Oracle® Database

2 Day + Application Express Developer's Guide

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Oracle Database 2 Day + Application Express Developer's Guide, Release 4.1

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Primary Author: Terri Jennings

Contributors: Drue Swadener, Sharon Kennedy, David Peake

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Preface

Oracle Database 2 Day + Application Express Developer's Guide introduces you to application development using Oracle Application Express. This guide shows you how to set up a development environment, or access a hosted demonstration environment. It then walks you through building an initial application, modifying it, and previewing it.

Through a series of exercises, you become familiar with the Oracle Application Express user interface, basic product functionality, and some underlying concepts that enable you to develop professional, fast, and secure applications.

Topics:

- Topic Overview
- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Topic Overview

This document contains the following sections:

Title	Description
Introducing Oracle Application Express	Describes Oracle Application Express, its architecture and the environment for using the product. It also introduces you to some concepts and terms used in this guide.
Accessing Your Development Environment	Leads you through the steps to access a development environment for your use.
Getting Started with Oracle Application Express	Introduces you to areas of the user interface. It also leads you through installing the sample objects to use with this guide.
Building Your Application	Leads you through the steps for building an application, modifying it, and previewing it at different points during the development process.
About Deploying Your Application	Describes some basic information about deploying your application. It also leads you through the steps to create end users and to determine the URL of your application.

Title	Description
About Globalization	Describes some basic information about globalization. It also leads you through the steps to specify how the application determines global identification.
Next Steps	Describes additional resources to expand your knowledge of Oracle Application Express and boost your productivity.

Audience

Oracle Database 2 Day + Application Express Developer's Guide is intended for:

- *Workspace administrators* who want to set up the Oracle Application Express development environment

- *Application developers* who want to learn how to build database-centric Web applications using Oracle Application Express

To use this guide, you must have a general understanding of relational database concepts and the operating system environment under which Oracle Application Express is running.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.

Related Documents

For more information, see these Oracle resources:

- *Oracle Application Express Installation Guide*

- *Oracle Application Express Release Notes*

- *Oracle Application Express End User's Guide*

- *Oracle Application Express Application Builder User's Guide*

- *Oracle Application Express SQL Workshop Guide*

- *Oracle Application Express API Reference*

- *Oracle Application Express Migration Guide*

- *Oracle Application Express Administration Guide*

- *Oracle Database Concepts*

- *Oracle Database Advanced Application Developer's Guide*

- *Oracle Database Administrator's Guide*

- *Oracle Database SQL Language Reference*

- *SQL*Plus User's Guide and Reference*

- *Oracle Database PL/SQL Language Reference*

For additional documentation available on Oracle Technology Network (OTN), visit the Oracle Application Express Web site located at:

http://www.oracle.com/technetwork/developer-tools/apex/overview/index.html

For information about Oracle error messages, see *Oracle Database Error Messages*. Oracle error message documentation is available only in HTML. If you have access to the Oracle Database 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. See *Oracle Database Sample Schemas* for information about how these schemas were created, and how you can use them yourself.

For additional application examples, go to the Learning Library. Search for free online training content, including Oracle by Example (OBE), demos, and tutorials. To access the Oracle Learning Library, go to:

http://www.oracle.com/technetwork/tutorials/index.html

Printed documentation is available for sale in the Oracle Store at:

http://shop.oracle.com/

If you have a user name and password for OTN, then you can go directly to the documentation section of the OTN Web site at:

http://www.oracle.com/technetwork/indexes/documentation/index.html

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.

Convention	Meaning
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

This section summarizes updates made to *Oracle Application Express Administration Guide* for release 4.1.

What's New in this Document for Release 4.1

This section summarizes general updates, revised content, and new content added to *Oracle Database 2 Day + Application Express Developer's Guide* for release 4.1.

General Updates

- All content has been updated to reflect new functionality

- Screen captures and graphics have been added and updated to reflect release 4.1 user interface enhancements

1

Introducing Oracle Application Express

This section describes Oracle Application Express, its architecture, and the environment for using the product. It also introduces you to concepts and terms used in this guide when discussing Oracle Application Express.

Topics:

- About Oracle Application Express
- Understanding Oracle Application Express Architecture
- About the Oracle Application Express Environment
- About Oracle Application Express User Roles
- Overview of the Application You Build

About Oracle Application Express

Oracle Application Express is a rapid Web application development tool for the Oracle database. Using only a Web browser and limited programming experience, you can develop professional applications that are both fast and secure. Thanks to built-in features such as user interface themes, navigational controls, form handlers, and flexible reports, Oracle Application Express accelerates the application development process.

From the end user's perspective, the deployed applications require only a browser and access to an Oracle database running Application Express.

> **Tip:**   To learn more about Oracle Application Express features, click the **Learn more...** button on the Workspace home page.

Understanding Oracle Application Express Architecture

Oracle Application Express installs with your Oracle database and is comprised of data in tables and PL/SQL code.

Whether you run the Oracle Application Express development environment or an application you built using Oracle Application Express, the process is the same. Your browser sends a URL request that is translated into the appropriate Oracle Application Express PL/SQL call. After the database processes the PL/SQL, the results are relayed back to your browser as HTML. This cycle happens each time you request or submit a page.

The application session state is managed in the database tables within Oracle Application Express. It does not use a dedicated database connection. Instead, each

request is made through a separate database session, consuming minimal CPU resources.

Understanding Web Server Options

In order to run, Oracle Application Express must have access to Oracle Application Express Listener, Oracle HTTP Server and `mod_plsql`, or the embedded PL/SQL gateway.

About Oracle HTTP Server (Apache) and Oracle Application Express Listener

Oracle HTTP Server uses the `mod_plsql` plug-in to communicate with the Oracle Application Express engine within the Oracle database. Oracle Application Express Listener communicates directly with the Oracle Application Express engine, thus eliminating the need for the `mod_plsql` plug-in.

Both Oracle HTTP Server and the Oracle Application Express Listener function as communication brokers between the Web server and the Oracle Application Express objects in the Oracle database. More specifically, they map browser requests into database stored procedure calls over a Oracle Net Services connection. The following graphic illustrates the Oracle Application Express architecture using Oracle HTTP Server and `mod_plsql`.
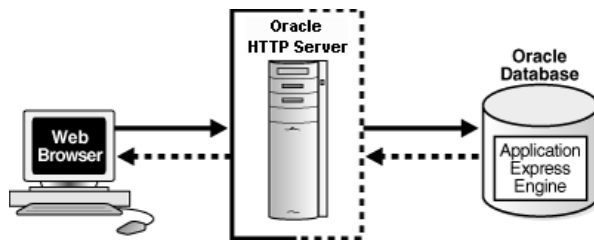
Note that this three tier architecture consists of the following components:

- A Web browser

- Oracle HTTP Server (Apache) with mod_plsql or Oracle Application Express Listener

- An Oracle database containing Oracle Application Express

Advantages of either Oracle HTTP Server (Apache) with `mod_plsql` or Oracle Application Express Listener include:

- Separation from mid-tier for the database tier

- Appropriate for Oracle Real Application Clusters (Oracle RAC) environments

- Versions prior to Oracle Database 11g Release 1 require Oracle Application Express Listener or Oracle HTTP Server (Apache) with `mod_plsql`

About the Embedded PL/SQL Gateway

The embedded PL/SQL gateway installs with in the Oracle database. It provides the Oracle database with a Web server and also the necessary infrastructure to create dynamic applications. The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database and includes the core features of `mod_plsql`. The following graphic illustrates the Oracle Application Express architecture using the embedded PL/SQL gateway.
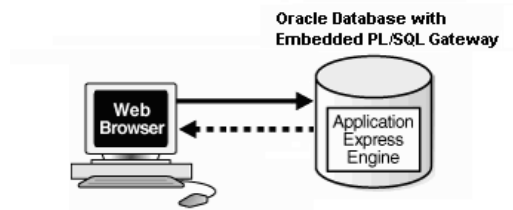
As shown in the previous graphic, the embedded PL/SQL gateway is a simple two tier architecture and consists of these components: a Web browser and an Oracle database containing the embedded PL/SQL, and Oracle Application Express.

Advantages of the embedded PL/SQL gateway:

- Ease of configuration

- Included in the database

- No separate server installation

> **See Also:** "Understanding Administrator Security Best Practice" in *Oracle Application Express Application Builder User's Guide*

About the Application Express Engine

The Application Express engine renders and processes pages. It also performs these tasks:

- Session state management

- Authentication services

- Authorization services

- Page flow control

- Validations processing

About the Oracle Application Express Environment

Oracle Application Express enables a single Oracle database to become a shared workgroup database service. Multiple users can access it using a Web browser without installing additional software.

About Workspaces

The area where you develop applications is called a workspace. A **workspace** is a virtual private database that enables multiple users to work within the same Oracle Application Express installation while keeping their objects, data, and applications private.

In a typical development environment, you might create a single workspace for all your developers to share. However, you can also create dedicated workspaces for specific developers or projects. Creating a dedicated workspace limits access to the workspace objects to only those users associated with the workspace.

The following illustration shows the relationship among users and developers, workspaces, and database schemas.
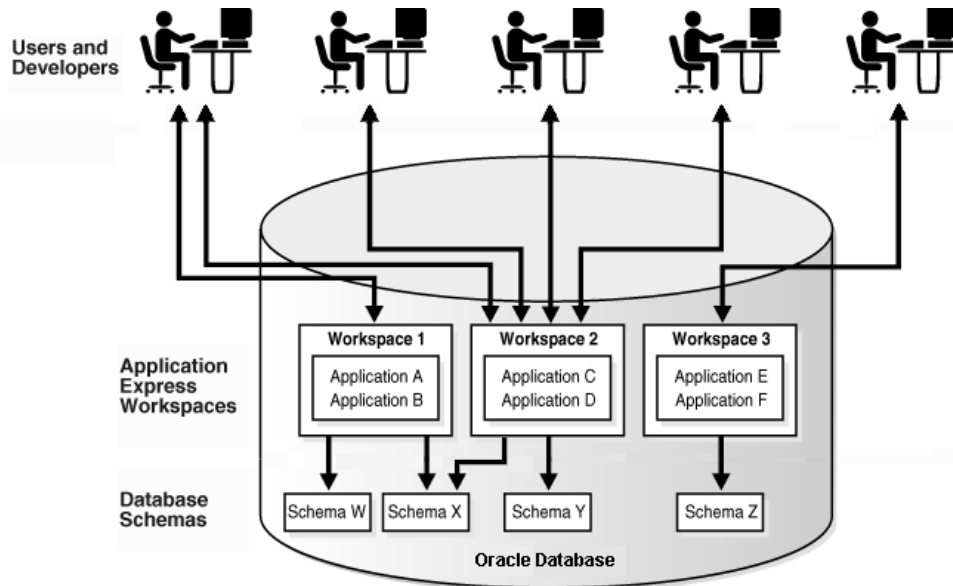
When you create a workspace, you associate it with a new or existing schema. A **schema** is a logical container for database objects such as tables, views, and stored procedures. A single schema can be associated with one or more workspaces.

About Oracle Application Express User Roles

When setting up Application Express users at a large organization, you assign roles and privileges to specific users. The roles within Oracle Application Express include the following:

- **End users** have no development privileges. You define end users so that they can access applications that do not use an external authentication scheme.

- **Developers** are users who create and edit applications and modify database objects. Developers can have their own workspace or share a workspace.

- **Workspace administrators** are users who perform administrator tasks specific to a workspace such as managing user accounts, monitoring workspace activity, and viewing log files.

- **Instance administrators** are superusers that manage an entire hosted instance using the Application Express Administration Services application.

The following illustration shows multiple users with various roles accessing the Oracle Application Express development environment, Application Express Administration Services, and the published applications.
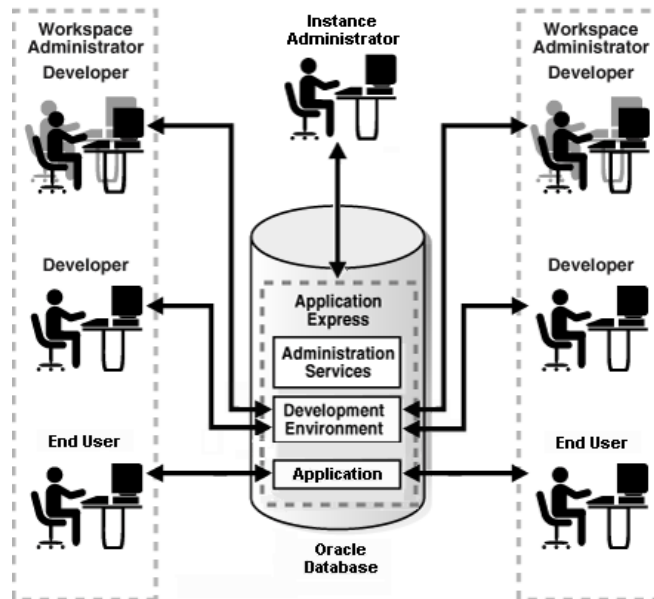
For this guide, you must have the privileges usually associated with three roles: Instance Administrator, Workspace Administrator, and Developer. The following illustration shows an Oracle Application Express instance with a single user.
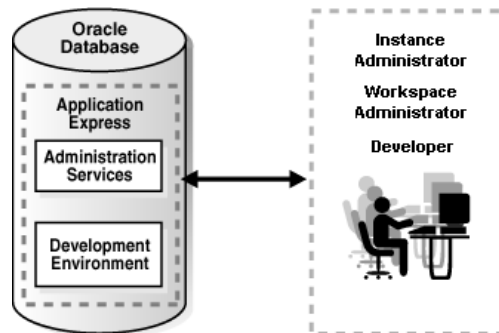
Overview of the Application You Build

In "Building Your Application" on page 4-1, you create a simple Human Resources (HR) application for a fictitious company called *AnyCo Corp*. The application manages departmental and employee information stored in the department and employees tables that you create. The tutorial shows you how to build the application, modify it, and then preview it.

