Application ID from Export File**

      – **Auto Assign New Application ID**

      – **Change Application ID**

      Use these options to avoid application ID conflicts. These options come in handy when you need to have two versions of the same application in the same instance. For example, you might be migrating an application to a production instance, but still need to maintain development version.

   d. Click **Install Application**.

In addition to installing files, you can also use this page to delete a file from the Export Repository.

To delete a file from the Export Repository:

1. Navigate to the Export Repository.
2. Select the file to be deleted **Delete Checked**.

Installing Export Files from SQL*Plus

You can also install export files from SQL*Plus. Note there are two restrictions:

- The export file must originate from the same workspace as the one into which you are installing.
- If the export file is an application, the application ID will be overwritten. Therefore, the target workspace must own the ID of the application being installed.

Topics in this section include:

- Verifying If Source and Target Workspace IDs Are Identical
- Using SQL*Plus to Install Export Files

Verifying If Source and Target Workspace IDs Are Identical

You can verify that the source and target workspace IDs are identical by running query in SQL Command Processor.

To verify that the source and target workspace IDs are identical:

1. Log in to the source workspace.

2. Click the **SQL Workshop** icon on the Workspace home page.
3. Click **SQL Commands**.
4. Enter the following in the SQL editor pane and click **Run**.

   ```
   SELECT &WORKSPACE_ID. FROM DUAL
   ```

5. Make note of workspace ID.
6. Log in to the target workspace.
7. Repeat steps 2 through 5 to verify the workspace IDs match.

Using SQL*Plus to Install Export Files

To install Oracle HTML DB export files from SQL*Plus:

1. Log in to SQL*Plus as a user account that has access to your workspace (in other words, the workspace has been mapped to the schema).
2. Run the export file.

   For example, if your export file is names f144.sql by default, you would type `@f144` at the command prompt.

About Publishing the Application URL

Once you have deployed your application, loaded data, and created users, you can publish your production URL.

You can determine the URL to your application by positioning the mouse over the **Run** icon on the Application home page. The URL displays in the status bar at the bottom of the page.

The Run icon gets its value from the Home link attribute on the Edit Security Attributes page. This link is only referenced by this icon and by applications that do not use the Oracle HTML DB Login API. Consider the following example:

```
http://htmldb.oracle.com/pls/otn/f?p=11563:1:3397731373043366363
```

Where:

- `htmldb.oracle.com` is the URL of the server
- `pls` is the indicator to use the `mod_plsql` cartridge
- `otn` is the DAD name
- `f?p=` is a prefix used by Oracle HTML DB
- `11563` is application being called
- `1` is the page within the application to be displayed
- `3397731373043366363` is the session number

To run this example application, you would use the URL:

```
http://htmldb.oracle.com/pls/otn/f?p=11563:1
```

When each user logs in, he or she will receive an unique session number.

See Also: "Accessing the Edit Security Attributes Page" on page 5-11

Using Build Options to Control Configuration

Build options enable you to conditionally display specific functionality within an application.

Build options have two possible values: INCLUDE and EXCLUDE. If you specify an attribute as being included, then the HTML DB engine considers it part of the application definition at run time. Conversely, if you specify an attribute as being excluded then the HTML DB engine treats it as if it does not exist.

Topics in this section include:

- Creating Build Options
- About the Build Options Page
- Viewing the Build Option Utilization Report

Creating Build Options

To create a build option:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application Builder home page, click **Shared Components**.
5. Under Logic, select **Build Options**.
6. To create a new build option, click **Create**.
7. Follow the on-screen instructions.

You can choose to enable or disable a build option on the appropriate attributes page. Most attributes pages contain a Configuration section where you can select defined build options.

> **See Also:** "Configuring Standard Application Attributes" on page 5-6 and "Editing Page Attributes" on page 5-19 for information about specifying build options

About the Build Options Page

Once you create a build option, it appears on the Build Options page. You control how the Build Options page displays by making a selection from the View list. Available options include:

- **Icons** (the default) displays each build option as a large icon. To edit a build option, click the appropriate icon.
- **Details** displays each build option as a line in a report. Each line includes the application ID, build option name, status, and a link to the Build Option Utilization report. To edit a build option, click the **appropriate** name.

Viewing the Build Option Utilization Report

Once you create a build option, a Utilization button appears on the Build Options page. This report details build option utilization in the current application.

Note: The Utilization button only appears on the Build Options page after you create a build option.

To view the Build Option Utilization report:

1. Navigate to the Build Options page:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. On the Application Builder home page, click **Shared Components**.
   e. Under Logic, select **Build Options**.

      Build Options page appears.
2. On the Build Options page, click **Utilization**.

   The Build Option Utilization report appears.

12

Managing a Development Workspace

In the Oracle HTML DB development environment, developers log in to a shared work area called a workspace. Users are divided into two primary roles: *developer* and *workspace administrator*.

Developers can create and edit applications as well as view developer activity, session state, workspace activity, application, and schema reports. Workspace administrators additionally can create and edit user accounts, manage groups, manage development services. This section describes how to access many of these reports and perform Workspace administrator tasks.

This section contains the following topics:

- Understanding Administrator Roles
- About the Workspace Administration Page
- Changing Your Password
- Monitoring Activity
- Managing Users
- Managing Groups
- Managing Services

Understanding Administrator Roles

In an Oracle HTML DB development environment there are two different administrator roles:

- Workspace administrator
- Oracle HTML DB administrator

A Workspace administrator uses HTML DB Workspace Administration to manage their workspace. In contrast, an Oracle HTML DB administrator is a superuser that manages the entire hosted instance. In order to become a Workspace administrator, an existing administrator must give the developer administrator privileges on the Edit User Page.

> **See Also:** "Managing an Oracle HTML DB Hosted Service" on page 22-1 for more information administering a workspace as an Oracle HTML DB administrator

About the Workspace Administration Page

You access Workspace Administration by clicking the **Administration** icon on the Workspace home page. On the Workspace Administration page, both developers and workspace administrators have access to the **Monitor Activity** icon. This icon links to the Monitor page where users can view a variety of Page View and Application Changes reports.

Additionally, workspace administrators have access to these icons:

- **Manage Service** links to the Mange Services page. Use this page view workspace information as well as submit requests to the Oracle HTML DB administrator for a new database schema, additional storage, or to terminate workspace service.
- **HTML DB Users** links to Manage Users page. Use this page to create new user accounts, manage existing user accounts, and change user passwords.

A Tasks list displays on the right side of the HTML DB Workspace Administration page. Both developers and workspace administrators have access to the following links:

- **About HTML DB** links to an About page that lists basic product information including the product version, schema compatibility, application owner, workspace information, current user name, language preference, and database version.
- **Change Password** links to a page where users can change their workspace password.

See Also: "Changing Your Password" on page 12-2, "Monitoring Activity" on page 12-3, "Managing Users" on page 12-4, "Managing Groups" on page 12-6, "Managing Services" on page 12-8, and "Managing an Oracle HTML DB Hosted Service" on page 22-1 for more information administering a workspace as an Oracle HTML DB administrator

Changing Your Password

All users can change their password using the Change Password page.

To change your password:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. From the Tasks list, select **Change Password**.
4. Type a new password in the Password field and then retype the password in the Confirm Password field.
5. Click **Apply Changes**.

Note: All users (developers and administrators) can use the Change Password link on the Oracle HTML DB home page to reset their password.

See Also: "Changing a User Password" on page 12-5

Monitoring Activity

Both developers and workspace administrators can monitor changes to page views and entire applications by viewing reports on the Monitor page.

Topics in this section include:

- Accessing the Monitor Page
- Viewing Application Changes by Developer
- Viewing Application Changes by Day
- Viewing Active Sessions

See Also: "Creating Custom Activity Reports Using HTMLDB_ACTIVITY_LOG" on page 14-12

Accessing the Monitor Page

To access the Monitor page:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Monitor Activity**.

   The Monitor page is divided into the following sections:

   - Page Views
   - Application Changes
   - Sessions
4. Select a report to review.

Viewing Application Changes by Developer

To view application changes by developer:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Monitor Activity**.
4. Under Application Changes, select **By Developer.**
5. Specify a time frame. Make a selection form the Time list and click **Go**.
6. To view additional details, select a user ID.

Viewing Application Changes by Day

To view application changes by developer:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Monitor Activity**.
4. Under Application Changes, select **By Application**.
5. Specify a time frame. Make a selection form the Time list and click **Go**.

6. To view additional details, select an application ID.

Viewing Active Sessions

The Active Sessions Report is only available to Workspace administrators. This displays active sessions for the current workspace.

To view application changes by developer:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Monitor Activity**.
4. Under Sessions, select **Active Sessions.**
5. Select the session ID to view the Session Details page.

Managing Users

Workspace administrators can create new user accounts, manage existing user accounts, and change user passwords. User accounts are particularly useful if you are using HTML DB Authentication. HTML DB Authentication checks the username and password against the Oracle HTML DB account repository. The Oracle HTML DB account repository contains account information that developers and administrators when logging in to Oracle HTML DB applications.

Topics in this section include:

- Creating New User Accounts
- Editing Existing User Accounts
- Changing a User Password

See Also: "About HTML DB Account Credentials" on page 13-18 for information about implementing HTML DB Authentication and "Managing Groups" on page 12-6

Creating New User Accounts

Workspace administrators create new user accounts on the Create User page.

To create a new user account:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage HTML DB Users**.

   The Manage HTML DB Users page appears.
4. Click **Create End User**.

   The Create User page appears.
5. Under User Identification, enter the appropriate information. Required fields are marked with a red asterisk (*).
6. Under Developer Privileges, specify whether the user is a developer or an administrator.

- **User is a developer** - These users can create and edit applications as well as view developer activity, session state, workspace activity, application, and schema reports.
- **User is an administrator** - Workspace administrators additionally can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.

7. Under User Groups, select an optional user group.

   You can use groups to restrict access to various parts of an application. Groups are primarily useful when using HTML DB Authentication.

8. Click **Create User** or **Create and Create Another**.

   See Also: "Managing Groups" on page 12-6 and "Adding Users to and Removing Users from a Group" on page 12-7

Editing Existing User Accounts

Workspace administrators edit existing user accounts on the Edit User page.

To edit an existing a user account:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage HTML DB Users**.

   The Manage HTML DB Users page appears.

4. Click **Existing Users**.

   The Existing Users page appears. You control how the page displays by making a selection from the View list. Available options include:

   - **Icons** (the default) displays each user as a large icon. To edit a user, click the appropriate icon.
   - **Details** displays each user as a line in a report. To edit a user, click a user name.

   The Edit User page appears.

5. Under Developer Privileges, specify whether the user is a developer or an administrator.

   Developers having administrator privilege have access to all tools and reports available on the Workspace Administration list. These users can also alter passwords of users within the same workspace.

6. Under User Groups, select an optional user group.

   You can use groups to restrict access to various parts of an application. Groups are primarily useful when using HTML DB Authentication.

7. Follow the on-screen instructions.

   See Also: "Adding Users to and Removing Users from a Group" on page 12-7

Changing a User Password

Workspace administrators can change the password of any user in their workspace.

To change a user password:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage HTML DB Users**.

   The Manage HTML DB Users page appears.
4. Click **Existing Users**.

   The Existing Users page appears.
5. To search for an existing user, enter a query in the Find field and clicking **Go**.
6. Select a user.
7. Scroll down to Password, type a new password in the Password and Confirm Password fields, and click **Apply Change**s.

Managing Groups

Workspace administrators can create groups to restrict access to various parts of an application. Keep in mind, however, that groups are not portable over different authentication schemes. Groups are primarily useful when using HTML DB Authentication.

Topics in this section include:

- Creating a Groups
- Editing an Existing Group
- Viewing Group Assignment Reports
- Adding Users to and Removing Users from a Group

See Also: "About HTML DB Account Credentials" on page 13-18 for information about implementing HTML DB Authentication and "Managing Users" on page 12-4

Creating a Groups

To create a new group:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage HTML DB Users**.
4. Click **Create Group**.

   The Create/Edit Group page appears.
5. Specify a group name, description, and click **Create Group**.

Editing an Existing Group

To edit an existing group:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage HTML DB Users**.

4. Click **Existing Groups**.

   The Existing Groups page appears.You control how the page displays by making a selection from the View list. Available options include:

   - **Icons** (the default) displays each group as a large icon. To edit a group, click the appropriate icon.
   - **Details** displays each group as a line in a report. To change the group name or description, click the appropriate name.

5. Make the appropriate change and click **Apply Changes**.

Viewing Group Assignment Reports

To view a report of user group assignments:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Mange HTML DB Users**.
4. Click **User Group Assignments**.

   The User Groups Assignments report appears.

Adding Users to and Removing Users from a Group

To add a user to a group:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Mange HTML DB Users**.
4. Click **Existing Users**.

   The Existing Users page appears.
5. Select a user.

   The Edit User page appears.
6. Scroll down to User Groups.
7. Select a group from the Groups list.
8. Click **Apply Changes**.

To remove a user to a group:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Mange HTML DB Users**.
4. Click **Existing Users**.

   The Existing Users page appears.
5. Select a user.

   The Edit User page appears.
6. Scroll down to User Groups.
7. Deselect the selected group in the Groups list.

8. Click **Apply Changes**.

Managing Services

Workspace administrators use the Managing Services page to view reports about the current workspace and associated schemas, manage session state, purge log files, terminate a workspace service, or request a new schema or additional storage.

Topics in this section include:

- Viewing a Workspace Overview Report
- Managing Session State and User Preferences
- Purging Log Files
- Terminating a Workspace Service
- Requesting a Database Schema
- Requesting Additional Storage
- Viewing Schema Reports
- Disabling PL/SQL Program Unit Editing
- Managing Application Models

Viewing a Workspace Overview Report

Workspace administrators can view a summary report about the current workspace by selecting **Workspace Overview** on the Manage Services page.

To view a summary report about the current workspace:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services** and Workspace Overview.
4. Follow the on-screen instructions.

Managing Session State and User Preferences

A session is a logical construct that establishes persistence (or stateful behavior) across page views. Each session is assigned a unique ID which the HTML DB engine uses to store and retrieve an application's working set of data (or session state) before and after each page view. Sessions persist in the database until purged by an administrator.

Workspace administrators can purge session state or user preferences within their workspace on the Session State Management page.

Topics in this section include:

- Managing Session State and User Preferences for the Current Session
- Purging Sessions by Age
- Viewing Session Details Prior to Removing Session State
- Viewing Preferences for Users
- Purging Preferences for a Specific User

See Also: "Understanding Session State Management" on page 4-8, "Managing User Preferences" on page 14-24, and "Managing Session State" on page 22-20

Managing Session State and User Preferences for the Current Session

Workspace administrators can use the Session State Management page to manage session state and user preferences for the current session.

To manage session state and user preferences for the current session:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services.**
4. Click **Session State**.
5. When the Session State Management page appears, click **Report your current session, with an option to purge**.
6. Under Session State you can:
   - Reset the session state for the current session by clicking **Purge Session State**.
   - View information about the current session by clicking **View Session State**.
7. Under User Preferences, you can:
   - View preferences for the current user, by clicking **View Preferences**.
   - Reset user preferences for the current user by clicking **Reset Preferences**.

See Also: "Viewing Session State" on page 4-9

Purging Sessions by Age

Sessions are used to maintain user state. Workspace administrators can purge existing sessions by age.

To purge existing session by age:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Session State**.
5. Select **Purge existing sessions by age**.
6. Make a selection from Sessions older than.
7. Click one of the following buttons:
   - **Report Session** generates a report detailing the total number of sessions for the workspace, the number of users, and the number of old sessions.
   - **Purge Sessions** purges existing sessions by age.

See Also: "Viewing Session State" on page 4-9

Viewing Session Details Prior to Removing Session State

Workspace administrators can determine whether to remove existing sessions by first reviewing session details on the Session State page.

To view session details prior to removing session state:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Service.**
4. Click **Session State**.
5. Select **Report recent sessions with drilldown to session details**.
6. To narrow the results, select a time increment, specify a user, and click **Go**.

Viewing Preferences for Users

Workspace administrators view preferences for a specific user on the Purge Preferences report.

To view the Purge Preferences report:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Session State**.
5. On the Session State Management page, select **Report preferences for users**.

   The Preferences Report page appears.
6. Specify a user and click **Go**.

Purging Preferences for a Specific User

Workspace administrators purge preferences for a specific user on the Purge Preferences page.

To purge preferences for a specific user:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Service.**
4. Click **Session State**.
5. On the Session State Management page, select **Purge preferences for a selected user**.

   The Purge Preferences page appears.
6. Select a specific user and click **Report**.

   A report appears at the bottom of the page.
7. To purge the displayed user preferences, click **Purge User Preferences**.

Purging Log Files

Oracle HTML DB automatically deletes log entries older then one month. Workspace administrators can manually purge developer logs and the External Count Clicks log on the Log files page.

See Also: "Managing Logs" on page 22-18 for more information deleting log files as an Oracle HTML DB administrator

Purging the Developer Activity Log

The Developer Activity Log track changes to applications within the current workspace.

To purge the Developer Activity Log:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Logs**.
5. Click **Purge Developer Log**.

Purging the External Clicks Log

The External Clicks Log counts clicks from an Oracle HTML DB application to an external site. You can implement this functionality using `COUNT_CLICK` procedure.

See Also: "COUNT_CLICK Procedure" on page 16-4

To purge the External Clicks Log:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Logs**.
5. Click **Purge Click Log**.

Terminating a Workspace Service

To submit a request to the Oracle HTML DB administrator to terminate workspace service:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Terminate Service**.
5. Follow the on-screen instructions and click **Request Termination**.

Requesting a Database Schema

To submit a request to the Oracle HTML DB administrator for a new database schema:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Request Schema**.
5. Enter a new schema name and click **Request Database Schema**.

Requesting Additional Storage

To submit a request to the Oracle HTML DB administrator for additional storage space for your workspace:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Request Storage**.
5. Specify the amount of storage to add and click **Request Storage**.

Viewing Schema Reports

Schema Reports offer summaries of database privileges by schema as well as a list of all database schemas available in the current workspace.

See Also: "Viewing Application Reports" on page 5-44

To view Schema Reports:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Schema Reports**.

   Available Schema Reports include:

   - Database Privileges by Schema
   - Database Schemas Available for the Current Workspace

   See Also: "Viewing Application Reports" on page 5-44

Disabling PL/SQL Program Unit Editing

By default, developers can change and compile PL/SQL source code when browsing database procedures, packages, and functions in Object Browser. You can disable PL/SQL program unit editing by selecting **Do not allow PL/SQL program unit editing** on the Workspace Preferences page.

To disable PL/SQL program unit editing:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Workspace Preferences**.

   The Workspace Preferences page appears.
5. From PL/SQL Editing select one of the following:
   - Allow PL/SQL program unit editing
   - Do not allow PL/SQL program unit editing

If you select **Do not allow PL/SQL program unit editing**, developers can still create and replace PL/SQL program units using scripts or the SQL Command Processor.

See Also: "Using SQL Command Processor" on page 20-1

Controlling PL/SQL Editing for an Oracle HTML DB Instance

You can also control PL/SQL program unit editing for an entire Oracle HTML DB instance within the Oracle HTML DB Administration Services application.

See Also: "Controlling PL/SQL Program Unit Editing" on page 22-22

Managing Application Models

Running the Create Application Wizard creates an application model. This model contains basic application property values, such as the application pages and page definitions, DML processes, and multi-row operation processes. When you create a new application, you can base it on an existing application model, making the creation process more productive.

Deleting an Application Model

You can remove unwanted application models on the Application Models page.

To delete an application model:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Services**.
4. Click **Application Models**.

   The Application Models page appears.
5. To search for a model, enter a case insensitive query in the Model field and click **Go**.
6. Select the models you want to delete and click **Delete Checked**.

See Also: "Creating an Application" on page 6-1

13 Managing Security

You can provide security for your application through cross-site scripting protection, session state protection, authentication, and authorization.

This section contains the following topics:

About Cross-Site Scripting Protection

Cross site-scripting (also referred to as XSS) is a security breach that takes advantage of dynamically generated Web pages. In a XSS attack, a Web application is sent a script that activates when it is read by a user's browser. Once activated, these scripts can steal data, or even session credentials and return the information to the attacker. If malicious code were introduced into an Oracle HTML DB application, it could be rendered into HTML regions and other places within the application during normal page rendering. To prevent the introduction of malicious code into session state, the HTML DB engine escapes characters in certain cases.

Topics in this section include:

Protecting HTML Regions and Other Static Areas

In HTML regions and other static display areas, you can reference session state using the `&ITEM.` notation. Examples of static displays areas include HTML regions, page headers and footers, region headers and footers, region titles, button labels, help text, form item labels and post-element text, templates, radiogroup (before and after field text), event success messages, event error messages, navigation bar attributes, application static substitution string values, chart labels and legends, breadcrumbs and list framing text, and calendar text, labels, or legends.

Using the Cross-Site Scripting Protection Attribute

You can control whether items are escaped when they are rendered using the Cross-Site Scripting Protection attribute on the Edit Page Item page.

To enable cross-site scripting protection:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Items, select the item name.

   The attributes page for the item appears.
3. Scroll down to Security.
4. From Cross-Site Scripting Protection select one of the following:
   - **Yes** - Indicates the item is deemed safe to render exactly as is when fetched from session state. If you select **Yes**, the item is escaped when it is passed into session state using an `f?p` URL or when saved in session state when it is submitted on the page.
   - **No** - Specifies the item should be escaped when it is rendered. If you select **No**, the item is not escaped when it is passed into session state using an `f?p` URL or saved in session state when it is submitted on the page.
5. Click **Apply Changes**.

Note: Application-level items have an implicit setting of **Yes** for this attribute which cannot be changed.

Protecting Dynamic Output

Items fetched from session state and rendered using `htp.p` or other methods should be explicitly escaped by the code where it is appropriate to do so. For example, suppose PL/SQL dynamic content region on a page uses the following:

```
 htp.p(v('SOME_ITEM'));
```

If the value of the item fetched from session state could contain unintended tags or script, you might want to use the following in the region:

```
htp.p(htf.escape_sc(v('SOME_ITEM'));
```

However, if you are confident that the fetched value is safe for rendering, you do not need to escape the value. As a developer, you need to determine when it is appropriate to not escape output.

Protecting Report Regions

The Oracle HTML DB escapes data rendered in the body of a report. References to session state in report headings and messages, are fetched from session state using a method that assumes that referenced values have the Cross-Site Scripting Protection attribute enabled. In other words, these values are not escaped when they are fetched because it is assumed that they have been escaped on input. As you create reports, it is important you understand this assumption and not reference items in reports for which the Cross-Site Scripting Protection attribute is set to No.

Protecting Form Items

When form items, including hidden items, obtain their values during page rendering, the resulting string is escaped before rendering. The only exception are items of display type **Display as Text (does not save state)**, which are not escaped.

Items having the display type **Display as Text (does not save state)** feature a unique escape on input behavior. These items obtain values containing HTML or script by way a page computation, page processes, or source and default values from within an application, but they cannot obtain values using `f?p` URLs or by POSTing them. This behavior makes them a good choice for framing text values in HTML markup or for including JavaScript.

Remembering to Follow Best Practices

As an added precaution, always follow best practices to guard against cross-site scripting attacks. For example, during the development process think about whether or not an item could have malicious content stored in it by URL tampering or another means. Avoid referencing form items using `&MY_ITEM.` for rendering in most types of static areas since it can lead to security vulnerabilities. Instead, use application-level items or page items of type **Display as text (does not save state)**. Another easy safeguard is to escape less than (<), greater than (>), and ampersands (&).

Understanding Session State Protection

Session State Protection is a built-in functionality that prevents hackers from tampering with the URLs within your application. URL tampering can adversely affect program logic, session state contents, and information privacy.

Enabling Session State Protection is a two step process. First, you enable the feature. Second, you set page and item security attributes.

Topics in this section include:

- How Session State Protection Works
- Enabling Session State Protection
- Configuring Session State Protection

How Session State Protection Works

When enabled, Session State Protection uses the Page Access Protection attributes and the Session State Protection item attributes in conjunction with checksums positioned in `f?p=` URLs to prevent URL tampering and unauthorized access to and alteration of session state. When Session State Protection is disabled, the page and item attributes related to session state protection are ignored and checksums are not included checksums in generated `f?p=` URLs.

Enabling Session State Protection

You can enable session state protection from either the Edit Security Attributes page or the Session State Protection page.

Enabling Session State Protection is a two step process. First, you enable the feature. Second, you set page and item security attributes. You can perform these steps using a wizard, or you can set security attributes for pages and items manually on the Session State Protection page.

Topics in this section include:

- Enabling Session State Protection from Edit Security Attributes
- Enabling Session State Protection from Session State Protection

Enabling Session State Protection from Edit Security Attributes

To enable Session State Protection from the Edit Security Attributes page:

1. Click the **Application Builder** icon on Workspace home page.
2. Select an application.
3. Click **Edit Attributes**.
4. Click **Edit Security Attributes**.
5. Scroll down to Session State Protection and select **Enabled** from the Session State Protection list.
6. To configure session Session State Protection, click **Manage Session State Protection**.

   The Session State Projection page appears.
7. Navigate to the Edit Security Attributes page to set page and item security attributes.

> **Tip:** To disable Session State Protection, perform the previous steps again, but select **Disabled** instead of **Enabled**. Disabling Session State Protection will not change existing security attribute settings, but those attributes will be ignored at runtime.

About the Expire Bookmarks Button Enabling Session State Protection affects whether or not bookmarked links to the current application will work. Consider the following rules:

1. Bookmarked links created after Session State Protection is enabled will work if the bookmarked link contains a checksum.
2. Bookmarked links created before Session State Protection is enabled will not work if the bookmarked link contains a checksum.
3. Bookmarks that do not contain checksums or contain unnecessary checksums will not be affected by Session State Protection.

During page rendering, the HTML DB engine uses a hidden application attribute (a checksum salt) during computation and to verify checksums included in `f?p` URLs. When you enable Session State Protection, the HTML DB engine includes checksums. You can reset the checksum salt attribute by clicking **Expire Bookmarks** on the Edit Security Attributes page. Note that if you click **Expire Bookmarks,** bookmarked URLs used to access your application that contain previously generated checksums will fail.

Enabling Session State Protection from Session State Protection

To enable Session State Protection:

1. Navigate to the Shared Components page:

   a. Click the **Application Builder** icon on Workspace home page.
   b. Select an application.
   c. Under Security, select **Session State**.

      The Session State Protection page appears. Note the current Session State Protection status (Enabled or Disabled) displays at the top of the page.

2. Click the **Set Protection** button.

   The Session State Protection wizard appears.

3. Under Select Action, select **Enable** and click **Next**.

   Next, determine whether to set security attributes for pages and items.

4. Select **Enable** and click **Next**.
5. Click **Enable Session State Protection**.

   > **Tip:** To disable Session State Protection, perform the same steps, but select **Disable** instead of **Enable**. Disabling Session State Protection will not change existing security attribute settings, but will be ignore them at run time.

Configuring Session State Protection

Once you have enabled Session State Protection, the next step is to configure security attributes. You can configure security attributes in two ways:

- Use a wizard and select a value for specific attribute categories. Those selections will then be applied to all pages and items within the application.
- Configure values for individual pages, items, or application items.

Topics in this section include:

- Reviewing Existing Session State Protection Settings
- Configuring Session State Protection Using a Wizard
- Configuring Session State Protection for Pages
- Configuring Session State Protection for Items
- Configuring Session State Protection for Application Items

> **Tip:** Before you can configure security attributes, you must first enable Session State Protection. See "Enabling Session State Protection" on page 13-3.

Reviewing Existing Session State Protection Settings

You can review a summary of Session State Protection settings for pages, items, and application items on the first page of the Session State Protection wizard.

To view summaries of existing Session State Protection settings:

1. Navigate to the Session State Protection page:
   a. Click the **Application Builder** icon on Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Security, select **Session State Protection**.

The Session State Protection page appears.

2. Click **Set Protection**.
3. Expand the following reports at the bottom of the page:
   - Page Level Session State Protection Summary
   - Page Item Session State Protection Summary
   - Application Item Session State Protection

Configuring Session State Protection Using a Wizard

When you configure Session State Protection using a wizard, you set a value for specific attribute categories. Those selections are then applied to all pages and items within the application.

To configure Session State Protection using a wizard:

1. Navigate to the Session State Protection page:
   a. Click the **Application Builder** icon on Workspace the home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Security, select **Session State Protection**.

      The Session State Protection page appears.
2. Click **Set Protection**.

   The Session State Protection wizard appears.
3. Under Select Action, select **Configure** and click **Next**.
4. For Page Access Protection, select one of the following:
   - **Unrestricted** - The page may be requested using an URL with or without session state arguments (Request, Clear Cache, Name/Values).
   - **Arguments Must Have Checksum** - If Request, Clear Cache, or Name/Value arguments appear in the URL, a checksum must also be provided. The checksum type must be compatible with the most stringent Session State Protection attribute of all the items passed as arguments.
   - **No Arguments Allowed** - A URL may be used to request the page but no Request, Clear Cache, or Name/Value arguments are allowed.
   - **No URL Access** - The page may not be accessed using a URL, however the page may be the target of a Branch to Page branch type, which does not do a URL redirect.
5. For Application Item Protection, select one of the following:
   - **Unrestricted** - The item's session state may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.

- **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
- **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
- **Restricted - May not be set from browser** - The item may not be altered using the URL or POSTDATA. Use this option when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is applicable only to items that cannot be used as data entry items and is always observed even if Session State Protection is disabled.

  Use this attribute for application items or for page items with any of these Display As types:

  – Display as Text (escape special characters, does not save state)

  – Display as Text (does not save state)

  – Display as Text (based on LOV, does not save state)

  – Display as Text (based on PLSQL, does not save state)

  – Text Field (Disabled, does not save state)

  – Stop and Start HTML Table (Displays label only)

6. For Page Data Entry Item Protection, select one of the following:
   - **Unrestricted** - The item's session state may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
7. For Page Display-Only Item Protection, select one of the following:

- **Unrestricted** - The item may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
- **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
- **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
- **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
- **Restricted: May not be set from browser** - The item may not be altered using the URL or POSTDATA. Use this when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is always observed, even if Session State Protection is disabled.

  This attribute may be used with any of these Display As types:

  - Display as Text (escape special characters, does not save state)
  - Display as Text (does not save state)
  - Display as Text (based on LOV, does not save state)
  - Display as Text (based on PLSQL, does not save state)
  - Text Field (Disabled, does not save state)
  - Stop and Start HTML Table (Displays label only)

8. Click **Next**.
9. Click **Finish**.

Configuring Session State Protection for Pages

To configure Session State Protection for Pages:

1. Navigate to the Session State Protection page:
   a. Click the **Application Builder** icon on Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Security, select **Session State Protection**.

      The Session State Protection page appears.
2. Click the **Page** icon.

3. To filter the view, use the Page, Display, and Page Access Protection lists at the top of the page.
4. Select a page ID.

   The Set Page and Item Protection page appears. The following information displays at the top of the page:

   - Application ID and name
   - Session State Protection status (Enabled or Disabled)
   - Page ID
   - Page name
5. For Page Access Protection, select one of the following:
   - **Unrestricted** - The page may be requested using an URL with or without session state arguments (Request, Clear Cache, Name/Values).
   - **Arguments Must Have Checksum** - If Request, Clear Cache, or Name/Value arguments appear in the URL, a checksum must also be provided. The checksum type must be compatible with the most stringent Session State Protection attribute of all the items passed as arguments.
   - **No Arguments Allowed** - A URL may be used to request the page but no Request, Clear Cache, or Name/Value arguments are allowed.
   - **No URL Access** - The page may not be accessed using a URL, however the page may be the target of a Branch to Page branch type, which does not do a URL redirect.
6. For Item Types, select **Data Entry Items** or **Display-only Items**.

   Data Entry items are items that can be altered using forms and include hidden items. Display-Only items are rendered only and are not submitted with the form.
7. If you select **Data Entry Items**, select a session state protection level for each item:
   - **Unrestricted** - The item's session state may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.

8. If you select **Display-only Item**, select a session state protection level for each item:

   - **Unrestricted** - The item may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Restricted: May not be set from browser** - The item may not be altered using the URL or POSTDATA. Use this when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is always observed, even if Session State Protection is disabled. This attribute may be used with any of these Display As types:
     - Display as Text (escape special characters, does not save state)
     - Display as Text (does not save state)
     - Display as Text (based on LOV, does not save state)
     - Display as Text (based on PLSQL, does not save state)
     - Text Field (Disabled, does not save state)
     - Stop and Start HTML Table (Displays label only)
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.

9. Click **Apply Changes**.

Configuring Session State Protection for Items

To configure Session State Protection for items:

1. Navigate to the Session State Protection page:

   a. Click the **Application Builder** icon on Workspace home page.

   b. Select an application.

   c. Click **Shared Components**.

   d. Under Security, select **Session State Protection**.

   The Session State Protection page appears.

2. Click the **Item** icon.

3. To filter the view, select from the Page, Display, and Item Session State Protection lists at the top of the page and click **Go**.
4. Select a page ID.

   The Edit Session State Protection for Page and Items page appears. The following information displays at the top of the page:

   - Application ID and name
   - Session State Protection status (Enabled or Disabled)
   - Page ID
   - Page name
5. For Page Access Protection, select a session state protection level for each item:
   - **Unrestricted** - The page may be requested using an URL with or without session state arguments (Request, Clear Cache, Name/Values).
   - **Arguments Must Have Checksum** - If Request, Clear Cache, or Name/Value arguments appear in the URL, a checksum must also be provided. The checksum type must be compatible with the most stringent Session State Protection attribute of all the items passed as arguments.
   - **No Arguments Allowed** - A URL may be used to request the page but no Request, Clear Cache, or Name/Value arguments are allowed.
   - **No URL Access** - The page may not be accessed using a URL, however the page may be the target of a Branch to Page branch type, which does not do a URL redirect.
6. For Item Types, select **Data Entry Items** or **Display-only Items**.

   Data Entry items are items that can be altered using forms and include hidden items. Display-Only items are rendered only and are not submitted with the form.
7. If you select **Data Entry Items**, select a session state protection level for each item:
   - **Unrestricted** - The item's session state may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.

8. If you select **Display-only Item**, select a session state protection level for each item:
   - **Unrestricted** - The item may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Restricted: May not be set from browser** - The item may not be altered using the URL or POSTDATA. Use this when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is always observed, even if Session State Protection is disabled. This attribute may be used with any of these Display As types:
     - Display as Text (escape special characters, does not save state)
     - Display as Text (does not save state)
     - Display as Text (based on LOV, does not save state)
     - Display as Text (based on PLSQL, does not save state)
     - Text Field (Disabled, does not save state)
     - Stop and Start HTML Table (Displays label only)
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
9. Click **Apply Changes**.

Configuring Session State Protection for Application Items

To configure Session State Protection for application items:

1. Navigate to the Session State Protection page:
   a. Click the **Application Builder** icon on Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Security, select **Session State Protection**.

      The Session State Protection page appears.
2. Click the **Application Item** icon.

3. Select an application item.
4. Under Security, select one of the following from the Session State Protection list:
   - **Unrestricted** - The item's session state may be set by passing the item name/value in a URL or in a form. No checksum is required in the URL.
   - **Restricted - May not be set from browser** - The item may not be altered using the URL or POSTDATA. Use this option when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is only applicable only to items that cannot be used as data entry items and is always observed even if Session State Protection is disabled. This attribute may be used for application items or for page items with any of these Display As types:
     – Display as Text (escape special characters, does not save state)
     – Display as Text (does not save state)
     – Display as Text (based on LOV, does not save state)
     – Display as Text (based on PLSQL, does not save state)
     – Text Field (Disabled, does not save state)
     – Stop and Start HTML Table (Displays label only)
   - **Checksum Required: Application Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace and application. A user-level checksum or a session-level checksum will also suffice (see next bullets). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
   - **Checksum Required: User Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the workspace, application, and user. A session-level checksum will also suffice (see next bullet). Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace but in a different session.
   - **Checksum Required: Session Level** - The item's session state may be set by passing the item name/value in a URL if a checksum is also provided that is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
5. Click **Apply Changes**.

Establishing User Identity Through Authentication

Authentication is the process of establishing each user's identify before they can access your application. Authentication may require a user identify a username and password or could involve the use of digital certificates or a secure key.

When you create an authentication scheme, you have the option of choosing from a number of preconfigured authentication schemes, copying an authentication scheme from an existing application, or creating your own custom authentication scheme.

Topics in this section include:

- Understanding How Authentication Works
- Determining Whether to Include Authentication
- Creating an Authentication Scheme
- Using the Authentication Scheme Repository
- Viewing the Current Authentication Scheme for an Application
- Changing the Current Authentication Scheme for an Application
- Viewing Authentication Scheme Utilization
- About Preconfigured Authentication Schemes
- About Creating an Authentication Scheme from Scratch

Understanding How Authentication Works

You determine how your application interacts with users. If all users have the same rights and privileges they are referred to as public users. However, if your application needs to track each user individually, you need to specify an authentication method.

Authentication establishes the identity of each user who accesses your application. Many authentication processes require a user provide some type of credentials such as a username and password. These credentials are then evaluated and they either pass or fail. If the credentials pass, the user has access to the application. Otherwise, access is denied.

Once a user has been identified, the HTML DB engine keeps track of each user by setting the value of the built-in substitution string `APP_USER`. As a user navigates from page to page, the HTML DB engine sets the value of `APP_USER` to identify the user. The HTML DB engine uses `APP_USER` as one component of a key for tracking each user's session state.

From a programming perspective, you can access `APP_USER` using the following syntax:

- From PL/SQL:

  ```
  V('APP_USER')
  ```

- As a bind variable from either PL/SQL or SQL:

  ```
  :APP_USER
  ```

You can use `APP_USER` to perform your own security checks and conditional processing. For example, suppose you created the following table:

```
CREATE TABLE my_security_table (
  user_id   VARCHAR2(30),
  privilege VARCHAR2(30));
```

Once created, you could populate this table with user privilege information and then use it to control the display of pages, tabs, navigation bars, buttons, regions, or any other control or component.

> **See Also:** "APP_USER" on page 4-21 and "Configuring Security Attributes" on page 5-11

Determining Whether to Include Authentication

As you create your application, you need to determine whether to include authentication. You can:

- **Choose to not require authentication**. Oracle HTML DB does not check any user credentials. All pages of your application are accessible to all users.
- **Select a built-in authentication scheme**. Create an authentication method based on available preconfigured authentication schemes. Depending on which scheme you choose, you may also have to configure the corresponding components of Oracle 10*g*iAS, Oracle Internet Directory, or other external services.
- **Create custom authentication scheme**. Create a custom authentication method, giving you complete control over the authentication interface. To implement this approach, you must provide a PL/SQL function the HTML DB engine executes before processing each page request. This function's Boolean return value determines whether the HTML DB engine processes the page normally or displays a failure page.

Creating an Authentication Scheme

To create an authentication scheme:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.
5. Under Security, select **Authentication Schemes**.

   The Authentication Schemes page appears.
6. To create a new authentication scheme, click **Create**.
7. Specify how the scheme should be created by selecting one of the following:
   - **Based on preconfigured scheme**
   - **As a copy of an existing scheme**
   - **From scratch**
8. Follow the on-screen instructions

   See Also: "About Preconfigured Authentication Schemes" on page 13-17 and "About Creating an Authentication Scheme from Scratch" on page 13-19

Using the Authentication Scheme Repository

Once created, available authentication schemes display in the Authentication Schemes Repository.

To navigate to the Authentication Schemes Repository:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.

5. Under Security, select **Authentication Schemes**.

   The Authentication Schemes page appears. You can change the appearance of the page by making a selection from the View list. Available options include:

   - **Icons** (the default) displays each authentication scheme as a large icon. To edit an authentication scheme, click the appropriate icon.
   - **Details** displays each application item as a line in a report.

     In Details view you can:

     – Edit an authentication scheme by selecting the scheme name

     – View a list of the steps performed on each page by clicking the **Show** icon

     – Apply an authentication scheme to an application by clicking the **make current** link

Viewing the Current Authentication Scheme for an Application

To view the current authentication scheme for an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Edit Attributes**.
5. Click **Edit Security Attributes**.
6. Locate the Authentication section. The current authentication scheme displays next to **Authentication Scheme**.
7. To link to the Authentication Scheme pages and select the scheme name.

Changing the Current Authentication Scheme for an Application

To change the authentication scheme for an application:

1. Navigate to the Authentication Schemes:

   a. Click the **Application Builder** icon on the Workspace home page.

   b. Select an application.

   c. On the Application home page, click **Shared Components**.

      The Shared Components page appears.

   d. Under Security, select **Authentication Schemes**.
2. Click the **Change Current** tab at the top of the page.
3. Select a new authentication scheme and click **Next**.
4. Click **Make Current**.

Viewing Authentication Scheme Utilization

The Authentication Schemes report lists authentication scheme utilization for all applications in the current workspace.

To view the Authentication Schemes report:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   The Applications home page appears.
4. From the Tasks list, select **View Application Reports**.
5. Click **Cross Application Reports**.
6. Select **Authentication Schemes**.
7. Click the application ID to link to the appropriate Application home page.

About Preconfigured Authentication Schemes

When you select a preconfigured authentication scheme, Oracle HTML DB creates an authentication scheme for your application that follows a standard behavior for authentication and session management. The following list describes available preconfigured authentication schemes:

- **Open Door Credentials** enables anyone to access your application using a built-in login page which captures a username. This can be useful during application development.
- **HTML DB Account Credentials** refers to the internal user accounts (also known as "cookie user" accounts) created and managed in the Oracle HTML DB user repository. Using method, your application can easily authenticate against these accounts.
- **LDAP Credentials Verification** requires you specify configuration parameters about the external Lightweight Directory Access Protocol (LDAP) directory you will be using.
- **No Authentication (using DAD)** gets the username from the data access descriptor (DAD), either as the value stored in the DAD configuration or, if the account information is not stored in the DAD configuration, as the username captured using the basic authentication challenge.
- **Oracle Application Server Single Sign-On (HTML DB engine as Partner App)** delegates authentication to the Oracle AS Single Sign-On (SSO) Server. To you use authentication scheme, your site must have already been registered as a partner application with the SSO server. For more information, contact your administrator.
- **Oracle Application Server Single Sign-On (My application as Partner App)** delegates authentication to the SSO server. Requires you register an application with SSO as a partner application.

About DAD Credentials Verification

DAD database authentication uses the Oracle database native authentication and user mechanisms to authenticate users using a basic authentication scheme. To use DAD credentials verification:

- Each application user must have a user account in the Oracle database.
- You must configure a PL/SQL DAD for basic authentication (without account information).

This results in one username/password challenge for browser session for your application users. The user identity token is then made available in the `APP_USER` item.

DAD database authentication is useful when you need to implement an authentication method that requires minimal setup for a manageable number of users. Ideally these users would already have self-managed accounts in the database and your use of this authentication method would be short lived (for example, during the demonstration or prototyping stages of development).

The main drawback of this approach is burdensome account maintenance, especially if users do not administer their own passwords, or if their database accounts exist only to facilitate authentication to your application.

About HTML DB Account Credentials

HTML DB Account Credentials authentication uses internal user accounts (also known as "cookie user" accounts) created and managed in the Oracle HTML DB user repository. Workspace administrators can create and edit user accounts using the Manage Users page. HTML DB Account Credentials is a good solution when:

- You want control of the user account repository
- Username and password based approach to security is sufficient
- You do not need to integrate into a single sign-on framework

This is an especially good approach when you need to get a group of users up and running on a new application quickly.

See Also: "Managing Users" on page 12-4 for information about creating and managing user accounts

About LDAP Credentials Verification

Any authentication scheme that uses a login page may be configured to use Lightweight Directory Access Protocol (LDAP) to verify the username and password submitted on the login page. Application Builder includes wizards and edit pages that explain how to configure this option. These wizards assume that an LDAP directory accessible to your application for this purpose already exists and that it can respond to a `SIMPLE_BIND_S` call for credentials verification. When you create a LDAP Credentials authentication scheme, the wizard requests and saves the LDAP host name, LDAP port, and the DN string. An optional pre-processing function can be specified to adjust formatting of the username passed to the API.

About Single Sign-On Server Verification

Oracle HTML DB applications can operate as partner applications with Oracle Application Server's Single Sign-On (SSO) infrastructure. To accomplish this, you must register your application (or register the HTML DB engine) as the partner application. To register your application or the HTML DB engine as a partner application, follow the Oracle Application Server instructions for registering partner applications and install the Oracle 9iAS SSO Software Developer Kit (SDK).

If you choose this approach, your application will not use an integrated login page. Instead, when a user accesses your application in a new browser session, the HTML DB engine redirects to the Single Sign-On login page. After the user is authentication by SSO, the SSO components redirect back to your application, passing the user identity and other information to the HTML DB engine. The user can then continue to use the application until they log off, terminate their browser session, or until some other session-terminating event occurs.

About Creating an Authentication Scheme from Scratch

Creating an authentication scheme from scratch gives you complete control over your authentication interface. This is the best approach for applications when any of the following is true:

- Database authentication, or other methods are not adequate.
- You want to develop your own login form and associated methods.
- You want to delegate all aspects of user authentication to external services such as Oracle 10*g*AS Single Sign-On.
- You want to control security aspects of Oracle HTML DB session management.
- You want to record or audit activity at the user or session level.
- You want to enforce session activity or expiry limits.
- You want to program conditional n-way redirection logic before Oracle HTML DB page processing.
- You want to integrate your application with non-Oracle HTML DB applications using a common session management framework.
- Your application consists of multiple applications that operate seamlessly (for example, more than one Oracle HTML DB application ID).

> **See Also:** "HTMLDB_CUSTOM_AUTH" on page 16-57 for more information

About Session Management Security

When running custom authentication, Oracle HTML DB attempts to prevent two improper situations:

- Intentional attempts by a user to access session state belonging to someone else. However, users can still type in an arbitrary application session ID into the URL.
- Inadvertent access to a stale session state (probably belonging to the same user from an earlier time). This would commonly result from using bookmarks to application pages.

Oracle HTML DB checks that the user identity token set by the custom authentication function matches the user identity recorded when the application session was first created. If the user has not yet been authenticated and the user identity is not yet known, the session state being accessed does not belong to someone else. These checks determine whether the session ID in the request can be used. If not, the HTML DB engine redirects back the same page using an appropriate session ID.

Building a Login Page

When you create a new application in Oracle HTML DB, a login page is created. The alias for the page is `'LOGIN'`. You can use this page as the 'invalid session page' in an authentication scheme. The page is constructed with processes that call the Oracle HTML DB login API to perform credentials verification and session registration.

You can also build your own login pages using the pre-built pages as models and tailoring all of the user interface and processing logic to your requirements.

To create a login page for your application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Create Page**.
5. Select **Login Page**.
6. Specify Login page attributes and click **Create**.

About Deep Linking

Deep linking refers to the ability to link to an Oracle HTML DB page out of context (for example, from a hyperlink in an e-mail or workflow notification). When you link to a page out of context and the application requires the user be authenticated, the user will be taken to the login page. After credentials verification, the HTML DB engine automatically displays the page that was referenced in the original link. Deep linking is supported for applications that use authentication schemes.

Providing Security Through Authorization

Authorization is a broad term for controlling access to resources based on user privileges. While conditions control the rendering and processing of specific page controls or components, authorization schemes control user access to specific controls or components.

Topics in this section include:

- How Authorization Schemes Work
- Creating an Authorization Scheme
- Attaching an Authorization Scheme to an Application, Page, or Components
- Viewing Authorization Reports

How Authorization Schemes Work

An authorization scheme extends the security of your application's authentication scheme. You can specify an authorization scheme for an entire application, a page, or specific control such as a region, item, or button. For example, you could use an authorization scheme to selectively determine which tabs, regions, or navigation bars a user sees.

An authorization scheme either succeeds or fails. If a component or control level authorization scheme succeeds, the user can view the component or control. If it fails, the user cannot view the component or control. If an application or page level authorization scheme fails, then Oracle HTML DB displays a previously defined message.

When you define an authorization scheme you give it a unique name. Once defined, you can attach it to any component or control in your application. To attach an authorization scheme to a component or control in your application, simply navigate to the appropriate attributes page and select an authorization scheme from the Authorization Scheme list.

Creating an Authorization Scheme

Before you can attach an authorization scheme to an application or an application component or control, you must first create it.

To create an authorization scheme:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.
5. Under Security, select **Authorization Schemes**.
6. Click **Create**.
7. Specify how to create an authorization scheme by selecting one of the following:
   - **From Scratch**
   - **As a Copy of an Existing Authorization Scheme**
8. Follow the on-screen instructions.

Editing Attributes of an Existing Authorization Scheme

To edit attributes of an existing authorization scheme:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.
5. Under Security, select **Authorization Schemes**.

   The Authorization Schemes page appears. By default, each scheme displays as an icon.
6. To access a detail view of all schemes, select **Details** from the View list.

   The Authorization Schemes page appears. You can change the appearance of the page by making a selection from the View list. Available options include:
   - **Icons** (the default) displays each authentication scheme as a large icon. To edit an authorization scheme, click the appropriate icon.
   - **Details** displays each application item as a line in a report. To edit an authorization scheme, select the scheme name.

About the Evaluation Point Attribute

You can specify when your authorization scheme is validated in the Evaluation Point attribute. You can choose to have your authorization scheme validated once for each session or once for each page view.

Keep in mind, that if you specify that an authorization scheme should be evaluated once for each session and the authorization scheme passes, the underlying code, test, or query will not be executed again for the duration of the application session. If your authorization scheme consists of a test whose results might change if evaluated at different times during the session, then you should specify that the evaluation point be once for each page view.

About Resetting Authorization Scheme State

If an authorization scheme is validated once for each session, Oracle HTML DB caches the validation results in each user's session cache. You can reset a session's authorization scheme state by calling the `HTMLDB_UTIL.RESET_AUTHORIZATIONS` API.

Calling this procedure nulls out any previously cached authorization scheme results for the current session. Be aware that this procedure takes no arguments and is part of the publicly executable `HTMLDB_UTIL` package.

See Also: "RESET_AUTHORIZATIONS Procedure" on page 16-23

Attaching an Authorization Scheme to an Application, Page, or Components

Once you have created an authorization scheme you can attach it to an entire application, page, control, or component.

Topics in this section include:

- Attaching an Authorization Scheme to an Application
- Attaching an Authorization Scheme to a Page
- Attaching an Authorization Scheme to a Control or Component

Attaching an Authorization Scheme to an Application

To attach an authorization scheme to an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click the **Edit Attributes** icon.

   The Application Attributes page appears.
5. Click the **Edit Security Attributes** icon.
6. Scroll down to Authorization and make a selection from the Authorization Scheme list.

Attaching an Authorization Scheme to a Page

To attach an authorization scheme to a page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.
5. Click **Edit Attributes**.
6. Scroll down to Security and make a selection from the Authorization Scheme list.

Attaching an Authorization Scheme to a Control or Component

To attach an authorization scheme to a page component or control:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.
5. Click the name of the component or control to which you want to apply the authorization scheme.
6. Scroll down to Security and make a selection from the Authorization Scheme list.

Viewing Authorization Reports

You can use the Authorization Scheme Subscription and Authorization Scheme Utilization reports to better manage authorization schemes within your application.

To view authorization scheme reports:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.

   The Shared Components page appears.
5. Under Security, select **Authorization Schemes**.
6. Click the appropriate tab at the top of the page:
   - **Subscription**
   - **Utilization**

Subscription

Use the Authorization Scheme Subscription report to view details about authorization schemes subscription.

Utilization

Use the Authorization Scheme Utilization report to view details about authorization schemes utilization.

To view additional reports indicating which pages having authorization schemes and which do not, select one of the following from the Tasks list:

- Report Pages With Authorization Schemes
- Report Pages Without Authorization Schemes

14 Advanced Programming Techniques

This section provides information about advanced programming techniques including establishing database links, using collections, running background SQL, utilizing Web services, and managing user preferences.

This section contains the following topics:

- Sending E-mail from an Application
- Accessing Data with Database Links
- Using Collections
- Creating Custom Activity Reports Using HTMLDB_ACTIVITY_LOG
- Running Background PL/SQL
- Implementing Web Services
- Managing User Preferences

> **See Also:** "Oracle HTML DB APIs" on page 16-1 and "Deploying an Application" on page 11-1

Sending E-mail from an Application

You can send an e-mail from an Oracle HTML DB application by:

- Creating a background job to periodically send all mail messages stored in the active mail queue
- Calling the PL/SQL package `HTMLDB_MAIL`

Topics in this section include:

- Sending E-mail Using a Background Job
- Sending E-mail Manually by Calling HTMLDB_MAIL

> **See Also:** "Configuring Oracle HTML DB to Send Mail" on page 22-23 and "Managing E-mail" on page 22-28 for information about viewing the mail queue and the mail log

Sending E-mail Using a Background Job

Oracle HTML DB stores unsent e-mail messages in a table named `HTMLDB_MAIL_QUEUE`. A `DBMS_JOB` background process is automatically created when you install Oracle HTML DB. This background process pushes the mail queue every 15 minutes. The package that is executed by the background process has two parameters:

- p_smtp_host is the hostname of your SMTP gateway. The default value is localhost.
- p_smtp_portno is the port number of your SMTP gatway. The default value is 25.

The most efficient approach to sending e-mail is to create a background job (using a DBMS_JOB package) to periodically send all mail messages stored in the active mail queue.

> **See Also:** "Configuring Oracle HTML DB to Send Mail" on page 22-23

Sending E-mail Manually by Calling HTMLDB_MAIL

You can send an e-mail from an Oracle HTML DB application by calling the PL/SQL HTMLDB_MAIL package. This package is built on top of the Oracle supplied UTL_SMTP package. Because of this dependence, in order to use HTMLDB_MAIL, the UTL_SMTP package must be installed and functioning.

> **See Also:** *Oracle Database PL/SQL Packages and Types Reference* for more information

HTMLDB_MAIL contains two procedures for manually sending e-mail:

- Use the HTMLDB_MAIL.SEND procedure to manually send an outbound e-mail message from your application
- Use HTMLDB_MAIL.PUSH_QUEUE to deliver mail messages stored in HTMLDB_MAIL_QUEUE

Oracle HTML DB stores unsent e-mail messages in a table named HTMLDB_MAIL_QUEUE. You can deliver mail messages stored in this queue to the specified SMTP gateway by calling the procedure HTMLDB_MAIL.PUSH_QUEUE. This procedure requires two input parameters:

- p_smtp_hostname defines the host name of your SMTP gateway
- p_smtp_portno defines port number of your SMTP gateway (for example, 25)

Oracle HTML DB logs successfully submitted messages in the table HTMLDB_MAIL_LOG with the timestamp reflecting your server's local time.

The following UNIX/LINUX example demonstrates the use of the HTMLDB_MAIL.PUSH_QUEUE procedure using a shell script. In this example, the SMTP gateway host name is defined as smtp01.oracle.com and the SMTP gateway port number is *25*.

```
SQLPLUS / <<EOF
FLOWS_020000.HTMLDB_MAIL.PUSH_QUEUE('smtp01.oracle.com','25');
DISCONNECT
EXIT
EOF
```

> **See Also:** "HTMLDB_MAIL" on page 16-29 for information about using the HTMLDB_MAIL

Accessing Data with Database Links

Because Oracle HTML DB runs on top of an Oracle database, you have access to all distributed Oracle database capabilities. Typically, you perform distributed database operations using database links.

