Oracle® Application Express

Administration Guide

Release 5.0

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Oracle Application Express Administration Guide, Release 5.0

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Preface

Oracle Application Express is a hosted declarative development environment for developing and deploying database-centric web applications. Oracle Application Express turns a single Oracle database into a shared service by enabling multiple workgroups to build and access applications as if they were running in separate databases.

Oracle Application Express Application Administration Guide describes how to perform administration tasks for an Oracle Application Express workspace, application, or an entire development instance.

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

Oracle Application Express Administration Guide is intended for application developers who are building database-centric web applications using Oracle Application Express. The guide describes how to use the Oracle Application Express development environment to build, debug, manage, and deploy applications.

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

> **See Also:** *Oracle Application Express Application Builder User's Guide*

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 that have purchased support 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.

Related Documents

For more information, see these Oracle resources:

- *Oracle Application Express Release Notes*

- *Oracle Application Express Installation Guide*

- *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 Database Concepts*

- *Oracle Database Administrator's Guide*

- *Oracle Database SQL Language Reference*

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

Conventions

The following text conventions are used in this document:

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

Changes in This Release

This preface contains:

- Changes in Oracle Application Express Release 5.0

Changes in Oracle Application Express Release 5.0

The following are changes in *Oracle Application Express Administration Guide* for Oracle Application Express release 5.0.

New Features

The following features are new in this release:

- Rejoin Sessions

  The Rejoin Sessions attributes enables Instance administrators to control if Oracle Application Express supports URLs that contain session IDs.

  See "Configuring Rejoin Sessions for an Instance" on page 2-23.

- Support for File Attachments in Bugs

  See "Enabling Workspace-level Support for File Upload in Team Development" on page 1-19 and "Enabling Instance-level Support for File Upload in Team Development" on page 2-18.

- Configure the Display of Unhandled Errors

  Oracle Application Express Administration Services includes a Unhandled Error attribute that enables you to configure how unhandled error display.

  See "Configuring Unhandled Errors" on page 2-24.

- HTTP Header Support

  Configure both your Oracle Application Express instance and all related applications to require HTTPS by configuring the Require HTTPS and Require Outbound HTTPS attributes.

  See "Configuring HTTP Protocol Attributes" on page 2-24.

- Support for Real Application Security

  Developers running Oracle Database 12c Release 1 (12.1.0.2) or later, you enable Oracle Real Application Security.

  See "Enabling Real Application Security" on page 2-27.

- Control Maximum Size of Upload File in Workspace

Use new attributes to control the size of files that can be uploaded to a workspace.

See "Configuring Workspace Isolation Attributes" on page 2-89 and "Configuring Instance-Level Workspace Isolation Attributes" on page 2-28.

- Upload File Support for Team Development Bugs and ToDos

  Developers can now upload files to Team Development Bugs and ToDos.

- Team Development File Repository Configuration Controls

  Administrators can now enable the team development file repository and configure the maximum file size per upload. At the workspace-level, administrators also control if Team Development and File Repository are available.

  See "Enabling Instance-level Support for File Upload in Team Development" on page 2-18, "Enabling Team Development for a Workspace" on page 1-18, and "Enabling Workspace-level Support for File Upload in Team Development" on page 1-19.

Deprecated and Desupported Features

See "Deprecated Features" and "Desupported Features" in *Oracle Application Express Release Notes*.

Other Changes

The following are additional changes in the release:

- All content has been updated to reflect new functionality.

- Screen captures and graphics have been added and updated to reflect Oracle Application Express release 5.0 user interface enhancements.

1

Workspace and Application Administration

In an Oracle Application Express development environment, users sign in to a shared work area called a workspace. Developers can create and edit applications, monitor workspace activity, and view dashboards. Workspace administrators can additionally monitor and administer the workspace. This section describes how to perform Workspace administration tasks including making service requests, configuring workspace preferences, creating workspace announcements, managing session state, creating user accounts, and managing groups.

- Understanding Workspace Administration
- Monitoring Activity Within a Workspace
- Using the Manage Service Page
- Making a Service Request
- Configuring Workspace Preferences
- Defining a Workspace Announcement
- Managing Users in a Workspace
- Purging the Developer Activity and Click Count Log Files
- Managing Session State for a Workspace
- Managing User Preferences
- Managing Page and Region Caching
- Changing Build Status for Multiple Applications
- Viewing Workspace Dashboards
- Leveraging Application Builder Defaults

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

Understanding Workspace Administration

This section offers an introduction to workspace administration and describes common tasks including resetting your password, viewing the About Application Express page, managing the Export repository, and managing Websheet database objects.

- What is a Workspace Administrator?
- Accessing the Workspace Administration Page

- [Workspace Administration Page](#)
- [Resetting Your Password](#)
- [Viewing Product Release and Environment Information](#)
- [Managing Exported Files](#)
- [Managing Saved Interactive Reports](#)
- [Viewing a Workspace Summary](#)
- [Removing and Validating Websheet Database Objects](#)

What is a Workspace Administrator?

In Oracle Application Express, users sign in to a shared work area called a workspace. A **workspace** enables multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. This flexible architecture enables a single database instance to manage thousands of applications.

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

> **See Also:** "About Application Express User Roles" on page 1-22

Accessing the Workspace Administration Page

To access the Workspace Administration page:

1. Sign in to Oracle Application Express. See "About Signing In To Oracle Application Express" in *Oracle Application Express Application Builder User's Guide*.

   The Workspace home page appears.

2. At the top of the page, click the **Administration** menu and select **Administration**.
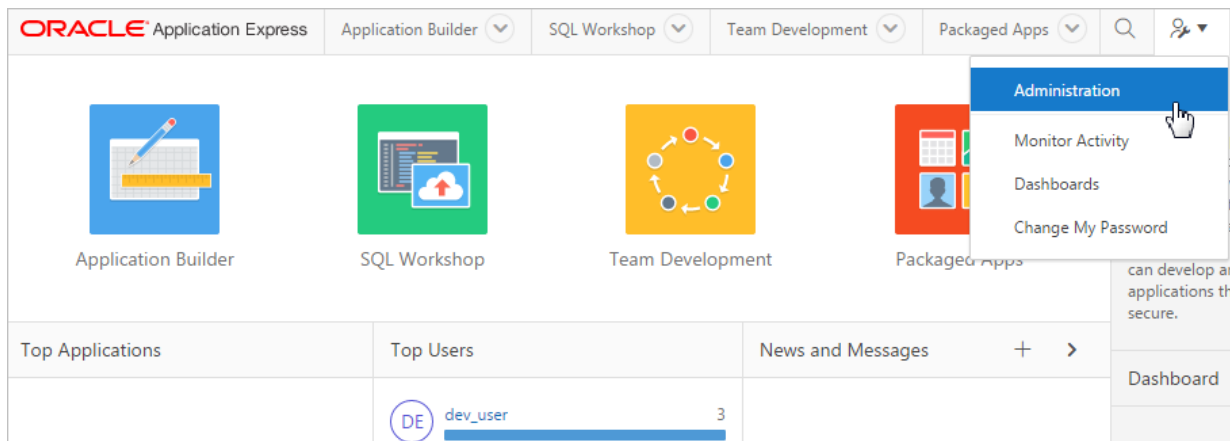
The Administration page appears.

> **See Also:** "Workspace Administration Page" on page 1-3

Workspace Administration Page
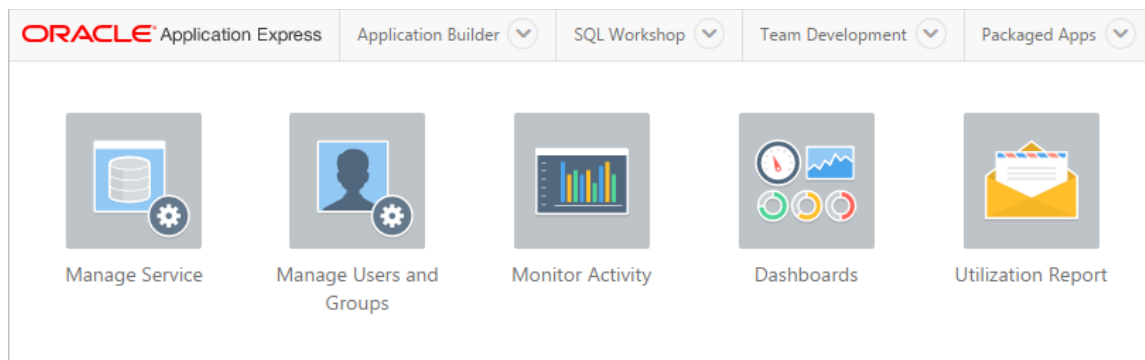
The top of Workspace Administration page contains the following icons:

- **Manage Service** links to the Manage Service page. Use this page to manage service requests (including, schema requests, storage requests, and service termination) and configure workspace preferences, edit announcements, view utilization reports and log files, and manage session state. See "Manage Service Page" on page 1-11.

- **Manage Users and Groups** links to the Manage Users and page. Use this page to manage Application Express user accounts and user groups. See "Managing Users in a Workspace" on page 1-21.

- **Monitor Activity** links to the Monitor Activity page. Use this page to monitor page views, developer activity, active sessions, view page view analysis reports, environment reports such as browser usage and click counts, and user login reports. See "Monitoring Activity Within a Workspace" on page 1-8.

- **Dashboard** links to the Dashboard page. Use this page to view details about the current workspace and monitor users, activity, developer activity, performance, Websheet application development, database application development, and view database details. See "Viewing Workspace Dashboards" on page 1-39.

Tasks Region

A Tasks region displays on the right side of the Workspace Administration page. This section describes each link in this region.

- **Change My Password** links to the Change Password section of the Edit Profile page. See "Resetting Your Password" on page 1-4.

- **About Application Express** links to an About page that lists basic product information. See "Viewing Product Release and Environment Information" on page 1-4.

- **Monitor Activity** links to the Monitor Activity page. See "Monitoring Activity Within a Workspace" on page 1-8.

- **Manage Service** links to the Manage Service page. See "Manage Service Page" on page 1-11.

- **Manage User Groups** links to the User groups page. See "Using Groups to Manage Application Express Users" on page 1-28.

- **Create User** links to a form where you can create new user. See "Creating New User Accounts" on page 1-22.

- **Create Multiple Users** enables you to create multiple users once. See "Creating Multiple Users Simultaneously" on page 1-24.

- **Delete Multiple Users** enables you to delete multiple users at once. See "Deleting Multiple Users at Once" on page 1-27.

- **Manage Interactive Report Settings** enables you to manage saved reports and subscriptions. See "Managing Saved Interactive Reports" on page 1-5.

- **Manage Export Repository** displays to the Manage Export Repository. See "Managing Exported Files" on page 1-5.

- **Websheet Database Objects** displays the Websheet Database Objects page. See "Removing and Validating Websheet Database Objects" on page 1-8.

Workspace Announcements

The Workspace Announcements region displays directly below the icons at the top of the Workspace Administration page. Use this display to communicate information to other users. See "Defining a Workspace Announcement" on page 1-19.

Resetting Your Password

To reset your password from the Administration page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Tasks list, click **Change Password**.

3. Under Change Password, enter the following:

   - Enter Current Password - Enter your current password.

   - Enter New Password - Enter your new password.

   - Confirm New Password - Enter your new password again.

4. Click **Apply Changes**.

   > **See Also:** "Changing a User Account Password" on page 1-26

Viewing Product Release and Environment Information

The About Application Express page lists basic product information, including the Application Express release number, workspace name, environment details, and database information.

To view the About Application Express page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Tasks list, click **About Application Express**.

   The About Application Express page appears. The page is divided into these sections: About; Visit Oracle Online For More Information; CGI Environment; and Database Version.

Details

The Details section displays the following information:

- Product build
- Schema compatibility
- Last DDL time
- Host schema
- Application Owner
- Workspace ID
- Workspace Name
- Current user
- Language Preference
- Current Time (on server)

CGI Environment

The Common Gateway Interface (CGI) Environment section provides information about the currently installed web server software such as currently defined parameters and variables.

Database Version

Database Version lists details about the currently installed database version.

Character Set

Character Set lists currently selected character sets. The selected character set determines the encoding scheme used to display characters on screen.

Managing Exported Files

Use the Manage Export Repository page to manage files in the current workspace.

To access the Manage Export Repository page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Tasks list, click **Manage Export Repository**.

   The Manage Export Repository page appears.

   You can customize the appearance of the page using the Search bar at the top of the page.

3. To remove a file, select the file and click **Delete Checked**.

   > **See Also:** "Exporting an Application and Application Components" in *Oracle Application Express Application Builder User's Guide*

Managing Saved Interactive Reports

Users can alter the layout of report data in interactive reports and then save them. They can also receive updated versions of a report by subscribing to it.

- [About Saved Interactive Reports](#)
- [Viewing and Deleting Saved Interactive Reports](#)
- [Managing Interactive Report Subscriptions](#)

> **See Also:** "Managing Reports" in *Oracle Application Express Application Builder User's Guide*

About Saved Interactive Reports

Both developers and end users can save interactive reports. However, only a developer can save the report that initially displays (called the Primary Default) or create an Alternative report.

There are four types of saved interactive reports:

- **Primary Default** (Developer Only). This 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.

Workspace administrators can view and manage these reports on the Saved Reports page.

Viewing and Deleting Saved Interactive Reports

To manage saved interactive reports:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. From the Tasks list, click **Manage Interactive Report Settings**.

   The Manage Interactive Report Settings page appears.

3. Click **Saved Reports**.

   The Saved Reports page appears.

   You can customize the appearance of the page using the Search bar at the top of the page.

4. To link to an application, page or region, click the appropriate hyperlink.

5. To delete a report:

   a. Select the report to be removed.

   b. Click **Delete Checked**.

Managing Interactive Report Subscriptions

End users can receive updated versions of a report by subscribing to it. Workspace administrators can view and manage these subscriptions on the Subscriptions page.

To manage interactive report subscriptions:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. From the Tasks list, click **Manage Interactive Report Settings**.

   The Manage Interactive Report Settings page appears.

3. Click **Subscriptions**.

   The Subscriptions page appears.

   You can customize the appearance of the page using the Search bar at the top of the page.

4. To link to an application, page or region, click the appropriate hyperlink.

5. To delete a subscription:

   a. Select the subscription to be removed.

   b. Click **Delete Checked**.

Viewing a Workspace Summary

This section describes the Workspace Utilization report. Administrators can use this report to view a comprehensive summary of the current workspace, including summaries of schemas, database applications, Websheet applications, SQL Workshop scripts and results, Team Development details, application activity, developer activity, and counts of database objects.

- Viewing the Workspace Utilization Report
- Emailing the Workspace Utilization Report

Viewing the Workspace Utilization Report

To view the Workspace Utilization report:

1. View the Workspace Summary Report:

   a. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   b. On the Workspace Administration page, click **Manage Service**.

   c. Click **Workspace Utilization**.

   d. From Show, select a time interval.

   e. Scroll down to view the report.

Emailing the Workspace Utilization Report

To email the Workspace Utilization report:

1. View the Workspace Summary Report:

   a. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   b. On the Workspace Administration page, click **Manage Service**.

   c. Click **Workspace Utilization**.

   d. From Show, select a time interval.

2. To email the report:

   a. Click **Email**.

   b. In the Email form, enter email addresses, edit the subject line, enter optional body text, and click **Email**.

      – **To** - Enter valid email addresses.

      – **Subject** - Enter text that describes the message.

      – **Body** - Enter optional body text.

      – Click **Email**.

   The report is automatically emailed to the specified recipients.

Removing and Validating Websheet Database Objects

All Websheet application data is stored within tables owned by a schema associated with this workspace. The tables are all prefixed by APEX$_. Use the Websheet Database Objects to manage these tables.

To access the Manage Export Repository page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Tasks list, click **Websheet Database Objects**.

   The Websheet Database Objects page appears.

3. Select one of the following:

   ■ **Remove Websheet Database Objects**

   ■ **Validate Websheet Database Objects**

   > **See Also:** "Creating Websheet Applications" in *Oracle Application Express Application Builder User's Guide*

Monitoring Activity Within a Workspace

Administrators can monitor developer activity and changes within a workspace by accessing the Monitor Activity page. The Monitor Activity page features links to numerous reports that track page views, developer activity, active sessions and also view page view analysis reports, environment reports such as browser usage and click counts, and login reports. This section only describes a few reports in detail.

■ Accessing the Monitor Activity Page

■ Viewing Application Changes by Developer

■ Viewing Application Changes by Day

■ Viewing Active Sessions

■ Viewing Schema Reports

> **See Also:** "Viewing Workspace Dashboards" on page 1-39, "Monitoring Activity Across a Development Instance" on page 2-99, and "Creating Custom Activity Reports Using APEX_ACTIVITY_ LOG" in *Oracle Application Express Application Builder User's Guide*

Accessing the Monitor Activity Page

To view developer activity and application change information from the Monitor Activity page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Monitor Activity**.

   The Monitor Activity page appears and is divided into the following sections:

   - **Page Views** - Contains reports of page views organized by view, user, application, application and page, day, hour, and by interactive report.

   - **Developer Activity** - Offers reports of developer activity organized by developer, day, application, application changes, and day or month.

   - **Sessions** - Lists active sessions with the current workspace (report or chart).

   - **Page View Analysis** - Contains reports analyzing page views, such most viewed pages, page views by day, usage by day (chart), weighted page performance, and Websheet page views.

   - **Environment** - Contains reports of environments organized by user agent, browser, external clicks, or operating system.

   - **Login Attempts** - Offers reports listing login attempts, login attempts by authentication result, and a developer login summary.

   - **Application Errors** - Contains a report of application errors.

   - **Workspace Schema Reports** - Offers summaries of schema tablespace utilization and database privileges by schema, workspace schemas, and report tablespace utilization.

3. Select a report to review.

Viewing Application Changes by Developer

The Application Changes by Developer report displays the number of pages changed by each developer and offers a graphical representation of the information in either a bar chart or pie chart format.

To view application changes by developer:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Monitor Activity**.

3. Under Developer Activity, select **By Developer.**

4. Make a time selection from the Since list, an application (if applicable), and click **Set**.

   You can customize the appearance of the page using the Search bar at the top of the page.

Viewing Application Changes by Day

The Application Changes by Day report displays a summary of the number of application changes by day. You have the option to view this information by month, as a line chart, or by developer.

To view application changes by day:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Monitor Activity**.

3. Under Developer Activity, click **By Day**.

   The Application Changes by Day page appears.

4. Make a time selection from the Since list, an application (if applicable), and click **Set**.

   You can customize the appearance of the page using the Search bar at the top of the page.

Viewing Active Sessions

A session is a logical construct that establishes persistence (or stateful behavior) across page views. The Active Sessions report lists active sessions with the current workspace.

- What is an Active Session?

- Viewing the Active Sessions Report

  > **See Also:** "Undertanding Session State Management" in *Oracle Application Express Application Builder User's Guide*

What is an Active Session?

Whenever an application is run, the Application Express engine maintains a record in a database table in the Oracle Application Express schema. This table records a numeric identifier (or session ID), the authenticated (or public) user identifier, the creation date, and other information. The session is the key record that enables session state, or persistence, across page requests. By viewing the Active Sessions report, a developer or administrator can see who has been using applications in a workspace. An **active session** is a session that has not yet been purged from the sessions table. An **expired session** is a session which has been existing longer than its maximum lifetime or which has not been used for longer than its maximum idle time. A DBMS job runs every hour and purges expired sessions.

Viewing the Active Sessions Report

To view active session details:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Monitor Activity**.

3. Under Sessions, select **Active Sessions.**

You can customize the appearance of the page using the Search bar at the top of the page.

4. Click a session ID to view the Session Details page.

Viewing Schema Reports

Schema Reports offer summaries of schema tablespace utilization and database privileges by schema and a list of all database schemas available in the current workspace.

To view Schema Reports:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Monitor Activity**.

3. Under Workspace Schema Reports, click one of the following reports:

   - **Schema Tablespace Utilization**
   - **Database Privileges by Schema**
   - **Workspace Schemas**
   - **Report Tablespace Utilization (popup)**

   You can customize the appearance of the Database Privileges and Workspace Schemas reports using the Search bar at the top of the page.

Using the Manage Service Page

This section describes the Manage Service page. Workspace administrators use the Manage Service page to manage service requests, configure workspace preferences, edit workspace announcements, and view reports. Additionally, administrators use this page to clear log files, manage session state, clear cached content, manage Websheet database objects, and manage interactive report settings.

- Accessing the Manage Service Page
- Manage Service Page

Accessing the Manage Service Page

To access the Manage Service page:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

   The Manage Service page appears.

   > **See Also:** "Manage Service Page" on page 1-11

Manage Service Page

Administrators use the Manage Service page to manage service requests, configure workspace preferences, edit workspace announcements, and view workspace

utilization reports. Additionally, links on the Manage Meta Data list enable administrators to manage log files, session state, page and region caching, Websheet Database objects, application build status, file utilization, and interactive report settings.
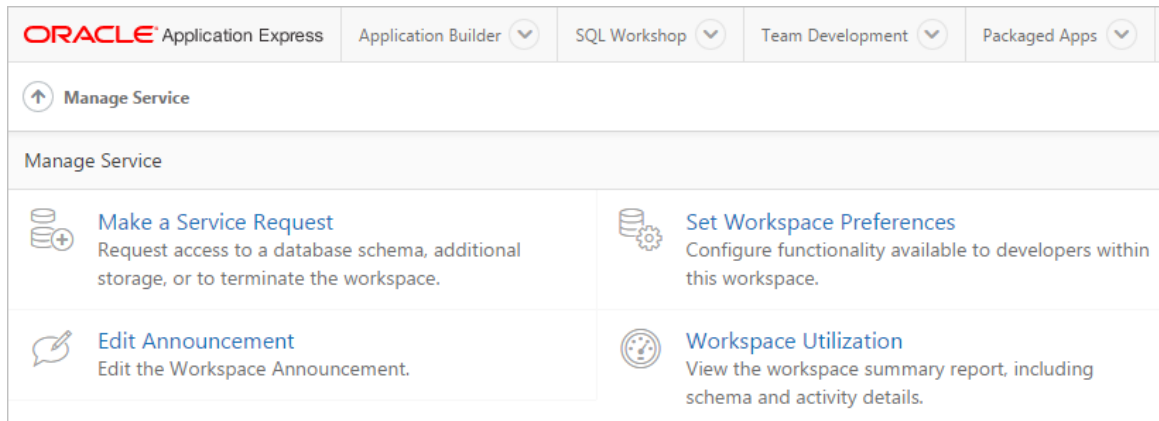
The center of the Manage Service page contains the following links:

- **Make a Service Request**. Use Make a Service Request to request a new schema, request additional storage space, or terminate a workspace. See "Making a Service Request" on page 1-13.

- **Set Workspace Preferences**. Click **Set Workspace Preferences** to configure login controls, Application Builder, SQL Workshop, PL/SQL editing capability, RESTful service support, and Team Development. See "Configuring Workspace Preferences" on page 1-15.

- **Edit Announcement**. Click **Edit Announcement** to create a message that displays on the Workspace home page and on the Workspace Administration page. See "Defining a Workspace Announcement" on page 1-19.