2

Accessing Your Development Environment

This section guides you through the steps to access an Oracle Application Express development environment for your use. Then, you and other developers can begin building applications within Oracle Application Express.

Topics:

- Before You Begin
- Accessing the Hosted Demo Environment
- Setting Up Your Own Local Environment
- Creating Additional User Accounts

Before You Begin

Before you begin this section, do the following:

- Install Oracle Application Express as described in *Oracle Application Express Installation Guide*.

- Read "Introducing Oracle Application Express" on page 1-1.

- Confirm your Web browser supports JavaScript and the HTML 4.0 and Cascading Style Sheet (CSS) 1.0 standards. The following browsers meet this requirement:

  - Microsoft Internet Explorer 7.0 or later version

  - Mozilla Firefox 3.6 or later version

  - Google Chrome 4.0 or later version

  - Apple Safari 4.0 or later version

- Enable cookies for your Web browser.

- Determine which environment you want to use:

  - Oracle provides a hosted demonstration (demo) environment where you can try out Oracle Application Express.

    Using the demo environment is the fastest way to access a development environment. You request a workspace from an Oracle Application Express Web site and provide some basic user information. Shortly after you submit your request, you receive your login credentials in an email. This option does not require installing any software.

    For instructions on using the demo environment, see "Accessing the Hosted Demo Environment" on page 2-2.

> **Note:** Do not use the hosted demonstration environment for your
> production work.

- Set up your own local instance of Oracle Application Express. Istall Oracle
  Application Express and then follow the steps in "Setting Up Your Own Local
  Environment" on page 2-3.

Accessing the Hosted Demo Environment

To use Oracle Application Express without installing the product locally, go to the
hosted demo environment and sign up for a workspace.

To access the hosted demo environment:

1. In a Web browser, go to:

   http://apex.oracle.com

2. Click the **Get Started** button.

3. On Welcome, review the information and click **Next**.

4. Identify the administrator for the service. Enter a first name, last name, and valid
   email address and click **Next**.

   The system generates an email with your login credentials and sends it to the
   email address you enter.

5. For Workspace, enter a workspace name.

   Workspace names must be unique. Requesting a duplicate name might delay your
   request. In general, enter a name that is significant to you. For example, enter your
   own name, your company name, or the name of the project or department to
   which your applications pertain.

   To use the same name for your workspace and your schema (defined in the next
   step) use alphabetic characters when naming your workspace. Schema names are
   restricted to alphabetic characters.

6. Specify a schema schema. Options include:

   a. **Use an existing schema from the database** - Enter a the existing schema
      name.

   b. **Request a new schema** - Enter a name containing only alphabetic characters.

   c. **Initial Space Allocation** - Select at least 10 MB to accommodate the space
      needed for creating the objects required for this guide.

   d. Click **Next**.

   A survey appears.

7. Answer the survey questions and click **Next**.

8. Indicate why you are requesting this service and click **Next**.

   A license agreement apears.

9. Review the agreement, select **I accept the terms**, and click **Next**.

10. Click **Submit Request**.

An initial email containing a link is sent to you. Click the link within the email to complete the workspace provisioning process. This step verifies that your email address is valid before approving a workspace. After that, an email with your login credentials is sent to you. Use those credentials to log in to the hosted demo environment and begin using Oracle Application Express.

Logging In To the Hosted Demo Environment

Using the login credentials you received in an email, log in to your dedicated workspace on the hosted demo environment.

To log in to the hosted demo environment:

1. In a Web browser, go to:

   http://apex.oracle.com

2. On the Login page, enter your login credentials.

3. Click **Login**.

   The Workspace home page appears. You may be prompted to change your password. If not, you can change it manually by clicking the **Change Password** link on the right side of the Workspace home page. Then, enter in the information requested on the page that appears.

   To continue with the tutorials, skip the rest of this section and go to "Getting Started with Oracle Application Express" on page 3-1.

Setting Up Your Own Local Environment

Instead of using the hosted demo environment, you can install Oracle Application Express locally. If you do a local installation, you must set up your development environment. The general steps you must perform include:

1. Install Oracle Application Express as described in *Oracle Application Express Installation Guide*.

2. Log in to Application Express Administration Services, as described in "Logging In To Administration Services" on page 2-3.

3. Create a workspace, as described in "Creating a Workspace" on page 2-5.

4. (Optional) Create additional users with developer or administrator privileges, as described in "Creating Additional User Accounts" on page 2-8.

   > **Note:** This tutorial explains a simplified method for setting up your development environment so that you can begin using Oracle Application Express. However, when you want to set up your development environment to accommodate your real-life development needs, review "Oracle Application Express Hosted Instance Administration" in *Oracle Application Express Administration Guide*.

Logging In To Administration Services

To set up your local development environment, you first must log in to Oracle Application Express Administration Services. This is a separate application for managing an entire Oracle Application Express instance.

To log in to the Oracle Application Express Administration Services:

1. In a Web browser, go to the Oracle Application Express Administration Services application. Depending on which setup you are using, Oracle Application Express is installed in one of these locations:

   ■ If your setup uses the embedded PL/SQL gateway:

   `http://hostname:port/apex/apex_admin`

   Where:

   – `hostname` is the name of the system where Oracle XML DB HTTP Server is installed.

   – `port` is the port number assigned to Oracle XML DB HTTP Server. In a default installation, this number is 8080.

   – `apex` is the database access descriptor (DAD) defined in the configuration file.

   For users who have upgraded from earlier versions, or who have a custom configuration, this value may be `htmldb` or something else. Verify your DAD with your Oracle Application Express administrator.

   See Also: "Verifying the Oracle XML DB HTTP Server Port" in *Oracle Application Express Application Builder User's Guide*

   ■ If your setup uses the Oracle Application Express Listener, go to:

   `http://hostname:port/apex/apex_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, for Oracle WebLogic Server this number is `7001`, in OC4J this number is `8888`, in Oracle Glassfish Server this number is `8080`. These defaults are correct at the time this document was written. Please review the related Web server documentation for the latest default port if necessary.

   – `apex` is the mount point defined in the Web Server configuration file.

   See Also: *Oracle Application Express Listener* documentation

   ■ If your setup uses the Oracle HTTP Server (Apache) with `mod_plsql`:

   `http://hostname:port/pls/apex/apex_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_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf`

Be aware that if you change a port number, it is not updated in the `portlist.ini` file. You can only rely on this file immediately after installation.

- `pls` is the indicator to use the `mod_plsql` cartridge.

- `apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

  For users who have upgraded from earlier versions, or who have a custom configuration, this value may be `htmldb` or something else. Verify the DAD with your Oracle Application Express administrator.

See Also: "Managing Oracle Database Port Numbers" in *Oracle Application Express Installation Guide* and `ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf\dads.readme` for more information on database access descriptors

The Login page appears.

2. In Username, enter the username you specified when you installed Oracle Application Express.

3. In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.

4. Click **Login**.

Oracle Application Express Administration Services appears.

Creating a Workspace

From Administration Services, create a workspace. A **workspace** is a shared work area within the Oracle Application Express development environment that has a unique ID and name. All users in the workspace can access all its applications and scripts. For more information about workspaces, see "About Workspaces" on page 1-3.

To create a workspace:

1. Log in to Oracle Application Express Administration Services.

    The Instance Administration Home page appears.

2. Click **Manage Workspaces**.
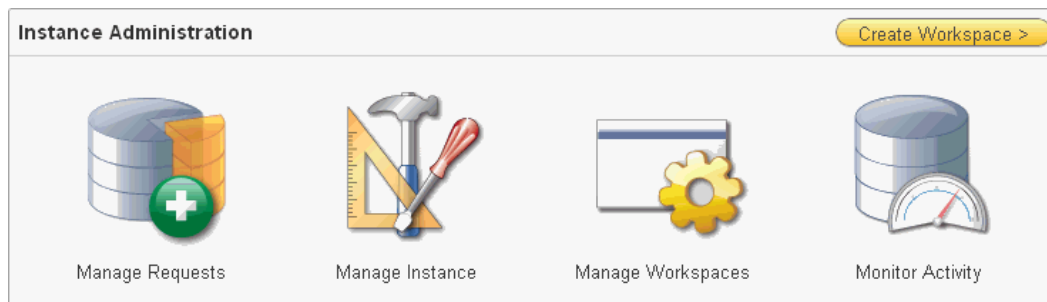
3. Under Workspace Actions, click **Create Workspace**.
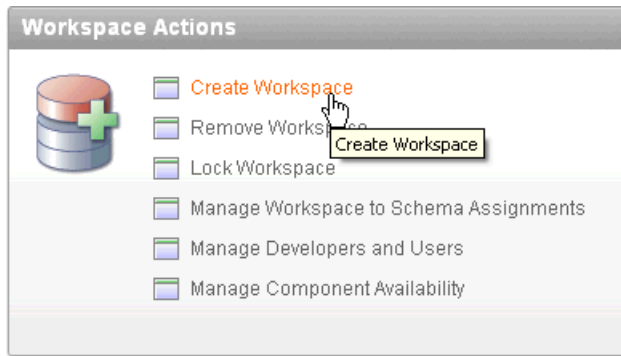
The Create Workspace Wizard appears.

4. For Identify Workspace, enter the following:

   a. Workspace Name - Enter a unique workspace name. This guide uses **2DayPlus** for the workspace name.

   In general, you want to enter a workspace name that is significant to you. For example, you might enter your own name, your company name, or the name of the project or department to which your application pertains.

   If you want to use the same name for both your workspace and schema, enter a workspace name that contains only alphabetic characters. Schema names are restricted to alphabetic characters.

   b. Workspace ID - Leave Workspace ID blank to have the new Workspace ID automatically generated. A Workspace ID must be a positive integer greater than 100000.

   c. Workspace Description - Enter a workspace description.

   d. Click **Next**.
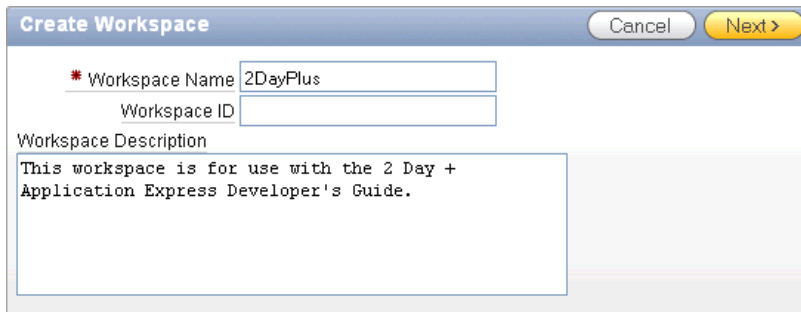
5. For Identify Schema, enter the following:

   a. Re-use existing schema - Select **No** if you are creating your first workspace.

   A **schema** is a logical container for database objects. In this step, you are creating the container for database objects you add later in this tutorial.

   b. Schema Name - Enter a schema name. This guide uses **TWODAYPLUS** for the schema name.

   You must use only alphabetic characters in your schema name.

   c. Schema Password - Enter a case-sensitive password.

   d. Space Quota (MB) - Select at least 10 MB to accommodate the necessary space for creating the objects required for this guide.

    e. Click **Next**.

        [Create Workspace dialog screenshot: "Select whether or not the schema already exists. If the schema exists, select the schema from the list. If the schema does not exist, enter a name and password and choose the size of the associated tablespace to be created." Re-use existing schema? No. Schema Name: TWODAYPLUS. Schema Password: •••••••••. Space Quota (MB): 10]

6. For Identify Administrator, enter the following:

    a. Administrator Username - Accept the default, **ADMIN**, or enter another user name to be used in Oracle Application Express.

        You are creating an account for only one user, yourself as an administrator. To see instructions for creating additional users, see "Creating Additional User Accounts" on page 2-8.

    b. Administrator Password - Enter a case-sensitive password.

    c. Enter the remaining information, including your valid email address, and click **Next**.