A database link is a schema object in one database that enables you to access objects on another database. Once you have created the database link you can access the remote objects by appending `@dblink` to the table or view name where `dblink` is the Database Link Name you specify in the Create Database Object Wizard.

To create a database link:

1. Navigate to the Workspace home page.
2. Click the **SQL Workshop** icon.
3. Click **Object Browser**.

   Object Browser appears.
4. Click **Create**.
5. Select **Database Link** and click **Next**.
6. Follow the on-screen instructions.

   Note that Database Link names must conform to Oracle naming conventions and cannot contain spaces, or start with a number or underscore.

To view an existing a database link:

1. Navigate to the Workspace home page.
2. Click the **SQL Workshop** icon.
3. Click **Object Browser**.

   Object Browser appears.
4. Select the object type **Database Links** at the top of the page.

See Also: "Managing Database Objects Using Object Browser" on page 18-1 and *Oracle Database Administrator's Guide*

Using Collections

Collections enable you to temporarily capture one or more nonscalar values. You can use collections to store rows and columns currently in session state so they can be accessed, manipulated, or processed during a user's specific session. Think of a collection as a bucket in which you can temporarily store and name rows of information.

Examples of when you might use collections include:

- When you are creating a data-entry wizard in which multiple rows of information first need to be collected within a logical transaction. You can use collections to temporarily store the contents of the multiple rows of information, prior to performing the final wizard step when both the physical and logical transactions are completed.
- When your application includes an update page on which a user updates multiple detail rows on one page. They can make many updates, apply these updates to a collection, then call a final process to apply the changes to the database.

- When you are building a wizard where you are collecting an arbitrary number of attributes. At the end of the wizard the user then performs a task that takes the information temporarily stored in the collection and applies it to the database.

Topics in this section include:

About the HTMLDB_COLLECTION API

Every collection contains a named list of data elements (or members) which can have up to 50 attributes (or columns). You insert, update, and delete collection information using the PL/SQL API `HTMLDB_COLLECTION`.

About Collection Naming

When you create a new collection, you must give it a name that cannot exceed 255 characters. Note that collection names are not case-sensitive and will be converted to uppercase.

Once named, you can access the values in a collection by running a SQL query against the view `HTMLDB_COLLECTIONS`.

See Also: "Accessing a Collection" on page 14-5

Creating a Collection

Every collection contains a named list of data elements (or members) which can have up to 50 attributes (or columns). Use the following methods to create a collection:

- `CREATE_COLLECTION`
- `CREATE_OR_TRUNCATE_COLLECTION`
- `CREATE_COLLECTION_FROM_QUERY`

`CREATE_COLLECTION` raises an exception if the named collection already exists. For example:

```
HTMLDB_COLLECTION.CREATE_COLLECTION(
    p_collection_name => collection name );
```

`CREATE_OR_TRUNCATE_COLLECTION` creates a new collection if the named collection does not exist. If the named collection already exists, this method truncates it. Truncating a collection empties it, but leaves it in place. For example:

```
HTMLDB_COLLECTION.CREATE_OR_TRUNCATE_COLLECTION(
    p_collection_name => collection name );
    p_generate_md5    => YES or NO );
```

`CREATE_COLLECTION_FROM_QUERY` creates a collection and then populates it with the results of a specified query. For example:

```
HTMLDB_COLLECTION.CREATE_COLLECTION_FROM_QUERY(
    p_collection_name => collection name,
    p_query           => your query );
    p_generate_md5    => YES or NO );
```

`CREATE_COLLECTION_FROM_QUERY_B` also creates a collection and then populates it with the results of a specified query. For example:

```
HTMLDB_COLLECTION.CREATE_COLLECTION_FROM_QUERY_B(
    p_collection_name => collection name,
    p_query           => your query );
```

`CREATE_COLLECTION_FROM_QUERY_B` offers significantly faster performance than `CREATE_COLLECTION_FROM_QUERY` by performing bulk SQL operations, but has the following limitations:

- No column value in the select list of the query can be more than 2,000 bytes. If a row is encountered that has a column value of more than 2,000 bytes, an error will be raised during execution.
- The MD5 checksum will not be computed for any members in the collection.

About the Parameter p_generate_md5

Use the `p_generate_md5` flag to specify if the message digest of the data of the collection member should be computed. By default, this flag is set to `NO`. Use this parameter to check the MD5 of the collection member (that is, compare it with another member or see if a member has changed).

> **See Also:** "Determining Collection Status" on page 14-9 for information about using the function `GET_MEMBER_MD5`

Truncating a Collection

Truncating a collection removes all members from the specified collection, but leaves the named collection in place. For example:

```
HTMLDB_COLLECTION.TRUNCATE_COLLECTION(
    p_collection_name => collection name );
```

Accessing a Collection

Accessing the members of a collection can be accomplished by querying the database view `HTMLDB_COLLECTIONS`. The `HTMLDB_COLLECTIONS` view has the following definition:

```
COLLECTION_NAME   NOT NULL VARCHAR2(255)
SEQ_ID            NOT NULL NUMBER
C001                       VARCHAR2(4000)
```

```
C002                        VARCHAR2(4000)
C003                        VARCHAR2(4000)
C004                        VARCHAR2(4000)
C005                        VARCHAR2(4000)
...
C050                        VARCHAR2(4000)
CLOB001                     CLOB
MD5_ORIGINAL                VARCHAR2(4000)
```

Use the HTMLDB_COLLECTIONS view in an Oracle HTML DB application just as you would use any other table or view in an application. For example:

```
SELECT c001, c002, c003
   FROM htmldb_collections
 WHERE collection_name = 'FIREARMS'
```

Deleting a Collection

Deleting a collection deletes the collection and all of its members. Be aware that if you do not delete a collection, it will eventually be deleted when the session is purged. For example:

```
HTMLDB_COLLECTION.DELETE_COLLECTION (
    p_collection_name => collection name );
```

Deleting All Collections for the Current Application

Use the method DELETE_ALL_COLLECTIONS to delete all collections defined in the current application. For example:

```
HTMLDB_COLLECTION.DELETE_ALL_COLLECTIONS;
```

Deleting All Collections in the Current Session

Use the method DELETE_ALL_COLLECTIONS_SESSION to delete all collections defined in the current session. For example:

```
HTMLDB_COLLECTION.DELETE_ALL_COLLECTIONS_SESSION;
```

Adding Members to a Collection

When data elements (or members) are added to a collection, they are assigned a unique sequence ID. As you add members to a collection, the sequence ID will change in increments of 1 with the newest members having the largest ID.

You add new member to a collection using the function ADD_MEMBER. Calling this method returns the sequence ID of the newly added member. The following example demonstrates how to use the procedure ADD_MEMBER.

```
HTMLDB_COLLECTION.ADD_MEMBER(
    p_collection_name => collection name,
    p_c001          => [member attribute 1],
    p_c002          => [member attribute 2],
    p_c003          => [member attribute 3],
    p_c004          => [member attribute 4],
    p_c005          => [member attribute 5],
    p_c006          => [member attribute 6],
    p_c007          => [member attribute 7],
  ...
    p_c050          => [member attribute 50]);
    p_clob001       => [CLOB member attribute 1],
    p_generate_md5  => YES or NO);
```

The next example demonstrates how to use the function ADD_MEMBER. This function returns the sequence number assigned to the newly created member.

```
l_id := HTMLDB_COLLECTION.ADD_MEMBER(
    p_collection_name => collection name,
    p_c001          => [member attribute 1],
    p_c002          => [member attribute 2],
    p_c003          => [member attribute 3],
    p_c004          => [member attribute 4],
    p_c005          => [member attribute 5],
    p_c006          => [member attribute 6],
    p_c007          => [member attribute 7],
  ...
    p_c050          => [member attribute 50]);
    p_clob001       => [CLOB member attribute 1],
    p_generate_md5  => YES or NO);
```

You can also add new members (or an array of members) to a collection using the method ADD_MEMBERS. This method raises an exception if the specified collection does not exist with the specified name of the current user and in the same session. Also any attribute exceeding 4,000 characters will be truncated to 4,000 characters. The number of members added is based on the number of elements in the first array. For example:

```
HTMLDB_COLLECTION.ADD_MEMBERS(
    p_collection_name => collection name,
    p_c001          => member attribute array 1,
    p_c002          => member attribute array 2,
    p_c003          => member attribute array 3,
    p_c004          => member attribute array 4,
    p_c005          => member attribute array 5,
    p_c006          => member attribute array 6,
    p_c007          => member attribute array 7,
    ...
    p_c050          => member attribute array 50);
    p_generate_md5  => YES or NO);
```

About the Parameters p_generate_md5 and p_clob001

Use the p_generate_md5 flag to specify if the message digest of the data of the collection member should be computed. By default, this flag is set to NO. Use this parameter to check the MD5 of the collection member (that is, compare it with another member or see if a member has changed).

Use p_clob001 for collection member attributes which exceed 4,000 characters.

> **See Also:** "Determining Collection Status" on page 14-9 for information about using the function GET_MEMBER_MD5

Updating Collection Members

You can update collection members by calling UPDATE_MEMBER and referencing the desired collection member by its sequence ID. This procedure replaces an entire collection member, not individual member attributes. This procedure raises an exception if the named collection does not exist. For example:

```
HTMLDB_COLLECTION.UPDATE_MEMBER (
    p_collection_name => collection name,
    p_seq             => member sequence number,
    p_c001            => member attribute 1,
    p_c002            => member attribute 2,
    p_c003            => member attribute 3,
    p_c004            => member attribute 4,
    p_c005            => member attribute 5,
    p_c006            => member attribute 6,
    p_c007            => member attribute 7,
    ...
    p_c050            => member attribute 50);
    p_clob001         => [CLOB member attribute 1],
```

Use `p_clob001` for collection member attributes which exceed 4,000 characters.

If you want to update a single attribute of a collection member, use `UPDATE_MEMBER_ATTRIBUTE`. Calling this procedure raises an exception if the named collection does not exist. For example:

```
HTMLDB_COLLECTION.UPDATE_MEMBER_ATTRIBUTE(
    p_collection_name       => collection_name,
    p_seq                   => member sequence number,
    p_attr_number           => member attribute number,
    p_attr_value            => member attribute value )

HTMLDB_COLLECTION.UPDATE_MEMBER_ATTRIBUTE(
    p_collection_name        => collection_name,
    p_seq                    => member sequence number,
    p_clob_number            => CLOB member attribute number,
    p_clob_value             => CLOB member attribute value );
```

Note that the only valid value for `p_clob_number` is 1.

Deleting a Collection Member

You can delete a collection member by calling `DELETE_MEMBER` and referencing the desired collection member by its sequence ID. For example:

```
HTMLDB_COLLECTION.DELETE_MEMBER(
    p_collection_name => collection name,
    p_seq             => member sequence number);
```

Be aware that this procedure leaves a gap in the sequence IDs in the specified collection. Also, calling this procedure results in an error if the named collection does not exist.

You can also delete all members from a collection by when an attribute matches a specific value. For example:

```
HTMLDB_COLLECTION.DELETE_MEMBERS(
    p_collection_name => collection name,
    p_attr_number     => number of attribute used to match for the specified
                         attribute value for deletion,
    p_attr_value      => attribute value of the member attribute used to
                         match for deletion);
```

Be aware that this procedure also leaves a gap in the sequence IDs in the specified collection. Also, this procedure raises an exception if:

- The named collection does not exist
- The specified attribute number is outside the range of 1 to 50, or is in invalid

If the supplied attribute value is null, then all members of the named collection will deleted.

Determining Collection Status

The `p_generate_md5` parameter determines whether the MD5 message digests are computed for each member of a collection. The collection status flag is set to `FALSE` immediately after you create a collection. If any operations are performed on the collection (such as add, update, truncate, and so on), this flag is set to `TRUE`.

You can reset this flag manually by calling `RESET_COLLECTION_CHANGED`. For example:

```
HTMLDB_COLLECTION.RESET_COLLECTION_CHANGED (
    p_collection_name => collection name)
```

Once this flag has been reset, you can determine if a collection has changed by calling `COLLECTION_HAS_CHANGED`. For example:

```
l_changed := HTMLDB_COLLECTION.COLLECTION_HAS_CHANGED(
  p_collection_name => collection_name);
```

When you add a new member to a collection, an MD5 message digest is computed against all 50 attributes and the CLOB attribute if the `p_generated_md5` parameter is set to `YES`. You can access this value from the MD5_ORIGINAL column of the view `HTMLDB_COLLECTION` using the function `GET_MEMBER_MD5`. For example:

```
HTMLDB_COLLECTION.GET_MEMBER_MD5 (
    p_collection_name => collection name,
    p_seq             => member sequence number );
    RETURN VARCHAR2;
```

Merging Collections

You can merge members of collection with values passed in a set of arrays. By using the argument `p_init_query`, you can create a collection from the supplied query. For example:

```
HTMLDB_COLLECTION.MERGE_MEMBERS
p_collection_name => collection_name
```

Be aware, however, that if the collection exists, the following occurs:

- Rows in the collection (not in the arrays) will be deleted
- Rows in the collection and in the arrays will be updated
- Rows in the array and not in the collection will be inserted

Any attribute value exceeding 4,000 characters will be truncated to 4,000 characters. Table 14–1 describes the available arguments you can use when merging collections.

Table 14–1 Available Arguments for Merging Collections

Argument	Description
`p_c001`	Array of first attribute values to be merged. Maximum length can be 4,000 characters. If the maximum length is greater, it will be truncated to 4,000 characters. The count of elements in the P_C001 PL/SQL table is used as the total number of items across all PL/SQL tables. For example, if P_C001.count = 2 and P_C002.count = 10, only 2 members will be merged. Be aware that if P_C001 is null, an application error will be raised.
`p_c0xx`	Attribute of `XX` attributes values to be merged. Maximum length can be 4,000 characters. If the maximum length is greater, it will be truncated to 4,000 characters.
`p_collection_name`	Name of the collection. **See Also:** "About Collection Naming" on page 14-4
`p_null_index`	Use this argument to identify rows the merge function should ignore. This argument identifies an row as null. Null rows are automatically removed from the collection. Use `p_null_index` in conjunction with.
`p_null_value`	Use this argument in conjunction with the `p_null_index`. Identifies the null value. If used this value cannot be null. A typical value for this argument is 0.
`p_init_query`	Use the query defined by this argument to create a collection if the collection does not exist.

Managing Collections

You can use the following utilities to manage collections.

Topics in this section include:

- Obtaining a Member Count
- Resequencing a Collection
- Verifying Whether a Collection Exists
- Adjusting Member Sequence ID
- Sorting Collection Members

Obtaining a Member Count

Use `COLLECTION_MEMBER_COUNT` to return the total count of all members in a collection. Be aware that this count does not imply the highest sequence in the collection. For example:

```
l_count := HTMLDB_COLLECTION.COLLECTION_MEMBER_COUNT (
  p_collection_name => collection name );
```

Resequencing a Collection

Use `RESEQUENCE_COLLECTION` to resequence a collection to remove any gaps in sequence IDs while maintaining the same element order. For example:

```
HTMLDB_COLLECTION.RESEQUENCE_COLLECTION (
   p_collection_name => collection name )
```

Verifying Whether a Collection Exists

Use COLLECTION_EXISTS to determine if a collection exists. For example:

```
l_exists := HTMLDB_COLLECTION.COLLECTION_EXISTS  (
  p_collection_name => collection name );
```

Adjusting Member Sequence ID

You can adjust the sequence ID of a specific member within a collection by moving the ID up or down. When you adjust a sequence ID, the specified ID is exchanged with another one. For example, if you were to move the ID 2 up, 2 would become 3 and 3 would become 2.

Use MOVE_MEMBER_UP to adjust a member sequence ID up by one. Alternately, use MOVE_MEMBER_DOWN to adjust a member sequence ID down by one. For example:

```
HTMLDB_COLLECTION.MOVE_MEMBER_DOWN(
    p_collection_name => collection name,
    p_seq             => member sequence number);
```

Be aware that while using either of these methods an application error displays:

- If the named collection does not exist for the current user in the current session
- If the member specified by sequence ID p_seq does not exist

However, an application error will not be returned if the specified member already has the highest or lowest sequence ID in the collection (depending on whether you are calling MOVE_MEMBER_UP or MOVE_MEMBER_DOWN).

Sorting Collection Members

Use SORT_MEMBERS to reorder members of a collection by the column number. This method not only sorts the collection by a particular column number, but it also reassigns the sequence IDs for each member to remove gaps. For example:

```
HTMLDB_COLLECTION.SORT_MEMBERS(
    p_collection_name       => collection name,
    p_sort_on_column_number => column number to sort by);
```

Clearing Collection Session State

Clearing the session state of a collection removes the collection members. A shopping cart is a good example of when you might need to clear collection session state. When a user requests to empty his or her cart and start again, you would need to clear the session state for a collection. You can remove session state of a collection by calling the CREATE_OR_TRUNCATE_COLLECTION method or by using f?p syntax.

Calling CREATE_OR_TRUNCATE_COLLECTION deletes the existing collection and then recreates it. For example:

```
HTMLDB_COLLECTION.CREATE_OR_TRUNCATE_COLLECTION(
    p_collection_name       => collection name,
```

You can also use the sixth f?p syntax argument to clear session state. For example:

```
f?p=App:Page:Session::NO:1,2,3,collection name
```

See Also: "Understanding URL Syntax" on page 4-14

Creating Custom Activity Reports Using HTMLDB_ACTIVITY_LOG

The HTMLDB_ACTIVITY_LOG view records all activity in a workspace, including developer activity and application runtime activity. You can use HTMLDB_ACTIVITY_LOG to view to query all activity for the current workspace. For example, you can use this view to develop monitoring reports within a specific application to provide real-time performance statistics.

Table 14–2 describes the columns in the HTMLDB_ACTIVITY_LOG view.

Table 14–2 Columns in HTMLDB_ACTIVITY_LOG

Column	Type	Description
time_stamp	DATE	Date and time that activity was logged at the end of the page view.
component_type	VARCHAR2(255)	Reserved for future use.
component_name	VARCHAR2(255)	Reserved for future use.
component_attribute	VARCHAR2(4000)	Title of page.
information	VARCHAR2(4000)	Reserved for future use.
elap	NUMBER	Elapsed time of page view in seconds.
num_rows	NUMBER	Number of rows processed on page.
userid	VARCHAR2(255)	User ID performing page view.
ip_address	VARCHAR2(4000)	IP address of client.
user_agent	VARCHAR2(4000)	Web browser user agent of client.
flow_id	NUMBER	Application ID.
step_id	NUMBER	Page ID.
session_id	NUMBER	Oracle HTML DB session identifier.

To conserve space in the activity log, only the first log entry of each unique Oracle HTML DB session will contain the IP address and Web browser user agent.

The following example demonstrates how to create a report that displays the total number of page views and the average page view time in the past 24 hours for application 9529, and grouped by userid:

```
SELECT COUNT(*), AVG(elap), userid
    FROM HTMLDB_ACTIVITY_LOG
 WHERE time_stamp > (SYSDATE-1)
   AND flow_id = 9529
GROUP BY userid
```

Running Background PL/SQL

You can use the HTMLDB_PLSQL_JOB package to run PL/SQL code in the background of your application. This is an effective approach for managing long running operations that do not need to complete in order for a user to continue working with your application.

Topics in this section include:

- Understanding the HTMLDB_PLSQL_JOB Package
- About System Status Updates

- Using a Process to Implement Background PL/SQL

Understanding the HTMLDB_PLSQL_JOB Package

HTMLDB_PLSQL_JOB is a wrapper package around DBMS_JOB functionality offered in the Oracle database. Be aware that the HTMLDB_PLSQL_JOB package only exposes that functionality which is necessary to run PL/SQL in the background. The following is a description of the HTMLDB_PLSQL_JOB package.

```
SQL> DESC HTMLDB_PLSQL_JOB
FUNCTION JOBS_ARE_ENABLED RETURNS BOOLEAN
PROCEDURE PURGE_PROCESS
 Argument Name                  Type                    In/Out Default?
 ------------------------------ ----------------------- ------ --------
 P_JOB                          NUMBER                  IN
FUNCTION SUBMIT_PROCESS RETURNS NUMBER
 Argument Name                  Type                    In/Out Default?
 ------------------------------ ----------------------- ------ --------
 P_SQL                          VARCHAR2                IN
 P_WHEN                         VARCHAR2                IN     DEFAULT
 P_STATUS                       VARCHAR2                IN     DEFAULT
FUNCTION TIME_ELAPSED RETURNS NUMBER
 Argument Name                  Type                    In/Out Default?
 ------------------------------ ----------------------- ------ --------
 P_JOB                          NUMBER                  IN
PROCEDURE UPDATE_JOB_STATUS
 Argument Name                  Type                    In/Out Default?
 ------------------------------ ----------------------- ------ --------
 P_JOB                          NUMBER                  IN
 P_STATUS                       VARCHAR2                IN
 P_DESC
```

Table 14–1 describes the functions available in the HTMLDB_PLSQL_JOB package.

Table 14–3 HTMLDB_PLSQL_JOB Package Available Functions

Function	Description
SUBMIT_PROCESS	Use this procedure to submit background PL/SQL. This procedure returns a unique job number. Since you can use this job number as a reference point for other procedures and functions in this package, it may be useful to store it in your own schema.
UPDATE_JOB_STATUS	Call this procedure to update the status of the currently running job. This procedure is most effective when called from the submitted PL/SQL.
TIME_ELAPSED	Use this function to determine how much time has elapsed since the job was submitted.
JOBS_ARE_ENABLED	Call this function to determine whether or not that database is currently in a mode which supports submitting jobs to the HTMLDB_PLSQL_JOB package.
PURGE_PROCESS	Call this procedure to clean up submitted jobs. Submitted jobs stay in the HTMLDB_PLSQL_JOBS view until either Oracle HTML DB cleans out those records, or you call PURGE_PROCESS to manually remove them.

You can view all jobs submitted to the HTMLDB_PLSQL_JOB package using the HTMLDB_PLSQL_JOBS view. The following is the description of HTMLDB_PLSQL_JOBS view.

```
SQL> DESCRIBE HTMLDB_PLSQL_JOBS
 Name                              Null?    Type
 --------------------------------- -------- ----------------------------
 ID                                         NUMBER
 JOB                                        NUMBER
 FLOW_ID                                    NUMBER
 OWNER                                      VARCHAR2(30)
 ENDUSER                                    VARCHAR2(30)
 CREATED                                    DATE
 MODIFIED                                   DATE
 STATUS                                     VARCHAR2(100)
 SYSTEM_STATUS                              VARCHAR2(4000)
 SYSTEM_MODIFIED                            DATE
 SECURITY_GROUP_ID                          NUMBER
```

Table 14–4 describes the columns available in `HTMLDB_PLSQL_JOBS` view.

Table 14–4 HTMLDB_PLSQL_JOBS View Columns

Name	Description
`ID`	An unique identifier for each row.
`JOB`	The job number assigned to each submitted PL/SQL job. The `HTMLDB_PLSQL_JOB.SUBMIT_PROCESS` function returns this value. This is also the value you pass into other procedures and functions in the `HTMLDB_PLSQL_JOB` package.
`FLOW_ID`	The application from which this job was submitted.
`OWNER`	The database schema that owns the application. This identifies what schema will parse this code when `DBMS_JOB` runs it.
`ENDUSER`	The end user (that is, who logged into the application) that caused this process to be submitted.
`CREATED`	The date when the job was submitted.
`MODIFIED`	The date when the status was modified.
`STATUS`	The user-defined status for this job. Calling `HTMLDB_PLSQL_JOB.UPDATE_JOB_STATUS` updates this column.
`SYSTEM_STATUS`	The system defined status for this job.
`SYSTEM_MODIFIED`	The date when the system status was modified.
`SECURITY_GROUP_ID`	The unique ID assigned to your workspace. Developers can only see jobs submitted from their own workspace.

About System Status Updates

Submitted jobs can contain any of the following system status settings:

- **SUBMITTED** indicates the job has been submitted, but has not yet started. DBMS_JOB does not guarantee immediate starting of jobs.
- **IN PROGRESS** indicates that `DBMS_JOB` has started the process.
- **COMPLETED** indicates the job has finished.
- **BROKEN (sqlcode) sqlerrm** indicates there was a problem in your job that resulted in an exception. The SQL code and SQL error message for the exception should be included in the system status. Review this information to determine what went wrong.

Using a Process to Implement Background PL/SQL

The simplest way to implement the HTMLDB_PLSQL_JOB package is to create a page process that specifies the process type PLSQL DBMS JOB. By selecting this process type, Application Builder will submit the PL/SQL code you specify as a job. Since you are not calling the function directly, you can use the built-in substitution item APP_JOB to determine the job number of any jobs you submit.

The following example runs a PL/SQL job in the background for testing and explanation.

```
001  BEGIN
002    FOR i IN 1 .. 100 LOOP
003      INSERT INTO emp(a,b) VALUES (:APP_JOB,i);
004      IF MOD(i,10) = 0 THEN
005        HTMLDB_PLSQL_JOB.UPDATE_JOB_STATUS(
006          P_JOB     => :APP_JOB,
007          P_STATUS  => i || 'rows inserted');
008      END IF;
009      HTMLDB_UTIL.PAUSE(2);
010    END LOOP;
011  END;
```

In this example, note that:

- Lines 002 to 010 run a loop that inserts 100 records into the emp table.
- APP_JOB is referenced as a bind variable inside the VALUES clause of the INSERT, and specified as the P_JOB parameter value in the call to UPDATE_JOB_STATUS.
- APP_JOB represents the job number which will be assigned to this process as it is submitted to HTMLDB_PLSQL_JOB. By specifying this reserved item inside your process code, it will be replaced for you at execution time with the actual job number.
- Notice this example calls to UPDATE_JOB_STATUS every ten records, INSIDE the block of code. Normally, Oracle transaction rules dictate updates made inside code blocks will not be seen until the entire transaction is committed. The HTMLDB_PLSQL_JOB.UPDATE_JOB_STATUS procedure, however, has been implemented in such a way that the update will happen regardless of whether or not the job succeeds or fails. This last point is important for two reasons:
    1. Even if your status reads "100 rows inserted," it does not mean the entire operation was successful. If an exception occurred at the time the block of code tried to commit, the user_status column of HTMLDB_PLSQL_JOBS would not be affected since status updates are committed separately.
    2. These updates are performed autonomously. You can view the job status before the job has completed. This gives you the ability to display status text about ongoing operations in the background as they are happening.

Implementing Web Services

Web services enable applications to interact with one another over the Web in a platform-neutral, language independent environment. In a typical Web services scenario, a business application sends a request to a service at a given URL by using the protocol over HTTP. The service receives the request, processes it, and returns a response. You can incorporate calls with external Web services in application developed in Oracle HTML DB

Web services in Oracle HTML DB are based on Simple Object Access Protocol (SOAP). SOAP is a World Wide Web Consortium (W3C) standard protocol for sending and receiving requests and responses across the Internet. SOAP messages can be sent back and forth between a service provider and a service user in SOAP envelopes.

SOAP offers two primary advantages:

- SOAP is based on XML and therefore easy to use.
- SOAP messages are not blocked by firewalls since this protocol uses simple transport protocols such as HTTP.

Topics in this section include:

- Understanding Web Service References
- Creating a Web Service Reference
- Using the Web Service Reference Repository
- Creating an Input Form and Report on a Web Service
- Creating a Form on a Web Service
- Invoking a Web Service as a Process
- Editing a Web Service Process
- Viewing a Web Service Reference History

Note: The SOAP 1.1 specification is a W3C note. (The W3C XML Protocol Working Group has been formed to create a standard that will supersede SOAP.)

For information about Simple Object Access Protocol (SOAP) 1.1 see:

`http://www.w3.org/TR/SOAP/`

Understanding Web Service References

To utilize Web services in Oracle HTML DB, you create a Web service reference using a wizard. Each Web service reference is based on a Web Services Description Language (WSDL) document that describes the target Web service. When you create a Web service reference, the wizard analyzes the WSDL and collects all the necessary information to create a valid SOAP message, including:

- The URL used to post the SOAP request over HTTP
- A Universal Resource Identifier (URI) identifying the SOAP HTTP request
- Operations of the Web Service
- Input parameters for each operation
- Output parameters for each operation

Accessing the Web Service References Page

You manage Web service references on the Web Service References page.

To access the Web Service References page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.

3. Select an application.

   Application Builder appears.
4. Click **Shared Components**.

   The Shared Components page appears.
5. Under Logic, select **Web Service References**.

   The Web Service References page appears.

Specifying an Application Proxy Server Address

If your environment requires a proxy server to access the Internet, you must specify a proxy server address on the Application Attributes page before you can create a Web service reference.

To specify a proxy address for an application:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   Application Builder appears.
4. Click **Edit Attributes**.
5. Click **Edit Standard Attributes**.
6. Under Application Definition, enter the proxy server in Proxy Server.
7. Click **Apply Changes**.

Creating a Web Service Reference

When you create a Web service reference you need to decide how to locate the WSDL. You can locate a WSDL in two ways:

- By searching a UDDI registry
- by entering the URL to the WSDL document

A Universal Description, Discovery and Integration (UDDI) registry is a directory where businesses register their Web services.

Creating a Web Service Reference by Searching a UDDI Registry

To create a new Web service by searching a UDDI registry:

1. Navigate to the Web Service References page:
   a. Click the **Application Builder** icon on the Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Logic, select **Web Service References**.

      The Web Service References page appears.
2. Click **Create**.
3. When prompted whether to search a UDDI registry to find a WSDL, click **Yes**.
4. For UDDI Location you can either:

- Enter a URL endpoint to a UDDI registry.
- Click the **List** icon and select a UDDI registry.

5. Under Search for Services, specify whether to search for a business name or a service name.
   a. For Search Type, specify whether to search for a business name or a service name. You cannot search for both.
   b. In Name, enter the business name or service name to search for.
   c. Optionally indicate whether the search should be case-sensitive or an exact match. Use the percent (%) symbol as a wildcard character.
   d. Click **Search**.
   e. When the search results appears, make a selection and click **Next**.

   A summary page appears describing the selected Web service.
6. Review your selection and click **Next** to continue.

   The URL to the WSDL document displays in the WSDL Location field.
7. Click **Finish**.

The Web service reference is added to the Web Service References Repository.

Creating a Web Service Reference by Specifying a WSDL Document

To create a new Web service by specifying a URL to a specific WSDL document:

1. Navigate to the Web Service References page:
   a. Click the **Application Builder** icon on the Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Logic, select **Web Service References**.

      The Web Service References page appears.
2. Click **Create**.
3. When prompted whether to search a UDDI registry to find a WSDL, click **No**.
4. In WSDL Location, enter the URL to the WSDL document.
5. Click **Finish**.

The Web service reference is added to the Web Service References Repository.

Using the Web Service Reference Repository

Web service references are stored in the Web Service Reference Repository.

To access the Web Service References Repository:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   Application Builder appears.
4. Click **Shared Components**.

The Shared Components page appears.

5. Under Logic, select **Web Service References**.

   The Web Service Reference page appears.

You can change the appearance of the page by making a selection from the View list. Available options include:

- **Icons** (the default) displays each Web service reference as a large icon. To edit a Web service reference, click the appropriate icon.
- **Details** displays each application item as a line in a report.

  In Details view you can:

  - Edit a reference by clicking the **Edit** icon.
  - Test a reference by clicking the **Run** icon.
  - View details about a reference, by clicking the reference name.

Testing a Web Service Reference

Once you have created a Web service reference you can test it on the Test Web Service Reference.

To test a Web service reference:

1. Navigate to the Web Service References page:
   a. Click the **Application Builder** icon on the Workspace home page.
   b. Select an application.
   c. Click **Shared Components**.
   d. Under Logic, select **Web Service References**.

      The Web Service References page appears.
2. From View, select **Details**.
3. Click the **Run** icon adjacent to the Web Service reference name.

   The Test Web Service Reference page appears. The Web service name and URL endpoint display at the top of the page.
4. From Operation, select an operation (that is, the method to be executed).
5. Under Input Parameters, enter the appropriate value.
6. Click **Test**.

   The message request and response appear at the bottom of the page.

Creating an Input Form and Report on a Web Service

The Create Form and Report on Web Service Wizard creates an input form, a submit button, and a report for displaying results. You can execute this wizard directly after creating the Web service reference, or by adding a new page.

Use this wizard when you expect a nonscalar result from the Web service. The Amazon Web service is a good example. This Web service returns many results based on the search criteria entered in an input form.

Creating a Form and Report Directly After Creating a Reference

To create a form and report directly after creating a Web Service Reference:

1. Create the Web service reference. See "Creating a Web Service Reference" on page 14-17.
2. Once the Web service references has been added, select **Create Form and Report on Web Service**.
3. For Web Service Reference and Operation, select the Web service reference and operation (that is, the method to be executed).
4. For Identify Page and Region Attributes, review the page and region attributes. If the page you specify does not exist, the wizard creates the page for you.
5. For Items for Input Parameters:
    a. Identify which items to add to the form. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
    b. If necessary, edit the item label.
6. For Base Node:
    a. In Temporary Result Set Name, enter a name for the collection that stores the Web service result.
    b. For Result Tree to Report On, select the portion of the resulting XML document that contains the information you want to include in the report.
7. For Result Parameters to Display, select the parameters to be included in the report.
8. Click **Finish**.

Creating a Form and Report by Adding a New Page

If you have an existing Web service reference, you can create an input form and report by adding a new page.

To create a form and report by adding a new page:

1. Create the Web service reference. See "Creating a Web Service Reference" on page 14-17.
2. Create a new page. See "Adding Pages to an Application" on page 6-7.

    In the Create Page Wizard:

    a. Select **Form**.
    b. Select **Form and Report on Web Service**.
3. For Web Service Reference and Operation, select the Web service reference and operation (that is, the method to be executed).
4. For Identify Page and Region Attributes, review the page and region attributes. If the page you specify does not exist, the wizard creates the page for you.
5. For Items for Input Parameters:
    a. Identify which items to add to the form. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
    b. If necessary, edit the item label.
6. For Base Node:

   a. In Temporary Result Set Name, enter a name for the collection that stores the Web service result.

   b. In Result Tree to Report On, select the portion of the resulting XML document that contains the information you want to include in the report.

7. For Result Parameters to Display, select the parameters to be included in the report.

8. Click **Finish**.

Creating a Form on a Web Service

The Create Form on Web Service wizard creates a form and a submit button. You can execute this wizard directly after creating the Web service reference, or from the Page Definition.

Use this wizard when you expect a scalar result from the Web service. A Web service that looks up a stock price is a good example since the input is a stock symbol and the output is the scalar value price.

Creating a Form Directly After Creating a Reference

To create a form directly after creating a Web Service Reference:

1. Create the Web service reference. See "Creating a Web Service Reference" on page 14-17.
2. Once the Web service references has been added, select **Create Form on Web Service**.
3. For Web Service Reference and Operation, select the Web service reference and operation (that is, the method to be executed).
4. For Identify Page and Region Attributes, review the page and region attributes. If the page you specify does not exist, the wizard creates the page for you.
5. For Items for Input Parameters:
   a. Identify which items to add. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
   b. If necessary, edit the item label.
6. For Items for Output Parameters:
   a. Identify which items need to be added. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
   b. If necessary, edit the item label.
7. Click **Finish**.

Creating a Form by Adding a New Page

If you have an existing Web service reference, you can create form by adding a new page.

To create a form by adding a new page:

1. Create the Web service reference. See "Creating a Web Service Reference" on page 14-17.
2. Create a new page. See "Adding Pages to an Application" on page 6-7.

   In the Create Page Wizard:

   a. Select **Form**.
   b. Select **Form on Web Service**.
3. For Web Service Reference and Operation, select the Web service reference and operation (that is, the method to be executed).
4. For Identify Page and Region Attributes, review the page and region attributes. If the page you specify does not exist, the wizard creates the page for you.
5. For Items for Input Parameters:
   a. Identify which items need to be added. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
   b. If necessary, edit the item label.
6. For Items for Output Parameters:
   a. Identify which items need to be added. To include an item, select **Yes** in the Create column. Otherwise, select **No**.
   b. If necessary, edit the item label.
7. Click **Finish**.

Invoking a Web Service as a Process

You can also implement a Web service as a process on the page. Running the process submits the request to the service provider. You can then display the request results in report.

To invoke a Web service as a process:

1. Create a new page. See "Adding Pages to an Application" on page 6-7.

   In the Create Page Wizard:
   a. Select **Blank Page**.
   b. When prompted whether to use tabs, select **No**.
2. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
3. Under Page Rendering, Processes, click the **Create** icon.

   The Create Page Processes Wizard appears.
4. From the process category, select **Web Services**.
5. Specify a process name, sequence, and processing point.
6. Select the Web service reference and operation (that is, the method to be executed).
7. Define the process. You can store the results in a collection or in items on the page by selecting options under Web Service Output Parameters.
   a. To store the results in a collection:
      – For Store Result in, select **Collection**.

   - Enter a name for the collection in the value field.

   b. To store the results in items on the page:

      - For Store Result in, select **Items**.
      - Enter the appropriate items value in the fields provided.

8. Click **Create Process**.

Displaying Web Service Results in a Report

To create a report in which to display Web Service request results:

1. Navigate to the Page Definition:

   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.

   c. Select an application.

   d. Select a page.

      The Page Definition appears.

2. Under Regions, click the **Create** icon.

   The Create Region Wizard appears.

3. For the region type, select **Report**.
4. For the report implementation, select **Report on collection containing Web service result**.
5. On Identify Region Attributes, enter a region title and optionally edit the region attributes.
6. For Web Service Reference and Operation, select a Web service reference and an operation (that is, the method to be executed).
7. For Result Tree to Report On, select the portion of the resulting XML document that contains the information you want to include in the report.
8. For Result Parameters:

   a. In Temporary Result Set Name, enter a name for the collection that stores the Web service result.

   b. Select and deselect the appropriate parameters.

9. Click **Create SQL Report**.

Editing a Web Service Process

Once you create a process of type Web service, you can map input parameters to a static value (for example to pass a key) by editing the Web service process.

To edit a Web service process:

1. Create a Web service process. See "Invoking a Web Service as a Process" on page 14-22.
2. Navigate to the Page Definition containing the Web service process.
3. Select the process name.

   The Edit Page Process page appears.

4. Scroll down to Web Service Input Parameters.
5. To map an input parameter to a static value:
   a. Scroll down to Web Service Input Parameters.
   b. Enter a value in the Value field adjacent to the appropriate parameter name.
6. Click **Apply Changes**.

Viewing a Web Service Reference History

The Web Services History displays changes to Web service references for the current application by application ID, Web service references name, developer, and date.

To view a history of Web service reference changes:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.

   Application Builder appears.
4. Click **Shared Components**.

   The Shared Components page appears.
5. Under Logic, select **Web Service References**.
6. Click **History**.

Note: The History button only appears on the Web Service Reference page after you have created a Web service reference.

Managing User Preferences

You can use preferences to store values for a specific user across distinct sessions. Once set, these preferences can removed programatically or by an Oracle HTML DB administrator. You can set user preferences by creating a page process, by the calculation of a preference Item Source Value, or programatically using a PL/SQL API.

Topics in this section include:

- Viewing User Preferences
- Setting User Preferences
- Removing User Preferences Programatically
- Resetting User Preferences Manually
- Resetting Preferences Using a Page Process

Viewing User Preferences

You view user preferences for a specific user on the Session State Management page.

To view user preferences for a specific user:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Service**.

4. Click **Session State**.
5. Click **Report preferences for users**.
6. Type a username in the field provided and click **Go**.

   See Also: "Managing Session State and User Preferences" on page 12-8 for information about using the Session State Management page

Setting User Preferences

You can set user preferences within your application through the creation of a page process, by creating a preference item, or programatically.

Topics in this section include:

- Setting User Preferences Using a Page Process
- Setting the Source of an Item Based on a User Preference
- Setting User Preferences Programatically

Setting User Preferences Using a Page Process

To set user preference values by creating a page process:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. Under Page Processes, click the **Create** icon.

   The Create Page Computation Wizard appears.
3. Specify a process name, sequence, and processing point.
4. From Type, select one of the following:
   - **Set Preference to value of item**
   - **Set Preference to value of item if item is not NULL**
5. Specify the preference value in the field provided using the format:

   ```
   PreferenceName:Item
   ```
6. Click **Page Items** to see a list of available items.
7. Follow the on-screen instructions

Setting the Source of an Item Based on a User Preference

You can set the source of an item based on a user preference by defining the item source type as Preference.

To define the source of item based on a user preference:

1. Navigate to the appropriate Page Definition:
   a. Navigate to the Workspace home page.

   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.

2. Under Item, click the **Create** icon.

   The Create Page Computation Wizard appears.

3. Specify the Item Name and Display Position Attributes and click **Next**.
4. Specify the Item Attributes click **Next**.
5. From the Item Source list, select **Preferences**.
6. In Item Source Value, enter the name of the preference.
7. Follow the on-screen instructions

Setting User Preferences Programatically

To set or reference user preferences programatically, you must use a PL/SQL API. User level caching is available programmatically. You can use the `set_preference` function to set a user level preference called `NAMED_PREFERENCE`. For example:

```
HTMLDB_UTIL.SET_PREFERENCE(
 p_preference=>'NAMED_PREFERENCE',
 p_value =>:ITEM_NAME);
```

You can reference the value of a user preference using the function `GET_PREFERENCES`. For example:

```
NVL(HTMLDB_UTIL.GET_PREFERENCE('NAMED_PREFERENCE'),15)
```

In the previous example, the preference would default to the value 15 if the preference contained no value.

> **See Also:** "GET_PREFERENCE Function" on page 16-16 and "SET_PREFERENCE Procedure" on page 16-27

Removing User Preferences Programatically

To remove user preferences programatically, you must use a PL/SQL API. You can use the `REMOVE_PREFERENCE` procedure to remove a user level preference called `NAMED_PREFERENCE`. For example:

```
HTMLDB_UTIL.REMOVE_PREFERENCE(
p_preference=>'NAMED_PREFERENCE',
p_value =>:ITEM_NAME);
```

Resetting User Preferences Manually

You can manually purge user preferences for a specific user.

To manually purge preferences for a specific user:

1. Navigate to the Workspace home page.
2. Click the **Administration** icon.
3. Click **Manage Service.**

4. Click **Session State**.
5. Click **Purge preferences for a selected user**.
6. Specify a user and follow the on-screen instructions.

    See Also: "Managing Session State and User Preferences" on page 12-8 for information about using the Session State Management page

Resetting Preferences Using a Page Process

You can reset user preferences by creating a page process and selecting the process type Reset Preferences.

To reset user preferences using a page process:

1. Navigate to the appropriate Page Definition:
    a. Navigate to the Workspace home page.
    b. Click the **Application Builder** icon.
    c. Select an application.
    d. Select a page.

       The Page Definition appears.
2. Under Page Processes, click the **Create** icon.

    The Create Page Computation Wizard appears.
3. Specify a process name, sequence, and processing point.
4. From Type, select **Reset Preferences**.
5. Follow the on-screen instructions

15

Managing Oracle HTML DB Globalization

This section describes how to translate an application built-in Oracle HTML DB.

This section contains the following topics:

- About Translating an Application and Globalization Support
- Specifying the Primary Language for an Application
- Understanding the Translation Process
- Translating Messages Used in PL/SQL Procedures
- Translating Data that Supports List of Values
- About Oracle HTML DB Globalization Codes

About Translating an Application and Globalization Support

In Oracle HTML DB you can develop applications that can run concurrently in different languages. A single Oracle database instance and Oracle HTML DB can support multiple database sessions customized to support different language.

In general, translating an Oracle HTML DB application involves the following steps:

- Map primary and target application IDs
- Seed and export text to a file for translation
- Translate the text in the file
- Apply and publish the translated file

See Also: "Understanding the Translation Process" on page 15-6

Topics in this section include:

- About Language Identification
- Rules for Translating Applications in Oracle HTML DB
- How Translated Applications Are Rendered
- About Translatable Components

About Language Identification

After you create an application, you specify a language preference on the Edit Application Attributes page. Under Globalization, you select a primary application language and select how the HTML DB engine determines the application language.

You can specify to have the application language based on the user's browser language preference, an application preference, or an item preference.

See Also: "Specifying the Primary Language for an Application" on page 15-4

Rules for Translating Applications in Oracle HTML DB

When using translated applications in Oracle HTML DB, use the following rules to determine which translated version to use:

- Look for an exact match between the user language preference and the language code of the translated application
- Look for a truncated match. That is, see if the language and locale exist. For example, if the user language preference is `en-us` and the translated version of `en-us` does not exist, look for a translated application that has the language code `en`
- Use the primary application

For example, suppose you create an application with the primary language of German, `de`, and you create a translated version of the application with a language code of `en-us`. Users accessing this application with a browser language of `en-us` execute the English `en-us` version of the application. Users accessing the application with a browser language of `en-gb` view the application in the application primary language. In this example, these users see the application in German, which is the application's primary language. For this example, you should create the translated English version using language code `en` to encompass all variations of `en`.

How Translated Applications Are Rendered

Once Oracle HTML DB determines the language for an application, the HTML DB engine alters the database language for a specific page request. It then looks for a translated application in the appropriate language. If the HTML DB engine finds that language, it render the application using that definition. Otherwise, it renders the application in the base (or primary) application language.

Note that the text that displays within an application is not translated on the fly. Oracle HTML DB dynamically collects page attributes from either a base language application definition or an alternative application definition.

See Also: "About Dynamic Translation Text Strings" on page 15-3 and "Translating Data that Supports List of Values" on page 15-12

About Translatable Components

When you build an application in Oracle HTML DB, you define a large number of declarative attributes such as field labels, region headings, page header text, and so on. Using the steps described in this section, you can make all the application definition attributes within your application translatable.

About Shortcuts that Support Translatable Messages

Oracle HTML DB includes two shortcuts type that enable you to reference translatable messages:

- **Message** - Use this shortcut to reference a translatable message at run time. Note that the name of the shortcut must match the corresponding message name. At run time, the name of the shortcut expands to the text of the translatable message for the current language.

- **Message with JavaScript Escaped Single Quotes** - Use this shortcut to reference a shortcut inside of JavaScript literal string and reference a translatable message at run time. This shortcut defines a text string. When the shortcut is referenced, it escapes the single quotation marks required for JavaScript.

  See Also: "Using Shortcuts" on page 6-63

About Messages

If your application includes PL/SQL regions or PL/SQL processes, you may need to translate any generated HTML or text. Within Oracle HTML DB these types of generated HTML and text are called "messages." You can define all messages and translate them on the Translatable Messages page. You can use the `HTMLDB_LANG.MESSAGE` API to translate text strings from PL/SQL stored procedures, functions, triggers, packaged procedures and functions.

See Also: "Translating Messages Used in PL/SQL Procedures" on page 15-10

About Dynamic Translation Text Strings

Dynamic translations are used for database data that needs to be translated at run time. For example, you might use a dynamic translation to translate a list of values based on a database query. A dynamic translation consists of a "translate-from" language string, a language code, and a "translate-to" string. You can also use the `HTMLDB_LANG.LANG` API to retrieve dynamic translations programmatically.

See Also: "Translating Data that Supports List of Values" on page 15-12

About Translating Region Titles

By default, page region titles are included in the generated translation file. However, you can mark a region title as not translatable.

To mark a region title as not translatable:

1. Navigate to the Page Definition:
   a. Navigate to the Workspace home page.
   b. Click the **Application Builder** icon.
   c. Select an application.
   d. Select a page.

      The Page Definition appears.
2. On the Page Definition, select the region title.

   The Edit Region page appears.
3. Select the **exclude title from translation** check box.

About Translating Templates

By default, templates in Oracle HTML DB are not translatable and therefore not included in the generated translation file. Generally, templates do not and should not contain translatable text. However, if you need to mark a template as translatable, mark the Translatable check box on the Edit Page Template page.

To identify a template as translatable:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. On the Application home page, click **Shared Components**.
5. Under User Interface, select **Templates**.

   The Templates page appears.
6. Locate the template you want to edit and select the template name.
7. Under Template Identification, select **Translatable**.

You can include translatable text at the application level by defining the translatable text using static substitution strings. Because application-level attributes are translated any text defined as a static substitution strings will be included in the generated translation file.

See Also:

- "Editing Templates" on page 7-20
- "Substitutions" on page 5-9

Specifying the Primary Language for an Application

Globalization attributes specify how the HTML DB engine determines the primary language of an application.

To edit globalization attributes:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Edit Attributes**.
5. Click **Edit Globalization Attributes**.
6. From **Application Primary Language**, select the language in which the application is being developed.
7. From **Application Language Derived From**, specify how the HTML DB engine determines (or derives) the application language. Available options are described in Table 15–1.

Table 15–1 Application Language Derived From Options

Option	Description
No NLS (Application not translated)	Select this option if the application will not be translated.
Use Application Primary Language	Determines the application primary language based on the Application Primary Language attribute (see step 5).
Browser (use browser language preference)	Determines the application primary language based on the user's browser language preference.

Table 15–1 (Cont.) Application Language Derived From Options

Option	Description
Application Preference (use FSP_ LANGUAGE_PREFERENCE)	Determines the application primary language based a value defined using the `HTMLDB_UTIL.SET_ PREFERENCE` API. Select this option to maintain the selected language preference across multiple log ins. **See Also:** "SET_PREFERENCE Procedure" on page 16-27
Item Preference (use item containing preference)	Determines based on an application-level item called `FSP_LANGUAGE_PREFERENCE`. Using this option requires Oracle HTML DB to determine the appropriate language preference every time the user logs in.

See Also: "Configuring Standard Application Attributes" on page 5-6, "Configuring Globalization Attributes" on page 5-14, and "About Oracle HTML DB Globalization Codes" on page 15-13

Using Format Masks for Items

The HTML DB engine applies globalization settings for each rendered page. This default behavior can impact the display of certain items such as numbers and dates.

For example, suppose your application determines the application language based on the user's browser language preference. If the HTML DB engine determines the users's browser language preference is French, it displays dates and numbers in a format that conforms to French standards. You can override this default behavior and explicitly control how items display by applying a format mask. You apply a format mask by making a selection from the Display As list:

- When you create the item
- After you create the item by editing the item attributes

To edit item attributes:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Select a page.

   The Page Definition appears.
5. Under Items, select the item name.

   The Edit Page Item page appears.
6. Under Identification, make a select from the Display As list.

See Also: "Items" on page 5-23 for information about item attributes.

Translating Applications for Multibyte Languages

If your application needs to run in several languages (such as Chinese or Japanese) simultaneously, consider configuring your database with a character set to support all of the languages. The same character set has to be configured in the corresponding data access descriptor (DAD) in mod_plsql. UTF8 and AL32UTF8 are the character sets you can use to support almost all languages around the world.

See Also: *Oracle Database Globalization Support Guide*

Understanding the Translation Process

To translate an application developed in Oracle HTML DB, you must map the primary and target application IDs, seed and export text to a translation file, translate the text, and then apply and publish the translation file.

Topics in this section include:

- Step 1: Navigate to the Translate Application Page
- Step 2: Map Primary and Target Application IDs
- Step 3: Seed and Export Text to a Translation File
- Step 4: Translate the XLIFF File
- Step 5: Upload and Publish a Translated XLIFF Document

Step 1: Navigate to the Translate Application Page

You perform the translation process on the Translate Application page.

To navigate to the Translate Application page:

1. Navigate to the Workspace home page.
2. Click the **Application Builder** icon.
3. Select an application.
4. Click **Shared Components**.
5. Under Globalization, select **Translation Services**.

   The Translate Application page appears.

Step 2: Map Primary and Target Application IDs

The first step in translating an application is to map the primary and target application IDs. The primary application is the application to be translated. The target application is the resulting translated application.

To map the primary and target application IDs:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Map your primary language application to a translated application ID**.

   The Application Mappings page appears.
3. Click **Create**.
4. On the Translation Application Mapping page:
   - Translation Application - Type a numeric application ID to identify the target application. The translated application ID must be an integer and cannot end in zero.
   - Translation Application Language Code - Select the language you are translating to.
   - Image Directory - Enter the directory where images will be obtained.

This attribute determines the virtual path for translated images. For example, if your primary language application had an image prefix of `'/images/'`, you could define additional virtual directories for other languages such as `'/images/de/'` for German or `'/images/es/'` for Spanish.

5. Click **Create**.

Step 3: Seed and Export Text to a Translation File

The second step is to seed the translation table and then export the translation text to a translation file.

Topics in this section include:

- Seeding Translatable Text
- Exporting Text to a Translation File

Seeding Translatable Text

To translate a application, you must seed the translations. Seeding the translation copies all translatable text into the Translation Text repository. Once you have seeded the application and specific language in the Translation Text repository, you can then generate and export an XLIFF file for translation.

The seeding process keeps your primary language application synchronized with the Translation Text repository. You should run the seed process any time your primary language application changes.

To seed translatable text:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Seed and export the translation text of your application into a translation file**.
3. From Language Mapping, select the appropriate primary and target application ID map.
4. Click **Seed Translatable Text**.

   The XLIFF Export page appears.

Note: XML Localization Interchange File Format (XLIFF) is a XML-based format for exchanging localization data. For information about the XLIFF, or to view the XLIFF specification see:

`http://www.xliff.org`

Exporting Text to a Translation File

Once you have seeded translatable text, a status box displays at the top of the XLIFF Export page indicating the total number of attributes that may require translation as well as the number of:

- Existing updated attributes that may require translation
- New attributes that may require translation
- Purged attributes that no longer require translation

You can use this information to determine whether you need to export translatable text for an entire application or just a specific page.

The XLIFF Export page is divided into two sections. Use the upper half of the page to export translatable text for an entire application (that is, all pages, lists of values, messages, and so on). Use the lower section to export translatable text for a specific page.

To export translatable text for an entire application:

1. Seed the translatable text as described in the previous procedure, "Seeding Translatable Text" on page 15-7.
2. Under **Step 2, Export XLIFF**:
    a. From Application, select the appropriate primary and target application ID map
    b. Specify whether to include XLIFF target elements
    c. Under Export, specify what translation text is included in your XLIFF file
    d. Click **Export XLIFF for Application**
3. Follow the on-screen instructions.

To export translatable text for a specific page:

1. Seed translatable text as described in "Seeding Translatable Text" on page 15-7.
2. Under **Export XLIFF for specific Page**:
    a. From Application, select the appropriate primary and target application ID map
    b. Specify whether to include XLIFF target elements
    c. Under Export, specify what translation text is included in your XLIFF file
    d. Click **Export XLIFF for Page**
3. Follow the on-screen instructions.

About Include XLIFF Target Elements When Oracle HTML DB generates an XLIFF document, each document contains multiple translation units. Each translation unit consists of a source element and a target element. The XLIFF document can be generated with both the source and target elements for each translation unit. You have the option of generating a file containing only source elements. The updated translations will be applied from the target elements of translation units.

About Export Use the options under **Export** to specify what translation text is included in your XLIFF file. Select **All translatable elements** to include all translation text for an application. In contrast, select **Only those elements requiring translation** to include only new elements that have not yet been translated. **Only those elements requiring translation** produces an XLIFF file containing new or modified translation units. Also, if translation units were intentionally not previously translated (that is, the source of the translation element equals the target of the translation element), those translation units will also be included in the file.