- **Workspace Utilization**. Use Workspace Utilization to view a summary report about the current workspace. See "Viewing a Workspace Summary" on page 1-7.

Dashboards

The Dashboards region displays links to specific dashboards. See "Viewing Workspace Dashboards" on page 1-39.

Manage Meta Data Region

The Manage Meta Data region displays on the right side of the page and displays the following links:

- **Developer Activity and Click Count Logs**. See "Purging the Developer Activity and Click Count Log Files" on page 1-30.

- **Session State**. See "Managing Session State for a Workspace" on page 1-31.

- **Application Cache.** See "Managing Page and Region Caching" on page 1-37.

- **Websheet Database Objects** displays the Websheet Database Objects page. See "Removing and Validating Websheet Database Objects" on page 1-8.

- **Application Build Status**. See "Changing Build Status for Multiple Applications" on page 1-38.

- **Utilization Page**. See "Viewing a Workspace Summary" on page 1-7.

- **Interactive Report Settings**. See "Managing Saved Interactive Reports" on page 1-5.

Making a Service Request

Use the Request Service page to request a schema, add storage space, or to terminate a workspace.

> **Tip:** This information does not apply to Oracle Database Cloud Service (Database Schema).

- Requesting a New Schema
- Requesting More Storage
- Terminating a Workspace
- Determining the Amount of Space Available in Your Workspace
- Requesting Another Workspace

> **See Also:** "Managing Workspace and Change Requests" on page 2-8

Requesting a New Schema

To request a new schema:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Make a Service Request**.

4. Select **Request Schema**.

5. On Request Database Schema, specify the following:

   a. Schema - Select either **Request a new schema** or **Use an existing schema**.

   b. Schema Name - Enter a new name or select one from the list.

   c. Click **Next**.

6. Click **Finish**.

Requesting More Storage

To request more storage:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Make a Service Request**.

4. Select **Request Storage**.

> **Tip:** To see the amount of free space available in the workspace, click **Detailed Tablespace Utilization Report (may take several seconds)**.

5. On Request Storage, specify the following:

   a. Amount of Storage to Add - Select the amount of storage to add.

   b. Click **Next**.

6. Confirm your request by clicking **Request Storage**.

Terminating a Workspace

To terminate a workspace:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Make a Service Request**.

4. Select **Request Termination**.

5. On Request Service Termination:

   a. Verify the name of workspace service to be terminated.

   b. Click **Next**.

   c. Confirm your request by clicking **Terminate Service**.

Determining the Amount of Space Available in Your Workspace

This section describes how to use the Detailed Tablespace Utilization report to see the amount of free space available in a workspace. When requesting additional storage, use this report to determine how much additional storage space you need.

Viewing the Detailed Tablespace Utilization Report

To view the Detailed Tablespace Utilization report:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Make a Service Request**.

4. Click **Detailed Tablespace Utilization Report (may take several seconds**).

   A report appears displaying the tablespace name, available bytes, amount used, amount free, and percentage used.

Requesting Another Workspace

To request another workspace:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Make a Service Request**.

4. Click **Sign up for another workspace.**

5. Follow the online registration instructions.

Configuring Workspace Preferences

This section describes how to configure workspace preferences for workspace login controls, access to Application Builder and SQL Workshop, support for PL/SQL editing and RESTful services, and access to Team Development.

- Creating Account Login Controls for a Workspace
- Controlling Access to Application Builder
- Controlling Access to SQL Workshop
- Disabling PL/SQL Program Unit Editing for a Workspace
- Managing Team Development

> **Tip:** Some of these preferences can also be configured for an entire instance. If applicable, this section includes references to any instance-level settings.

Creating Account Login Controls for a Workspace

This section describes how to configure workspace login controls.

- About Login Controls
- Configuring Workspace Account Login Controls

> **See Also:** "Configuring Authentication Controls" on page 2-30

About Login Controls

Administrators can configure login controls for an entire Oracle Application Express instance or for each individual workspace. For example, if an Instance administrator configures account login controls in Oracle Application Express Administration Services that configuration applies to all Application Express accounts in all workspaces across an entire instance.

If the Instance administrator does *not* enable login controls across an entire instance, then each Workspace administrator can configure the following controls on a workspace-by-workspace basis:

- End-user account expiration and locking
- A maximum number of failed login attempts for end-user accounts
- The password lifetime (or number of days an end-user account password can be used before it expires for end-user accounts

> **Tip:** This feature applies only to accounts created using the Application Express user creation and management. Application Accounts Authentication provides additional authentication security for applications. See "Managing Users in a Workspace" on page 1-21.

Configuring Workspace Account Login Controls

To configure login controls for a workspace:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Under Account Login Control:

   a. Account Expiration and Locking - Make a selection to determine whether Application Express end user accounts can be expired or locked. This feature applies only to end-user accounts created using the Application Express user management interface. Options include: **Enable** or **Disable**.

      If you select **Enable**, end-user account passwords expire after the time period specified and accounts are locked after a configurable number of authentication failures. Account passwords can be set to expire after the first use.

      Tip: If the Instance administrator sets the **Require User Account Expiration and Locking** preference to **Yes**, this preference defaults to **Enable** and you cannot update it.

   b. Maximum Login Failures Allowed - Enter a positive integer for the maximum number of consecutive unsuccessful authentication attempts allowed before an end-user account is locked. If you do not specify a value in this field, the instance-level setting for Maximum Login Failures Allowed is used.

   c. End User Account Lifetime (days) - Enter a positive integer for the maximum number of days an end-user account password may be used before the account expires. If you do not specify a value in this field, the instance-level setting for Account Password Lifetime is used.

5. Click **Apply Changes**.

   See Also: "Configuring Authentication Controls" on page 2-30

Controlling Access to Application Builder

To control access to Application Builder:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Scroll down to Application Builder.

5. To Enable Application Builder, select **Yes**. To disable Application Builder, select **No**.

6. Click **Apply Changes**.

   Tip: These settings can be overridden by an Instance administrator. See "Managing Component Availability for an Instance" on page 2-88.

Controlling Access to SQL Workshop

To control access to SQL Workshop:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

    The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Scroll down to SQL Workshop.

5. To Enable SQL Workshop, select **Yes**. To disable SQL Workshop, select **No**.

6. Click **Apply Changes**.

    > **Tip:** These settings can be overridden by an Instance administrator. See "Managing Component Availability for an Instance" on page 2-88.

Disabling PL/SQL Program Unit Editing for a Workspace

By default, developers can change and compile PL/SQL source code when browsing database procedures, packages, and functions in SQL Workshop Object Browser. Workspace administrators can disable PL/SQL program unit editing by selecting **Do not allow PL/SQL program unit editing** on the Set Workspace Preferences page.

To disable PL/SQL program unit editing:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

    The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Scroll down to SQL Workshop.

5. Under PL/SQL Editing, select one of the following:

    - **Allow PL/SQL program unit editing**

    - **Do not allow PL/SQL program unit editing**

    If you select **Do not allow PL/SQL program unit editing**, developers can still create and replace PL/SQL program units using scripts or SQL Commands.

6. Click **Apply Changes**.

    > **See Also:** "Disabling PL/SQL Program Unit Editing" on page 2-13 and "Using SQL Commands" in *Oracle Application Express SQL Workshop Guide*

Controlling RESTful Services for a Workspace

Use the Enable RESTful Services attribute to control whether developers can expose report regions as RESTful services. You can enable RESTful services for specific workspace or for an entire development instance.

To configure RESTful access for a workspace:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Scroll down to SQL Workshop.

5. From Enable RESTful Services, select one of the following:

   - **Yes** - Enables developers to expose report regions as RESTful services.

   - **No** - Prevents developers from exposing report regions as RESTful services.

6. For Path Prefix, specify the path prefix to be used to access RESTful Services in the current workspace.

   For example, a workspace named QA_1 could have a path prefix set to QA. The default value is the short name of the workspace.

7. Click **Apply Changes**.

   > **See Also:** "Controlling RESTful Services for an Instance" on page 2-27 and "Using RESTful Services" in *Oracle Application Express SQL Workshop Guide*

Managing Team Development

Use the options under Team Development to specify whether Team Development is available in the current workspace, enable support for file attachments, and specify the maximum size of uploaded files.

- Enabling Team Development for a Workspace

- Enabling Workspace-level Support for File Upload in Team Development

   > **Tip:** This attribute can only be modified if the instance-level setting, Enable Team Development's File Repository is set to **Yes**. See "Enabling Instance-level Support for File Upload in Team Development" on page 2-18.

Enabling Team Development for a Workspace

To enable Team Development:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Scroll down to Team Development.

5. For Enable Team Development, select either:

   - **Yes** - Select **Yes** to enable Team Development in the current workspace.

   - **No** - Select **No** to disable Team Development in the current workspace.

6. Click **Apply Changes**.

Enabling Workspace-level Support for File Upload in Team Development

To enable support for file upload in for Team Development file upload:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Click **Set Workspace Preferences**.

4. Under Team Development:

   a. Enable File Repository - Specify whether to enable file upload in Team Development:

      – **Yes** - Enables support for file attachments in Team Development and creates a local APEX$ table to store the files.

      – **No** - Disables support for file attachments in Team Development.

      Tip: This attribute can only be modified if the instance-level setting, Enable Team Development's File Repository, is set to **Yes**. See "Enabling Instance-level Support for File Upload in Team Development" on page 2-18.

   b. Maximum File Size (in MB) - Select the maximum file size for any file uploaded into the team development file repository. The default value is 15 MB.

5. Click **Apply Changes**.

Defining a Workspace Announcement

This section describes how administrators can quickly communicate with other users by creating workspace announcements.

- About Workspace Announcements
- Creating and Editing a Workspace Announcement

About Workspace Announcements

Workspace announcements display both on the Workspace home page and on the Workspace Administration page. Workspace announcements display in the News and Messages region on the Workspace home page as shown in the following illustration.
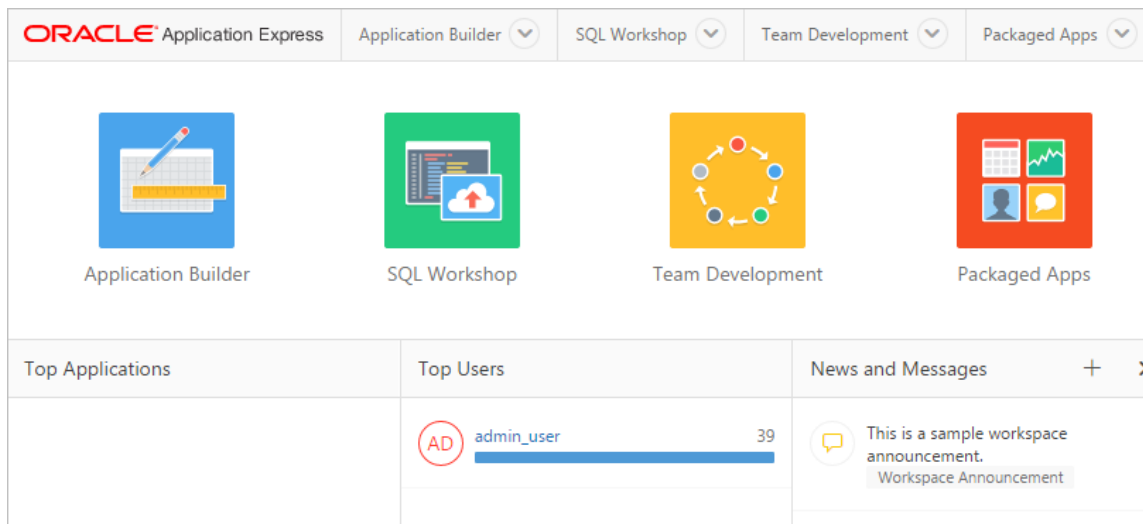
Workspace announcements include a gold icon to the left of message text and the textual identifier, `Workspace Announcement`, displays beneath the message text.

Workspace announcements also display in the center of the Workspace Administration page as shown in the next illustration.
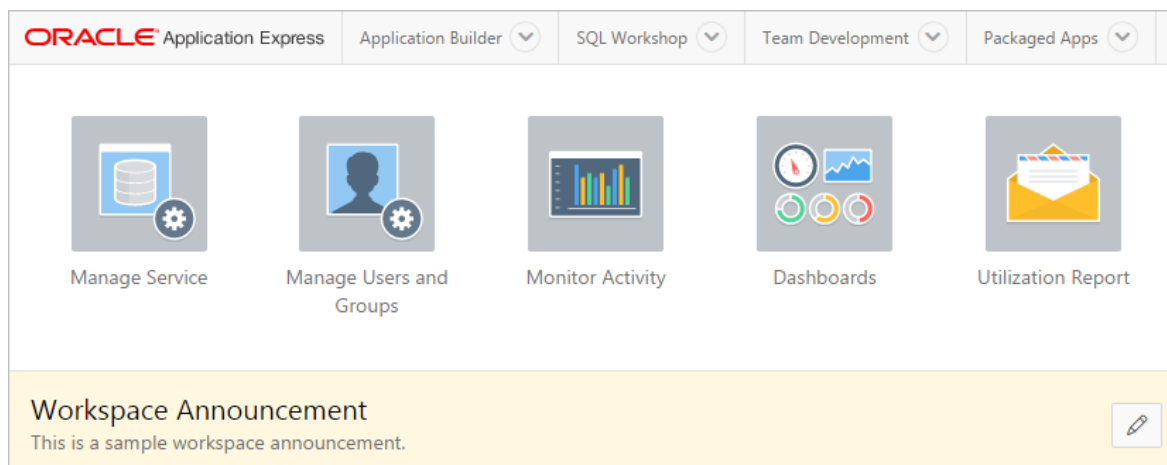
Creating and Editing a Workspace Announcement

To create or edit a workspace announcement:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears. The Workspace Announcements region displays in the center of the page.

2. To create or edit an announcement, click the **Edit Announcement** icon.
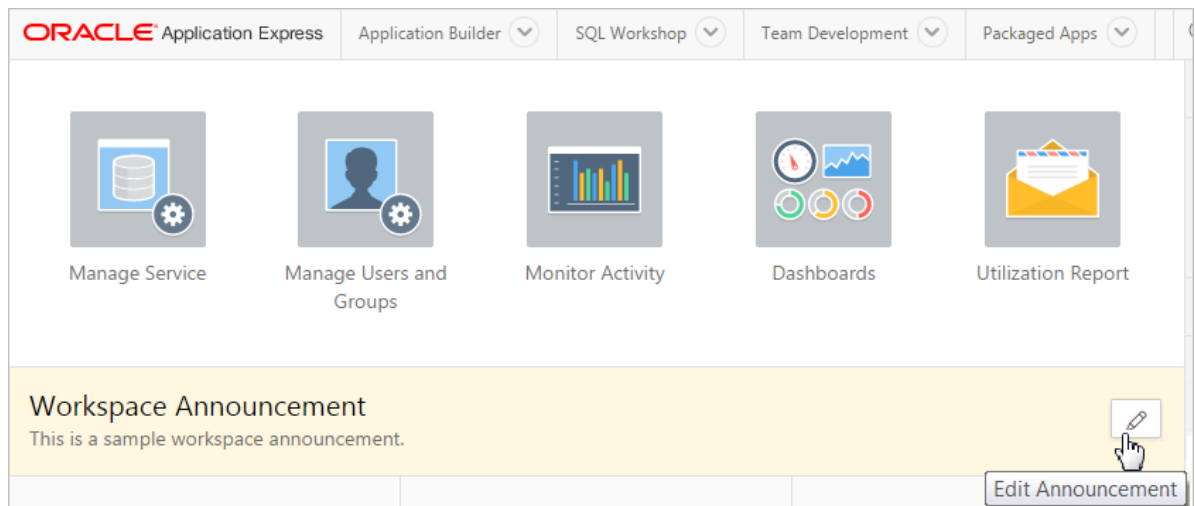
3. In Message, enter text. Use standard HTML tags to include formatting.

4. Click **Apply Changes**.

> **Tip:** You can also create or edit announcements by navigating to the Workspace Administration page and then clicking **Manage Service** and then **Edit Announcement**.

> **See Also:** "Defining a Workspace Message in Administration Services" on page 2-88

Managing Users in a Workspace

This section describes how workspace administrators can create new user accounts, manage existing user accounts, and change user passwords.

- About Application Accounts Authentication
- About Application Express User Roles
- Creating New User Accounts
- Editing Existing User Accounts
- Locking and Unlocking a User Account
- Changing a User Account Password
- Deleting User Accounts
- Viewing the Users Dashboard
- Using Groups to Manage Application Express Users

> **See Also:** "Creating Account Login Controls for a Workspace" on page 1-15 and "Managing Users Across an Application Express Instance" on page 2-96

About Application Accounts Authentication

User accounts are particularly useful if your application is using Application Express Accounts authentication. Application Express Accounts is an built-in authentication

method in which user accounts are created and managed in the Oracle Application Express user repository.

> **See Also:** "Application Express Account Credentials" in *Oracle Application Express Application Builder User's Guide*

About Application Express User Roles

To access the Oracle Application Express development environment, users sign in to a shared work area called a workspace. Users are divided into four primary roles:

- **End users** do not have access to development or administrative capabilities. End cannot sign into a workspace and create applications. End users can only run existing database or Websheet applications.

- **Developers** are users who create and edit applications.

- **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. Instance administrators manage workspace provisioning, configure features and instance settings, and manage security.

Creating New User Accounts

This section describes the ways a workspace administrator can create new user accounts.

- Creating a New User Account

- Creating Multiple Users Simultaneously

Creating a New User Account

To create a new user account:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Click **Create User**.

   The Create User page appears.

4. Under User Identification, enter:

   a. **Username** - Enter the username used to sign 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).

    f. **Default Date Format** - Specify the default Oracle date format for the user. This option controls the default date format within SQL Workshop.

5. 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 schemas associated with the workspace.

    c. **User is a workspace administrator** - Select **Yes** or **No** to 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** - Select **Yes** or **No** to specify if this user should have developer privileges. Developers create and modify applications and database objects and view developer activity, session state, workspace activity, application, and schema reports.

    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.

    If the user has exceeded the maximum login failures allowed as defined in Workspace Preferences, then the account is locked automatically.

    Tip: An Instance administrator can configure these settings for an entire Oracle Application Express instance and define password complexity policies. See "About Authentication Controls" on page 2-30, "About Strong Password Policies" on page 2-33, and "Configuring Password Policies" on page 2-33.

6. 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.

  > **Tip:** An Instance administrator can configure these settings for an entire Oracle Application Express instance and define password complexity policies. See "About Authentication Controls" on page 2-30, "About Strong Password Policies" on page 2-33, and "Configuring Password Policies" on page 2-33.

7. Under Group Assignments, specify the groups to which this user belongs. To assign a user to a group, select the group and click Move. To select multiple groups, press and hold the **CTRL** key and then click **Move All**. To remove a user from a group, select the group and click **Remove**.

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

   > **See Also:** "Using Groups to Manage Application Express Users" on page 1-28 and "Adding and Removing Users from a Group" on page 1-29

Creating Multiple Users Simultaneously

Workspace administrators can create multiple user accounts in a single operation.

To create multiple user accounts simultaneously:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Click **Create Multiple Users**.

   The Create Multiple Users page appears.

4. In List of Email Addresses, enter or copy and paste email addresses separated by commas, semicolons, or new lines.

5. Under Users:

   - List of Email Addresses - Enter or copy and paste email addresses separated by commas, semicolons, or new lines.

   - Usernames - Specify whether to include or exclude the domain name. Select one of the following:

     – **Set username to full email address**

     – **Exclude @ domain as part of the username**

       Removes all text after the @ symbol (for example, `user1@xyz.com` becomes `user1`).

6. Under Account Privileges:

   - **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 for creating applications, performing SQL queries, and so on.

- **Accessible Schemas (null for all)** - Enter a colon-delimited list of schemas for which this developer has permissions when using the SQL Workshop. The list of schemas you enter here restricts the user to a subset of the full set of schemas provisioned for the workspace and determines what schema names the user sees in SQL Workshop.

- **Users are workspace administrators** - Select **Yes** or **No** to 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.

- **User are developers** - Select **Yes** or **No** to specify if this user should have developer privileges. Developers create and modify applications and database objects.

  Tip: An administrator always has access to the Application Builder. A developer must have access to either the Application Builder, the SQL Workshop, or both. These components may not be available if they are switched off by your Instance Administrators.

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

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

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

7. Under Password:

- **Password** - Specify a password. Passwords are case-sensitive. Developers can change their own passwords. Developers with Administrator privilege can change the passwords of users within the same workspace.

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

8. Click **Next**.

9. Click **Create Valid Users**.

  See Also: "Using Groups to Manage Application Express Users" on page 1-28 and "Adding and Removing Users from a Group" on page 1-29

Editing Existing User Accounts

Workspace administrators can edit existing user accounts.

To edit an existing user account:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

   The Users page appears.

   You can customize the appearance of the page using the Search bar at the top of the page.

3. Select a user.

   The Edit User page appears.

4. Edit the appropriate attributes. To learn more, see field-level Help.

5. Click **Apply Changes**.

   > **See Also:** "Using Groups to Manage Application Express Users" on page 1-28 and "Adding and Removing Users from a Group" on page 1-29

Locking and Unlocking a User Account

Workspace administrators can control access to a workspace by locking and unlocking the user account.

To lock or unlock a user account:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Select a user.

   The Edit User page appears.

4. Scroll down to Account Privileges.

5. Under Account Availability, select **Locked** to prevent the account from being used. Select **Unlocked** to enable the account to be used.

   If the user exceeds the maximum login failures specified in Workspace Preferences, then the account is locked automatically. Instance administrators can configure these settings for an entire Oracle Application Express instance.

   > **See Also:** "Configuring Security" on page 2-18

6. Click **Apply Changes**.

Changing a User Account Password

To change an user account password:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Select a user.

   The Edit User page appears.

4. Scroll down to Password.

5. 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.

6. Click **Apply Changes**.

   See Also: "Resetting Your Password" on page 1-4

Deleting User Accounts

This section describes the ways in which workspace administrators can delete user accounts.

- Deleting a Single User Account
- Deleting Multiple Users at Once

Deleting a Single User Account

To delete a user account:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

   The Users page appears.

3. Select a user.

   The Edit User page appears.

4. To delete a user:

   a. Click **Delete User**.

   b. Confirm your selection and click **OK**.

Deleting Multiple Users at Once

Workspace administrators can delete multiple user accounts at the same time

To delete multiple user accounts:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. On the Tasks list, click **Delete Multiple Users**.

   The Delete Multiple Users page appears.

4. Select the users to be deleted.

5. Click **Delete Users**.

Viewing the Users Dashboard

The Users Dashboard displays a summary of your account information, users in the current workspace, defined user groups, recently created users, and user status.

   See Also: "Viewing Workspace Dashboards" on page 1-39

To view the Users Dashboard:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

    The Workspace Administration home page appears.

2. Click **Dashboards**.

    The Dashboard page appears.

3. Click **Users**.

    The Users Dashboard appears listing the following information:

    - **Your Account** lists information about your account including your username, workspace, account credentials, and email address.

    - **Workspace Users** lists statistics about all users in the current workspace.

    - **User Groups** lists all currently defined user groups.