        The login credentials for accessing Oracle Application Express are sent to the email address you enter here, if you have configured the email settings for your Oracle Application Express environment.

        [Create Workspace dialog screenshot: Administrator Username: ADMIN. Administrator Password: •••••. First Name: Terri. Last Name: Frank. Email: terri.frank@company.com]

7. Confirm your selections and click **Create Workspace**.

Logging In To Your Local Instance

To log in to your local instance of Oracle Application Express, you must have this information:

- URL where you can access Oracle Application Express
- Workspace name you use to develop applications
- Username set up for you for this workspace within Oracle Application Express
- Password set up for you for this workspace within Oracle Application Express

If you set up your development environment, you have your login credentials. Otherwise, contact the person who created your user account to supply the information.

To log in to Oracle Application Express:

1. In a Web browser, go to the Oracle Application Express Login page. Depending on your setup, Oracle Application Express installs to one of these locations:

   - If your setup uses the embedded PL/SQL gateway or the Oracle Application Express Listener:

     `http://hostname:port/apex`

   - If your setup uses the Oracle HTTP Server (Apache) with `mod_plsql`:

     `http://hostname:port/pls/apex`

   For an explanation of the URLs, see "Logging In To Administration Services" on page 2-3.

   The Login page appears.

2. Under Login, enter your login credentials.

3. Click **Login**.

Creating Additional User Accounts

As an administrator, you inherit all the privileges associated with the developer role. If you want to start developing the application shown in this guide, skip this section and go to "Logging In To Your Local Instance" on page 2-7.

However, you might want to create user accounts for other developers who share this workspace. Associating users with the workspace grants them access to all applications and scripts within that workspace. You can also create additional user accounts for workspace administrators.

To create a user account:

1. Log in to the workspace where you want to add users. See "Logging In To the Hosted Demo Environment" on page 2-3 or "Logging In To Your Local Instance" on page 2-7.

   The Workspace home page appears.

2. Click **Administration**.

3. Click **Manage Users and Groups**.

4. Click **Create User**.

   The Create User page appears.

5. Under User Identification, enter:

   a. **Username** - Enter the username used to log in to the system. Restrictions include:

      – Maximum length of 100 characters

      – No spaces

      – Only these special characters are permitted: ampersand (@) and period (.)

   b. **Email Address** - Enter the valid email address for this user.

   c. **First Name** - Enter the first or given name to further identify the user (optional).

   d. **Last Name** - Enter the last or family name to further identify the user (optional).

   e. **Description** - Enter comments about this user (optional).

6. Under Account Privileges:

   a. **Default Schema** - Specify the default schema used for data browsing, application creation, and SQL script execution.

      When using workspaces that have more than one schema available, this schema is the default. This setting does not control security, only the user's preference.

   b. **Accessible Schemas (null for all)** - Leave this blank to enable the end user to access all applications in the workspace, or enter a colon-delimited list of schemas for which this user has permissions when using the SQL Workshop.

   c. **User is a workspace administrator** - Specify if this user should have workspace administrator privileges.

      Administrators are given access to all components. Additionally, they can manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.

   d. **User is a developer** - Specify if this user should have developer privileges.

Developers must have access to either Application Builder, SQL Workshop, or both. Components may not be available if they are switched off by Instance Administrators.

e. **Application Builder Access** - Determines whether a developer has access to the Application Builder.

f. **SQL Workshop Access** - Determines whether a developer has access to the SQL Workshop.

g. **Team Development Access** - Determines whether a developer has access to the Team Development.

h. **Set Account Availability** - Select **Locked** to prevent the account from being used. Select **Unlocked** to allow the account to be used.

7. Under Password:

■ **Password** - Enter a case sensitive password.

■ **Confirm Password** - Enter the password again.

■ Require Change of Password On First Use - Select **No** to not require this user to change his or her password at first log in. Select **Yes** to require the user to change the password immediately after logging in the first time.

8. Under User Groups, optionally select a user group.

9. Click **Create User** or **Create and Create Another**.

See also: "Managing Application Express Users" in *Oracle Application Express Administration Guide*

3

Getting Started with Oracle Application Express

This section introduces you to areas of the Oracle Application Express user interface. It also shows you how to install the sample objects to use with this guide.
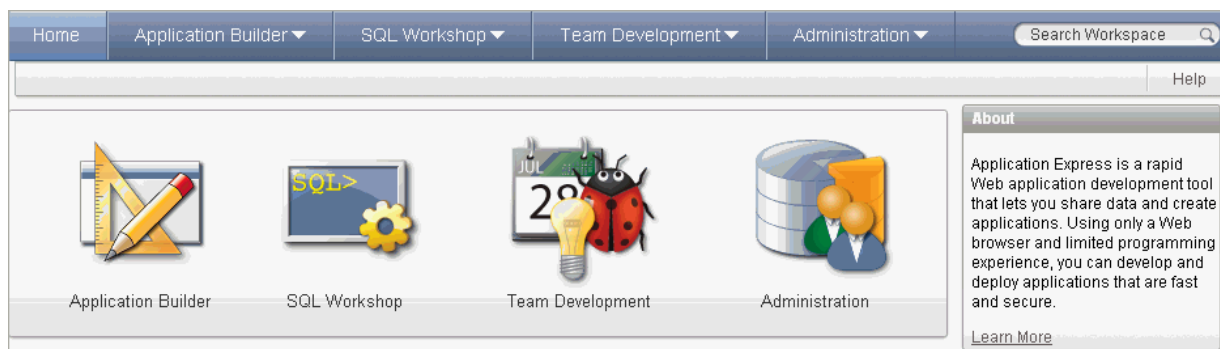
Before you begin, log in to Oracle Application Express. For instructions, see "Accessing Your Development Environment" on page 2-1.

Topics:

- About the Workspace Home Page
- What Is Application Builder?
- Installing the Sample Objects

About the Workspace Home Page

When you log in to Oracle Application Express, the Workspace home page appears.

Take a few minutes to explore the product. The following large icons display in the center of the page:

- **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 the SQL Workshop to access tools for viewing and managing database objects.

- **Team Development**. Use Team Development to track new features, non-feature to do tasks, bugs, and milestones. Users can also provide real-time feedback which then can be categorized into features, to do tasks, or bugs.

- **Administration** links to the Workspace Administration page.

About the Learn More Link

Click the **Learn More** link in the About box to view an informative introduction to Oracle Application Express. Topics covered include architecture, self service, security, Websheets, application development, SQL Workshop, Team Development, administration, and managing development.

What Is Application Builder?

You use the Application Builder component of Oracle Application Express to build your application. Through wizards or your direct input, you can assemble an HTML interface (or application) on top of database objects such as tables and procedures. Each application is a collection of linked pages using tabs, buttons, or hypertext links.

A **page** is the basic building block of an application. Pages also contain user interface elements such as tabs, lists, buttons, items, and regions. To see the definition of each page belonging to your application, you use the Page Definition page.

The Page Definition contains three main areas:

- **Page Rendering** lists user interface controls and logic that are executed when a page is rendered. Page rendering is the process of generating a page from the database.

- **Page Processing** lists logic controls (such as computations and processes) that are evaluated and executed when the page is processed.

- **Shared Components** lists components used by the current page that can also be referenced by other pages within your application.

Installing the Sample Objects

In Oracle Application Express, users log in to a workspace. You can think of each workspace as a shared work area that separates your objects, data, and applications into a virtual private database.

Before performing any tasks in this guide, you must create the appropriate sample objects within your workspace. These sample objects are copies of the objects that are typically installed in two schemas:

- Human Resources (HR)

  The HR schema contains information about the employees and the facilities where they work. Each employee has an identification number, email address, job identification code, salary, and manager. Employees are assigned to a department, and each department is associated with one location that has a full address, including the street name, postal code, city, state or province, and country code.

- Order Entry (OE)

  The OE schema tracks product inventories and sales of a company's products, including the product identification number, the product name, the associated associates product category, product descriptions, the weight group (for shipping purposes), the warranty periods, the suppliers, the availability status, and a minimum price.

To create the objects locally in your workspace, import the *OEHR Sample Objects* application.

Topics:

- Downloading OEHR Sample Objects

- Importing the OEHR Sample Objects

- Viewing Your Database Objects

> **Tip:** In order to successfully import the objects associated with the *OEHR Sample Objects* application, your Oracle database must include Oracle Spatial. If your database instance does not include Oracle Spatial, you can install it using Database Configuration Assistant. To learn more, see the *Oracle Application Express Installation Guide* for your operating environment.

Downloading OEHR Sample Objects

To import the *OEHR Sample Objects* application, you must download it from the Oracle Technology Network (OTN).

To download the *OEHR Sample Objects* application from OTN:

1. In your Web browser, go to:

   http://www.oracle.com/technetwork/testcontent/oehr-sample-objects-1
   31098.zip

2. Under Sample Code, click **OEHR Sample Objects**.

3. Download and save the oehr_sample_objects.zip file to your computer.

4. Unzip and extract the oehr_sample_objects_installer.sql file:

   - Microsoft Windows - Double-click the oehr_sample_objects.zip file

   - UNIX or Linux - Enter the following command:

     $ unzip oehr_sample_objects.zip

Importing the OEHR Sample Objects

After you download and unzip the *OEHR Sample Objects* application, import it into Oracle Application Express. During the import process, specify installation of both the application and the supporting objects. Installing the application creates the objects and sample data needed to complete the exercises in this guide.

To import and install the *OEHR Sample Objects* application:

1. Log in to Oracle Application Express.

   For instructions, see "Logging In To the Hosted Demo Environment" on page 2-3 or "Logging In To Your Local Instance" on page 2-7.

2. On the Workspace home page, click **Application Builder**.

   The Application Builder home page appears.

3. Click the **Import** button.

4. For Specify File, specify the following:

   a. Import file - Click **Browse** and navigate to the oehr_sample_objects_installer.sql file.

   b. File Type - Select **Database Application, Page, or Component Export**.

   c. File Character Set - Select the correct character set.

   d. Click **Next**.

Next, you install the imported file.

5. To install an imported file, click **Next**.

The Install Database Application Wizard appears.

6. For Install Application, specify the following:

   a. Parsing Schema - Select the schema you created when you set up your development environment.

   b. Build Status - Select **Run and Build Application**.

   c. Install As Application - Select **Auto Assign New Application ID**.

   d. Click **Install**.

   Once you install the application, you must install the supporting objects.

7. For Install Supporting Objects, select **Yes** and click **Next**.

8. Confirm your selections by clicking **Install**.

9. After the installation is completed, click the **Home** breadcrumb link at the top of the page.

The Application Builder home page appears.

Checking Your Workspace Storage Space

If you experience problems installing the *OEHR Sample Objects* application, verify the available space in your workspace. If you do not have enough space, request additional storage space.

If you are a workspace administrator, you can:

- Determine if you have enough storage space. See "About the Workspace Utilization Report" in *Oracle Application Express Administration Guide*.

- Request additional storage space. See "Requesting a New Schema, More Storage, or Terminating Service" in *Oracle Application Express Administration Guide*.

Deleting the OEHR Sample Objects Application

Deleting the *OEHR Sample Objects* application and deinstalling the supporting objects completely removes all associated objects and sample data.

To delete the *OEHR Sample Objects* application:

1. Log in to Oracle Application Express.

2. On the Workspace home page, click **Application Builder**.

The Application Builder home page appears.

3. Click the **OEHR Sample Objects** icon.

4. On the Tasks list, click **Delete this Application**.

The Deinstall page appears.

5. To remove all associated objects and sample data, select **Remove Application Definition** and **Deinstall Supporting Objects**.

6. Click **Deinstall**.

Viewing Your Database Objects

Review the objects you just created by going to Object Browser. Object Browser enables you to browse, create, and edit objects in your database.

To view the objects:

1. On the Workspace home page, click **SQL Workshop**.

2. Click **Object Browser**.

    Object Browser appears.

Object Browser 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.

- Detail pane displays to the right of the page and displays detailed information about a selected object.

3. From the list in the Object Selection pane on the left, select **Tables**.

    The Detail pane lists the tables in your current schema.

4. In the Object Selection pane, click **OEHR_EMPLOYEES** from the list.

    The Detail pane shows details about the table.

5. Click the **Data** tab at the top of the Details pane.

    The data in the OEHR_EMPLOYEES table appears. Note that other tabs show additional details about the object you select.

6. To search for an object name, enter a case-insensitive term in the Search field.

7. To view all objects, leave the Search field blank.

> **See also:** "Managing Database Objects with Object Browser" in
> *Oracle Application Express SQL Workshop Guide*

4

Building Your Application

In this tutorial, you create a Human Resources (HR) application for a fictitious company called *AnyCo Corp*. This section shows you how to build the application, modify it, and preview it at different points during the development process.