Step 4: Translate the XLIFF File

After you export a translatable file to XLIFF format, you can translate it into the appropriate languages. Since XLIFF is an open standard XML file for exchanging translation, most translation vendors should support it. Oracle HTML DB only supports XLIFF files encoded in UTF-8 character sets. In other words, it exports XLIFF files for translation in UTF-8 and assumes that the translated XLIFF files will be in the same character set.

Translation is a time-consuming task. Oracle HTML DB supports incremental translation so that application development can be done in parallel with the translation. A XLIFF file can be translated and uploaded to Oracle HTML DB even when only part of the XLIFF file is translated. For strings that have no translation in the corresponding translated application, Oracle HTML DB uses the corresponding ones in the primary language.

> **See Also:** For more information about the XLIFF, or to view the XLIFF specification see:
>
> `http://www.xliff.org`

Step 5: Upload and Publish a Translated XLIFF Document

Once your XLIFF document has been translated, the next step is to upload it back into Oracle HTML DB.

To upload a translated XLIFF document:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Apply your translation file and publish**.
3. Click **Upload XLIFF**.
4. On the XLIFF Upload page:
   a. Specify a title
   b. Enter a description
   c. Click **Browse** and locate the file to be uploaded
   d. Click **Upload XLIFF File**

   The uploaded document appears in the XLIFF Files repository.

Once you upload an XLIFF document, the next step is to apply the XLIFF document and then publish the translated application. When you apply an XLIFF document, the HTML DB engine parses the file and then updates the translation tables with the new translatable text.

Publishing your application creates a copy of the base language application, substituting the translated text strings from your translations table. This published application can then be used to render your application in alternate languages.

Remember that in order to run an application in an alternative language, you need to run it with globalization settings that will cause an alternative language version to display. For example, if the language is derived from the browser language, you must set the browser language to the same language as the translated application.

> **See Also:** "Specifying the Primary Language for an Application" on page 15-4

To apply and publish a translated XLIFF document:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Apply your translation file and publish**.
3. In the XLIFF Files repository, click the **View** icon adjacent to the document you want to publish.
4. From Apply to, select the appropriate primary and target application ID map.
5. Click **Apply XLIFF Translation File**.
6. Click **Publish Application**.

To delete an uploaded XLIFF document:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Apply your translation file and publish**.
3. In the XLIFF Files repository, select the check box to the left of the document title.
4. Click **Delete Checked**.

You should verify the existence of the translated application once it is published. Translated applications do not display in the Available Applications list on the Application Builder home page. Instead, use the Application Navigate list on the left side of the page.

Note that in order for a translated application to appear in Application Builder, you need to make sure the you have correctly configured the application Globalization attributes.

See Also: "Specifying the Primary Language for an Application" on page 15-4

Translating Messages Used in PL/SQL Procedures

If your application includes PL/SQL regions or PL/SQL processes or calls PL/SQL package, procedures, or functions, you may need to translate generated HTML. First, you define each message on the Translatable Messages page. Second, you use the `HTMLDB_LANG.MESSAGE` API to translate the messages from PL/SQL stored procedures, functions, triggers, or packaged procedures and functions.

Defining Translatable Messages

You create translatable messages on the Translate Messages page.

To define a new translation message:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Optionally translate messages which are used by PL/SQL procedures and functions**.
3. On the Translate Messages page, click **Create**.
4. On the Identify Text Message page:
   a. In Name, type a name to identify the text message

b. In Language, select the language for which the message would be used

c. In text, type the text to be returned when the text message is called.

For example, you could define the message `GREETING_MSG` in English as:

```
Good morning %0
```

Or, you could define the message `GREETING_MSG` in German as:

```
Guten Tag %0
```

5. Click **Create**.

HTMLDB_LANG.MESSAGE API

Use the `HTMLDB_LANG.MESSAGE` API to translate text strings (or messages) generated from PL/SQL stored procedures, functions, triggers, packaged procedures and functions.

Syntax

```
HTMLDB_LANG.MESSAGE (
    p_name    IN    VARCHAR2 DEFAULT NULL,
    p0        IN    VARCHAR2 DEFAULT NULL,
    p1        IN    VARCHAR2 DEFAULT NULL,
    p2        IN    VARCHAR2 DEFAULT NULL,
    ...
    p9        IN    VARCHAR2 DEFAULT NULL,
    p_lang    IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 15–2 describes the parameters available in the `HTMLDB_LANG.MESSAGE`.

Table 15–2 HTMLDB_LANG.MESSAGE Parameters

Parameter	Description
`p_name`	Name of the message as defined in Oracle HTML DB.

`p0`
...
`p9`
	Dynamic substitution value. `p0` corresponds to 0% in the message. `p1` corresponds to 1% in the message. p2 corresponds to2% in the message and so on.

`p_lang`	Language code for the message to be retrieved. If not specified, Oracle HTML DB uses the current language for the user as defined in the Application Language Derived From attribute. **See Also:** "Specifying the Primary Language for an Application" on page 15-4

Example

The following example assumes you have defined a message called `GREETING_MSG` in your application in English as `Good morning%0` and in German as `Guten Tag%1`. The following example demonstrates how you could invoke this message from PL/SQL:

```
BEGIN
    --
    -- Print the greeting
    --
    HTMLDB_LANG.MESSAGE('GREETING_MSG', V('APP_USER'));
END;
```

How `p_lang` attribute is defined depends on how the HTML DB engine derives the Application Primary Language. For example, if you are running the application in German and the previous call is made `HTMLDB_LANG.MESSAGE`, the HTML DB engine first looks for a message called `GREETING_MSG` with a `LANG_CODE` of `de`. If it does not find anything, then it will revert to the Application Primary Language attribute. If it still does not find anything, the HTML DB engine looks for a message by this name with a language code of `en-us`.

> **See Also:** "Specifying the Primary Language for an Application" on page 15-4 for information about the Application Primary Language attribute

Translating Data that Supports List of Values

You create a dynamic translation to translate dynamic pieces of data. For example, you might use a dynamic translation on a list of values based on a database query.

Dynamic translations differ from messages in that you query a specific string rather then a message name. You define dynamic translations on the Dynamic Translations page. You then use the `HTMLDB_LANG.LANG` API to return the dynamic translation string identified by the parameter `p_primary_text_string`.

Defining a Dynamic Translation

You define dynamic translations on the Dynamic Translations page. A dynamic translation consists of a "translate-from" language string, a language code, and a "translate-to" string.

To define a dynamic translation:

1. Navigate to the Translate Application page. See "Step 1: Navigate to the Translate Application Page" on page 15-6.
2. On the Translate Application page, select **Optionally identify any data that needs to be dynamically translated to support SQL based lists of values**.
3. On the Dynamic Translations page, click **Create** and specify the following:
   a. In Language, select a target language
   b. In Translate From Text, type the source text to be translated
   c. In Translate To, type the translated text
4. Click **Create**.

HTMLDB_LANG.LANG API

Syntax

```
HTMLDB_LANG.LANG (
    p_primary_text_string    IN    VARCHAR2 DEFAULT NULL,
    p0                       IN    VARCHAR2 DEFAULT NULL,
    p1                       IN    VARCHAR2 DEFAULT NULL,
    p2                       IN    VARCHAR2 DEFAULT NULL,
    ...
    p9                       IN    VARCHAR2 DEFAULT NULL,
    p_primary_language        IN     VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 15–3 describes the parameters available in the HTMLDB_LANG.LANG.

Table 15–3 HTMLDB_LANG.LANG Parameters

Parameter	Description
`p_primary_string`	Text string of the primary language. This will be the value of the Translate From Text in the dynamic translation.

`p0`
...
`p9`
	Dynamic substitution value. `p0` corresponds to 0% in the in the translation string. `p1` corresponds to 1% in the in the translation string. `p2` corresponds to 2% in the in the translation string and so on.

`p_primary_language`	Language code for the message to be retrieved. If not specified, Oracle HTML DB uses the current language for the user as defined in the Application Language Derived From attribute. **See Also:** "Specifying the Primary Language for an Application" on page 15-4

Example

Suppose you have a table that defines all primary colors. You could define a dynamic message for each color and then apply the LANG function to the defined values in a query. For example:

```
SELECT HTMLDB_LANG.LANG(color)
  FROM my_colors
```

For example, suppose you were running the application in German andRED was a value for the color column in my_colors table. If you defined the German word for red, the previous example would return ROT.

About Oracle HTML DB Globalization Codes

If you are building a multilingual application, it is important to understand how Oracle HTML DB globalization codes impact the way in which your application runs. These codes are set automatically based on the application-level Globalization attributes you select.

> **See Also:** "Specifying the Primary Language for an Application" on page 15-4

NLS_LANGUAGE and NLS_TERRITORY determine the default presentation of number, dates, and currency.

Table 15–4 describes the globalization codes in Oracle HTML DB.

Table 15–4 Oracle HTML DB Globalization Codes

Language Name	Language Code	NLS_LANGUAGE	NLS_TERRITORY
Afrikaans	`af`	ENGLISH	SOUTH AFRICA
Arabic	`ar`	ARABIC	UNITED ARAB EMIRATES
Arabic (Algeria)	`ar-dz`	ARABIC	ALGERIA
Arabic (Bahrain)	`ar-bh`	ARABIC	BAHRAIN
Arabic (Egypt)	`ar-eg`	EGYPTIAN	EGYPT
Arabic (Iraq)	`ar-iq`	ARABIC	IRAQ
Arabic (Jordan)	`ar-jo`	ARABIC	JORDAN
Arabic (Kuwait)	`ar-kw`	ARABIC	KUWAIT
Arabic (Lebanon	`ar-lb`	ARABIC	LEBANNON
Arabic (Libya)	`ar-ly`	ARABIC	LIBYA
Arabic (Morocco)	`ar-ma`	ARABIC	MOROCCO
Arabic (Oman)	`ar-om`	ARABIC	OMAN
Arabic (Qatar)	`ar-qa`	ARABIC	QATAR
Arabic (Saudi Arabia)	`ar-sa`	ARABIC	SAUDI ARABIA
Arabic (Syria)	`ar-sy`	ARABIC	SYRIA
Arabic (Tunisia)	`ar-tn`	ARABIC	TUNISIA
Arabic (U.A.E.)	`ar-ae`	ARABIC	UNITED ARAB EMIRATES
Arabic (YEMEN)	`ar-ye`	ARABIC	YEMEN
Assamese	`as`	ASSAMESE	INDIA
Basque	`eu`	FRENCH	FRANCE
Belarusian	`be`	RUSSIAN	RUSSIA
Bengali	`bn`	BANGLA	BANGLADESH
Bulgarian	`bg`	BULGARIAN	BULGARIA
Catalan	`ca`	CATALAN	CATALONIA
Chinese	`zh`	SIMPLIFIED CHINESE	CHINA
Chinese (China)	`zh-cn`	SIMPLIFIED CHINESE	CHINA
Chinese (Hong Kong SAR)	`zh-hk`	TRADITIONAL CHINESE	HONG KONG
Chinese (Macau SAR)	`zh-mo`	TRADITIONAL CHINESE	HONG KONG
Chinese (Singapore)	`zh-sg`	SIMPLIFIED CHINESE	SINGAPORE
Chinese (Taiwan)	`zh-tw`	TRADITIONAL CHINESE	TAIWAN
Croatian	`hr`	CROATIAN	CROATIA
Czech	`cs`	CZECH	CZECH REPUBLIC
Danish	`da`	DANISH	DENMARK
Dutch (Belgium)	`nl-be`	DUTCH	BELGIUM
Dutch (Netherlands)	`nl`	DUTCH	THE NETHERLANDS
English	`en`	AMERICAN	AMERICA

Table 15–4 (Cont.) Oracle HTML DB Globalization Codes

Language Name	Language Code	NLS_LANGUAGE	NLS_TERRITORY
English (Australia)	`en-au`	ENGLISH	AUSTRALIA
English (Belize)	`en-bz`	ENGLISH	UNITED KINGDOM
English (Canada)	`en-ca`	ENGLISH	CANADA
English (Ireland)	`en-ie`	ENGLISH	IRELAND
English (Jamaica)	`en-jm`	ENGLISH	UNITED KINGDOM
English (New Zealand)	`en-nz`	ENGLISH	NEW ZEALAND
English (Philippines)	`en-ph`	ENGLISH	PHILIPPINES
English (South Africa)	`en-za`	ENGLISH	SOUTH AFRICA
English (Trinidad)	`en-tt`	ENGLISH	UNITED KINGDOM
English (United Kingdom)	`en-gb`	ENGLISH	UNITED KINGDOM
English (United States)	`en-us`	AMERICAN	AMERICA
English (Zimbabwe)	`en-zw`	ENGLISH	UNITED KINGDOM
Estonian	`et`	ESTONIAN	ESTONIA
Faeroese	`fo`	ENGLISH	UNITED KINGDOM
Farsi	`fa`	ENGLISH	UNITED KINGDOM
Finnish	`fi`	FINNISH	FINLAND
French (Belgium)	`fr-be`	FRENCH	BELGIUM
French (Canada)	`fr-ca`	CANADIAN FRENCH	CANADA
French (France)	`fr`	FRENCH	FRANCE
French (Luxembourg)	`fr-lu`	FRENCH	LUXEMBOURG
French (Monaco)	`fr-mc`	FRENCH	FRANCE
French (Switzerland)	`fr-ch`	FRANCH	SWITZERLAND
FYRO Macedonian	`mk`	MACEDONIAN	FYR MACEDONIA
Gaelic	`gd`	ENGLISH	UNITED KINGDOM
Galician	`gl`	SPANISH	SPAIN
German (Austria)	`de-at`	GERMAN	AUSTRIA
German (Germany)	`de`	GERMAN	GERMANY
German (Liechtenstein)	`de-li`	GERMAN	GERMANY
German (Luxemgourg)	`de-lu`	GERMAN	LUXEMBOURG
German (Switzerland)	`de-ch`	GERMAN	SWITZERLAND
Greek	`el`	GREEK	GREECE
Gujarati	`gu`	GUJARATI	INDIA
Hebrew	`he`	HEBREW	ISRAEL
Hindi	`hi`	HINDI	INDIA
Hungarian	`hu`	HUNGARIAN	HUNGARY
Icelandic	`is`	ICELANDIC	ICELAND

Table 15–4 (Cont.) Oracle HTML DB Globalization Codes

Language Name	Language Code	NLS_LANGUAGE	NLS_TERRITORY
Indonesian	id	INDONESIAN	INDONESIA
Italian (Italy)	it	ITALIAN	ITALY
Italian (Switzerland)	it-ch	ITALIAN	SWITZERLAND
Japanese	ja	JAPANESE	JAPAN
Kannada	kn	KANNADA	INDIA
Kazakh	kk	CYRILLIC KAZAKH	KAZAKHSTAN
Konkani	kok	KOREAN	KOREA
Korean	ko	KOREAN	KOREA
Kyrgyz	kz	RUSSIAN	RUSSIA
Latvian	lv	LATVIAN	LATVIA
Lithuanian	lt	LITHUANIAN	LITHUANIANA
Malay (Malaysia)	ms	MALAY	MALAYSIA
Malayalam	ml	MALAYALAM	INDIA
Maltese	mt	ENGLISH	UNITED KINGDOM
Marathi	mr	ENGLISH	INDIA
Nepali (India)	ne	ENGLISH	UNITED KINGDOM
Norwegian (Bokmal)	nb-no	NORWEGIAN	NORWAY
Norwegian (Bokmal)	no	NORWEGIAN	NORWAY
Norwegian (Nynorsk)	nn-no	NORWEGIAN	NORWAY
Oriya	or	ORIYA	INDIA
Polish	pl	POLISH	POLAND
Portuguese (Brazil)	pt-br	BRAZILIAN PORTUGUESE	BRAZIL
Portuguese (Portugal)	pt	PORTUGUESE	PORTUGAL
Punjabi	pa	PUNJABI	INDIA
Romanian	ro	ROMANIAN	ROMANIA
Russian	ru	RUSSIAN	RUSSIA
Russian (Moldova)	ru-md	RUSSIAN	RUSSIA
Serbia	sr	CYRILLIC SERBIAN	SERBIA AND MONTENEGRO
Slovak	sk	SLOVAK	SLOVAKIA
Slovenian	sl	SLOVENIAN	SLOVENIA
Spanish (Argentina)	es-ar	LATIN AMERICAN SPANISH	ARGENTINA
Spanish (Bolivia)	es-bo	LATIN AMERICAN SPANISH	ARGENTINA
Spanish (Chile)	es-cl	LATIN AMERICAN SPANISH	CHILE
Spanish (Columbia)	ec-co	LATIN AMERICAN SPANISH	COLUMBIA
Spanish (Costa Rica)	es-cr	LATIN AMERICAN SPANISH	COSTA RICA
Spanish (Dominican Republic)	es-do	LATIN AMERICAN SPANISH	PUERTO RICO

Table 15–4 (Cont.) Oracle HTML DB Globalization Codes

Language Name	Language Code	NLS_LANGUAGE	NLS_TERRITORY
Spanish (Ecudor)	`es-ec`	LATIN AMERICAN SPANISH	ECUDOR
Spanish (El Salvador)	`es-sv`	LATIN AMERICAN SPANISH	EL SALVADOR
Spanish (Guatemala)	`es-gt`	LATIN AMERICAN SPANISH	GUATEMALA
Spanish (Honduras)	`es-hn`	LATIN AMERICAN SPANISH	GUATEMALA
Spanish (Mexico)	`es-mx`	MEXICAN SPANISH	MEXICO
Spanish (Nicaragua)	`es-ni`	LATIN AMERICAN SPANISH	Nicaragua
Spanish (Panama)	`es-pa`	LATIN AMERICAN SPANISH	Panama
Spanish (Paraguay)	`es-py`	LATIN AMERICAN SPANISH	ARGENTINA
Spanish (Peru)	`es-pe`	LATIN AMERICAN SPANISH	PERU
Spanish (Peurto Rico)	`es-pr`	LATIN AMERICAN SPANISH	PEURTO RICO
Spanish (Traditional Sort)	`es`	LATIN AMERICAN SPANISH	SPAIN
Spanish (United States)	`es-us`	LATIN AMERICAN SPANISH	AMERICAN
Spanish (Uruguay)	`es-uy`	LATIN AMERICAN SPANISH	ARGENTINA
Spanish (Venezuela)	`es-ve`	LATIN AMERICAN SPANISH	VENEZUELA
Swedish	`sv`	SWEDISH	SWEDEN
Swedish	`sv-fi`	SWEDISH	FINLAND
Tamil	`ta`	TAMIL	INDIA
Telugu	`te`	TELUGU	INDIA
Thai	`th`	THAI	THAILAND
Turkish	`tr`	TURKISH	TURKEY
Ukrainian	`uk`	UKRAINIAN	UKRAINE
Urdu	`ur`	ENGLISH	UNITED KINGDOM
Uzbek	`uz`	LATIN UZBEK	UZBEKISTAN
Vietnamese	`vi`	VIETNAMESE	VIETNAM
Zulu	`zu`	ENGLISH	UNITED KINGDOM

16 Oracle HTML DB APIs

This section describes the APIs available in Oracle HTML DB.

This section contains the following topics:

HTMLDB_UTIL

The `HTMLDB_UTIL` package provides utilities you can use when programming in the Oracle HTML DB environment. You can use `HTMLDB_UTIL` to get and set session state, get files, check authorizations for users, reset different states for users, and also to get and set preferences for users.

Topics in this section include:

- STRING_TO_TABLE Function
- TABLE_TO_STRING Function
- URL_ENCODE Function

CHANGE_CURRENT_USER_PW Procedure

This procedure changes the password of the currently authenticated user, assuming HTML DB user accounts are in use.

Syntax

```
HTMLDB_UTIL.CHANGE_CURRENT_USER_PW(
    p_new_password IN VARCHAR2);
```

Parameters

Table 16–1 describes the parameters available in the `CHANGE_CURRENT_USER_PW` procedure.

Table 16–1 CHANGE_CURRENT_USER_PW Parameters

Parameter	Description
`p_new_password`	The new password value in clear text.

Example

```
BEGIN
HTMLDB_UTIL.CHANGE_CURRENT_USER_PW ('secret99');
END;
```

CLEAR_APP_CACHE Procedure

This procedure removes session state for a given application for the current session.

Syntax

```
HTMLDB_UTIL.CLEAR_APP_CACHE (
    p_app_id    IN    VARCHAR2 DEFAULT NULL);
```

Parameters

`p_app_id` is the ID of the application for which session state will be cleared for current session.

Example

```
BEGIN
        HTMLDB_UTIL.CLEAR_APP_CACHE('100');
END;
```

CLEAR_PAGE_CACHE Procedure

This procedure removes session state for a given page for the current session.

Syntax

```
HTMLDB_UTIL.CLEAR_PAGE_CACHE (
    p_page_id IN NUMBER DEFAULT NULL);
```

Parameters

`p_page_id` is the ID of the page in the current application for which session state will be cleared for current session.

Example

```
BEGIN
HTMLDB_UTIL.CLEAR_PAGE_CACHE('10');
END;
```

CLEAR_USER_CACHE Procedure

This procedure removes session state and application system preferences for the current user's session. Run this procedure if you reuse session IDs and want to run applications without the benefit of existing session state.

Syntax

```
HTMLDB_UTIL.CLEAR_USER_CACHE;
```

Example

```
BEGIN
      HTMLDB_UTIL.CLEAR_USER_CACHE;
END;
```

COUNT_CLICK Procedure

This procedure counts clicks from an Oracle HTML DB application to an external site. You can also use the shorthand version procedure `Z` in place of `HTMLDB_UTIL.COUNT_CLICK`.

Syntax

```
HTMLDB_UTIL.COUNT_CLICK (
    p_url         IN    VARCHAR2,
    p_cat         IN    VARCHAR2,
    p_id          IN    VARCHAR2    DEFAULT NULL,
    p_user        IN    VARCHAR2    DEFAULT NULL,
    p_workspace   IN    VARCHAR2    DEFAULT NULL);
```

Parameters

Table 16–2 describes the parameters available in the `COUNT_CLICK` procedure.

Table 16–2 COUNT_CLICK Parameters

Parameter	Description
`p_url`	The URL to redirect to.
`p_cat`	A category to classify the click.
`p_id`	Secondary ID to associate with the click (optional).
`p_user`	The application user ID (optional).
`p_workspace`	The workspace associated with the application (optional).

Example

```
BEGIN
htp.p('<a
href=HTMLDB_UTIL.COUNT_CLICK?p_url=http://yahoo.com&p_cat=yahoo&p_workspace=NNN>
Click</a>');
end;
```

Where `NNN` equals your workspace ID.

See Also: "Purging the External Clicks Log" on page 12-11

CREATE_USER Procedure

This procedure creates a new account record in the HTML DB user account table. To execute this procedure, the current user must have administrative privileges.

Syntax

```
HTMLDB_UTIL.CREATE_USER(
    p_user_id                   NUMBER                IN     DEFAULT NULL
    p_user_name                 VARCHAR2              IN
    p_first_name                VARCHAR2              IN     DEFAULT NULL
    p_last_name                 VARCHAR2              IN     DEFAULT NULL
    p_description               VARCHAR2              IN     DEFAULT NULL
    p_email_address             VARCHAR2              IN     DEFAULT NULL
    p_web_password              VARCHAR2              IN
    p_web_password_format       VARCHAR2              IN     DEFAULT NULL
    p_group_ids                 VARCHAR2              IN     DEFAULT NULL
    p_developer_privs           VARCHAR2              IN     DEFAULT NULL
    p_default_schema            VARCHAR2              IN     DEFAULT NULL
    p_allow_access_to_schemas   VARCHAR2              IN     DEFAULT NULL
    p_attribute_01              VARCHAR2              IN     DEFAULT NULL
    p_attribute_02              VARCHAR2              IN     DEFAULT NULL
    p_attribute_03              VARCHAR2              IN     DEFAULT NULL
    p_attribute_04              VARCHAR2              IN     DEFAULT NULL
    p_attribute_05              VARCHAR2              IN     DEFAULT NULL
    p_attribute_06              VARCHAR2              IN     DEFAULT NULL
    p_attribute_07              VARCHAR2              IN     DEFAULT NULL
    p_attribute_08              VARCHAR2              IN     DEFAULT NULL
    p_attribute_09              VARCHAR2              IN     DEFAULT NULL
    p_attribute_10              VARCHAR2              IN     DEFAULT NULL)
```

Parameters

Table 16–3 describes the parameters available in `CREATE_USER` procedure.

Table 16–3 CREATE_USER Procedure Parameters

Parameter	Description
`p_user_id`	Numeric primary key of user account.
`p_user_name`	Alphanumeric name used for login.
`p_first_name`	Informational.
`p_last_name`	Informational.
`p_description`	Informational.
`p_email_address`	E-mail address.
`p_web_address`	Clear text password.

Table 16–3 (Cont.) CREATE_USER Procedure Parameters

Parameter	Description
`p_group_ID`	Colon separated list of numeric group IDs.
`p_developer_privs`	Colon separated list of developer privileges (only applies to Oracle HTML DB administrators).
`p_default_schema`	A database schema assigned to user's workspace used by default for browsing.
`p_allow_access_to_ schemas`	A list of schemas assigned to user's workspace to which user is restricted.
`p_attribute_01`	Arbitrary text accessible with API.
`...`	
`p_attribute_10`	

Example

```
BEGIN
HTMLDB_UTIL.CREATE_USER
    P_USER_NAME    => 'NEWUSER1',
    P_WEB_PASSWORD => 'secret99');
END;
```

CREATE_USER_GROUP Procedure

This procedure changes the password of the currently authenticated user, assuming HTML DB user accounts are in use. To execute this procedure, the current user must have administrative privilege in the workspace.

Syntax

```
HTMLDB_UTIL.CREATE_USER_GROUP(
    p_id                      NUMBER                  IN
    p_group_name              VARCHAR2                IN
    p_security_group_id       NUMBER                  IN
    p_group_desc              VARCHAR2                IN);
```

Parameter

Table 16–4 describes the parameters available in the `CREATE_USER_GROUP` procedure.

Table 16–4 CREATE_USER_GROUP Parameters

Parameter	Description
`p_id`	Primary key of group.
`p_group_name`	Arbitrary name.
`p_security_group_id`	Workspace ID.
`p_group_desc`	Descriptive text.

Example

```
BEGIN
HTMLDB_UTIL.CREATE_USER_GROUP (
    p_id                => 0 - trigger will assign PK,
    p_group_name        => 'Managers',
    p_security_group_id => null, -- defaults to current workspace ID
    p_group_desc        => 'text');
END;
```

CURRENT_USER_IN_GROUP Function

This function returns a Boolean result based on whether the current user is a member of the specified group. You may use the group name or group ID to identify the group.

Syntax

```
HTMLDB_UTIL.CURRENT_USER_IN_GROUP(
    p_group_name    IN VARCHAR2)
RETURN BOOLEAN;

HTMLDB_UTIL.CURRENT_USER_IN_GROUP(
    p_group_id    IN NUMBER)
RETURN BOOLEAN;
```

Parameters

Table 16–5 describes the parameters available in `CURRENT_USER_IN_GROUP` function.

Table 16–5 CURRENT_USER_IN_GROUP Parameters

Parameter	Description
`p_group_name`	Identifies the name of an existing group in the workspace.
`p_group_id`	Identifies the numeric ID of an existing group in the workspace.

Example

```
DECLARE VAL BOOLEAN;
BEGIN
  VAL := HTMLDB_UTIL.CURRENT_USER_IN_GROUP(p_group_name=>'Managers');
END;
```

EDIT_USER Procedure

This procedure enables a user account record to be altered. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
EDIT_USER (
    p_user_id                      NUMBER                 IN
    p_user_name                    VARCHAR2               IN
    p_first_name                   VARCHAR2               IN     DEFAULT
    p_last_name                    VARCHAR2               IN     DEFAULT
    p_web_password                 VARCHAR2               IN     DEFAULT
    p_new_password                 VARCHAR2               IN     DEFAULT
    p_email_address                VARCHAR2               IN     DEFAULT
    p_start_date                   VARCHAR2               IN     DEFAULT
    p_end_date                     VARCHAR2               IN     DEFAULT
    p_employee_id                  VARCHAR2               IN     DEFAULT
    p_allow_access_to_schemas      VARCHAR2               IN     DEFAULT
    p_person_type                  VARCHAR2               IN     DEFAULT
    p_default_schema               VARCHAR2               IN     DEFAULT
    p_group_idS                    VARCHAR2               IN     DEFAULT
    P_DEVELOPER_ROLES           VARCHAR2            IN     DEFAULT
    P_DESCRIPTION               VARCHAR2            IN     DEFAULTIN);
```

Parameters

Table 16–6 describes the parameters available in `EDIT_USER` procedure.

Table 16–6 EDIT_USER Parameters

Parameter	Description
`p_user_id`	Numeric primary key of user account.
`p_user_name`	Alphanumeric name used for login.
`p_first_name`	Informational.
`p_last_name`	Informational.
`p_web_password`	Clear text password,
`p_start_date`	Unused.
`p_end_date`	Unused.
`p_employee_id`	Unused.
`p_allow_access_to_schemas`	A list of schemas assigned to user's workspace to which user is restricted.
`p_person_type`	Unused.
`p_default_schema`	A database schema assigned to user's workspace used by default for browsing.
`p_group_ids`	Colon separated list of numeric group IDs.
`p_developer_privs`	Colon separated list of developer p.rivileges (only ADMIN: has meaning to HTML DB)
`p_description`	Informational.

EXPORT_USERS Procedure

When called from an Oracle HTML DB page, this procedure produces an export file of the current workspace definition, workspace users, and workspace groups. To execute this procedure, the current user must have administrative privilege in the workspace.

Syntax

```
HTMLDB_UTIL.EXPORT_USERS(
    p_export_format in VARCHAR2 DEFAULT 'UNIX')
```

Parameters

Table 16–7 describes the parameters available in `EXPORT_USERS` procedure.

Table 16–7 EXPORT_USERS Parameters

Parameter	Description
`p_export_format`	Indicates how rows in the export file will be formatted. Specify `'UNIX'` to have the resulting file contain rows delimited by line feeds. Specify `'DOS'` to have the resulting file contain rows delimited by carriage returns and line feeds.

Example

```
BEGIN
  HTMLDB_UTIL.EXPORT_USERS;
END;
```

FETCH_APP_ITEM Function

This function fetches session state for the current or specified application in the current or specified session.

Syntax

```
HTMLDB_UTIL.FETCH_APP_ITEM(
    p_item    IN VARCHAR2,
    p_app     IN NUMBER DEFAULT NULL,
    p_session IN NUMBER DEFAULT NULL)
RETURN VARCHAR2;
```

Parameters

Table 16–8 describes the parameters available in `the FETCH_APP_ITEM` function.

Table 16–8 FETCH_APP_ITEM Parameters

Parameter	Description
`p_item`	The name of an application-level item (not a page item) whose current value is to be fetched.
`p_app`	The ID of the application that owns the item (leave null for current application).
`p_session`	The session ID from which to obtain the value (leave null for current session)

Example

```
DECLARE VAL VARCHAR2(30);
BEGIN
VAL := HTMLDB_UTIL.FETCH_APP_ITEM (p_item=>'F300_NAME',p_app=>300);
END;
```

FETCH_USER Procedure

This procedure fetches a user account record. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
FETCH_USER (
    P_USER_ID                     NUMBER                  IN
    P_WORKSPACE                   VARCHAR2                OUT
    P_USER_NAME                   VARCHAR2                OUT
    P_FIRST_NAME                  VARCHAR2                OUT
    P_LAST_NAME                   VARCHAR2                OUT
    P_WEB_PASSWORD                VARCHAR2                OUT
    P_EMAIL_ADDRESS               VARCHAR2                OUT
    P_START_DATE                  VARCHAR2                OUT
    P_END_DATE                    VARCHAR2                OUT
    P_EMPLOYEE_ID                 VARCHAR2                OUT
    P_ALLOW_ACCESS_TO_SCHEMAS     VARCHAR2                OUT
    P_PERSON_TYPE              VARCHAR2            OUT
    P_DEFAULT_SCHEMA           VARCHAR2            OUT
    P_GROUPS                   VARCHAR2            OUT
    P_DEVELOPER_ROLE           VARCHAR2            OUT);
```

Parameters

Table 16–9 describes the parameters available in the `FETCH_USER` procedure.

Table 16–9 Fetch_User Parameters

Parameter	Description
`p_user_id`	Numeric primary key of user account.
`p_workspace`	The name of the workspace
`p_user_name`	Alphanumeric name used for login.
`p_first_name`	Informational.
`p_last_name`	Informational.
`p_description`	Informational.
`p_email_address`	E-mail address.
`p_start_date`	Unused.
`p_end_date`	Unused.
`p_employee_id`	Unused.
`p_allow_access_to_schemas`	A list of schemas assigned to user's workspace to which user is restricted.
`p_person_type`	Unused.
`p_default_schema`	A database schema assigned to user's workspace used by default for browsing.
`p_groups`	Unused.
`p_developer_role`	Unused.

FIND_SECURITY_GROUP_ID Function

This function returns the numeric security group ID of the named workspace.

Syntax

```
HTMLDB_UTIL.FIND_SECURITY_GROUP_ID(
    p_workspace    IN VARCHAR2
RETURN NUMBER;
```

Parameters

`p_workspace` is the name of the workspace.

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_UTIL.FIND_SECURITY_GROUP_ID (p_workspace=>'DEMOS');
END;
```

FIND_WORKSPACE Function

This function returns the workspace name associated with a security group ID.

Syntax

```
HTMLDB_UTIL.FIND_WORKSPACE(
    p_security_group_id    IN VARCHAR2)
RETURN VARCHAR2;
```

Parameters

`p_security_group_id` is the security group ID of a workspace.

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_UTIL.FIND_ FIND_WORKSPACE (p_security_group_id =>'20');
END;
```

GET_ATTRIBUTE Function

This function returns the value of one of the attribute values (1 through 10) of a named user in the HTML DB accounts table.

Syntax

```
HTMLDB_UTIL.GET_ATTRIBUTE(
    p_username                IN VARCHAR2
    p_attribute_number        IN NUMBER)
RETURN VARCHAR2;
```

Parameters

Table 16–10 describes the parameters available in the GET_ATTRIBUTE function.

Table 16–10 GET_ATTRIBUTE Parameters

Parameter	Description
`p_username`	User name in the account.
`p_attribute_number`	Number of attributes in the user record (1 through 10).

Example

```
DECLARE VAL VARCHAR2(30);
BEGIN
  VAL := HTMLDB_UTIL.GET_ATTRIBUTE (
                          p_username => 'SCOTT',
                          p_attribute_number => 1);
END;
```

GET_CURRENT_USER_ID Function

This function returns the numeric user ID of the current user.

Syntax

```
HTMLDB_UTIL.GET_CURRENT_USER_ID;
RETURN NUMBER;
```

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_UTIL.GET_CURRENT_USER_ID;
END;
```

GET_DEFAULT_SCHEMA Function

This function returns the default schema name associated with the current user.

Syntax

```
HTMLDB_UTIL.GET_DEFAULT_SCHEMA;
RETURN VARCHAR2;
```

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL. GET_DEFAULT_SCHEMA;
END;
```

GET_EMAIL Function

This function returns the e-mail address associated with the named user.

Syntax

```
HTMLDB_UTIL.GET_EMAIL(
   p_username IN VARCHAR2);
RETURN VARCHAR2;
```

Parameters

`p_username` is the user name in the account.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_EMAIL(p_username => 'SCOTT');
END;
```

GET_FILE Procedure

This procedure downloads files from the Oracle HTML DB file repository.

Syntax

```
HTMLDB_UTIL.GET_FILE (
    p_file_id    IN   VARCHAR2,
    p_mime_type  IN   VARCHAR2 DEFAULT NULL,
    p_inline     IN   VARCHAR2 DEFAULT 'NO');
```

Parameters

Table 16–11 describes the parameters available in GET_FILE procedure.

Table 16–11 GET_FILE Parameters

Parameter	Description

p_file_id	ID in HTMLDB_APPLICATION_FILES of the file to be downloaded. HTMLDB_APPLICATION_FILES is a view on all files uploaded to your workspace. The following example demonstrates how to use HTMLDB_APPLICATION_FILES:
	`DECLARE`
	`    l_file_id NUMBER;`
	`BEGIN`
	`        SELECT id INTO l_file_id FROM HTMLDB_APPLICATION_FILES`
	`WHERE filename = 'myxml';`
	`        --`
	`        HTMLDB_UTIL.GET_FILE(`
	`              p_file_id   => l_file_id,`
	`              p_mime_type => 'text/xml',`
	`              p_inline    => 'YES');`
	`END;`

p_mime_type	Mime type of the file to download.
p_inline	Valid values include YES and NO. YES to display inline in a browser. NO to download as attachment.

Example

```
BEGIN
        HTMLDB_UTIL.GET_FILE(
              p_file_id   => '8675309',
              p_mime_type => 'text/xml',
              p_inline    => 'YES');
END;
```

GET_FILE_ID Function

This function obtains the primary key of a file in the Oracle HTML DB file repository.

Syntax

```
HTMLDB_UTIL.GET_FILE_ID (
    p_fname    IN   VARCHAR2)
RETURN NUMBER;
```

Parameters

p_fname is NAME in HTMLDB_APPLICATION_FILES of the file to be downloaded. HTMLDB_APPLICATION_FILES is a view on all files uploaded to your workspace

Example

```
DECLARE
        l_name VARCHAR2(255);
        l_file_id NUMBER;
BEGIN
        SELECT name INTO l_name FROM HTMLDB_APPLICATION_FILES
        WHERE filename = 'F125.sql';
```

```
--
        l_file_id := HTMLDB_UTIL.GET_FILE_ID(p_fname => );
END;
```

GET_FIRST_NAME Function

This function returns the `FIRST_NAME` field stored in the named user account record.

Syntax

```
HTMLDB_UTIL.GET_FIRST_NAME
   p_username IN VARCHAR2);
RETURN VARCHAR2;
```

Parameters

`p_username` identifies the user name in the account.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_FIRST_NAME(p_username => 'SCOTT');
END;
```

GET_GROUPS_USER_BELONGS_TO Function

This function returns a colon separated list of group names to which the named user is a member.

Syntax

```
HTMLDB_UTIL.GET_GROUPS_USER_BELONGS_TO(
   p_username IN VARCHAR2);
RETURN VARCHAR2;
```

Parameters

`p_username` identifies the user name in the account.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_GROUPS_USER_BELONGS_TO(p_username => 'SCOTT');
END;
```

GET_GROUP_ID Function

This function returns the numeric ID of a named group in the workspace.

Syntax

```
HTMLDB_UTIL.GET_GROUP_ID(
   p_group_name);
RETURN VARCHAR2;
```

Parameters

`p_group_name` identifies the user name in the account.

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_UTIL.GET_GROUP_ID(p_group_name => 'Managers');
END;
```

GET_GROUP_NAME Function

This function returns the name of a group identified by a numeric ID.

Syntax

```
HTMLDB_UTIL.GET_GROUP_NAME(
   p_group_id);
RETURN NUMBER;
```

Parameters

`p_group_id` identifies a numeric ID of a group in the workspace.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_GROUP_NAME(p_group_id => 8922003);
END;
```

GET_LAST_NAME Function

This function returns the `LAST_NAME` field stored in the named user account record.

Syntax

```
HTMLDB_UTIL.GET_LAST_NAME(
   p_username IN VARCHAR2);
RETURN VARCHAR2;
```

Parameters

`p_username` is the user name in the user account record.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_LAST_NAME(p_username => 'SCOTT');
END;
```

GET_USERNAME Function

This function returns the user name of a user account identified by a numeric ID.

Syntax

```
HTMLDB_UTIL.GET_USERNAME(
   p_userid);
RETURN NUMBER;
```

Parameters

`p_userid` identifies the numeric ID of a user account in the workspace.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_USERNAME(p_userid => 228922003);
END;
```

GET_NUMERIC_SESSION_STATE Function

This function returns a numeric value for a numeric item. You can use this function in Oracle HTML DB applications wherever you can use PL/SQL or SQL. You can also use the shorthand, function `NV`, in place of `HTMLDB_UTIL.GET_NUMERIC_SESSION_STATE`.

Syntax

```
HTMLDB_UTIL.GET_NUMERIC_SESSION_STATE (
    p_item     IN VARCHAR2)
    RETURN NUMBER;
```

Parameters

`p_item` is the case insensitive name of the item for which you want to have the session state fetched.

Example

```
DECLARE
      l_item_value    Number;
BEGIN
      l_item_value := HTMLDB_UTIL.GET_NUMERIC_SESSION_STATE('my_item');
END;
```

GET_PREFERENCE Function

This function retrieves the value of a previously saved preference for a given user.

Syntax

```
HTMLDB_UTIL.GET_PREFERENCE (
    p_preference  IN    VARCHAR2 DEFAULT NULL,
    p_user        IN    VARCHAR2 DEFAULT V('USER'))
    RETURN VARCHAR2;
```

Parameters

Table 16–12 describes the parameters available in the `GET_PREFERENCE` function.

Table 16–12 GET_PREFERENCE Parameters

Parameter	Description
p_preference	Name of the preference to retrieve the value.
p_value	Value of the preference.
p_user	User for whom the preference is being retrieved.

Example

```
DECLARE
      l_default_view    VARCHAR2(255);
BEGIN
      l_default_view := HTMLDB_UTIL.GET_PREFERENCE(
                   p_preference => 'default_view',
                   p_user       => :APP_USER);
END;
```

GET_SESSION_STATE Function

This function returns the value for an item. You can use this function in your Oracle HTML DB applications wherever you can use PL/SQL or SQL. You can also use the shorthand, function `V`, in place of `HTMLDB_UTIL.GET_SESSION_STATE`.

Syntax

```
HTMLDB_UTIL.GET_SESSION_STATE (
    p_item    IN   VARCHAR2)
    RETURN VARCHAR2;
```

Parameters

`p_item` is the case insensitive name of the item for which you want to fetch session state.

Example

```
DECLARE
      l_item_value  VARCHAR2(255);
BEGIN
      l_item_value := HTMLDB_UTIL.GET_SESSION_STATE('my_item');
END;
```

GET_USER_ID Function

This function returns the numeric ID of a named user in the workspace.

Syntax

```
HTMLDB_UTIL.GET_USER_ID(
   p_username);
RETURN VARCHAR2;
```

Parameters

`p_username` identifies the name of a user in the workspace.

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_UTIL.GET_USER_ID(p_username => 'Managers');
END;
```

GET_USER_ROLES Function

This function returns the `DEVELOPER_ROLE` field stored in the named user account record.

Syntax

```
HTMLDB_UTIL.GET_USER_ROLES(
   p_username IN VARCHAR2);
RETURN VARCHAR2;
```

Parameters

`p_username` identifies a user name in the account.

Example

```
DECLARE VAL VARCHAR2;
BEGIN
  VAL := HTMLDB_UTIL.GET_USER_ROLES(p_username=>'SCOTT');
END;
```

IS_LOGIN_PASSWORD_VALID Function

This function returns a Boolean result based on the validity of the password for a named user account in the current workspace. Returns true if the password matches and false if the password does not match.

Syntax

```
HTMLDB_UTIL.IS_LOGIN_PASSWORD_VALID(
   p_username IN VARCHAR2,
   p_password IN VARCHAR2);
RETURN BOOLEAN;
```

Parameters

Table 16–13 describes the parameters available in the `IS_LOGIN_PASSWORD_VALID` function.

Table 16–13 IS_LOGIN_PASSWORD_VALID Parameters

Parameter	Description
`p_username`	User name in account
`p_password`	Password to be compared with password stored in the account.

Example

```
DECLARE VAL BOOLEAN;
BEGIN
  VAL := HTMLDB_UTIL. IS_LOGIN_PASSWORD_VALID (
             p_username=>'SCOTT'
             p_password=>'tiger');
END;
```

IS_USERNAME_UNIQUE Function

This function returns a Boolean result based on whether the named user account is unique in the workspace.

Syntax

```
HTMLDB_UTIL.IS_USERNAME_UNIQUE(
   P_username IN VARCHAR2);
RETURN BOOLEAN;
```

Parameters

`p_username` identifies the user name to be tested.

Example

```
DECLARE VAL BOOLEAN;
BEGIN
  VAL := HTMLDB_UTIL.IS_USERNAME_UNIQUE(
             p_username=>'SCOTT');
END;
```

KEYVAL_NUM Function

This function gets the value of the package variable (`wwv_flow_utilities.g_val_num`) set by `HTMLDB_UTIL.SAVEKEY_NUM`.

Syntax

```
HTMLDB_UTIL.KEYVAL_NUM;
```

Parameters

`p_val` is the numeric value previously saved.

Example

```
DECLARE
BEGIN
    VAL := HTMLDB_UTIL.KEYVAL_NUM;
END;
```

See Also: "SAVEKEY_NUM Function" on page 16-23

KEYVAL_VC2 Function

This function gets the value of the package variable (`wwv_flow_utilities.g_val_vc2`) set by `HTMLDB_UTIL.SAVEKEY_VC2`.

Syntax

```
HTMLDB_UTIL.KEYVAL_VC2;
```

Parameters

`p_val` is the VARCHAR2 value previously saved.

Example

```
DECLARE
VAL VARCHAR2(4000);
BEGIN
    VAL := HTMLDB_UTIL.KEYVAL_VC2;

END;
```

See Also: "SAVEKEY_VC2 Function" on page 16-24

PREPARE_URL Function

Given a ready-to-render `f?p` relative URL, this function adds a Session State Protection checksum argument (`&cs=`) if one is required.

Syntax

```
HTMLDB_UTIL.PREPARE_URL (
   p_url IN VARCHAR2
   p_url_charset IN VARCHAR2 default null,
   p_checksum_type IN VARCHAR2 default null)
RETURN VARCHAR2;
```

Parameters

Table 16–14 describes the parameters available in the PREPARE_URL function.

Table 16–14 PREPARE_URL Parameters

Parameter	Description
p_url	An f?p relative URL with all substitutions resolved.
p_url_charset	The character set name (for example, `UTF-8`) to use when escaping special characters contained within argument values.
p_checksum type	Null or any of the following six values, `SESSION` or `3`, `PRIVATE_BOOKMARK` or `2`, or `PUBLIC_BOOKMARK` or `1`.

Example

```
DECLARE
l_url varchar2(2000);
l_session number := v('APP_SESSION');
BEGIN
l_url :=
HTMLDB_UTIL.PREPARE_URL('f?p=100:1:'||l_session||'::NO::P1_ITEM:xyz');
END;
```

PUBLIC_CHECK_AUTHORIZATION Function

Given the name of a security scheme, this function determines if the current user passes the security check.

Syntax

```
HTMLDB_UTIL.PUBLIC_CHECK_AUTHORIZATION (
    p_security_scheme    IN    VARCHAR2)
    RETURN BOOLEAN;
```

Parameters

`p_security_name` is the name of the security scheme that determines if the user passes the security check.

Example

```
DECLARE
      l_check_security  BOOLEAN;
BEGIN
      l_check_security := HTMLDB_UTIL.PUBLIC_CHECK_AUTHORIZATION('my_auth_
scheme');
END;
```

REMOVE_PREFERENCE Procedure

This function removes the preference for the supplied user.

Syntax

```
HTMLDB_UTIL.REMOVE_PREFERENCE(
    p_preference    IN    VARCHAR2 DEFAULT NULL,
    p_user          IN    VARCHAR2 DEFAULT V('USER'));
```

Parameters

Table 16–15 describes the parameters available in the `REMOVE_PREFERENCE` procedure.

Table 16–15 REMOVE_PREFERENCE Parameters

Parameter	Description
`p_preference`	Name of the preference to remove.
`p_user`	User for whom the preference is for.

Example

```
BEGIN
       HTMLDB_UTIL.REMOVE_PREFERENCE(
                    p_preference => 'default_view',
                    p_user       => :APP_USER);
END;
```

REMOVE_SORT_PREFERENCES Procedure

This procedure removes the user's column heading sorting preference value.

Syntax

```
HTMLDB_UTIL.REMOVE_SORT_PREFERENCES (
    p_user  IN VARCHAR2 DEFAULT V('USER'));
```

Parameters

`p_user` identifies the user for whom sorting preferences will be removed.

Example

```
BEGIN
      HTMLDB_UTIL.REMOVE_SORT_PREFERENCES(:APP_USER);
END;
```

REMOVE_USER Procedure

This procedure removes the user account identified by the primary key or a user name. To execute this procedure, the current user must have administrative privilege in the workspace.

Syntax

```
HTMLDB_UTIL.REMOVE_USER(
    p_user_id IN NUMBER,
    p_user_name IN VARCHAR2);
```

Parameters

Table 16–16 describes the parameters available in the `REMOVE_USER` procedure.

Table 16–16 REMOVE_USER Parameters

Parameter	Description
`p_user_id`	The numeric primary key of the user account record.
`p_user_name`	The the user name of the user account.

Example

```
BEGIN
HTMLDB_UTIL.REMOVE_USER(p_user_id=>'99997');
END;

BEGIN
HTMLDB_UTIL.REMOVE_USER(p_user_name => 'SCOTT');
END;
```

RESET_PW Procedure

This procedure resets the password for a named user and emails it in a message to the e-mail address located for the named account in the current workspace. To execute this procedure, the current user must have administrative privilege in the workspace.

Syntax

```
HTMLDB_UTIL.RESET_PW(
    p_user IN VARCHAR2,
    p_msg  IN VARCHAR2);
```

Parameters

Table 16–17describes the parameters available in the `RESET_PW` procedure.

Table 16–17 RESET_PW Parameters

Parameter	Description
`p_user`	The user name of the user account
`p_msg`	Message text to be emailed to user.

Example

```
BEGIN
HTMLDB_UTIL.RESET_PW(
    p_user => 'SCOTT',
    p_msg => 'Contact help desk at 555-1212 with questions');
END;
```

RESET_AUTHORIZATIONS Procedure

To increase performance, Oracle HTML DB caches the results of authorization schemes after they have been evaluated. You can use this procedure to undo caching thus requiring each authorization scheme be revalidated when it is next encountered during page show or accept processing. You can use this procedure if you want users to have the ability to change their responsibilities (their authorization profile) within your application.

Syntax

```
HTMLDB_UTIL.RESET_AUTHORIZATIONS;
```

Example

```
BEGIN
HTMLDB_UTIL.RESET_AUTHORIZATIONS;
END;
```

SAVEKEY_NUM Function

This function sets a package variable (`wwv_flow_utilities.g_val_num`) so that it can be retrieved using the function `KEYVAL_NUM`.

Syntax

```
HTMLDB_UTIL.SAVEKEY_NUM(
    p_val IN NUMBER);
```

Parameters

`p_val` is the numeric value to be saved.

Example

```
DECLARE
VAL NUMBER;
```

```
BEGIN
    VAL := HTMLDB_UTIL.SAVEKEY_NUM(
        p_val => 10);
END;
```

See Also: "KEYVAL_NUM Function" on page 16-19

SAVEKEY_VC2 Function

This function sets a package variable (`wwv_flow_utilities.g_val_vc2`) so that it can be retrieved using the function `KEYVAL_VC2`.

Syntax

```
HTMLDB_UTIL.SAVEKEY_VC2
    p_val IN VARCHAR2);
```

Parameters

`p_val` is the VARCHAR2 value to be saved.

Example

```
DECLARE
VAL VARCHAR2(4000);
BEGIN
    VAL := HTMLDB_UTIL.SAVEKEY_VC2(
        p_val => 'XXX');
END;
```

See Also: "KEYVAL_VC2 Function" on page 16-19

SET_ATTRIBUTE Procedure

This procedure sets the value of one of the attribute values (1 through 10) of a user in the HTML DB accounts table.

Syntax

```
HTMLDB_UTIL.SET_ATTRIBUTE(
    p_userid IN NUMBER,
    p_attribute_number IN NUMBER,
    p_attribute_value  IN VARCHAR2);
```

Parameters

Table 16–18 describes the parameters available in the `SET_ATTRIBUTE` procedure.

Table 16–18 SET_ATTRIBUTE Parameters

Parameter	Description
`p_userid`	The numeric ID of the user account.
`p_attribute_number`	Attribute number in the user record (1 through 10).
p_attribute_value	Value of the attribute located by `p_attribute_number` to be set in the user record.

Example

```
DECLARE VAL VARCHAR2(30);
BEGIN
    HTMLDB_UTIL.SET_ATTRIBUTE (
        p_userid => htmldb_util.get_user_id(p_username => 'SCOTT'),
        p_attribute_number => 1,
        p_attribute_value => 'foo');
END;
```

SET_EMAIL Procedure

This procedure updates a user account with a new e-mail address. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
HTMLDB_UTIL.SET_EMAIL(
    p_userid IN NUMBER,
    p_email  IN VARCHAR2);
```

Parameters

Table 16–19 describes the parameters available in the `SET_EMAIL` procedure.

Table 16–19 SET_EMAIL Parameters

Parameter	Description
`p_userid`	The numeric ID of the user account.
`p_email`	The e-mail address to be saved in user account.

Example

```
BEGIN
HTMLDB_UTIL.SET_EMAIL(
    p_userid  => '888883232',
    P_email   => 'scott.scott@oracle.com');
END;
```

SET_FIRST_NAME Procedure

This procedure updates a user account with a new `FIRST_NAME` value. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
HTMLDB_UTIL.SET_FIRST_NAME(
    p_userid      IN NUMBER,
    p_first_name  IN VARCHAR2);
```

Parameters

Table 16–21 describes the parameters available in the `SET_FIRST_NAME` procedure.

Table 16–20 SET_FIRST_NAME Parameters

Parameter	Description
`p_userid`	The numeric ID of the user account.

Table 16–20 (Cont.) SET_FIRST_NAME Parameters

Parameter	Description
`p_first_name`	`FIRST_NAME` value to be saved in user account.