    - **Recently Created** lists recently created users.

    - **User Status** lists valid passwords, expired passwords, locked accounts, unlocked accounts, and any accounts for which no email address is defined.

Using Groups to Manage Application Express Users

This section describes how to create and manage Application Express users using groups. You can use groups for categorization and to manage privileges.

- About Groups
- Creating a Group
- Editing an Existing User Group
- Adding and Removing Users from a Group
- Assigning a Group to Another Group
- Viewing Group Assignments

> **See Also:** "Managing Users in a Workspace" on page 1-21 and About Application Accounts Authentication

About Groups

You can create user groups to restrict access to various parts of an application. Specifically, creating groups enables you to:

- Control access to application components.

- Manage the privileges for a group of users. You can assign application groups to user groups to control user access.

User groups are not portable over different authentication schemes and are primarily useful when using Application Express Account Credentials authentication.

Creating a Group

To create a new group:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Click **Groups**.

4. Click **Create User Group**.

5. On the User Group Page:

    a. Group Name - Enter a name for group to be created.

    b. Description - Enter a description for the group to be created.

    c. Group Grants - The current group is a member of the groups on the right. To make the current group a member of an additional group, select the group and click **Move**. To remove group membership, select the group and click **Remove**.

6. Click **Create Group**.

Editing an Existing User Group

To edit an existing group assignment:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. You can customize the appearance of the page using the Search bar at the top of the page.

4. Select the group you want to edit.

The Create/Edit User Group page appears.

5. Make the appropriate edits and click **Apply Changes**.

Adding and Removing Users from a Group

To add a user to a group:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

3. Click **Users**.

4. Select a user.

The Edit User page appears.

5. Scroll down to Group Assignments.

Each user belongs to the groups on the right.

6. To add a user to a group, select the group and click **Move**.

7. To remove a user from a group, select the group and click **Remove**.

8. Click **Apply Changes**.

Assigning a Group to Another Group

You can manage privileges by assigning application groups to user groups.

To assign a group to another group:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

   The Manage Users and Groups page appears.

3. Click **Groups**.

4. Select the user group you want to add an group.

5. Scroll down to Group Grants.

   The current group is a member of the groups on the right. To make the current group a member of an additional group, select the group and click **Move**. To remove group membership, select the group and click **Remove**.

6. Click **Apply Changes**.

Viewing Group Assignments

The Group Assignments report lists groups assigned to users and other groups. You can use groups for categorization and to manage privileges.

To view group assignments:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.

   The Manage Users and Groups page appears.

3. Click **Group Assignments**.

4. Select the grantee to edit.

Purging the Developer Activity and Click Count Log Files

Log entries older then one month are automatically deleted. Workspace administrators can manually purge developer logs and the External Count Clicks log on the Log files page.

- Purging the Developer Activity Log
- Purging the External Click Count Log

   See Also: "Managing Logs and Files" on page 2-66

Purging the Developer Activity Log

The Developer Activity Log tracks changes to applications within the current workspace.

To purge the Developer Activity Log:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

   2. On the Administration page, click **Manage Service**.

   3. Under Manage Meta Data, click **Developer Activity and Click Count Logs**.

   4. Click the **Manage Developer Activity Log** tab.

   5. Click **Purge Developer Log**.

Purging the External Click Count Log

The external Click Count Log counts clicks from an application to an external site. You can implement this functionality using the APEX_UTIL.COUNT_CLICK procedure.

> **See Also:** "COUNT_CLICK Procedure" in *Oracle Application Express API Reference*

To purge the external Click Count Log:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Developer Activity and Click Count Logs**.

4. Click the **Manage Click Count Log** tab.

5. Click **Purge Click Log**.

> **See Also:** "Viewing Workspace Dashboards" on page 1-39

Managing Session State for a Workspace

A session establishes persistence (or stateful behavior) across page views. This section describes how administrators can view session details for the current session or for recent sessions, purge the current session state, or purge sessions based on their age.

- About Session State
- Removing Session State After Reviewing Session Details
- Viewing Session State for the Current Session
- Purging Sessions by Age
- Purging Session State for the Current Session

> **See Also:** "Managing Session State" in *Oracle Application Express Application Builder User's Guide* and "Managing Session State for an Instance" on page 2-58

About Session State

A session is a logical construct that establishes persistence (or stateful behavior) across page views. Each session is assigned a unique ID, which the Application Express engine uses to store and retrieve an application's working set of data (or session state) before and after each page view. Sessions persist in the database until purged.

> **See Also:** "What Is a Session?" in *Oracle Application Express Application Builder User's Guide*

Removing Session State After Reviewing Session Details

You can determine whether to remove existing sessions by first reviewing session details. From the Session Details page, you can remove the session record or session state.

To view session details and remove session state:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Recent Sessions**.

   You can customize the appearance of the page using the Search bar at the top of the page

5. To view session details, select the session ID.

   The Session Details page appears.

6. Click one of the following buttons:

   - **Remove State** clears the session data from the session state tables (including collections data) but does not remove the session record. Removing a session is a good approach for developers during debugging.

     This is the equivalent of clearing session state for the current session using the Clear Cache argument value SESSION in the f?p URL. This option might also be used by developers during debugging.

   - **Remove Session** removes the record of the session from the SESSIONS table along with the session state (including collections data) associated with the session.

     Any user using a session that has removed is no longer able to use the session and is prompted to re-authenticate upon their next page request (in most situations). This option can be used by administrators who must ensure a specific user can no longer access an Oracle Application Express application.

     See Also: "Debugging an Application" in *Oracle Application Express Application Builder User's Guide*

Viewing Session State for the Current Session

To view session state for the current or recent sessions:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Session State for Current Session**.

   You can customize the appearance of the page using the Search bar at the top of the page

> **See Also:** "Removing Session State After Reviewing Session Details" on page 1-32

Purging Sessions by Age

To purge existing sessions by age:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Purge Sessions by Age**.

5. Make a selection from the Sessions older than list.

6. Click one of the following buttons:

   - **Purge Sessions** purges existing sessions by the age you selected.

   - **Report Sessions** generates a report detailing the total number of sessions for the workspace, the number of users, and the number of old sessions.

     > **See Also:** "Viewing Session State" in *Oracle Application Express Application Builder User's Guide*

Purging Session State for the Current Session

To purge session state for the current session:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Purge Session State for Current Session**.

5. Click one of the following buttons:

   - **View Session State** - Displays information about the current session.

   - **Purge Session State** - Resets the session state for the current session.

Managing User Preferences

Developers can use preferences to store values for a specific Application Express user across distinct sessions. Once set, these preferences can be removed programmatically or manually. You can set user preferences by creating a page process, by the calculation of a preference Item Source Value, or programmatically by using a PL/SQL API.

- Setting User Preferences

- Viewing Preferences by User

- Viewing Current User Preferences

- Purging Preferences for a Specific User

- Purging Preferences for the Current User
- Removing User Preferences Programmatically
- Resetting User Preferences Using a Page Process

Setting User Preferences

Developers can set user preferences within an application by creating a page process, creating a preference item, or programmatically.

- Setting User Preferences by Creating a Page Process in Component View
- Setting the Source of an Item Based on a User Preference
- Setting User Preferences Programmatically

Setting User Preferences by Creating a Page Process in Component View

To set user preference values by creating a page process:

1. Navigate to the appropriate Page Definition. See "Viewing a Page in Component View" in *Oracle Application Express Application Builder User's Guide*.

2. Access the Create Page Process Wizard. Under Processes, click the **Create** icon.

3. For Process type, select **User Preferences** and click **Next**.

4. For Process Attributes, specify a name, sequence, and processing point and click **Next**.

5. For Type, select **Reset Preferences (remove all preferences for current user)** and click **Next**.

6. Follow the on-screen instructions and click **Create Process**.

> **See Also:** "Creating Page Processes in Page Designer" in *Oracle Application Express Application Builder User's Guide*

Setting the Source of an Item Based on a User Preference

You can set the source of an item based on a user preference by defining the item source type as Preference.

To define the source of item based on a user preference:

1. Navigate to the appropriate Page Definition. See "Viewing a Page in Component View" in *Oracle Application Express Application Builder User's Guide*.

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

3. For Item Type, select **Hidden** and click **Next**.

4. For Display Position and Name:

   a. Item Name - Enter an item name.

   b. Sequence - Specify the sequence for this component. The sequence determines the order of evaluation.

   c. Region - Select the region in which the item is placed.

   d. Click **Next**.

5. For Settings:

    a. Value Protected - Specify whether the item is protected. Selecting **Yes** prevents the value from being manipulated when the page is posted.

    b. Click **Next**.

6. For Source:

> **Tip:** To learn more about an attribute, see field-level Help.

    a. Source Used - Determines which value takes precedence, the cached value from session state or the item source value.

    b. Source Type - Select a source type for this item's value.

    c. Item Source Value - Enter the text corresponding to the source type for the item. For example, if the source type is QUERY, enter the SELECT statement here.

    d. Format Mask - Select or enter a format mask.

    e. Default Value - If the items source results in a null value, then set the item to this value. Reference the item default type attribute, since this attribute defines how the default value is interpreted.

    f. Default Value Type - Select how the default value is interpreted.

    g. Click **Next**.

7. Click **Create Item**.

Setting User Preferences Programmatically

To set or reference user preferences programmatically, you must use a PL/SQL API. User-level caching is available programmatically. You can use the SET_PREFERENCE procedure to set a user level preference called NAMED_PREFERENCE. For example:

```
APEX_UTIL.SET_PREFERENCE(
 p_preference=>'NAMED_PREFERENCE',
 p_value =>:ITEM_NAME);
```

You can reference the value of a user preference using the function GET_PREFERENCE. For example:

```
NVL(APEX_UTIL.GET_PREFERENCE('NAMED_PREFERENCE'),15)
```

In the previous example, the preference would default to the value 15 if the preference contained no value.

> **See Also:** GET_PREFERENCE Function and SET_PREFERENCE Procedure in *Oracle Application Express API Reference*

Viewing Preferences by User

To view the preferences by user:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

The Workspace Administration home page appears.

2. On the Administration page, click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Preferences by User**.

The Preferences by User page appears.

5. You can customize the appearance of the page using the Search bar at the top of the page.

Viewing Current User Preferences

To view current user preferences:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Current User Preferences**.

   The Current user Preferences page appears.

   You can customize the appearance of the page using the Search bar at the top of the page.

Purging Preferences for a Specific User

You can purge preferences for a specific user on the Purge Preferences page.

To purge preferences for a specific user:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Purge Preferences by User**.

   The Purge Preferences page appears.

5. Select a specific user and click **Report**.

   A report appears at the bottom of the page.

6. To purge the displayed user preferences, click **Purge User Preferences**.

Purging Preferences for the Current User

To purge preferences for the current user:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Session State**.

4. Click **Purge Preferences for Current User**.

   The Purge Preferences page appears.

5. Select a user and click **Report**.

6. To purge preferences, click **Purge User Preferences**.

Removing User Preferences Programmatically

To remove user preferences programmatically, you must use a PL/SQL API. You can use the REMOVE_PREFERENCE procedure to remove a user level preference called NAMED_PREFERENCE. For example:

```
APEX_UTIL.REMOVE_PREFERENCE(
p_preference=>'NAMED_PREFERENCE');
```

> **See Also:** "REMOVE_PREFERENCE" in *Oracle Application Express API Reference*

Resetting User Preferences Using a Page Process

You can reset user preferences by creating a page process and selecting the Reset Preferences process type.

To reset user preferences using a page process:

1. Navigate to the appropriate Page Definition. See "Viewing a Page in Component View" in *Oracle Application Express Application Builder User's Guide*.

2. Access the Create Page Process Wizard. Under Processes, click the **Create** icon.

3. For Process type, select **Clear Session State** and click **Next**.

4. For Process Attributes, specify a name, sequence, and processing point and click **Next**.

5. For Type, select a page process type and click **Next**.

6. Follow the on-screen instructions and click **Create Process**.

> **See Also:** "Creating Page Processes in Page Designer" in *Oracle Application Express Application Builder User's Guide*

Managing Page and Region Caching

One way to improve an application's performance is to take advantage of page and region caching. Developers can configure page and region caching by setting the Cache attribute on the Edit Page or Edit Region pages. This section describes how Workspace administrators can view and purge cached regions and pages.

- Purging Cached Regions
- Purging Cached Pages

Purging Cached Regions

To view and purge cached regions:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

    The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Application Cache** and select a Purge Cached Regions option.

4. Follow the on-screen instructions.

Purging Cached Pages

To view and purge cached pages:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Application Cache** and select a Purge Cached Pages option.

4. Follow the on-screen instructions.

Changing Build Status for Multiple Applications

This section describes how to manage application build status.

- About Changing Application Build Status?

- Managing Build Status in Workspace Administration

   > **See Also:** "Changing Build Status in Administration Services" on page 2-95

About Changing Application Build Status?

Every Oracle Application Express application has an application-level attribute called Build Status. Developers can use this attribute to prevent an application from being modified by other developers.

Build Status has two settings:

- **Run and Build Application** - Developers can both run and edit an application.

- **Run Application Only** - Developers can only run an application.

Setting the Build Status to **Run Application Only** is an effective way to prevent other developers from modifying it.

You can change the Build Status of an application in the following ways:

- Developers and administrators can change the Build Status attribute on the Edit Application page. See "Availability" in *Oracle Application Express Application Builder User's Guide*.

- Workspace administrators can change the Build Status of applications within the current workspace as described in this section. See "Changing Build Status for Multiple Applications" on page 1-38.

- Instance administrators can change the Build Status of an application on the Build Status page. See "Changing Application Build Status in Administration Services" on page 2-94.

Managing Build Status in Workspace Administration

To manage Build Status in Workspace Administration:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click **Manage Service**.

3. Under Manage Meta Data, click **Application Build Status**.

   Next, select a status. Status specifies whether the application is available or unavailable for use.

4. For Status, select one of the following:

   - **Available** - Application is available with no restrictions.

   - **Available with Developer Toolbar** - Application is available for use. For developers, the Developer toolbar displays at the bottom of each page. Requires the developer to be logged in to the Application Builder in the same browser session.

   - Application is available for use. For developers, the Developer Toolbar is included on each page. Requires the developer to be logged in to the Application Builder in the same browser session.

   - **Available to Developers Only** - Application is available to users having developer privileges.

   - **Restricted Access** - Application is available to developers named in the Restrict to comma separated user list.

   - **Unavailable** - Application cannot be run or edited. The message in Message for unavailable application displays when users attempt to access the application.

   - **Unavailable (Status Shown with PL/SQL)** - Application cannot be run or edited.

   - **Unavailable (Redirect to URL)** - Application cannot be run or edited.

5. From Build Status, select one of the following:

   - **Run and Build Application** - Developers can both run and edit an application.

   - **Run Application Only** - Developers can only run an application.

6. Click **Apply Changes**.

Viewing Workspace Dashboards

This section describes how to use the Dashboard page to view details about the current workspace and monitor overall workspace activity.

- Accessing the Workspace Dashboard

- Users Dashboard

- Activity Dashboard

- Developer Activity Dashboard

- Performance Dashboard

- Websheets Dashboard

- Applications Dashboard

■ Database Dashboard

> **See Also:** "Monitoring Activity Across a Development Instance" on page 2-99 and "Creating Custom Activity Reports Using APEX_ ACTIVITY_LOG in *Oracle Application Express Application Builder User's Guide*

Accessing the Workspace Dashboard

To view the Administration Dashboard:

1. Navigate to the Workspace Administration page. See "Accessing the Workspace Administration Page" on page 1-2.

   The Workspace Administration home page appears.

2. Click the **Dashboards** icon.

   The Dashboard page appears.

3. Select a dashboard to review. Options include:

   ■ Workspace - See "Workspace Dashboard" on page 1-40.

   ■ Users - See "Users Dashboard" on page 1-40.

   ■ Activity - See "Activity Dashboard" on page 1-41.

   ■ Developer Activity - See "Developer Activity Dashboard" on page 1-41.

   ■ Performance - See "Performance Dashboard" on page 1-41.

   ■ Websheets - See "Websheets Dashboard" on page 1-41.

   ■ Applications - See "Applications Dashboard" on page 1-41.

   ■ Database - See "Database Dashboard" on page 1-42.

Workspace Dashboard

The Administration Dashboard offers a summary of workspace attributes and statistics, including:

■ Service - Lists the workspace name, the number and type of applications, SQL scripts, schemas, and open service requests.

■ Available Schemas - Lists schemas within the current workspace.

■ Files - Details the space used by specific file types.

■ Recent Service Requests lists pending service requests.

Users Dashboard

The Users Dashboard displays a summary of workspace users, including:

■ Your Account - List your username, associated user roles, workspace name, creation date, and email address.

■ Workspace Users - Lists statistics about all users in the current workspace.

■ User Groups - Lists are currently defined user groups.

■ Recently Created - Lists recently created users.

■ User Status - Lists valid passwords, expired passwords, locked accounts, unlocked accounts, and any accounts for which no email address is defined.

Activity Dashboard

The Activity Dashboard displays a summary of workspace user activity for the selected time frame, including:

- Top Users - Lists the most active users in the workspace.

- Top Applications - Lists applications having the most activity.

- Top Pages - Lists the application pages having the most activity.

- Recent Logins- Shows the time and date a user authenticated to an application.

- Recent Errors - Lists errors that have occurred in the current workspace from the Application Express activity log.

Developer Activity Dashboard

The Developer Activity Dashboard displays a summary of developer application and page changes for the selected timeframe, including:

- Top Developers - Lists the most active developers in the workspace.

- Top Applications - Lists the applications having the most developer activity.

- Top Pages - Lists the application pages having the most developer activity.

- Recent Changes - Lists changes by application, page, and user.

- Recent Application Edits - Lists edits by application.

Performance Dashboard

The Performance Dashboard displays a report of pages having the worst page performance. Page performance is calculated by multiplying page events by median elapsed server page generation time. Page events include page gets, page posts, and partial page gets.

Websheets Dashboard

The Websheets Dashboard displays a websheet activity for the selected time frame. Sections include:

- Workspace Summary

- Recent Views

- Recently Created

- Recently Updated

Applications Dashboard

The Applications Dashboard displays a summary of applications in the current workspace. Sections include:

- Summary - Lists the number of applications, pages, and workspace themes.

- Application Groups - Lists defined application groups.

- Recently Created - Lists recently created applications.

- Defaults - Lists defined defaults.

Database Dashboard

The Database Dashboard displays a summary of database objects by schema. Row counts are based on database table statistics. Sections include:

- Recently Modified Program Units
- Object Counts
- Recently Created Tables
- Top Tables by Row Count

Leveraging Application Builder Defaults

Application Builder Defaults enable developers to reduce the number of steps needed to create a new application. By configuring these attributes, developers can exit the Create Application Wizard early and can create a new application in two simple steps.

- About Application Builder Defaults
- Configuring Application Builder Defaults

About Application Builder Defaults

Application Builder Defaults are specific to each workspace. These attributes define preferences for tabs, authentication schemes, themes, and globalization when running the Create Application Wizard. When a Workspace administrator configures these attributes, developers within that workspace can use these defaults and exit the Create Application Wizard after two easy steps.

Configuring Application Builder Defaults

To configure Application Builder Defaults:

1. On the Workspace home page, click the **Application Builder** icon.

2. Click **Workspace Utilities**.

3. Click **Application Builder Defaults**.

   The Manage Application Builder Defaults page appears and is divided into the following sections:

   - Settings
   - Authentication
   - Globalization

4. For each section of the page, select the appropriate default.

   To learn more about an attribute, see field-level Help.

5. Click **Apply Changes**.

2

Oracle Application Express Administration Services

Instance Administrators use the Administration Services application to manage an entire Oracle Application Express instance. The topics in this section only apply to instance administrators.

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

- What Is an Instance Administrator?
- Accessing Oracle Application Express Administration Services
- Overview of Oracle Application Express Administration Services
- Managing Workspace and Change Requests
- Managing Instance Settings
- Managing Shared Components
- Managing Meta Data
- Installing Exported Applications in a Runtime Environment
- Managing Messages
- Managing Logs and Files
- Including an Agreement or Survey When Running the Signup Wizard
- Managing Schemas
- Creating Workspaces
- Managing Existing Workspaces
- Managing Users Across an Application Express Instance
- Monitoring Activity Across a Development Instance

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

What Is an Instance Administrator?

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

Instance administrators are superusers that are responsible for managing an entire Oracle Application Express instance. Instance administrators manage workspace provisioning, configure features and instance settings, and manage security. To perform these tasks, an Instance administrator signs in to the Oracle Application Express Administration Services application.

> **Tip:** To learn more about creating an Instance Administrator account in a new installation, see the "Creating or Updating Your Instance Administration Account" section for your Web Listener in *Oracle Application Express Installation Guide*.

> **See Also:** "Accessing Oracle Application Express Administration Services" on page 2-2 and "Overview of Oracle Application Express Administration Services" on page 2-3

Accessing Oracle Application Express Administration Services

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

To access Oracle Application Express Administration Services:

1. In a web browser, navigate to the Oracle Application Express Administration Services application. By default, Oracle Application Express Administration Services installs to the following location:

   - If your setup uses the Oracle REST Data Services, go to:

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

     Where:

     - *hostname* is the name of the system where Oracle REST Data Services is installed.

     - *port* is the port number assigned when configuring the Oracle REST Data Services. In a default installation, this number is 8080. To learn more, see *Oracle REST Data Services Installation, Configuration, and Development Guide*.

     - apex is the service name defined when configuring the Oracle REST Data Services.

   - If your setup uses the embedded PL/SQL gateway, go to:

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

     Where:

     - *hostname* is the name of the system where Oracle XML DB Protocol Server is installed.

     - *port* is the port number assigned to HTTP on the Oracle XML DB Protocol Server. In a default installation, this number is 8080.

     - apex is the Database Access Descriptor (DAD) defined in the configuration file.

   - If your setup uses Apache and mod_plsql, go to:

     ```
     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.

- 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 releases, or who have a custom configuration, this value may be htmldb or something else. Verify your DAD with your Instance administrator.

The Sign In page appears.

2. In Username, enter the username of an Instance administrator.

3. In Password, enter your Instance administrator account password.

> **Tip:** admin is the default Instance administrator account. As a post installation step, administrators can run the script apxchpwd.sql to create one or more Instance administrator accounts or change passwords for these accounts. To learn more, see the "Creating or Updating Your Instance Administration Account" section for your Web Listener in *Oracle Application Express Installation Guide*. To create and manage additional Instance administrator accounts, see also "Creating New User Accounts in Administration Services" on page 2-97.

4. Click **Sign In to Administration**.

Oracle Application Express Administration Services appears.

> **See Also:** *Oracle Application Express Installation Guide* for information about installing Oracle Application Express

Overview of Oracle Application Express Administration Services

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes key pages in the Oracle Application Express Administration Services application.