Before you begin this section:

- Read "Getting Started with Oracle Application Express" on page 3-1.
- Ensure you have installed the database objects as described in "Installing the Sample Objects" on page 3-2.

Topics:

- About the Application You Build in This Tutorial
- Creating the Initial Application
- Using an Interactive Report
- Modifying the Departments Report
- Adding an Employees Report and Form
- Editing the Employees Report
- Adding a Link on the Home Page to the Employees Report
- Adding a Department Column to the Employees Report
- Linking a Column Value to Another Page
- Adding a List of Values to the Employees Report
- Adding Your Company Name
- Switching Themes to Change the User Interface

About the Application You Build in This Tutorial

This tutorial guides you through the development of a Human Resources (HR) application for a fictitious company called *AnyCo Corp.* The application enables users to view and modify employee information stored in the OEHR_DEPARTMENTS and OEHR_EMPLOYEES tables.

When building the application, you perform these tasks:

1. Creating the Initial Application: Create an application that includes a Home page and a basic Departments report.

2. Modifying the Departments Report: Expand the report to pull in data from other tables.

3. Using an Interactive Report: Run and use the Interactive Report.

4. Adding an Employees Report and Form: Build an Employee form and report based on the OEHR_EMPLOYEES table.

5. Editing the Employees Report: Add calculated fields to the Employees report.

6. Adding a Link on the Home Page to the Employees Report: Add a link on the Home page.

7. Adding a Department Column to the Employees Report: Modify the Employees report to enable the user to select a department.

8. Linking a Column Value to Another Page: Add a link on the Departments report that navigates the user to the Employees report.

9. Adding a List of Values to the Employees Report: Add a report as a region that displays department details.

10. Adding Your Company Name: Add your company name so that it appears on all pages in your application.

11. Switching Themes to Change the User Interface: Switch the theme for your application.

Creating the Initial Application

This first exercise guides you through creating your initial application. Using the Create Application Wizard, you create two pages and specify basic application functionality.

The pages created in this section include:

- Home - This page is the first page displayed when the application is run. This page contains a link to the Departments report.

- Departments - This page is an interactive report of all departments.

  There are two types of reports, interactive and classic. Interactive is the default when creating applications, converting forms and creating report regions. Interactive reports should be selected when you want to provide user customizations such as filters, sorting, compilation and so on. If you have limited need for this functionality, you are best served by using a classic report.

To create your initial application:

1. Log in to Oracle Application Express.

   For instructions, see "Logging In To the Hosted Demo Environment" on page 2-3 or "Logging In To Your Local Instance" on page 2-7.

2. On the Workspace home page, click **Application Builder**.

3. Click the **Create** button.

   The Create Application Wizard appears.
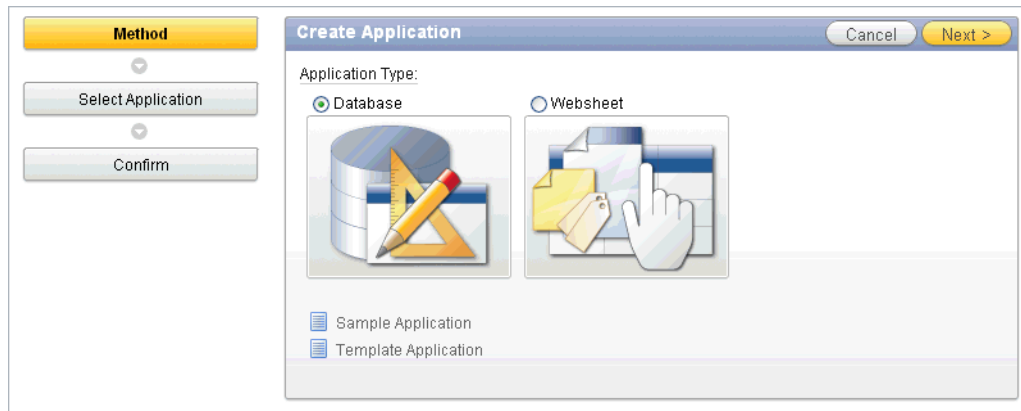
Note that each page within a wizard displays the title of the wizard (for example, *Create Application*). Each wizard page also displays a series of blocks on the left, representing the sequence of steps. The highlighted block indicates the step you are performing.
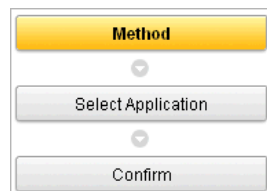
To orient you, each step in these exercises generally begin with the block label. For example, the first step in the Create Application Wizard highlights the word *Method*. Therefore, the next step orients you by beginning with the words *For Method*.

4. For Method, select **Database** and click **Next**.

5. Accept the default, **From Scratch**, and click **Next**.

6. For Name:

    a. Name - Enter `AnyCo Corp`

    b. Application - Accept the default ID. The system provides a unique ID for each application you create in this workspace.

    c. Create Application - Accept the default, **From scratch**.

    d. Schema - Select the schema that contains the objects for this tutorial (for example, **TWODAYPLUS**).

    e. Click **Next**.

    Next, add a page to your application.

7. For Pages, specify the following in the Add Page section:

    a. Select Page Type - Accept the default, **Blank**.

       Tip: Explanatory information for each option in item Help. When help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.

    b. Page Name - Enter `Home`.

c. Click **Add Page**.

The Home page is now listed in the top area. Also, note that the Add Page area appears so you can continue adding pages to your initial application.
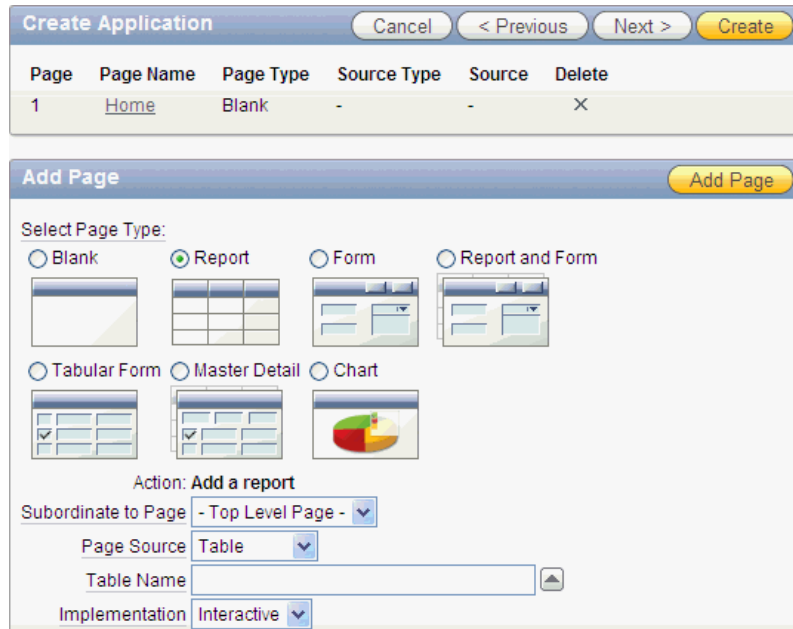
Next, add a report page on the OEHR_DEPARTMENTS table.

8. In the Add Page section, specify the following:

a. Select Page Type - Select **Report**.

b. Subordinate to Page - Select **Home (1)**.

This sets up the hierarchy among the pages in your application.

c. Page Source - Accept the default, **Table**.

d. Table Name - Select **OEHR_DEPARTMENTS**.

The list shows all tables and views in the schema associated with the application.

e. Implementation - Accept the default **Interactive**.

f. Click **Add Page**.

Notice that the pages listed in the Create Application section reflect the hierarchy of the pages in your application.

Next, change the default page name, OEHR_DEPARTMENTS, to Departments.

9. Click the **Oehr Departments** link.

10. Under Page Definition, change the Page Name to Departments and click **Apply Changes**.

11. In the Create Application section, click **Next**.

Next, define some application-level settings.

12. For Tabs, select **No Tabs** and click **Next**.

13. For Shared Components, accept the default, **No**, and click **Next**.

14. For Attributes, make these changes:

    a. Authentication Scheme - Accept the default, **Application Express**.

    Note that Application Express is the default Authentication Scheme. The authentication scheme option enables you to control users' access to the application using Application Express authentication or another type of authentication.

    b. Language - Accept the default, **English (en)**

    c. User Language Preference Derived From - Accept the default, **Application Primary Language**.

    d. Date Format - Click the up arrow and select **12-JAN-04**.

    e. Date Time Format - Click the up arrow and select **12-JAN-2004 1430**.

    f. Timestamp Format - Click the up arrow and select **12-JAN-2004 1430**.

    g. Timestamp Time Zone Format - Click the up arrow and select **12-JAN-2004 1430**.

    h. Click **Next**.

15. For User Interface, select **Theme 2** and click **Next**.

16. For Confirm, verify the information and click **Create**.

The two pages you created, Home and Departments, appear as icons by default.

> **Note:** To view the pages in a report instead of as icons, click the **View Report** icon. Your view setting is retained from session to session.
>
> Because these steps use the default setting, switch back to Icons view before continuing.

Notice that Oracle Application Express adds a Login page automatically to your application.
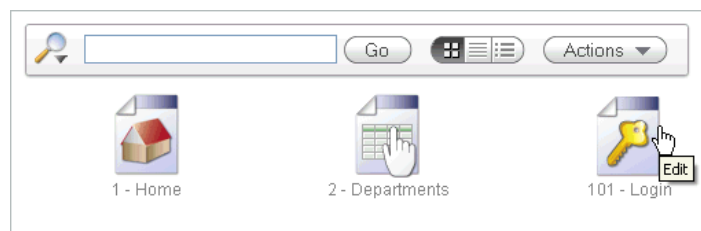
Congratulations! You created your first application using Oracle Application Express. Next, preview the application to see the application the way it would appear to end users.

Previewing Your Application

You preview your application by running it. Running the application displays the rendered version of the application as end users would see it.

As you create pages, you can view them by running the page individually or by running the entire application. When you run a page or application, the Application Express engine dynamically renders it into viewable HTML based on data stored in the database.

You can run an application in the following ways:

- To run the application, click the **Run Application** icon.
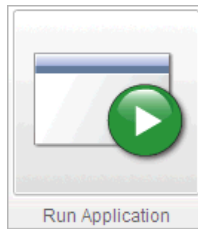
Run Application

- To run a specific page, click the **Run Page** icon.

To preview your application:

1. On the Application home page, click **Run Application**.

2. The first time you run an application you are prompted to enter a user name and password. To continue, simply enter your workspace user name and password and then click **Login**.

   You can run the application using your Application Express login credentials because you chose Application Express Authentication when creating the application. For more information, see "Establishing User Identity Through Authentication" in *Oracle Application Express Application Builder User's Guide*.

   The Home page of your application appears.
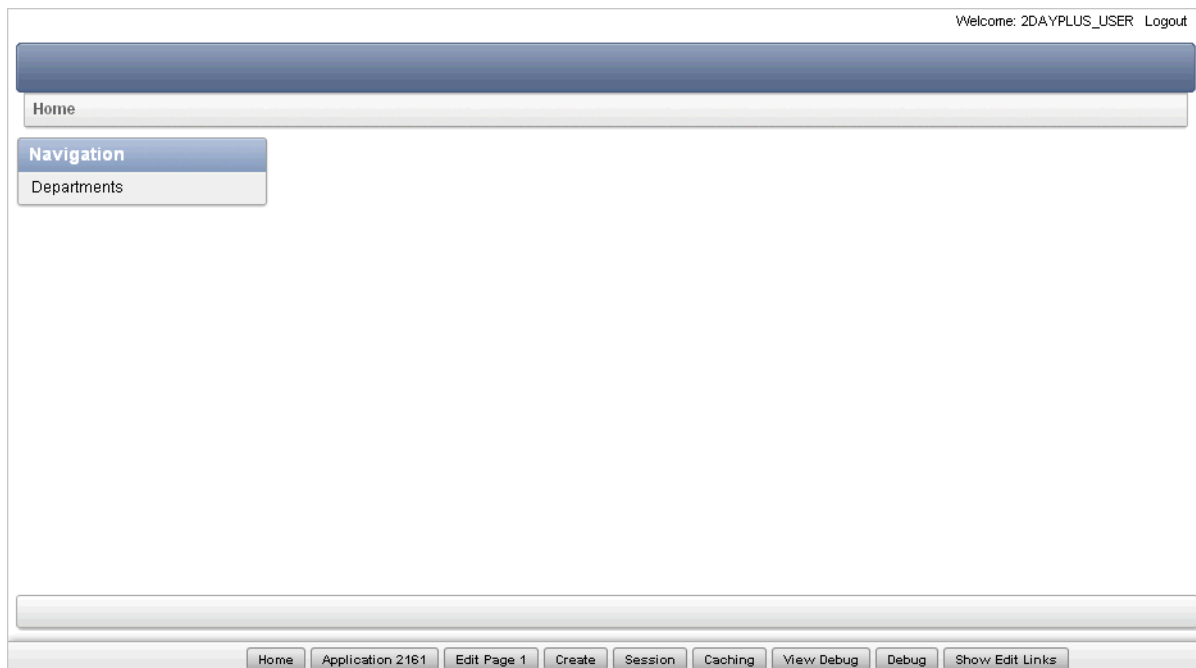
Notice that a link to the Departments page appears on the Home page because you set up that hierarchy.