Example

```
BEGIN
HTMLDB_UTIL.SET_FIRST_NAME(
    p_userid       => '888883232',
    P_first_name   => 'Scott');
END;
```

SET_LAST_NAME Procedure

This procedure updates a user account with a new `LAST_NAME` value. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
HTMLDB_UTIL.SET_LAST_NAME(
    p_userid      IN NUMBER,
    p_last_name  IN VARCHAR2);
```

Parameters

Table 16–21 describes the parameters available in the `SET_LAST_NAME` procedure.

Table 16–21 SET_LAST_NAME Parameters

Parameter	Description
`p_userid`	The numeric ID of the user account.
`p_last_name`	`LAST_NAME` value to be saved in the user account.

Example

```
BEGIN
HTMLDB_UTIL.SET_LAST_NAME(
    p_userid       => '888883232',
    p_last_name   => 'SMITH');
END;
```

SET_USERNAME Procedure

This procedure updates a user account with a new `USER_NAME` value. To execute this procedure, the current user must have administrative privileges in the workspace.

Syntax

```
HTMLDB_UTIL.USERNAME(
    p_userid      IN NUMBER,
    p_username    IN VARCHAR2);
```

Parameters

Table 16–22 describes the parameters available in the `SET_USERNAME` procedure.

Table 16–22 SET_USERNAME Parameters

Parameter	Description
`p_userid`	The numeric ID of the user account.
`p_username`	`USER_NAME` value to be saved in the user account.

Example

```
BEGIN
HTMLDB_UTIL.SET_USERNAME(
    p_userid       => '888883232',
    P_username   => 'USER-XRAY');
END;
```

SET_PREFERENCE Procedure

This procedure sets a preference that will persist beyond the user's current session.

Syntax

```
HTMLDB_UTIL.SET_PREFERENCE (
    p_preference   IN    VARCHAR2 DEFAULT NULL,
    p_value        IN    VARCHAR2 DEFAULT NULL,
    p_user         IN    VARCHAR2 DEFAULT NULL);
```

Parameters

Table 16–23 describes the parameters available in the `SET_PREFERENCE` procedure.

Table 16–23 SET_PREFERENCE Parameters

Parameter	Description
`p_preference`	Name of the preference (case-sensitive).
`p_value`	Value of the preference.
`p_user`	User for whom the preference is being set.

Example

```
BEGIN
       HTMLDB_UTIL.SET_PREFERENCE(
             p_preference => 'default_view',
             p_value      => 'WEEKLY',
             p_user       => :APP_USER);
END;
```

SET_SESSION_STATE Procedure

This procedure sets session state for a current Oracle HTML DB session.

Syntax

```
HTMLDB_UTIL.SET_SESSION_STATE (
    p_name     IN    VARCHAR2 DEFAULT NULL,
    p_value    IN    VARCHAR2 DEFAULT NULL);
```

Parameters

Table 16–24 describes the parameters available in the `SET_SESSION_STATE` procedure.

Table 16–24 SET_SESSION_STATE Parameters

Parameter	Description
`p_name`	Name of the application or page-level item for which you are setting sessions state.
`p_value`	Value of session state to set.

Example

```
BEGIN
HTMLDB_UTIL.SET_SESSION_STATE('my_item','myvalue');
END;
```

STRING_TO_TABLE Function

Given a string, this function returns a PL/SQL array of type `HTMLDB_APPLICATION_GLOBAL.VC_ARR2`. This array is a `VARCHAR2(32767)` table.

Syntax

```
HTMLDB_UTIL.STRING_TO_TABLE (
    p_string       IN VARCHAR2,
    p_separator    IN VARCHAR2 DEFAULT ':')
    RETURN HTMLDB_APPLICATION_GLOBAL.VC_ARR2;
```

Parameters

Table 16–25 describes the parameters available in the STRING_TO_TABLE function.

Table 16–25 STRING_TO_TABLE Parameters

Parameter	Description
`p_string`	String to be converted into a PL/SQL table of type `HTMLDB_APPLICATION_GLOBAL.VC_ARR2`.
`p_separator`	String separator. The default is a colon.

Example

```
DECLARE
       l_vc_arr2    HTMLDB_APPLICATION_GLOBAL.VC_ARR2;
BEGIN
       l_vc_arr2 := HTMLDB_UTIL.STRING_TO_TABLE('One:Two:Three');
       FOR z IN 1..l_vc_arr2.count LOOP
             htp.p(l_vc_arr2(z));
       END LOOP;
END;
```

TABLE_TO_STRING Function

Given a a PL/SQL table of type `HTMLDB_APPLICATION_GLOBAL.VC_ARR2`, this function returns a delimited string separated by the supplied separator, or by the default separator, a colon (:).

Syntax

```
HTMLDB_UTIL.TABLE_TO_STRING (
    p_table       IN     HTMLDB_APPLICATION_GLOBAL.VC_ARR2,
    p_string      IN     VARCHAR2 DEFAULT ':')
    RETURN VARCHAR2;
```

Parameters

Table 16–26 describes the parameters available in the `TABLE_TO_STRING` function.

Table 16–26 TABLE_TO_STRING Parameters

Parameter	Description
`p_string`	String separator. Default separator is a colon (:).
`p_table`	PL/SQL table that is to be converted into a delimited string.

Example

```
DECLARE
       l_string     VARCHAR2(255);
       l_vc_arr2    HTMLDB_APPLICATION_GLOBAL.VC_ARR2;
BEGIN
       l_vc_arr2 := HTMLDB_UTIL.STRING_TO_TABLE('One:Two:Three');

       l_string := HTMLDB_UTIL.TABLE_TO_STRING(l_vc_arr2);
END;
```

URL_ENCODE Function

This function encodes (into HEX) all special characters that include spaces, question marks, and ampersands.

Syntax

```
HTMLDB_UTIL.URL_ENCODE (
    p_url    IN    VARCHAR2)
    RETURN VARCHAR2;
```

Parameters

`p_url` is the string you would like to have encoded.

Example

```
DECLARE
      l_url  VARCHAR2(255);
BEGIN
      l_url := HTMLDB_UTIL.URL_ENCODE('http://www.myurl.com?id=1&cat=foo');
END;
```

HTMLDB_MAIL

You can use the `HTMLDB_MAIL` package to send an e-mail from an Oracle HTML DB application. This package is built on top of the Oracle supplied `UTL_SMTP` package.

Because of this dependence, the `UTL_SMTP` package must be installed and functioning in order to use HTMLDB_MAIL.

> **See Also:** *Oracle Database PL/SQL Packages and Types Reference* for more information about the UTL_SMTP package

`HTMLDB_MAIL` contains two procedures. Use `HTMLDB_MAIL.SEND` to send an outbound e-mail message from your application. Use `HTMLDB_MAIL.PUSH_QUEUE` to deliver mail messages stored in `HTMLDB_MAIL_QUEUE`.

Topics in this section include:

- SEND Procedure
- PUSH_QUEUE Procedure

> **Note:** The most efficient approach to sending e-mail is to create a background job (using a DBMS_JOB package) to periodically send all mail messages stored in the active mail queue.

> **See Also:** "Sending E-mail from an Application" on page 14-1

SEND Procedure

This procedure sends an outbound e-mail message from an application. Although you can use this procedure to pass in either a `VARCHAR2` or a `CLOB` to `p_body` and `p_body_html`, the data types must be the same. In other words, you cannot pass a `CLOB` to `P_BODY` and a `VARCHAR2` to `p_body_html`.

When using `HTMLDB_MAIL.SEND`, remember the following:

- **No single line may exceed 1000 characters.** The SMTP/MIME specification dictates that no single line shall exceed 1000 characters. To comply with this restriction, you must add a carriage return or line feed characters to break up your `p_body` or `p_body_html` parameters into chunks of 1000 characters or less. Failing to do so will result in erroneous e-mail messages, including partial messages or messages with extraneous exclamation points.
- **Plain text and HTML e-mail content.** Passing a value to `p_body,` but not `p_body_html` results in a plain text message. Passing a value to `p_body` and `p_body_html` yields a multi-part message that includes both plain text and HTML content. The settings and capabilities of the recipient's email client determine what displays. Although most modern e-mail clients can read a HTML formatted email, remember that some users disable this functionality to address security issues.
- **Avoid images.** When referencing images in `p_body_html` using the `<img />` tag, remember that the images must be accessible to the recipient's e-mail client in order for them to see the image.

  For example, suppose you reference an image on your network called `hello.gif` as follows:

  ```
  <img src="http://someserver.com/hello.gif" alt="Hello" />]
  ```

  In this example, the image is not attached to the email, but is referenced by the e-mail. For the recipient to see it, they must be able to access the image using a Web browser. If the image is inside a firewall and the recipient is outside of the firewall, the image will not display. For this reason, avoid using images. If you must include images, be sure to include the ALT attribute to provide a textual description in the event the image is not accessible.

Syntax

```
HTMLDB_MAIL.SEND(
    p_to                        IN    VARCHAR2,
    p_from                      IN    VARCHAR2,
    p_body                      IN  [ VARCHAR2 | CLOB ],
    p_body_html                 IN  [ VARCHAR2 | CLOB ] DEFAULT,
    p_subj                      IN    VARCHAR2 DEFAULT)
    p_cc                        IN    VARCHAR2 DEFAULT)
    p_bcc                       IN    VARCHAR2 DEFAULT);
```

Parameters

Table 16–27 describes the parameters available in the `SEND` procedure.

Table 16–27   Send Parameters

Parameter	Description
`p_to`	Valid e-mail address to which the e-mail will be sent (required). For multiple e-mail addresses, use a comma separated list.
`p_from`	E-mail address from which the e-mail will be sent (required). This e-mail address must be a valid address. Otherwise, the message will not be sent.
`p_body`	Body of the e-mail in plain text, not HTML (required). If a value is passed to `p_body_html`, then this is the only text the recipient sees. If a value is not passed to `p_body_html`, then this text only displays for e-mail clients that do not support HTML or have HTML disabled. A carriage return or line feed (CRLF) must be included every 1000 characters.
`p_body_html`	Body of the e-mail in HTML format. This must be a full HTML document including the `<html>` and `<body>` tags. A single line cannot exceed 1000 characters without a carriage return or line feed (CRLF).
`p_subj`	Subject of the e-mail.
`p_cc`	Valid e-mail addresses to which the e-mail is copied. For multiple e-mail addresses, use a comma separated list.
`p_bcc`	Valid e-mail addresses to which the e-mail is blind copied. For multiple e-mail addresses, use a comma separated list.

Examples

The following example demonstrates how to use `HTMLDB_MAIL.SEND` to send a plain text e-mail message from an application.

```
-- Example One: Plain Text only message
DECLARE
    l_body      CLOB;
BEGIN
    l_body := 'Thank you for your interest in the HTMLDB_MAIL
package.'||utl_tcp.crlf||utl_tcp.crlf;
    l_body := l_body ||'  Sincerely,'||utl_tcp.crlf;
    l_body := l_body ||'  The HTMLDB Dev Team'||utl_tcp.crlf;
    htmldb_mail.send(
        p_to       => 'some_user@somewhere.com',   -- change to your email address
        p_from     => 'some_sender@somewhere.com', -- change to a real senders
email address
        p_body     => l_body,
        p_subj     => 'HTMLDB_MAIL Package - Plain Text message');
END;
/
```

The following example demonstrates how to use `HTMLDB_MAIL.SEND` to send a HTML e-mail message from an application. Remember, you must include a carriage return or line feed (CRLF) every 1000 characters. The example that follows uses `utl_tcp.crlf`.

```
-- Example Two: Plain Text / HTML message
DECLARE
    l_body      CLOB;
    l_body_html CLOB;
BEGIN
    l_body := 'To view the content of this message, please use an HTML enabled
mail client.'||utl_tcp.crlf;

    l_body_html := '<html>
                      <head>
                        <style type="text/css">
                          body{font-family: Arial, Helvetica, sans-serif;
                               font-size:10pt;
                               margin:30px;
                               background-color:#ffffff;}

                          span.sig{font-style:italic;
                                   font-weight:bold;
                                   color:#811919;}
                        </style>
                      </head>
                      <body>'||utl_tcp.crlf;
    l_body_html := l_body_html ||'<p>Thank you for your interest in the
<strong>HTMLDB_MAIL</strong> package.</p>'||utl_tcp.crlf;
    l_body_html := l_body_html ||'  Sincerely,<br />'||utl_tcp.crlf;
    l_body_html := l_body_html ||'  <span class="sig">The HTMLDB Dev
Team</span><br />'||utl_tcp.crlf;
    htmldb_mail.send(
     p_to        => 'some_user@somewhere.com',   -- change to your email address
     p_from      => 'some_sender@somewhere.com', -- change to a real senders email
address
     p_body      => l_body,
     p_body_html => l_body_html,
     p_subj      => 'HTMLDB_MAIL Package - HTML formatted message');
END;
/
```

PUSH_QUEUE Procedure

Oracle HTML DB stores unsent e-mail messages in a table named `HTMLDB_MAIL_QUEUE`. You can manually deliver mail messages stored in this queue to the specified SMTP gateway by invoking the `HTMLDB_MAIL.PUSH_QUEUE` procedure. This procedure requires two input parameters:

- `p_smtp_hostname` defines the host name of your SMTP gateway
- `p_smtp_portno` defines port number of your SMTP gateway (for example, 25)

Oracle HTML DB logs successfully submitted message in the table HTMLDB_MAIL_LOG with the timestamp reflecting your server's local time. Keep in mind, the most efficient approach to sending e-mail is to create a background job (using a DBMS_JOB package) to periodically send all mail messages stored in the active mail queue.

See Also: "Sending E-mail Using a Background Job" on page 14-1

Syntax

```
HTMLDB_MAIL.PUSH_QUEUE(
    p_smtp_hostname             IN    VARCHAR2 DEFAULT,
    p_smtp_portno               IN    NUMBER   DEFAULT;
```

Parameters

Table 16–28 describes the parameters available in the HTMLDB_MAIL procedure.

Table 16–28 PUSH_QUEUE Parameters

Parameters	Description
p_smtp_hostname	SMTP gateway host name.
p_smtp_portno	SMTP gateway port number.

Example

The following example demonstrates the use of the HTMLDB_MAIL.PUSH_QUEUE procedure using a shell script. This example only applies to UNIX/LINUX installations. In this example, the SMTP gateway host name is defined as smtp01.oracle.com and the SMTP gateway port number is 25.

```
SQLPLUS / <<EOF
FLOWS_020000.HTMLDB_MAIL.PUSH_QUEUE('smtp01.oracle.com','25');
DISCONNECT
EXIT
EOF
```

See Also: "Sending E-mail from an Application" on page 14-1

HTMLDB_ITEM

You can use the HTMLDB_ITEM package to create form elements dynamically based on a SQL query instead of creating individual items page by page.

Topics in this section include:

- CHECKBOX Function
- DATE_POPUP Function
- DISPLAY_AND_SAVE Function
- HIDDEN Function
- MD5_CHECKSUM Function
- MD5_HIDDEN Function
- MULTI_ROW_UPDATE Procedure
- POPUP_FROM_LOV Function

- POPUP_FROM_QUERY Function
- POPUPKEY_FROM_LOV Function
- POPUPKEY_FROM_QUERY Function
- RADIOGROUP Function
- SELECT_LIST Function
- SELECT_LIST_FROM_LOV Function
- SELECT_LIST_FROM_LOV_XL Function
- SELECT_LIST_FROM_QUERY Function
- SELECT_LIST_FROM_QUERY_XL Function
- TEXTAREA
- TEXT Function
- TEXT_FROM_LOV Function
- TEXT_FROM_LOV_QUERY Function

CHECKBOX Function

This function creates check boxes.

Syntax

```
HTMLDB_ITEM.CHECKBOX(
    p_idx                         IN    NUMBER,
    p_value                       IN    VARCHAR2 DEFAULT,
    p_attributes                  IN    VARCHAR2 DEFAULT,
    p_checked_values              IN    VARCHAR2 DEFAULT,
    p_checked_values_delimiter    IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–29 describes the parameters available in the `CHECKBOX` function.

Table 16–29 CHECKBOX Parameters

Parameter	Description
`p_idx`	Number which determines which `HTMLDB_APPLICATION` global will be used. Valid range of values is 1 to 50. For example 1 creates `F01` and 2 creates `F02`.
`p_value`	Value of a check box, hidden field, or input form item.
`p_attributes`	Controls HTML tag attributes (such as disabled).
`p_checked_values`	Values to be checked by default.
`p_checked_values_delimiter`	Delimits the values in the previous parameter, `p_checked_values`.

Examples of Default Check Box Behavior

The following example demonstrates how to create a selected check box for each employee in the `emp` table.

```
SELECT HTMLDB_ITEM.CHECKBOX(1,empno,'CHECKED') " ",
       ename,
       job
FROM   emp
ORDER BY 1
```

The next example demonstrates how to have all check boxes for employees display without being selected.

```
SELECT HTMLDB_ITEM.CHECKBOX(1,empno) " ",
       ename,
       job
FROM   emp
ORDER BY 1
```

The next example demonstrates how to select the check boxes for employees who work in department 10.

```
SELECT HTMLDB_ITEM.CHECKBOX(1,empno,DECODE(deptno,10,'CHECKED',null)) " ",
       ename,
       job
FROM   emp
ORDER BY 1
```

The next example demonstrates how to select the check boxes for employees who work in department 10 or department 20.

```
SELECT HTMLDB_ITEM.CHECKBOX(1,deptno,NULL,'10:20',':') " ",
       ename,
       job
FROM   emp
ORDER BY 1
```

Creating an On-Submit Process

If you are using check boxes in your application, you might need to create an On Submit process to perform a specific type of action on the selected rows. For example, you could have a Delete button that utilizes the following logic:

```
SELECT HTMLDB_ITEM.CHECKBOX(1,empno) " ",
       ename,
       job
FROM   emp
ORDER  by 1
```

Consider the following sample on-submit process:

```
FOR I in 1..HTMLDB_APPLICATION.G_F01.COUNT LOOP
    DELETE FROM emp WHERE empno = to_number(HTMLDB_APPLICATION.G_F01(i));
END LOOP;
```

DATE_POPUP Function

Use this function with forms that include date fields. DATE_POPUP dynamically generates a date field that has popup calendar button.

Syntax

```
HTMLDB_ITEM.DATE_POPUP(
    p_idx          IN    NUMBER,
    p_row          IN    NUMBER,
    p_value        IN    VARCHAR2 DEFAULT,
    p_date_format  IN    DATE DEFAULT,
    p_size         IN    NUMBER DEFAULT,
    p_maxlength    IN    NUMBER DEFAULT,
    p_attributes   IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–30 describes the parameters available in the DATE_POPUP function.

Table 16–30 DATE_POPUP Parameters

Parameter	Description
p_idx	Number which determines which HTMLDB_APPLICATION global will be used.Valid range of values is 1 to 50. For example 1 creates F01 and 2 creates F02.
p_row	p_row is deprecated. Anything specified for this value will be ignored.
p_value	Value of a field item.
p_date_format	Valid database date format.
p_size	Controls HTML tag attributes (such as disabled).
p_maxlength	Determine the maximum number of enterable characters. Becomes the maxlength attribute of the <input > HTML tag.
p_attributes	Extra HTML parameters you want to add.

> **See Also:** *Oracle Database SQL Reference* for information about the TO_CHAR or TO_DATE functions

Example

The following example demonstrates how to use HTMLDB_ITEM.DATE_POPUP to create popup calendar buttons for the hiredate column.

```
SELECT
  empno,
  HTMLDB_ITEM.HIDDEN(1,empno)||
  HTMLDB_ITEM.TEXT(2,ename) ename,
  HTMLDB_ITEM.TEXT(3,job) job,
  mgr,
  HTMLDB_ITEM.DATE_POPUP(4,rownum,hiredate,'dd-mon-yyyy') hd,
  HTMLDB_ITEM.TEXT(5,sal) sal,
  HTMLDB_ITEM.TEXT(6,comm) comm,
  deptno
FROM emp
ORDER BY 1
```

DISPLAY_AND_SAVE Function

Use this function to display an item as text, but save its value to session state.

Syntax

```
HTMLDB_ITEM.DISPLAY_AND_SAVE(
    p_idx         IN    NUMBER,
    p_value       IN    VARCHAR2 DEFAULT NULL
    p_item_id     IN    VARCHAR2 DEFAULT NULL,
    p_item_label  IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 16–31 describes the parameters available in the `DISPLAY_AND_SAVE`.

Table 16–31 DISPLAY_AND_SAVE Parameters

Parameter	Description
`p_idx`	Number which determines which `HTMLDB_APPLICATION` global will be used.Valid range of values is 1 to 50. For example 1 creates `F01` and 2 creates `F02`.
`p_value`	Current value.
`p_item_id`	HTML attribute ID for the `<input>` tag.
`p_item_label`	Label of the text field item.

Example

The following example demonstrates how to use HTMLDB_ITEM.DISPLAY_AND_SAVE.

```
SELECT HTMLDB_ITEM.DISPLAY_AND_SAVE(10,empno) c FROM emp
```

HIDDEN Function

This function dynamically generates hidden form items.

Syntax

```
HTMLDB_ITEM.HIDDEN(
    p_idx     IN    NUMBER,
    p_value   IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–32 describes the parameters available in the `HIDDEN` function.

Table 16–32 HIDDEN Parameters

Parameter	Description
`p_idx`	Number to identify the item you want to generate. The number will determine which `G_FXX` global is populated. **See Also:** "HTMLDB_APPLICATION" on page 16-55
`p_value`	Value of the hidden input form item.

Example

Typically, the primary key of a table is stored as a hidden column and used for subsequent update processing. Consider the following sample SLQ query:

```
SELECT
  empno,
  HTMLDB_ITEM.HIDDEN(1,empno)||
  HTMLDB_ITEM.TEXT(2,ename) ename,
  HTMLDB_ITEM.TEXT(3,job) job,
  mgr,
  HTMLDB_ITEM.DATE_POPUP(4,rownum,hiredate,'dd-mon-yyyy') hiredate,
  HTMLDB_ITEM.TEXT(5,sal) sal,
  HTMLDB_ITEM.TEXT(6,comm) comm,
  deptno
FROM emp
ORDER BY 1
```

The previous query could use the following page process to process the results:

```
BEGIN
  FOR i IN 1..HTMLDB_APPLICATION.G_F01.COUNT LOOP
    UPDATE emp
    SET
      ename=HTMLDB_APPLICATION.G_F02(i),
      job=HTMLDB_APPLICATION.G_F03(i),
      hiredate=to_date(HTMLDB_APPLICATION.G_F04(i),'dd-mon-yyyy'),
      sal=HTMLDB_APPLICATION.G_F05(i),
      comm=HTMLDB_APPLICATION.G_F06(i)
    WHERE empno=to_number(HTMLDB_APPLICATION.G_F01(i));
  END LOOP;
END;
```

Note that the `G_F01` column (which corresponds to the hidden `EMPNO`) is used as the key to update each row.

MD5_CHECKSUM Function

This function passes values to `HTMLDB_ITEM.MULTI_ROW_UPDATE` and is used for lost update detection. Lost update detection ensures data integrity in applications where data can be accessed concurrently.

Syntax

```
HTMLDB_ITEM.MD5_CHECKSUM(
    p_value01   IN    VARCHAR2 DEFAULT,
    p_value02   IN    VARCHAR2 DEFAULT,
    p_value03   IN    VARCHAR2 DEFAULT,
    ...
    p_value50   IN    VARCHAR2 DEFAULT,
    p_col_sep   IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–34 describes the parameters available in the `MD5_CHECKSUM` function.

Table 16–33 MD5_HIDDEN Parameters

Parameter	Description
`p_value01`	Fifty available inputs. Parameters that are not supplied default to null.
...	
`p_value50`	
`p_col_sep`	String used to separate `p_value` inputs. Defaults to the pipe symbol (`|`).

Example

```
SELECT HTMLDB_ITEM.MD5_CHECKSUM(ename,job,sal)
FROM emp
```

MD5_HIDDEN Function

This function is used for lost update detection which ensures data integrity in applications where data can be accessed concurrently.

This function produces a hidden form field and includes 50 inputs. `HTMLDB_ITEM.MD5_HIDDEN` also produces an MD5 checksum using the Oracle database `DBMS_OBFUSCATION_TOOLKIT`:

```
UTL_RAW.CAST_TO_RAW(DBMS_OBFUSCATION_TOOLKIT.MD5())
```

An MD5 checksum provides data integrity through hashing and sequencing to assure that data is not altered or stolen as it is transmitted over a network

Syntax

```
HTMLDB_ITEM.MD5_HIDDEN(
    p_idx       IN    NUMBER,
    p_value01   IN    VARCHAR2 DEFAULT,
    p_value02   IN    VARCHAR2 DEFAULT,
    p_value03   IN    VARCHAR2 DEFAULT,
    ...
    p_value50   IN    VARCHAR2 DEFAULT,
    p_col_sep   IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–34 describes the parameters available in the `MD5_HIDDEN` function.

Table 16–34 MD5_HIDDEN Parameters

Parameter	Description
`p_idx`	Indicates the form element to be generated. For example, 1 equals `F01` and 2 equals `F02`. Typically the `p_idx` parameter is constant for a given column.
`p_value01`	Fifty available inputs. Parameters not supplied default to null.
...	
`p_value50`	
`p_col_sep`	String used to separate `p_value` inputs. Defaults to the pipe symbol (`|`).

Example

`p_idx` specifies the FXX form element to be generated. In the following example, 7 generates `F07`. Also note that an HTML hidden form element will be generated.

```
SELECT HTMLDB_ITEM.MD5_HIDDEN(7,ename,job,sal), ename, job, sal FROM emp
```

MULTI_ROW_UPDATE Procedure

Use this procedure within a Multi Row Update process type. This procedure takes a string containing a multiple row update definition in the following format:

```
OWNER:TABLE:pk_column1,pk_idx:pk_column2,pk_idx2|col,idx:col,idx...
```

Syntax

```
HTMLDB_ITEM.MULTI_ROW_UPDATE(
    p_mru_string    IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Example

To use this procedure indirectly within application-level process, you need to create a query to generate a form of database data. The following example demonstrates how to create a multiple row update on the `emp` table.

```
SELECT
empno,
HTMLDB_ITEM.HIDDEN(1,empno),
HTMLDB_ITEM.HIDDEN(2,deptno),
HTMLDB_ITEM.TEXT(3,ename),
HTMLDB_ITEM.SELECT_LIST_FROM_QUERY(4,job,'SELECT DISTINCT job FROM emp'),
HTMLDB_ITEM.TEXT(5,sal),
HTMLDB_ITEM.TEXT(7,comm),
HTMLDB_ITEM.MD5_CHECKSUM(ename,job,sal,comm),
deptno
FROM emp
WHERE deptno = 20
```

Note the call to `HTMLDB_ITEM.MD5_CHECKSUM` instead of `HTMLDB_ITEM.MD5_HIDDEN`. Since `HTMLDB_ITEM.MULTI_ROW_UPDATE` gets the checksum from `HTMLDB_APPLICATION.G_FCS`, you need to call `HTMLDB_ITEM.MD5_CHECKSUM` in order to populate `HTMLDB_APPLICATION.G_FCS` when the page is submitted. Additionally, the columns in `HTMLDB_ITEM.MD5_CHECKSUM` must be in the same order those in the `MULTI_ROW_UPDATE` process. These updates can then processed (or applied to the database) using an after submit page process of Multi Row Update in a string similar to the following:

```
SCOTT:emp:empno,1:deptno,2|ename,3:job,4:sal,5:comm,7:,:,:,:,
```

POPUP_FROM_LOV Function

This function generates an HTML popup select list from an application list of values (LOV). Like other available functions in the `HTMLDB_ITEM` package, `POPUP_FROM_LOV` is designed to generate forms with `F01` to `F50` form array elements.

Syntax

```
HTMLDB_ITEM.POPUP_FROM_LOV(

    p_idx              IN    NUMBER,
    p_value            IN    VARCHAR2 DEFAULT,
    p_lov_name         IN    VARCHAR2,
    p_width            IN    VARCHAR2 DEFAULT,
    p_max_length       IN    VARCHAR2 DEFAULT,
    p_form_index       IN    VARCHAR2 DEFAULT,
    p_escape_html      IN    VARCHAR2 DEFAULT,
    p_max_elements     IN    VARCHAR2 DEFAULT,
    p_attributes       IN    VARCHAR2 DEFAULT,
    p_ok_to_query      IN    VARCHAR2 DEFAULT,
    p_item_id          IN    VARCHAR2 DEFAULT NULL,
    p_item_label       IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 16–35 describes the some parameters in the `POPUP_FROM_LOV` function.

Table 16–35 POPUP_FROM_LOV Parameters

Parameter	Description
`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically, `p_idx` is a constant for a given column.
`p_value`	Form element current value. This value should be one of the values in the `p_lov_name` parameter.
`p_lov_name`	Named LOV used for this popup.
`p_width`	Width of the text box.
`p_max_length`	Maximum number of characters that can be entered in the text box.
`p_form_index`	HTML form on the page in which an item is contained. Defaults to 0 and rarely used. Only use this parameter when it is necessary to embed a custom form in your page template (such as a search field which posts to a different Web site). If this form comes before the `#FORM_OPEN#` substitution string, then its index is zero and the form opened automatically by Oracle HTML DB must be referenced as form 1. This functionality supports the JavaScript used in the popup LOV which passes a value back to a form element.
`p_escape_html`	Replacements for special characters that require an escaped equivalent. ■ `&lt;` for < ■ `&gt;` for > ■ `&amp;` for & Range of values is YES and NO. If YES, special characters will be escaped. This parameter is useful if you know your query will return illegal HTML.
`p_max_elements`	Limit on the number of rows that can be returned by your query. Limits the performance impact of user searches. By entering a value in this parameter, you force the user to search for a more narrow set of results.
`p_attributes`	Additional HTML attributes to use for the form item.

Table 16–35 (Cont.) POPUP_FROM_LOV Parameters

Parameter	Description
p_ok_to_query	Range of values is YES and NO. If YES, a popup returns first set of rows for the LOV. If NO, a search is initiated to return rows.
p_item_id	ID attribute of the form element.
p_item_label	Invisible label created for the item.

Example

The following example demonstrates a sample query the generates a popup from a LOV named DEPT.

```
SELECT HTMLDB_ITEM.POPUP_FROM_LOV (1,deptno,'DEPT_LOV') dt
FROM emp
```

POPUP_FROM_QUERY Function

This function generates an HTML popup select list from a query. Like other available functions in the HTMLDB_ITEM package, POPUP_FROM_QUERY is designed to generate forms with F01 to F50 form array elements.

Syntax

```
HTMLDB_ITEM.POPUP_FROM_QUERY(

    p_idx             IN    NUMBER,
    p_value           IN    VARCHAR2 DEFAULT,
    p_lov_query       IN    VARCHAR2,
    p_width           IN    VARCHAR2 DEFAULT,
    p_max_length      IN    VARCHAR2 DEFAULT,
    p_form_index      IN    VARCHAR2 DEFAULT,
    p_escape_html     IN    VARCHAR2 DEFAULT,
    p_max_elements    IN    VARCHAR2 DEFAULT,
    p_attributes      IN    VARCHAR2 DEFAULT,
    p_ok_to_query     IN    VARCHAR2 DEFAULT,
    p_item_id         IN    VARCHAR2 DEFAULT NULL,
    p_item_label      IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 16–36 describes the parameters in the POPUP_FROM_QUERY function.

Table 16–36 POPUP_FROM_QUERY Parameters

Parameter	Description
p_idx	Form element name. For example, 1 equals F01 and 2 equals F02. Typically, p_idx is a constant for a given column.
p_value	Form element current value. This value should be one of the values in the p_lov_query parameter.
p_lov_query	SQL query that is expected to select two columns (a display column and a return column). For example: `SELECT dname, deptno FROM dept`
p_width	Width of the text box.

Table 16–36 (Cont.) POPUP_FROM_QUERY Parameters

Parameter	Description
`p_max_length`	Maximum number of characters that can be entered in the text box.
`p_form_index`	HTML form on the page in which an item is contained. Defaults to 0 and rarely used. Only use this parameter when it is necessary to embed a custom form in your page template (such as a search field which posts to a different Web site). If this form comes before the `#FORM_OPEN#` substitution string, then its index is zero and the form opened automatically by Oracle HTML DB must be referenced as form 1. This functionality supports the JavaScript used in the popup LOV which passes a value back to a form element.
`p_escape_html`	Replacements for special characters that require an escaped equivalent. ■ `&lt;` for < ■ `&gt;` for > ■ `&amp;` for & Range of values is YES and NO. If YES, special characters will be escaped. This parameter is useful if you know your query will return illegal HTML.
`p_max_elements`	Limit on the number of rows that can be returned by your query. Limits the performance impact of user searches. By entering a value in this parameter, you force the user to search for a more narrow set of results.
`p_attributes`	Additional HTML attributes to use for the form item.
`p_ok_to_query`	Range of values is `YES` and `NO`. If `YES`, a popup returns first set of rows for the LOV. If `NO`, a search is initiated to return rows.
`p_item_id`	ID attribute of the form element.
`p_item_label`	Invisible label created for the item.

Example
The following example demonstrates a sample query the generates a popup select list from the `emp` table.

```
SELECT HTMLDB_ITEM.POPUP_FROM_QUERY (1,deptno,'SELECT dname, deptno FROM dept') dt
FROM emp
```

POPUPKEY_FROM_LOV Function

This function generates a popup key select list from a shared list of values (LOV). Like other available functions in the `HTMLDB_ITEM` package, `POPUPKEY_FROM_LOV` is designed to generate forms with `F01` to `F50` form array elements.

Syntax

```
HTMLDB_ITEM.POPUPKEY_FROM_LOV(
    p_idx              IN    NUMBER,
    p_value            IN    VARCHAR2 DEFAULT,
    p_lov_name         IN    VARCHAR2,
    p_width            IN    VARCHAR2 DEFAULT,
    p_max_length       IN    VARCHAR2 DEFAULT,
    p_form_index       IN    VARCHAR2 DEFAULT,
    p_escape_html      IN    VARCHAR2 DEFAULT,
    p_max_elements     IN    VARCHAR2 DEFAULT,
    p_attributes       IN    VARCHAR2 DEFAULT,
    p_ok_to_query      IN    VARCHAR2 DEFAULT,
    RETURN VARCHAR2;
```

Although the text field associated with the popup displays in the first column in the LOV query, the actual value is specified in the second column in the query.

Parameters

Table 16–37 describes the some parameters in the `POPUPKEY_FROM_LOV` function.

Table 16–37 POPUPKEY_FROM_LOV Parameters

Parameter	Description

`p_idx`	Identifies a form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically, `p_idx` is a constant for a given column
	
	Because of the behavior of `POPUPKEY_FROM_QUERY`, the next index value should be `p_idx + 1`. For example:
	
	`SELECT HTMLDB_ITEM.POPUPKEY_FROM_LOV (1,deptno,'DEPT') dt,`
	`HTMLDB_ITEM.HIDDEN(3,empno) eno`

`p_value`	Indicates the current value. This value should be one of the values in the `P_LOV_NAME` parameter.
`p_lov_name`	Identifies a named LOV used for this popup.
`p_width`	Width of the text box.
`p_max_length`	Maximum number of characters that can be entered in the text box.
`p_form_index`	HTML form on the page in which an item is contained. Defaults to 0 and rarely used. Only use this parameter when it is necessary to embed a custom form in your page template (such as a search field which posts to a different Web site). If this form comes before the `#FORM_OPEN#` substitution string, then its index is zero and the form opened automatically by Oracle HTML DB must be referenced as form 1. This functionality supports the JavaScript used in the popup LOV which passes a value back to a form element.
`p_escape_html`	Replacements for special characters that require an escaped equivalent. ■ `&lt;` for `<` ■ `&gt;` for `>` ■ `&amp;` for `&` This parameter is useful if you know your query will return illegal HTML.
`p_max_elements`	Limit on the number of rows that can be returned by your query. Limits the performance impact of user searches. By entering a value in this parameter, you force the user to search for a more narrow set of results.
`p_attributes`	Additional HTML attributes to use for the form item.
`p_ok_to_query`	Range of values is `YES` and `NO`. If `YES`, a popup returns first set of rows for the LOV. If `NO`, a search is initiated to return rows.

Example

The following example demonstrates how to generate a popup key select list from a shared list of values (LOV).

```
SELECT HTMLDB_ITEM.POPUPKEY_FROM_LOV (1,deptno,'DEPT') dt
FROM emp
```

POPUPKEY_FROM_QUERY Function

This function generates a popup key select list from a SQL query. Like other available functions in the `HTMLDB_ITEM` package, `POPUPKEY_FROM_QUERY` is designed to generate forms with `F01` to `F50` form array elements.

Syntax

```
HTMLDB_ITEM.POPUPKEY_FROM_QUERY(
    p_idx               IN    NUMBER,
    p_value             IN    VARCHAR2 DEFAULT,
    p_lov_query         IN    VARCHAR2,
    p_width             IN    VARCHAR2 DEFAULT,
    p_max_length        IN    VARCHAR2 DEFAULT,
    p_form_index        IN    VARCHAR2 DEFAULT,
    p_escape_html       IN    VARCHAR2 DEFAULT,
    p_max_elements      IN    VARCHAR2 DEFAULT,
    p_attributes        IN    VARCHAR2 DEFAULT,
    p_ok_to_query       IN    VARCHAR2 DEFAULT,
    p_item_id           IN    VARCHAR2 DEFAULT NULL,
    p_item_label        IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 16–38 describes the some parameters in the `POPUPKEY_FROM_QUERY` function.

Table 16–38 POPUPKEY_FROM_QUERY Parameters

Parameter	Description

`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically, `p_idx` is a constant for a given column.
	Because of the behavior of `POPUPKEY_FROM_QUERY`, the next index value should be `p_idx + 1`. For example:
	`SELECT HTMLDB_ITEM.POPUPKEY_FROM_QUERY (1,deptno,'SELECT dname, deptno FROM dept') dt,`
	`HTMLDB_ITEM.HIDDEN(3,empno) eno`

`p_value`	Form element current value. This value should be one of the values in the `P_LOV_QUERY` parameter.
`p_lov_query`	LOV query used for this popup.
`p_width`	Width of the text box.
`p_max_length`	Maximum number of characters that can be entered in the text box.

Table 16–38 (Cont.) POPUPKEY_FROM_QUERY Parameters

Parameter	Description
`p_form_index`	HTML form on the page in which an item is contained. Defaults to 0 and rarely used. Only use this parameter when it is necessary to embed a custom form in your page template (such as a search field which posts to a different Web site). If this form comes before the `#FORM_OPEN#` substitution string, then its index is zero and the form opened automatically by Oracle HTML DB must be referenced as form 1. This functionality supports the JavaScript used in the popup LOV which passes a value back to a form element.
`p_escape_html`	Replacements for special characters that require an escaped equivalent. ■ `&lt;` for < ■ `&gt;` for > ■ `&amp;` for & This parameter is useful if you know your query will return illegal HTML.
`p_max_elements`	Limit on the number of rows that can be returned by your query. Limits the performance impact of user searches. By entering a value in this parameter, you force the user to search for a more narrow set of results.
`p_attributes`	Additional HTML attributes to use for the form item.
`p_ok_to_query`	Range of values is `YES` and `NO`. If `YES`, a popup returns first set of rows for the LOV. If `NO`, a search is initiated to return rows.
`p_item_id`	ID attribute of the form element.
`p_item_label`	Invisible label created for the item.

Example

The following example demonstrates how to generate a popup select list from a SQL query.

```
SELECT HTMLDB_ITEM.POPUPKEY_FROM_QUERY (1,deptno,'SELECT dname, deptno FROM dept') 
dt
FROM emp
```

RADIOGROUP Function

This function generates a radio group from a SQL query.

Syntax

```
HTMLDB_ITEM.RADIOGROUP(
    p_idx              IN    NUMBER,
    p_value            IN    VARCHAR2 DEFAULT,
    p_selected_value   IN    VARCHAR2 DEFAULT,
    p_display          IN    VARCHAR2 DEFAULT,
    p_attributes       IN    VARCHAR2 DEFAULT,
    p_onblur           IN    VARCHAR2 DEFAULT,
    p_onchange         IN    VARCHAR2 DEFAULT,
    p_onfocus          IN    VARCHAR2 DEFAULT,)
    RETURN VARCHAR2;
```

Parameters

Table 16–39 describes the parameters available in the RADIOGROUP function.

Table 16–39 RADIOGROUP Parameters

Parameter	Description
p_idx	Number which determines which HTMLDB_APPLICATION global will be used. Valid range of values is 1 to 50.For example 1 creates F01 and 2 creates F02.
p_value	Value of the radio group.
p_selected_value	Value that should be "on", or selected.
p_display	Text to display next to the radio option.
p_attributes	Extra HTML parameters you want to add.
p_onblur	JavaScript to execute in the onBlur event.
p_onchange	JavaScript to execute in the onChange event.
p_onfocus	JavaScript to execute in the onFocus event.

Example

The following example demonstrates how to select department 20 from the emp table as a default in a radio group.

```
SELECT HTMLDB_ITEM.CHECKBOX(1,deptno,'20',dname) dt
FROM   dept
ORDER  BY 1
```

SELECT_LIST Function

This function dynamically generates a static select list. Similar to other functions available in the HTMLDB_ITEM package, these select list functions are designed to generate forms with F01 to F50 form array elements.

Syntax

```
HTMLDB_ITEM.SELECT_LIST(
    p_idx           IN   NUMBER,
    p_value         IN   VARCHAR2 DEFAULT,
    p_list_values   IN   VARCHAR2 DEFAULT,
    p_attributes    IN   VARCHAR2 DEFAULT,
    p_show_null     IN   VARCHAR2 DEFAULT,
    p_null_value    IN   VARCHAR2 DEFAULT,
    p_null_text     IN   VARCHAR2 DEFAULT,
    p_item_id       IN   VARCHAR2 DEFAULT,
    p_item_label    IN   VARCHAR2 DEFAULT,
    p_show_extra    IN   VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–40 describes the parameters available in the SELECT_LIST function.

Table 16–40 SELECT_LIST Parameters

Parameter	Description
`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically the `P_IDX` parameter is constant for a given column.
`p_value`	Current value. This value should be a value in the `P_LIST_VALUES` parameter.
`p_list_values`	List of static values separated by commas. Display values and return values are separated by semicolons. Note that this is only available in the `SELECT_LIST` function.
`p_attributes`	Extra HTML parameters you want to add.
`p_show_null`	Extra select option to enable the NULL selection. Range of values is `YES` and `NO`.
`p_null_value`	Value to be returned when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_null_text`	Value to be displayed when a user selects the null option. Only relevant when `p_show_null` equals YES.
`p_item_id`	HTML attribute ID for the <input> tag.
`p_item_label`	Label of the select list.
`p_show_extra`	Show the current value even if the value of p_value is not located in the select list.

Example

The following example demonstrates a static select list that displays `Yes`, returns `Y`, defaults to `Y`, and generates a `F01` form item.

```
SELECT HTMLDB_ITEM.SELECT_LIST(1,'Y','Yes;Y,No;N')
FROM emp
```

SELECT_LIST_FROM_LOV Function

This function dynamically generates select lists from a shared list of values (LOV). Similar to other functions available in the `HTMLDB_ITEM` package, these select list functions are designed to generate forms with `F01` to `F50` form array elements.

Syntax

```
HTMLDB_ITEM.SELECT_LIST_FROM_LOV(
    p_idx           IN   NUMBER,
    p_value         IN   VARCHAR2 DEFAULT,
    p_lov           IN   VARCHAR2,
    p_attributes    IN   VARCHAR2 DEFAULT,
    p_show_null     IN   VARCHAR2 DEFAULT,
    p_null_value    IN   VARCHAR2 DEFAULT,
    p_null_text     IN   VARCHAR2 DEFAULT,
    p_item_id       IN   VARCHAR2 DEFAULT,
    p_item_label    IN   VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–41 describes the parameters available in the `SELECT_LIST_FROM_LOV` function.

Table 16–41 SELECT_LIST_FROM_LOV Parameters

Parameter	Description
`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically the `p_idx` parameter is constant for a given column.
`p_value`	Current value. This value should be a value in the `p_list_values` parameter.
`p_lov`	Text name of a application list of values. This list of values must be defined in your application. This parameter is used only by the `select_list_from_lov` function.
`p_attributes`	Extra HTML parameters you want to add.
`p_show_null`	Extra select option to enable the NULL selection. Range of values is `YES` and `NO`.
`p_null_value`	Value to be returned when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_null_text`	Value to be displayed when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_item_id`	HTML attribute ID for the `<input>` tag.
`p_item_label`	Label of the select list.

Example

The following demonstrates a select list based on a LOV defined in the application.

```
SELECT HTMLDB_ITEM.SELECT_LIST_FROM_LOV(2,job,'JOB_FLOW_LOV')
FROM emp
```

SELECT_LIST_FROM_LOV_XL Function

This function dynamically generates very large select lists (greater than 32K) from a shared list of values (LOV). Similar to other functions available in the `HTMLDB_ITEM` package, these select list functions are designed to generate forms with `F01` to `F50` form array elements. This function is the same as `SELECT_LIST_FROM_LOV`, but its return value is CLOB. This enables you to use it in SQL queries where you need to handle a column value longer than 4000 characters.

Syntax

```
HTMLDB_ITEM.SELECT_LIST_FROM_LOV_XL(
    p_idx           IN   NUMBER,
    p_value         IN   VARCHAR2 DEFAULT,
    p_lov           IN   VARCHAR2,
    p_attributes    IN   VARCHAR2 DEFAULT,
    p_show_null     IN   VARCHAR2 DEFAULT,
    p_null_value    IN   VARCHAR2 DEFAULT,
    p_null_text     IN   VARCHAR2 DEFAULT,
    p_item_id       IN   VARCHAR2 DEFAULT,
    p_item_label    IN   VARCHAR2 DEFAULT)
    RETURN CLOB;
```

Parameters

Table 16–42 describes the parameters available in the `SELECT_LIST_FROM_LOV_XL` function.

Table 16–42 SELECT_LIST_FROM_LOV_XL Parameters

Parameter	Description
`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically the `p_idx` parameter is constant for a given column.
`p_value`	Current value. This value should be a value in the `p_list_values` parameter.
`p_lov`	Text name of a list of values. This list of values must be defined in your application. This parameter is used only by the `select_list_from_lov` function.
`p_attributes`	Extra HTML parameters you want to add.
`p_show_null`	Extra select option to enable the NULL selection. Range of values is `YES` and `NO`.
`p_null_value`	Value to be returned when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_null_text`	Value to be displayed when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_item_id`	HTML attribute ID for the <input> tag.
`p_item_label`	Label of the select list.

Example

The following demonstrates a select list based on a LOV defined in the application.

```
SELECT HTMLDB_ITEM.SELECT_LIST_FROM_LOV_XL(2,job,'JOB_FLOW_LOV')
FROM emp
```

SELECT_LIST_FROM_QUERY Function

This function is the same as This function dynamically generates a select list from a query. Similar to other functions available in the `HTMLDB_ITEM` package, these select list functions are designed to generate forms with F01 to F50 form array elements.

Syntax

```
HTMLDB_ITEM.SELECT_LIST_FROM_QUERY(
    p_idx           IN    NUMBER,
    p_value         IN    VARCHAR2 DEFAULT,
    p_query         IN    VARCHAR2,
    p_attributes    IN    VARCHAR2 DEFAULT,
    p_show_null     IN    VARCHAR2 DEFAULT,
    p_null_value    IN    VARCHAR2 DEFAULT,
    p_null_text     IN    VARCHAR2 DEFAULT,
    p_item_id       IN    VARCHAR2 DEFAULT,
    p_item_label    IN    VARCHAR2 DEFAULT,
    p_show_extra    IN    VARCHAR2 DEFAULT)
    RETURN VARCHAR2;
```

Parameters

Table 16–43 describes the parameters available in the `SELECT_LIST_FROM_QUERY` function.

Table 16–43 SELECT_LIST_FROM_QUERY Parameters

Parameter	Description
`p_idx`	Form element name. For example, `1` equals `F01` and `2` equals `F02`. Typically the `p_idx` parameter is constant for a given column.
`p_value`	Current value. This value should be a value in the `p_list_values` parameter.
`p_query`	SQL query that is expected to select two columns, a display column, and a return column. For example: `SELECT dname, deptno FROM dept` Note that this is used only by the `SELECT_LIST_FROM_QUERY` function.
`p_attributes`	Extra HTML parameters you want to add.
`p_show_null`	Extra select option to enable the NULL selection. Range of values is `YES` and `NO`.
`p_null_value`	Value to be returned when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_null_text`	Value to be displayed when a user selects the null option. Only relevant when `p_show_null` equals `YES`.
`p_item_id`	HTML attribute ID for the <input> tag.
`p_item_label`	Label of the select list.
`p_show_extra`	Show the current value even if the value of p_value is not located in the select list.

Example

The following demonstrates a select list based on a SQL query.

```
SELECT HTMLDB_ITEM.SELECT_LIST_FROM_QUERY(3,job,'SELECT DISTINCT job FROM emp')
FROM emp
```

SELECT_LIST_FROM_QUERY_XL Function

This function is the same as `SELECT_LIST_FROM_QUERY`, but its return value is a CLOB. This allows its use in SQL queries where you need to handle a column value longer than 4000 characters. Similar to other functions available in the `HTMLDB_ITEM` package, these select list functions are designed to generate forms with `F01` to `F50` form array elements.

Syntax

```
HTMLDB_ITEM.SELECT_LIST_FROM_QUERY_XL(
    p_idx           IN    NUMBER,
    p_value         IN    VARCHAR2 DEFAULT,
    p_query         IN    VARCHAR2,
    p_attributes    IN    VARCHAR2 DEFAULT,
    p_show_null     IN    VARCHAR2 DEFAULT,
    p_null_value    IN    VARCHAR2 DEFAULT,
    p_null_text     IN    VARCHAR2 DEFAULT,
    p_item_id       IN    VARCHAR2 DEFAULT,
    p_item_label    IN    VARCHAR2 DEFAULT,
    p_show_extra    IN    VARCHAR2 DEFAULT)
    RETURN CLOB;
```

Parameters

Table 16–44 describes the parameters available in the SELECT_LIST_FROM_QUERY_XL function.

Table 16–44 SELECT_LIST_FROM_QUERY_XL Parameters

Parameter	Description
p_idx	Form element name. For example, 1 equals F01 and 2 equals F02. Typically the p_idx parameter is constant for a given column.
p_value	Current value. This value should be a value in the p_list_values parameter.
p_query	SQL query that is expected to select two columns, a display column, and a return column. For example: `SELECT dname, deptno FROM dept` Note that this is used only by the SELECT_LIST_FROM_QUERY_XL function.
p_attributes	Extra HTML parameters you want to add.
p_show_null	Extra select option to enable the NULL selection. Range of values is YES and NO.
p_null_value	Value to be returned when a user selects the null option. Only relevant when p_show_null equals YES.
p_null_text	Value to be displayed when a user selects the null option. Only relevant when p_show_null equals YES.
p_item_id	HTML attribute ID for the <input> tag.
p_item_label	Label of the select list.
p_show_extra	Show the current value even if the value of p_value is not located in the select list.

Example

The following demonstrates a select list based on a SQL query.

```
SELECT HTMLDB_ITEM.SELECT_LIST_FROM_QUERY_XL(3,job,'SELECT DISTINCT job FROM emp')
FROM emp
```

TEXTAREA

This function creates text areas

Syntax

```
HTMLDB_ITEM.TEXTAREA(
    p_idx          IN    NUMBER,
    p_value        IN    VARCHAR2 DEFAULT NULL,
    p_rows         IN    NUMBER DEAULT 40,
    p_cols         IN    NUMBER DEFAULT 4
    p_attributes   IN    VARCHAR2 DEFAULT,
    p_item_id      IN    VARCHAR2 DEFAULT NULL,
    p_item_label   IN    VARCHAR2 DEFAULT NULL)
    RETURN VARCHAR2;
```

Parameters

Table 16–46 describes the parameters available in the TEXT function.

Table 16–45 TEXTAREA Parameters

Parameter	Description
p_idx	Number to identify the item you want to generate. The number will determine which G_FXX global is populated. **See Also:** "HTMLDB_APPLICATION" on page 16-55
p_value	Value of a textarea item.
p_rows	Height of the textarea (HTML rows attribute)
p_cols	Width of the textarea (HTML cols attribute).
p_attributes	Extra HTML parameters you want to add.
p_item_id	HTML attribute ID for the <input> tag.
p_item_label	Label of the text textarea item.

Example

The following example demonstrates a textarea based on a SQL query.

```
SELECT HTMLDB_ITEM.TEXTAREA(3,ename,5,80) a
FROM emp
```

TEXT Function

This function generates text fields (or text input form items) from a SQL query.

Syntax

```
HTMLDB_ITEM.TEXT(
    p_idx          IN    NUMBER,
    p_value        IN    VARCHAR2 DEFAULT NULL,
    p_size         IN    NUMBER DEFAULT NULL,
    p_maxlength    IN    NUMBER DEFAULT NULL,
    p_attributes   IN    VARCHAR2 DEFAULT NULL,
    p_item_id      IN    VARCHAR2 DEFAULT NULL,
    p_item_label   IN    VARCHAR2 DEFAULT NULL)
```

Parameters

Table 16–46 describes the parameters available in the TEXT function.

Table 16–46 TEXT Parameters

Parameter	Description
p_idx	Number to identify the item you want to generate. The number will determine which G_FXX global is populated. **See Also:** "HTMLDB_APPLICATION" on page 16-55
p_value	Value of a text field item.
p_size	Controls HTML tag attributes (such as disabled).

Table 16–46 (Cont.) TEXT Parameters

Parameter	Description
`p_maxlength`	Maximum number of characters that can be entered in the text box.
`p_attributes`	Extra HTML parameters you want to add.
`p_item_id`	HTML attribute ID for the `<input>` tag.
`p_item_label`	Label of the text field item.

Example

The following sample query demonstrates how to generate one update field for each row. Note that the `ename`, `sal`, and `comm` columns use the `HTMLDB_ITEM.TEXT` function to generate an HTML text field for each row. Also, notice that each item in the query is passed an unique `p_idx` parameter to ensure that each column is stored in its own array.

```
SELECT
  empno,
  HTMLDB_ITEM.HIDDEN(1,empno)||
  HTMLDB_ITEM.TEXT(2,ename) ename,
  HTMLDB_ITEM.TEXT(3,job) job,
  mgr,
  HTMLDB_ITEM.DATE_POPUP(4,rownum,hiredate,'dd-mon-yyyy') hiredate,
  HTMLDB_ITEM.TEXT(5,sal) sal,
  HTMLDB_ITEM.TEXT(6,comm) comm,
  deptno
FROM emp
ORDER BY 1
```

TEXT_FROM_LOV Function

Use this function to display an item as text, deriving the display value of the named LOV.

Syntax

```
HTMLDB_ITEM.TEXT_FROM_LOV (
    p_value       IN    VARCHAR2 DEFAULT NULL,
    p_lov         IN    VARCHAR2,
    p_null_text   IN    VARCHAR2 DEFAULT '%')
    RETURN VARCHAR2;
```

Parameters

Table 16–47 describes the parameters available in the `TEXT_FROM_LOV` function.

Table 16–47 TEXT_FROM_LOV Parameters

Parameter	Description
`p_value`	Value of a field item.
`p_lov`	Text name of a shared list of values. This list of values must be defined in your application.
`p_null_text`	Value to be displayed when the value of the field item is null or a corresponding entry is not located for the value `p_value` in the list of values.

Example

The following example demonstrates how to derive the display value from a named LOV (EMPNO_ENAME_LOV).

```
SELECT HTMLDB_ITEM.TEXT_FROM_LOV(empno,'EMPNO_ENAME_LOV') c FROM emp
```

TEXT_FROM_LOV_QUERY Function

Use this function to display an item as text, deriving the display value from a list of values query.

Syntax

```
HTMLDB_ITEM.TEXT_FROM_LOV_QUERY (
    p_value       IN    VARCHAR2 DEFAULT NULL,
    p_query       IN    VARCHAR2,
    p_null_text   IN    VARCHAR2 DEFAULT '%')
    RETURN VARCHAR2;
```

Parameters

Table 16–47 describes the parameters available in the TEXT_FROM_LOV_QUERY function.

Table 16–48 TEXT_FROM_LOV_QUERY Parameters

Parameter	Description
p_value	Value of a field item.
p_query	SQL query that is expected to select two columns, a display column and a return column. For example: `SELECT dname, deptno FROM dept`
p_null_text	Value to be displayed when the value of the field item is null or a corresponding entry is not located for the value p_value in the list of values query.

Example

The following how to derive the display value from a query.