- Instance Administration Home Page

- Manage Instance Page

- Manage Workspaces Page

> **See Also:** "Managing Workspace and Change Requests" on page 2-8 and "Monitoring Activity Across a Development Instance" on page 2-99

Instance Administration Home Page

The Instance Administration home page is the starting point for managing an entire Oracle Application Express instance. This section describes options on the Instance Administration home page.
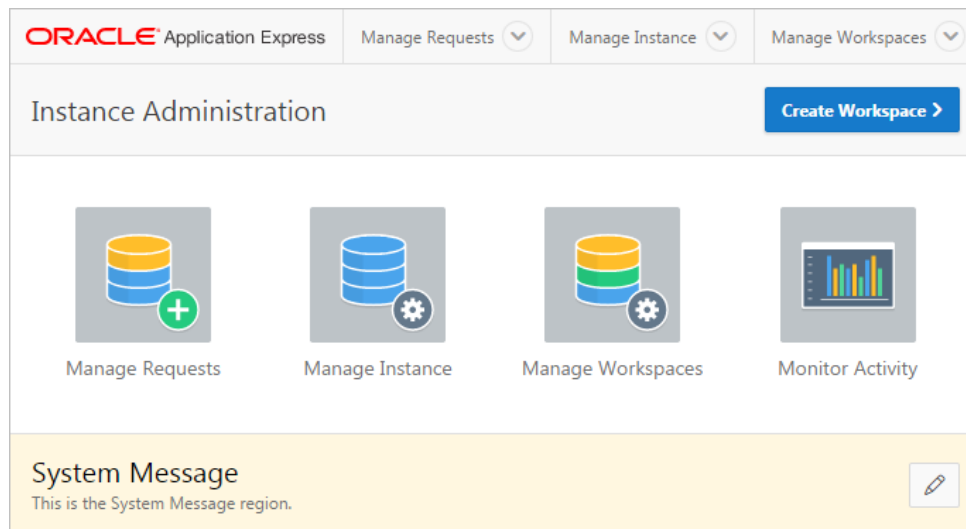
Four icons display at the top of the page:

- **Manage Requests**. See "Managing Workspace and Change Requests" on page 2-8.
- **Manage Instance**. See "Manage Instance Page" on page 2-5.
- **Manage Workspace**s. See "Manage Workspaces Page" on page 2-7.
- **Monitor Activity**. See "Monitoring Activity Across a Development Instance" on page 2-99.

System Message Region

The System Message region displays in the center of the page. Instance administrators can use this region to communicate with other users in the workspace. To add a system message, click the **Edit System Message** icon. See "Defining a System Message" on page 2-63.

Instance Tasks Region

Use Instance Tasks region to access the following links:

- **Feature Configuration**. See "Configuring Features" on page 2-13.
- **Security**. See "Configuring Security" on page 2-18.
- **Instance Settings**. See "Managing Shared Components" on page 2-53.
- **Workspace Purge Settings**. See "Purging Inactive Workspaces" on page 2-52.

Workspace Tasks Region

Use the Workspace Tasks region to access the following tasks:

- **Create Workspace**. See "Creating Workspaces" on page 2-74.
- **Create Multiple Workspaces**. See "Creating Multiple Workspaces" on page 2-78.
- **Find a Workspace**. See "Performing a Workspace Search" on page 2-89.

- **Manage Workspaces**. See "Managing Existing Workspaces" on page 2-79.

- **Create User**. See "Creating New User Accounts in Administration Services" on page 2-97.

- **Find a User**. See "Managing Users Across an Application Express Instance" on page 2-96.

- **Reset User Password**. See "Editing an Existing User Account in Administration Services" on page 2-98.

Available Updates

The Available Updates region indicates if updates are available for Oracle Application Express and the Oracle REST Data Services. If your installation is current the following message displays:

```
System is up-to-date
```

To configure updates, click **Set Preferences for Available Updates** icon which resembles a gear. The Available Updates dialog appears. You can enable or disable updates by selecting **Yes** or **No** from Check for Available Updates. To learn more, see field-level Help.

> **Tip:** To perform this check Application Express transmits the version number of Oracle Application Express and other system components to Oracle Corporation. To continuously improve our products, Oracle is interested in learning about product usage. To that end, statistics can occasionally be sent to Oracle describing the product features in use. No personally identifiable information is sent. To review Oracle's privacy policy, see:
>
> http://www.oracle.com/us/legal/privacy/overview/index.html

Accessibility Mode

Use the Accessibility Mode list to select the accessibility mode for an Oracle Application Express instance. Options include:

- **Standard**

- **Screen Reader** - Optimizes the Oracle Application Express development environment, Websheet runtime, and database applications for screen readers.

- **High Contrast** - Optimizes sessions for high contrast in the Oracle Application Express development environment, Websheet runtime, and within database applications.

> **See Also:** "Using Screen Reader Mode in Your Database Applications" and "Using High Contrast Mode in Your Database Applications" in *Oracle Application Express Application Builder User's Guide*

Manage Instance Page

Instance administrators use the Manage Instance page to configure an Oracle Application Express instance. This section describes links on the Manage Instance page.

Instance Settings

Instance Settings contains the following links:

- **Feature Configuration**. See "Configuring Features" on page 2-13.

- **Security**. See "Configuring Security" on page 2-18.

- **Instance Settings**. See "Configuring Instance Settings" on page 2-38.

- **Workspace Purge Settings**. See "Purging Inactive Workspaces" on page 2-52.

Manage Shared Components

Manage Shared Components contains the following link:

- **Packaged Applications**. See "Managing Custom Applications" on page 2-53.

- **Monitor Packaged Application Installations**. See "Monitoring the Progress Packaged Application Installations" on page 2-56.

- **Public Themes**. See "Managing Public Themes" on page 2-56.

> **See Also:** "Managing Existing Workspaces" on page 2-79 and "Manage Workspaces Page" on page 2-7

Manage Meta Data

Manage Meta Data contains the following links:

- **Session State**. See "Managing Session State for an Instance" on page 2-58.

- **Mail Queue**. See "Managing the Mail Queue" on page 2-59.

- **Installed Translations.** See "Viewing Installed Translations" on page 2-60.

- **Interactive Report Subscriptions**. See "Deleting Interactive Report Subscriptions" on page 2-60.

Messages

Messages contains the following links:

- **Define Login Message**. See "Defining a Login Message" on page 2-62.

- **Set System Message**. See "Defining a System Message" on page 2-63.

- **Manage Site-Specific Tasks.** See "Creating a Site-Specific Tasks List" on page 2-64..

Manage Logs and Files

Manage Logs and Files contains the following links:

- **Set SQL Workshop logs**. See "Deleting SQL Workshop Logs" on page 2-66.

- **Page View Activity Log, with option to truncate**. See "Deleting Page View Activity Log Entries" on page 2-66.

- **Developer Activity Log, with option to truncate**. See "Deleting Developer Activity Log Entries" on page 2-67.

- **External Click Counting Log, with option to truncate**. See "Deleting Click Counting Log Entries" on page 2-67.

- **Login Access Log**. See "Deleting the Login Access Log" on page 2-68.

- **Manage Log Interval**. See "Managing Log Intervals" on page 2-68.

Self Service Sign Up

Self Service Sign Up contains the following links:

- **Manage New Service Signup Wizard**. See "Including an Agreement or Survey When Running the Signup Wizard" on page 2-69.

- **Run New Service Signup Wizard**. See "Defining a Signup Survey" on page 2-69.

Manage Workspaces Page

Instance administrators use the Manage Workspaces page to manage workspaces for an Oracle Application Express instance. This section describes links on the Manage Workspaces page.

Workspace Actions

Manage Workspaces contains the following links:

- **Create Workspace**. See "Creating Workspaces" on page 2-74.

- **Create Multiple Workspace**s. See "Creating Multiple Workspaces" on page 2-78.

- **Remove Workspace**. See "Deleting a Workspace" on page 2-80.

- **Lock Workspace**. See "Locking a Workspace" on page 2-84.

- **Manage Workspace to Schema Assignments**. See "Managing Workspace to Schema Assignments" on page 2-84.

- **Manage Developers and Users**. See "Managing Users Across an Application Express Instance" on page 2-96.

- **Manage Component Availability**. See "Managing Component Availability for an Instance" on page 2-88.

Workspace Reports

Use Workspace Reports to access the following links:

- **Existing Workspaces**. See "Managing Existing Workspaces" on page 2-79.

- **Workspace Details**. See "Viewing the Workspace Summary Report" on page 2-91.

- **Workspace Database Privileges**. See "Viewing Workspace Database Privileges" on page 2-92.

- **Workspaces with Only Sample Application**. See "Viewing Workspaces with Only a Sample Application" on page 2-82.

- **Manage File Utilization**. See "Viewing File Size and File Count by Workspace" on page 2-92.

- **Find and Email Workspace Summary**. See "Performing a Workspace Search" on page 2-89.

Export Import

Use Export Import to access the following links:

- **Import Workspaces**. See "Importing a Workspace in Administration Services" on page 2-94.

- **Export Workspaces**. See "Exporting a Workspace in Administration Services" on page 2-93.

Manage Applications

Use Manage Applications to access the following links:

- **Application Attributes**. See "Viewing Application Attributes" on page 2-94.

- **Build Status**. See "Changing Application Build Status in Administration Services" on page 2-94.

- **Parsing Schemas**. See "Viewing the Parsing Schemas Report" on page 2-95.

Managing Workspace and Change Requests

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how an Instance administrator manages workspace requests and change requests.

- About Workspace Requests and Change Requests
- Viewing Requests on the Instance Administration Home Page
- Viewing Pending Requests
- Managing Workspace Requests
- Managing Change Requests

About Workspace Requests and Change Requests

An Instance administrator is responsible for reviewing and managing workspace requests and change requests.

A **Workspace Request** enables users to request workspaces directly in a self-service fashion. For example, users could click a link on the login page to access a request form. Once the Instance administrator approves the workspace request, each user is automatically emailed the appropriate login information. To use workspace requests, an Instance administrator must select the Self Service Provisioning Status, **Request** on the Instance Settings page.

A **Change Request** enables users to modify an existing workspace (for example, add a new schema or increase the disk space limit).

> **See Also:** "About Specifying How Workspaces Are Created" on page 2-74, "Enabling Instance-level Support for File Upload in Team Development" on page 2-18, and "Making a Service Request" on page 1-13

Viewing Requests on the Instance Administration Home Page

To view new and pending service requests on the Instance Administration home page:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

   The Pending Requests region lists the total number of new service requests and service change requests.

2. To view a more detailed report, click the Service Change number.

   The All Change Requests report displays. This report lists all service requests by date.

3. To view a specific request, click **View Request**.

Tip: To view the new Service Requests report page, see "Monitoring Activity Across a Development Instance" on page 2-99

Viewing Pending Requests

To view pending service requests from the Manage Service Requests page:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

   The Manage Service Requests page has three tabs:

   - **Open Requests**

   - **All Workspace Requests**

   - **All Change Requests**

     Tip: All Change Requests pages display as interactive reports. You can customize the appearance of each page using the Search bar at the top of each page.

3. Open Requests displays new service requests and change requests.

   To approve or decline a new request, click the **Edit** icon to the left of the request description.

4. Click the **All Workspace Requests** tab.

   All Workspace Requests lists requests by workspace name, schema, size, and request date.

   To edit the request, click the **Edit** icon. To approve or decline the request, click **Provision** in the Action column.

5. Click **All Change Requests**.

   All Change Requests lists requests by workspace name, request change description, requestor, and status.

   To view a request, click **View Request**. The View Change Request page appears. To approve the request, click **Add Space**. To decline the request, click **Deny Request**.

     See Also: "Managing Workspace Requests" on page 2-9 and "Managing Change Requests" on page 2-12

Managing Workspace Requests

A Workspace Request enables a user to request a workspace by clicking a link on the login page to access a request form. Once submitted, the Instance administrator can review the request and either approve or decline it.

- About the Approval Process

- What Happens When an Error Occurs?

- Approving or Declining a Pending Workspace Request

- Changing the Status of an Existing Workspace Request

- Deleting a Workspace Request

> **See Also:** "About Workspace Requests and Change Requests" on page 2-8 and "About Specifying How Workspaces Are Created" on page 2-74

About the Approval Process

If you are using Email Verification, when an Instance administrator approves a workspace request, the following events occur:

1. An email containing a verification link is sent to the user.

2. When user clicks the verification link, the workspace is created.

3. Another email is sent to the user containing login credentials (that is, the workspace name, username, and password).

4. The status of the workspace request changes from `Accepted` to `Approved`.

If the user fails to click the verification link, you can quickly delete the request by clicking the **DELETE** link in the Action column.

What Happens When an Error Occurs?

If an error occurs during the workspace creation process, the status of the request reverts to `Requested` and an email is sent to the user containing the following message:

```
Please contact administrator.
```

Once the issue is resolved, the administrator can again repeat the previous procedure and approve the request.

Approving or Declining a Pending Workspace Request

To approve or decline a pending workspace request:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

3. Click the **All Workspace Requests** tab.

   The Workspace Requests page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. To approve a request:

   a. Click **Provision** in the Actions column.

   b. On the Provisioning Administration page, click **Approve**.

   c. Review the email message.

   d. If needed, update the message and click **Approve and Send Email**.

      If you selected the Provisioning Status, **Email Verification**, an email containing a verification link is sent to the user. To create the workspace, the user must click the verification link to create the workspace. See "About Specifying How Workspaces Are Created" on page 2-74.

5. To decline a request:

   a. Click **Provision** in the Actions column.

   b. On the Provisioning Administration page, click **Decline**.

   c. Review the email message.

d. To add information, such as the reason for declining a request, update the message and then click **Decline and Send Email**.

The email is sent to the user notifying them the request was declined.

Changing the Status of an Existing Workspace Request

To change the status of an existing workspace request:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

3. Click the **All Workspace Requests** tab.

The Workspace Requests page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. To review all workspace requests, deselect the filter **Status_Code = '1'**.

5. Locate a request to review.

6. Click the **Adjust** link in the Actions column.

The Adjust Request page appears.

7. From the Project Status list, select a new status.

8. Click **Apply Changes**.

> **Note:** Be careful when setting the Project Status to **Requested**. Although **Requested** enables you to provision a workspace, it could result in data corruption due to the manner in which accounts are provisioned. The provisioning system assumes Requested workspace requests do not have the corresponding schemas and dictionary entries for a Workspace administrator or developers. If you must change the Project Status for an **Approved** workspace to **Requested**, terminate the service first and then change the status to Requested.

Deleting a Workspace Request

To delete a workspace request:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

3. Click **All Workspace Requests**.

The Open Requests page appears.

4. Click the Edit icon adjacent to the request to be deleted.

5. On the Provision Request page, click the appropriate button:

   - If the Project Status is `Approved`, click **Terminate or Delete**.

   - If the Project Status is `Declined`, `Requested`, `Terminated`, or `Accepted`, click **Delete**.

6. Click **Delete Request**.

Managing Change Requests

A Change Request enables users to modify an existing workspace (for example, by adding a new schema or increasing the available disk space). Once submitted, the Instance administrator reviews and either approves or declines the change request.

- Viewing All Change Requests
- Approving or Declining a Pending Change Request

> **See Also:** "About Workspace Requests and Change Requests" on page 2-8

Viewing All Change Requests

To view all change request:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

3. Under Manage Requests, click the **All Change Requests** tab.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. Locate the request and click **View Request** under the Action column.

   The View Change Request page appears. Note that the buttons that display depend upon the nature of the change request.

5. Approve or deny the change request. See "Approving or Declining a Pending Change Request" on page 2-12.

Approving or Declining a Pending Change Request

To approve or decline a pending change request:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Requests**.

3. Under Manage Requests, click the **All Change Requests** tab.

4. Locate the request and click **View Request** under the Action column.

   The View Change Request page appears. Note that the buttons that display depend upon the nature of the change request.

5. To approve the request, click one of the following:

   - Create Schema - Approves a schema request.
   - Deny Request - Denies the current change request.
   - Add Space - Approves a request for additional disk space.
   - Terminate Service - Approves a request to terminate the service.

Managing Instance Settings

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how to configure feature availability, security, instance settings, and workspace purge settings.

- Configuring Features
- Configuring Security
- Configuring Instance Settings
- Including an Agreement or Survey When Running the Signup Wizard
- Purging Inactive Workspaces

Configuring Features

This section describes how to use the Feature Configuration page to configure your application development environment, SQL Workshop functionality, and database monitoring.

- Disabling PL/SQL Program Unit Editing
- Enabling or Disabling the Creation of Demonstration Objects
- Disabling the Creation of Sample Websheet Objects
- Enabling and Disabling SQL Access in Websheets
- Configuring Packaged Application Installation Options
- Configuring SQL Workshop
- Enabling Database Monitoring
- Enabling Application Activity Logging
- Enabling Instance-level Support for File Upload in Team Development
- Enabling Instance-level Support for File Upload in Team Development

> **See Also:** "Managing Component Availability for an Instance" on page 2-88

Disabling PL/SQL Program Unit Editing

By default, developers can change and compile PL/SQL source code when browsing database procedures, packages, and functions in Object Browser. As an Instance administrator, you can control if PL/SQL program unit editing is available on an Oracle Application Express instance.

To disable PL/SQL program unit editing:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Locate the Application Development section.

5. For Allow PL/SQL Program Unit Editing, select **No**.

6. Click **Apply Changes**.

> **See Also:** "Disabling PL/SQL Program Unit Editing for a Workspace" on page 1-17

Enabling or Disabling the Creation of Demonstration Objects

When an Instance administrator creates a new workspace, Oracle Application Express automatically creates demonstration objects for sample applications.

To disable or enable the creation of demonstration objects:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Locate the Application Development section.

5. For Create demonstration objects in new workspaces, select **No**.

6. Click **Apply Changes**.

Disabling the Creation of Sample Websheet Objects

When an Instance administrator creates a new workspace, Oracle Application Express automatically creates sample objects for sample Websheets.

To disable the creation of sample Websheet objects:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Locate the Application Development section.

5. For Create Websheet objects in new workspaces, select **No**.

6. Click **Apply Changes**.

Enabling and Disabling SQL Access in Websheets

An Instance administrator can control the ability to use the SQL tag and the ability to create SQL reports in Application Express Websheets. When disabled, all Websheet applications in all workspaces in the instance are prevented from using the SQL tag or creating SQL reports.

To control SQL access in Websheets:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Locate the Application Development section.

5. For Enable SQL Access in Websheets, select **Yes** or **No**.

6. Click **Apply Changes**.

Configuring Packaged Application Installation Options

When installing a packaged application, Instance administrators can support for the following authentication schemes.

> **See Also:** "Utilizing Packaged Applications" in *Oracle Application Express Application Builder User's Guide*

To configure packaged application installation options:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Under Packaged Application Install Options, select **Yes** to support for the following authentication schemes when installing new packaged for the following options:

   - **Allow HTTP Header Variable authentication**

   - **Allow LDAP Directory authentication**

   - **Allow Oracle Application Server Single Sign-On authentication**.

5. Click **Apply Changes**.

Configuring SQL Workshop

As an Instance administrator, you can use the attributes under SQL Workshop to configure basic SQL Workshop behavior.

To configure SQL Workshop:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Under SQL Workshop, enter the attributes described in Table 2–1.

Table 2–1   SQL Workshop Attributes

Attribute	Description
SQL Commands Maximum Inactivity in minutes	Identify the maximum amount of time a transactional command in the SQL Command Processor waits before timing out.
SQL Scripts Maximum Script Output Size in bytes	Identify the maximum amount of output a single SQL script can generate. SQL scripts are run from the SQL Workshop.
SQL Scripts Maximum Workspace Output Size in bytes	Identify the maximum amount of space all scripts within a workspace may consume. SQL script results are the output generated when running SQL scripts from the Script Editor or from the SQL Scripts home page.
SQL Scripts Maximum Script Size in bytes	Identify the maximum size of a SQL script used within the SQL Workshop.

Table 2–1   (Cont.) SQL Workshop Attributes

Attribute	Description
Enable Transactional SQL Commands	Select **Yes** to enable transactional SQL commands for the entire Oracle Application Express instance. Enabling this feature permits SQL Command Processor users to issue multiple SQL commands within the same physical database transaction.
	When you select **Yes**, an Autocommit check box appears on the SQL Command Processor page. By default, this option is set to **No**.

5. Click **Apply Changes**.

Enabling Database Monitoring

Setting Enable Database Monitoring to **Yes** enables monitoring within SQL Workshop. Before you can access the Database Monitoring page, an Instance administrator must enable database monitoring.

> **See Also:**   "Monitoring the Database" in *Oracle Application Express SQL Workshop Guide*

To enable database monitoring:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Scroll down to Monitoring.

5. For Enable Database Monitoring, select **Yes**.

6. Click **Apply Changes**.

> **Note:**   Only users having a database user account that has been granted a DBA role can access the Database Monitor page.

Enabling Application Activity Logging

Application Activity Logging controls how application activity is logged for all applications on this instance.

> **See Also:**   "Monitoring Activity Across a Development Instance" on page 2-99

To configuring application activity logging:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Scroll down to Monitoring.

5. For Application Activity Logging, select one of the following:

- **Use Application Settings (default)** - Use the Logging attribute of each application to determine if activity is logged.

- **Never** - Disable activity logging for all applications in the instance.

- **Always** - Enable activity logging for all applications in the instance.

- **Initially Disabled for New Applications and Packaged Applications** - New applications and packaged applications will initially have activity logging disabled.

6. Click **Apply Changes**.

Enabling Application Tracing

Instance administrators can control whether developers or users can generate database trace files simply by specifying `&p_trace=YES` on the URL when displaying a page. The ability to generate a trace file is already controlled if the application has Debug enabled.

> **See Also:** "Monitoring Activity Across a Development Instance" on page 2-99

To control application tracing at the instance-level:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Scroll down to Monitoring.

5. From Enable Application Tracing, select:

- **Yes** - Any application which has Debug enabled can also generate a server-side database trace file for a page using `&p_trace=YES` on the URL. To learn more, see "Enabling SQL Tracing and Using TKPROF" in *Oracle Application Express Application Builder User's Guide*.

- **No** - Tracing cannot be enabled for any application on the instance. If someone attempts to run an application with `&p_trace=YES` in the URL, the page renders but the request to generate the SQL trace file is silently ignored.

6. Click **Apply Changes**.

> **See Also:** "Available Parameter Values" in *Oracle Application Express API Reference* to learn about the `TRACING_ENABLED` parameter

Enabling Service Requests

Controls the ability for workspace administrators to make service requests from Workspace Administration. Service Requests include the ability to request a new schema, request storage, or request termination of their workspace.

To enable service requests:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Scroll down to Workspace Administration.

5. For Enable Service Requests, select **Yes**.

6. Click **Apply Changes**.

> **See Also:** "Managing Workspace and Change Requests" on page 2-8

Enabling Instance-level Support for File Upload in Team Development

To enable support for file upload in Team Development for an instance:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Feature Configuration**.

4. Under Team Development:

    a. Enable Team Development's File Repository - Specify whether to enable file upload in Team Development:

        – **Yes** - Select **Yes** for all new workspaces created in this instance to allow files to be uploaded into the Team Development file repository. Select **No** for all new workspaces created in this instance to not allow files to be uploaded into the Team Development file repository.

        – **No** - Select **No** to disable support for file attachments in Team Development.

    > **Tip:** These settings do not affect existing workspaces.

    b. Maximum File Size (in MB) - Select the maximum file size for any file uploaded into the team development file repository. The default value is 15 MB.