Also notice the Developer toolbar at the bottom of the page. These links appear when you run an application within the development environment. The

Developer toolbar offers a quick way to edit the current page, create a page, region, or page control, view session state, or toggle in and out of Debug mode.

3. Click the **Departments** link.

The Departments report appears.

Modifying the Departments Report

When you run the Create Application Wizard, the wizard creates forms and reports based on the selections you make. Behind the scenes, Application Express writes a query for you to extract the appropriate data from the database.

In this exercise, you modify the query for the Departments report to include information from the OEHR_EMPLOYEES table. Three columns from the OEHR_EMPLOYEES table, Number of Employees, Manager Name and Location, are added to the Departments report. The Manager Name column replaces the Manager Id column and the Location column replaces the Location Id column.

To modify the Departments report:

1. Click the **Edit Page 2** link on the Developer toolbar (at the bottom of the page).

The Page Definition for Page 2 appears.

A **page** is the basic building block of an application. Pages contain user interface elements such as tabs, lists, buttons, items, and regions. To see the definition of each page belonging to your application, you use the Page Definition page. For more information, see "What Is Application Builder?" on page 3-2.

2. Under Page Rendering, locate Regions.

3. Expand Region and locate Departments.
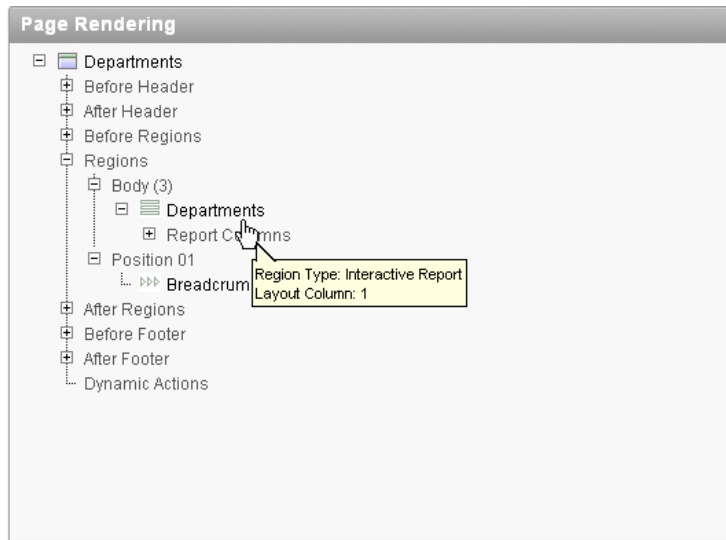
4. Right-click **Departments** and select **Edit**.

> **Tip:** You can also double-click **Departments**.

The Region Definition appears.

5. Scroll down to Source, and replace the default Region Source script with the following:

```
SELECT d.DEPARTMENT_ID,
    d.DEPARTMENT_NAME,
    (select count(*)from oehr_employees where department_id = d.department_id)
"Number of Employees",
    substr(e.first_name,1,1)||'.'||e.last_name "Manager Name",
    c.COUNTRY_NAME "Location"
FROM OEHR_DEPARTMENTS d,
   OEHR_EMPLOYEES e,
   OEHR_LOCATIONS l,
   OEHR_COUNTRIES c
WHERE d.LOCATION_ID=l.LOCATION_ID
    AND l.COUNTRY_ID=c.COUNTRY_ID
    AND d.DEPARTMENT_ID=e.department_id
    AND d.manager_id=e.employee_id
    AND instr(upper(d.department_name),upper(nvl(:P2_REPORT_
SEARCH,d.department_name)))>0
```

6. Click **Apply Changes**.

7. Click **Apply Changes** to confirm.

8. Right-click **Departments** and select **Edit Report Attributes**.

9. Click the **Edit** icon next to Number of Employees.

10. Under Column Definition, select **center** for Column Alignment.

11. Click **Apply Changes**.

Run the Report to View Added Columns

To see how the page looks to end users, run the page. When you run a page, the Application Express engine dynamically renders and processes the page to display viewable HTML.

To run the page:

1. Click the **Run Page** icon in the upper right corner.
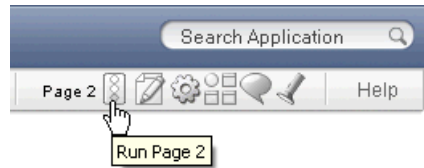
The revised Departments report appears.

Note that the Manager Id and Location Id columns are not available. Also note that the three new columns do not display on the revised report: Number of Employees, Manager Name, and Location. The following steps are required to add these columns to the display and reorder them.

2. To add the new columns, click the **Actions** menu.

The list of Action options appears.
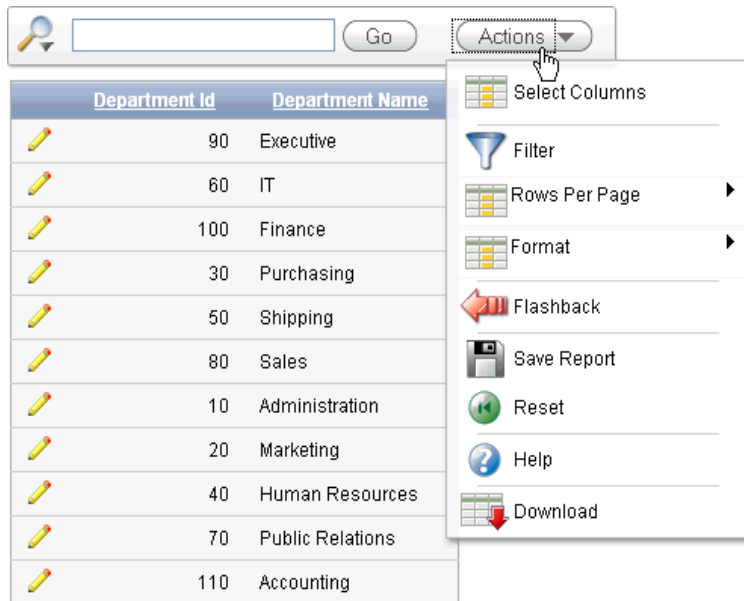
1 - 11

3. From the Actions menu, select **Select Columns**.

   The columns that were added by the new SQL query are in the **Do Not Display** box.

4. Click the **Move All** icon to add these three columns to the **Display in Report** box. The Move All icon looks like the following figure.

5. Verify if the columns are in the following order. If they are not, click up and down arrows to the right of the Display in Report to change the order:

   - Department ID

   - Department Name

   - Number of Employees

   - Manager Name

   - Location

6. Click **Apply**.

The Departments page appears and includes the new columns.

Using an Interactive Report

This exercise guides you through some commonly used report options available to users when they run interactive reports. These options enable the user to perform certain tasks quickly.

Topics:

- Save Report Settings as the Default
- Create a Filter
- Change the Sort Order
- Add a Controlled Break
- Display the Single Row View
- Reset Report Settings

You already used the Select Column option from the Actions menu to add columns to the report display. In this section, you run the application and use some of the various search, sort, highlight, and reset features to manipulate the Departments interactive report.

This tutorial only touches on some of the most prominent functionality available with interactive reports. For complete details see "Customizing Interactive Reports" in *Oracle Application Express Application Builder User's Guide*.

Save Report Settings as the Default

Both developers and end users can save an interactive report. However, only a developer can save the report that initially displays, called the Primary Default report.

You can save four types of interactive reports:

- **Primary Default** (Developer Only). The Primary Default is the report that initially displays. Primary Default reports cannot be renamed or deleted.
- **Alternative Report** (Developer Only). Enables developers to create multiple report layouts. Only developers can save, rename, or delete an Alternative Report.

- **Public Report** (End user). Can be saved, renamed, or deleted by the end user who created it. Other users can view and save the layout as another report.

- **Private Report** (End user). Only the end user that created the report can view, save, rename or delete the report.

To save current report settings as the default:

1. Click the **Actions** menu.

2. Select **Save Report**.

   The Save Report settings appear.

3. From Save, select **As Default Report Settings**.
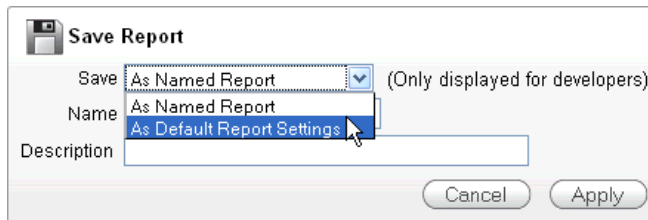
   The Default Report Type settings appear

4. Select **Primary** and click **Apply.**

   The report will show all columns when the user selects the **Reset** option from the Actions menu or when the page is reset by a Reset Interactive Report command, RIR.

   > **See Also:** For a description of how to save as a report as a Named Report see "Customizing Interactive Reports" in the *Oracle Application Express Application Builder User's Guide*.

Create a Filter

This exercise shows you how to add a filter to the Departments report. This example creates a filter to show all departments with the exception of departments with an Id of 60.

There is more than one way a user can create a filter. The user can add a filter from the:
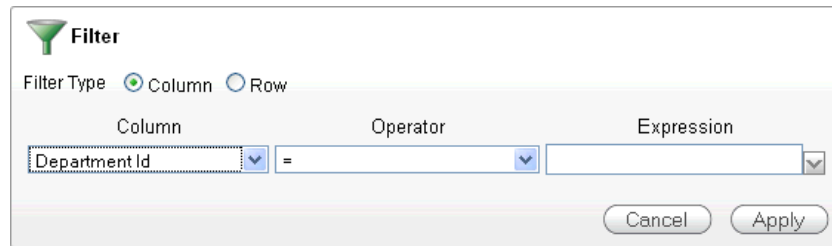
- Search Bar

- Actions Menu

- Column Heading

The Actions menu offers more options than the others. For a quick filter using the equals operator, the Search Bar or column heading are the quickest methods. For anything else, use the Filter option from the Actions menu.

To create a filter for all departments not equal to 60:

1. Click the **Actions** menu.

2. Select **Filter**.

   The filter settings display. Note you can also click the column heading link to create a filter for that column. Creating a filter from the column heading menu, however, is limited to the equal operator.

3. From Operator, select the not equals operator (!=).

4. From Expression, select **60**.

5. Click **Apply**.

   The Departments report is displayed with the Department_Id!=60 filter applied. All departments, accept for the IT department with a Department Id of 60, are included in the report.

   Notice the filter displays at the top of the report. You can edit, disable, or delete this filter. To edit, click the filter name. To disable, deselect the check box. To delete, click the Delete icon that looks like an X over the filter icon.

6. Deselect the check box next to the `Department Id!=60` filter to disable it.

   The report shows data for all Department Ids.

Change the Sort Order

In this exercise, you learn how the user can reorder the data for each column.

To change the sort order:

1. Click the **Actions** menu.

2. Select **Format** and then **Sort**.

   The sort settings are displayed. Note this option is also available for each column by clicking the column heading. The Actions menu is quicker when changing the sort order for multiple columns.

3. Select **Department Name** for the first column entry.

4. Click **Apply**.

    The report shows the Department Name column in ascending alphabetical order.

Notice the up arrow icon after the Department Name that indicates the column has been sorted in ascending order. You can click this arrow to resort the column.

Add a Controlled Break

Another way to reformat a report is to create a controlled break. A controlled break enables the user to delineate data into clearly visible groups.

To add a controlled break:

1. Click the **Location** column heading.

    The column heading menu appears.

2. Click the **Control Break** icon as shown below.

    Note this same option is also available from the Actions, Format menu.

The report is reformatted to show a break after each group of rows that share the same location.

Note the `Location` control break report setting displays under the Search bar.

Display the Single Row View

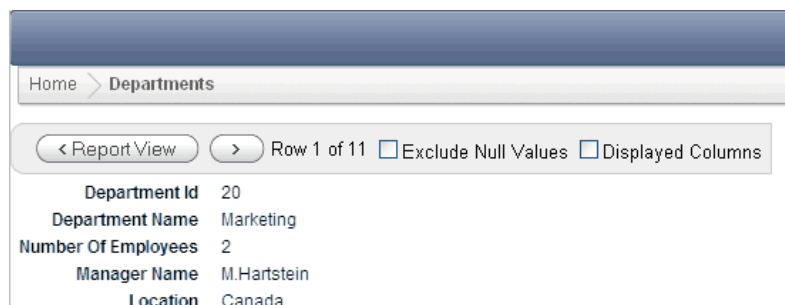You can also display details for a row by selecting the Single Row icon.