```
SELECT HTMLDB_ITEM.TEXT_FROM_LOV_QUERY(empno,'SELECT ename, empno FROM emp') c
from emp
```

HTMLDB_APPLICATION

The HTMLDB_APPLICATION package is a PL/SQL package that implements the Oracle HTML DB rendering engine. You can use this package to take advantage of a number of global variables. Table 16–49 describes the global variables available in HTMLDB_APPLICATION.

Table 16–49 Global Variables Available in HTMLDB_APPLICATION

Global Variable	Description
G_USER	Specifies the currently logged in user.
G_FLOW_ID	Specifies the ID of the currently running application.

Table 16–49 (Cont.) Global Variables Available in HTMLDB_APPLICATION

Global Variable	Description
`G_FLOW_STEP_ID`	Specifies the ID of the currently running page.
`G_FLOW_OWNER`	Specifies the schema to parse for the currently running application.
`G_REQUEST`	Specifies the value of the request variable most recently passed to or set within the show or accept modules.

Topics in this section include:

- Referencing Arrays
- Referencing Values Within an On Submit Process
- Converting an Array to a Single Value

Referencing Arrays

Items are typically HTML form elements such as text fields, select lists and check boxes. When you create a new form item using a wizard, the wizard uses a standard naming format. The naming format provides a handle so you can retrieve the value of the item later on.

If you need to create your own items, you can access them after a page is submitted by referencing `HTMLDB_APPLICATION.G_F01` to `HTMLDB_APPLICATION.G_F50` arrays. You can create your own HTML form fields by providing the input parameters using the format `F01`, `F02`, `F03` and so on. You can create up to 50 input parameters ranging from `F01` to `F50`. Consider the following example:

```
<INPUT TYPE="text" NAME="F01" SIZE="32" MAXLENGTH="32" VALUE="some value">

<TEXTAREA NAME="F02" ROWS=4 COLS=90 WRAP="VIRTUAL">this is the example of a text
area.</TEXTAREA>

<SELECT NAME="F03" SIZE="1">
<OPTION VALUE="abc">abc
<OPTION VALUE="123">123
</SELECT>
```

Since the `F01` to `F50` input items are declared as PL/SQL arrays, you can have multiple items named the same value. For example:

```
<INPUT TYPE="text" NAME="F01" SIZE="32" MAXLENGTH="32" VALUE="array element 1">
<INPUT TYPE="text" NAME="F01" SIZE="32" MAXLENGTH="32" ALUE="array element 2">
<INPUT TYPE="text" NAME="F01" SIZE="32" MAXLENGTH="32" VALUE="array element 3">
```

Note that following PL/SQL produces the same HTML as show in the previous example.

```
FOR i IN 1..3 LOOP
HTMLDB_ITEM.TEXT(P_IDX        => 1,
 p_value      =>'array element '||i ,
 p_size       =>32,
 p_maxlength  =>32);
END LOOP;
```

Referencing Values Within an On Submit Process

You can reference the values posted by an HTML form using the PL/SQL variable `HTMLDB_APPLICATION.G_F01` to `HTMLDB_APPLICATION.G_F50`. Since this element is an array you can reference values directly. For example:

```
FOR i IN 1.. HTMLDB_APPLICATION.G_F01.COUNT LOOP
    htp.p('element '||I||' has a value of '||HTMLDB_APPLICATION.G_F01(i));
END LOOP;
```

Note that check boxes displayed using `HTMLDB_ITEM.CHECKBOX` will only contain values in the `HTMLDB_APPLICATION` arrays for those rows which are checked. Unlike other items (TEXT, TEXTAREA, DATE_POPUP) which can contain an entry in the corresponding `HTMLDB_APPLICATION` array for every row submitted, a check box will only have an entry in the `HTMLDB_APPLICATION` array if it is selected.

Converting an Array to a Single Value

You can also use Oracle HTML DB public utility functions to convert an array into a single value. The resulting string value is a colon-separated list of the array element values. The resulting string value is a colon-separated list of the array element values. For example:

```
htp.p(HTMLDB_UTIL.TABLE_TO_STRING(HTMLDB_APPLICATION.G_F01));
```

This function is enables you to reference `G_F01` to `G_F50` values in an application process that performs actions on data. The following sample process demonstrates the insertion of values into an table:

```
FOR i IN 1..HTMLDB_APPLICATION.G_F01.COUNT LOOP
    INSERT INTO my_table (my_column) VALUES HTMLDB_APPLICATION.G_F01(i);
END LOOP;
```

HTMLDB_CUSTOM_AUTH

You can use `HTMLDB_CUSTOM_AUTH` to perform various operations related to authentication and session management.

Topics in this section include:

- APPLICATION_PAGE_ITEM_EXISTS Function
- CURRENT_PAGE_IS_PUBLIC Function
- DEFINE_USER_SESSION Procedure
- GET_COOKIE_PROPS Procedure
- GET_LDAP_PROPS Procedure
- GET_NEXT_SESSION_ID Function
- GET_SESSION_ID_FROM_COOKIE Function
- GET_USERNAME Function
- GET_SECURITY_GROUP_ID Function
- GET_SESSION_ID Function
- GET_USER Function
- IS_SESSION_VALID Function

- LOGIN Procedure
- LOGOUT Procedure
- POST_LOGIN Procedure
- SESSION_ID_EXISTS Function
- SET_USER Procedure
- SET_SESSION_ID Procedure
- SET_SESSION_ID_TO_NEXT_VALUE Procedure

APPLICATION_PAGE_ITEM_EXISTS Function

This function checks for the existence of page-level item within an application. This function requires the parameter `p_item_name`. This function returns a Boolean value (true or false).

Syntax

```
FUNCTION APPLICATION_PAGE_ITEM_EXISTS(
    p_item_name   IN    VARCHAR2)
RETURN BOOLEAN;
```

CURRENT_PAGE_IS_PUBLIC Function

This function checks whether the current page's authentication attribute is set to **Page Is Public** and returns a Boolean value (true or false)

> **See Also:** "Editing Page Attributes" on page 5-19 and "Security" on page 5-22 for information about setting this page attribute

Syntax

```
FUNCTION CURRENT_PAGE_IS_PUBLIC
RETURN BOOLEAN;
```

DEFINE_USER_SESSION Procedure

This procedure combines the `SET_USER` and `SET_SESSION_ID` functions to create one call.

Syntax

```
PROCEDURE DEFINE_USER_SESSION(
    p_user         IN    VARCHAR2)
    p_session_id   IN    NUMBER);
```

GET_COOKIE_PROPS Procedure

This procedure obtains the properties of the session cookie used in the current authentication scheme for the specified application. These properties can be viewed directly in the Application Builder by viewing the authentication scheme attributes.

Syntax

```
HTMLDB_CUSTOM_AUTH.GET_COOKIE_PROPS(
 p_app_id                       IN  NUMBER,
 p_cookie_name                  OUT VARCHAR2,
 p_cookie_path                  OUT VARCHAR2,
 p_cookie_domain                OUT VARCHAR2);
```

Parameters

Table 16–50 describes the parameters available in the `GET_COOKIE_PROPS` procedure.

Table 16–50 GET_COOKIE_PROPS Parameters

Parameter	Description
`p_app_id`	An application ID in the current workspace.
`p_cookie_name`	The cookie name.
`p_cookie_path`	The cookie path.
`p_cookie_domain`	The cookie domain.

Example

```
DECLARE
    l_cookie_name   varchar2(256);
    l_cookie_path   varchar2(256);
    l_cookie_domain varchar2(256);
BEGIN
HTMLDB_CUSTOM_AUTH.GET_COOKIE_PROPS (
    p _cookie_name   => l_cookie_name,
    p _cookie_path   => l_cookie_path,
    p _cookie_domain => l_cookie_domain);
END;
```

GET_LDAP_PROPS Procedure

This procedure obtains the LDAP attributes of the current authentication scheme for the current application. These properties can be viewed directly in Application Builder by viewing the authentication scheme attributes.

Syntax

```
HTMLDB_CUSTOM_AUTH.GET_LDAP_PROPS(
 p_ldap_host                OUT VARCHAR2,
 p_ldap_port                OUT NUMBER,
 p_ldap_dn                  OUT VARCHAR2,
 p_ldap_edit_function       OUT VARCHAR2);
```

Parameters

Table 16–51 describes the parameters available in the GET_LDAP_PROPS procedure.

Table 16–51 GET_LDAP_PROPS Parameters

Parameter	Description
`p_ldap_host`	LDAP host name.
`p_ldap_port`	LDAP port number.
`p_ldap_host`	LDAP DN string.

Table 16–51 (Cont.) GET_LDAP_PROPS Parameters

Parameter	Description
`p_ldap_host`	LDAP host name.
`p_ldap_edit_function`	LDAP edit function name.

Example

```
DECLARE
    l_ldap_host          varchar2(256);
    l_ldap_port          number;
    l_ldap_dn            varchar2(256);
    l_ldap_edit_function varchar2(256);
BEGIN
HTMLDB_CUSTOM_AUTH.GET_LDAP_PROPS (
    p_ldap_host       => l_ldap_host,
    p_ldap_port       => l_ldap_port,
    p_ldap_dn         => l_ldap_dn,'
    p_ldap_edit_function => l_ldap_edit_function);
END;
```

GET_NEXT_SESSION_ID Function

This function generates the next session ID from the Oracle HTML DB sequence generator. This function returns a number.

Syntax

```
FUNCTION GET_NEXT_SESSION_ID
RETURN NUMBER;
```

GET_SESSION_ID_FROM_COOKIE Function

This function returns the Oracle HTML DB session ID located by the session cookie in the context of a page request in the current browser session.

Syntax

```
HTMLDB_CUSTOM_AUTH.GET_SESSION_ID_FROM_COOKIE;
RETURN NUMBER;
```

Example

```
DECLARE VAL NUMBER;
BEGIN
  VAL := HTMLDB_CUSTOM_AUTH.GET_SESSION_ID_FROM_COOKIE;
END;
```

GET_USERNAME Function

This function returns user name registered with the current Oracle HTML DB session in the internal sessions table. This user name is usually the same as the authenticated user running the current page.

Syntax

```
HTMLDB_CUSTOM_AUTH.GET_USERNAME;
RETURN VARCHAR2;
```

Example

```
DECLARE VAL VARCHAR2(256);
BEGIN
  VAL := HTMLDB_CUSTOM_AUTH.GET_USERNAME;
END;
```

GET_SECURITY_GROUP_ID Function

This function returns a number with the value of the security group ID that identifies the workspace of the current user.

Syntax

```
FUNCTION GET_SECURITY_GROUP_ID
RETURN NUMBER;
```

GET_SESSION_ID Function

This function returns `HTMLDB_APPLICATION.G_INSTANCE` global variable. `GET_SESSION_ID` returns a number.

Syntax

```
PROCEDURE GET_SESSION_ID
RETURN NUMBER;
```

GET_USER Function

This function returns the `HTMLDB_APPLICATION.G_USER` global variable (`VARCHAR2`).

Syntax

```
FUNCTION GET_USER
RETURN VARCHAR2;
```

IS_SESSION_VALID Function

This function is a Boolean result obtained from executing the current application's authentication scheme to determine if a valid session exists. This function returns the Boolean result of the authentication scheme's page sentry.

Syntax

```
HTMLDB_CUSTOM_AUTH.IS_SESSION_VALID;
RETURN BOOLEAN;
```

Example

```
DECLARE VAL VARCHAR2(256);
```

```
BEGIN
  VAL := HTMLDB_CUSTOM_AUTH.IS_SESSION_VALID;
END;
```

LOGIN Procedure

Also referred to as the "Login API," this procedure performs authentication and session registration.

Syntax

```
HTMLDB_CUSTOM_AUTH.LOGIN(
 p_uname                    IN  VARCHAR2,
 p_password                 IN  VARCHAR2,
 p_session_id               IN  VARCHAR2,
 p_app_page                 IN  VARCHAR2,
 p_entry_point              IN  VARCHAR2,
 p_preserve_case            IN  BOOLEAN);
```

Parameter

Table 16–52 describes the parameters available in the `LOGIN` procedure.

Table 16–52 LOGIN Parameters

Parameter	Description
`p_uname`	Login name of the user.
`p_password`	Clear text user password.
`p_session_id`	Current Oracle HTML DB session ID.
`p_app_page`	Current application ID. After login page separated by a colon (:).
`p_entry_point`	Internal use only.
`p_preserve_case`	If true, do not upper `p_uname` during session registration

Example

```
BEGIN
HTMLDB_CUSTOM_AUTH.LOGIN (
    p_uname       => 'SCOTT',
    p_password    => 'secret99',
    p_session_id  => V('APP_SESSION'),
    p_app_page    => :APP_ID||':1');
END;
```

Note: :Do not use bind variable notations for `p_session_id` argument.

LOGOUT Procedure

This procedure effects a logout from the current session by unsetting the session cookie and redirecting to a new location.

Syntax

```
HTMLDB_CUSTOM_AUTH.LOGOUT(
 p_this_app                   IN VARCHAR2,
 p_next_app_page_sess         IN VARCHAR2,
 p_next_url                   IN VARCHAR2);
```

Parameter

Table 16–53 describes the parameters available in the `LOGOUT` procedure.

Table 16–53 LOGOUT Parameters

Parameter	Description
`p_this_app`	Current application ID.
`p_next_app_page_sess`	Application and page ID to redirect to. Separate multiple pages using a colon (:) and optionally followed by a colon (:) and the session ID (if control over the session ID is desired).
`p_next_url`	URL to redirect to (use this instead of `p_next_app_page_sess`).

Example

```
BEGIN
HTMLDB_CUSTOM_AUTH.LOGOUT (
    p_this_app           => '1000',
    p_next_app_page_sess  => '1000:99');
END;
```

POST_LOGIN Procedure

This procedure performs session registration, assuming the authentication step has been completed. It can be called only from within an Oracle HTML DB application page context.

Syntax

```
HTMLDB_CUSTOM_AUTH.POST_LOGIN(
 p_uname                    IN  VARCHAR2,
 p_session_id               IN  VARCHAR2,
 p_app_page                 IN  VARCHAR2,
 p_preserve_case            IN  BOOLEAN);
```

Parameter

Table 16–54 describes the parameters available in the `POST_LOGIN` procedure.

Table 16–54 POST_LOGIN Parameters

Parameter	Description
`p_uname`	Login name of user.
`p_session_id`	Current Oracle HTML DB session ID.
`p_app_page`	Current application ID and after login page separated by a colon (:).
`p_preserve_case`	If true, do not include `p_uname` in uppercase during session registration.

Example

```
BEGIN
HTMLDB_CUSTOM_AUTH.POST_LOGIN (
    p_uname       => 'SCOTT',
    p_session_id  => V('APP_SESSION'),
    p_app_page    => :APP_ID||':1');
END;
```

SESSION_ID_EXISTS Function

This function returns a Boolean result based on the global package variable containing the current Oracle HTML DB session ID. Returns true if the result is a positive number. returns false if the result is a negative number.

Syntax

```
FUNCTION SESSION_ID_EXISTS
RETURN BOOLEAN;
```

Example

```
DECLARE VAL BOOLEAN;
BEGIN
  VAL := HTMLDB_CUSTOM_AUTH.SESSION_ID_EXISTS;
END;
```

SET_USER Procedure

This procedure sets the `HTMLDB_APPLICATION.G_USER` global variable. `SET_USER` requires the parameter `P_USER` (`VARCHAR2`) which defines a user ID.

Syntax

```
PROCEDURE SET_USER(
    p_user   IN    VARCHAR2)
```

SET_SESSION_ID Procedure

This procedure sets `HTMLDB_APPLICATION.G_INSTANCE` global variable. `SET_SESSION_ID` returns a number. This procedure requires the parameter `P_SESSION_ID` (`NUMBER`) which specifies a session ID.

Syntax

```
PROCEDURE SET_SESSION_ID(
    p_session_id    IN    NUMBER)
```

SET_SESSION_ID_TO_NEXT_VALUE Procedure

This procedure combines the operation of `GET_NEXT_SESSION_ID` and `SET_SESSION_ID` in one call.

Syntax

```
PROCEDURE SETsN_ID_TO_NEXT_VALUE;
```

HTMLDB_LDAP

You can use HTMLDB_CUSTOM_AUTH to perform various operations related to Lightweight Directory Access Protocol (LDAP) authentication.

Topics in this section include:

- AUTHENTICATE Function
- IS_MEMBER Function
- MEMBER_OF Function
- MEMBER_OF2 Function
- GET_USER_ATTRIBUTES Procedure
- GET_ALL_USER_ATTRIBUTES Procedure

AUTHENTICATE Function

The AUTHENTICATE function returns a boolean true if the username and password can be used to perform a SIMPLE_BIND_S call using the provided search base, host, and port.

Syntax

```
FUNCTION AUTHENTICATE(
    p_username     in VARCHAR2 DEFAULT NULL,
    p_password     in VARCHAR2 DEFAULT NULL,
    p_search_base  in VARCHAR2,
    p_host         in VARCHAR2,
    p_port         in VARCHAR2 DEFAULT 389)
RETURN BOOLEAN;
```

Parameters

Table 16–55 describes the parameters available in the AUTHENTICATE function.

Table 16–55 AUTHENTICATE Parameters

Parameter	Description
p_username	Login name of the user.
p_password	Password for p_username.
p_search_base	LDAP search base, for example, dc=users,dc=my,dc=org.
p_host	LDAP server host name.
p_port	LDAP server port number.

IS_MEMBER Function

The IS_MEMBER function returns a boolean true if the user named by p_username (with password if required) is a member of the group specified by the p_group and p_group_base parameters using the provided auth base, host, and port.

Syntax

```
FUNCTION IS_MEMBER(
    p_username     in VARCHAR2 DEFAULT NULL,
    p_pass         in VARCHAR2 DEFAULT NULL,
    p_auth_base    in VARCHAR2,
    p_host         in VARCHAR2,
    p_port         in VARCHAR2 DEFAULT 389,
    p_group        in VARCHAR2,
    p_group_base   in VARCHAR2)
RETURN BOOLEAN;
```

Parameters

Table 16–56 describes the parameters available in the `IS_MEMBER` function.

Table 16–56 IS_MEMBER Parameters

Parameter	Description
`p_username`	Login name of the user.
`p_pass`	Password for `p_username`.
`p_auth_base`	LDAP search base, for example, `dc=users,dc=my,dc=org`.
`p_host`	LDAP server host name.
`p_port`	LDAP server port number.
`p_group`	Name of the group to be search for membership.
`p_group_base`	The base dn from which the search should be started.

MEMBER_OF Function

The `MEMBER_OF` function returns an array of groups the username designated by `p_username` (with password if required) belongs to, using the provided auth base, host, and port.

Syntax

```
FUNCTION MEMBER_OF(
    p_username     in VARCHAR2 DEFAULT NULL,
    p_pass         in VARCHAR2 DEFAULT NULL,
    p_auth_base    in VARCHAR2,
    p_host         in VARCHAR2,
    p_port         in VARCHAR2 DEFAULT 389,
RETURN wwv_flow_global.vc_arr2;
```

Parameters

Table 16–57 describes the parameters available in the `MEMBER_OF` function.

Table 16–57 MEMBER_OF Parameters

Parameter	Description
`p_username`	Login name of the user.
`p_pass`	Password for `p_username`.
`p_auth_base`	LDAP search base, for example, `dc=users,dc=my,dc=org`.
`p_host`	LDAP server host name.
`p_port`	LDAP server port number.

MEMBER_OF2 Function

The MEMBER_OF2 function returns an VARCHAR2 list of groups the username designated by p_username (with password if required) belongs to, using the provided auth base, host, and port.

Syntax

```
FUNCTION MEMBER_OF2(
    p_username     in VARCHAR2 DEFAULT NULL,
    p_pass         in VARCHAR2 DEFAULT NULL,
    p_auth_base    in VARCHAR2,
    p_host         in VARCHAR2,
    p_port         in VARCHAR2 DEFAULT 389,
RETURN VARCHAR2;
```

Parameters

Table 16–58 describes the parameters available in the MEMBER_OF2 function.

Table 16–58 MEMBER_OF2 Parameters

Parameter	Description
p_username	Login name of the user.
p_pass	Password for p_username.
p_auth_base	LDAP search base, for example, dc=users,dc=my,dc=org.
p_host	LDAP server host name.
p_port	LDAP server port number.

GET_USER_ATTRIBUTES Procedure

The GET_USER_ATTRIBUTES procedure returns an OUT array of user_attribute values for the username designated by p_username (with password if required) corresponding to the attribute names passed in p_attributes, using the provided auth base, host, and port.

Syntax

```
PROCEDURE GET_USER_ATTRIBUTES(
    p_username         in VARCHAR2 DEFAULT NULL,
    p_pass             in VARCHAR2 DEFAULT NULL,
    p_auth_base        in VARCHAR2,
    p_host             in VARCHAR2,
    p_port             in VARCHAR2 DEFAULT 389,
    p_attributes       in  wwv_flow_global.vc_arr2,
    p_attribute_values out wwv_flow_global.vc_arr2);
```

Parameters

Table 16–59 describes the parameters available in the GET_USER_ATTRIBUTES procedure.

Table 16–59 GET_USER_ATTRIBUTES Parameters

Parameter	Description
p_username	Login name of the user.

Table 16–59 (Cont.) GET_USER_ATTRIBUTES Parameters

Parameter	Description
p_pass	Password for p_username.
p_auth_base	LDAP search base, for example, dc=users,dc=my,dc=org.
p_host	LDAP server host name.
p_port	LDAP server port number.
p_attributes	An array of attribute names for which values are to be returned.
p_attribute_values	An array of values returned for each corresponding attribute name in p_attributes.

GET_ALL_USER_ATTRIBUTES Procedure

The GET_ALL_USER_ATTRIBUTES procedure returns two OUT arrays of user_attribute names and values for the username designated by p_username (with password if required) using the provided auth base, host, and port.

Syntax