5. Click **Apply Changes**.

> **See Also:** "Enabling Workspace-level Support for File Upload in Team Development" on page 1-19

Configuring Security

This section describes how to configure instance security, including configuring login controls, controlling file upload capability, restricting access by IP address, requiring HTTPS, setting session timeout restrictions, and defining password policies.

- Turning Off Cookies Used to Populate the Login Form
- Disabling Access to Oracle Application Express Administration Services
- Enabling Access to Oracle Application Express Administration Services
- Disabling Workspace Login Access
- Controlling Public File Upload
- Restricting User Access by IP Address
- Configuring a Proxy Server for an Instance
- Configuring Rejoin Sessions for an Instance
- Configuring Unhandled Errors

- Enabling Real Application Security
- Controlling RESTful Services for an Instance
- Isolating All Workspaces in an Instance
- Configuring Session Timeout
- Defining Excluded Domains for Regions and Web Services
- Configuring Authentication Controls
- Creating Strong Password Policies
- Restricting Access to Oracle Application Express by Database Access Descriptor (DAD)
- Managing Authorized URLs

Configuring Service-level Security Settings

This section describes how to configure service-level security settings:

- Turning Off Cookies Used to Populate the Login Form
- Disabling Access to Oracle Application Express Administration Services
- Enabling Access to Oracle Application Express Administration Services
- Disabling Workspace Login Access
- Controlling Public File Upload
- Restricting User Access by IP Address
- Configuring a Proxy Server for an Instance
- Selecting a Checksum Hash Function
- Configuring Rejoin Sessions for an Instance
- Configuring Unhandled Errors

Turning Off Cookies Used to Populate the Login Form   Instance administrators can control if a convenience cookie is sent to a user's computer whenever a developer or administrator logs in to a workspace from the Application Express Login page.

If Set Workspace Cookie option is set to **Yes**, Oracle Application Express sends a persistent cookie that:

- Combines the last used workspace name and user name
- Has a lifetime of six months
- Is read to populate the Application Express Workspace Login form (but not the Oracle Application Express Administration Services Login form)

To turn off cookies used to populate the login form:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. For Set Workspace Cookie, select **No**.

6. Click **Apply Changes**.

> **Note:** If your computer has received this cookie, you can physically remove it from its persistent location on disk using browser tools or system utilities. The cookie is named `ORA_WWV_REMEMBER_UN`. In older releases of Oracle Application Express, this cookie was named `ORACLE_PLATFORM_REMEMBER_UN`. It may exist for each Oracle Application Express service accessed having distinct hostname and path components.

Disabling Access to Oracle Application Express Administration Services Instance administrators prevent a user from logging in to Oracle Application Express Administration Services. Disabling administrator login production environments prevents unauthorized users from accessing Application Express Administration Services and possibly compromising other user login credentials.

To disable user access to Oracle Application Express Administration Services:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. For Disable Administrator Login, select **Yes**.

   Selecting **Yes** and signing out prevents anyone from accessing Oracle Application Express Administration Services.

6. Click **Apply Changes**.

Enabling Access to Oracle Application Express Administration Services To enable user access to Oracle Application Express Administration Services if it has been disabled:

1. Connect in SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`, for example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
   ```

3. Run the following statements:

   ```
   BEGIN
     APEX_INSTANCE_ADMIN.SET_PARAMETER('DISABLE_ADMIN_LOGIN', 'N');
     commit;
   END;
   /
   ```

Disabling Workspace Login Access Developers and Workspace administrators sign in to the Oracle Application Express development environment to access the Application Builder, SQL Workshop, Team Development, and Administration.

To restrict access to these applications, select **Yes** from Disable Workspace Login. This option effectively sets a Runtime-Only environment while still allowing Instance administrators to sign in to Instance Administration. Selecting **Yes** in production environments prevents developers from changing applications or data.

To disable user access to the Internal workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. From Disable Workspace Login, select **Yes**.

   Selecting **Yes** prevents users from accessing the Internal workspace.

6. Click **Apply Changes**.

Controlling Public File Upload Use the **Allow Public File Upload** attribute to control whether unauthenticated users can upload files in applications that provide file upload controls.

To control file upload:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. From Allow Public File Upload, select one of the following:

   - **Yes** - Enables unauthenticated users to upload files in applications in the Internal workspace.

   - **No** - Prevents unauthenticated users from uploading files in applications in the Internal workspace.

6. Click **Apply Changes**.

Restricting User Access by IP Address Instance administrators can restrict user access to an Oracle Application Express instance by specifying a comma-delimited list of allowable IP addresses.

To restrict user access by IP address:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. For Disable Administrator Login, select **No**.

6. In Restrict Access by IP Address, enter a comma-delimited list of allowable IP addresses. Use an asterisk (*) to specify a wildcard.

   You can enter IP addresses from one to four levels. For example:

   ```
   141, 141.* ...
   192.128.23.1 ...
   ```

   > **Note:** When using wildcards, do not include additional numeric values after wildcard characters. For example, `138.*.41.2`.

7. Click **Apply Changes**.

Configuring a Proxy Server for an Instance You can configure an entire Oracle Application Express instance to use a proxy for all outbound HTTP traffic. Setting a proxy at the instance-level supersedes any proxies defined at the application-level or in web service references. If a proxy is specified, regions of type URL, Web services, and report printing will use the proxy.

To configure a proxy for an Oracle Application Express instance:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. In Instance Proxy, enter the address of the proxy to be used for the entire instance.

6. Click **Apply Changes**.

Selecting a Checksum Hash Function The Checksum Hash Function attribute enables you to react to recent developments and switch between algorithms based on new research. Use the Checksum Hash Function attribute to select a hash function that Oracle Application Express uses to generate one way hash strings for checksums. This attribute is also the default value for the Security Bookmark Hash Function attribute in new applications. Applications use the Bookmark Hash Function when defining bookmark URLs.

   > **Tip:** Changing the Checksum Hash Function does not change the Bookmark Hash Function currently defined for existing applications because this would invalidate all existing bookmarks saved by end users.
   >
   > Oracle strongly recommends going into existing applications, expiring existing bookmarks, and then updating the Bookmark Hash Function to the same value defined for Checksum Hash Function.

To select a checksum hash function:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. From Checksum Hash Function, select a a hash function that Application Express uses to generate one way hash strings for checksums.

   The **SHA-2** algorithms are only supported on Oracle Database 12*c* or later. **Most Secure** automatically selects the most secure algorithm available. Therefore, Oracle recommends this setting. On Oracle Database 12*c* or later, this evaluates to **SHA-2, 512 bit** and on Oracle Database 11*g*, **SHA-1** is the most secure algorithm. Since the **MD5** algorithm is deprecated, Oracle does not recommend this setting.

6. Click **Apply Changes**.

Configuring Rejoin Sessions for an Instance By configuring the Rejoin Sessions attribute, Instance administrators can control if Oracle Application Express supports URLs that contain session IDs. When rejoin sessions is enabled, Oracle Application Express attempts to use the session cookie to join an existing session, when a URL does not contain a session ID.

> **Warning:** For security reasons, Oracles recommends that administrators disable support for session joining unless they implement workspace isolation by configuring the Allow Hostname attributes. See "Isolating a Workspace to Prevent Browser Attacks" on page 2-89 and "Isolating All Workspaces in an Instance" on page 2-28.

> **Note:** Enabling rejoin sessions may expose your application to possible security breaches, as it can enable attackers to take over existing end user sessions. To learn more, see "About Rejoin Sessions" in *Oracle Application Express Application Builder User's Guide*

To configure Rejoin Sessions:

1. Sign in to Oracle Application Express Administration Services. See "Configuring Rejoin Sessions for an Instance" on page 2-23.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. From Rejoin Sessions, select an option:

   - **Disabled** - If the URL does not contain a session ID, Oracle Application Express creates a new session.

   - **Enabled for Public Sessions** - If the URL goes to a public page and does not contain a session ID Oracle Application Express attempts to use the existing session cookie established for that application. Oracle Application Express only joins using the cookie when the session is not yet authenticated.

   - **Enabled for All Sessions** - If the URL does not contain a session ID, Oracle Application Express attempts to use the existing session cookie established for that application, providing one of the following conditions are met:

     – Session State Protection is enabled for the application and the URL includes a valid checksum. For public bookmarks, the most restrictive item level protection must be either **Unrestricted** or **Checksum Required - Application Level**.

– The URL does not contain payload (a request parameter, clear cache or data value pairs). This setting requires that Embed In Frames is set to **Allow from same origin** or to **Deny** for the application.

Enabled for Public Sessions requires that Embed in Frames is set to **Allow from same origin** or **Deny**. This is not tied to a condition about the URL payload, but also applies to session state protected URLs.

6. Click **Apply Changes**.

> **See Also:** "Browser Security," "Configuring Rejoin Sessions in Component View," "Configuring Rejoin Sessions in Page Designer," and "About Rejoins Sessions" in *Oracle Application Express Application Builder User's Guide*

Configuring Unhandled Errors Use this attribute to control how Oracle Application Express displays the results of unhandled errors. When Oracle Application Express encounters an unhandled error during processing, an error page displays to the end user of the application. From a security standpoint, it is often better to not display these messages and error codes to the end user and simply return a HTTP 400 (Bad Request) error code to the client browser.

To configure Unhandled Errors:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the Security section.

5. From Unhandled Errors, select an option:

- **Show Error Page** - This is the default behavior. For any error or exception which is not handled by the error processing of an application, an error page displays to the end user with the specific error and the error code.

- **Return HTTP 400** - Returns an HTTP 400 status to the end user's client browser when the Application Express engine encounters an unhandled error.

6. Click **Apply Changes**.

Configuring HTTP Protocol Attributes

You can configure both your Oracle Application Express instance and all related applications to require HTTPS by configuring the Require HTTPS and Require Outbound HTTPS attributes.

> **Note:** Require HTTPS make Oracle Application Express unreachable by the HTTP protocol. Before enabling this setting, ensure that the HTTPS protocol is enabled and configured correctly on your server.

- About SSL
- Requiring HTTPS
- Reversing Require HTTPS
- Reversing Require Outbound HTTPS
- Configuring Additional Response Headers

About SSL Secure Socktets Layer (SSL) is a protocol for managing the security of data transmitted on the Internet. For web applications, SSL is implemented by using the HTTPS protocol. Oracle recommends running Oracle Application Express applications using SSL (HTTPS protocol) to prevent any sensitive data from being sent over an unencrypted (cleartext) communication channel.

Requiring HTTPS To require HTTPS in Oracle Application Express:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate HTTP Protocol and configure the following:

    a. Require HTTPS. Options include:

    – **Always** - Enforces HTTPS for all applications (including the Oracle Application Express development and administration applications) to require HTTPS.

    If set to **Always**, the he Strict-Transport-Security Max Age attribute displays. Use this field to specify the time period in seconds during which the browser shall access the server with HTTPS only. To learn more, see field-level Help.

    – **Development and Administration** - Forces all internal applications within Oracle Application Express (that is, Application Builder, SQL Workshop, Instance Administration and so on) to require HTTPS.

    – **Application specific** - Makes HTTPS dependent on application-level settings.

    b. Require Outbound HTTPS - Select **Yes** to require all outbound traffic from an Application Express instance to use the HTTPS protocol.

    c. HTTP Response Headers - Enter additional HTTP response headers that Oracle Application Express should send on each request for all applications. Developers can specify additional headers at application-level. Each header has to start on a new line. Note that support for various headers differs between browsers. To learn more, see field-level Help.

5. Click **Apply Changes**.

Note: If you set Require HTTPS to **Yes**, you are only able to sign in to an Oracle Application Express workspace or Oracle Application Express Administration Services over HTTPS.

Reversing Require HTTPS To reverse Require HTTPS:

1. Connect in SQL*Plus or SQL Developer with the Application Express engine schema as the current schema, for example:

    ■ On Windows:

    ```
    SYSTEM_DRIVE:\ sqlplus /nolog
    SQL> CONNECT SYS as SYSDBA
    Enter password: SYS_password
    ```

    ■ On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
```

3. Run the following statements:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER('REQUIRE_HTTPS', 'N');
    commit;
end;
/
```

Reversing Require Outbound HTTPS To reverse Require Outbound HTTPS:

1. Connect in SQL*Plus or SQL Developer with the Application Express engine schema as the current schema, for example:

   ■ On Windows:

   ```
   SYSTEM_DRIVE:\ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

   ■ On UNIX and Linux:

   ```
   $ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
```

3. Run the following statements:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER('REQUIRE_OUT_HTTPS', 'N');
    commit;
end;
/
```

Configuring Additional Response Headers To configure additional response headers:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate HTTP Protocol.

5. In HTTP Response Headers, enter additional HTTP response headers that Oracle Application Express should send on each request for all applications. Developers can specify additional headers at application-level. Each header has to start on a new line. Note that support for various headers differs between browsers.

   To learn more, see field-level Help.

6. Click **Apply Changes**.

Controlling RESTful Services for an Instance

Use the Allow RESTful Access attribute to control whether developers can expose report regions as RESTful services. You can enable RESTful services for specific workspace or for an entire development instance.

To configure RESTful access for an instance:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate the RESTful Access section.

5. From Allow RESTful Access, select one of the following:

- **Yes** - Enables developers to expose report regions as RESTful services.

- **No** - Prevents developers from exposing report regions as RESTful services.

6. Click **Apply Changes**.

> **See Also:** "Controlling RESTful Services for a Workspace" on page 1-17 and "Using RESTful Services" in *Oracle Application Express SQL Workshop Guide*

Enabling Real Application Security

If you are running Oracle Database 12c Release 1 (12.1.0.2) or later, you can enable Oracle Real Application Security. Oracle Real Application Security (RAS) is a database authorization framework that enables application developers and administrators to define, provision, and enforce application-level security policies at the database layer.

> **See Also:** *Oracle Database Real Application Security Administrator's and Developer's Guide*

To enable Real Application Security:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Locate Real Application Security.

5. For Allow Real Application Security.

- **Yes** - Enables Oracle Database Real Application Security support for applications. If Real Application Security is configured in an application's authentication scheme, Oracle Application Express creates a Real Application Security session for a new Oracle Application Express session and automatically attaches to it.

- No - Disables Oracle Database Real Application Security.

6. Click **Apply Changes**.

Configuring Session Timeout

Use the attributes under Session Timeout to reduce exposure at the application level for abandoned computers with an open web browser.

To configure session timeout for an instance:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Under Session Timeout For Application Express, specify the following attributes:

   - **Maximum Session Length in Seconds** - Enter a positive integer to control how many seconds an application session is allowed to exist. This setting is superseded by the application-level setting. Leave the value null to revert to the default value of 8 hours (28800 seconds). Enter 0 to have the session exist indefinitely. This session duration may be superseded by the operation of the job that runs every hour which deletes sessions older than 12 hours.

   - **Maximum Session Idle Time in Seconds** - Enter a positive integer to control how many seconds a session may remain idle for Oracle Application Express applications. This setting is superseded by the application-level setting. Leave the value null to revert to the default value of 1 hour (3600 seconds). Set to 0 to prevent session idle time checks from being performed.

5. Click **Apply Changes**.

> **See Also:** "Session Timeout" in *Oracle Application Express Application Builder User's Guide*

Isolating All Workspaces in an Instance

This section describes how Instance administrators can isolate a workspace and prevent browser attacks.

- About Isolating a Workspace to Prevent Browser Attacks
- Configuring Workspace Isolation Attributes

About Isolating Workspaces to Prevent Browser Attacks Isolating workspaces is an effective approach to preventing browser attacks. The only way to truly isolate a workspace is to enforce different domains in the URL by configuring the Allow Hostnames attribute. When the URLs of the attacker and the victim have different domains and hostnames, the browser's same-origin policy prevents attacks.

> **See Also:** "Isolating a Workspace to Prevent Browser Attacks" on page 2-89 and "About Isolating Workspaces" in *Oracle Application Express Application Builder User's Guide*

Configuring Instance-Level Workspace Isolation Attributes To configure instance-level Workspace Isolation attributes:

1. Access the Edit Workspace Information page for the workspace:

   a. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

   b. Click **Manage Instance**.

   c. Under Instance Settings, click **Security**.

2. Locate the Workspace Isolation section.

3. Edit the appropriate attributes as described in Table 2–2.

> **Tip:** To learn more about an attribute, see field-level Help.

Table 2–2 Workspace Isolation Attributes

Attribute	Description
Allow Hostnames	Enter a comma separated list of hostnames that can be used to access this instance. This attribute can be used to specify which DNS aliases of the web server can be used with applications. You can configure specific values that override this one at workspace level. If you enter one or more hostnames, the incoming HTTP request URL's hostname part must match one of the listed hostnames.
Resource Consumer Group	Specify the Database Resource Manager consumer group to be used for all page events on the instance. You can configure specific values that override this one at the workspace-level. At the beginning of every request, the Application Express engine switches the current consumer group of the current database session to the consumer group that is defined at workspace or instance level. This applies to both executing applications and any of the applications used within the Application Express development environment.
	The privilege to switch to this consumer group must be granted to either PUBLIC or the Application Express schema. This privilege is typically granted using the procedure `DBMS_RESOURCE_MANAGER_PRIVS.GRANT_SWITCH_CONSUMER_GROUP`.
Maximum Concurrent Workspace Requests	Enter the maximum number of concurrent page events that Oracle Application Express supports for all applications. You can configure a specific value at the workspace-level. Instead of processing a page event, Oracle Application Express shows an error message when the limit is already reached.
	Oracle Application Express keeps track of workspace requests by querying the `CLIENT_INFO` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_INFO`, for example, with a call to `DBMS_APPLICATION_INFO.SET_CLIENT_INFO`.
Maximum Concurrent Session Requests	Enter the maximum number of concurrent page events that Oracle Application Express supports for each session for applications in this instance. You can configure a specific value at the workspace-level. Instead of processing a new page event, Oracle Application Express shows an error message when the limit is already reached. Alternatively, you can use the Concurrent Session Requests Kill Timeout attribute to kill an active database session, to process the new page event.
	Oracle Application Express keeps track of session requests by querying the `CLIENT_IDENTIFIER` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_IDENTIFIER`, for example, with a call to `DBMS_SESSION.SET_IDENTIFIER`.

Table 2–2   (Cont.) Workspace Isolation Attributes

Attribute	Description
Concurrent Session Requests Kill Timeout	If a new page event comes in that is outside the limits of Maximum Concurrent Session Requests, Oracle Application Express can execute `alter system kill session` on the oldest active database session which processes another page event for this Application Express session. The Concurrent Session Requests Kill Timeout attribute specifies the number of seconds a database process has to be active, before it can be killed. If you leave this attribute empty, Application Express will not kill any database sessions. **Warning**: Killing sessions can cause problems with the application server's database session pool.
Maximum Size of Files in Workspace	Enter the total size (in bytes) of all files that can be uploaded to a workspace. You can configure a specific value at the workspace-level.

4. Click **Apply Changes**.

Defining Excluded Domains for Regions and Web Services

An Instance administrator can define a list of restricted domains for regions of type URL and Web services. If a Web service or region of type URL contains an excluded domain, an error displays informing the user that it is restricted.

To define a list of excluded domain from regions of type URL and Web services:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Under Domain Must Not Contain, enter a colon-delimited list of excluded domains, for example:

```
mycompany.com:yourcompany.com:abccompany.com
```

5. Click **Apply Changes**.

Configuring Authentication Controls

his section describes how instance administrators can configure authentication controls for an entire Oracle Application Express instance.

- About Authentication Controls
- Configuring Security for Developer and End User Login
- Configuring Security Settings for Workspace Administrator and Developer Accounts

> **See Also:**   "Creating Account Login Controls for a Workspace" on page 1-15

About Authentication Controls Administrators can configure authentication controls for an entire instance or for each individual workspace. For example, if an instance administrator configures authentication controls in Oracle Application Express Administration Services that configuration applies to all Application Express accounts in all workspaces across an entire development instance.

If the instance administrator does *not* enable authentication controls across an entire instance, then each Workspace administrator can enable the following controls on a workspace-by-workspace basis:

- User account expiration and locking

- A maximum number of failed login attempts for user accounts

- Account password lifetime (or number of days an end-user account password can be used before it expires for end-user accounts)

> **Tip:** This feature applies only to accounts created using the Application Express user creation and management. It provides additional authentication security for applications. See "Managing Users in a Workspace" on page 1-21.

> **See Also:** "Creating Account Login Controls for a Workspace" on page 1-15, "Configuring Security for Developer and End User Login" on page 2-31, and "Configuring Security Settings for Workspace Administrator and Developer Accounts" on page 2-31

Configuring Security for Developer and End User Login To configure security settings for developer and end user login:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Under General Settings, configure the following attributes:

   a. **Delay after failed login attempts in Seconds** - Enter a positive integer value for the delay in seconds between login attempts. Enter 0 to disable the countdown and enable immediate access. If the delay is greater than 0, Oracle Application Express always displays the countdown, even on the first login failure.

   b. **Method for computing the Delay** - Select a method for computing the delay for failed log ins. The computation methods are based on recent data in the Login Access Log. See item help for further details.

   c. **Inbound Proxy Servers** - Enter a comma-separated list of IP addresses for well known proxy servers, through which requests come in. Oracle Application Express uses this list to compute the actual client address from the HTTP Headers `X-Forwarded-For` and `REMOTE_ADDR`.

   d. **Single Sign-On Logout URL** - Enter the URL Application Express redirects to trigger a logout from the Single Sign-On server. Application Express automatically appends `?p_done_url=...login url....`

5. Click **Apply Changes**.

Configuring Security Settings for Workspace Administrator and Developer Accounts To configure security controls for workspace administrator and developer accounts:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Under Development Environment Settings, configure the following attributes:

   a. **Username Validation Expression** - Enter a regular expression to validate the usernames of developers and administrators. Enter * to bypass the validation. The following example validates that the username is an email address:

      ```
      ^[[:alnum:]._%-]+@[[:alnum:].-]+\.[[:alpha:]]{2,4}$
      ```

   b. **Require User Account Expiration and Locking** - Select **Yes** to enable Application Express user account expiration and locking features across all workspaces in an instance. This selection prevents the same feature from being disabled at the workspace-level.

      Select **No** to relinquish control to each Workspace administrator.

   c. **Maximum Login Failures Allowed** - Enter a integer for the maximum number of consecutive unsuccessful authentication attempts allowed before a developer or administrator account is locked. If you do not specify a value in this field, the default value is 4.

      This setting applies to administrator and developer accounts. It does not apply to end user accounts.

      The value you enter is used as the default for the workspace-level **Maximum Login Failures Allowed** preference if the Workspace administrator does not specify a value. That preference is used for end-user accounts within the respective workspace.

   d. **Account Password Lifetime (days)** - Enter a number for the maximum number of days a developer or administrator account password may be used before the account expires. If you do not specify a value in this field, a default value is 45 days.

      This setting applies to accounts used to access the Application Express administration and development environment only. It does not apply to end user accounts.

      The value you enter is used as the default workspace-level **End User Account Lifetime** preference, if the Workspace administrator specifies no value. That preference is used for end-user accounts within the respective workspace.

5. Click **Apply Changes**.

Editing Development Environment Authentication Scheme To edit development environment authentication schemes:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Scroll down to Development Environment Authentication Schemes.

5. Click the Edit icon adjacent to the authentication scheme you wish to edit.

6. Edit the appropriate attributes. To learn more about an attribute, see field-level Help.

7. To save you changes, click **Apply Changes**. To make the selected authentication scheme current, click **Make Current Scheme**.

> **Tip:** You can also change the authentication scheme using the `APEX_BUILDER_AUTHENTICATION` parameter in `APEX_INSTANCE_ADMIN` package. See "Available Parameter Values" in *Oracle Application Express API Reference*.

Creating Strong Password Policies

This section describes how instance administrators can create strong password policies for an Oracle Application Express instance.

- About Strong Password Policies
- Configuring Password Policies

About Strong Password Policies Password policies can:

- Apply to all users (including, Workspace administrators, developers, and end users) in an Oracle Application Express instance.

- Include restrictions on characters, password length, specific words, and differences in consecutive passwords.

- Apply to users signing in to Oracle Application Express Administration Services.

The Application Express instance administrator can select the password policy for service administrators. Options include:

- **Use policy specified in Workspace Password Policy** - Applies the password rules specified the in Workspace Password Policy.

- **Use default strong password policy** - Adds another layer of security to prevent hackers from determining an administrator's password. This password policy requires that service administrator passwords meet these restrictions:

  - Consist of at least six characters.

  - Contain at least one lowercase alphabetic character, one uppercase alphabetic character, one numeric digit, and one punctuation character.

  - Cannot include the username.

  - Cannot include the word Internal.

  - Cannot contain any words shown in the Must Not Contain Workspace Name field in this section.

Adds another layer of security to prevent hackers from determining an administrator's password.

Configuring Password Policies To configure password policies:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Under Password Policy and specify the attributes described in Table 2–3.

Table 2–3   Workspace Password Policy Attributes

Attribute	Description
Password Hash Function	Select a hash function that Application Express uses to generate one way hash strings for workspace user passwords. To learn, see field-level Help.
Minimum Password Length	Enter a number to set a minimum character length for passwords for workspace administrator, developer, and end user accounts.
Minimum Password Differences	Enter a positive integer or 0.
	When users change their password, the new password must differ from the old password by this number of characters. The old and new passwords are compared, character-by-character, for differences such that each difference in any position common to the old and new passwords counts toward the required minimum difference.
	This setting applies to accounts for workspace administrators, developers, and end users.
Must Contain At Least One Alphabetic Character	Select **Yes** to require that workspace administrator, developer, and end user account passwords contain at least one alphabetic character as specified in the Alphabetic Characters field.
Must Contain At Least One Numeric Character	Select **Yes** to require that workspace administrator, developer, and end user account passwords contain at least one Arabic numeric character (for example, 0,1,2,3,4,5,6,7,8,9).
Must Contain At Least One Punctuation Character	Select **Yes** to require that workspace administrator, developer, and end user account passwords contain at least one punctuation character as specified in the Punctuation Characters field.
Must Contain At Least One Upper Case Character	Select **Yes** to require that workspace administrator, developer, and end user account passwords contain at least one uppercase alphabetic character.
Must Contain At Least One Lower Case Character	Select **Yes** to require that workspace administrator, developer, and end user account passwords contain at least one lowercase alphabetic character.
Must Not Contain Username	Select **Yes** to prevent workspace administrator, developer, and end user account passwords from containing the username.
Must Not Contain Workspace Name	Select **Yes** to prevent workspace administrator, developer, and end user account passwords from containing the workspace name, regardless of case.
Must Not Contain	Enter words, separated by colons, that workspace administrator, developer, and end user account passwords must not contain. These words may not appear in the password in any combination of uppercase or lowercase.
	This feature improves security by preventing the creation of simple, easy-to-guess passwords based on words like *hello*, *guest*, *welcome*, and so on.
Alphabetic Characters	Enter new or edit the existing alphabetic characters. This is the set of characters used in password validations involving alphabetic characters.
Punctuation Characters	Enter new or edit existing punctuation characters. This is the set of characters used in password validations involving punctuation characters.

Next, set up a password policy for Application Express service administrators.

5. Scroll down to the Service Administrator Password Policy and specify one of the following:

   a. **Use policy specified in Workspace Password Policy** - Applies the password rules specified in Workspace Password Policy to service administrator passwords.

   b. **Use default strong password policy** - Adds another layer of security to prevent hackers from determining an administrator's password. This password policy requires that service administrator passwords:

      – Consist of at least six characters.

      – Contain at least one lowercase alphabetic character, one uppercase alphabetic character, one numeric digit, and one punctuation character.

      – Cannot include the username.

      – Cannot include the word Internal.

      – Cannot contain any words shown in the Must Not Contain Workspace Name field in this section.

6. Click **Apply Changes**.

Restricting Access to Oracle Application Express by Database Access Descriptor (DAD)

This section describes how to restrict access to Oracle Application Express by Database Access Descriptor (DAD).

> **Tip:** The PL/SQL Request Validation Function directive is only available in Oracle Application Server 10*g* and Oracle HTTP Server 11*g* or later, and the embedded PL/SQL gateway in Oracle Database 11*g* or later. This directive is not available in Oracle HTTP Server Release 9.0.3.

- About Enforcing Access Restrictions Per DAD

- About the wwv_flow_epg_include_local Function

- Specifying Allowed Named Procedures

- Altering the Product Schema

About Enforcing Access Restrictions Per DAD mod_plsql and the embedded PL/SQL gateway support a directive which enables you to name a PL/SQL function which is called for each HTTP request. You can use this functionality to restrict the procedures that can be called through the embedded PL/SQL gateway or mod_plsql. The function returns TRUE if the named procedure in the current request is allowed and FALSE if it is not allowed. You can also use this function to enforce access restrictions for Oracle Application Express on a per-Database Access Descriptor (DAD) basis.

During installation, the installer also creates a PL/SQL function in the Oracle Application Express product schema (APEX_050000). To restrict access, you can change and recompile this function. The source code for this function is not wrapped and can be found in the Oracle Application Express product core directory in the file named wwv_flow_epg_include_local.sql.

Oracle Application Express ships with a request validation function named wwv_flow_epg_include_modules.authorize. This function specifies access restrictions appropriate for the standard DAD configured for Oracle Application Express.

The `wwv_flow_epg_include_mod_local` function is called by Oracle Application Express's request validation function which itself is called by the embedded PL/SQL gateway or `mod_plsql`. The Oracle Application Express function first evaluates the request and based on the procedure name, approves it, rejects it, or passes it to the local function, `wwv_flow_epg_include_mod_local`, which can evaluate the request using its own rules.

When you create new DADs for use with Oracle Application Express, the request validation function directive should be specified. Specifically, the function `wwv_flow_epg_include_modules.authorize` should be named in the directive `PlsqlRequestValidationFunction` in the Database Access Descriptor entry in `dads.conf`.

If you have no additional restrictions beyond those implemented in the `wwv_flow_epg_include_modules.authorize` function, there is no need to take any action with respect to the source code for the `wwv_flow_epg_include_mod_local` function.

> **See Also:** *Oracle Application Express Installation Guide*

About the wwv_flow_epg_include_local Function You can change and recompile the `wwv_flow_epg_include_local` function to restrict access. The source code for the `wwv_flow_epg_include_local` function is not wrapped and can be found in the Oracle Application Express product core directory in the file named `wwv_flow_epg_include_local.sql`. The source code is as follows:

```
CREATE OR REPLACE FUNCTION
wwv_flow_epg_include_mod_local(
    PROCEDURE_NAME IN VARCHAR2)
RETURN BOOLEAN
IS
BEGIN
    RETURN FALSE; -- remove this statement when
you add procedure names to the "IN" list
    IF UPPER(procedure_name) IN (
        '') THEN
        RETURN TRUE;
    ELSE
        RETURN FALSE;
    END IF;
END wwv_flow_epg_include_mod_local;
/
```

Specifying Allowed Named Procedures To specify names of procedures that should be allowed, edit `wwv_flow_epg_include_local`as follows:

1. Remove or comment out the `RETURN FALSE` statement that immediately follows the `BEGIN` statement:

   ```
   ...
   BEGIN
       RETURN FALSE; -- remove this statement when
   you add procedure names to the "IN" list
   ...
   ```

2. Add names to the clause representing procedure names that should be allowed to be invoked in HTTP requests. For example to allow procedures `PROC1` and `PROC2` the `IN` list you would write `IN ('PROC1', 'PROC2')`.

   After changing the source code of this function, alter the Oracle Application Express product schema (`APEX_050000`) and compile the function in that schema.

Altering the Product Schema To alter the product schema, `APEX_050000`

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Alter the product schema (`APEX_050000`) by entering the following command:

   ```
   ALTER SESSION SET CURRENT_SCHEMA APEX_050000;
   ```

3. Compile the function `wwv_flow_epg_include_local.sql`.

Managing Authorized URLs

In Oracle Application Express developers can use a URL as an argument in Oracle Application Express procedures that redirect to the defined URL. Examples include `APEX_UTIL.COUNT_CLICK` (`p_url` parameter) and `WWV_FLOW_CUSTOM_AUTH_STD.LOGOUT` (`p_next_url` parameter).

- Defining a List of Authorized URLs

- Editing a Defined Authorized URL

- Deleting Defined Authorized URL

This section describes how instance administrators can define a list of authorized URLs. When a URL is provided as an argument to these procedures, it is verified internally against this list.

> **See Also:** *Oracle Application Express Installation Guide*

Defining a List of Authorized URLs To define a list of Authorized URLs:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Click the **Authorized URLs** tab.

5. Click **Create Authorized URL**.

6. On the Authorized URL page:

   a. Authorized URL - Enter an authorized URL that can be used as the parameter value to certain Application Express procedures.

   The entire authorized URL value is compared with the URL parameter value in Oracle Application Express procedures. If there is an exact match up to and including the entire length of the Authorized URL value, then the URL parameter value is permitted.

b. Description - Enter a description of the URL.

c. Click **Create Authorized URL**.

Editing a Defined Authorized URL To edit an existing URL:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Click the **Authorized URLs** tab.

A report of defined authorized URLs appears.

5. Click the **Edit** icon adjacent to the URL.

6. Edit the Authorized URL and Description fields.

7. Click **Apply Changes**.

Deleting Defined Authorized URL To delete an existing URL:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Security**.

4. Click the **Authorized URLs** tab.

A report of defined authorized URLs appears.

5. Click the **Edit** icon adjacent to the URL.

6. Click **Delete**.

7. Click **OK** to confirm your selection.

Configuring Instance Settings

This section describes configuring general settings for an Oracle Application Express development instance. Instance Settings impact general behavior of workspace provisioning, storage, email, wallet, report printing, Help, workspace change request size, and Application ID Ranges.

- About Configuring Self Service Workspace Provisioning
- Disabling Email Provisioning
- Configuring Storage
- Configuring Email
- Configuring Wallet Information
- Configuring Report Printing
- Configuring the Help Menu
- Configuring Workspace Size Options for Requests
- Managing Application ID Range

> **See Also:**   "Creating Workspaces" on page 2-74

About Configuring Self Service Workspace Provisioning

The instance administrator determines the amount of automation when provisioning (or creating) a workspace. To determine how provisioning works, an Instance Administrator selects one of the following Provisioning Status options on the Instance Settings page:

- **Manual** - In this mode, an instance administrator creates new workspaces and notifies the Workspace administrator of the login information.

- **Request** - Users request workspaces directly in a self-service fashion. Users click a link on the login page to access a request form. After the workspace request has been granted, users are automatically emailed the appropriate login information.

- **Request with Email Verification** - In this mode, users request workspaces directly by clicking a link on the Sign In page to access a request form. Each user receives an initial email containing a verification link. When the user clicks the verification link, the request is processed. The user can then access the workspace using the Sign In page.

> **Note:** To enable users to request a workspace using a link on the Sign In page, you must choose the provisioning status of **Request** or **Request with Email Verification** as described in the previous section. If the provisioning status is set to **Manual**, no link appears on the sign in page.

> **See Also:** "Selecting a Provisioning Mode" on page 2-75 "Disabling Email Provisioning" on page 2-39, "Configuring Email" on page 2-42, and "Managing Workspace and Change Requests" on page 2-8

Disabling Email Provisioning

Use Email Provisioning to disable workspace provisioning when provisioning with Email Verification.

To disable email provisioning:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. From Email Provisioning, select **Disabled**.

    Selecting **Disabled** completely disables workspace provisioning when provisioning with Email Verification.

5. In Message, enter a message that explains why email provisioning is disabled.

6. Click **Apply Changes**.

Configuring Storage

Instance administrators can configure the following storage options: require a new schema when requesting a workspace, auto extend tablespaces, or delete uploaded files are a specified number of days.

- Requiring a New Schema
- Enabling Auto Extend Tablespaces

- Enabling Bigfile Tablespaces
- Enabling Encrypted Tablespaces
- Deleting Uploaded Files

Requiring a New Schema To require a new schema when creating a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Storage.

5. From Require New Schema, select one of the following:

    - **Yes** - Requires users to request a new schema when they request a new workspace.

    - **No** - Enables users to select an existing schema when they request a new workspace.

6. Auto Extend Tablespaces, select **Yes** or **No**. See "Enabling Auto Extend Tablespaces" on page 2-40.

7. Click **Apply Changes**.

Enabling Auto Extend Tablespaces If Auto Extend Tablespaces is enabled, tablespaces provisioned with Oracle Application Express are created with a data file that is one tenth the requested size. The data file automatically extends up to the requested size. For example, if a user requests a 100 MB workspace, the initial size of the data file is 10 MB and automatically extends up to a maximum size of 100 MB.

To enable Auto Extend Tablespaces:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Storage.

5. To enable Auto Extend Tablespaces, select **Yes**.

6. Click **Apply Changes**.

Enabling Bigfile Tablespaces When a workspace is provisioned, Oracle Application Express creates the associated database user, tablespace, and data file. If Bigfile Tablespaces is enabled, tablespaces provisioned with Oracle Application Express are created as bigfile tablespaces. A bigfile tablespace is a tablespace with a single, but very large data file. Traditional smallfile tablespaces, in contrast, can contain multiple data files, but the files cannot be as large.

> **Tip:** Oracle does not recommend using bigfile tablespaces on platforms that do not support large file sizes and can limit tablespace capacity. Refer to your operating system specific documentation for information about maximum supported file sizes.

To enable bigfile tablespaces:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Storage.

5. For Bigfile Tablespaces, select **Yes**.

6. Click **Apply Changes**.

> **See Also:** "Available Parameter Values" in *Oracle Application Express API Reference* to learn about the BIGFILE_TABLESPACES_ENABLED parameter

Enabling Encrypted Tablespaces If Encrypted Tablespaces is enabled, tablespaces provisioned with Oracle Application Express are created as encrypted tablespaces using the Oracle database feature Transparent Data Encryption (TDE). TDE encrypts sensitive data stored in data files. To prevent unauthorized decryption, TDE stores the encryption keys in a security module external to the database.

To be able to exploit this feature in Application Express, an encryption wallet must be created and with a master encryption key set. Additionally, the encryption wallet must be open before provisioning a new Application Express workspace.

To enable Encrypted Tablespaces:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Storage.

5. For Encrypted Tablespaces, select **Yes**.

6. Click **Apply Changes**.

> **See Also:** "Available Parameter Values" in *Oracle Application Express API Reference* to learn about the ENCRYPTED_TABLESPACES_ENABLED parameter

Deleting Uploaded Files Use **Delete Uploaded Files After (days)** to specify the number of days after which Oracle Application Express automatically deletes uploaded files. Note this automatic deletion process applies to all workspaces in an Oracle Application Express instance. The types of files that are deleted include:

- Application Export
- CSS Export
- Images Export
- Page Export
- Plug-in
- Script Export
- Spreadsheet / Text Data Import
- Static Files Export

- Themes

- User Interface Defaults

- Workspace Export

- XML Data Import

To configure when export and import files are deleted:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Storage.

5. In Delete Uploaded Files After (days), enter the number of days after which Oracle Application Express deletes uploaded files. Enter a positive, whole number. If this setting is null, then no files are automatically deleted.

6. Click **Apply Changes**.

> **Tip:** To view a summary of deleted files, see the Automatic File Delete Log. See "Monitoring Activity Across a Development Instance" on page 2-99

Configuring Email

To enable Oracle Application Express to send mail, an instance administrator must configure email settings. This section describes how to configure email settings in a full development environment and a runtime environment.

> **Tip:** You can configure Oracle Application Express to automatically email users their login credentials when a new workspace request has been approved. See "About Specifying How Workspaces Are Created" on page 2-74 and "Selecting a Provisioning Mode" on page 2-75.

- About Enabling Network Services

- Configuring Email in a Full Development Environment

- Configuring Email in a Runtime Environment

- Determining Email Settings in a Runtime Environment

> **See Also:** "Managing the Mail Queue" on page 2-59 and "APEX_MAIL" in *Oracle Application Express API Reference*

About Enabling Network Services If you are running Oracle Application Express with Oracle Database 11*g* or later, you must enable outbound mail. Starting with Oracle Database 11*g* Release 1 (11.1), the ability to interact with network services is disabled by default.

By default, the ability to interact with network services is disabled in Oracle Database 11g or later. Therefore, if you are running Oracle Application Express with Oracle Database 11*g* or later, you must use the DBMS_NETWORK_ACL_ADMIN package to grant connect privileges to any host for the APEX_050000 database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.

- Using Web services in Oracle Application Express.

- PDF/report printing.

> **See Also:** "Enabling Network Services in Oracle Database 11*g* or Later" for your configuration scenario in *Oracle Application Express Installation Guide*

Configuring Email in a Full Development Environment To configure Oracle Application Express to send mail in a full development environment:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services".

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Under Email, enter the following:

   a. **Application Express Instance URL** - Enter the URL to the Oracle Application Express instance, inclusive of the DAD and trailing slash. For example:

      ```
      http://your_server/pls/apex/
      ```

      This setting is used for Oracle Application Express system-generated emails.

   b. **Application Express Images URL** - Enter the URL to the Oracle Application Express images directory, inclusive of the trailing slash.

      ```
      http://your_server/i/
      ```

      This setting is used for Oracle Application Express system-generated emails.

   c. **SMTP Host Address** - Defines the server address of the SMTP server. By default on installation, this is set to `localhost`. If you are using another server as an SMTP relay, change this parameter to that server's address.

   d. **SMTP Host Port** - Defines the port the SMTP server listens to for mail requests. The default setting is 25.

   e. **SMTP Authentication Username** - If you enter a username, Oracle Application Express authenticates against it when sending emails. Prior to Oracle Database 11*g* Release 2 (11.2.0.2), only the SMTP authentication scheme "LOGIN" is supported. On newer database versions, all authentication schemes of `UTL_SMTP` are supported.

   f. **SMTP Authentication Password** - If you enter a password, Oracle Application Express authenticates against it when sending emails. Prior to Oracle Database 11*g* Release 2, Release 11.2.0.2, only the SMTP authentication scheme "LOGIN" is supported. On newer database versions, all authentication schemes of `UTL_SMTP` are supported.

   g. **Use SSL/TLS** - Beginning with Oracle Database 11*g* Release 2 (11.2.0.2), Oracle Application Express supports secure SMTP connections. Options include:

      – **Yes** - A secure connection with SSL/TLS is made before SMTP communication.

      – **After connection is established** - Oracle Application Express sends the SMTP command `STARTTLS` immediately after the connection is opened.

      – **No** - A non-secure connection is opened.

    h. **Default Email From Address** - Defines the `from` address for tasks that generate email, such as approving a provision request or resetting a password.

    i. **Maximum Emails per Workspace** - Defines the number of email messages that can be sent with the `APEX_MAIL` API per workspace per 24 hour period.

5. Click **Apply Changes**.

Configuring Email in a Runtime Environment To configure Oracle Application Express to send mail in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
```

3. Run the following statement:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
END;
```

For a description of email parameters, see "Configuring Email in a Full Development Environment" on page 2-43.

> **See Also:**   "SET_PARAMETER Procedure" in *Oracle Application Express API Reference*

Determining Email Settings in a Runtime Environment To determine email settings in runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
```

3. Run the following statement:

```
SELECT
APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
FROM DUAL;
```

For a description of email parameters, see "Configuring Email in a Full Development Environment" on page 2-43.

> **See Also:** "GET_PARAMETER Function" in *Oracle Application Express API Reference*

Configuring Wallet Information

This section describes how to configure wallet information for an Oracle Application Express instance.

- About SSL and Wallet Creation

- Overview of Creating a Wallet

- Configuring a Wallet in a Full Development Environment

- Configuring a Wallet in a Runtime Environment

- Determining Wallet Settings in a Runtime Environment

About SSL and Wallet Creation Secure Sockets Layer (SSL) is an industry standard protocol that uses RSA public key cryptography with symmetric key cryptography to provide authentication, encryption, and data integrity. When SSL is enabled, `https` displays in the URL.

A wallet is a password-protected container that stores authentication and signing credentials (including private keys, certificates, and trusted certificates) needed by SSL. You must create a wallet if you:

- Call a SSL-enabled URL (for example, by invoking a Web service).

- Create a region of type URL that is SSL-enabled.

- Configure secure SMTP, by setting the Use SSL/TLS attribute to **Yes**.

- Have applications with LDAP authentication schemes that are configured to use SSL with Authentication.

Overview of Creating a Wallet To create a wallet:

1. The database administrator must create a wallet on the Oracle Application Express database instance. See "Using Oracle Wallet Manager" in *Oracle Database Advanced Security Administrator's Guide*.

2. The instance administrator configures the Wallet section of the Instance Settings page to specify the file system path to the wallet and the wallet password (if required).

> **See Also:** "Working with SSL Enabled Web Services" in *Oracle Application Express Application Builder User's Guide* and "Using Oracle Wallet Manager" in *Oracle Database Enterprise User Security Administrator's Guide*

Configuring a Wallet in a Full Development Environment To specify wallet settings in a full development environment:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Wallet.

5. In Wallet Path, enter the path on the file system where the wallet is located using the following format:

   ```
   file:directory-path
   ```

   See field-level Help for examples.

6. If a password is required to open the wallet:

   a. In Wallet Password, enter a password.

   b. Select **Check to confirm that you wish to change the wallet password**.