To display the single row view:

1. Locate the **Single Row View** icon for the first row.

2. Select the **Single Row View** icon for the first row.

The details page for the first row appears.

Reset Report Settings

You can revert the report settings back to the saved default settings. When an interactive report is reset, the default settings are applied to the report. An interactive report can be reset by the user and by the developer under the following conditions:

- A user can reset an interactive report if the Reset option is available from the Actions menu. This option is enabled or disabled by the developer. For further details see "Customizing Interactive Reports" in the *Oracle Application Express Application Builder User's Guide*.

- A developer can specify that an interactive report be reset when it is called from another page. The Reset Interactive Report command, RIR, is used for this purpose. For further details see "Customizing Interactive Reports as a Developer" in the *Oracle Application Express Application Builder User's Guide*.

To return to the default settings:

1. Click the **Report View** button.

2. Click the **Actions** menu and select **Reset**.

3. When prompted to restore the default settings, click **Apply**.

    The report goes back to the default report settings saved in the previous section.

Adding an Employees Report and Form

In this exercise, you add a report to display employee information and a form to create, update, and delete employee information.

To add an employee report and form:

1. Click the **Application ID** link on the Developer toolbar (at the bottom of the page).

    The Application home page appears.

2. Click **Create Page**.

3. For Page:

    a. Select **Form** and click **Next**.

    b. Select **Form on a Table with Report**.

        This option creates two pages, a report and form, based on a single table or view.

    c. Click **Next**.

4. For Page:

    a. Table/View Owner - Accept the default. This specifies the schema owner.

    b. Table/View Name - Select **OEHR_EMPLOYEES**.

    c. Click **Next**.

5. For Define Report Page, make these changes:

    a. Implementation - Select **Interactive**.

    b. Page Name - Change to `Employees`.

    c. Region Title - Change to `Employees`.

    d. Regioni Template - Select **Reports Region**.

    e. Breadcrumb - Select **Breadcrumb**.

    The Create Breadcrumb Entry section appears.

    f. For Select Parent Entry, click the **Home** link.

    Home appears in the Parent Entry field.

    g. Click **Next**.

6. For Define Report Page, accept the default, **Do not use tabs**, and click **Next**.

7. For Define Report Page:

    a. Press the CTRL key and select only the following columns:

       – EMPLOYEE_ID

       – FIRST_NAME

       – LAST_NAME

       – HIRE_DATE

       – SALARY

       – COMMISSION_PCT

    b. Click **Next**.

    The columns you selected appear on the Report page when the page is run.

8. For Define Report Page, accept the defaults and click **Next**.

    Note that the default Edit Link image resembles a small piece of paper and pencil.

    Next, define the page and region information for the form.

9. For Define Form Page, edit the following:

    a. Page Name - Enter `Create/Edit Employee`

    b. Region Title - Enter `Create/Edit Employee`

    c. Entry Name - Enter `Create/Edit Employee`

    d. Click **Next**.

10. For Primary Key Type, accept the defaults and click **Next**.

11. In Define the source for the primary key columns, accept the default, **Existing trigger**, and click **Next**.

    Your table, `OEHR_EMPLOYEES`, already has a trigger that populates the primary key.

12. In Select Column(s), select all columns and click **Next**.

    These columns appear in the Create/Edit Employee form when the page is run.

13. In Identify Process Options, accept the defaults and click **Next**.

These selections enable users to add, update, and create employee records.

14. For Confirm, verify the information and click **Finish**.

Previewing the Pages

To preview the two pages you just created, run the current page. From the Employees report, you can then preview the form.

To preview the pages:

1. Click the **Run Page** icon.

The Employees report appears.

Note the following about the Employees report:

- The Search Bar with the Actions menu appears at the top. For more information, see "Using an Interactive Report" on page 4-11.

- The column headings are links that enable the user to quickly perform various sorting, filtering, and reformatting operations. For more information, see "Using an Interactive Report" on page 4-11.

- The Edit icon you selected appears in each row. You can click the Edit icon to update the employee record. Since you created a form based on a table with a report, the wizard automatically linked the report to the form. If you create

just a report, as described in the previous section, "Creating the Initial Application", the wizard automatically links the report to the single row view.

- The Create button appears in the upper right corner. You can click the Create button to add an employee to the underlying table.

- The Employees report includes the six columns you specified. When you selected the columns and applied the changes, Oracle Application Express created the appropriate SQL code in the background to produce this result.

Your data might appear in a different order. If so, ignore this difference and continue with these steps.

2. To review the form you also created, click the **Edit** icon in an Employee row.

The Create/Edit Employee form appears.

Note the following about the Create/Edit Employee form:

- The form includes Cancel, Delete, and Apply Changes buttons.

- The Hire Date field displays a calendar, which is included because the data type of the underlying column is DATE.

- Fields labeled in red require are mandatory and cannot be left blank or null.

Editing the Employees Report

In this exercise, you create a new column entitled Remuneration to display employee salaries in the Employees report.

Topics:

- Create a Function

- Add a Column

- Previewing the Page

- Changing the Column Format

Create a Function

First, create a function to calculate employees' salaries.

To create a function:

1. Click the **Home** link on the Developer toolbar.

2. Click **SQL Workshop** and then **SQL Commands**.

   SQL Commands provides a window where you can run PL/SQL against the database.

3. In the SQL editor, enter the following script:

```
CREATE OR REPLACE FUNCTION calc_remuneration(
    salary IN number, commission_pct IN number)
RETURN NUMBER IS
BEGIN
    RETURN ((salary*12) + (salary * 12 * nvl(commission_pct,0)));
END;
```

   When copying and pasting this SQL, make sure there is not an empty line before the first statement, CREATE OR REPLACE FUNCTION.

4. Click **Run**.

   The Results section displays this message:

```
Function created.
```

Add a Column

Next, add a column to display the results of the employees' salary calculations.

To add a column:

1. Navigate to the Page Definition for page 3:

   a. Click the **Application Builder** tab.

   b. Select the **AnyCo Corp** application.

   c. Click **3 - Employees**.

      The Page Definition for page 3 appears.

2. Under Regions, locate **Employees**.
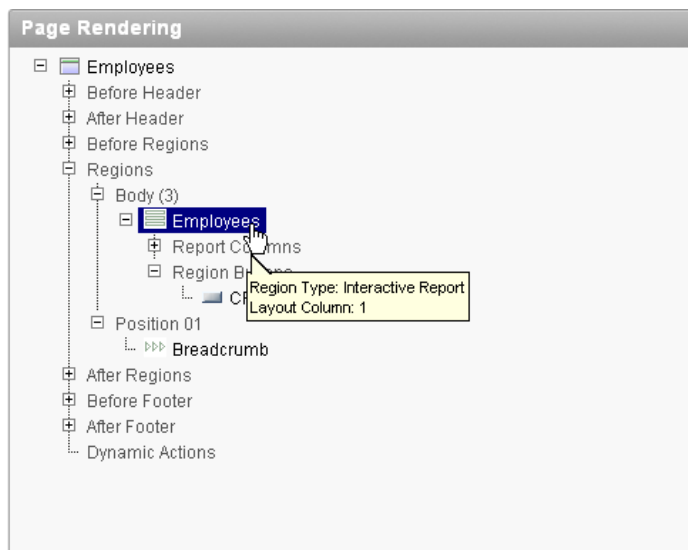
3. Right-click **Employees** and select **Edit**.

The Region Definition appears.

4. Scroll down to Source, and replace the existing code with the following:

```
SELECT "EMPLOYEE_ID",
    "FIRST_NAME",
    "LAST_NAME",
    "HIRE_DATE",
    "SALARY",
    "COMMISSION_PCT",
    calc_remuneration(salary, commission_pct) REMUNERATION
FROM "#OWNER#"."OEHR_EMPLOYEES"
```

5. Click **Apply Changes**.

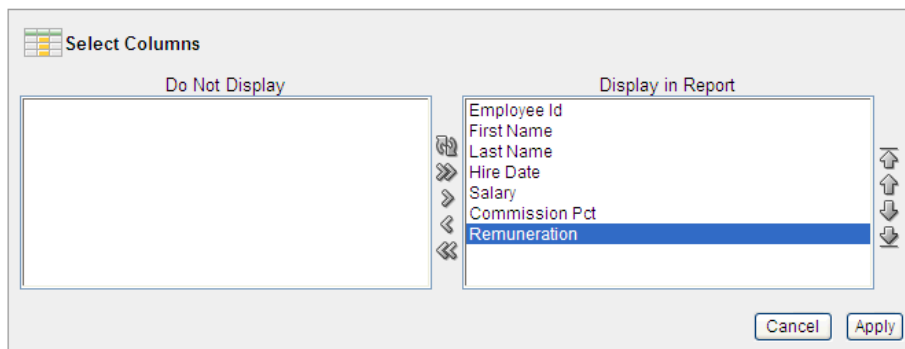6. Click **Apply Changes** to confirm.

Previewing the Page

To preview the page, click the **Run Page** icon in the upper right corner. Notice the Remuneration column does not appear. You must add the column by using the Select Column action.

To display the Remuneration column:

1. Click the **Actions** menu.

2. Select the **Select Columns** action.

3. Move the **Remuneration** column from the Do Not Display box to the Display in Report box.

4. Click **Apply**.

The Employees Report is displayed and includes the Remuneration column.

Changing the Column Format

Next, change the format of the columns that contain numeric values.

To change the column format:

1. Click **Edit Page 3** on the Developer toolbar (at the bottom of the page).

   The Page Definition appears.

2. Under Regions, right-click **Employees** and select the **Edit Report Attributes**.

   The Report Attributes page appears.

3. Locate the Column Attributes section.

   Next, change the format of the value in the Salary and Remuneration columns.

4. To edit the Salary format:

   a. Click the **Edit** icon next to SALARY.

   b. For Number/Date Format, select **$5,234.10** from the list.

      Notice that the appropriate format mask appears in the field.

   c. Click **Apply Changes**.

5. Repeat the previous step for REMUNERATION.

6. Click the **Run Page 3** icon in the upper right corner to preview the page.

   Notice that the numbers in the Salary and Remuneration columns now appear with the dollar sign and include commas and decimals.

Adding a Link on the Home Page to the Employees Report

In this exercise, you add a link on the Home page to take users to the Employees report. This link appears in the Navigation region on the left side of the Home page.

To add a link on the Home page to the Employees report:

1. Navigate to the Page Definition for the Home page, page 1:

   a. Click the **Application ID** link on the Developer toolbar (at the bottom of the page).

   b. On the Application home page, click **1 - Home**.

2. Under Regions, right-click **Navigation** and select **Edit List**.

3. On the Entries by List page, click the **Create List Entry** button.

4. On the Create/Edit List page, edit the following:

   a. Sequence - Change to `20`.

   b. List Entry Label - Enter `Employees`

   c. Page - Select `3`.

5. Click **Create**.

6. Run the page.

Notice that your Home page now includes a link to Employees.

7. Click **Employees** to test the link.

The Employees report appears.

Adding a Department Column to the Employees Report

In this exercise, you link the Employees and Departments reports. When you complete this section, the Employees report will have a Departments column showing which department each employee belongs to.

To perform this task, you create a column on the Employees page to enable the user to select a department. You then run the Employees report and add the Departments column to the report. The report settings are saved as the default.

Topics:

- Add a Column
- Display Column in the Report
- Save Report Settings as the Default

Add a Column

In order to filter the Employees report by department, add a Department column to the report.

To add a column:

1. Click **Edit Page 3** in the Developer toolbar.

2. Under Regions, right-click **Employees** and select **Edit**.

   The Region Definition appears.

3. Scroll down to Source.

4. Replace Region Source with the following SQL:

```
SELECT e.EMPLOYEE_ID,
    e.FIRST_NAME,
    e.LAST_NAME,
    e.HIRE_DATE,
    e.SALARY,
    e.COMMISSION_PCT,
    calc_remuneration(salary, commission_pct) REMUNERATION,
    e.DEPARTMENT_ID,
    d.DEPARTMENT_NAME
FROM OEHR_EMPLOYEES e,
    OEHR_DEPARTMENTS d
WHERE e.DEPARTMENT_ID=d.DEPARTMENT_ID
```

5. Click **Apply Changes**.

6. Click **Apply Changes** to confirm.

   The next section explains how to add the column to the report display and how to use this column to filter employee reports.
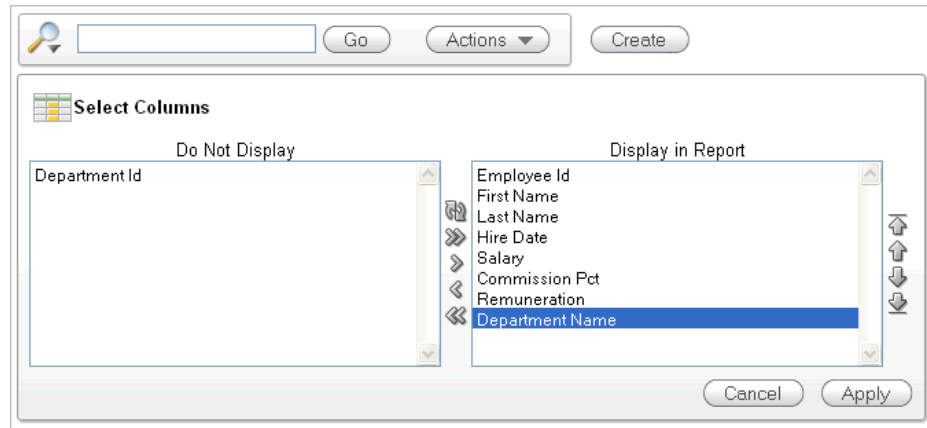
Display Column in the Report

When you first run this report, use the Select Columns action to add the Department Name column to the display. Once this column is visible on the report, make this report the default and filter by department.