```
PROCEDURE GET_ALL_USER_ATTRIBUTES(
    p_username          in VARCHAR2 DEFAULT NULL,
    p_pass              in VARCHAR2 DEFAULT NULL,
    p_auth_base         in VARCHAR2,
    p_host              in VARCHAR2,
    p_port              in VARCHAR2 DEFAULT 389,
    p_attributes        out  wwv_flow_global.vc_arr2,
    p_attribute_values  out wwv_flow_global.vc_arr2);
```

Parameters

Table 16–60 describes the parameters available in the GET_ALL_USER_ATTRIBUTES procedure.

Table 16–60 GET_ALL_USER_ATTRIBUTES Parameters

Parameter	Description
p_username	Login name of the user.
p_pass	Password for p_username.
p_auth_base	LDAP search base, for example, dc=users,dc=my,dc=org.
p_host	LDAP server host name.
p_port	LDAP server port number.
p_attributes	An array of attribute names returned.
p_attribute_values	An array of values returned for each corresponding attribute name returned in p_attributes.

Part III

SQL Workshop

Part III explains how to use SQL Workshop view and manage database objects from a Web browser.

Part III contains the following chapters:

17

Building Queries with Query Builder

Query Builder's graphical user interface enables database developers to build SQL queries without the need for manual SQL coding. Using Query Builder, you can search and filter database objects, select objects and columns, create relationships between objects, view formatted query results, and save queries with little or no SQL knowledge.

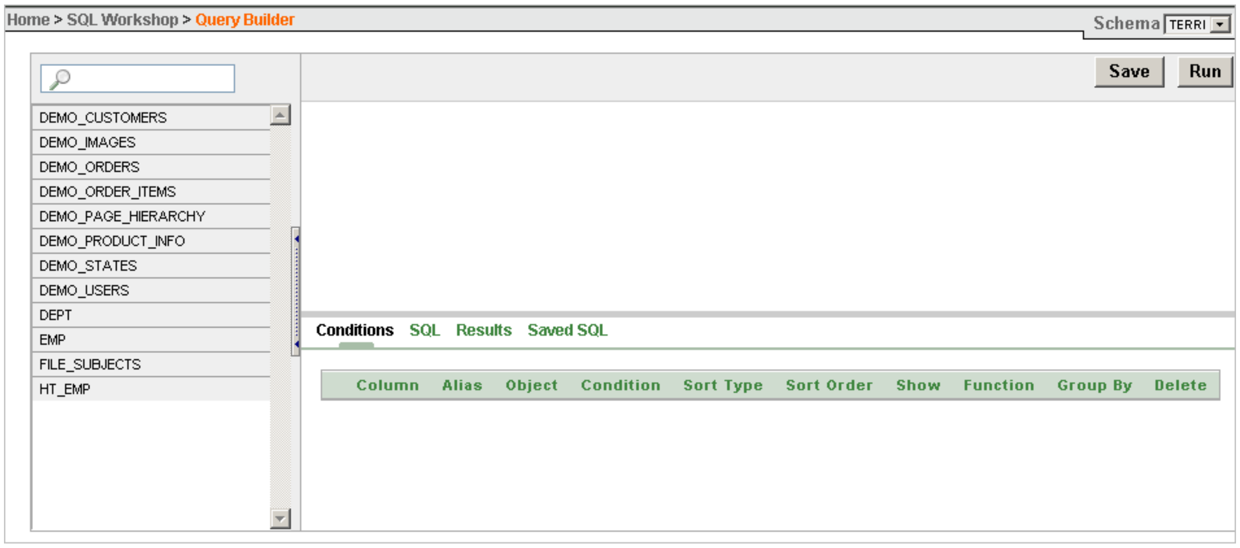
This section contains the following topics:

About Query Builder

The Query Builder page is divided into three sections:

- **Object Selection pane** displays on the left side of the page and contains a list objects from which you can build queries. Only objects in the current schema display. To select another schema, make a selection from the Schema list.
- **Design pane** displays to the right of the Object Selection pane and above the Conditions, SQL, Results, and Saved SQL tabs. When you select an object from the Object Selection pane, it appears in the Design pane.
- **Output pane** displays below the Design pane. Once you select objects and columns, you can create conditions, view the generated SQL, or view query results.

Figure 17–1 Query Builder Home Page



Topics in this section include:

- Accessing Query Builder
- Understanding the Query Building Process

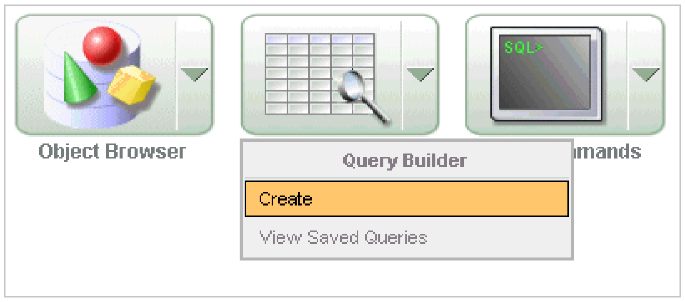
Accessing Query Builder

To access Query Builder:

1. Log in to Oracle HTML DB.
2. Click the **SQL Workshop** icon on the Workspace home page.

   The SQL Workshop home page appears.
3. To view Query Builder you can either:
   - Click the **Query Builder** icon.
   - Click the down arrow on the right side of the icon to view a pull-down menu. Then, select the appropriate menu option.

Figure 17–2 Query Builder Pull-down Menu



Note: For the purposes of consistency, this document uses the primary navigation path (or drill-down approach) when explaining navigation.

Understanding the Query Building Process

To build a a query in Query Builder, you perform the following steps:

1. Select objects from the Object Selection pane. See "Using the Object Selection Pane" on page 17-3.
2. Add objects to the Design pane and select columns. See "Selecting Objects" on page 17-4.
3. **Optional**: Establish relationships between objects. See "Creating Relationships Between Objects" on page 17-8.
4. **Optional**: Create query conditions. See "Specifying Query Conditions" on page 17-6.
5. Execute the query and view results. See "Viewing Query Results" on page 17-12.

See Also: "Viewing Generated SQL" on page 17-12 and "Working with Saved Queries" on page 17-10

Using the Object Selection Pane

The Object Selection pane displays on the left side of the Query Builder page and lists tables, views, and materialized views within the current schema.

Topics in this section include:

- Searching and Filtering Objects
- Hiding the Object Selection Pane

Searching and Filtering Objects

Use the Object Selection pane to search for and view tables, views, and materialized views within the current schema.

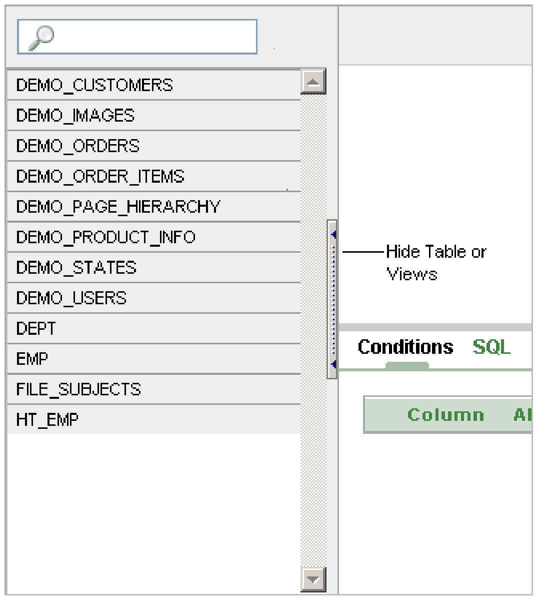
To search or filter objects:

1. Navigate to Query Builder:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Query Builder**.

      Query Builder appears.
2. Select a schema from the Schema list on the right side of the page.

   Only objects in the current schema display. Note that the values available in the Schema list depend upon your resource privileges.
3. In the search field at the top of the pane, enter a case insensitive query.
4. To view all tables or views within the currently selected schema, leave the search field blank.

Figure 17–3 Search Field on the Query Builder Home Page



Hiding the Object Selection Pane

You can hide the Object Selection pane by selecting the **Hide Table or Views** control. By hiding the Object Selection pane, you can increase the size of the Design and Result panes.

The Hide Table or Views control displays on the right side of the Object Selection pane. If the Object list appears, selecting this control hides it. Similarly, if the Object list is hidden, selecting this control causes the pane to reappear.

Selecting Objects

The Design pane displays to the right of the Object Selection pane. When you select an object from the Object Selection pane, it appears in the Design pane. You use the Object Selection pane to select objects (that is, tables, views, and materialized views) and the Design pane to identify how those selected objects will be used in a query.

Topics in this section include:

- About Supported Column Types
- Adding an Object to the Design Pane
- Removing or Hiding Objects in the Design Pane

See Also: "Creating Relationships Between Objects" on page 17-8

About Supported Column Types

Columns of all types available in Oracle Database 10g Release (10.2) display as objects in the Design pane. Note the following column restrictions:

- You may only select a maximum of 60 columns for each query.
- The following column types are selectable and will not be included in a generated query:
  - `BLOB`

- `CLOB`
- `NCLOB`
- `RAW`
- `LONG`
- `LONGRAW`
- `XML TYPE`
- Any other nonscalar column types

Adding an Object to the Design Pane

You add an object to the Design pane by selecting it from the Object Selection pane.

To add an object to the Design pane:

1. Navigate to Query Builder:

   a. Click the **SQL Workshop** icon on the Workspace home page.

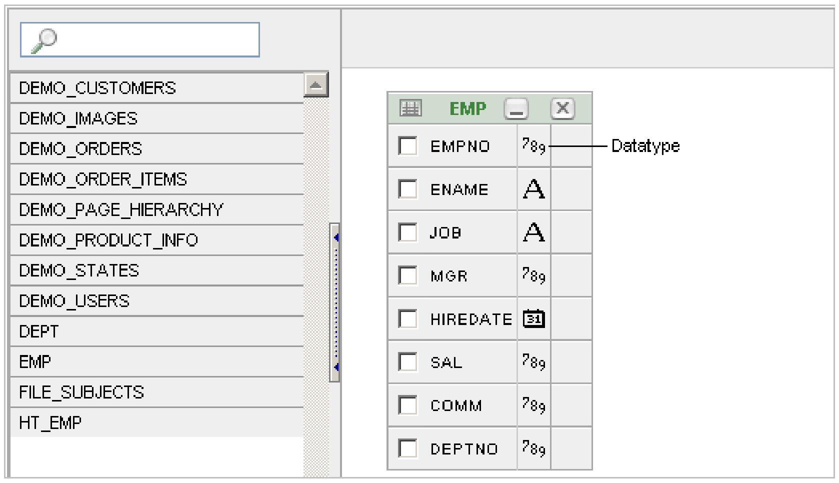
   b. Click **Query Builder**.

   Query Builder appears.

2. Select an object from the Object Selection pane.

   The selected object appears in the Design Pane. Note that a graphical representation of the datatype displays to the right of the column name.

Figure 17–4 Object Added to the Design Pane



3. Select the columns to be included in your query by clicking the check box to the left of the column name.

   When you select a column you are indicating it will be used in the query. As you select a column, it appears on the Conditions tab. Note that the Show check box on the Conditions tab controls whether a column is included in query results. Be default, this check box is selected.

   To select the first twenty columns, click the small icon in the upper left corner of the object and then select **Check All**.

4. To execute the query and view results, click **Run**.

Tip: You can also execute a query by pressing **CTRL + ENTER**.

The Results pane displays the query results.

See Also: "Specifying Query Conditions" on page 17-6

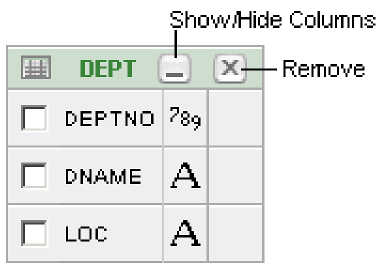
Resizing the Design and Results Panes

As you select objects, you can resize Design and Results panes by selecting the grey horizontal rule in the center of the page. Moving the rule up, shrinks the Design pane. Moving the rule down expands the Design pane.

Removing or Hiding Objects in the Design Pane

You remove or hide objects in the Design pane by selecting controls at the top of the object. To remove an object, select the **Remove** icon in the upper right corner. To temporarily hide the columns within an object, click the **Show/Hide Columns** icon.

Figure 17–5 Object Controls



Specifying Query Conditions

Conditions enable you to filter and identify the data you want to work with. As you select columns within an object, you can specify conditions on the Conditions tab. You can use these attributes to modify the column alias, apply column conditions, sort columns, or apply functions.

To specify query conditions:

1. Navigate to Query Builder:

   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Query Builder**.

      Query Builder appears.

2. Select an object from the Object Selection pane.

   The selected object appears in the Design Pane.

3. Select the columns to be included in your query by clicking the box to the left of the column name.

   When you select a column, you are indicating you want to include it in your query. As you select each column, it appears as a separate row in the Conditions view. Table 17–1 describes the attributes available on the Conditions tab.

Table 17–1 Conditions Tab

Condition Attribute	**Description**
Up and Down Arrows	Controls the order that the columns to be displayed in the resulting query. Click the arrow buttons to move columns up and down. **See Also:** "Viewing Query Results" on page 17-12
Column	Displays the column name.
Alias	Specify an optional column alias. An **alias** is an alternative column name. Aliases are used to make a column name more descriptive, to shorten the column name, or prevent possible ambiguous references.

Condition	Specify a condition for the column.
	The condition you enter modifies the query's `WHERE` clause. When specifying a column condition, you must include the appropriate operator and operand. Consider the following examples:
	`>=10`
	`='VA'`
	`IN (SELECT dept_no FROM dept)`
	`BETWEEN SYSDATE AND SYSDATE + 15`

Sort Type	Select a sort type. Options include: ■ Ascending (`Asc`) ■ Descending (`Desc`)
Sort Order	Enter a number (1, 2, 3, and so on) to specify the order in which selected columns should display.
Show	Select this check box to include the column in your query results. You do not need to select Show if you need to add a column to the query for filtering only. For example, suppose you wish to create following query: `SELECT ename FROM emp WHERE deptno = 10` To create this query in Query Builder: **1.** From the Object list, select EMP. **2.** In the Design Pane, select `ename` and `deptno`. **3.** For the deptno column, in Condition enter `=10` and uncheck the Show check box.
Function	Select an argument function. Available functions include: ■ **NUMBER columns** - `COUNT`, `COUNT DISTINCT`, `AVG`, `MAXIMUM`,. `MINIMUM`, `SUM` ■ **VARCHAR2, CHAR columns** - `COUNT`, `COUNT DISTINCT`, `INITCAP`, `LENGTH`, `LOWER`, `LTRIM`, `RTRIM`, `TRIM`, `UPPER` ■ **DATE, TIMESTAMP columns** - `COUNT`, `COUNT DISTINCT`
Group By	Specify columns to be used for grouping when an aggregate function is used. Only applicable for columns included in output.
Delete	Deselect the column, excluding it from the query.

As you select columns and define conditions, Query Builder writes the SQL for you.

4. To view the underlying SQL, click the **SQL** tab.

Creating Relationships Between Objects

You can create relationships between objects by creating a join. A **join** identifies a relationship between two or more tables, views, or materialized views.

Topics in this section include:

- About Join Conditions
- Joining Objects Manually
- Joining Objects Automatically

About Join Conditions

When you write a join query, you specify a condition that conveys a relationship between two objects. This condition is called a **join condition**. A join condition determines how the rows from one object will combine with the rows from another object.

Query Builder supports inner, outer, left, and right joins. An **inner join** (also called a **simple join**) returns the rows that satisfy the join condition. An outer join extends the result of a simple join. An **outer join** returns all rows that satisfy the join condition and returns some or all of those rows from one table for which no rows from the other satisfy the join condition.

See Also: *Oracle Database SQL Reference* for information about join conditions

Joining Objects Manually

You can create a join manually by selecting the Join column in the Design pane.

To join two objects manually:

1. Navigate to Query Builder:

   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Query Builder**.

      Query Builder appears.

2. From the Object Selection pane, select the objects you want to join.

   The objects display in the Design pane.

3. Identify the columns you want to join.

   You create a join by selecting the Join column adjacent to the column name. The Join column displays to the right of the datatype, beneath the Remove icon. When your cursor is in the appropriate position, the following help tip displays:

   ```
   Click here to select column for join
   ```

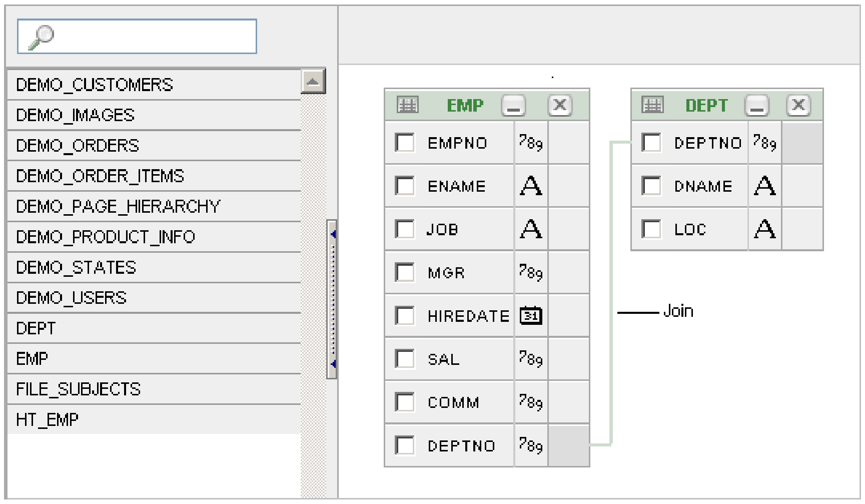
4. Select the appropriate Join column for the first object.

   When selected, the Join column displays as a dark gray. To deselect a Join column, simply select is again or press **ESC**.

5. Select the appropriate Join column for the second object.

Tip: You can also join two objects by dragging and dropping. Select a column in the first table and then drag and drop it onto a column in another table.

Figure 17–6 Two Joined Columns



When joined, a green line connects the two columns.

6. Select the columns to be included in your query. You can view the SQL statement resulting from the join by positioning the cursor over the green line.
7. Click **Run** to execute the query.

   The Results pane displays the query results.

Joining Objects Automatically

When you join objects automatically, the Query Builder suggests logical, existing parent and child relationships between existing columns.

To join objects automatically:

1. Navigate to Query Builder:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Query Builder**.

      Query Builder appears.
2. From the Object Selection pane, select an object.

   The object displays in the Design pane.
3. Click the small icon in the upper left corner of the object. Depending upon the selected object, the icon label displays as **Table Actions** or **View Actions**.

   The Actions window appears. Use the Actions window to select all columns within the current object or objects related to the current object.
4. In the Actions window, select the appropriate options:
   - **Check All** - Select this option to select the first twenty columns in the current object.

- **Add Parent** - Displays tables that are referenced as a foreign key to the current object.
- **Add Child** - Displays tables that reference the current object in a foreign key.

If using Add Parent or Add child, the selected object appears and a green line connects the foreign key columns.

5. Select additional columns to be included in your query.

   You can view the SQL statement resulting from the join by positioning the cursor over the green line.

6. Click **Run** to execute the query.

   The Results pane displays the query results.

Working with Saved Queries

As you create new queries, you can save them by clicking the Save button in the Design pane. Once you save a query, you can access it later in the Saved SQL view.

Topics in this section include:

- Saving a Query
- Editing a Saved Query
- Deleting a Saved Query

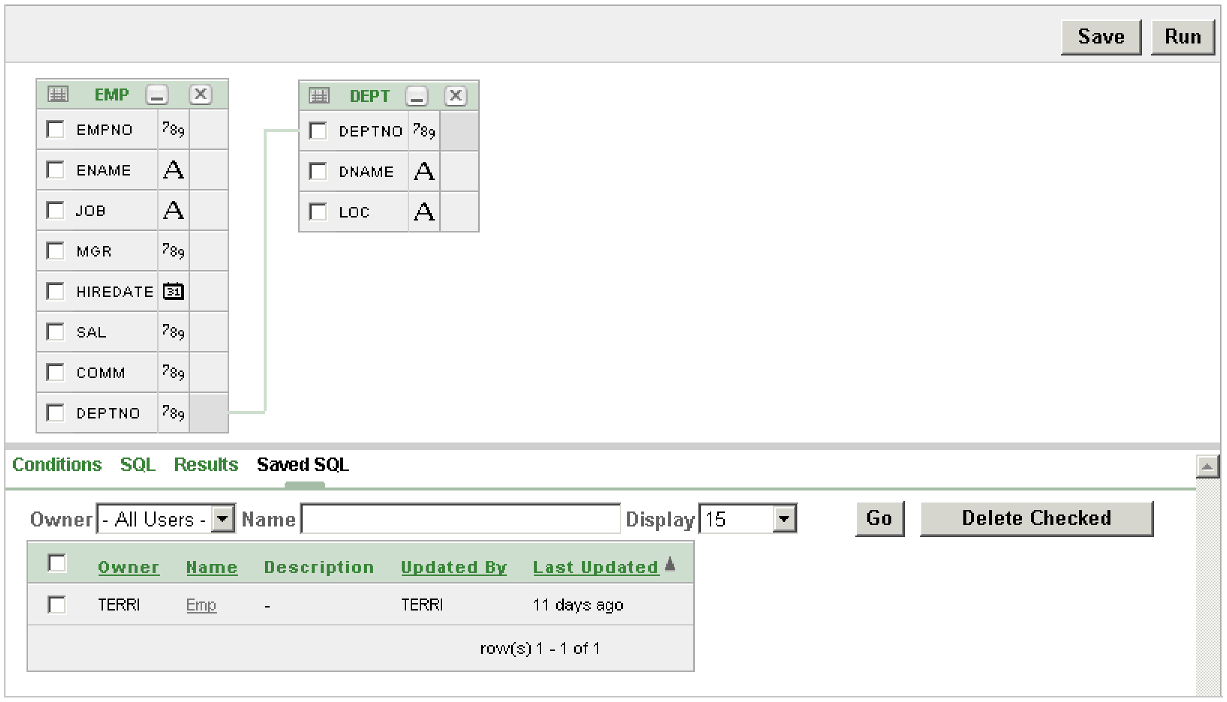
Saving a Query

To save a query:

1. Build a query:
   a. Navigate to Query Builder
   b. Select objects from the Object Selection pane.
   c. Add objects to the Design pane and select columns.
   d. Execute the query.
2. Click **Save**.
3. Enter a name and description and click **Save**.

   The saved query displays in the Saved SQL view.

Figure 17–7 Saved SQL Query



	Owner	Name	Description	Updated By	Last Updated
	TERRI	Emp	-	TERRI	11 days ago

row(s) 1 - 1 of 1

Note that Query Builder does not support duplicate query names. If you open an existing query, keep the existing name, and save it again, Query Builder over-writes the existing query. If you change the name of an existing query and save it again,Query Builder saves the query again under the new name.

Editing a Saved Query

Once you save a query, you can access it in the Saved SQL view.

To edit a Saved SQL query:

1. Navigate to Query Builder:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Query Builder**.

      Query Builder appears.
2. Select the **Saved SQL** tab.
3. To filter the display, you can:
   - Make a selection from the Owner list and click **Go**.
   - Enter a search query in the Name field and click **Go**.
4. To edit a query, select the appropriate name.

   The saved query appears. The selected objects display in the Design pane and the Conditions view appears.

Deleting a Saved Query

To delete a Saved SQL query:

1. Navigate to Query Builder:

   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Query Builder**.

      Query Builder appears.
2. Select the **Saved SQL** tab.
3. Select the queries to be deleted and click **Delete Checked**.

Viewing Generated SQL

The SQL view presents a read-only, formatted representation of the SQL generated by Query Builder. You can copy the SQL code that appears in the SQL View for use in other tools such as SQL Command Processor or Application Builder.

See Also: "Using SQL Command Processor" on page 20-1

To access the SQL view:

1. Navigate to Query Builder:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Query Builder**.

      Query Builder appears.
2. Select an object from the Object Selection pane.

   The selected object appears in the Design Pane.
3. Select the columns to be included in your query.
4. Click the **SQL** tab.

   The SQL code generated by Query Builder appears.

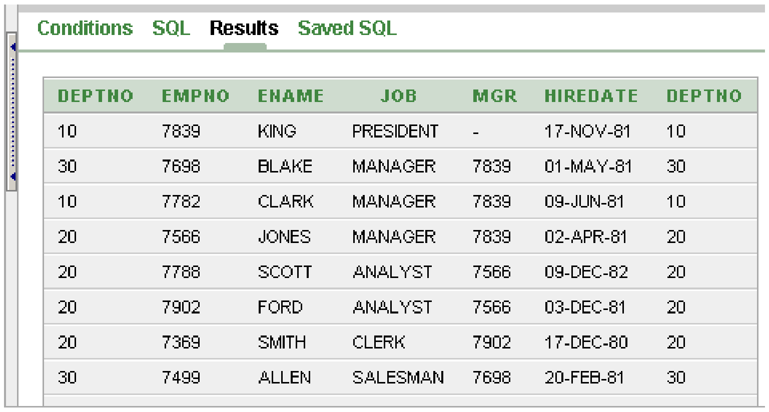
Viewing Query Results

Once you select objects and determine what columns to include in your query, you execute a query by:

- Clicking the **Run** button (or pressing **CTRL + ENTER**)
- Selecting the **Results** tab

The Results view appears, displaying formatted query results.

Figure 17–8 Results View Displaying Formatted Query Results



DEPTNO	EMPNO	ENAME	JOB	MGR	HIREDATE	DEPTNO
10	7839	KING	PRESIDENT	-	17-NOV-81	10
30	7698	BLAKE	MANAGER	7839	01-MAY-81	30
10	7782	CLARK	MANAGER	7839	09-JUN-81	10
20	7566	JONES	MANAGER	7839	02-APR-81	20
20	7788	SCOTT	ANALYST	7566	09-DEC-82	20
20	7902	FORD	ANALYST	7566	03-DEC-81	20
20	7369	SMITH	CLERK	7902	17-DEC-80	20
30	7499	ALLEN	SALESMAN	7698	20-FEB-81	30

18 Managing Database Objects Using Object Browser

Object Browser enables developers to browse, create, and edit objects in multiple schemas in a single database.

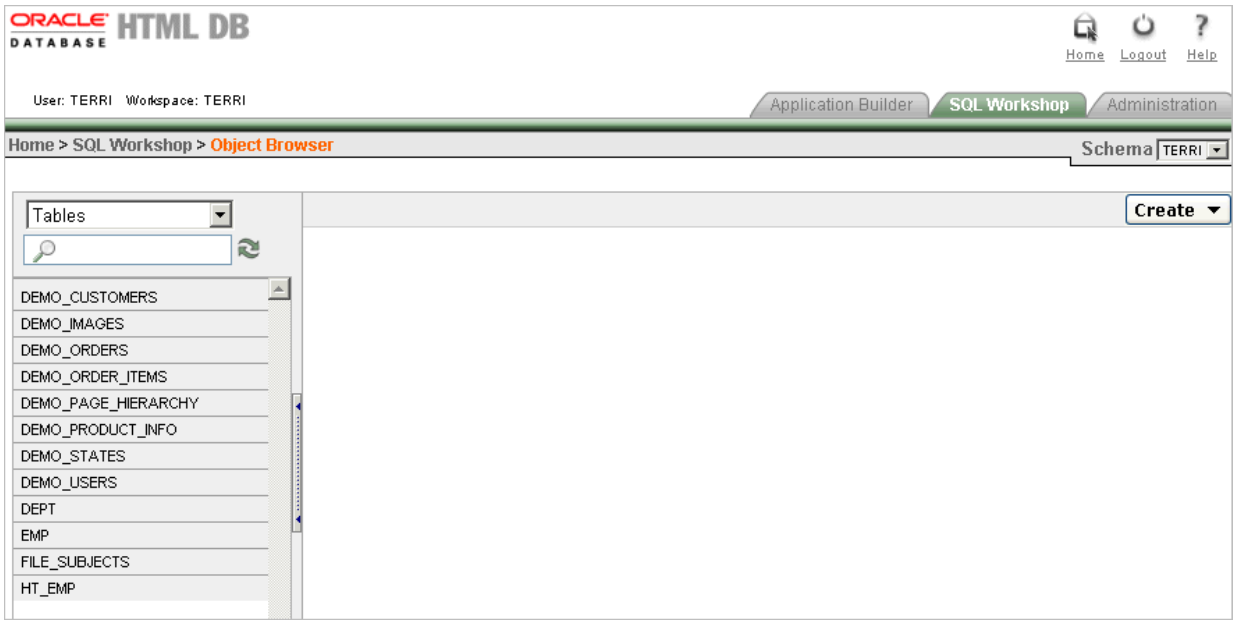
This section contains the following topics:

About Object Browser

The Object Browser page is divided into two sections:

- **Object Selection pane** displays on the left side of the Object Browser page and lists database objects of a selected type within the current schema. You can further narrow the results by filtering on the object name.
- **Detail pane** displays to the right of the page and displays detailed information about the selected object. To view object details, select an object in the Object Selection pane. Click the tabs at the top of the Detail pane to view additional details about the current object. To edit an object, click the appropriate button.

Figure 18–1 Object Browser



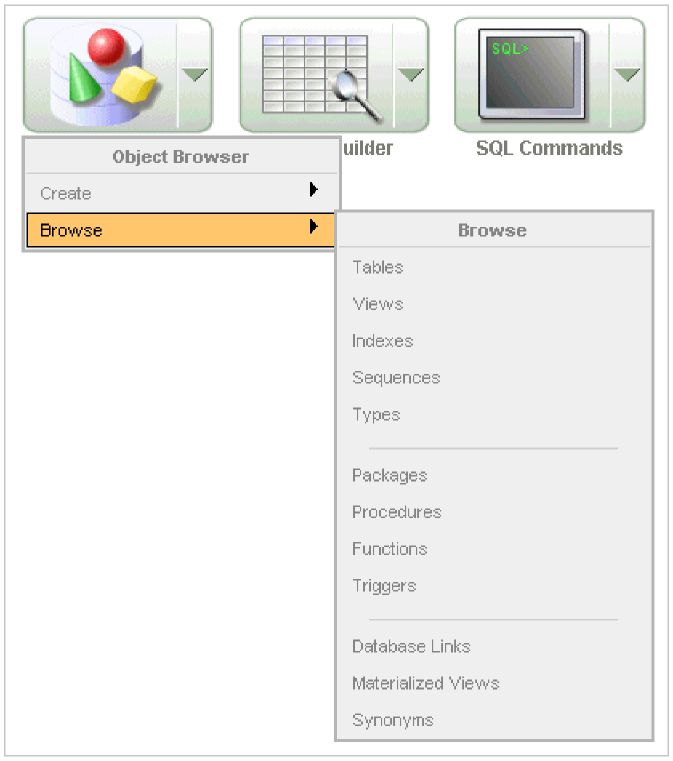
Accessing Object Browser

To access Object Browser:

1. Log in to Oracle HTML DB.
2. Click the **SQL Workshop** icon on the Workspace home page.

   The SQL Workshop home page appears.
3. To view Object Browser you can either:
   - Click the Object Browser icon.
   - Click the down arrow on the right side of the icon to view a pull-down menu. Then, select the appropriate menu option.

Figure 18–2 Object Browser Pull-down Menu



Note: For the purposes of consistency, this document uses the primary navigation path (or drill-down approach) when explaining navigation.

Searching For and Browsing Database Objects

The Object Selection pane displays on the left side of the Object Browser page and lists database objects by type with the current schema. You can filter the view by selecting an object type or entering a case insensitive search term.

Topics in this section include:

- Searching and Filtering Database Objects
- Hiding the Object Selection pane
- Selecting a Database Object

Searching and Filtering Database Objects

To search or filter objects in the Object Selection pane:

1. Navigate to Query Builder:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Select a schema from the Schema list on the right side of the page.

Only objects in the current schema display. Remember that the values available in the schema depend upon your workspace privileges.

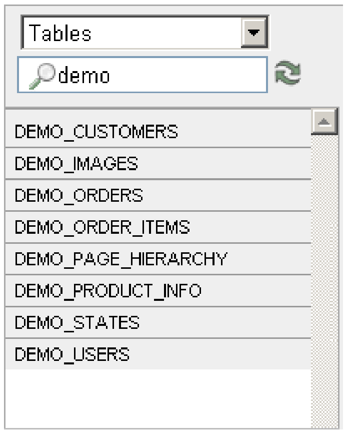
3. Select an object type from the Object list.

   The list of objects that appears depends upon the available objects in the current schema. Note that any object having a red bar adjacent to it is invalid.

4. To search for an object name, enter a case insensitive search term in the search field.

5. To view all objects, leave the search field blank.

Figure 18–3 Object Browser Search Field



Tables

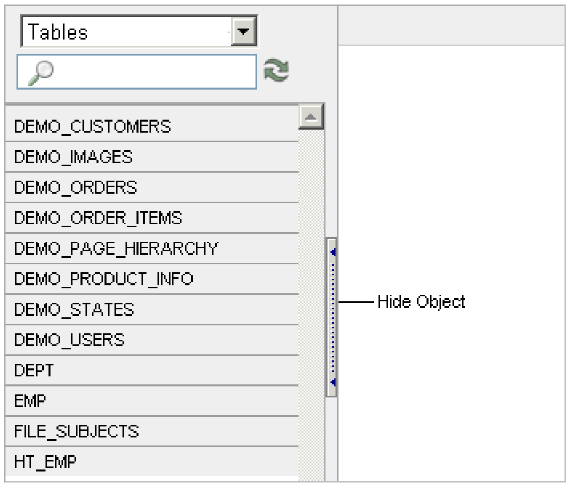
demo

DEMO_CUSTOMERS
DEMO_IMAGES
DEMO_ORDERS
DEMO_ORDER_ITEMS
DEMO_PAGE_HIERARCHY
DEMO_PRODUCT_INFO
DEMO_STATES
DEMO_USERS

Hiding the Object Selection pane

You can hide the Object Selection pane by selecting the **Hide Objects** control. This control displays on the right side of the Object Selection pane. If the Object Selection pane appears, selecting this control hides it. Similarly, if the Object Selection pane is hidden, selecting this control causes the pane to reappear.

Figure 18–4 Hide Object Control



Tables

DEMO_CUSTOMERS
DEMO_IMAGES
DEMO_ORDERS
DEMO_ORDER_ITEMS
DEMO_PAGE_HIERARCHY
DEMO_PRODUCT_INFO
DEMO_STATES
DEMO_USERS
DEPT
EMP
FILE_SUBJECTS
HT_EMP

Selecting a Database Object

Once you locate the database object you want to view, simply select it. The selected object displays in the Detail pane. If no object is selected, the Detail pane is blank.

About Creating New Database Objects

You can create new database objects using the Create Database Object Wizard. Once you select an object, a set of tabs and buttons appears at the top of the Detail pane. Use the tabs to view different aspects of the current items (for example, a tables indexes). Use the buttons to modify the current object.

To create a new object:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**, located in the upper right corner of the Detail pane.
3. From the list of object types, select the type of object you want to create.
4. Follow the on-screen instructions.

Managing Tables

A table is a unit of data storage in an Oracle database, containing rows and columns. When you view a table in Object Browser, a table description appears that describes each column in the table.

Topics in this section include:

- Creating a Table
- Browsing a Table
- Editing a Table

Creating a Table

To create a new table:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Table**.
4. Enter a table name.

   Table names must conform to Oracle naming conventions and not contain spaces or start with a number or underscore.
5. To have the final table name match the case entered in the Table Name field, click **Preserve Case**.

6. Enter details for each column. For each column:

   a. Enter the column name.

   b. Select the column type. Available types include NUMBER, VARCHAR2, DATE, TIMESTAMP, CHAR, CLOB, BLOB, NVARCHAR2, BINARY_FLOAT, and BINARY_DOUBLE

   c. Enter the following additional information as appropriate:

      – Precision

      – Scale

   d. To specify a column should not be NULL, select the check box in the **Not Null** column.

   To change the order of previously entered columns, click the **Up** and **Down** arrows in the Move column. To add additional columns, click **Add Column**.

   Next, define the primary key for this table (optional). A primary key is a single field or combination of fields that uniquely identifies a record.

7. For Primary Key, select one of the following and click **Next**:

   - **No primary key** - No primary key is created.
   - **Generated from a new sequence** - Creates a primary key and creates a trigger and a new sequence. The new sequence is used in the trigger to populated the selected primary key column. The primary key can only be a single column.
   - **Generated from an existing sequence** - Creates a primary key and creates a trigger. The selected sequence is used in the trigger to populate the selected primary key column. The primary key can only be a single column.
   - **Not generated** - Defines a primary key but does not have the value automatically populated with a sequence within a trigger. You can also select this option to define a composite primary key (that is, a primary key made up of more than one column).

   Next, add foreign keys (optional). A foreign key establishes a relationship between a column (or columns) in one table and a primary or unique key in another table.

8. To add a foreign key:

   a. Name - Enter a name of the foreign key constraint that you are defining.

   b. Select Key Column(s) - Select the columns that are part of the foreign key. Once selected, click the **Add** icon to move them to Key Column(s).

   c. References Table - Select the table which will be referenced by this foreign key. Then, select the columns to be referenced by this foreign key. Once selected, click the **Add** icon to move the selected columns to Referenced Column(s).

   d. Select one of the following:

      – **Disallow Delete** - Blocks the delete of rows from the referenced table when there are dependent rows in this table.

      – **Select Cascade Delete** - Deletes the dependent rows from this table when the corresponding parent table row is deleted.

      – **Set to Null on Delete** - Sets the foreign key column values in this table to null when the corresponding parent table row is deleted.

   e. Click **Add**.

   f. Click **Next**.

   Next, add a constraint (optional). You can create multiple constraints, but you must add each constraint separately.

9. To add a constraint:

   a. Specify the type of constraint (Check or Unique).

      A **check constraint is** a validation check on one or more columns within the table. No records can be inserted or updated in a table which violates an enabled check constraint. A **unique constraint** designates a column or a combination of columns as a unique key. To satisfy a unique constraint, no two rows in the table can have the same values for the specified columns.

   b. Enter the constraint in the field provided. For unique constraints, select the column(s) that are to be unique. For check constraints, enter the expression that should be checked such as, `flag in ('Y','N')`.

   c. Click **Add**.

10. Click **Finish**.

    A confirmation page appears. To view the SQL used to create the table, click **SQL Syntax.**

11. Click **Create**.

    Note that you do not need to follow the steps for creating a table in the order described in the previous procedure. Instead of navigating through the wizard by clicking the Next and Previous button, you can also access a specific step by selecting it in the progress indicator on the left side of the page.

See Also: *Oracle Database Concepts* for information about tables

Browsing a Table

When you view a table in Object Browser, the table description appears. While viewing this description, you can add a column, modify a column, rename a column, drop a column, rename the table, copy the table, drop the table, truncate the table, or create a lookup table based upon a column in the current table. Additionally, you have access other reports that offer related information including the table data, indexes, data model, constraints, grants, statistics, user interface defaults, triggers, dependencies, and SQL to produce the selected table.

To view a table description:

1. Navigate to Object Browser:

   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Object Browser**.

      Object Browser appears.

2. From the Object list, select **Tables**.

3. From the Object Selection pane, select a table.

   The table description appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the table. Table 18–1 describes all available views.

Table 18–1 Available Views for Tables

View	Description
Table	While viewing table details you can add, modify, delete, or rename a column. Additionally, you can drop, rename, copy, or truncate the table as long as the referencing table has no records well as create a lookup table. **See Also:** "Editing a Table" on page 18-9
Data	Displays a report of the data in the current table. Actions you can perform include: ■ **Query** - Enables you to sort by column. To restrict specific rows, enter a condition in the Column Condition field. Use the percent sign (%) for wildcards. From Order by, select the columns you want to review and click **Query**. ■ **Count Rows** - Displays a report of the number of rows in the current table. ■ **Insert Row** - Enables you to insert a new row into the table. ■ **Download** - Exports all data in the table to a spreadsheet. Click the download link at the bottom of the page to export all data in the selected table.
Indexes	Displays indexes associated with this table. Actions you can perform include **Create** and **Drop**. **See Also:** "Managing Indexes" on page 18-12
Model	Displays a graphical representation of the selected table along with all related tables. Related tables are those that reference the current table in a foreign key and those tables referenced by foreign keys within the current table. You can position the cursor over an underlined table name to view the relationship between that table and the current table. Click an underlined table name to view the model of the related table.
Constraints	Displays a list of constraints for the current table. Actions you can perform include **Create**, **Drop**, **Enable**, and **Disable**.
Grants	Displays a list of grants on the current table, including the grantee, the privilege, and grant options. Actions you can perform in this view include **Grant** and **Revoke**.
Statistics	Displays collected statistics about the current table, including the number of rows and blocks, the average row length, sample size, when the data was last analyzed, and the compression status (enabled or disabled). Click **Analyze** to access the Analyze Table Wizard.
UI Defaults	Displays user interface defaults for forms and reports. User interface defaults enable developers to assign default user interface properties to a table, column, or view within a specified schema. Click **Edit** to edit defined user interface defaults. Click **Create** to initialize user interface defaults for tables that do not currently have user interface defaults defined. **See Also:** "Managing User Interface Defaults" on page 9-1
Triggers	Displays a list of triggers associated with the current table. Actions you can perform include **Create**, **Drop**, **Enable**, and **Disable**. To view trigger details, click the trigger name. **See Also**: "Managing Triggers" on page 18-24

Table 18–1 (Cont.) Available Views for Tables

View	Description
Dependencies	Displays report showing objects referenced by this table, objects this table references, and synonyms for this table.
SQL	Displays the SQL necessary to re-create this table, including keys, indexes, triggers and table definition.

Editing a Table

While viewing a table description, you can edit it by clicking the buttons above the table description.

To edit a table:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Tables**.
3. From the Object Selection pane, select a table.

   The table description appears.
4. Click the appropriate button described in Table 18–2.

Table 18–2 Edit Table Buttons

Button	Description
Add Column	Adds a new column to the table. Enter a column name and select a type. Depending upon the column type, specify whether the column requires a value as well as the column length, precision, and scale.
Modify Column	Modifies the selected column.
Rename Column	Renames the selected column.
Drop Column	Drops the selected column.
Rename	Renames the selected table.
Copy	Copies the selected table.
Drop	Drops the selected table. **See Also:** "Using the Recycle Bin to View and Restore Dropped Objects" on page 21-13
Truncate	Removes all rows from the selected table. Truncating a table can be more efficient than dropping and re-creating a table. Dropping and re-creating a table may invalidate dependent objects, requiring you to regrant object privileges or re-create indexes, integrity constraints, and triggers.
Create Lookup Table	Creates a lookup table based on the column you select. That column becomes a foreign key to the lookup table.

Managing Views

A view is a logical representation of another table or combination of tables. A view derives its data from the tables on which it is based. These tables are called **base**

tables. Base tables might in turn be actual tables or might be views themselves. All operations performed on a view actually affect the base table of the view. You can use views in almost the same way as tables. You can query, update, insert into, and delete from views, just as you can standard tables.

Topics in this section include:

- Creating a View
- Browsing a View
- Editing a View
- Compiling a View
- Dropping a View

See Also: *Oracle Database Administrator's Guide* for information about views

Creating a View

To create a new view:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **View**.
4. Define the view:
   - **View Name** - Enter a name for the View.
   - **Query** - Specify a query to define the view.

     To access Query Builder or SQL Command Processor, click the appropriate link at the bottom of the page. The selected tool appears in a pop-up window. Once you create the appropriate SQL, click **Return** to automatically close the popup window and return to the wizard with the SQL.
5. Click **Next**.

   A confirmation page appears. To view the SQL used to create the view, click **SQL**.
6. Click **Create**.

See Also: "Building Queries with Query Builder" on page 17-1 and "Using SQL Command Processor" on page 20-1

Browsing a View

When you access a view in Object Browser, the Detail pane displays a report listing the columns in that view.

To browse a view:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Object Browser**.

      Object Browser appears.

2. From the Object list, select **Views**.
3. From the Object Selection pane, select a view.

   The view definition appears displaying the appropriate columns.

Summary of Available Views

Click the tabs at the top of the page to view different reports. Table 18–3 describes all available views.

Table 18–3 Available Views for Views

View	Description
View	(Default) Displays the columns in the current view. Actions you can perform include: ■ Compile ■ Drop **See Also:** "Editing a View" on page 18-11, "Compiling a View" on page 18-12, and "Dropping a View" on page 18-12
Data	Displays a report of the data in the columns in the view. Actions you can perform include: ■ **Query** - Enables you to sort by column. To restrict specific rows, enter a condition in the Column Condition field. Use the percent sign (%) for wildcards. From Order by, select the columns you want to review and click **Query**. ■ **Count Rows** - Enables you to insert a new row into the table. ■ **Insert Row** - Enables you to insert a new row into the table.
Grants	Displays a list of grants associated with the columns in the view. Grant details include grantee, privilege, and grant options. Actions you can perform include **Grant** and **Revoke**.
UI Defaults	Displays user interface defaults for forms and reports. User interface defaults enable developers to assign default user interface properties to a table, column, or view within a specified schema. Click **Edit** to edit existing user interface defaults. Click **Create** to initialize user interface defaults for views that do not currently have user interface defaults defined. **See Also:** "Managing User Interface Defaults" on page 9-1
Dependencies	Displays a report showing objects referenced by this view, objects this view references, and synonyms for this view.
SQL	Displays the SQL necessary to re-create this view.

Editing a View

When you edit a view you can edit the code manually, perform a search and replace, and compile the view. Additionally, you can save the view as a file or drop it.

Editing a View Manually

To edit a view manually:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Views**.
3. From the Object Selection pane, select a view.
4. Select the Code tab.
5. Click **Edit** to activate manual edit mode.

   If you edit and make changes to a view, you need to compile.

Note: You can expand the Edit pane by clicking the Full Screen icon in the upper right of the pane, beneath the Create button.

Using Find and Replace

Click **Find** to perform a basic search and replace.

Downloading a View

Click **Download** to save the current view as a file.

Compiling a View

If you edit and make changes to a view, you need to compile in order to save your changes. Note that there is no save function since this is just a view of the object within the database.

Click **Compile** to re-create the current view.

Dropping a View

Click **Drop** to delete the current view.

Managing Indexes

An index is an optional structure associated with tables and clusters. You can create indexes on one or more columns of a table to speed access to data on that table.

When you view an index in Object Browser, the Detail pane displays a report containing the index name, index type, table owner, table type, and a listing of the indexed columns.

Topics in this section include:

- Creating an Index
- Browsing an Index

See Also: *Oracle Database Concepts* for information about indexes

Creating an Index

To create an view:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Index**.
4. Select a table and select the type of index you want to create. Available index types include:
   - **Normal** - Indexes one or more scalar typed object attributes of a table
   - **Text** - Creates a text index (Oracle Text)
5. Click **Next**.
6. Create the index definition. Specify an index name, select one or more columns to be indexed, and click **Next**.

   A confirmation page appears. To view the SQL used to create the index, click **SQL.**
7. Click **Finish**.

Browsing an Index

To browse an index:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Indexes**.
3. From the Object Selection pane, select an index.

   The index appears displaying the index name, type, table owner, and table type as well as a listing of indexed columns.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the index. Table 18–4 describes all available views.

Table 18–4 Available Views for Indexes

View	Description
Object Details	(Default) Displays the index name, index type, table owner, and table type as well as a listing of the indexed columns. Actions you can perform while viewing Object Details include: ■ Disable - Disables the current index ■ Drop - Drops the current index.x ■ Rebuild - Rebuilds the current index
Statistics	Displays collected statistics about the current view, including the number of rows, sample size, when the data was last analyzed, and the compression status (enabled or disabled). Click **Analyze** to refresh the displayed statistics.

Table 18–4 (Cont.) Available Views for Indexes

View	Description
SQL	Displays the SQL necessary to re-create this index.

Managing Sequences

A sequence generates a serial list of unique numbers for numeric columns of a database table. Database sequences are generally used to populate table primary keys.

Topics in this section include:

- Creating a Sequence
- Browsing a Sequence

> **See Also:** *Oracle Database Administrator's Guide* for information about sequences

Creating a Sequence

To create a sequence:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Sequence**.
4. Define the sequence, specify a sequence name, and click **Next**.

   A confirmation page appears. To view the SQL used to create the sequence, click **Show SQL.**
5. Click **Create**.

Browsing a Sequence

To browse a sequence:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Sequences**.
3. From the Object Selection pane, select a sequence.

   The Object Details view appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the sequence. Table 18–5 describes all available views.

Table 18–5 Available Views for Sequences

View	Description
Object Details	(Default) Displays details about the current sequence. Actions you can perform in this view include **Alter** and **Drop**.
Grant	Displays a list of grants associated with the sequence. Grant details include grantee, privilege, and grant options. Actions you can perform include **Grant** and **Revoke**.
Dependencies	Displays a list of objects that use (or depend) upon this sequence.
SQL	Displays the SQL necessary to re-create this sequence.

Managing Types

A type is a user-specified object or collection definition. Oracle HTML DB currently only supports collection definitions. There are two categories of Oracle collections (SQL collections):

- Variable-length arrays (`VARRAY` types)
- Nested tables (`TABLE` types)

`VARRAY` types are used for one-dimensional arrays, while nested table types are used for single-column tables within an outer table.

Topics in this section include:

- Creating a Type
- Browsing a Type

See Also: *Oracle Database Concepts* and *SQL*Plus User's Guide and Reference* for information about collection types

Creating a Type

To create a collection type:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Type**.
4. Specify a name and click **Next**.
5. Select a type, data type, limit, and click **Next**.

   A confirmation page appears. To view the SQL used to create the collection type, click **Show SQL**.
6. Click **Finish**.

Browsing a Type

To browse a collection type:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Type**.
3. From the Object Selection pane, select a type.

   The Object Details view appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports. Table 18–6 describes all available views.

Table 18–6 Available Views for Types

View	Description
Object Details	(Default) Displays details about the selected type. To drop a type, click **Drop**.
Synonyms	Displays a list of synonyms for the current type.
Grants	Displays a list of grants associated with the type. Grant details include grantee, privilege, and grant options. Actions you can perform include **Grant** and **Revoke**.
SQL	Displays the SQL necessary to re-create this type.

Managing Packages

A package is a database object that groups logically related PL/SQL types, items, functions and procedures. Packages usually have two parts, a specification and a body. The **specification** is the interface to your application. The **body** implements the specification.

Topics in this section include:

- Creating a Package
- Viewing a Package
- Editing a Package
- Compiling a Package
- Dropping a Package
- Dropping a Package

See Also: *SQL*Plus User's Guide and Reference* for information about PL/SQL packages

Creating a Package

To create a package:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

Object Browser appears.

2. Click **Create**.
3. From the list of object types, select **Package**.
4. Select the type of package you want to create:
   - Specification
   - Body
   - Package with methods on database tables
5. If you select **Specification**:
   a. Enter a name and click **Next**.

      The wizard creates a dummy package specification and displays it for editing.

   b. Edit the specification and click **Finish**.
6. If you select **Body**:
   a. Select the package you want to create the body for and click **Next**

      The wizard creates a package body with stubbed out calls identified in the specification and displays it for editing.

   b. Edit the package body and click **Finish**.
7. If you select **Package with methods on database tables**:
   a. Enter a name and click **Next**.

   b. Select up to ten tables and click **Next**.

      The wizard creates a specification and body with insert, update, delete, and GET APIs for the selected tables. Note that you have the option to show or download the specification or body.

   c. Click **Finish**.

Viewing a Package

When you access a package in Object Browser the specification appears.

To view a specification:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Packages**.
3. From the Object Selection pane, select a package.

   The Specification appears. You can copy the code in this view for use in other tools.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the package. Table 18–7 describes all available views.

Table 18–7 Available Views for Packages

View	Description
Specification	(Default) Displays the package specification. This define the interface to your application. Actions you can perform include: ■ **Edit** ■ **Compile** ■ **Download** ■ **Drop** ■ **Find**
Body	Displays the package body, if one exists, for the selected package. Actions you can perform include: ■ **Edit** ■ **Compile** ■ **Download** ■ **Drop** ■ **Find**
Dependencies	Displays objects that use (or depend on) on the current package and objects the package depends on.
Errors	Displays errors related to the current package.
Grants	Lists details of grants for the current package, including privilege, grantee, grantable, grantor, and object name.

Editing a Package

When you edit a package, you can edit the code manually, perform a search and replace, and compile the package.

Editing a Package Manually

To edit a package manually:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Packages**.
3. From the Object Selection pane, select a package.

   The Specification appears. You can copy the code in this view for use in other tools. Note you can edit both the specification and the body fromObject Browser.
4. Click **Edit** to activate edit mode.
5. Click **Find** to perform a basic search and replace.

Note: You can expand the Edit pane by clicking the Full Screen icon in the upper right of the pane, beneath the Create button.

Compiling a Package

If you edit and make changes to a package, you need to compile in order to save your changes. There is no save function because this is just a view of the object within the database.

Click **Compile** to compile the current package. Compiling re-creates the object in the database. If the compile fails, an error message display above the code.

Downloading a Package

Click **Download** to save the current package as a file.

Dropping a Package

Click **Drop** to delete the current package.

Managing Procedures

A procedure is a subprogram that performs a specific action. You can use Object Browser to view, create, edit, download, and drop procedures.

Topics in this section include:

- Creating a Procedure
- Browsing a Procedure
- Editing a Procedure
- Compiling a Procedure
- Downloading a Procedure
- Dropping a Procedure

See Also: *SQL*Plus User's Guide and Reference* for information about PL/SQL procedures

Creating a Procedure

To create a procedure:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Procedures**.
4. Enter a procedure name and click **Next**.
5. Define the arguments by specifying the following information (optional):
   - Argument Name
   - In/Out (the parameter mode)
   - Argument Type (datatype)
   - Default (value)

To add additional arguments, click **Add Argument**.

6. Click **Next**.
7. Enter PL/SQL block you want to use as the procedure body and click **Next**.

   To view the previously defined arguments, click **Defined Arguments**.

   A confirmation page appears. To view the SQL used to create the procedure, click **Show SQL**.
8. Click **Finish**.

Browsing a Procedure

To browse a procedure:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Procedures**.
3. From the Object Selection pane, select a procedure.

   The Code view appears, displaying the source code for the procedure. You can copy the code in this view for use in other tools.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the procedure. Table 18–8 describes all available views.

Table 18–8 Available Views for Procedures

View	Description
Code	(Default) Displays the source code for the procedure. You can copy the code in this view for use in other tools. Actions you can perform in this view include: ■ **Edit** ■ **Compile** ■ **Download** ■ **Drop** ■ **Find** **See Also:** "Editing a Procedure" on page 18-21, "Compiling a Procedure" on page 18-21, "Downloading a Procedure" on page 18-21, and "Dropping a Procedure" on page 18-21
Dependencies	Displays objects that use (or depend) on the current procedure and objects the procedure depends on.
Errors	Lists errors related to the current procedure.
Grants	Lists details of grants for the current procedure, including privilege, grantee, grantable, grantor, and object name.

Editing a Procedure

When you edit a procedure you can edit the code manually or perform a search and replace.

Editing a Procedure Manually

To edit a procedure manually:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Procedures**.
3. From the Object Selection pane, select a procedure.

   The Code view appears. Be default, you can copy the code in this view for use in other tools.
4. Click **Edit** to activate edit mode.
5. Click **Find** to perform a basic search and replace.

> **Note:** You can expand the Edit pane by clicking the Full Screen icon in the upper right of the pane, beneath the Create button.

Compiling a Procedure

If you edit and make changes to a procedure, you need to compile in order to save your changes. There is no save function because this is just a view of the object within the database.

Click **Compile** to compile the current procedure. Compiling re-creates the object in the database. If the compile fails, an error message display above the code.

Downloading a Procedure

Click **Download** to save the current procedure as a file.

Dropping a Procedure

Click **Drop** to delete the current procedure.

Managing Functions

A function is a subprogram that can take parameters and return a single value.

Topics in this section include:

- Creating a Function
- Browsing a Function
- Editing a Function
- Compiling a Function
- Downloading a Function

- Dropping a Function

See Also: *SQL*Plus User's Guide and Reference* for information about PL/SQL functions

Creating a Function

To create a function:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Functions**.
4. Enter a function name, specify the return datatype, and click **Next**.
5. Define the arguments and click **Next** (optional):
   - Argument Name
   - Argument Type (datatype)
   - Default (value)

   To add additional arguments, click **Add Argument**.
6. Enter P/LSQL block you want to use as the function body and click **Next**.

   To link to the SQL Command Processor, click **Command Processor.** To view the previously defined arguments, click **Defined Arguments**.

   A confirmation page appears. To view the SQL used to create the function, click **Show SQL**.
7. Click **Finish**.

Browsing a Function

To view a function in Object Browser:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Functions**.
3. From the Object Selection pane, select a function.

   The Code view appears. You can copy the code in this view for use in other tools.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the function. Table 18–9 describes all available views.

Table 18–9 Available Views for Functions

View	Description
Code	(Default) Displays the source code for the function. You can copy the code in this view for use in other tools. Actions you can perform in this view include: ■ **Edit** ■ **Compile** ■ **Download** ■ **Drop** ■ **Find** **See Also:** "Editing a Function" on page 18-23, "Compiling a Function" on page 18-23, "Downloading a Function" on page 18-24, and "Dropping a Function" on page 18-24
Dependencies	Displays objects that use (or depend) on the current function and objects the function depends on.
Errors	Displays errors related to the current function.
Grants	Lists details of grants for the current function, including privilege, grantee, grantable, grantor, and object name.

Editing a Function

When you edit a function you can edit the code manually, perform a search and replace, and compile the function.

Editing a Function Manually

To edit a function manually:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Functions**.
3. From the Object Selection pane, select a function.

   The Code view appears. Be default, you can copy code from this view for use in other tools.
4. Click **Edit** to activate manual edit mode.
5. Click **Find** to perform a basic search and replace.

Note: You can expand the Edit pane by clicking the Full Screen icon in the upper right of the pane, beneath the Create button.

Compiling a Function

If you edit and make changes to a function, you need to compile in order to save your changes. There is no save function because this is just a view of the object within the database.

Click **Compile** to compile the current function. Compiling re-creates the object in the database. If the compile fails, an error message display above the code.

Downloading a Function

Click **Download** to save the current function as a file.

Dropping a Function

Click **Drop** to delete the current function.

Managing Triggers

A database trigger is a stored subprogram associated with a database table, view, or event. The trigger can be called once, for example when an event occurs, or many times, for example for each row affected by an INSERT, UPDATE, or DELETE statement.

Topics in this section include:

- Creating Triggers
- Browsing a Trigger
- Editing a Trigger
- Compiling a Trigger
- Downloading a Trigger
- Dropping a Trigger

See Also: *Oracle Database Concepts* and *SQL*Plus User's Guide and Reference* for information about triggers

Creating Triggers

To create a trigger:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Trigger**.
4. Select a table name and click **Next**.
5. Select the appropriate trigger attributes, enter the trigger body, and click **Next**.

   A confirmation page appears. To view the SQL used to create the trigger, click **SQL**.
6. Click **Finish**.

Browsing a Trigger

To browse a trigger in Object Browser:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Triggers**.
3. From the Object Selection pane, select a trigger.

   The Details view appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the trigger. Table 18–10 describes all available views.

Table 18–10 Available Views for Triggers

View	Description
Object Details	(Default) Lists of the details about the current trigger. Actions you can perform include: ▪ **Compile** ▪ **Disable** ▪ **Download** ▪ **Drop** ▪ **Code** **See Also:** "Editing a Trigger" on page 18-25, "Compiling a Trigger" on page 18-26, "Downloading a Trigger" on page 18-26, and "Dropping a Trigger" on page 18-26
Errors	Displays errors related to the current trigger.
SQL	Displays the SQL necessary to re-create the trigger.

Editing a Trigger

When you edit a trigger you can edit the code manually, perform a search and replace, and compile the trigger.

Editing a Trigger Manually

To edit a trigger manually:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Triggers**.
3. From the Object Selection pane, select a trigger.
4. Select the **Code** tab and then click **Edit** to activate manual edit mode.
5. Click **Find** to perform a basic search and replace.

Note: You can expand the Edit pane by clicking the Full Screen icon in the upper right of the pane, beneath the Create button.

Compiling a Trigger

If you edit and make changes to a function, you need to compile in order to save your changes. There is no save function because this is just a view of the object within the database.

Click **Compile** to compile the current trigger. Compiling re-creates the object in the database. If the compile fails, an error message display above the code.

Downloading a Trigger

Click **Download** to save the current trigger as a file.

Dropping a Trigger

Click **Drop** to delete the current trigger.

Managing Database Links

A database link is a schema object in one database that enables you to access objects in another database. Once you create a database link, you can access the remote objects by appending `@dblink` to the table or view name, where `dblink` is the name of the database link.

Topics in this section include:

- Creating a Database Link
- Browsing a Database Link

Creating a Database Link

To create a database link:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. Click **Create**.
3. From the list of object types, select **Database Link**.
4. Specify the following information and click **Next**.
   - Database Link Name
   - Connect To Schema
   - Password
   - Remote Hostname or IP
   - Remove Host Port
   - SID or Service Name

A confirmation page appears.

5. To view the SQL used to create the database link, click **Show SQL**.
6. Click **Create**.

Browsing a Database Link

To browse a database link:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Database Links**.
3. From the Object Selection pane, select a database link.

   The Object Details View appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the database link. Table 18–11 describes all available views.

Table 18–11 Available Views for Database Links

View	Description
Object Details	(Default) Displays details about the database link. Actions you can perform include: ■ **Drop** - Deletes the database link ■ **Test** - Tests the database link
Dependencies	Displays a list of objects that use (or depend) upon this database link.
SQL	Displays the SQL necessary to re-create this database link.

Managing Materialized Views

A materialized view provides indirect access to table data by storing the results of a query in a separate schema object. Unlike an ordinary view, which does not take up any storage space or contain any data, a materialized view contains the rows resulting from a query against one or more base tables or views. A materialized view can be stored in the same database as its base tables or in a different database.

Topics in this section include:

- Creating a Materialized View
- Browsing a Materialized View

See Also: *Oracle Database Concepts* for information about materialized views

Creating a Materialized View

To create a materialized view:

1. Navigate to Object Browser:

   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.

2. Click **Create**.
3. From the list of object types, select **Materialized View**.
4. Define the materialized view:
   a. **Materialized View Name** - Enter a name.
   b. **Query** - Specify a query to define the view.

      To access Query Builder or SQL Command Processor, click the appropriate link at the bottom of the page. The selected tool appears in a pop-up window. Once you generate the appropriate SQL, click **Return** to automatically close the popup window and return to the wizard with the SQL.
   c. Click **Next**.

      A confirmation page appears. To view the SQL used to create the materialized view, click **SQL**.
5. Click **Create**.

See Also: "Building Queries with Query Builder" on page 17-1 and "Using SQL Command Processor" on page 20-1

Browsing a Materialized View

To view a materialized view:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.
2. From the Object list, select **Materialized Views**.
3. From the Object Selection pane, select a view.

   The Materialized View appears.

Summary of Available Views

Click the tabs at the top of the page to view different reports about the materialized view. Table 18–12 describes all available views.

Table 18–12 Available Views for Materialized View

View	Description
Materialized View	(Default) Displays details about the columns in the materialized view, including: ■ Column Name ■ Data type ■ Nullable flag ■ Default value ■ Primary key Click **Drop** to delete the current materialized view.
Data	Displays a report of the data in the columns. Actions you can perform include: ■ **Query** - Enables you to sort by column. To restrict specific rows, enter a condition in the Column Condition field. Use the percent sign (%) for wildcards. From Order by, select the columns you want to review and click Query. ■ **Count Rows** - Displays a report of the data in the current table.
Details	Displays object details stored in `DBA_SNAPSHOTS` such as updatable and status.
Grants	Displays a list of grants on the current view, including grantee, privilege, and grant options. Actions you can perform in this view include **Grant** and **Revoke**.
Dependencies	Displays a list of objects that use (or depend) upon this materialized view.
SQL	Displays the SQL necessary to re-create this materialized view.

Managing Synonyms

A synonym is an alias for a schema object. Synonyms can provide a level of security by masking the name and owner of an object and by providing location transparency for remote objects of a distributed database. Also, they are convenient to use and reduce the complexity of SQL statements for database users.

Topics in this section include:

- Creating Synonyms
- Viewing a Synonym
- Dropping a Synonym

See Also: *Oracle Database Administrator's Guide* for information about synonyms

Creating Synonyms

To create a synonym:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

      Object Browser appears.

2. Click **Create**.
3. From the list of object types, select **Synonym**.
4. Define the synonym:
   a. **Synonym Name** - Enter a name.
   b. **Public or Private** - Specify whether the synonym should be public or private.
   c. **Schema** - Select the database schema (or username) which owns the object upon which you want to create your synonym.
   d. **Object** - Enter the name of the object upon which you want to create a synonym.
   e. **Database Link** - Enter the name of the database link to use if the synonym is to be create on a remote object.
   f. Click **Next**.

   A confirmation page appears. To view the SQL used to create the synonym, click **Show SQL**.
5. Click **Finish**.

See Also: "Managing Synonyms" on page 18-29

Viewing a Synonym

To view a synonym:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

   Object Browser appears.
2. From the Object list, select **Synonyms**.
3. From the Object Selection pane, select a synonym.

   The Object Details view appears displaying the following:
   - Synonym owner
   - Synonym name
   - Object owner
   - Object Name
   - Object Status
   - Status

Dropping a Synonym

To view drop a synonym:

1. Navigate to Object Browser:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Object Browser**.

   Object Browser appears.

2. From the Object list, select **Synonyms**.
3. From the Object Selection pane, select a synonym.
4. Click **Drop**.

19

Using the SQL Script Repository

This section provides information on how to use the SQL Script Repository.

This section contains the following topics:

About the SQL Script Repository

A SQL script is a set of SQL commands saved as a file in the SQL Script repository. It can contain one or more SQL statements or PL/SQL blocks. SQL*Plus commands in a SQL script are ignored at runtime.

You can use the SQL Script Repository to create, edit, view, run, and delete script files.

There is no interaction between the SQL Command Processor and the SQL Script Repository. You can cut and paste a SQL command from the SQL Script editor to run in the SQL Command Processor.

Bind variables are not supported.

Accessing the SQL Script Repository

To access the SQL Script Repository:

1. Log in to Oracle HTML DB.

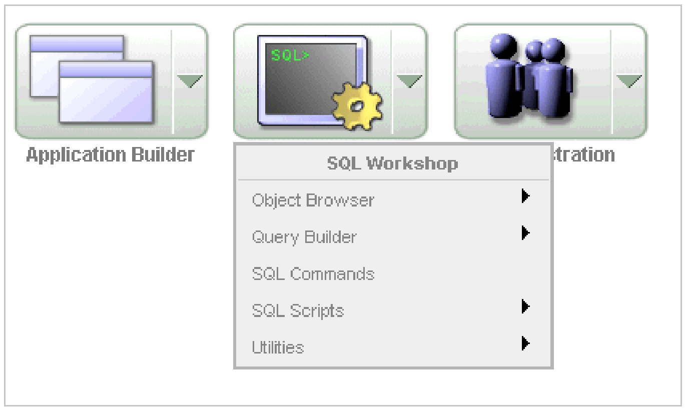
   The Workspace home page appears.

2. To view the SQL Script repository home page you can either:

   - Click the **SQL Workshop** icon and then **SQL Scripts** to drill-down to the SQL Scripts home page.

- Click the down arrow on the right side of the SQL Workshop icon to view a pull-down menu. Then select the **SQL Scripts** menu option.

Figure 19–1 SQL Workshop Pull-down Menu

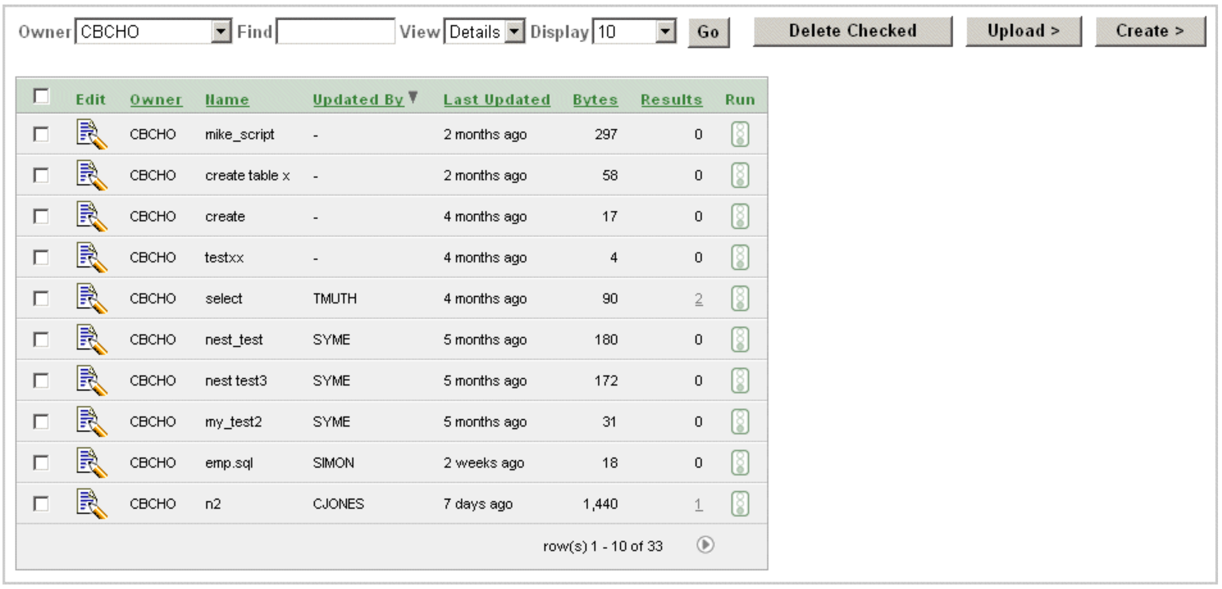


Note: For the purposes of consistency, this document uses the primary navigation path (or drill-down approach) when explaining navigation.

About the SQL Scripts Home Page

By default, the SQL Scripts home page lists all SQL scripts in the SQL Script repository created by the current user.

Figure 19–2 SQL Scripts Home Page



	Edit	Owner	Name	Updated By	Last Updated	Bytes	Results	Run
		CBCHO	mike_script	-	2 months ago	297	0	
		CBCHO	create table x	-	2 months ago	58	0	
		CBCHO	create	-	4 months ago	17	0	
		CBCHO	testxx	-	4 months ago	4	0	
		CBCHO	select	TMUTH	4 months ago	90	2	
		CBCHO	nest_test	SYME	5 months ago	180	0	
		CBCHO	nest test3	SYME	5 months ago	172	0	
		CBCHO	my_test2	SYME	5 months ago	31	0	
		CBCHO	emp.sql	SIMON	2 weeks ago	18	0	
		CBCHO	n2	CJONES	7 days ago	1,440	1	

row(s) 1 - 10 of 33

On the SQL Scripts home page you can:

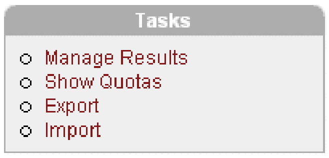
- **Search for a script.** Enter a script name or partial name in the Find field and click **Go**. To view all scripts, leave the Find field blank, select **- All Users -** from the Owner list and click **Go**. You control how many rows display by making a selection from the Display list.

- **Change the Page View.** You can change the appearance of the home page by making a selection from the View list. Available View options include:
  - **Icons** displays each script as an icon identified by the script name. Click the **Show Results** check box to additionally display run results as icons identified by the script name.
  - **Details** displays each script as a line in a report. Each line includes a check box to enable the selection of scripts for deletion, an edit icon to enable the script to be loaded into the script editor, the script name, the script owner, when the script was last updated and by who, the size in bytes, the number of times the script has been run linked to the run results, and an icon to enable the script to be run.
- **Delete a script.** In Details view, select the check box associated with each script you want to delete, and click **Delete Checked**. See "Deleting a SQL Script" on page 19-6.
- **Sort scripts.** In Details view, click a column heading to sort the listed scripts by that column.
- **Upload a script.** Click **Upload** to upload a script from your local file system into the SQL Script Repository. See "Editing a SQL Script" on page 19-5.
- **Create a script.** Click **Create** to create a new script in the Script Editor. See "Creating a SQL Script" on page 19-4.

About the Tasks List

A Tasks list displays on the right side of the SQL Scripts home page.

Figure 19–3 SQL Scripts Tasks List



The Task list contains the following links:

- **Manage Results** enables you to view, search and display results. See "Viewing SQL Script Results" on page 19-9.
- **Show Quotas** displays the Script Quotas page. The Script Quotas page shows the maximum size of a single result, the maximum size of all results, the quota used and the quota free. It also shows the maximum size of a SQL Script. These limits are set by the HTML DB Administrator. See "Managing Environment Settings" on page 22-22.
- **Export** enables you to export multiple scripts from the current SQL Script Repository for import into the SQL Script Repository in a different workspace. The scripts you select to export are encoded in a single export script written to your local file system. The export script is named *workspace_name*_script.sql by default. See "Transferring SQL Scripts between Workspaces" on page 19-11.
- **Import** enables you to import a script exported by this, or a different workspace. **Import** only imports scripts encoded in an export script created using **Export**. The export script to import must be accessible on your local file system. See "Transferring SQL Scripts between Workspaces" on page 19-11.

Creating a SQL Script

You can create a new script in the Script Repository by:

- Creating a new script in the Script Editor
- Uploading a script from your local file system

Topics in this section include:

- Creating a SQL Script in the Script Editor
- Uploading a SQL Script

Creating a SQL Script in the Script Editor

To create a new SQL script in the Script Editor:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. Click the **Create** button.

   The Script Editor appears.
4. Enter a name for the script in the Script Name field.

   Script name extensions are optional.
5. Enter the SQL statements, PL/SQL blocks and SQL*Plus commands you want to include in your script.

   SQL*Plus commands are ignored at runtime.
6. Click **Save** to save your script to the repository.

   The SQL Scripts home page appears listing your newly saved script.

Uploading a SQL Script

To upload a script from your local file system:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. Click the **Upload** button.

   The Upload Script dialog appears.
4. Enter the name and path to the script you want to upload to the Script Repository,

   or

   click **Browse** to locate the script you want to upload.
5. Optionally rename the script by entering the new name in the Script Name field.

   This is the name given to the script in the Script Repository.
6. Click **Upload** to add the script to the Script Repository.

   The SQL Scripts home page appears listing your newly uploaded script.

   The script is parsed during upload. If it has a syntax error, an error icon appears in place of the run icon in the SQL Scripts home page Details view.

   If a script of the same name exists in the Script Repository, you are prompted to rename it.

Using the Script Editor

You use the Script Editor to add content to a new script, to edit existing scripts, and to run and delete scripts in the script repository.

Topics in this section include:

- Editing a SQL Script
- About the Script Editor

Editing a SQL Script

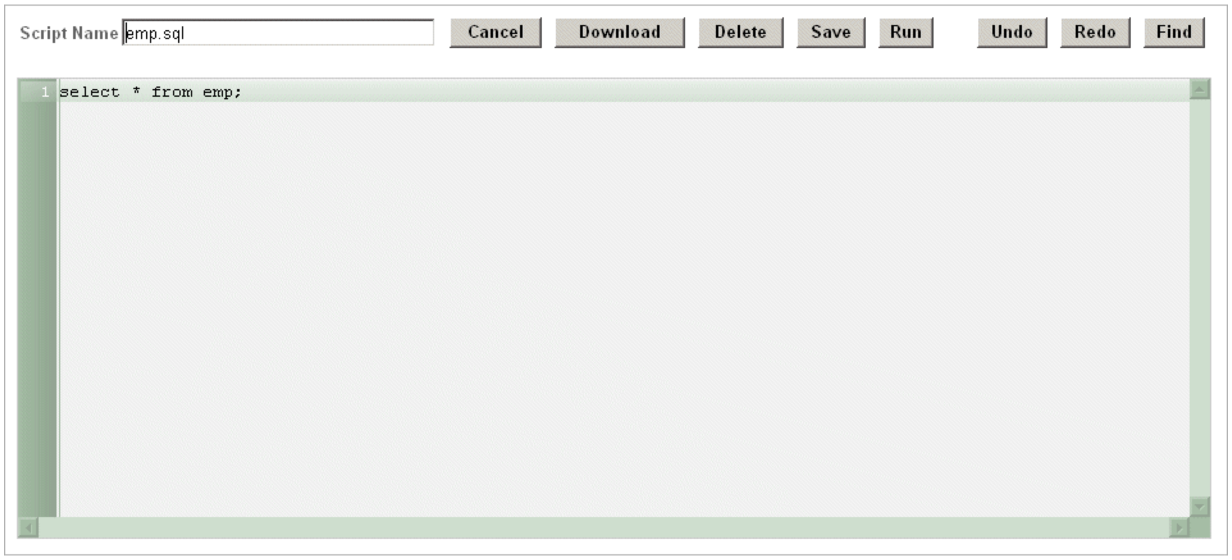
To edit a SQL script:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.

   The SQL Scripts home page appears listing your scripts in the repository by default. The last view selected from the View list is the new default.
3. You can load a script into the editor as follows:
   - In Icons view, click the script icon.
   - In Details view, click the **Edit** icon.

   The Script Editor appears.

Figure 19–4 SQL Scripts Editor



```
select * from emp;
```

This illustration shows the SQL Script Editor. It contains a single SELECT statement. The Script Name field and the editor controls for the Script Editor are located above the editor pane. There are scroll bars on the right and bottom of the editor pane.

Additional information about this illustration can be found in the surrounding text.

****

4. Edit the script. See "About the Script Editor" on page 19-6.

   You can test your script during editing by running the script to reveal errors. The Run Script dialog and the Script Results pages enable you to resume editing the script. See "Executing a SQL Script" on page 19-7, and "Viewing SQL Script Results" on page 19-9.

5. Click **Save** to save your script to the Script Repository,

   The SQL Scripts home page appears.

About the Script Editor

You can perform the following actions in the Script Editor:

- **Cancel the editing session.** Click **Cancel** to exit the Script Editor without saving changes made since you last saved. The SQL Scripts home page appears.
- **Save the script to your local file system.** Click **Download** to save a copy of the current script to your local file system. Enter a name for the script on your local file system and a directory path.
- **Delete the script from the Script Repository.** Click **Delete** to remove the current script from the Script Repository. See "Deleting a SQL Script" on page 19-6.
- **Save the script to the Script Repository.** Click **Save** to save your changes to the script to the Script Repository. The SQL Scripts home page appears.
- **Execute the script.** Click **Run** to submit the script for execution. See "Executing a SQL Script" on page 19-7.
- **Undoing/redoing edits.** Click **Undo** (Ctrl+Z) and **Redo** (Ctrl+Y) to undo or redo line edits in the Script Editor.
- **Searching in your script.** Click **Find** to display the text and JavaScript regular expression find and replace options. Click **Find** again to hide the options.
- **Selecting a line.** Click the line number on the left side of the Script Editor to select the associated line of your script for copying or deleting.
- **Cutting and Pasting.** Use standard edit controls to cut, copy and paste content in the Script Editor.
- **Auto indenting lines.** New lines automatically indent to the previous line start column.

Deleting a SQL Script

You can delete scripts from the Script Repository by:

- Deleting selected scripts from the SQL Scripts home page
- Deleting the current script in the Script Editor

Topics in this section include:

- Deleting Scripts from the SQL Scripts Home Page
- Deleting a Script in the Script Editor

Deleting Scripts from the SQL Scripts Home Page

To delete scripts from the SQL Scripts home page.

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon to display the SQL Scripts home page.
3. Select **Details** from the View list to display the SQL Scripts home page detail view.

4. Click the check box for each of the scripts you want to delete, or click the check box in the column heading to select all scripts visible in the current page. The check boxes are at the left end of the scripts listed in the Details view.
5. Click **Delete Checked** to permanently remove the selected scripts from the Script Repository. You are prompted to confirm this action before the script is deleted.

   A "Script(s) deleted." message appears above the updated list of Scripts.

Deleting a Script in the Script Editor

To delete a script in the Script Editor:

1. Open the script you want to delete in the Script Editor.
2. Click **Delete** to delete the current script from the script repository.

   The SQL Scripts home page appears.

Copying a SQL Script

You can copy a script in the Script Repository by saving it with a new name.

To copy a script:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. Load the script to copy into the editor.
4. Enter a name for the copied script in the Script Name field.
5. Click **Save** to save a copy of the script in the Script Repository.

   The SQL Scripts home page appears listing the newly copied script.

Executing a SQL Script

You can execute scripts stored in the Script Repository. You can submit a script for execution either from the Script Editor, or from the SQL Scripts home page.

When you submit a script for execution, the Run Script page appears. It displays the script name, when it was created and by who, when it was last updated and by who, the number of statements it contains, and its size in bytes. It also lists unknown statements such as SQL*Plus commands that it will ignore during execution.

Finally, it lists statements with errors. If there are errors, the **Run** control does not appear.

Topics in this section include:

- About the Run Script Page
- Executing a SQL Script in the Script Editor
- Executing a SQL Script from the SQL Scripts Home Page
- Viewing the Status of a Long Running Script

Executing a SQL Script in the Script Editor

To execute a script in the Script Editor:

1. Open the script you want to execute in the Script Editor.

2. Click **Run** in the Script Editor.
3. The Run Script page appears.

   The Run Script page displays information about the script and lists statements in error preventing execution, or statements such as SQL*Plus commands that will be ignored when the script is executed. The Run Script page has three controls:

   Cancel to return to the SQL Scripts home page without executing the script.

   Edit Script to load the script into the Script Editor.**Edit Script** appears instead of **Run** when a script has errors.

   Run to submit the script for execution. **Run** is not available if there are script errors.
4. Click **Run** to submit the script for execution.

   The Manage Script Results page appears listing script results.
5. Click the View icon for the results you want to view. The View icon is at the right end of the scripts listed in the Manage Script Results page.

   See Also: "Viewing SQL Script Results" on page 19-9

Executing a SQL Script from the SQL Scripts Home Page

To execute a script from the SQL Scripts home page:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. Click the Run icon for the script you want to execute in the SQL Scripts home page.

   The Run icon is at the right end of the scripts listed in the Details view of the SQL Scripts home page.
4. The Run Script page appears.

   The Run Script page displays information about the script and lists statements in error preventing execution, or statements such as SQL*Plus commands that will be ignored when the script is executed. The Run Script page has three controls:

   Cancel to return to the SQL Scripts home page without executing the script.

   Edit Script to load the script into the Script Editor. **Edit Script** appears instead of **Run** when a script has errors.

   Run to submit the script for execution. **Run** is not available for scripts with errors.
5. Click **Run** to submit the script for execution.

   The Manage Script Results page appears listing available results for the script.
6. Click the View icon for the results you want to view. The View icon is at the right end of the scripts listed in the Manage Script Results page.

   See Also: "Viewing SQL Script Results" on page 19-9

About the Run Script Page

On the Run Script page, you can:

- **Cancel the execution.** Click **Cancel** to exit the Run Script page without executing the script. The SQL Scripts home page appears.
- **Edit the script. Edit Script** appears instead of **Run** when a script has errors. Click **Edit Script** to load the script into the Script Editor to remove the lines with errors.
- **Execute the script.** Click **Run** to execute the script.

Viewing the Status of a Long Running Script

If you execute a script that takes a long time to complete, you can view its status in the Long Operations report available in the Database Monitor.

To view the status of a long running script:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Database Monitor.**

   Accessing the Database Monitor page requires database administrator privileges. You must have a database account that has been granted the DBA role.
3. Enter a valid database account username and password at the prompt and click **Login**.
4. Select **Long Operations** under **Activity**.

   The Long Operations report displays. You can see the status of your long-running script.

   See Also: "Long Operations" on page 21-11

Viewing SQL Script Results

You use the Manage Script Results page to view and delete script results.

You can also select script results to view from the Icons view of the SQL Scripts home page, and from the Results column of the SQL Scripts home page Details view.

Topics in this section include:

- Viewing Script Results
- About the Manage Script Results Page
- About the Results Page

Viewing Script Results

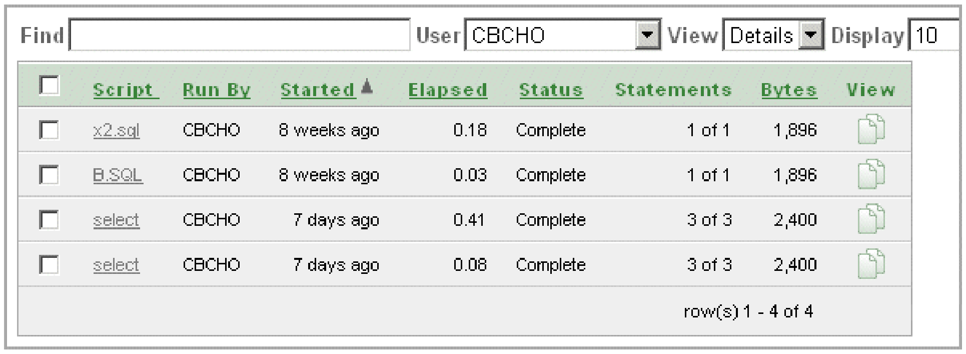
To view script results from the SQL Scripts home page:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.

   The SQL Scripts page appears.
3. You can access the Manage Script Results page in the following ways:
   - From the Tasks list, select **Manage Results**.
   - In Details view, click the Results number for the script you want to display.
   - In Icons view, click the appropriate icon. Results icons only appear in the Icons view if you click the Show Results check box.

The Manage Script Results page appears, listing available results for the script.

Figure 19–5 Manage Script Results Page



Find [ ] User CBCHO View Details Display 10

☐	Script	Run By	Started	Elapsed	Status	Statements	Bytes	View
☐	x2.sql	CBCHO	8 weeks ago	0.18	Complete	1 of 1	1,896	🗎
☐	B.SQL	CBCHO	8 weeks ago	0.03	Complete	1 of 1	1,896	🗎
☐	select	CBCHO	7 days ago	0.41	Complete	3 of 3	2,400	🗎
☐	select	CBCHO	7 days ago	0.08	Complete	3 of 3	2,400	🗎

row(s) 1 - 4 of 4

4. Click the **View** icon for the results you want to view. The View icon appears on the far right side of the Manage Script Results page.

About the Manage Script Results Page

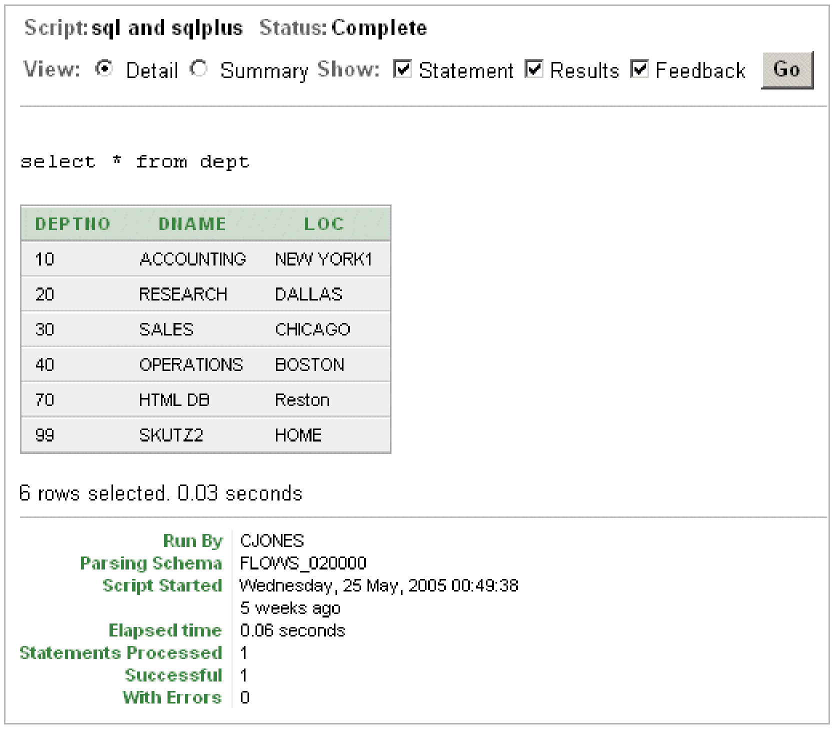
On the Manage Script Results page you can:

- **Search for a result.** Enter a result name or partial name in the Find field and click **Go**. To view all results, leave the Find field blank, select **- All Users -** from the User list and click **Go**. You control how many rows display by making a selection from the Display list.
- **Change the Page View.** You can change the appearance of the page by making a selection from the View list. Available View options include:
  - **Icons** displays each result as an icon identified by the script name, and time and date stamp.
  - **Details** displays each result as a line in a report. Each line includes a check box to enable the selection of results for deletion, the associated script name which is a link enabling it to be loaded into the Script Editor, who ran the script, when the run started, how long it took to run, whether the run is complete or not, the number of statements executed, the size in bytes, and a View icon to view the results.
- **Delete a result.** In Details view, select the check box associated with each result you want to delete, and click **Delete Checked**.
- **Sort results.** In Details view, click a column heading to sort the listed results by that column.

About the Results Page

The Results page displays the script name and status (Complete, Canceled, Executing or Submitted), and lists the statements executed.

Figure 19–6 Result Page


Script: sql and sqlplus Status: Complete
View: Detail Summary Show: Statement Results Feedback Go