7. Click **Apply Changes**.

Configuring a Wallet in a Runtime Environment To specify wallet settings in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
   ```

3. Run the following statement:

   ```
   BEGIN
       APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
   END;
   ```

   For a description of wallet parameters, see Table 2–4 on page 2-46.

Table 2–4   Wallet Parameters

Parameter Name	Description
WALLET_PATH	The path to the wallet on the file system, for example:
	file:/home/username/wallets
WALLET_PWD	The password associated with the wallet.

> **See Also:** "SET_PARAMETER Procedure" in *Oracle Application Express API Reference*

Determining Wallet Settings in a Runtime Environment To determine wallet settings in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

    ■   On Windows:

        ```
        SYSTEM_DRIVE:\ sqlplus /nolog
        SQL> CONNECT SYS as SYSDBA
        Enter password: SYS_password
        ```

    ■   On UNIX and Linux:

        ```
        $ sqlplus /nolog
        SQL> CONNECT SYS as SYSDBA
        Enter password: SYS_password
        ```

2. Run the following statement:

    ```
    ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
    ```

3. Run the following statement:

    ```
    SELECT
    APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
    FROM DUAL;
    ```

    For a description of wallet parameters, see Table 2–4, " Wallet Parameters" on page 2-46.

    > **See Also:** "GET_PARAMETER Function" in *Oracle Application Express API Reference*

Configuring Report Printing

This section describes how to configure report printing options for an Oracle Application Express instance.

■   About Configuring Report Printing

■   Configuring Report Printing in a Full Development Environment

■   Configuring Report Printing Settings in a Runtime Environment

■   Determining Report Printing Settings in a Runtime Environment

About Configuring Report Printing Oracle Application Express provides several features so that end users can download and print reports in various formats, including PDF. To set up this functionality, different users must configure the following printing settings:

1. **Site Level**: Instance administrators must specify the level of functionality (Standard or Advanced) for an entire Oracle Application Express instance, as described in this section.

2. **Application Level**: Workspace administrators and developers can define Report Queries and Report Layouts. Report Queries and Report Layouts are stored under Shared Components and are not tied to a specific page.

3. **Page/Region Level**: Developers can edit the Report regions on specific pages to enable printing. This, in turn, enables end users to print regions as reports in various formats. See "Configuring Classic Report Region Print Attributes" in *Oracle Application Express Application Builder User's Guide*.

> **Tip:** If you are running Oracle Application Express with Oracle Database 11*g* Release 1 (11.1) or later, you must enable network services to use report printing. See "Enabling Network Services in Oracle Database 11*g* or Later" for your configuration scenario in *Oracle Application Express Installation Guide*.

Configuring Report Printing in a Full Development Environment To configure the printing of reports in a full development environment:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Report Printing.

5. For Printer Server, select one of the following:

   – **Oracle REST Data Services** - Select this option if you are using the Oracle REST Data Services release 2.0 or later. This option enables you to use the basic printing functionality, which includes creating report queries and printing report regions using the default templates provided in Application Express and using your own customized XSL-FO templates.

     Note: The Oracle REST Data Services option does not require an external print server, instead the report data and style sheet are downloaded to the listener, rendered into PDF format by the listener and then sent to the client. The PDF documents in this setup are not returned back into the database, thus the print APIs are not supported when using the Oracle REST Data Services-based configuration.

   – **External (Apache FOP)** - Select this option if you are using Apache FOP on an external J2EE server. This option enables you to use the basic printing functionality, which includes creating report queries and printing report regions using the default templates provided in Application Express and using your own customized XSL-FO templates.

   – **Oracle BI Publisher** - This option requires a valid license of Oracle BI Publisher (also known as Oracle XML Publisher). This option enables you to take report query results and convert them from XML to RTF format using Oracle BI Publisher. Select this option to upload your own customized RTF or XSL-FO templates for printing reports within Application Express.

     See Also: *PDF Printing in Application Express* to learn more about installing and configuring Oracle BI Publisher. Go to:

     http://www.oracle.com/technetwork/developer-tools/apex/application-express/configure-printing-093060.html

6. The following options apply to External (Apache FOP) and Oracle BI Publisher:

- Print Server Protocol - Select the protocol (HTTP or HTTPS) that the print server uses.

- Print Server Host Address - Specify the host address of the print server engine. By default, this is set to `localhost`. Enter the appropriate host address if the print server is installed at another location.

- Print Server Port - Define the port of the print server engine. The default setting is `8888`.

- Print Server Script - Defines the script that is the print server engine. The default setting is:

  ```
  /xmlpserver/convert
  ```

7. In Print Timeout, enter the number of seconds. This option defines the transfer timeout for communicating with the print server in seconds.

8. Click **Apply Changes**.

Configuring Report Printing Settings in a Runtime Environment To configure report printing settings in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

- On Windows:

  ```
  SYSTEM_DRIVE:\ sqlplus /nolog
  SQL> CONNECT SYS as SYSDBA
  Enter password: SYS_password
  ```

- On UNIX and Linux:

  ```
  $ sqlplus /nolog
  SQL> CONNECT SYS as SYSDBA
  Enter password: SYS_password
  ```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
```

3. Run the following statement:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
END;
```

For a description of available parameters, see Table 2–5.

Table 2–5   Report Printing Parameters in Runtime Environment

Parameter Name	Description
PRINT_BIB_LICENSED	Specify either standard support or advanced support. Advanced support requires an Oracle BI Publisher license. Valid values include: ■ STANDARD ■ ADVANCED ■ APEX_LISTENER
PRINT_SVR_HOST	Specifies the host address of the print server converting engine, for example, `localhost`. Enter the appropriate host address if the print server is installed at another location.

Table 2–5   (Cont.) Report Printing Parameters in Runtime Environment

Parameter Name	Description
PRINT_SVR_PORT	Defines the port of the print server engine, for example 8888. Value must be a positive integer.
PRINT_SVR_PROTOCOL	Valid values include: ■ http ■ https
PRINT_SVR_SCRIPT	Defines the script that is the print server engine, for example: /xmlpserver/convert

> **See Also:** "SET_PARAMETER Procedure" in *Oracle Application Express API Reference*

Determining Report Printing Settings in a Runtime Environment To determine report printing settings in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

   ■ On Windows:

   ```
   SYSTEM_DRIVE:\ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

   ■ On UNIX and Linux:

   ```
   $ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
   ```

3. Run the following statement:

   ```
   SELECT
   APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
   FROM DUAL;
   ```

   For a description of available parameters, see Table 2–5 on page 2-49.

   > **See Also:** "GET_PARAMETER Function" in *Oracle Application Express API Reference*

Configuring the Help Menu

Instance administrators can configure the target location of the Help menu that displays in the upper right corner of the Oracle Application Express development environment. By default, the Help menu points to the current Oracle Application Express online documentation library.

To configure the Help menu:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Help.

5. In Help URL, edit the URL.

   The URL defined here displays when users click the Help link from within Oracle Application Express.

6. Click **Apply Changes**.

> **See Also:** "About the Oracle Application Express Documentation" in *Oracle Application Express Application Builder User's Guide*

Configuring Workspace Size Options for Requests

Instance administrators can configure the workspace sizes available when users request:

- A new workspace and schema

- Additional space for an existing workspace

To configure workspace size options:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to New Workspace Request Size and Workspace Change Request Size. Specify the following:

   - Size in Megabytes - Edit the default numbers to change the size options.

   - Display - Select **Yes** for all the size options you want to appear in the select list for workspace size.

   - Default - Select the default value to appear in the storage field for workspace and change requests.

5. Click **Apply Changes**.

> **See Also:** "Enabling Auto Extend Tablespaces" on page 2-40

Managing Application ID Range

Instance administrators can control the range for IDs of new database or Websheet applications. If you separate ID ranges in large multi-instance installations, you can easily move workspaces between the instances and keep their application IDs. To enable ID ranges, you must specify at least an ID Minimum.

To configure the application ID ranges:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Scroll down to Application ID Range and specify the following:

- ■ ID Minimum - Enter the lower range for database and Websheet application IDs.

- ■ ID Maximum - Enter the maximum range for database and Websheet application IDs.

5. Click **Apply Changes**.

Purging Inactive Workspaces

This section describes how an Instance administrator purges inactive workspaces.

- ■ Why Purge Inactive Workspaces?

- ■ Configuring Workspace Purge Settings

> **See Also:** "Monitoring Activity Across a Development Instance" on page 2-99 to view reports concerning purging workspaces

Why Purge Inactive Workspaces?

Inactive workspaces consume valuable storage space and degrade system performance. By enabling Workspace Purge Settings, you can configure Oracle Application Express to purge inactive workspaces.

If a workspace is designated as inactive, a notification email is sent to each workspace administrator explaining that the workspace will be purged in a specific number of days. The workspace administrator can prevent the workspace from being purged by following an embedded link and following the online instructions.

> **See Also:** "Configuring Email" on page 2-42 and "Sending Email from an Application" in *Oracle Application Express Application Builder User's Guide*

Configuring Workspace Purge Settings

To configure workspace purge settings:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Workspace Purge Settings**.

4. On the Workspace Purge Settings, configure the following:

   a. Enabled - Select **Yes** to enable the workspace purge process. Select **No** to disable the workspace purge process.

   b. Language - Select the language of the text of emails sent to workspace administrators of inactive workspaces. Note that only one language can be selected for each instance.

   c. Purge Administration Email Address - Enter the email address (or From address) from which emails are sent to workspace administrators.

   d. Send Summary Email To - Enter a list of email addresses separated by commas. Recipients will receive a daily email summary of the purge process.

   e. Days Until Purge - Enter the number of days before a workspace is physically purged. For example, entering 10 means a workspace will be purged 10 days after it is added to the inactive list.

     f. Reminder Days in Advance - Enter the number of days before the purge date to send a reminder email to workspace administrators. Reminder email criteria includes:

       – The workspace is on the inactive list.

       – There has been no activity in the workspace.

       – The workspace administrator has not chosen to follow the link in the email to prevent the workspace from being purged.

     g. Days Inactive - Enter the number of days of inactivity before a workspace is classified as inactive. Inactivity includes not logging into the workspace and the no runtime activity of any application in the workspace.

     h. Grace Period (Days) - Enter the number of days for the grace period. The grace period starts after workspace administrators click the link in the email to not have their workspace purged. If there is no activity during the grace period, the workspace is added back to the list of inactive workspaces.

     i. Maximum Execution Time (Hours) - Enter the number limiting the number of hours that the purge process may execute per run of the workspace purge job.

     j. Maximum Number of Workspaces - Enter the maximum number of workspaces to be purged per run of the workspace purge job.

     k. Maximum Number of Emails - Enter the maximum number of reminder emails and workspace inactive emails to be send per run of the workspace purge job.

   5. Click **Apply Changes**.

Managing Shared Components

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how Instance administrators manage custom applications uploaded to the Packaged Applications repository, monitor packaged application installations, and manage public themes.

- Managing Custom Applications

- Monitoring the Progress Packaged Application Installations

- Managing Public Themes

> **See Also:** "About Specifying How Workspaces Are Created" on page 2-74

Managing Custom Applications

This section describes how Instance administrators upload, edit, and delete custom applications.

- About Making Custom Applications Available to Users

- Accessing the Packaged Applications Repository

- Uploading a Custom Application to the Packaged Applications Repository

- Editing Custom Application Details

- [Deleting a Custom Application](#)

About Making Custom Applications Available to Users

Developers can develop their own custom packaged applications. Like Oracle-supplied packaged applications, custom applications typically include both application pages and the supporting database objects. To create a custom applications, you first export it. Then, an instance administrator adds the application export to Packaged Applications repository. Once a custom application has been added to the Packaged Applications repository, developers can view, install, run, upgrade and deinstall it in Apps Gallery.

> **Tip:** Although the Packaged Application repository displays all applications installed in the current workspace, instance administrators can only edit custom applications.

> **See Also:** "Utilizing Packaged Applications" and "Exporting an Application" in *Oracle Application Express Application Builder User's Guide*

Accessing the Packaged Applications Repository

The Packaged Application repository displays all applications installed in the current workspace. However, instance administrators can only upload, edit, and delete custom applications.

To view the Packaged Application repository:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Packaged Applications**.

   The Packaged Database Applications page displays as an interactive report. You can customize the appearance of the page using the Search bar at the top of the page.

   > **Tip:** Although the Packaged Application repository displays all applications installed in the current workspace, instance administrators can only edit custom applications.

Uploading a Custom Application to the Packaged Applications Repository

To upload a custom application:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Packaged Applications**.

4. Click **Create**.

5. For Specify File:

   a. Import file - Navigate to the file.

   b. File Type - Select **the type of export file to be imported**.

   c. File Character Set - Verify that File Character Set is correct.

    d. Click **Next**.

6. For Application Details:

    a. Application ID - Specify a unique integer value that identifies the packaged application. The default is the value of Export File Application. Application IDs in the range of 3000 to 9000 are reserved for internal use by Oracle Application Express.

    b. Category - Select the primary category to associate with the application.

    To learn more about this attribute, see field-level Help.

    c. Description - Enter a brief description of the application.

    d. Click **Next**.

7. Click **Create**.

    To learn more about an attribute, see field-level Help.

Editing Custom Application Details

Instance administrators can track a variety of information about a custom application including the application description, status, associated categories, application statistics, and version.

> **Tip:** Although the Packaged Application repository displays all applications installed in the current workspace, instance administrators can only edit and delete custom applications.

To edit the application details:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Packaged Applications**.

4. To edit application details, click the **Edit** icon adjacent to the application name.

The Application Detail page appears.

5. Edit the appropriate attributes.

> **Tip:** Use the Status attribute to control if an application displays on the Packaged Application page. To learn more, see field-level Help.

Deleting a Custom Application

To delete a custom application:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Packaged Applications**.

4. Locate the application and click the **Edit** icon adjacent to the application name.

The Application Detail page appears.

5. Click **Delete** and follow the on-screen instructions.

Monitoring the Progress Packaged Application Installations

Instance administrators have the ability to view the progress of a packaged application installation.

To monitor packaged application installation progress:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Monitor Packaged Application Installations**.

   The Packaged Applications Installations page appears. You can customize the page using the Search bar at the top of the page.

   The report displays total elapsed time to install each packaged application. Click the number in the Events column to view the log in detail.

   > **Note:** The Packaged Application log is kept for up to 60 days. Any log older than 60 days is deleted.

Managing Public Themes

Instance administrators manage the theme repository for an entire Oracle Application Express instance. Only an Instance administrators can add or delete a theme from the repository.

- What Is a Public Theme?
- Adding a Public Theme to the Theme Repository
- Deleting a Public Theme
- Modifying a Public Theme
- About Exporting a Public Theme

What Is a Public Theme?

When you create a public theme, you add it to the theme repository. Public themes are available when you create an application or when you create a theme for an existing application.

> **See Also:** "Managing Workspace Themes" in *Oracle Application Express Application Builder User's Guide*

Adding a Public Theme to the Theme Repository

To add a theme to the Theme repository:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Public Themes**.

   The Public Themes page appears.

4. Select **Create Public Theme**.

5. For Workspace, select a workspace and click **Next**.

6. For Application, select an application and click **Next**.

7. For Theme, select a theme and click **Next**.

8. For Name, specify the following:

    a. Theme Number - Enter a number that uniquely identifies a theme within a workspace.

    b. Theme Name - Enter a name for the workspace theme.

    c. Description - Enter a description.

    d. Click **Next**.

9. Click **Create Public Theme**.

Deleting a Public Theme

To delete a public theme:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Shared Components, click **Public Themes**.

    The Public Themes page appears.

4. Select the theme to be deleted.

5. Click **Delete**.

6. Click **OK** to confirm your selection.

Modifying a Public Theme

You cannot edit a public theme directly. To modify a public theme, you must create a new application using the theme, modify it, and then manually add it to the theme repository.

To modify a public theme:

1. Create an application using the theme you want to modify. See "Creating a Database Application" in *Oracle Application Express Application Builder User's Guide*.

2. Modify the theme. See "Editing a Theme" in *Oracle Application Express Application Builder User's Guide*.

3. Delete the existing public theme.

4. Add the modified theme to the theme repository. See "Adding a Public Theme to the Theme Repository" on page 2-56.

About Exporting a Public Theme

You export a theme in the same way you export any related application files. Exporting a public theme involves the following steps:

1. Create an application using the theme you want to modify. See "Creating a Database Application" in *Oracle Application Express Application Builder User's Guide*.

2. Export the application. See "Exporting an Application" in *Oracle Application Express Application Builder User's Guide*.

3. Import the exported file into the target Oracle Application Express instance. See "Importing an Application, Page or Component Export" in *Oracle Application Express Application Builder User's Guide*.

4. Install the exported file from the Export Repository. See "Installing Export Files" in *Oracle Application Express Application Builder User's Guide*.

Managing Meta Data

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

Instance administrators use the links under Manage Meta Data to view and manage session state, the mail queue, installed translations, and interactive report descriptions.

- Managing Session State for an Instance
- Managing the Mail Queue
- Viewing Installed Translations
- Deleting Interactive Report Subscriptions

Managing Session State for an Instance

This section describes how to view session state statistics and purge the session state on the Session State page.

- About Session State
- Viewing Session Details Before Purging
- Purging Sessions by Age
- Viewing Session Statistics Before Purging

> **See Also:** "Managing Session State for a Workspace" on page 1-31 and "Managing Session State" in *Oracle Application Express Application Builder User's Guide*

About Session State

A session is a logical construct used to establish persistence (or stateful behavior) across page views. Each session is assigned a unique ID, which the Application Express engine uses to store and retrieve an application's working set of data (or session state) before and after each page view. An automatic process clears sessions older than 24 hours every eight hours. Instance administrators can also purge them manually.

> **See Also:** "What Is a Session?" in *Oracle Application Express Application Builder User's Guide*

Viewing Session Details Before Purging

Before purging sessions, Instance administrators can view a listing of recent sessions and then drill down on session details on the Recent Sessions page.

To view a listing of recent sessions:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Session State**.

   The Session State page appears.

4. Click **Recent Sessions**.

5. On the Recent Sessions page, you can:

   - Click a session number to view additional details.

   - Click **Purge Sessions** to delete the displayed sessions.

Purging Sessions by Age

Using the Purge Session page, Instance administrators can purge sessions by age.
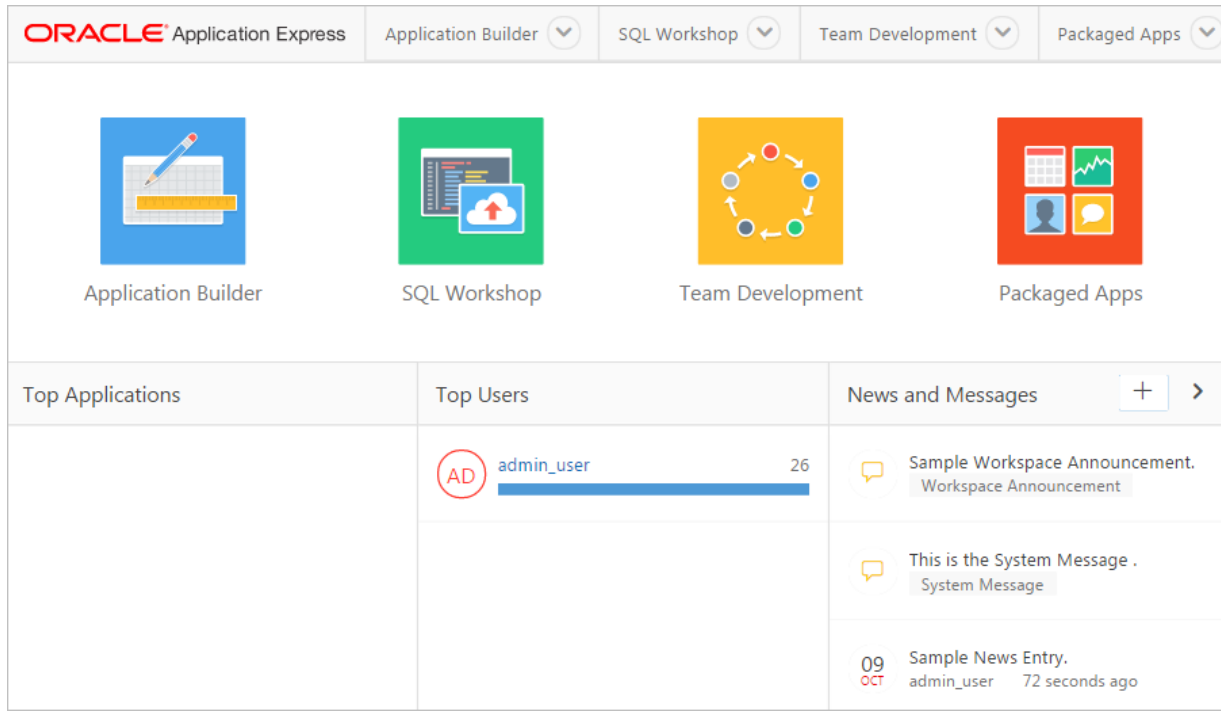
To purge sessions by age:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Session State**.

   The Session State page appears.

4. Click **Purge Sessions**.

   The Purge Sessions page appears.

5. For Maximum Sessions to Purge, identify the maximum number of sessions to delete.

6. For Only Purge Session Older Than, specify the age of sessions to be deleted.

7. To purge the selected sessions, click **Purge Sessions**.

Viewing Session Statistics Before Purging

On the Session State Statistics page, Instance administrators can view statistics about current sessions before purging.

To view session state statistics:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Session State**.

   The Session State page appears.

4. Select **Session State Statistics**.

5. To delete current sessions, click **Purge Sessions**.

Managing the Mail Queue

This section describes how Instance administrators can manage email sent from applications by monitoring email messages in the mail queue.

> **Tip:** To view the Mail Log, see "Monitoring Activity Across a Development Instance" on page 2-99

Sending and Deleting Messages in the Mail Queue

To send and delete messages in the mail queue:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Mail Queue**.

   The Mail Queue page appears.

   If there is an issue sending an email (for example, because of a bad email address or unavailable mail server) then the mail message remains in the queue along with the last encountered error. For every subsequent attempt to send the email, the gap in time increases between send attempts (for example, 1 minute, 2 minutes, 4 minutes, 8 minutes, 16 minutes, and so on).

4. Use the following buttons to manage messages in the mail queue:

   - **Send All Mail** - Pushes the messages in the queue. The calculated delay for messages which encounter an error is observed.

   - **Force Send All Mail** - The calculated delay for messages which encounter an error is ignored and an attempt is made to push all messages in the queue.

   - **Delete** - Deletes selected messages.

   - **Reset** - Resets the page pagination.

     > **See Also:** "Configuring Email" on page 2-42 and "Sending Email from an Application" in *Oracle Application Express Application Builder User's Guide*

Viewing Installed Translations

Instance administrators can view a page showing which translated languages have been installed within the current development instance.

To view the list of installed translations:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Installed Translations**.

   The Installed Translations page appears. This page displays a list of languages and indicates if the translations have been loaded.

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

Deleting Interactive Report Subscriptions

Instance administrators can manage the interactive report subscriptions within the current development instance.

To delete an interactive report subscription:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Meta Data, click **Interactive Report Subscriptions**.

   The Interactive Report Subscriptions page displays as an interactive report. You can customize the appearance of the page using the Search bar at the top of the page.

4. Find the subscription you want to remove and select the check box to the left.

5. Click **Delete Checked**.

> **See Also:** "Subscribing to Interactive Reports" in *Oracle Application Express Application Builder User's Guide* and "REMOVE_SUBSCRIPTION Procedure" in *Oracle Application Express API Reference*

Installing Exported Applications in a Runtime Environment

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how to install exported applications into a runtime environment.

- About the Advantages of Using Runtime Environment
- Installing an Exported Application in to a Runtime Environment

About the Advantages of Using Runtime Environment

An Oracle Application Express runtime environment enables you to run production applications, but it does not provide a web interface for administration. A runtime environment only includes the packages necessary to run your application, making it a more hardened environment.