To add the Department Name column to the report:

1. Click the **Run Page 3** icon.

2. Click the **Actions** menu and select **Select Columns**.

3. Move Department Name from the Do Not Display box to the last entry in the Display in Report box.

4. Click **Apply**.

The Employees Report is displayed and includes the Department Name column.

Next, make these report settings the default.

Save Report Settings as the Default

This section describes how to save the current report settings as the Primary Default report. Report settings are any setting made through the Actions menu including: selected columns, filters, sorting, rows per page, format setting such as sort control breaks, highlighting, and so on, and flashback.

Both developers and end users can save interactive reports. However, only a developer can save the report that initially displays, called the Primary Default report.

Once the default settings are saved, these columns are the default display in this report.

To save the current report settings as the default:

1. Run the Employees report page.

The current report default does not include the Department Name column when the report is displayed.

2. Click the **Actions** menu.

3. Select **Save Report**.

4. For Save, select **As Default Report Settings** from the list.

5. Accept the Default Report Type setting, **Primary**, and click **Apply**.

> **Note:** If a reset is performed on this page, these default report settings are used. The Department Name column is displayed by default.

Linking a Column Value to Another Page

In this exercise, you add a link to the Number of Employees column on the Departments report that navigates the user to the Employees report. It also sets the focus to the selected department. The column link includes a Clear Interactive Report command, CIR, to clear the Employees report, when shown, of any filters, control breaks, highlights, aggregates, computed columns, chart settings and flashback settings.

Topics:

- Change Column Value to a Link
- Run the Departments Report
- Create a Highlight to Test Clear Interactive Report Command

Change Column Value to a Link

To make this change, you edit the report attributes on the Departments report to change the value for the Number of Employees column to a link.

To change the column value to a link:

1. Click the **Application ID** link on the Developer toolbar.

2. Click **2 -Departments**.

3. Under Regions, right-click **Departments** and select **Edit Report Attributes**.

   The Report Attributes page appears.

4. Locate the Column Attributes section.

5. In the Column Attributes section, click the **Edit** icon next to Number of Employees.

6. Scroll down to the Column Link section.

7. Under Column Link, make these changes:

   a. Link Text - Select **#Number of Employees#**.

   b. Page - Enter 3.

   c. Select the **Reset Pagination** check box.

   d. Clear Cache - Enter:

      ```
      3,CIR
      ```

      The 3 means the cache for page 3 is cleared and the string CIR clears the Employees interactive report of any filters, control breaks, highlights,

aggregates, computed columns, chart settings or flashback settings when the report is displayed.

Note: If you want to reset the interactive report to the default report settings instead of clear the report, replace `CIR` with `RIR`. The last saved default report settings are applied to the interactive report.

---

   e. Item 1, Name - Enter `IR_DEPARTMENT_ID`

      By prefixing the item name with IR_, the URL item will be associated with an interactive report column rather than an item on the page.

   f. Item 1, Value - Select **#DEPARTMENT_ ID#**

      The Column Link section shows all the options you selected.

In summary, these options enable the following behavior when the end user clicks the link:

- The end user is navigated to page 3 of the Employees report.

- On the Employees report, the selected department is in focus.

- The Employees report is cleared. This means any filters, control breaks, highlights, aggregates, computed columns, chart settings or flashback settings are removed.

- The user is returned to the first set of employee records when the user selects another department.

   g. Click **Apply Changes**.

      Note that in the Column Attributes section, the Number of Employees row contains a check mark in the Link column, reflecting the change you just made.

Run the Departments Report

Now, run the report and test the Number of Employees column link from the Departments report. The Employees report is displayed showing all employees that belong to the selected department.

1. Click the **Run Page 2** icon.

The Departments report is displayed. Note that end users can now drill down on the data in the Number of Employees column.

	Department Id	Department Name	Number Of Employees	Manager Name	Location
✎	90	Executive	3	S.King	United States of America
✎	60	IT	5	A.Hunold	United States of America
✎	100	Finance	6	N.Greenberg	United States of America
✎	30	Purchasing	6	D.Raphaely	United States of America
✎	50	Shipping	45	A.Fripp	United States of America
✎	80	Sales	34	J.Russell	United Kingdom
✎	10	Administration	1	J.Whalen	United States of America
✎	20	Marketing	2	M.Hartstein	Canada
✎	40	Human Resources	1	S.Mavris	United Kingdom
✎	70	Public Relations	1	H.Baer	Germany
✎	110	Accounting	2	S.Higgins	United States of America

1 - 11

2. In the Number of Employees column, click the 3 for the Executive row.

All employees that belong to the Executive department appear in the Employees report.

Department Id = 90 ☑ ✖

	Employee Id	First Name	Last Name	Hire Date	Salary	Commission Pct	Remuneration	Department Name
✎	100	Steven	King	17-JUN-87	$24,000.00	-	$288,000.00	Executive
✎	101	Neena	Kochhar	21-SEP-89	$17,000.00	-	$204,000.00	Executive
✎	102	Lex	De Haan	13-JAN-93	$17,000.00	-	$204,000.00	Executive

The Department Id filter is displayed because this report is filtered by the Department Id value for the Executive department, 90, passed to this report from the Departments report. Notice the Clear Interactive Report command is included at the end of the URL in your browser, as shown in this example:

```
f?p=9257:3:3672543193352902::NO:RP,3,CIR:IR_DEPARTMENT_ID:90
```

Create a Highlight to Test Clear Interactive Report Command

This exercise demonstrates how to use the CIR command to clear a highlight before displaying the Employees report. To show this, you highlight any rows containing the first name of Neena, then display the Employees report from the Number of Employees column on the Departments report.

To highlight rows in the Employees report:

1. Click the **Actions** menu and select **Format** and then **Highlight**.

   The Highlight options appear.

2. For Highlight options make these changes:

   a. Name - Enter Neena

      b. Background Color - Select **[yellow]**

      c. Text Color - Select **[red]**

      d. Column - Select **First Name**

      e. Operator - Select **=**

      f. Expression - Select **Neena**

      g. Click **Apply**.

The Employees report appears with the row for Neena highlighted.

3. Next, reset the report.

      a. Click the **Home** breadcrumb.

      b. Click **Departments** link.

      c. Click **Number of Employees** in the Executive row.

      The Employees report is displayed with the highlighting cleared, due to the CIR command specified in the column link.

4. Click the **Remove Filter** icon to the right of **DepartmentID = 90**.

5. Click **Application ID** on the Developer toolbar.

Adding a List of Values to the Employees Report

In this exercise, you add a list of values to the Employees page to display employees by department. You also change the Employees report query, edit the column link on the Department report, and turn off pagination.

Topics:

- Add a List of Values
- Add an Item to Display List of Values
- Change Employees Report Query
- Change Column Link on Department Report
- Turning Off Pagination

Add a List of Values

In this section, you create a list of values that is used to select which department details to view. This is a dynamic list that queries the OEHR_DEPARTMENTS table for a list of all the department names.

To create a list of values:

1. Click **Shared Components** icon.

2. Under User Interface, select **Lists of Values**.

3. Click the **Create** button.

4. Accept the default, **From Scratch**, and click **Next**.

5. For Name and Type:

    a. Name - Enter DEPARTMENTS

    b. Type - Select **Dynamic**.

    c. Click **Next**.

6. For the Query, enter the following SQL:

    ```
    SELECT department_name d, department_id v
        FROM oehr_departments
        ORDER BY d
    ```

7. Click **Create List of Values**.

Add an Item to Display List of Values

Now, you create an item in the Department Details region to display the list of departments.

To add an item:

1. Navigate to the Page Definition for page 3, Employees.

2. Under Region, right-click **Employees** and select **Create Page Item**.

3. Select **Select List** and click **Next**.

4. For Create Item:

    a. Item Name - Enter P3_DEPARTMENT_ID

    b. Sequence - Enter 10

    c. Region - Select **Employee (1) 10**

    d. Click **Next**.

5. For Item Attributes:

    a. Label - Enter Department

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

6. For Settings:

    a. Value Required - Select **No**.

    b. Page Action when Value Changed - Select **Redirect and Set Value**.

    c. Click **Next**.

7. For Identify List of Values, make these changes:

    a. Named LOV - Select **DEPARTMENTS**

    b. Display Null Option - Select **Yes**

    c. Null Display Value - Enter:

```
        - No Department Assigned -
```

    d. Null Return Value - Enter:

       -1

    e. Click **Next**.

8. Click **Create Item**.

Change Employees Report Query

Now, you change the Employees report query to display employees that belong to the selected department.

To change the query:

1. Under Regions, right-click **Employees** and click **Edit**.

2. Enter the following SQL for Region Source:

```
SELECT  e.EMPLOYEE_ID,
        e.FIRST_NAME,
        e.LAST_NAME,
        e.HIRE_DATE,
        e.SALARY,
        e.COMMISSION_PCT,
        calc_remuneration(salary, commission_pct) REMUNERATION,
        e.DEPARTMENT_ID,
        d.DEPARTMENT_NAME
  FROM  OEHR_EMPLOYEES e,
        OEHR_DEPARTMENTS d
 WHERE  e.DEPARTMENT_ID = d.DEPARTMENT_ID(+) AND
        (e.DEPARTMENT_ID = :P3_DEPARTMENT_ID or
        (e.DEPARTMENT_ID is null and nvl(:P3_DEPARTMENT_ID,'-1') = '-1'))
```

3. Click **Apply Changes**.

Change Column Link on Department Report

Because the Employees query has changed, the Number of Employees column link needs to initialize the P3_DEPARTMENT_ID item to the value of DEPARTMENT_ID.

To change the column link for Number of Employees:

1. Click the **Application ID** breadcrumb.

2. Click **2 - Departments**.

3. Under Regions, right-click **Departments** and select **Edit Report Attributes**.

4. Click the **Edit** icon for Number of Employees.

5. Scroll down to Column Link.

6. For Item 1, select **P3_DEPARTMENT_ID**.

7. Click **Apply Changes**.

Turning Off Pagination

Next, turn off pagination for the Department Details report, because only one record (the department details report) displays at a time. If pagination is on, the region that displays the department details includes the information *row 1 - 1*.

To turn off pagination:

1. Click the **Application ID** breadcrumb.

2. Click **3 - Employees**.

3. Under Regions, right-click **Employees** and select **Edit Report Attributes**.

4. Scroll down to Pagination.

5. For Pagination Type, select **- No Pagination Selected -**.

6. Click **Apply Changes**.

7. Run the page.

8. From the Department list, select **No Department Assigned**.

Employee Kimberely Grant appears. This employee is not currently assigned to a department.

> **Tip:** If no records initially display, reload the page and try again.

Adding Your Company Name

You can add a graphical logo or text to your application so that it displays on each page. Your page template determines the display location.

In this exercise, you add your company name to your application.

To add your company name to your application:

1. Navigate to the Application home page. Click **Application ID** on the Developer toolbar (at the bottom of the page).

2. Click the **Edit Application Properties** button.

   The Edit Application Definition page appears.

3. Under Logo:

   a. Logo Type - Select **Text**.

   b. Logo - Enter `AnyCo Corp`

   c. Logo Attributes - Select **Black Text** from the pop up list.

4. Click **Apply Changes**.

5. Click the **1 - Home**.

6. Click the **Run Page** icon in the upper right corner.

The company name now appears on each page in your application.

Switching Themes to Change the User Interface

In this exercise, you switch the current theme to another one for your application. A **theme** is a 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.

Oracle Application Express separates presentation (or user interface themes) from the application logic. You can design your application in one theme, change to another supplied theme, or create and use your own custom theme. By separating the application logic (such as queries, processes, and branches) from the HTML rendering, your application can take advantage of the latest designs and other technological advances without an application rewrite. Each theme provides a complete set of templates that accommodate every user interface pattern that may be needed in an application.