```
select * from dept
```

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK1
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON
70	HTML DB	Reston
99	SKUTZ2	HOME

6 rows selected. 0.03 seconds

Run By	CJONES
Parsing Schema	FLOWS_020000
Script Started	Wednesday, 25 May, 2005 00:49:38 5 weeks ago
Elapsed time	0.06 seconds
Statements Processed	1
Successful	1
With Errors	0

On the Results page you can:

- **Choose the view.** Click the **Detail** or **Summary** radio button and click **Go** to specify whether to display complete or summarized information.
- **Choose the number of rows displayed.** In Summary view, make a selection from the Display list and click **Go** to specify the number of rows displayed.
- **Sort the statement report.** In Summary view, select a column heading to sort the listed values by that column.
- **Edit the script.** Click **Edit Script** to load the script into the Script Editor.

Transferring SQL Scripts between Workspaces

You can transfer selected scripts from your current Script Repository to a Script Repository in a different Workspace by using the Export and Import tasks. The scripts you select to export are encoded in a single file on your local file system. You can then log in to another Workspace and import the file. During import, the file is run to re-create the scripts in the current Script Repository.

By default, the Export SQL Scripts page lists all SQL scripts in the SQL Script Repository created by the current user. There are two panes on the Export SQL Scripts page, the Scripts pane and the Scripts to Export pane. You use the Scripts pane to select scripts to export. You use the Scripts to Export pane to finalize the scripts to export, to choose a name for the export script, and to save the selected scripts in the export script on your local file system. You use the Import Scripts pane to select the export script containing the scripts to import.

Topics in this section include:

- Copying Scripts to an Export Script
- Importing Scripts from an Export Script

Copying Scripts to an Export Script

To copy scripts to an export script:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. From the Tasks list, select **Export**.

   The Export SQL Scripts page appears.
4. Click the check box for each of the scripts you want to export. The check boxes display on the left side adjacent to the script name. To select all displayed scripts for export, click the column head check box.
5. Click **Add to Export** to create a list of scripts to be added to the export script.

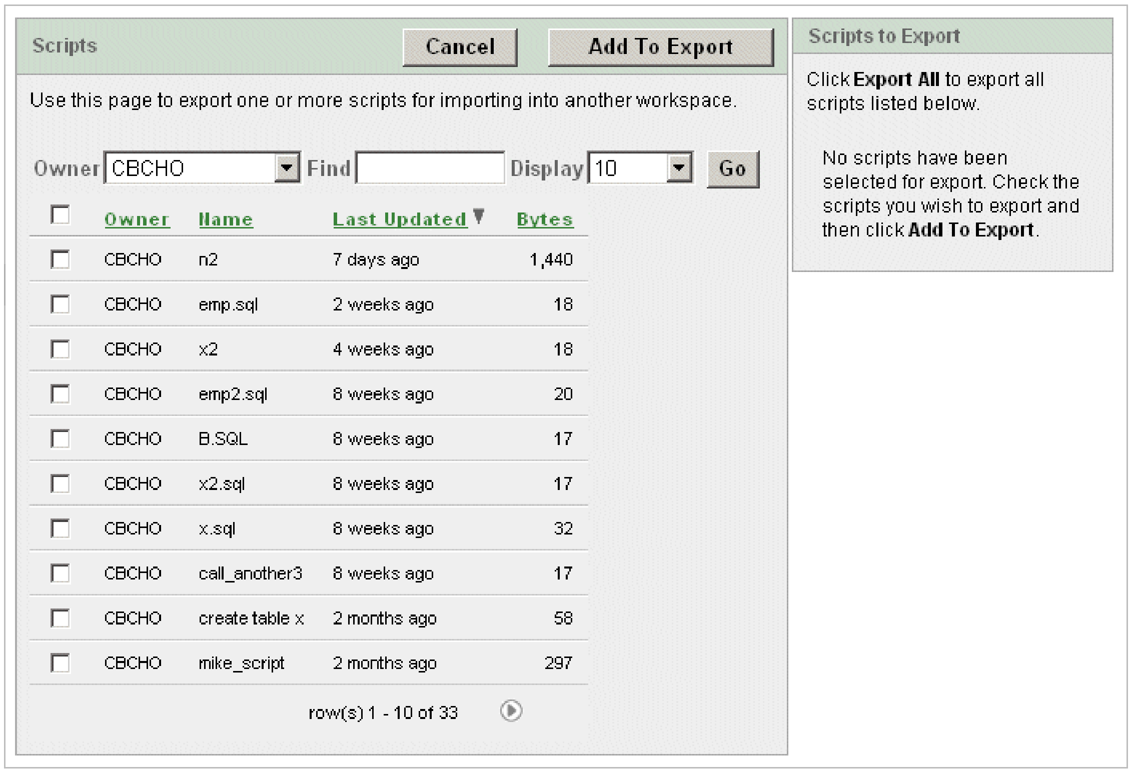
   The selected scripts are added to the list of scripts in the Scripts to Export pane.
6. Enter a name for the export script in the File Name field.

   The default script name is *workspace_name*_script.sql.
7. Click **Export All** to export the scripts to the export script.

   You are prompted to enter the directory where you want to save the export script.

About the Scripts Pane

Figure 19–7 Scripts Pane



Use this page to export one or more scripts for importing into another workspace.

Owner CBCHO Find Display 10 Go

	Owner	Name	Last Updated	Bytes
☐	CBCHO	n2	7 days ago	1,440
☐	CBCHO	emp.sql	2 weeks ago	18
☐	CBCHO	x2	4 weeks ago	18
☐	CBCHO	emp2.sql	8 weeks ago	20
☐	CBCHO	B.SQL	8 weeks ago	17
☐	CBCHO	x2.sql	8 weeks ago	17
☐	CBCHO	x.sql	8 weeks ago	32
☐	CBCHO	call_another3	8 weeks ago	17
☐	CBCHO	create table x	2 months ago	58
☐	CBCHO	mike_script	2 months ago	297

row(s) 1 - 10 of 33

Click **Export All** to export all scripts listed below.

No scripts have been selected for export. Check the scripts you wish to export and then click **Add To Export**.

In the Scripts pane you can:

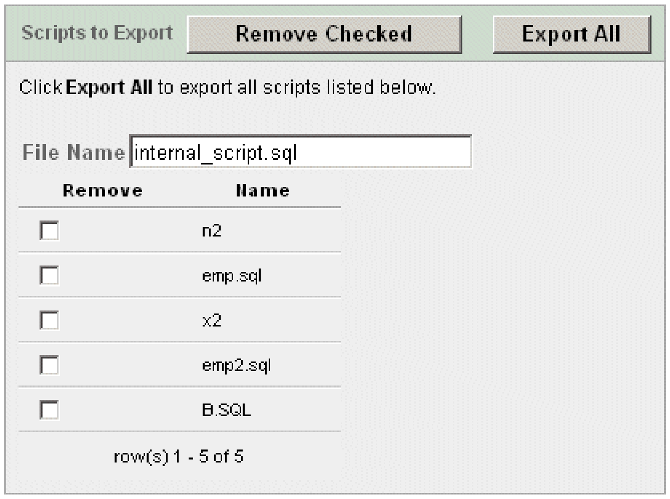
- **Search for a script.** Enter a script name or partial name in the Find field and click **Go**. To view all scripts, leave the Find field blank, select **- All Users -** from the

Owner list and click **Go**. You control how many rows display by making a selection from the Display list.

- **Cancel the export.** Click **Cancel** to return to the SQL Scripts home page without exporting any scripts, or to return to the SQL Scripts home page after saving an export script.
- **Selecting scripts to export.** Click **Add to Export** to add scripts to the export script. Scripts added to the export script are no longer listed in the Script pane, but appear in the Scripts to Export pane.
- **Sort scripts.** Click a column heading to sort the listed scripts by that column.

About the Scripts to Export Pane

Figure 19–8 Scripts to Export Pane



Click **Export All** to export all scripts listed below.

File Name: internal_script.sql

Remove	Name
☐	n2
☐	emp.sql
☐	x2
☐	emp2.sql
☐	B.SQL

row(s) 1 - 5 of 5

In the Scripts to Export pane you can:

- **Rename the export script.** Enter a name for the export script in the File Name field or leave the default script name.
- **Remove scripts.** Click the check box of scripts you want to remove from the export script and then click **Remove Checked**. Scripts removed are no longer listed in the Scripts to Export pane, but appear in the Scripts pane.
- **Save the export script.** Click **Export All** to save the export script to your local file system. You are prompted to enter the directory where you want to save the export script.

Importing Scripts from an Export Script

To import scripts from an export script:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. From the Tasks list, select **Import**.

   The Import Scripts pane appears. (See "About the Import Scripts Pane" on page 19-14).

4. Enter the name and path to the export script you want to import to the Script Repository, or click **Browse** to locate the export script you want to import.
5. Click **Next** to list the scripts in the export script.

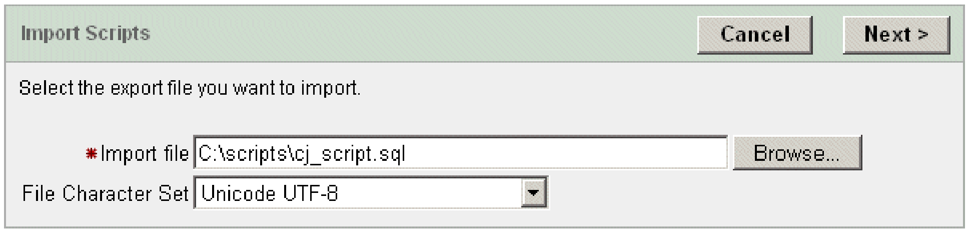
   The Action column indicates whether the imported script is new, or whether it will replace an existing script of the same name.
6. Click **Import Script(s)** to import the listed scripts into the current Script Repository.

   The SQL Scripts home page appears listing the imported scripts.
7. Enter a name for the export script in the File Name field.

   The default script name is *workspace_name*_script.sql.

About the Import Scripts Pane

Figure 19–9 Script Import Pane



Select the export file you want to import.

*Import file C:\scripts\cj_script.sql

File Character Set Unicode UTF-8

In the Import Scripts pane you can:

- **Enter the export script.** Enter the name and path of the script to import in the Import file field, or click **Browse** to locate the script.
- **Cancel the import.** Click **Cancel** to return to the SQL Scripts home page without importing scripts.
- **Proceed with the import.** Click **Next** to import the scripts in the specified export script. You can review the listed scripts to import.
- **Choose another export file.** Click **Previous** to return to the Import Scripts file selection page to choose a different export script.
- **Import the scripts.** Click **Import Script(s)** to import the scripts contained in the export script.

Viewing Script and Result Quotas

You can view the script limits in the current Workspace on the Script Quotas page. The Script Quotas page displays the following limits:

Result Quota in Bytes

- **Maximum Script Result Size.** The maximum size in bytes of a single script result. The size is set by the HTML DB administrator and cannot be changed from within the Workspace.
- **Quota for All Script Results.** The maximum size in bytes of all results in this Workspace. The size is set by the HTML DB administrator and cannot be changed from within the Workspace.

- **Used.** The number of bytes currently used in this Workspace.
- **Free.** The number of bytes currently free in this Workspace.
- **Quota.** A usage bar illustrating the percentage of Workspace quota currently used.

Script Quota in Bytes

- **Maximum Script Size.** The maximum size in bytes of a single script. The size is set by the HTML DB administrator and cannot be changed from within the Workspace.

To view the Script Quotas page:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Scripts** icon.
3. Click **Show Quotas** in the Tasks list.

   The Script Quotas page appears.
4. Click **OK** to return to the SQL Scripts home page.

For further information about script quotas, see "Configuring Security Settings" on page 22-25.

20 Using SQL Command Processor

This section provides information on how to use the SQL Command Processor.

This section contains the following topics:

About the SQL Command Processor

You can use the SQL Command Processor to create, edit, view, run, and delete SQL commands. A SQL command can contain SQL statements or PL/SQL blocks.

SQL commands created in the Query Builder can be accessed in the SQL Command Processor. Saved SQL commands must have names unique in the Workspace.

There is no interaction between the SQL Command Processor and the SQL Script Repository. You can cut and paste a SQL command from the SQL Command Processor to run in the SQL Script Editor.

Accessing the SQL Command Processor

To access the SQL Command Processor:

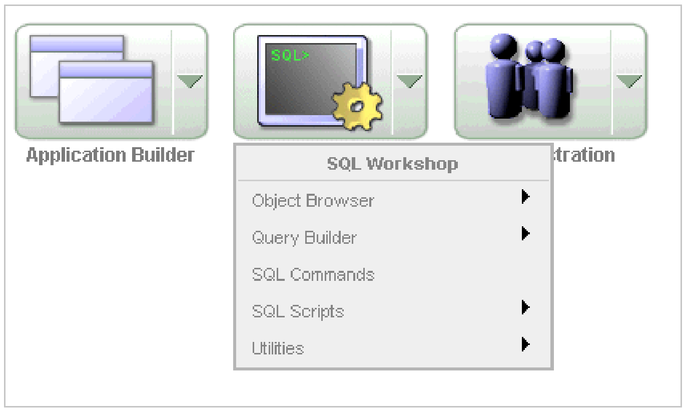
1. Log in to Oracle HTML DB.

   The Workspace home page appears.

2. To view the SQL Command Processor home page you can either:

   - Click the **SQL Workshop** icon and then the **SQL Commands** icon to drill-down to the SQL Command Processor home page.
   - Click the down arrow on the right side of the SQL Workshop icon to view a pull-down menu. Then select the **SQL Commands** menu option.

Figure 20–1 SQL Workshop Pull-down Menu

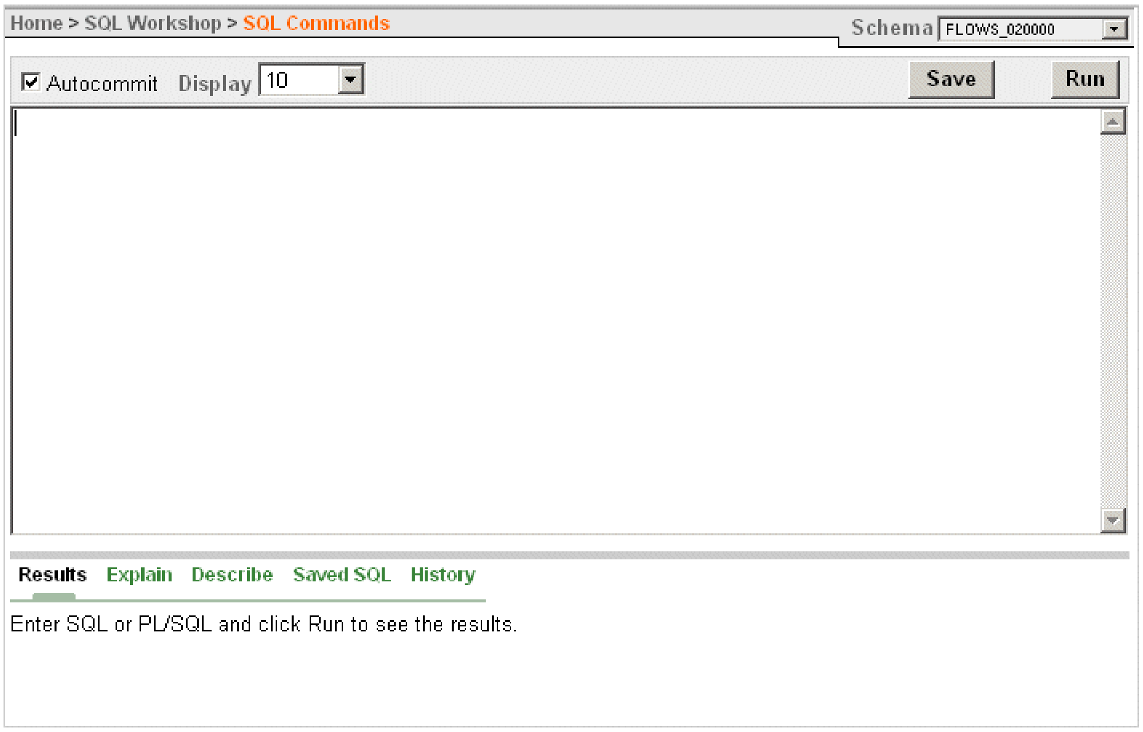


Note: For the purposes of consistency, this document uses the primary navigation path (or drill-down approach) when explaining navigation.

About the SQL Command Processor Home Page

The SQL Command Processor home page contains a command editor and a display pane. You enter and edit SQL commands in the editor and view output, saved command lists, and history lists in the display pane.

Figure 20–2 SQL Command Processor Home Page


Home > SQL Workshop > SQL Commands
Schema FLOWS_020000
Autocommit Display 10
Save
Run
Results Explain Describe Saved SQL History

Enter SQL or PL/SQL and click Run to see the results.

On the SQL Commands home page you can:

- **Choose the schema.** Make a selection from the Schema list to specify the schema in which to execute the command.

- **Disable transactional commands.** If available, click the **Autocommit** check box to enable autocommit and disable transactional commands. The Autocommit check box is only available if transactional SQL commands are enabled for this HTML DB instance.
- **Set the Number of Output Rows.** Make a selection from the Display list to specify the number of rows of output to display at one time up to a maximum of 100,000. All rows of DBMS Output are displayed regardless of the Display list setting.
- **Save a SQL command.** Click **Save** to save the contents of the editor, or the currently highlighted content to a file. You are prompted to enter a name and an optional description. The new command appears in the Saved SQL list.
- **Execute a SQL command.** Click **Run** (Ctrl+Enter) to run the command in the editor, or the currently highlighted command in the editor.
- **Highlight an individual statement for execution.** Select an individual statement in the editor and click **Run** or press **Ctrl+Enter** to execute only the highlighted statement.

See Also: "About Transactions in the SQL Command Processor" on page 20-4 and "Configuring SQL Workshop" on page 22-24 for information about enabling the Autocommit check box

About the Results Tab

Click the **Results** tab to see the results from the last successfully executed SQL command. Click **DBMS Output** at the bottom of the displayed results to display lines of DBMS output. This control only appears when there is DBMS output to display. Click **CSV Export** to export results to a comma separated file on your local file system.

About the Explain Tab

Click the **Explain** tab to examine the execution plan used by the optimizer for statements that make changes to the database. Objects in the output are linked to the Object Browser. Click the linked object to view its properties in the Object Browser.

See Also: "Top SQL" on page 21-11 for more information about the execution plan

About the Describe tab

Enter Describe *object_name* and click **Run** to display column definitions for a table or view, or specifications for a function or procedure in the **Describe** tab. Select links in the Describe results to write that information into the command editor. For example, click a table name to add *owner.table*, click a column name to add the *column name*, click a procedure or function name to add the object call with parameters, or click a package name to add the package call.

About the Saved SQL tab

Click the **Saved SQL** tab to display a list of all SQL commands saved in the current workspace. Click the command title to load it into the command editor.

About the History tab

Click the **History** tab to list your recently executed commands. Your last 200 executed commands are saved.

Executing a SQL Command

You use the SQL Command Processor to run SQL commands on any Oracle database schema for which you have privileges.

To execute a SQL Command:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.
3. Enter the SQL command you want to run in the SQL editor pane.
4. Make a selection from the Schema list to specify the Database schema in which to execute the SQL command.
5. Click **Run** (Ctrl+Enter) to execute the command.

   The results appear in the display pane.

About Transactions in the SQL Command Processor

If transactional SQL commands are enabled for the HTML DB instance, an Autocommit check box appears in the SQL Command Processor home page.

To disable transactional SQL commands in the SQL Command Processor, check the Autocommit check box. Attempting to use any transactional SQL commands such as COMMIT or ROLLBACK when transactional mode is disabled returns an error message.

To enable transactional SQL commands, clear the Autocommit check box. HTML DB verifies that the necessary system resources are available before entering the transactional mode. If resources are unavailable, an error message is displayed.

Transactional mode is a stateful transaction mode where you can, for example, perform an update, select data for review, and COMMIT or ROLLBACK changes. It is implemented using DBMS_JOBS.

Consider the following behavior in transactional mode:

- Actions are not committed to the database until you enter an explicit COMMIT command.
- Exiting the SQL Command Processor terminates and rolls back the current transaction.
- A session time out terminates and rolls back the current transaction. The system preference, SQL_COMMAND_MAX_INACTIVITY, sets the time before an inactive session times out. The default timeout is 60 minutes.
- The **CSV Export** option is not available.

See Also: "Using the SQL Script Repository" on page 19-1 for information on running scripts and "Configuring SQL Workshop" on page 22-24 for information about setting the session timeout and enabling transactional SQL commands

About Unsupported SQL*Plus Commands

The SQL Command Processor does not support SQL*Plus commands. If you attempt to enter a SQL*Plus command such as `SET ECHO` or `DEFINE` in the SQL Command Processor, an error message displays.

About Command Termination

You can terminate a command in the SQL Command Processor using a semicolon (;), a forward slash (/), or with nothing. Consider the following valid alternatives:

```
SELECT * from emp;
```

or

```
SELECT * from emp
/
```

or

```
SELECT * from emp
```

The first example demonstrates the use of a semicolon (;), the second example demonstrates the use of forward slash (/), and the final example demonstrates a command with no termination.

Using Bind Variables

Bind variables are supported. You are prompted to enter values for bind variables during command execution. Bind variables are prefixed with a colon.

For example

```
SELECT * from emp where deptno = :dept
```

In earlier versions of Oracle HTML DB, you could check your Workspace ID by running the command:

```
select :WORKSPACE_ID from dual
```

In this release, run the following SQL command to check your Workspace ID:

```
select v('WORKSPACE_ID') from dual
```

Saving a SQL Command

You can save commands you enter in the SQL Command Processor.

To save a SQL command:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.
3. Enter the command in the command editor.
4. Click **Save** to save the command.

   You are prompted to enter a name and description for the command.
5. Click **Save**, or click **Cancel** to return to the command editor without saving.

   The saved command is listed in the display area.

Copying a Command

To copy a SQL command:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.

3. Click the **Saved SQL** tab, located between the command editor and the display pane.

   The Saved SQL list of commands appears in the display pane.
4. Click the title of the command to load it into the command editor
5. Click **Save** to save the command.
6. Enter a new name for the command in the Name field and click **Save**.

   The command is copied to the new name.

Using Saved Commands

You can access the commands you save and commands saved by other users in the same Workspace. You can also access SQL commands you and other users of the same Workspace saved from the Query Builder.

Topics in this section include:

- Accessing Saved Commands
- About the Saved SQL Pane

Accessing Saved Commands

To access saved SQL commands:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.
3. Click the **Saved SQL** tab which is located between the command editor and the display pane.

   The Saved SQL list of commands appears in the display pane.
4. Click the title of the command to load it into the command editor.

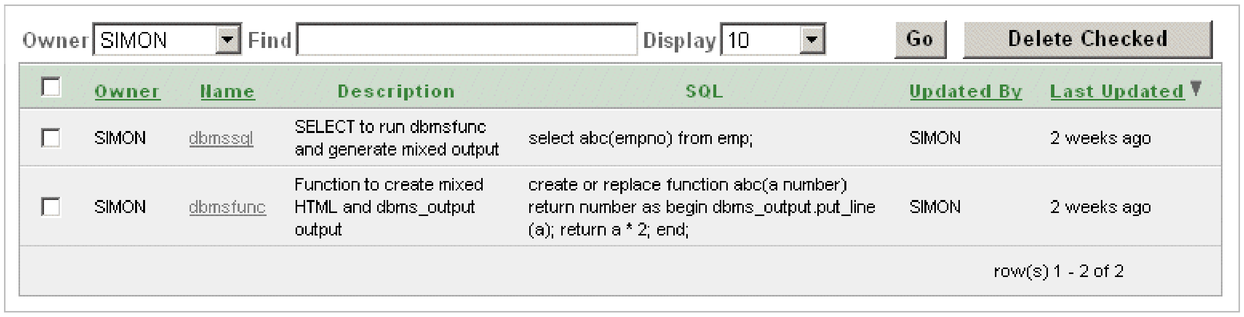
   The command appears in the editor.
5. Click **Run** to execute the command.

About the Saved SQL Pane

The saved SQL pane displays a list of all commands saved in this Workspace. The list displays commands saved from the SQL Command Processor and SQL commands saved from the Query Builder. Saved SQL commands must have unique names in the Workspace. The same name cannot be used in the Query Builder and the SQL Command Processor

Each command entry shows the owner name, the command name, the first characters of the SQL command, a description if it exists, who last updated the command and when.

Figure 20–3 Saved SQL Pane



	Owner	Name	Description	SQL	Updated By	Last Updated
☐	SIMON	dbmssql	SELECT to run dbmsfunc and generate mixed output	select abc(empno) from emp;	SIMON	2 weeks ago
☐	SIMON	dbmsfunc	Function to create mixed HTML and dbms_output output	create or replace function abc(a number) return number as begin dbms_output.put_line (a); return a * 2; end;	SIMON	2 weeks ago

row(s) 1 - 2 of 2

On the Saved SQL pane you can:

- **Show commands by owner.** Make a selection from the Owner list to specify the user whose commands you want to display. To view all scripts select -All Users-.
- **Search for a command.** Enter a command name or partial name, or enter a code snippet in the Find field and click **Go**. To view all scripts, leave the Find field blank and click **Go**. You control how many rows display by making a selection from the Rows list.
- **Set the Number of Output Rows.** Make a selection from the Display list to specify the number of Saved SQL commands to display at one time.
- **Delete a command.** Click the check box associated with each command you want to delete, and click **Delete Checked**.
- **Sort commands.** Click a column heading to sort the listed commands by that column.

Using SQL Command History

Commands you have executed are stored in the command history regardless of whether you explicitly save them. You use SQL Command History to access commands you have executed in this Workspace.

Topics in this section include:

- Accessing a Command from Command History
- About the History Pane

Accessing a Command from Command History

To access history commands:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.
3. Click the **History** tab, located between the command editor and the display pane.

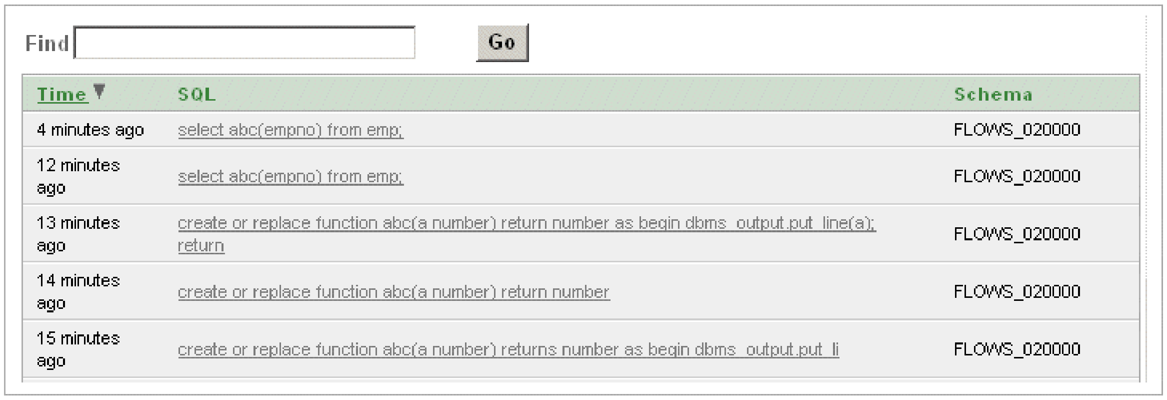
   The list of commands in History appears in the display pane.
4. Click the partial command displayed in the SQL column.

   The command appears in the editor.

About the History Pane

The History pane displays a list of commands you have executed.

Figure 20–4 History Pane



Find | Go

Time	SQL	Schema
4 minutes ago	select abc(empno) from emp;	FLOWS_020000
12 minutes ago	select abc(empno) from emp;	FLOWS_020000
13 minutes ago	create or replace function abc(a number) return number as begin dbms_output.put_line(a); return	FLOWS_020000
14 minutes ago	create or replace function abc(a number) return number	FLOWS_020000
15 minutes ago	create or replace function abc(a number) returns number as begin dbms_output.put_li	FLOWS_020000

Each history entry shows the time the command was last executed, the first characters of the command, and the schema in which it was executed.

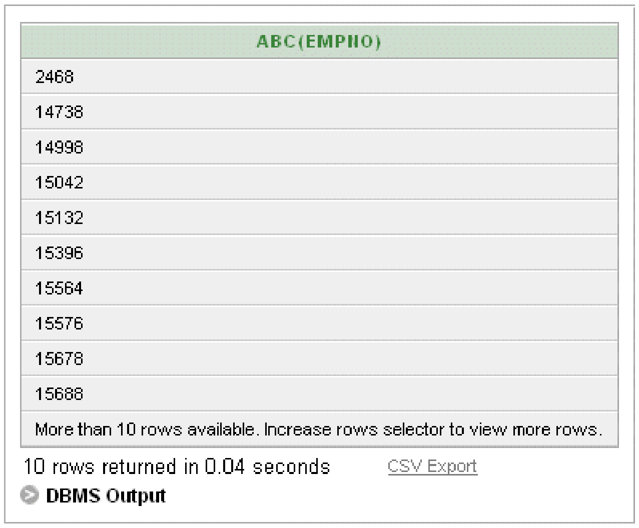
On the History pane you can:

- **Load a command.** Click the partial command displayed in the SQL column to load the command into the command editor. When the command loads, it also sets the schema in which it was last executed.
- **Sort by time.** Click the Time column heading to sort the command history by least recent or most recent.

Displaying Results

When you execute a SQL command, the results are displayed. The results of the last executed command are available until you execute another SQL command, or leave the SQL Command Processor.

Figure 20–5 Results Pane



ABC(EMPNO)
2468
14738
14998
15042
15132
15396
15564
15576
15678
15688
More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.04 seconds CSV Export

DBMS Output

To display SQL command results:

1. Click the **SQL Workshop** icon on the Workspace home page.

2. Click the **SQL Commands** icon.
3. Click the **Results** tab which is located between the command editor and the display pane.

   The HTML formatted results appear in the display pane.
4. Click **DBMS Output** to display plain text DBMS output results.

   The **DBMS Output** control only appears if there is DBMS output in addition to HTML formatted results. It does not appear if there is only DBMS output, or if there is only HTML formatted output.

About the Results Pane

The Results pane displays SQL command results as HTML formatted table. The number of rows returned appears at the end of the output, and the time taken. DBMS output appears as plain text after the HTML formatted results.

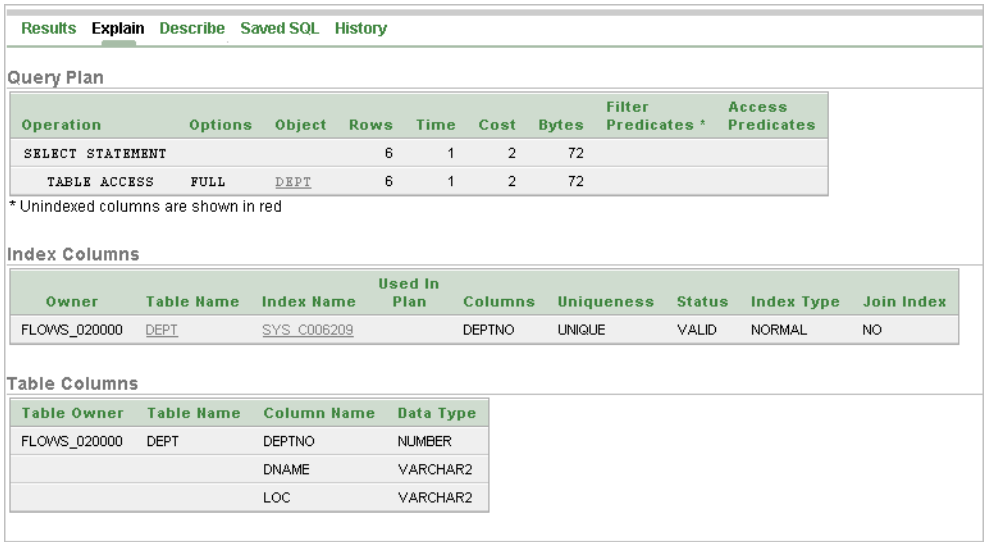
On the Results pane you can:

- **Display DBMS output.** Click **DBMS Output** at the bottom of the displayed results to display lines of DBMS output. This control only appears when there is DBMS output to display.
- **Export results.** Click **CSV Export** to export results to a comma separated file on your local file system. You are prompted to enter a name and directory for the file.

Using Explain Plan

You can view the explain plan the Oracle Optimizer uses to run your SQL command. You do not need to execute the command to view the explain plan.

Figure 20–6 Explain Plan Pane



Query Plan

Operation	Options	Object	Rows	Time	Cost	Bytes	Filter Predicates *	Access Predicates
SELECT STATEMENT			6	1	2	72		
TABLE ACCESS	FULL	DEPT	6	1	2	72		

* Unindexed columns are shown in red

Index Columns

Owner	Table Name	Index Name	Used In Plan	Columns	Uniqueness	Status	Index Type	Join Index
FLOWS_020000	DEPT	SYS_C006209		DEPTNO	UNIQUE	VALID	NORMAL	NO

Table Columns

Table Owner	Table Name	Column Name	Data Type
FLOWS_020000	DEPT	DEPTNO	NUMBER
		DNAME	VARCHAR2
		LOC	VARCHAR2

Topics in this section include:

- Viewing an Explain Plan
- About Explain Plan Pane

Viewing an Explain Plan

To view the Explain Plan:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click the **SQL Commands** icon.
3. Enter or load the command whose plan you want to view.
4. Click **Explain** which is located between the command editor and the display pane.

   The explain plan used by the optimizer appears in the display pane.

About Explain Plan Pane

The Explain Plan pane shows the plan used by the Oracle Optimizer to run your SQL command. It typically displays the Query Plan, Index Columns and Table Columns used.

On the Explain Plan pane you can:

- **View object definitions.** Click the object name in Query Plan to display the object definition in the Object Browser.
- **View index definitions.** Click the index name in Table Columns to display the index definition in the Object Browser.

21 Using SQL Workshop Utilities

This section describes how to use SQL Workshop utilities to import and export data from the database, generate DDL, view object reports, monitor the database, and restore dropped database objects.

This section contains the following topics:

- Importing and Exporting Data To and From the Database
- Generating DDL
- Viewing Object Reports
- Monitoring the Database
- Using the Recycle Bin to View and Restore Dropped Objects

Importing and Exporting Data To and From the Database

You can import data into and export data from the hosted database using the Data Import/Export page. Supported import formats include:

- Text file containing comma-delimited or tab-delimited data
- XML documents
- Spreadsheets

Supported export formats include:

- Text such as comma-delimited or tab-delimited data
- XML documents

This section contains the following topics:

- Accessing the Data Import/Export Page
- Importing Data
- Exporting Data
- Using Text Data Import Repository

Accessing the Data Import/Export Page

To access the Data Import/Export page:

1. Click the **SQL Workshop** icon on the Workspace home page.

   The SQL Workshop home page appears.

2. Click **Utilities**.
3. Click **Data Import/Export**.

   The Data Import/Export page appears.
4. Click the appropriate icon to import data, export data, or view the Import Repository.

Importing Data

You can import data into the Oracle database using Oracle HTML DB in the following ways:

- Copy and paste data from a spreadsheet.
- Upload a spreadsheet file in a delimited format (such as comma-delimited (.csv) or tab-delimited).
- Upload a text file containing comma-delimited or tab-delimited data.

Topics in this section include:

- Importing a Text File
- Importing an XML Document
- Importing Spreadsheet Data
- Viewing the Import Data Repository

Importing a Text File

For files less than 30KB, you can copy and paste tab-delimited data directly into the Import Text Wizard. For files larger than 30KB, you must upload a separate file.

To import a text file:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Import**.
3. Click **Import Text Data**.

   The Import Text or Spreadsheet Data Wizard appears.
4. Under Import To, select either **Existing table** or **New table**.
5. Under Import from, select either **Upload file** or **Copy and paste**.
6. Follow the on-screen instructions.

Importing an XML Document

Data Workshop supports the import of XML documents adhering to the Canonical XML specification.

To import an XML document:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.

   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Import**.
3. Click **Import XML Data**.

   The Import XML Wizard appears.
4. Follow the on-screen instructions.

Importing Spreadsheet Data

You can load spreadsheet data by either copying and pasting text, or by importing a file. To copy and paste text, the spreadsheet file must be less than 30KB. For files larger than 30KB, you can import the file in a delimited format (such as comma-delimited (.csv) or tab-delimited), upload the file, and then load the data into a new or existing table.

To import spreadsheet data:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Import**.
3. Click **Import Spreadsheet Data**.

   The Import Spreadsheet Data Wizard appears.
4. Under Import to, select either **Existing table** or **New table**.
5. Under Import from, select either **Upload file** or **Copy and paste**.
6. Follow the on-screen instructions.

Viewing the Import Data Repository

You can view imported information in the Text Data Import Repository.

To view imported data:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Import Repository**.
3. To filter the view, make a selection from the Show list and click **Go**.
4. To view details about the imported file, click the **Details** icon.
5. To download a file, click the file name.
6. To delete a file, select the check box adjacent to the file name and click **Delete Checked**.

Exporting Data

You can also use the Data Import/Export page to export the contents of a table to a text file or XML document.

Topics in this section include:

- Exporting to a Text File
- Exporting to an XML Document

Exporting to a Text File

Use the Export Text Data Wizard to export the contents of a table to a text file. For example, you could export an entire table to a comma-delimited file (.csv).

To export a table to a text file:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Export**.
3. Click **Export To Text**.

   The Export to Text Wizard appears.
4. Follow the on-screen instructions.

You select the schema and choose the table and columns to be exported. You can also specify the type of separator to be used to separate column values as well as whether column text strings are identified using single or double quotation marks.

Exporting to an XML Document

Use the Export XML Wizard to export the contents of a table to an XML document adhering to the Canonical XML specification.

To export a table to an XML document:

1. Navigate to the Data Import/Export page:
   a. Click the **SQL Workshop** icon on the Workspace home page.
   b. Click **Utilities**.
   c. Click **Data Import/Export**.
2. Click **Export**.
3. Click **Export to XML**.

   The Export to XML Wizard appears.
4. Follow the on-screen instructions.

You select the schema and choose the table and columns to be exported.

Using Text Data Import Repository

Imported files are stored in the Text Data Import Repository.

To access the Text Data Import Repository:

1. Navigate to the Data Import/Export page:
    a. Click the **SQL Workshop** icon on the Workspace home page.
    b. Click **Utilities**.
    c. Click **Data Import/Export**.
2. Click **Import Repository**.
3. To filter the display, make a selection from the Show list and click **Go**.
4. To view information about a specific file, click the **View** icon.
5. To delete an imported file, select it and click **Delete Checked**.

Generating DDL

If you are running Oracle HTML DB with Oracle Database 10g release 1 (10.1) or later, you can generate Data Definition Language (DDL) statements from the Oracle data dictionary. These scripts can be used to create or recreate database schema objects. The scripts can be generated to the screen, or they can be saved as a SQL Script. You can generate the create scripts for all objects for a specific schema, specific object types, or specific objects.

To generate a DDL statement:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Generate DDL**.

    The Generate DDL Wizard appears.
3. Follow the on-screen instructions.

See Also:

- *Oracle Database SQL Reference* for information about DDL statements
- *Oracle Database Concepts* for information about the data dictionary

Viewing Object Reports

SQL Workshop includes a variety to object reports to help you better manage the objects in your database.

Topics in this section include:

- Viewing All Objects Reports
- Accessing the Data Dictionary
- Viewing PL/SQL Reports
- Viewing Security Reports
- Viewing Details about the Tables in Your Database

Viewing All Objects Reports

Use the reports on the All Objects page to view all objects for the selected schema. Available reports include All Objects, Invalid Objects, Object Calendar, and Objects Counts by Type.

To access the reports available on the All Objects page:

1. Click the **SQL Workshop** icon on the Workspace home page.

   The SQL Workshop home page appears.

2. Click **Utilities**, **Object Reports**, and then **All Objects**.
3. Select one of the following reports:
   - **All Objects**. Sort objects by creation date as well as last DDL (data definition language). To filter the report, select a object type, specify an object name, and click Go.
   - **Invalid Objects**. View all invalid objects in the database by object type. To filter the report, enter an object name, select a object type, and click **Go**.
   - **Object Calendar**. View all objects in a calendar format based on the date each database object was created.
   - **Object Counts by Type**. View counts of database object types for the selected schema.
4. Make a selection from the Schema list (optional).
5. To filter the report, select a object type, specify an object name, and click **Go**.

Accessing the Data Dictionary

Each Oracle database has a data dictionary. An Oracle data dictionary is a set of tables and views that are used as a read-only reference about the database. For example, a data dictionary stores information about both the logical and physical structure of the database. A data dictionary also stores information about valid Oracle database users, integrity constraints for tables in the database, and the amount of space allocated for a schema object as well as how much of it is being used.

To browse the data dictionary:

1. Click the **SQL Workshop** icon on the Workspace home page.

   The SQL Workshop home page appears.

2. Click **Utilities**, **Object Reports**, and then **Data Dictionary**.

   The Data Dictionary appears, listing all the Oracle Data Dictionary views

3. To filter the report, enter a query in the Search field and click **Go**.

   You can query for details about database objects in the Data Dictionary Browser.

4. Click the **View** icon to display Data Dictionary Browser. Use this form to query the Oracle Data Dictionary for details about database objects.
5. In the Data Dictionary Browser, select the appropriate views and click **Query**.

   See Also: *Oracle Database Concepts* for information about the data dictionary

Viewing PL/SQL Reports

PL/SQL reports enable you to view program unit arguments or unit line counts or search PL/SQL source code.

Topics in this section include:

- Viewing Program Unit Arguments

- Viewing Unit Line Counts
- Searching PL/SQL Source Code

Viewing Program Unit Arguments

Use the Program Unit Arguments report to view package input and output parameters.

To view the PL/SQL Arguments report:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Object Reports**.
3. Click **PL/SQL** and then **Program Unit Arguments**.
4. To filter the report, enter a query in Object Name and click **Go**.

Viewing Unit Line Counts

Use the Unit Line Counts report to view then number of lines of code for each object. Use this report to identify larger PL/SQL program units.

To view the Unit Line Counts report:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Object Reports**.
3. Click **PL/SQL** and then **Unit Line Counts**.
4. To filter the report, enter an object name and click **Go**.

Searching PL/SQL Source Code

Use the Search PL/SQL Source code page to search the text within your PL/SQL code. Use this report to find references to tables or functions you might be thinking of deleting. You can also use this page to locate code when you can only recall a code snippet.

To search for PL/SQL source code:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Object Reports**.
3. Click **PL/SQL** and then **Search PL/SQL Source**.
4. To filter the report:
   a. In Object Name, enter a query.
   b. In Text, enter the PL/SQL code you want to search for.
   c. Click **Go**.

Viewing Security Reports

Security reports enable you to see privileges granted on database objects owned by other schemas. You can also use these reports to view database roles and system privileges. The SQL injection report is only available with Oracle Database 10*g* release 1 (10.2) or later.

Topics in this section include:

- Viewing Role Privileges

- Viewing Object Grants
- Viewing Column Privileges
- Evaluating an Application for SQL Injection Vulnerability

Viewing Role Privileges

Role Privileges report shows the database roles that have been granted to a selected schema. Roles are collections of various privileges.

To view Role Privileges:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Object Reports**.
3. Click **Security** and then **Role Privileges**.

   The Role Privileges report appears.

Viewing Object Grants

The Object Grants report identifies privileges granted from or to the selected database schema. Use this report to determine the privileges for an existing schema has as well understand what privileges have been granted from the selected schema to other schemas.

To view the Object Grants report:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**, **Object Reports**, and **Security**.
3. Click **User Privileges** and then **Object Grants**.

   The Object Grants report appears.
4. From Schema, select the database schema owner.
5. To filter the report, make a selection from the Show list and click **Go**.

Viewing Column Privileges

The Column Privileges report identifies column privileges granted from or to the selected database schema. Use this report to determine the privileges for an existing schema as well as understand what privileges have been granted from the selected schema to other schemas.

To view the Column Privileges report:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**, **Object Reports**, and **Security**.
3. Click **User Privileges** and then **Column Privileges**.

   The Column Privileges report appears.
4. From Schema, select the database schema owner.
5. To filter the report, make a selection from the Show list and click **Go**.

Evaluating an Application for SQL Injection Vulnerability

A SQL infection is a potential security vulnerability for any database-driven application. In a SQL Injection attack, the attacker modifies the parameters of an application in order to change the SQL statements passed to the database. For example, a SQL Injection attack could pass the text of a SQL statement or clause instead of user data from the application UI. A successful SQL injection attack may corrupt the database or grant access to privileged data.

Note: The SQL injection report is only available with Oracle Database 10*g* release 1 (10.2) or later.

You can use the following two reports to check for vulnerabilities within a given schema:

- **Compile PL/SQL** - This report analyzes and reports how user values concatenated into the text of dynamic SQL statements are transformed and passed through the whole application.
- **Review Vulnerabilities** - Displays a report of potential vulnerable code.

Running the Compile PL/SQL Report To run the Compile PL/SQL Injection report:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**, **Object Reports**, and then **Security**.
3. Click **SQL Injection** and then **Compile PL/SQL**.
4. Select a schema from the Schema list on the right side of the page.

   Only objects in the current schema display. Remember that the values available in the schema depend upon your workspace privileges.
5. To search for an object, enter a case insensitive query in the Object field and click **Go**.
6. Select the program units to be compiled and click **Compile**.
7. To remove program units, select the program units to be removed and click **Remove Checked**.

Viewing the Review Vulnerabilities Report To view the Review Vulnerabilities report:

1. Run the Compile PL/SQL Injection report as described in the previous procedure.
2. Click the **Review Vulnerabilities** icon.

   The Potential Vulnerable Code report appears, displaying packages, procedures, and links to potential program units with vulnerabilities.
3. To search for a package or process, enter a case insensitive query in the Search field and click **Go**.
4. To view details about a specific program unit, select the appropriate link.
5. To access the SQL Injection Tree View, click the **Tree** icon.

Viewing Details about the Tables in Your Database

You can view specific details about the tables within your database by accessing the reports available on the Tables page.

To view the reports available on the Tables page:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**.

3. Click **Object Reports** and then **Tables**.

   The Tables page appears.
4. Select a report as report to review.
5. To filter each report, enter search criteria in the fields provided and click **Go**.

Monitoring the Database

The Database Monitor page features a variety reports that describe the activity, storage, and configuration of the current database instance.

Note: Only users having a database user account that has been granted a DBA role can access the Database Monitor page.

This section contains the following topics:

- Monitoring Database Activity
- Monitoring Database Storage
- Monitoring Database Configuration

Monitoring Database Activity

The reports available under Activity detailed provide a database-wide view of the database sessions, system statistics, SQL statements, and longer operations. You can use these reports to identify poorly preforming SQL and to gain a better understand the workload of the database.

To access database activity reports:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Database Monitor**.

   Accessing the Database Monitor page requires database administrator privileges. You must have a database account that has been granted a DBA role.
3. When prompted, enter the appropriate username and password and click **Login**.
4. Under Activity, select the appropriate report.

   The following sections describe each report page.

Sessions

A session is the connection of a user to an Oracle database instance. A session lasts from the time the user connects until the time the user disconnects or exits the database application.

The Sessions page contains six reports as described Table 21–1. To view a report, select the appropriate tab.

Table 21–1 Database Monitor Activity Reports

Report Name	Description
Sessions	Displays a report of the current session on the database.
Locks	Displays a report of session which has locks blocking another session(s).

Table 21–1 (Cont.) Database Monitor Activity Reports

Report Name	Description
Waits	Displays a report of the wait events for each session.
I/O	Displays a report of the I/O for each session.
SQL	Displays a report showing the current or last SQL statement executed for each session.
Open Cursors	Displays a report of the number of open cursors for each session.

System Statistics

The System Statistics report displays statistics for:

- **Physical I/O**. A physical I/O is an I/O that requires disk access. This report displays disk access statistics for physical reads and writes.
- **Logical I/O**. An logical I/O is an I/O that is satisfied in memory or disk. Displays the sum of buffer reads which might be consistent gets or current mode gets. Redo is the buffer in the SGA that contains information about changes.
- **Memory**. Displays memory consumption of the database.
- **Time**. Shows various times consumed by the database
- **SQL Cursor**. Displays statistics about the cursors in the Oracle database. See
- **Transaction**. Shows the number of transactions performed.

Additional controls on the System Statistics page include:

- **Refresh Report** - Click this button to refresh the System Statistics report.
- **Save Statistics** - Click this button to save the current report.
- **Removed Saved Statistics** - Click this link to create a baseline which is used on subsequent refreshes of the page. The statistics will then show deltas from what was saved and what is current.

See Also: "Memory and Configuration Use" and "Cursor Access and Management" in *Oracle Database Performance Tuning Guide*

Top SQL

Use the Top SQL page to identify poorly performing SQL. Use the search fields and lists and the top of the page to narrow the display.

Click the **View** icon to access the SQL Plan page. The SQL Plan page contains the following sections:

- **Query Plan** - Contains a color coded explain plan. Note that unindexed columns display in red.
- **SQL Text** - Displays the full text of the SQL statement.
- **Indexes** - Displays all indexes on the table in the query. There is a checkmark when that index is used in the query.
- **Table Columns** - Shows all columns on all tables or views in the query.

Long Operations

This view displays the status of various operations that run for longer than 6 seconds (in absolute time). These operations currently include many backup and recovery functions, statistics gathering, and query execution, and more operations are added for every Oracle release.

See Also: V$SESSION_LONGOPS" in *Oracle Database Reference*

Monitoring Database Storage

Oracle stores data logically in tablespaces and physically in datafiles associated with the corresponding tablespace. The reports available under Storage provide information about tablespaces, data files, and free space.

To access database storage reports:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Database Monitor**.

   Accessing the Database Monitor page requires database administrator privileges. You must have a database account that has been granted a DBA role.
3. When prompted, enter the appropriate username and password and click **Login**.
4. Under Storage, select the appropriate icon:
   - **Tablespaces** -Displays the size of each tablespace in MB as well as the number of related data files.
   - **Data Files** - Displays information about each data file, including the related table space, related file name, size in MB, and auto extensible status.
   - **Free Space** - Displays free space in the database by tablespaces.

See Also: *Oracle Database Reference* for information about tablespaces and data files

Monitoring Database Configuration

The reports in the Configuration section of the Database Monitor provide details about how the database is configured. This information is useful in understanding your database version and configuration options.

To access database storage reports:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities** and then **Database Monitor**.

   Accessing the Database Monitor page requires database administrator privileges. You must have a database account that has been granted a DBA role.
3. When prompted, enter the appropriate username and password and click **Login**.
4. Under Configuration, select the appropriate icon:
   - **Database**

     Click **Database** to view details about the current database instance. The About Database page is divided into two sections: Database and Version. To view additional information about installed options, currently used features, or National Language Support, expand the following:
     – Options
     – Feature Usage
     – National Language Support

- CGI Environment

- **Parameters**

  Click **Parameters** to view configuration parameters for the current database instance.

Using the Recycle Bin to View and Restore Dropped Objects

If you are running Oracle HTML DB with Oracle Database 10g release 1 (10.1) or later, you can use the Recycle Bin to view and restore dropped database objects. When you drop a table, the space associated with the table is not immediately removed. The Oracle database renames the table and places it and any associated objects in the Recycle Bin where it can be recovered at a later time.

This section contains the following topics:

- Managing Objects in the Recycle Bin
- Emptying the Recycle Bin

Note: The Recycle Bin feature is only available if you are running Oracle HTML DB with an Oracle 10g or later database.

Managing Objects in the Recycle Bin

To view objects in the Recycle Bin:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**.
3. Click **Recycle Bin**.
4. Click **View Objects**.
5. To filter the report, select an object type, enter the object name in the Original Name field, and click **Go**.
6. Click the **View** icon to access the Object Detail page. On this page you can:
7. To view object details, click the **View** icon adjacent to the original name.

   On the Object Details page, you can:

   - Click **Restore Object** to restore the current object
   - Click **Purge** to permanently delete the current object

Emptying the Recycle Bin

To empty the Recycle Bin without viewing the objects:

1. Click the **SQL Workshop** icon on the Workspace home page.
2. Click **Utilities**.
3. Click **Recycle Bin**.
4. From the Tasks list on the right side of the page, select **Purge Recycle Bin**.

Part IV

Administration

Part IV describes all tasks performed by an Oracle HTML DB administrator. An Oracle HTML DB administrator manages an entire Oracle HTML DB development environment instance through the Oracle HTML DB Administration Services application. Common Oracle HTML DB administrator tasks include creating and managing workspaces, translating an application, and managing activities, log files, and sessions.

Part IV contains the following chapter:

22 Managing an Oracle HTML DB Hosted Service

Oracle HTML DB administrators are responsible for managing an entire Oracle HTML DB instance. To perform these tasks, an Oracle HTML DB administrator logs into the Oracle HTML DB Administration Services application.

This section describes tasks an Oracle HTML DB administrator performs when administering an Oracle HTML DB hosted service.

This section contains the following topics:

What Is an Oracle HTML DB Administrator?

In the Oracle HTML DB development environment, users log in to a shared work area called a workspace. Users are divided into three primary roles:

- **Developers** create and edit applications.
- **Workspace administrators** perform administrator tasks specific to their workspace such as managing user accounts, monitoring workspace activity, and viewing log files. See "Managing a Development Workspace" on page 12-1.

- **Oracle HTML DB administrator** are superusers that manages the entire hosted instance using the Oracle HTML DB Administration Services application.

  See Also: Refer to appropriate installation guide for your platform for information about installing Oracle HTML DB

Logging in to Oracle HTML DB Administration Services

Oracle HTML DB administrators are responsible for managing an entire Oracle HTML DB instance. To perform these tasks, an Oracle HTML DB administrator logs into the Oracle HTML DB Administration Services application.

To log in to Oracle HTML DB Administration Services:

1. In a Web browser, navigate to the Oracle HTML DB Administration Services application:

   ```
   http://hostname:port/pls/htmldb/htmldb_admin
   ```

   Where:

   - *`hostname`* is the name of the system where Oracle HTTP Server is installed.
   - *`port`* is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777. You can find information about your Oracle HTTP Server installation's port number from either of the following files:
     – *`ORACLE_BASE`*`\`*`ORACLE_HOME`*`\install\portlist.ini`
     – *`ORACLE_BASE`*`\`*`ORACLE_HOME`*`\Apache\Apache\conf\httpd.conf`
   - *`htmldb`* is the database access descriptor (DAD) defined in the mod_plsql configuration file.

   The Login page appears.
2. In Username, enter `admin`.
3. In Password, enter the Oracle HTML DB administrator account password you specified when you installed Oracle HTML DB.
4. Click **Login**.

   Oracle HTML DB Administration Services appears.

   See Also: Refer to the appropriate installation guide for information about installing Oracle HTML DB

Managing Schemas

This section describes how to manage the schemas within an Oracle HTML DB instance.

Topics in this section include:

- Determining the HTML DB Engine Schema
- Understanding Oracle Default Schema Restrictions
- Managing Workspace to Schema Assignments

Determining the HTML DB Engine Schema

Oracle HTML DB administrators may need to perform certain actions within the HTML DB engine schema. For example, in order for an Oracle HTML DB administrator to have the ability to assign Oracle default schemas, the database administrator (DBA) must explicitly grant the privilege by running the `HTMLDB_SITE_ADMIN.UNRESTRICT_SCHEMA` procedure within the HTML DB engine schema.

> **See Also:** "Understanding Oracle Default Schema Restrictions" on page 22-3 for information about the `HTMLDB_SITE_ADMIN.UNRESTRICT_SCHEMA` procedure

To determine the current HTML DB engine schema for your Oracle HTML DB instance:

1. Use SQL*Plus to connect to the database.
2. Run the following query in a schema with DBA privileges (for example, `SYSTEM`).