To switch the theme:

1. Click the **Application** link on the Developer toolbar (at the bottom of the page).

2. On the Application home page, click **Shared Components**.

3. Under User Interface, click **Themes**.
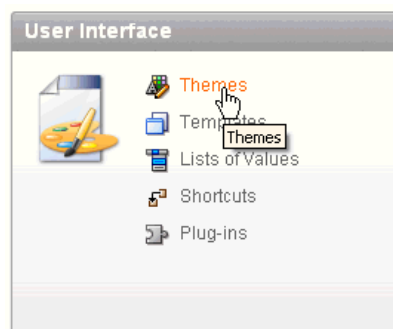
4. On the Themes page, click **Create**.

   The Create Theme Wizard appears.

5. For Method, accept the default, **From the Repository**, and click **Next**.

6. For Identify Theme, select **Theme 22** and click **Next**.

7. For Confirm, click **Create**.

8. Click **Switch Theme**.

9. For Identify Theme, accept the default, **22.Bluejay**, and click **Next**.

10. For Verify Compatibility, review the information, accept the defaults, and click **Next**.

The wizard verifies that corresponding templates exist in the selected theme for all templates used in your current application. If a template is missing, it warns you with a message in the Status column. For this tutorial, you can ignore this message because Oracle Application Express maps missing region templates to existing ones.

11. For Confirm Switch, click **Switch Theme**.

12. Run the page.
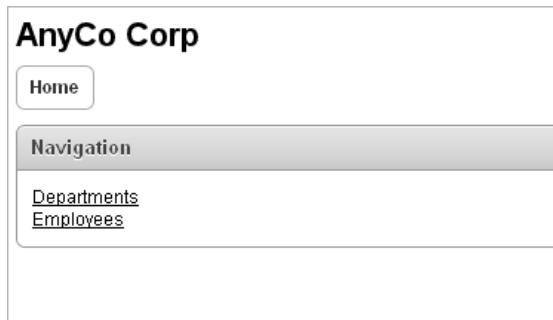
The color scheme and display layouts are changed in all your pages.

5

About Deploying Your Application

This section describes basic information about deploying your Oracle Application Express application. It also shows you how to create end users and to determine the URL of your application.

Topics:

- [Overview of Deploying Your Application](#)
- [Creating End Users](#)
- [About Publishing the Application URL](#)

Overview of Deploying Your Application

After building your application in your development environment, you need deploy it so that end users can begin using it. Deploying involves the following steps:

1. Collect your supporting object definitions (CREATE object statements, sample data, images, files, and so on). Review the Database Object Dependencies report to determine which supporting objects to move. See "Viewing Dashboards and Reports" in *Oracle Application Express Application Builder User's Guide*.

2. Define your supporting objects. This includes the object definitions you collected in the previous step and other supporting objects, such as messages and prerequisites.

3. Export the application with its supporting objects.

4. Import and install the exported files.

Using Oracle Application Express greatly simplifies the deployment process. It enables you to migrate the application definition, associated files, and all supporting objects in just a few steps.

> **See also:** "Deploying an Application" in *Oracle Application Express Application Builder User's Guide*.
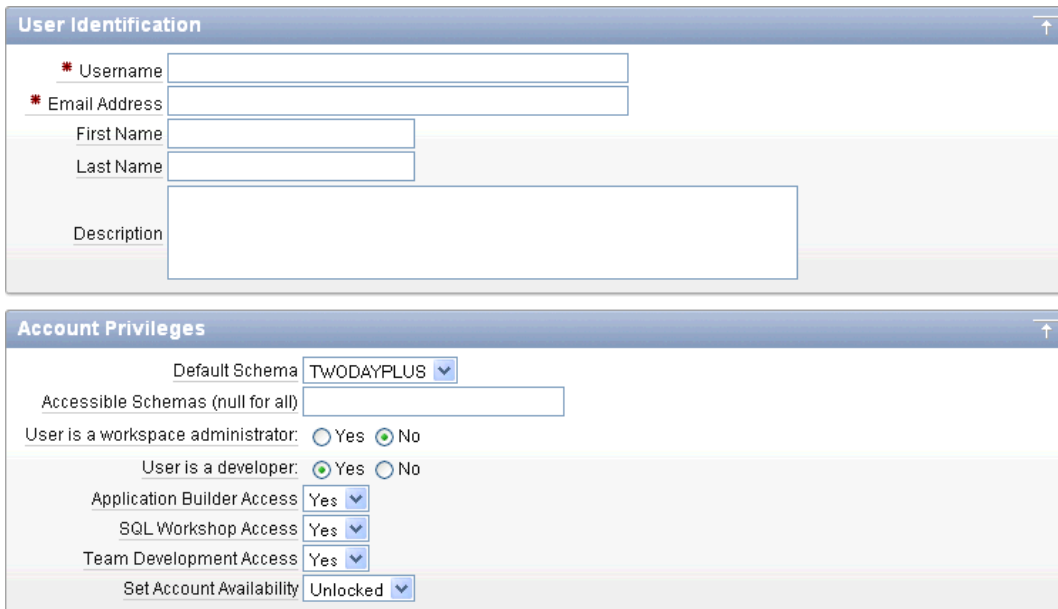
Creating End Users

After moving your application to a production environment, you must now create user accounts within Oracle Application Express for all your end users.

To create end user accounts:

1. Navigate to the Workspace home page.

2. Click **Administration**.

3. Click **Manage Users and Groups**.

4. Click the **Create User** button.

The Create User page appears.

User Identification

    * Username [   ]
    * Email Address [   ]
    First Name [   ]
    Last Name [   ]

    Description [   ]

Account Privileges

    Default Schema [TWODAYPLUS ▼]
    Accessible Schemas (null for all) [   ]
    User is a workspace administrator: ○ Yes ● No
    User is a developer: ● Yes ○ No
    Application Builder Access [Yes ▼]
    SQL Workshop Access [Yes ▼]
    Team Development Access [Yes ▼]
    Set Account Availability [Unlocked ▼]

5. Under User Identification, enter:

a. **Username** - Enter the username used to log in to the system. Restrictions include:

– Maximum length of 100 characters

– No spaces

– Only these special characters are permitted: ampersand (@) and period (.)

b. **Email Address** - Enter the valid email address for this user.

c. **First Name** - Enter the first or given name to further identify the user (optional).

d. **Last Name** - Enter the last or family name to further identify the user (optional).

e. **Description** - Enter comments about this user (optional).

6. Under Account Privileges:

a. **Default Schemas** - Specify the default schema used for data browsing, application creation, and SQL script execution.

When using workspaces that have more than one schema available, this schema is the default. This setting does not control security, only the user's preference.

b. **Accessible Schemas** (null for all) - Leave this blank to enable the end user to access all schemas associated with the workspace.

c. **User is a workspace administrator** - Specify if this user should have workspace administrator privileges.

Administrators are given access to all components. Additionally, they can manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.

    d. **User is a developer** - Specify if this user should have developer privileges.

    Developers must have access to either Application Builder, SQL Workshop, or both. Components may not be available if they are switched off by Instance Administrators.

    e. **Application Builder Access** - Determines whether a developer has access to the Application Builder.

    f. **SQL Workshop Access** - Determines whether a developer has access to the SQL Workshop.

    g. **Team Development Access** - Determines whether a developer has access to the Team Development.

    h. Set Account Availability - Select **Locked** to prevent the account from being used. Select **Unlocked** to allow the account to be used.

7. Under Password:

- **Password** - Enter a case sensitive password.

- **Confirm Password** - Enter the password again.

- **Require Change of Password On First Use** - Select **No** to allow the user to use the same password until it expires. Select **Yes** to require the user to change the password immediately when logging in the first time.

8. Under User Groups, optionally select a user group.

9. Click **Create User** or **Create and Create Another**.

> **See also:** "Managing Application Express Users" in *Oracle Application Express Administration Guide*

About Publishing the Application URL

After deploying your application, you must now publish its URL so end users know how to access it.

To determine the URL:

1. Log in to Oracle Application Express on the production environment.

2. Select the application.

3. On the Application home page, position the mouse over the **Run Application** icon.

4. Note the URL that displays in the status bar at the bottom of the page.

For example:

```
http://apex.oracle.com/pls/apex/f?p=11563:1:3397731373043366363
```

Where:

- `apex.oracle.com` is the URL of the server.

- `pls` is the indicator to use the `mod_plsql`.

- `apex` is the database access descriptor (DAD) name. The DAD describes how Oracle HTTP Server connects to the database server so that it can fulfill an HTTP request. The default value is `apex`.

- `f?p=` is a prefix used by Oracle Application Express.

- `11563` is the application being called.

- `1` is the page within the application to be displayed.

- `3397731373043366363` is the session number, which is unique for every user's access to the application. Do not include session numbers as a part of the URL communicated to end users.

To run this example application, you would go to this URL:

```
http://apex.oracle.com/pls/apex/f?p=11563:1
```

> **See also:** "Deploying an Application" in *Oracle Application Express Application Builder User's Guide*

6

About Globalization

This section describes some basic information about globalization. It also leads you through the steps to specify how the application determines global identification.

Topics:

- About Language Identification and Rendering
- Specifying the Method for Global Identification

> **See also:** "Managing Application Globalization" in *Oracle Application Express Application Builder User's Guide*

About Language Identification and Rendering

You can develop applications in Application Builder that run concurrently in different languages. This feature enables different users to view the application in their own language and data in the appropriate formats.

When rendering a page in the application, Oracle Application Express first determines the language for an application based on the method you specified. Then, the Application Express engine alters the session language and territory settings for a specific page request. It then looks for a translated application in the appropriate language. If the Application Express engine finds that language, it renders the application using that definition. Otherwise, it renders the application in the base (or primary) application language.

Even if your application is not translated, the language display determines the format for displaying data so that end users view numbers, dates, and currency in the appropriate formats.

Specifying the Method for Global Identification

As part of the application definition settings, you can specify how the application determines which language and formats to display. You can base it on the user's browser language preference or restrict it to the language you specify.

To specify the method for determining global identification:

1. Click **Application Builder** and then select the application.

2. Click **Shared Components**.

3. Under Globalization, click **Globalization Attributes**.

4. Under Globalization, specify the following:

a. Application Primary Language - Select the language you used when developing the application.

b. Application Language Derived From - Select **Browser (use browser language preference)**.

This option enables users to view the application in the language specified in their browsers.

c. Application Date Format - Determines the date format to be used in the application.

d. Application Date Time Format - Specify the date time format to be used in the application.

e. Application Timestamp Format - Determines the timestamp format to be used in the application.

f. Application Timestamp Time Zone Format - Determines the timestamp with time zone format to be used in the application.

g. Automatic Time Zone - Controls the setting of the database session time zone. When set to Yes, the client time zone is derived from the client's Web browser and set for the duration of the Application Express session.

h. Automatic CSV Encoding - Select **Yes** or **No**.

Automatic CSV Encoding controls the encoding of all comma-delimited (CSV) report output in an application. If Automatic CSV Encoding is set to Yes, CSV report output is 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.

For example, the end user whose browser setting is German (de) sees these changes on the Employees page of AnyCo Corp:

■ The euro currency symbol appears for the amounts in the Salary and Remuneration columns.

■ The amounts reflect the formatting used in Germany (commas and decimals).

	Employee Id	First Name	Last Name	Hire Date	Salary	Commission Pct	Remuneration
	102	Lex	De Haan	13-JANV.-93	€17 000,00	-	€204 000,00
	101	Neena	Kochhar	21-SEPT.-89	€17 000,00	-	€204 000,00
	100	Steven	King	17-JUIN -87	€24 000,00	-	€288 000,00

Note that the application fields are not yet translated. For instructions on translating your application, see "Managing Application Globalization" in *Oracle Application Express Application Builder User's Guide*.

7

Next Steps

Now that you have completed this guide, you are ready to take advantage of other resources to expand your knowledge of Oracle Application Express and boost your productivity. This section describes those resources.

> **Note:** Consider deleting the sample objects required to complete this tutorial, which will free up space in your workspace. For instructions, see "Deleting the OEHR Sample Objects Application" on page 3-4.

Additional Resources

To continue learning about Oracle Application Express, review these additional resources designed for Application Express users.

Oracle Learning Library

Search for free online training content, including Oracle by Example (OBE), demos, and tutorials. To access the Oracle Learning Library, go to:

http://www.oracle.com/technetwork/tutorials/index.html

Training Courses

You can attend training courses for Oracle Application Express. To review these courses, go to the following Web site and enter Application Express in the search criteria field:

http://education.oracle.com

Oracle Technology Network

Oracle Technology Network (OTN) is a central Web site for Oracle Application Express resources and information. In addition to downloading the latest product version, sample code, and packaged applications, the OTN site includes:

- Discussion forum, where you can post questions and search for solutions

- How-to documents, which are technical notes written by subject matter experts

- Quick tour of the product

- News and magazine articles related to Oracle Application Express

To access the Oracle Application Express page on OTN, go to the following Web site:

http://www.oracle.com/technetwork/developer-tools/apex/overview/index.h

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