```
SELECT TABLE_OWNER FROM all_synonyms
WHERE SYNONYM_NAME = 'WWV_FLOW' and OWNER = 'PUBLIC'
```

Understanding Oracle Default Schema Restrictions

When Oracle HTML DB installs, the Oracle HTML DB administrator does not have the ability to assign Oracle default schemas to workspaces. Default schemas (such as `SYS`, `SYSTEM`, and `RMAN`) are reserved by Oracle for various product features and for internal use. Access to a default schema can be a very powerful privilege. For example, a workspace with access to the default schema `SYSTEM` can run applications that parse as the `SYSTEM` user.

In order for an Oracle HTML DB administrator to have the ability to assign Oracle default schemas to workspaces, the database administrator (DBA) must explicitly grant the privilege using SQL*Plus to run a procedure within the `HTMLDB_SITE_ADMIN_PRIVS` package.

> **Note:** All schema and workspace names used as arguments to procedures in the `HTMLDB_SITE_ADMIN_PRIVS` package are used exactly as they are provided by the caller.
>
> For example, if you pass an argument value such as `p_schema =>'system'`, the lower-case schema name `'system'` will be recorded and referenced. This example could return unexpected results if you really meant to reference the common schema name SYSTEM, which would be referenced using upper case.

Topics in this section include:

- Granting the Privilege to Assign Oracle Default Schemas
- Revoking the Privilege to Assign Oracle Default Schemas
- Working with Restricted Schemas

Granting the Privilege to Assign Oracle Default Schemas

The DBA can grant an Oracle HTML DB administrator the ability to assign Oracle default schemas to workspaces by using SQL*Plus to run the `HTMLDB_SITE_ADMIN_`

`PRIVS.UNRESTRICT_SCHEMA` procedure from within the HTML DB engine schema. For example:

```
EXEC HTMLDB_SITE_ADMIN_PRIVS.UNRESTRICT_SCHEMA(p_schema => 'SYSTEM');
COMMIT:
```

This example would enable the Oracle HTML DB administrator to assign the SYSTEM schema to any workspace.

See Also: "Determining the HTML DB Engine Schema" on page 22-3

Revoking the Privilege to Assign Oracle Default Schemas

The DBA can revoke this privilege using SQL*Plus to run the `HTMLDB_SITE_ADMIN_PRIVS.RESTRICT_SCHEMA` procedure from within the HTML DB engine schema. For example:

```
EXEC HTMLDB_SITE_ADMIN_PRIVS.RESTRICT_SCHEMA(p_schema => 'SYSTEM');
COMMIT;
```

This example would prevent the Oracle HTML DB administrator from assigning the SYSTEM schema to any workspace. It does not, however, prevent workspaces that have already had the SYSTEM schema assigned to them from using the SYSTEM schema.

See Also: "Determining the HTML DB Engine Schema" on page 22-3

Working with Restricted Schemas

If a schema has been designated as restricted using the `RESTRICT_SCHEMA` procedure, the DBA can designate specific workspaces as exceptions by running the `HTMLDB_SITE_ADMIN_PRIVS.CREATE_EXCEPTION` procedure. For example:

```
EXEC HTMLDB_SITE_ADMIN_PRIVS.CREATE_EXCEPTION(p_schema => 'SYSTEM', p_schema =>
'DBA_WORKSPACE');
EXEC HTMLDB_SITE_ADMIN_PRIVS.CREATE_EXCEPTION(p_schema => 'SYSTEM', p_schema =>
'AUDITOR_WORKSPACE');
COMMIT:
```

This example would prevent the Oracle HTML DB administrator from assigning the SYSTEM schema to the workspace named AUDITOR_WORKSPACE. However this restriction only applies to workspace provisioning requests processed after the `REMOVE_EXCEPTION` procedure has been run. If the AUDITOR_WORKSPACE already had the SYSTEM schema assigned to it, this method would not prevent that workspace from continuing to use the schema.

Removing Workspace Exceptions for a Schema The DBA can remove all workspace exceptions for a schema by using SQL*Plus to run the `HTMLDB_SITE_ADMIN_PRIVS.REMOVE_WORKSPACE_EXCEPTIONS` procedure from within the HTML DB engine schema. For example:

```
EXEC HTMLDB_SITE_ADMIN_PRIVS.REMOVE_WORKSPACE_EXCEPTIONS(p_schema => 'SYSTEM');
COMMIT:
```

This example would prevent the Oracle HTML DB administrator from assigning the SYSTEM schema to any workspaces if the SYSTEM schema were already restricted, but had one or more exceptions previously created for it.

Removing Schema Exceptions for a Workspace The DBA can remove all schema exceptions for a workspace by using SQL*Plus to run the `REMOVE_SCHEMA_EXCEPTIONS` procedure from within the HTML DB engine schema. For example:

```
EXEC REMOVE_WORKSPACE_EXCEPTIONS(p_workspace => 'AUDITOR_WORKSPACE');
COMMIT:
```

This example would prevent the Oracle HTML DB administrator from assigning any restricted schemas to the workspace named AUDITOR_WORKSPACE if that workspace had exceptions previously created for it with respect to any restricted schemas.

Determining the Privilege Status

The DBA can determine the current status of the privilege by using SQL*Plus to run the `HTMLDB_SITE_ADMIN_PRIVS.REPORT` procedure. For example:

```
SET SERVEROUTPUT ON
EXEC HTMLDB_SITE_ADMIN_PRIVS.REPORT;
```

This example would display the text of a query that dumps the tables that defines the schema and workspace restrictions.

```
SELECT a.schema "SCHEMA",b.workspace_name "WORKSPACE" FROM WWV_FLOW_RESTRICTED_
SCHEMAS a, WWV_FLOW_RSCHEMA_EXCEPTIONS b WHERE b.schema_id (+)= a.id;
```

When reviewing the output of this query, remember the following:

- A schema name in the SCHEMA column indicates that the schema is restricted.
- Schemas that are not listed are not restricted and may be assigned to any workspace.
- A workspace name next to a schema name means that an exception exists for the schema for the named workspace.

You can run this query in SQL*Plus as shown above, or you can change it and format the output.

Managing Workspace to Schema Assignments

When a user logs into the Oracle HTML DB, they log in to a shared work area called a workspace. Each workspace can have multiple associated schemas. By associating a workspace with a schema, developers in that workspace can:

- Build applications that interact with the database objects in that schema.
- Create new database objects in that schema.

Viewing Workspace to Schema Assignments

To create a workspace manually:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Manage Workspace to Schema Assignments**.

   The Manage Workspace to Schema Assignments page appears.
4. To create a new workspace to schema assignment, click **Create** and follow the on-screen instructions.

5. To edit and existing workspace to schema assignment:
   a. Select the workspace name.

      The Edit Schema to Workspace Assignment page appears.
   b. Select a new workspace or schema.
   c. Click **Apply Changes**.

Provisioning Workspaces

When a user logs into the Oracle HTML DB they log in to a shared work area called a workspace. Each workspace is an area within the Oracle HTML DB development environment where multiple developers can create applications. Each workspace has a unique numeric ID and name. In order to make changes to their workspace, Workspace administrators submit change request to an Oracle HTML DB administrator. Only an Oracle HTML DB administrator can approve change requests or provision new workspaces.

Topics in this section include:

- About Workspace Provisioning
- Specifying a Provisioning Mode
- Creating a Workspace Manually
- Viewing Workspace Reports

See Also: "Managing Services" on page 12-8, "Viewing Workspace Reports" on page 22-8, and "Removing a Workspace" on page 22-17

About Workspace Provisioning

When an Oracle HTML DB administrator creates a new workspace with a new schema, a new tablespace and datafile are created for that schema. The datafile for the new tablespace is managed by Oracle-managed files if Oracle-managed files is enabled.

Oracle-managed files simplifies the administration of the Oracle database and eliminates the need for the database administrator (DBA) to directly manage the operating system files that comprise the database. Using Oracle-managed files the DBA specifies operations in terms of database objects rather than file names. The datafile for the any new tablespaces will be named according to the Oracle-managed files conventions and the placement of these files will be determined by the database initialization parameter `DB_CREATE_FILE_DEST`.

If the Oracle-Managed Files is not enabled, the datafile will be created in the same directory as the first datafile of the tablespace in which Oracle HTML DB was installed.

See Also: *Oracle Database Administrator's Guide* for information about Oracle-managed files

Specifying a Provisioning Mode

As an Oracle HTML DB administrator, you determine how the process of provisioning (or creating) a workspace works for your Oracle HTML DB development instance.

In **manual** provision mode, an Oracle HTML DB administrator creates new workspaces and notifies the Workspace administrator of the login information. In

request provision mode, users request workspaces directly in a self-service fashion. In this scenario, users use a link on the login page to access a request form. After the workspace request has been granted, users are automatically e-mailed the appropriate login information.

To specify a provisioning mode:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Under Self Service, select a provisioning status:
   - **Manual** - Oracle HTML DB administrator manually creates new workspaces and notifies the Workspace administrator of the login information.
   - **Request** - Users request workspaces directly in a self-service fashion.
5. If you select **Request** in the previous step, enter a URL in Development Service URL (optional).

   The value you enter will used in the e-mail when the request is approved. This setting defines the URL for the service. If this setting is not present, the URL will be derived from your environment.
6. Click **Apply Changes**.

Note: To enable users to request a workspace using a link on the login page, an Oracle HTML DB administrator must choose the provisioning status of **Request** as described in the previous procedure. If the provisioning status is set to **Manual**, no link will appear on the login page.

See Also: "Configuring Oracle HTML DB to Send Mail" on page 22-23 and "Managing Service Requests" on page 22-9

Creating a Workspace Manually

Oracle HTML DB administrators can provision a workspace manually by running the Create Workspace Wizard.

To create a workspace manually:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Create Workspace**.

   The Create Workspace Wizard appears.
4. Specify a workspace name and description and click **Next**.
5. Specify whether you are re-using an existing schema or creating a new one.

   If you are using an existing schema:

   a. Re-use existing schema, select **Yes**.

   b. Select a schema from the list and click **Next**.

If you creating a new schema:

a. Re-use existing schema, select **No**.

b. Enter a schema name and password.x

c. Specify a space quota and click **Next**.

6. Specify a Workspace administrator by providing a username, password, and e-mail address. Click **Next**.

7. Confirm your selections and click **Provision**.

Viewing Workspace Reports

Oracle HTML DB administrators can view detailed information about a specific workspace by viewing the Workspace Utilization Report.

To view a workspace report:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.

2. Click **Manage Workspaces**.

3. Select **Workspace Details**.

4. Select a workspace from the list and click **Go**.

   The Workspace Utilization Report appears. Table 22–1 describes the various sections of the Workspace Utilization Report.

Table 22–1 Workspace Utilization Report

Report	Description
Name	Displays high level information about the current workspace. **See Also:** "Managing Workspace to Schema Assignments" on page 22-5
Schemas	Displays the default tablespace associated with the workspace schema.
Tablespace Utilization	Displays the schema that utilizing space in a tablespace.
Applications	Lists all applications within the current workspace.
Developers	Lists all application developers within the current workspace.
HTML DB Users	Lists all defined users within the current workspace. **See Also:** "Managing Users in an Oracle HTML DB Instance" on page 22-13
Objects by Type	Lists objects used in the current workspace.
Change Requests	Lists all change requests in an Oracle HTML DB development instance. **See Also:** "Managing Change Requests" on page 22-11
User Activity	Lists user activity by date.
Developer Activity	Lists developer activity by developer name and application.

See Also: "Provisioning Workspaces" on page 22-6 and "Removing a Workspace" on page 22-17

Managing Service Requests

An Oracle HTML DB administrator is responsible for reviewing requests for new service. In order to manage service requests, you need to have selected the **Request** provisioning status. In **Request** mode, users request workspaces directly in a self-service fashion. For example, users could click a link on the login page to access a request form. Once the service request has been approved, each user is e-mailed the appropriate login information.

See Also: "Specifying a Provisioning Mode" on page 22-6

Topics in this section include:

- Viewing a Pending Service Request
- Approving or Declining a Pending Service Request
- Changing an Existing a Service Request
- Deleting a Service Request

Viewing a Pending Service Request

You can view existing service requests on the Notifications list on the Oracle HTML DB Administration Services home page or the Service Requests page.

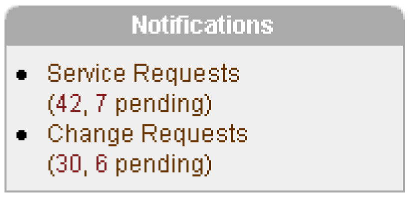
Topics in this section include:

- Viewing a Pending Service Request on the Notifications List
- Viewing Requests from the Service Requests Page

Viewing a Pending Service Request on the Notifications List

The Notifications list on the Oracle HTML DB Administration Services home page displays pending or approved service requests.

Figure 22–1 Notifications List


Notifications

- Service Requests (42, 7 pending)
- Change Requests (30, 6 pending)

This illustration shows the Notifications list located on the lower right side of the Administration home page. Each list items displays a summary of total and pending service and change requests. To view additional details, click the appropriate service request number.

Additional information about this illustration can be found in the surrounding text.

****

To view service requests on the Notifications list:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Locate the Notifications list.

   The Notifications list displays a summary of total and pending service requests.
3. To view additional details, click the appropriate service request number.

Viewing Requests from the Service Requests Page

To view service requests from the Service Requests page:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Service Requests**.

   The Service Requests page appears.
4. To filter the report, make a selection from the Status list and click **Go**.
5. To view request details, click the **Edit** icon associated with the appropriate request.

Approving or Declining a Pending Service Request

To approve or decline a pending service request:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Service Requests**.

   The Service Requests page appears.
4. From the Status list, select **Requested** and click **Go**.
5. Locate a request to review.
6. To view request details, click the **Edit** icon associated with the appropriate request.
7. Click **Provision** in the Actions column:
   - To approve the request, click **Approved**.
   - To decline the request, click **Declined**.

Changing an Existing a Service Request

To change an existing service request:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Service Requests**.

   The Service Requests page appears.
4. To filter the report, make a selection from the Status list and click **Go**.
5. Locate a request to review.
6. Click **Adjust** in the Actions column.

The Adjust Request page appears.

7. Select a new status from the Project Status list.
8. Click **Apply Changes**.

> **Note:** Be cautious when setting the Project Status to **Requested**. Although **Requested** enables you to reprovision a workspace, it could result in data corruption due to the manner in which accounts are provisioned. The provisioning system assumes Requested service requests do not have the corresponding schemas and dictionary entries for a workspace administrator or developers. If you need to change the Project Status for an **Approved** workspace to **Requested**, terminate the service first and then change the status to Requested.

Deleting a Service Request

To delete an existing service or change request:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Service Request**.
4. From Status, select the type of request you want to delete.
5. Click the **Edit** icon associated with the request you want to delete.
6. Click **Delete**.

Managing Change Requests

Oracle HTML DB administrators can modify a workspace (for example, add a new schema or increase the disk space limit) by approving a change request.

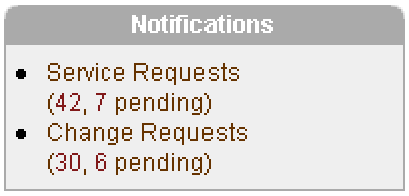
Topics in this section include:

- Viewing a Pending Change Request
- Approving or Declining a Pending Change Request

Viewing a Pending Change Request

You can view existing service requests and change requests from the Notifications list on the Oracle HTML DB Administration Services home page or from the Change Requests pages.

Figure 22–2 Notifications List


Notifications

- Service Requests (42, 7 pending)
- Change Requests (30, 6 pending)

This illustration shows the Notifications list located on the lower right side of the Administration home page. Each list items displays a summary of total and pending service and change requests. To view additional details, click the appropriate change request number.

Additional information about this illustration can be found in the surrounding text.

****

Topics in this section include:

- Viewing a Pending Change Request from the Notifications List
- Viewing a Change Request from the Workspace Utilization Report
- Viewing Requests from the Change Requests Page

Viewing a Pending Change Request from the Notifications List

To view change requests from the Notifications list:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Locate the Notifications list.

   The Notifications list displays a summary of total and pending change requests.
3. To view additional details, click the appropriate change request number.

   The appropriate Change Request page appears.

Viewing a Change Request from the Workspace Utilization Report

To view pending requests from the Workspace Utilization Report:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Workspace Details**.
4. Locate a workspace as follows:
   - To locate a specific workspace, type the workspace name in the Search field and click **Go**.
   - To view all workspaces, leave the Search field blank and click **Go**.
5. To view details about a specific workspace, click the **View** icon to the left of the workspace name.

   The Workspace Utilization Report appears.
6. Locate the section **Service Change Requests**.

Viewing Requests from the Change Requests Page

To view change requests from the Service Requests page:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service Requests**.
3. Select **Manage Change Requests**.
4. From Status, select the type of requests you want to view and click **Go**.

Approving or Declining a Pending Change Request

To approve or decline a pending change request:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Change Requests**.
4. Locate the request and click **View Request** under the Action column.

   The Process Change Request page appears.
5. Select one of the following:
   - To approve a request for a schema, click **Create Schema**.
   - To approve a request for additional disk space, click **Provision Space**.
   - To approve a request to terminate the service, click **Terminate Service**
   - To deny a request, click **Deny Request**.
   - To delete a request and deny it, select **Delete this request if denying?** and then click **Deny Request**.
6. Follow the on-screen instructions.

Managing Users in an Oracle HTML DB Instance

Oracle HTML DB administrators can manage all user accounts within an Oracle HTML DB instance on the Manage Application Developers and Users page. User accounts are particularly useful if a workspace utilizes HTML DB Authentication.

See Also:

- "Managing a Development Workspace" on page 12-1
- "About HTML DB Account Credentials" on page 13-18 for information about implementing HTML DB Authentication

Topics in this section include:

- Creating New User Accounts
- Editing an Existing User Account

Creating New User Accounts

To create a new user account:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Manage Developers and Users**.

   The Manage Application Developers and Users page appears.
4. Click **Create**.
5. Under User Attributes, enter the appropriate information. Fields marked with a red asterisk (*) are required.

6. Under Password, type a case-sensitive password for this account.
7. Under Developer Privileges, specify the developer's privileges:
   - **User is a developer** - These users can create and edit applications as well as view developer activity, session state, workspace activity, application, and schema reports.
   - **User is an administrator** - Workspace administrators additionally can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services as described in "Managing a Development Workspace" on page 12-1.
8. Click **Create** or **Create and Create Another**.

Editing an Existing User Account

To edit an existing user account:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Manage Developers and Users**.

   The Manage Application Developers and Users page appears.
4. Locate a user as follows:
   - To locate a specific user, type a username or partial string in the Find User field and click **Go**.
   - To view all users, leave the Find User field blank and click **Go**
5. To edit account details, select the user name.
6. Make the appropriate changes and click **Apply Changes**.

Managing Existing Workspaces

This section describes how to manage existing workspaces within an Oracle HTML DB instance.

Topics in this section include:

- About Purging Inactive Workspaces
- Identifying Inactive Workspaces
- Removing the Resources Associated with Inactive Workspaces
- Deleting Inactive Workspaces
- Removing a Workspace
- Exporting and Importing a Workspace

About Purging Inactive Workspaces

If you are managing a large hosted Oracle HTML DB instance, periodically purging inactive workspaces can free up resources for other users. The process of purging inactive workspaces consists of the following steps:

- Identify inactive workspaces

- Remove the resources associated with each inactive workspace
- Delete the inactive workspaces

Identifying Inactive Workspaces

The first step in determining if a workspace is inactive is to establish some basic rules. A common approach is to base the rules on the Oracle HTML DB activity records found in the current HTML DB engine schema.

See Also: "Determining the HTML DB Engine Schema" on page 22-3

The following DDL (data definition language) creates a table of all workspaces requested before June 28, 2004 but that have been inactive since June 10, 2004. In this example, inactivity is determined by checking a key within the HTML DB engine schema for the most recent updates by each workspace.

```
CREATE TABLE ws_to_purge AS
 SELECT c.security_group_id, c.company_name, c.admin_email, c.request_date,
 SYSDATE last_updated_on, 'Y' ok_to_delete
   FROM wwv_flow_provision_company c
  WHERE
c.request_date <= to_date('20040628','YYYYMMDD') AND
     (  not exists
 (SELECT NULL /* Activity Log */
        FROM wwv_flow_activity_log l
       WHERE l.security_group_id = c.security_group_id
         AND l.time_stamp > to_date('20040610','YYYYMMDD'))
 )
    AND NOT EXISTS
     (SELECT NULL /* workspace applications */
        FROM wwv_flows f
       WHERE f.security_group_id = c.security_group_id
         AND f.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Pages */
        FROM wwv_flow_steps s
       WHERE s.security_group_id = c.security_group_id
         AND s.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Regions */
        FROM wwv_flow_page_plugs p
       WHERE p.security_group_id = c.security_group_id
         AND p.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Items */
        FROM wwv_flow_step_items i
       WHERE i.security_group_id = c.security_group_id
         AND i.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Templates */
        FROM wwv_flow_templates t
       WHERE t.security_group_id = c.security_group_id
         AND t.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Files uploaded */
        FROM wwv_flow_file_objects$ o
       WHERE o.security_group_id = c.security_group_id
         AND o.created_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
```

```
(SELECT NULL /* SQL Workshop history */
   FROM wwv_flow_sw_sql_cmds s
  WHERE s.security_group_id = c.security_group_id
    AND s.created_on > to_date('20040610','YYYYMMDD'));
```

After you identify inactive workspaces, you can purge them. Purging inactive workspaces is a two step process:

- First, remove the resources (that is, the database schemas, tablespaces, and data files) associated with each inactive workspace
- Second, drop the inactive workspaces from Oracle HTML DB

Removing the Resources Associated with Inactive Workspaces

After you have identified inactive workspaces in a single table, the next step is to remove them.

Note: Before removing the schemas, tablespaces, or data files associated with inactive workspaces, make sure these resources are not being used in by any other workspace or application

To remove the resources associated with inactive workspaces:

1. Identify the schemas used by the workspaces to be deleted by joining the table containing the identified inactive workspaces to `wwv_flow_company_schemas`.
2. Drop the schemas, tablespaces, and data files used exclusively by the inactive workspaces from the database. You can identify the schemas to drop by running a query similar to the following.

```
SELECT s.schema
  FROM ws_to_purge ws,
       wwv_flow_company_schemas s
WHERE s.security_group_id = ws.security_group_id
   AND ws.ok_to_delete = 'Y';
```

Deleting Inactive Workspaces

Once you remove the resources associated with an inactive workspace, you can delete it. You can delete inactive workspaces manually using the Oracle HTML DB Administration Services application. Or, you can delete them programmatically as shown in the following PL/SQL example.

```
BEGIN
     FOR c1 IN (SELECT security_group_id
                 FROM ws_to_purge
                 WHERE ok_to_delete = 'Y')
     LOOP
         WWV_FLOW_PROVISIONING.TERMINATE_SERVICE_BY_SGID(c1.security_group_id);
     END LOOP;
 END;
```

Removing a Workspace

Removing a workspace does not remove any of the associated database objects. To remove the associated schemas, a database administrator (DBA) must use a standard database administration tool such as Oracle Enterprise Manager or SQL*Plus.

Sees Also:

- *Oracle Enterprise Manager Administrator's Guide*
- *SQL*Plus User's Guide and Reference*
- "Viewing Workspace Reports" on page 22-8
- "Provisioning Workspaces" on page 22-6

To remove a workspace:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Remove Workspace**.
4. Select a workspace name and click **Next**.
5. Follow the on-screen instructions.

Exporting and Importing a Workspace

To move a workspace and all associated users to a new Oracle HTML DB instance, you must export the workspace. When you export a workspace, Oracle HTML DB generates a text file. This file contains information about your workspace, all the users in your workspace, and any groups in your workspace (if applicable). You can use this file to import your workspace into another Oracle HTML DB instance.

Keep in mind, this method only imports workspace, users, and groups. This file does not contain:

- The schemas associated with this workspace, or the objects in those schemas.
- Any applications, images, cascading style sheets and static text files.

All of these items must be exported separately.

See Also:

- "How to Deploy an Application to Another Oracle HTML DB Instance" on page 11-4
- "About Managing Database Objects" on page 11-4
- "Using Custom Cascading Style Sheets" on page 7-43

To export a workspace:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Export Workspace**.
4. Select a workspace name and click **Export Workspace**.

5. To export the selected workspace, click **Save File**.
6. Follow the on-screen instructions.

To import a workspace:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Workspaces**.
3. Select **Import Workspace**.
4. Select a workspace name and click **Next**.
5. To install the workspace, click **Install**.
6. Follow the on-screen instructions.

Managing Logs

Oracle HTML DB administrators can manage the following log files on the Manage Logs and Files page:

- SQL Workshop logs
- Page View Activity logs
- Developer activity logs
- External click counting log

Topics in this section include:

- Deleting SQL Workshop Logs
- Deleting Page View Activity Log Entries
- Deleting Developer Activity Log Entries
- Deleting Click Counting Log Entries
- Deleting the HTML DB Mail Log Entries

Deleting SQL Workshop Logs

The SQL Workshop logs maintain a history of recent commands and scripts run in the SQL Command Processor.

To delete log files entries:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **SQL Workshop logs**.
5. Select one of the following:
   - Script File executions log entries
   - SQL Command Processor history entries
6. To delete entries by age:

- Specify the age of the entries to deleted.
- Click **Delete Entries**.

7. To delete all entries, click **Truncate Log**.

See Also: "Accessing a Command from Command History" on page 20-7

Deleting Page View Activity Log Entries

Page view activity logs track user activity for an application. Developers enable logging within their application on the Edit Application Attributes page.

The HTML DB engine actually uses two logs to track user activity. At any given time, one log is designated as current. For each rendered page view, the HTML DB engine inserts one row into the log file. A log switch occurs at the interval listed on the Manage Activity Logs page. At that point, the HTML DB engine removes all entries in the noncurrent log and designates it as current.

To truncate the activity logs manually:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **Page View Activity Log, with option to truncate**.
5. Click **Truncate Logs**.
6. Click either **Truncate Log 1** or **Truncate Log 2**.

See Also:

- "Name" on page 5-7 for information about enabling logging
- "Monitoring Activity" on page 12-3

Deleting Developer Activity Log Entries

The Developer Activity Log tracks changes to applications within an individual workspace. Log entries older than one month are automatically deleted.

To delete Developer Activity Log entries:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **Developer Activity Logs, with option to delete entries**.
5. On the Developer Activity Logs page, click **Manage**.
6. Specify the age of the entries to be deleted and click **Delete Entries**.

See Also: "Viewing Application Changes by Developer" on page 12-3 for information about the Developer Activity Log

Deleting Click Counting Log Entries

The External Clicks Log counts clicks from an Oracle HTML DB application to an external site. You can implement this functionality using `COUNT_CLICK` procedure.

See Also: "COUNT_CLICK Procedure" on page 16-4

To delete click counting log entries:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **External Click Counting Log, with option to truncate**.
5. On the Click Counting Log page, click **Manage**.
6. Specify the age of the entries to be deleted and click **Delete Entries**.

Deleting the HTML DB Mail Log Entries

The HTML DB Mail Log records message header information and send date of successfully sent mail message.

See Also: "Managing E-mail" on page 22-28

To truncate the mail log:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **Mail Log**.
5. On the Manage Mail Log page, click **Truncate Log**.

Managing Session State

A session is a logical construct that is used to establish persistence (or stateful behavior) across page views. Each session is assigned a unique ID which the HTML DB engine uses to store and retrieve an application's working set of data (or session state) before and after each page view. An automatic process clears sessions older than 24 hours every eight hours. As an Oracle HTML DB administrator, you can also purge them manually.

An Oracle HTML DB administrator can view session state statistics and purge session state on the Session State page.

Topics in this section include:

- Purging Sessions by Age
- Viewing Session Details Before Purging
- Viewing Session Statistics Before Purging

See Also: "Understanding Session State Management" on page 4-8

Purging Sessions by Age

Using the Purge Session page, administrators can purge sessions by age.

To view specific session details:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Session State**.
4. Select **Purge Sessions by age**.
5. On the Purge Session page, specify:
   - The maximum number of sessions to be purged
   - The age of session to be purged
6. To view a report of session statistics, click **Count Sessions**.
7. To purge the selected sessions, click **Purge Sessions**.

Viewing Session Details Before Purging

Before purging sessions, administrators can use the Recent Sessions page to first view a listing of recent sessions and then drill down on session details.

To purge sessions by age:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Session State**.
4. Select **Recent Sessions, with drill down to session details**.
5. On the Recent Sessions page, you can:
   - Click a session ID to view additional details.
   - Click **Purge Session** to delete the displayed sessions.

Viewing Session Statistics Before Purging

On the Session State Statistics page, administrators can view statistics about current sessions prior to purging.

To view session state statistics:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.

3. Select **Manage Session State**.
4. Select **Session State Statistics**.
5. Click **Purge Sessions** to delete the current sessions.

Monitoring Activities

Oracle HTML DB administrators can monitor user activity by accessing a number of charts and reports on the Monitoring page. You can use the Monitor Activity page to view activity of all workspaces within the current Oracle HTML DB instance.

To monitor user activity:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Monitor Activity**.
3. Select a chart or report to review.

Managing Environment Settings

Environment settings control HTML DB configuration and apply to all workspaces within the current Oracle HTML DB instance.

Topics in this section include:

- Viewing Current Environment Settings
- Controlling PL/SQL Program Unit Editing
- Including Demonstration Applications in a New Workspace
- Configuring Oracle HTML DB to Send Mail
- Configuring SQL Workshop
- Enabling Database Monitoring
- Configuring Security Settings

See Also: "Specifying a Provisioning Mode" on page 22-6

Viewing Current Environment Settings

To view existing environment settings:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Scroll down to the bottom of the page and select Settings.

   The current selected settings appears

Controlling PL/SQL Program Unit Editing

By default, developers can change and compile PL/SQL source code when browsing database procedures, packages, and functions in Object Browser. You can control

PL/SQL program unit editing for an entire workspace by making a selection from Allow PL/SQL Program Unit Editing.

To disable PL/SQL program unit editing:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Locate the section Application Development.
5. From Allow PL/SQL Program Unit Editing, select **No**.
6. Click **Apply Changes**.

> **See Also:** "Disabling PL/SQL Program Unit Editing" on page 12-12 for information about disabling PL/SQL program unit editing for a specific workspace

Including Demonstration Applications in a New Workspace

When you create a new workspace, Oracle HTML DB automatically creates demonstration applications within the workspace.

To disable the creation of demonstration applications:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Locate the section Application Development.
5. From Create demonstration objects in new workspaces, select **No**.
6. Click **Apply Changes**.

Configuring Oracle HTML DB to Send Mail

To enable users to request a workspace or reset their passwords using links on the login page, you must configure Oracle HTML DB to send mail. In order to enable Oracle HTML DB to send mail, you must configure a number of settings on the Environment Preferences page.

> **See Also:** "Specifying a Provisioning Mode" on page 22-6 and "Configuring Oracle HTML DB to Send Mail" on page 22-23

To configure Oracle HTML DB to send mail:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Under Email, enter the following:

   a. **SMTP Host Address** - Defines the server address of the SMTP server. On installation, this will be set to localhost. If you are using another server as an SMTP relay, change localhost to that server's address.
   b. **SMTP Host Port** - Defines the port the SMTP server listens to for mail requests. By default, this setting will be set to 25 at the time of installation.
   c. **Administration Email Address** - Defines the "from" address for administrative tasks such as approving a provision request, or resetting a password generates an e-mail.

5. Click **Apply Changes**.

Configuring SQL Workshop

Use the attributes under SQL Workshop to configure basic SQL Workshop behavior.

To configure SQL Workshop:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Under SQL Workshop, enter the attributes described in Table 22–2.

Table 22–2 SQL Workshop Attributes

Attribute	Description
SQL Commands Maximum Inactivity in minutes	Identify the maximum amount of time a transactional command in the SQL Command Processor waits before timing out.
SQL Scripts Maximum Script Output Size in bytes	Identify the maximum amount of output a single SQL script can generate. SQL scripts are run from the SQL Workshop.
SQL Scripts Maximum Workspace Output Size in bytes	Identify the maximum amount of space all scripts within a workspace may consume. SQL script results are the output generated when running SQL scripts from the Script Editor or from the SQL Scripts home page.
SQL Scripts Maximum Script Size in bytes	Identify the maximum size of a SQL script used within the SQL Workshop.
Enable Transactional SQL Commands	Select **Yes** to enable transactional SQL commands for the entire Oracle HTML DB instance. Enabling this feature permits SQL Command Processor users to issue multiple SQL commands within the same physical database transaction. When you select **Yes**, an Autocommit check box appears on the SQL Command Processor page. By default, this option is set to **No**.

5. Click **Apply Changes**.

Enabling Database Monitoring

The Database Monitoring page contains a variety of reports that describe the activity, storage, and configuration of the current database instance. Once enabled, only users having a database user account that has been granted a DBA role can access the Database Monitor page.

Before you can access the Database Monitoring page, you must enable database monitoring on Manage Environment Settings page.

To enable database monitoring:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. From Enable Database Monitoring, select **Yes**.
5. Click **Apply Changes**.

Note: Only users having a database user account that has been granted a DBA role can access the Database Monitor page.

Configuring Security Settings

Use the Security section of the Manage Environment Settings page to disable administrator and workspace login as well as restrict user access by IP address.

Topics in this section include:

- Disabling Access to Oracle HTML DB Administration Services
- Disabling Access to Oracle HTML DB Internal Applications
- Restricting User Access by IP Address

Disabling Access to Oracle HTML DB Administration Services

Oracle HTML DB administrators can restrict user access to Oracle HTML DB Administration Services by selecting **Yes** from Disable Administrator Login. Selecting **Yes** prevents unauthorized users from logging in to Oracle HTML DB Administration Services and possibly compromising user login credentials.

To disable user access to Oracle HTML DB Administration Services:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Scroll down to **Security**.
5. From Disable Administrator Login, select **Yes**.

Setting this value and logging out, prevents anyone from logging in to Oracle HTML DB Administration Services.

To reverse this setting, connect in SQL*Plus as the HTML DB engine schema and execute the following:

```
BEGIN
    WWV_FLOW_API.SET_SECURITY_GROUP_ID(p_security_group_id=>10);
    WWV_FLOW_PLATFORM.SET_PREFERENCE(
        p_preference_name => 'DISABLE_ADMIN_LOGIN',
        p_preference_value => 'N' );
end;
/
```

```
commit
/
```

Disabling Access to Oracle HTML DB Internal Applications

The applications that comprise Oracle HTML DB (such as, Application Builder and SQL Workshop) exist within a workspace named Internal. To restrict user access to Internal applications, select **Yes** from Disable Workspace Login. Selecting **Yes** in production environments prevents unauthorized users from running applications in the Internal workspace (such as, Application Builder and SQL Workshop) and possibly compromising login credentials. Administrators who use this feature should also consider disabling user access to Oracle HTML DB Administration Services.

> **See Also:** "Disabling Access to Oracle HTML DB Administration Services" on page 22-25

To disable user access to the Internal workspace:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Scroll down to **Security**.
5. From Disable Workspace Login, select **Yes**.

   Selecting **Yes**, prevents users for logging in to the Internal workspace.
6. Click **Apply Changes**.

Restricting User Access by IP Address

Oracle HTML DB administrators can restrict user access to an Oracle HTML DB instance by creating a Runtime setting named `RESTRICT_IP_RANGE`.

To restrict user access by IP address:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Environment Settings**.
4. Scroll down to **Security**.
5. From Disable Administrator Login, select **No**.
6. In Restrict Access by IP Address, enter a comma-delimited list of IP addresses. Use an asterisk (*) to specify a wildcard.

   You can enter IP addresses from one to four levels. For example:

   ```
   141, 141.* ...
   192.128.23.1 ...
   ```

> **Note:** When using wildcards, do not include additional numeric values after wildcard characters. For example, `138.*.41.2`.

7. Click **Apply Changes**.

Managing Applications

Use the Manage Applications page to change the Build Status of an application or view application reports.

Topics in this section include:

- Changing Application Build Status
- Viewing the Application Attributes Report
- Viewing the Parse As Schemas by Application Report

Changing Application Build Status

Every Oracle HTML DB application has an application-level attribute called Build Status. You can use this attribute to prevent an application from being modified by other developers. Build Status has two settings:

- **Run and Build Application** - Developers can both run and edit an application
- **Run Application Only** - Developers can only run an application

Setting the Build Status to **Run Application Only** is an effective way to prevent other developers from modifying it. You can change the Build Status by:

- Changing the Build Status attribute on the Edit Application Attributes page. See "Availability" on page 5-8.
- Changing the Build Status during the deployment process. See "How to Deploy an Application to Another Oracle HTML DB Instance" on page 11-4.

Deploying an application from one Oracle HTML DB instance to another is a four step process:

1. Move any supporting database objects (if appropriate).
2. Export the application definition and all related files
3. Import the exported files into the target Oracle HTML DB instance.

   Note that if the target instance is a different schema, you also need to export and import any required database objects.
4. Install the exported files from Export Repository

During steps 1 and 2, you have the option of setting the Build Status to **Run Application Only**. Be aware that if you set the Build Status to **Run Application Only** during deployment, you can only change it in Oracle HTML DB Administration Services.

To change a Build Status set during deployment:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Applications**.
3. Select **Build Status**.

   The Build Status page appears.
4. Locate an application by making selections from the Build Status, Workspace, and Application lists and clicking **Go**.

5. Click the **Edit** icon adjacent to the appropriate application.

   The Edit Build Status page appears.

6. Select an alternate build status and click **Apply Changes**.

Viewing the Application Attributes Report

Oracle HTML DB administrators can view applications by workspace on the Application Attributes page.

To view the Application Attributes page:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Applications**.
3. Select **Application Attributes**.

   The Application Attributes page appears.

4. Filter the display by making selections from the Display, Application, and Workspace lists and clicking **Go**.
5. To sort by column, select a column heading.

Viewing the Parse As Schemas by Application Report

To change a Build Status set during deployment:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Applications**.
3. Select **Parse as Schemas**.

   The Parse As Schemas page appears.

4. Filter the display by making selections from the Parse As, Application, and Workspace lists and clicking **Go**.

Managing E-mail

Oracle HTML DB administrators can manage e-mail sent from an application by accessing the HTML DB Mail Queue and HTML DB Mail Log.

See Also: "Sending E-mail from an Application" on page 14-1

Topics in this section include:

- Viewing the Mail Queue
- Viewing the HTML DB Mail Log

Viewing the Mail Queue

Oracle HTML DB administrators can use the Manage Mail Queue page to monitor e-mail messages in the mail queue.

To monitor messages in the mail queue:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Mail Queue**.

   The Manage Mail Queue page appears.
4. To send e-mail messages, click **Send All Mail**.
5. To delete e-mail messages, select the messages to be deleted and click **Delete**.

Viewing the HTML DB Mail Log

The HTML DB Mail Log records message header information and send date of successfully sent mail message.

To view the mail log:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Logs**.

   The Manage Logs page appears.
4. Select **Mail log**.
5. To control the number of rows that display, make a selection from the Display list and click **Go**.
6. To delete all log entries, click **Truncate Log**.

Creating a Site-Specific Tasks List

The Site-Specific Tasks list is a list of links which displays on the Workspace home page. If links are defined, a Site-Specific Tasks region appears. If no Site-Specific Tasks are defined, the region will not display. This feature enables Oracle HTML DB administrators the ability to customize the Workspace home page. Typical uses for the Site-Specific Tasks list include links to training, discussion forums, and user feedback applications.

Topics in this section include:

- Adding a New Task
- Editing an Existing Task
- Deleting a Task

Adding a New Task

To add new task to a Site-Specific Tasks lists:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Site-Specific Task Lists**.

   The Site-Specific Tasks page appears.

4. To create a new link, click **Create**.
5. On the Site-Specific Tasks page you can specify the following:
   a. **Display Sequence** - Indicate the relative order of this task within the list.
   b. **Display Location** - Indicate the page on which the task should display (that is, the Workspace Login page or Workspace home page).
   c. **Task Name** - Enter a name for this task.
   d. **Tasks Link** - Enter the link target for this task using either a relative URL (for example, using `f?p` syntax) or an absolute URL (such as `http://otn.oracle.com`).
   e. **Displayed** - Determines whether a task or link displays. Select **Yes** to enable display, or select **No** to disable display.

   See Also: "Using f?p Syntax to Link Pages" on page 4-15

6. Click **Create**.

Editing an Existing Task

To edit an existing task:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Site-Specific Task Lists**.

   The Site-Specific Tasks page appears.
4. Select the task name.
5. On the Site-Specific Tasks page, edit the appropriate attributes.
6. Click **Apply Changes**.

Deleting a Task

To delete an existing task:

1. Log in to Oracle HTML DB Administration Services. See "Logging in to Oracle HTML DB Administration Services" on page 22-2.
2. Click **Manage Service**.
3. Select **Manage Site-Specific Task Lists**.

   The Site-Specific Tasks page appears.
4. Select the task name.
5. Click **Delete**.

A Available Conditions

A condition is a small unit of logic that helps you control the display of regions, items, buttons, and tabs as well execute processes, computations and validations. When you apply a condition to a control or component, the condition is evaluated. Whether a condition passes or fails determines whether a control or component displays, or page processing executes.

You can specify conditions by selecting a condition type when you create the control (region, button, or item) or component (tab, list, or navigation bar), or by making a selection under the Condition attribute.

> **See Also:** "Understanding Conditional Rendering and Processing" on page 4-6

Conditions Available in Oracle HTML DB

The following table describes some Oracle HTML DB conditions. To view a complete listing of all available conditions for a given control or component, click the View icon to the right of the Condition Type list. Shortcuts to common selections appear directly beneath the Type list. If your condition requires an expression, type it in the appropriate field.

Table A–1 describes the conditions available in Oracle HTML DB.

Table A–1 Available Conditions

Condition	Description
Always	Always returns true. Used primarily for the read-only conditions of a page item
Current Language != Expression 1	Verifies the language setting in which the client browser is not currently running. Evaluates to true if the current language is contained within the string entered in Expression 1.
Current Language = Expression	Verifies the language setting in which the client browser is currently running. Evaluates to true if the current language matches the value entered in Expression 1.
Current Language is contained within Expression 1	Determines whether the browser current language is contained within a string. Evaluates to true if the current language matches the string entered in Expression 1. For example, to check if the current language is either en-US or en-GB, choose this condition and enter the following string in Expression 1: `en-us,en-gb`
Current Language is not contained within Expression 1	Verifies the application's current language is not contained within a specified string. Evaluates to true if the current language is not contained within the string entered in Expression 1.
Current page != Expression 1	Evaluates to true if the current page does not equal the page you specify in Expression 1.

Table A–1 (Cont.) Available Conditions

Condition	**Description**
Current Page != Page Submitted (this page was not the page posted)	Determines if the specified page was not posted. Evaluates to true if the current page does not match the value entered in Expression 1.
Current page = Expression 1	Evaluates to true if the current page equals the page you specify in Expression 1.
Current Page = Page Submitted (this page was posted)	Verifies the whether the specified page was posted. Evaluates to true if the current page matches the value entered in Expression 1.
Current Page is contained within Expression 1 (comma-delimited list of pages)	Verifies if the current page is part of the list of pages you specify in Expression 1. To check if the current page is in either page 1, 2, 3 or 4, select this condition type and enter the following string in Expression 1: `1,2,3,4`
Current page is in Printer Friendly mode	Only displays certain page control or components when the user has selected printer friendly mode. If the current page is in printer friendly mode, then the condition evaluates to true. Use `f?p` syntax to specify printer friendly mode.
Current page is not in Printer Friendly mode	Hides page controls or components when printer friendly mode is selected. Use `f?p` syntax to specify printer friendly mode. **See Also:** "Using f?p Syntax to Link Pages" on page 4-15 for information about `f?p` syntax
Current Page not in Expression 1 (comma-delimited list of pages)	Verifies if the current page is not part of the comma separated list of pages specified in Expression 1.
Exists (SQL query returns at least one row)	This condition is expressed as a SQL query. If the query returns at least one row then the condition evaluates as true. For example: `select 1 from emp where deptno = :P101_DEPTNO` This example references item `P101_DEPTNO` as a bind variable. You can use bind variables a within an application processes and SQL query regions to reference item session state. If one or more employees are in the department identified by the value of `P101_DEPTNO` then the condition evaluates as true. **See Also:** "About Bind Variables" on page 4-13 for information about bind variables
Never	This condition type is hard wired to always fail. It is useful in temporarily preventing controls or components (such as regions, buttons, or items) from being rendered on a page, or to prevent processes, computations and validations from running.
NOT Exists (SQL query returns no rows)	This condition is expressed as a SQL query. If the query does not return any rows, it evaluates as true.
PLSQL Expression	A PL/SQL expression is any expression in valid PL/SQL syntax that evaluates to true or false. For example: `nvl(:MY_FLOW_ITEM,'NO') = 'YES'` If the value of `MY_FLOW_ITEM` is YES then the condition evaluates as true. Otherwise it evaluates as false.
PLSQL Function Body returning a Boolean	The body of a PL/SQL function that returns true or false. For example: `BEGIN` `IF :P1_DAY = 'MONDAY' THEN` `RETURN TRUE;` `ELSE` `RETURN FALSE;` `END IF:` `END;`

Table A–1 (Cont.) Available Conditions

Condition	Description
Request != Expression 1	`REQUEST` is an internal attribute that tracks of how a page is submitted. By default, when a page is submitted, the value of the application attribute `REQUEST` is set according the name of the object that caused the page to be submitted. For a regular button, `REQUEST` is set as the name of the button (such as CANCEL or SAVE) not the label of the button. You can also set request using `f?p` syntax. For example, the event could be when a user clicks a button or selects a tab menu. Depending upon the event, you can perform different operations by referencing the value of the `REQUEST` application attribute. This condition evaluates as true if `REQUEST` does not equal the value entered in Expression 1. **See Also:** "Understanding URL Syntax" on page 4-14, "REQUEST" on page 4-25, and "Understanding the Relationship Between Button Names and REQUEST" on page 6-50
Request = Expression 1	This condition is the opposite of `Request != Expression 1`. This condition evaluates as true if `REQUEST` equals the value entered in Expression 1. From PL/SQL you can also reference the application attribute using the following syntax: `V('REQUEST')` **See Also:** "Understanding URL Syntax" on page 4-14, "REQUEST" on page 4-25, and "Understanding the Relationship Between Button Names and REQUEST" on page 6-50
Request is contained within Expression 1	`REQUEST` is an internal application attribute that tracks of how a page is submitted. By default, when a page is submitted, the value of `REQUEST` is set according to the event that caused the page to be submitted. For example, the event could be when a user clicks a button or selects a tab. Depending upon the event, you can perform different operations by referencing the value of the `REQUEST` application attribute. Use this condition to specify a list of allowed requests (such as SAVE or UPDATE) in Expression 1. The condition evaluates to true if the value of `REQUEST` is contained in the list. **See Also:** "REQUEST" on page 4-25, and "Understanding the Relationship Between Button Names and REQUEST" on page 6-50
Request is not contained within Expression 1	This condition is the opposite of `Request is contained within Expression 1`. Evaluates to true if the value of the `REQUEST` is not contained within Expression 1. **See Also:** "REQUEST" on page 4-25, and "Understanding the Relationship Between Button Names and REQUEST" on page 6-50
SQL Expression	SQL Expressions are evaluated as a WHERE clause in a SQL statement. For example suppose your expression is `:MY_ITEM = 'ABC'`. The HTML DB engine processes the following: `select 1 from dual where :MY_ITEM = 'ABC'` This condition evaluates to true if a row is returned.
SQL Reports (OK to show the back button)	Use this condition for reports having pagination. It automatically determines when it is appropriate to include a button that pages back in the result set.
SQL Reports (OK to show the forward button)	Use this condition for reports having pagination. It automatically determines when it is appropriate to include a button that pages forward in the result set.
Text in Expression 1 != Expression 2 (includes &amp;ITEM substitutions)	Use this expression to compare two expressions containing strings. Either expression may contain references to session state using `&MY_ITEM` syntax. **See Also:** "Using Substitution Strings" on page 4-16 for information about `&MY_ITEM` syntax

Table A–1 (Cont.) Available Conditions

Condition	Description
Text in Expression 1 = Expression 2 (includes &amp;ITEM substitutions)	This condition is the opposite of `Text in Expression 1 != Expression 2` (includes `&amp;ITEM` substitutions). Compares two expressions containing strings. Either expression may contain references to session state using the `&ITEM.` syntax. To check if the item `F100_P2_DAY_DATE` equals "Wednesday", select this condition enter the following in Expression 1 and Expression 2: ■ Expression 1: `F100_P2_DAY_DATE` ■ Expression 2: `Wednesday` **See Also:** "Using Substitution Strings" on page 4-16 for information about `&MY_ITEM` syntax
User is authenticated (not public)	Verifies whether the current user was authenticated using one of the built-in authentication schemes or a custom authentication scheme. **See Also:** "Establishing User Identity Through Authentication" on page 13-13 for information about authentication
User is the public user (user has not authenticated)	The public user is defined as an application attribute. To set the public user for a specific application, navigate to the Application Builder home page and click the edit link corresponding to your application. A public user is a user used for multiple users. Sometimes applications have pages that are public and thus require authentication and log in. This condition returns true if the user is the public user (that is, the user is authenticated as themselves or some other user not equal to the public user identified in the application attribute Public User. **See Also:** "Authentication" on page 5-12 for information about Public User
Value of Item in Expression 1 != zero	Verifies if the value of the item in Expression 1 does not equal zero.
Value of item in Expression 1 = Expression 2	Compares the value of an item with a specific string. Comparisons using this condition are case-sensitive. For example, to verify whether the value of an item `F100_P2_WORD` is contained within the string "the quick brown fox", enter the following in the Expression 1 and Expression 2 fields: ■ Expression 1: `F100_P2_WORD` ■ Expression 2: `the quick brown fox`
Value of Item in Expression 1 = zero	Verifies if the value of the item in Expression 1 does equal zero.
Value of item in Expression 1 contains no spaces	Evaluate to true if the value of the item specified in Expression 1 contains no spaces.
Value of Item in Expression 1 is alphanumeric	Evaluates to true when the string in Expression 1 contains only alphanumeric characters.
Value of Item in Expression 1 is contained within colon-delimited list in Expression 2	Use this condition type to check whether a certain string is contained within the value of a session state item. Verifies whether the string specified in Expression 1 is contained in the value of the item specified in Expression 2.
Value of Item in Expression 1 is NOT contained within colon-delimited list in Expression 2	Evaluates to true when the value specified in Expression 1 contains a string that lists elements delimited by colons. To check if the item `P1_TODAY` is either "Monday", "Tuesday", or "Wednesday", select this condition and enter the following in Expression 1 and Expression 2: ■ Expression 1: `P1_TODAY` ■ Expression 2: `Monday: Tuesday:Wednesday`
Value of Item in Expression 1 is NOT NULL	In Expression 1, enter the name (uppercase) of the application or page item. Evaluates as true, if the current cache value of the item is not null and has a value. If not, the condition evaluates as false.
Value of Item in Expression 1 is NULL	Evaluates as true if the item in Expression 1 has no value.
Value of Item in Expression 1 is NULL or zero	Evaluates as true if the item in Expression is either NULL or zero.
Value of item in Expression 1 is numeric	Evaluates to true if the value of the Item in Expression 1 is numeric.
Value of user preference in Expression 1 != Expression 2	This condition is the opposite of `Value of user preference in Expression 1 = Expression 2`. Evaluates to true if the name of the user preference specified in Expression 1 is not equal to the string in Expression 2.

Table A–1 (Cont.) Available Conditions

Condition	Description
Value of user preference in Expression 1 = Expression 2	Verifies the value of a user preferences. Evaluates to true if the name of the user preference specified in Expression 1 is equal to the string in Expression 2.
When any item in comma-delimited list of items has changed	Evaluates to true when the value of any nonnull session state item in the list of items specified in Expression 1 has changed.
When any item in comma-delimited list of pages has changed	Evaluates to true when the value of any nonnull session state item in the list of pages specified in Expression 1 has changed.
When any item in current application has changed	This condition passes when the value of any nonnull session state item in the current application has changed.
When any item in current page has changed	Evaluate to true when the value of any nonnull session state item in the current page has changed.
When any item in current session has changed	Evaluates to true when the value of any nonnull session state item in the current session has changed.
When cgi_env DAD_NAME != Expression 1	This condition is the opposite of `When cgi_env DAD_NAME = Expression 1`. Checks for the data access descriptor (DAD) that is being used in the URL to call the current page in the application and compares it to Expression 1. Evaluate to true, when the DAD is not the same as Expression 1.
When cgi_env DAD_NAME = Expression 1	Checks for the data access descriptor (DAD) that is being used in the URL to call the current page in the application and compares it to Expression 1. Evaluate to true, when the DAD is the same as Expression 1.
When cgi_env HTTP_HOST != Expression 1	This condition is the opposite of `When cgi_env HTTP_HOST = Expression 1`. Checks for the value of the common gateway interface (CGI) environment variable `HTTP_HOST` that is the value returned by `owa_util.get_cgi_env ('HTTP_HOST')`. Evaluate to true, when this value is not equal to the string in Expression 1.
When cgi_env HTTP_HOST = Expression 1	Checks for the value of the common gateway interface (CGI) environment variable `HTTP_HOST` that is the value returned by `owa_util.get_cgi_env ('HTTP_HOST')`. Evaluate to true, when this value is equal to the string in Expression 1.
When cgi_env SERVER_NAME != Expression 1	This condition is the opposite of `When cgi_env SERVER_NAME = Expression 1`. This condition checks for the value of the common gateway interface (CGI) environment variable `SERVER_NAME`, that is the value returned by `owa_util.get_cgi_env ('SERVER_NAME')`. Evaluate to true, when this value is not equal to the string in Expression 1.
When cgi_env SERVER_NAME = Expression 1	This condition checks for the value of the common gateway interface (CGI) environment variable `SERVER_NAME`, that is the value returned by `owa_util.get_cgi_env ('SERVER_NAME')`. Evaluate to true, when this value is equal to the string in Expression 1.

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