You administer the Oracle Application Express runtime environment using SQL*Plus and the APEX_INSTANCE_ADMIN API.

> **See Also:** "APEX_INSTANCE_ADMIN" in *Oracle Application Express API Reference*.

> **Tip:** Websheets are not supported in an Oracle Application Express runtime environment.

Installing an Exported Application in to a Runtime Environment

To install an exported application into a runtime installation, you must:

1. Export the workspace from the Application Express instance where the application was developed as described in "Exporting and Importing a Workspace" on page 2-93.

2. Use SQL*Plus to import your workspace in to the runtime environment:

   - Connect as APEX_050000, SYS, SYSTEM, or any schema to which the role APEX_ADMINISTRATOR_ROLE has been granted.

> **Tip:** The `APEX_ADMINISTRATOR_ROLE` must be granted directly to a user and not through another database role.

- Run the workspace import file.

    If the workspace export file was created with a version of Oracle Application Express lower than 3.2, you must connect as `APEX_050000`.

3. Export and then import your application using SQL*Plus in to the runtime environment. See "Exporting an Application and Related Files" in *Oracle Application Express Application Builder User's Guide*.

> **See Also:** "Creating a Workspace Manually in a Runtime Environment" on page 2-77, "Managing Workspace to Schema Assignments" on page 2-84, "Removing a Schema Mapping from a Workspace in a Runtime Environment" on page 2-87, and "Deleting Workspaces in a Runtime Development Environment" on page 2-83

Managing Messages

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

Instance administrators can communicate with all users in an Oracle Application Express instance by creating login and system messages. Administrators can use login and system messages to communicate with all system users, for example regarding privacy notices or access restrictions.

- Defining a Login Message
- Defining a System Message
- Creating a Site-Specific Tasks List

> **See Also:** "Defining a Workspace Announcement" on page 1-19 and "Defining a Workspace Message in Administration Services" on page 2-88
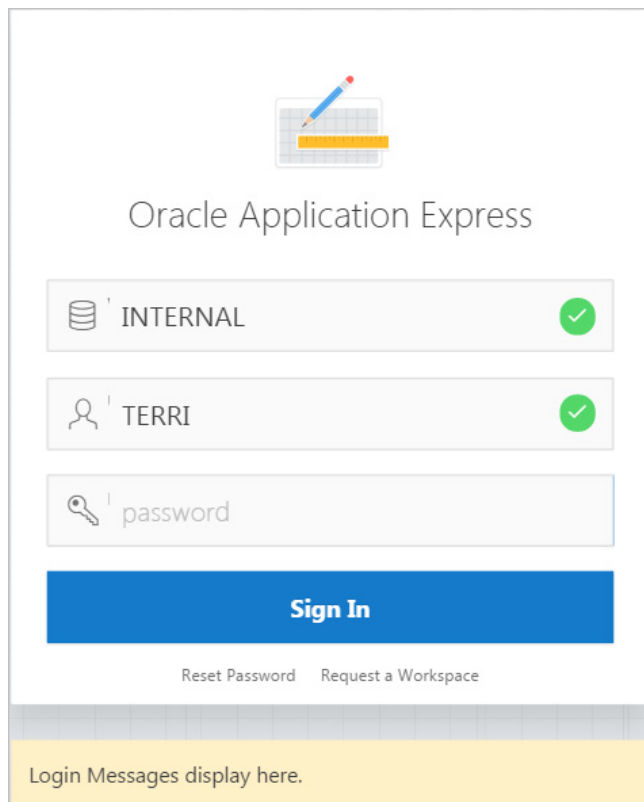
Defining a Login Message

This section describes how an Instance administrator can create messages that display on the Oracle Application Express Sign In page.

- About Login Messages
- Creating a Login Message
- Editing or Removing a Login Message

About Login Messages

Login messages display directly below the Oracle Application Express Sign In page as shown in the following illustration.

Creating a Login Message

To create a login message:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Define Login Message**.

4. In Message, enter a message. The message can contain any text and can optionally include HTML formatting.

5. Click **Apply Changes**.

Editing or Removing a Login Message

To edit or remove a login message:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Define Login Message**.

4. In Message, edit or remove the text.

5. Click **Apply Changes**.

Defining a System Message

This section describes how an Instance administrator can create a system message that displays on the Workspace home page.

- [About System Messages](#)
- [Creating and Editing a System Message](#)

About System Messages

System messages include a gold icon to the left of message text and the textual identifier, either `System Message,` displays beneath the message text.

Creating and Editing a System Message

To create a system message:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Define System Message**.

4. In Message, enter a message. The message can contain any text and can optionally include HTML formatting.

5. Click **Apply Changes**.

Creating a Site-Specific Tasks List

This section describes how an Instance administrator can create a Site-Specific Tasks list of links on the Workspace home page or Workspace login page. Use the Site-Specific Tasks list include to links to important user information such as training, discussion forums, and user feedback applications.

> **Tip:** The Site-Specific Tasks region only displays if links are defined.

- [Adding a New Task](#)

- Editing an Existing Task

- Deleting a Task

Adding a New Task

To add a new task to a Site-Specific Tasks list:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Manage Site-Specific Tasks**.

    The Site-Specific Tasks page appears.

4. To create a new link, click **Create**.

5. On the Create/Edit Site-Specific Tasks page, you can specify the following:

    a. **Display Sequence** - Indicate the relative order of this task within the list.

    b. **Display Location** - Indicate the page on which the task should display (that is, the Workspace Login page or Workspace home page).

    c. **Task Name** - Enter a name for this task.

    d. **Tasks Link** - Enter the link target for this task using either a relative URL (for example, using `f?p` syntax) or an absolute URL (such as `http://www.oracle.com/technetwork/index.html`).

    e. **Displayed** - Select **Yes** to display the task link. Select No to disable the display.

6. Click **Create**.

> **See Also:**   "Using f?p Syntax to Link Pages" in *Oracle Application Express Application Builder User's Guide*

Editing an Existing Task

To edit an existing task:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Site-Specific Tasks**.

    The Site-Specific Tasks page appears.

4. Select the task name.

5. On the Create/Edit Site-Specific Tasks page, edit the appropriate attributes.

6. Click **Apply Changes**.

Deleting a Task

To delete an existing task:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Messages, click **Site-Specific Tasks**.

The Site-Specific Tasks page appears.

4. Select the task name.

5. Click **Delete**.

Managing Logs and Files

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how delete log entries and configure log intervals.

- Deleting SQL Workshop Logs
- Deleting Page View Activity Log Entries
- Deleting Developer Activity Log Entries
- Deleting Click Counting Log Entries
- Deleting the Login Access Log
- Managing Log Intervals
- Archiving the Activity Log

Deleting SQL Workshop Logs

The SQL Workshop maintains a history of SQL statements run in the SQL Commands.

To delete SQL Workshop log entries:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **SQL Workshop Logs**.

4. On the SQL Workshop Logs page, click one of the following:

   - **Script File executions log entries**
   - **SQL Command Processor history entries**

5. On the Clean up Logs page:

   - To delete entries by age, specify the age of the entries to be deleted and click **Delete Entries**.

   - To delete all entries, click **Truncate Log**.

     > **See Also:** "Accessing a Command from Command History" in *Oracle Application Express SQL Workshop Guide*

Deleting Page View Activity Log Entries

Page view activity logs track user activity for an application. This section explains how to delete page activity logs.

- About Page View Activity Logs
- Truncating Page View Activity Logs Manually

About Page View Activity Logs

The Application Express engine uses two logs to track user activity. At any given time, one log is designated as current. For each rendered page view, the Application Express engine inserts one row into the log file. A log switch occurs at the interval listed on the Page View Activity Logs page. At that point, the Application Express engine removes all entries in the noncurrent log and designates it as current.

Developers enable logging within their application using the Logging attribute on the Edit Application Definition page.

> **See Also:** "Editing the Application Definition" in *Oracle Application Express Application Builder User's Guide*

Truncating Page View Activity Logs Manually

To truncate the activity logs manually:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **Page View Activity Logs**.

   The Page View Activity Logs page appears.

4. Click **Truncate Logs**.

5. Click either **Truncate Log 1** or **Truncate Log 2**.

   > **See Also:** "Viewing Workspace Dashboards" on page 1-39

Deleting Developer Activity Log Entries

The Developer Activity log tracks changes to applications within an individual workspace. Log entries older than one month are automatically deleted.

To delete Developer Activity Log entries manually:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **Developer Activity Logs**.

   The Developer Activity Log page appears.

4. On the Developer Activity Log page, click **Manage**.

5. Specify the age of the entries to be deleted and click **Delete Entries**.

   > **See Also:** "Developer Activity Dashboard" on page 1-41 for information about the Developer Activity Log

Deleting Click Counting Log Entries

The External Clicks Counting log counts clicks from an Oracle Application Express application to an external site. You can implement this functionality using the `APEX_UTIL.COUNT_CLICK` procedure.

To delete External Clicks Counting log entries:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **External Click Counting Log**.

   The External Click Counting Log page appears.

4. Specify the age of the entries to be deleted and click **Delete Entries**.

   > **See Also:** "COUNT_CLICK Procedure" in *Oracle Application Express API Reference*

Deleting the Login Access Log

The Login Access log records authentication events by developers and administrators accessing the Oracle Application Express environment and by end users of Oracle Application Express applications that use the built-in login APIs available to developers. Log entries are aged out of the log tables and purged periodically.

To truncate the Login Access log:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **Login Access Log**.

   The Login Access Log page appears.

4. Specify the age of the entries to be deleted and click **Delete Entries**.

Managing Log Intervals

Use the Manage Log Interval page to set the minimum number of days to retain log information for log files.

To manage the log interval:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **Manage Log Interval**.

   The Manage Log Interval page appears.

4. For each log type, enter the duration of the interval in days.

   The maximum value that can be specified is 180 days, with a default value of 14 days. Keeping log information for longer periods can degrade runtime performance.

5. Click **Apply Changes**.

   > **See Also:** SET_LOG_SWITCH_INTERVAL Procedure in *Oracle Application Express API Reference*

Archiving the Activity Log

Archiving the Activity log takes the Oracle Application Express Activity log, summarizes it, and writes the results to an archived activity log.

To archive the Oracle Application Express Activity log:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Manage Logs and Files, click **Archive Activity Log**.

   The Archive Activity Log page appears listing the last archive date, archive day count, and workspace count.

4. Click **Archive Activity Summary**.

Including an Agreement or Survey When Running the Signup Wizard

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

Instance administrators have the option to create and include an agreement or survey when users run the New Signup Wizard.

- Defining an Agreement
- Defining a Signup Survey
- Running a New Service Signup Wizard

Defining an Agreement

When users run the New Service Signup Wizard, Instance administrators can require they accept an agreement before the wizards submits the service request.

To include and define an agreement:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Self Service Sign Up, click **Manage New Service Signup Wizard**.

4. Under Justification and Agreement:

   a. For Require Justification, select **Yes** or **No**.

   b. For Enable Agreement, select whether to include an agreement. Options include:

      – **Yes** - Includes the agreement you define when users run the New Signup Service Wizard.

      – **No** - Excludes the agreement you define when users run the New Signup Service Wizard.

   c. In Agreement Text, enter the text of the agreement

5. Click **Apply Changes**.

Defining a Signup Survey

Instance administrators can also include survey questions users must complete when running the New Service Signup Wizard.

To include and define a survey:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Self Service Sign Up, click **Manage New Service Signup Wizard**.

4. Under Survey Questions,

   a. For Enable Survey, select whether to include a survey. Options include:

      – **Yes** - Includes the survey questions you define when users run the New Signup Service Wizard.

      – **No** - Excludes the survey questions you define when users run the New Signup Service Wizard.

   b. Under Questions, enter questions and answers.

      Enter all answers for each question in one field, delimited by a new line. Use the Pre Text and Post Text fields to include introductory and closing text.

5. Click **Apply Changes**.

> **See Also:** "Viewing the Signup Survey Report" on page 2-100

Running a New Service Signup Wizard

To run a new Service Signup Wizard:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Self Service Sign Up, click **Run New Service Signup Wizard**.

4. Follow the on-screen instructions.

Managing Schemas

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how to manage the schemas within an Oracle Application Express instance.

- What Is the Oracle Application Express Engine Schema?

- Determining the Oracle Application Express Engine Schema

- Understanding Oracle Default Schema Restrictions

  > **See Also:** "Viewing the Parsing Schemas Report" on page 2-95 and "Managing Workspace to Schema Assignments" on page 2-84

What Is the Oracle Application Express Engine Schema?

A schema is a logical container for the database objects. Instance administrators may need to perform certain actions within the Application Express engine schema. For example, in order for an Instance administrator to have the ability to assign Oracle

default schemas, the database administrator (DBA) must explicitly grant the privilege by running the `APEX_SITE_ADMIN.UNRESTRICT_SCHEMA` procedure within the Application Express engine.

> **See Also:** "Understanding Oracle Default Schema Restrictions" on page 2-71 for information about the `APEX_SITE_ADMIN.UNRESTRICT_SCHEMA` procedure

Determining the Oracle Application Express Engine Schema

> **See Also:** "Understanding Oracle Default Schema Restrictions" on page 2-71 for information about the `APEX_SITE_ADMIN.UNRESTRICT_SCHEMA` procedure

To determine the current Application Express engine schema for your Oracle Application Express instance:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Run the following query in a schema with DBA privileges (for example, `SYSTEM`).

   ```
   SELECT DISTINCT TABLE_OWNER FROM all_synonyms
   WHERE SYNONYM_NAME = 'WWV_FLOW' and OWNER = 'PUBLIC'
   ```

Understanding Oracle Default Schema Restrictions

This section explains how to grant and revoke privileges.

- About Assigning Oracle Default Schemas to Workspaces
- Granting the Privilege to Assign Oracle Default Schemas
- Revoking the Privilege to Assign Oracle Default Schemas
- Working with Restricted Schemas
- Determining the Privilege Status

About Assigning Oracle Default Schemas to Workspaces

When Oracle Application Express installs, the Instance administrator does not have the ability to assign Oracle default schemas to workspaces. Default schemas such as `SYS`, `SYSTEM`, and `RMAN` are reserved by Oracle for various product features and for internal use. Access to a default schema can be a very powerful privilege. For example, a workspace with access to the default schema `SYSTEM` can run applications that parse as the `SYSTEM` user.

In order for an Instance administrator to have the ability to assign most Oracle default schemas to workspaces, the database administrator (DBA) must explicitly grant the privilege using SQL*Plus to run a procedure within the APEX_INSTANCE_ADMIN package. Note, however, that beginning with Oracle Application Express release 3.1, the SYS and SYSTEM schemas may no longer be used by workspaces as parsing schemas.

> **Note:** All schema and workspace names used as arguments to procedures in the APEX_INSTANCE_ADMIN package are used exactly as they are provided by the caller.
>
> For example, if you pass an argument value such as p_schema =>'system', the lower-case schema name 'system' is recorded and referenced. This example could return unexpected results if you really meant to reference the common schema name SYSTEM, which would be referenced using upper case.

Granting the Privilege to Assign Oracle Default Schemas

The DBA can grant an Instance administrator the ability to assign Oracle schemas to workspaces by using SQL*Plus to run the APEX_INSTANCE_ADMIN.UNRESTRICT_SCHEMA procedure from within the Application Express engine schema. For example:

```
EXEC APEX_INSTANCE_ADMIN.UNRESTRICT_SCHEMA(p_schema => 'RMAN');
COMMIT;
```

This example would enable the Instance administrator to assign the RMAN schema to any workspace.

> **See Also:** "Determining the Oracle Application Express Engine Schema" on page 2-71

Revoking the Privilege to Assign Oracle Default Schemas

The DBA can revoke this privilege using SQL*Plus to run the APEX_INSTANCE_ADMIN.RESTRICT_SCHEMA procedure from within the Application Express engine schema. For example:

```
EXEC APEX_050000.APEX_INSTANCE_ADMIN.RESTRICT_SCHEMA(p_schema => 'RMAN');
COMMIT;
```

This example would prevent the Instance administrator from assigning the RMAN schema to any workspace. It does not, however, prevent workspaces that have already had the RMAN schema assigned to them from using the RMAN schema.

> **See Also:** "Determining the Oracle Application Express Engine Schema" on page 2-71

Working with Restricted Schemas

This section describes how to work with restricted schemas.

- Designating Specific Workspaces as Exceptions

- Removing Workspace Exceptions for a Schema

- Removing Schema Exceptions for a Workspace

Designating Specific Workspaces as Exceptions If a schema has been designated as restricted using the CREATE_SCHEMA_EXCEPTION procedure, the DBA can designate

specific workspaces as exceptions by running the APEX_INSTANCE_ADMIN.CREATE_ SCHEMA_EXCEPTION procedure. For example:

```
EXEC APEX_050000.APEX_INSTANCE_ADMIN.CREATE_SCHEMA_EXCEPTION(p_schema => 'RMAN',
p_workspace=> 'DBA_WORKSPACE');
EXEC APEX_050000.APEX_INSTANCE_ADMIN.CREATE_SCHEMA_EXCEPTION(p_schema => 'RMAN',
p_workspace  => 'AUDITOR_WORKSPACE');
COMMIT;
```

This example would prevent the Instance administrator from assigning the RMAN schema to the workspace named AUDITOR_WORKSPACE. However this restriction only applies to workspace provisioning requests processed after the REMOVE_SCHEMA_ EXCEPTION procedure has been run. If the AUDITOR_WORKSPACE has the RMAN schema assigned to it, this method would not prevent that workspace from continuing to use the schema.

Removing Workspace Exceptions for a Schema The DBA can remove all workspace exceptions for a schema by using SQL*Plus to run the APEX_INSTANCE_ADMIN.REMOVE_ SCHEMA_EXCEPTIONS procedure from within the Application Express engine schema. For example:

```
EXEC APEX_050000.APEX_INSTANCE_ADMIN.REMOVE_SCHEMA_EXCEPTIONS(p_schema => 'RMAN');
COMMIT;
```

This example would prevent the Instance administrator from assigning the RMAN schema to any workspaces if the RMAN schema were already restricted, but had one or more exceptions previously created for it.

Removing Schema Exceptions for a Workspace The DBA can remove all schema exceptions for a workspace by using SQL*Plus to run the APEX_INSTANCE_ADMIN.REMOVE_ WORKSPACE_EXCEPTIONS procedure from within the Application Express engine schema. For example:

```
EXEC APEX_050000.APEX_INSTANCE_ADMIN.REMOVE_WORKSPACE_EXCEPTIONS(p_workspace =>
'AUDITOR_WORKSPACE');
COMMIT;
```

This example would prevent the Instance administrator from assigning any restricted schemas to the workspace named AUDITOR_WORKSPACE if that workspace had exceptions previously created for it for any restricted schemas.

Determining the Privilege Status

The DBA can determine the current status of the privileges by using SQL*Plus to run the script report_instance_configuration.sql in the utilities directory. For example:

To run the script report_instance_configuration.sql in the utilities directory:

1. Change to the utilities directory.

   ```
   $ cd utilities
   ```

2. Connect in SQL*Plus and connect to the database where Oracle Application Express is installed as SYS, for example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Run the following statement:

```
SQL> @report_instance_configuration.sql
```

The resulting report displays general information about the Application Express instance, including restricted schemas and schema exceptions.

Creating Workspaces

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

In order for a user to sign in to Oracle Application Express, they sign in to Oracle Application Express, they sign in to a shared work area called a **workspace**. An administrator can create workspaces manually or take advantage of a more automated approach in which users click a link a a login page. This section describes how an Instance administrator can create workspaces.

- About Workspaces
- About Specifying How Workspaces Are Created
- Selecting a Provisioning Mode
- How Oracle-Managed Files Effects Workspace Provisioning
- Creating a Workspace Manually
- Creating Multiple Workspaces

> **See Also:** "Managing Existing Workspaces" on page 2-79

About Workspaces

When users sign in to Oracle Application Express, they sign in to a shared work area called a **workspace**. A workspace enables multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique numeric ID and name.

To make changes to a workspace, the Workspace administrators must submit a service or change requests to an Instance administrator. Only the Instance administrator can approve change requests or provision new workspaces.

> **See Also:** "Making a Service Request" on page 1-13 and "Managing Workspace and Change Requests" on page 2-8

About Specifying How Workspaces Are Created

The Instance administrator determines how the process of provisioning (or creating) a workspace works for a specific Oracle Application Express instance. To determine how provisioning works, an Instance Administrator selects one of the following options on the Instance Settings page:

- **Manual** - In this mode, an Instance administrator creates new workspaces and notifies the Workspace administrator of the login information.

- **Request** - Users request workspaces directly in a self-service fashion. Users click a link on the login page to access a request form. After the workspace request has been granted, users are automatically emailed the appropriate login information.

- **Request with Email Verification** - In this mode, users request workspaces directly by clicking a link on the login page to access a request form. Each user receives an initial email containing a verification link. When the user clicks the verification link, the request is processed. The user can then access the workspace using the Sign In page.

> **Note:** To enable users to request a workspace using a link on the Login page, you must choose the provisioning status of **Request** or **Request with Email Verification** as described in the previous section. If the provisioning status is set to **Manual**, no link appears on the login page.

> **See Also:** "Selecting a Provisioning Mode" on page 2-75, "Disabling Email Provisioning" on page 2-39, "Configuring Email" on page 2-42, and "Managing Workspace and Change Requests" on page 2-8

Selecting a Provisioning Mode

To select a provisioning mode:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Instance**.

3. Under Instance Settings, click **Instance Settings**.

4. Under Self Service, select a provisioning status:

   - **Manual** - An Instance administrator manually creates new workspaces and notifies the Workspace administrator of the login information.

   - **Request** - Users request workspaces directly in a self-service fashion. Selecting this option displays a link on the Login page enabling users to request a workspace. When a user requests a workspace, each request is submitted to a queue for approval. When the request is approved, the user is sent an email containing login credentials (the workspace name, username, and password).

   - **Request with Email Verification** - In this mode, users request workspaces directly by clicking a link on the Sign In page to access a request form. Each user receives an initial email containing a verification link. When the user clicks the verification link, the request is processed. The user can then access the workspace using the Sign In page.

   > **Tip:** If you select **Request with Email Verification**, you can disable workspace provisioning and send users a message. See "Disabling Email Provisioning" on page 2-39.

5. If you select **Request** or **Request with Email Verification**:

- Development Service URL - Enter a URL for the service (optional). This value is used in the email when the request is approved. If this setting is not present, the URL is derived from your environment.

- Require Verification Code - Determines if a verification code displays and is required during the request process. Select **Yes** or **No**.

6. Click **Apply Changes**.

Note: To enable users to request a workspace using a link on the Login page, you must choose the provisioning status of **Request** or **Email Verification** as described in the previous procedure. If the provisioning status is set to **Manual**, no link appears on the login page.

See Also: "Disabling Email Provisioning" on page 2-39, "Configuring Email" on page 2-42, and "Managing Workspace and Change Requests" on page 2-8

How Oracle-Managed Files Effects Workspace Provisioning

When an Instance administrator creates a new workspace with a new schema, a new tablespace and data file are created for that schema. If Oracle-Managed Files is enabled, it manages the data file for the new tablespace.

Using Oracle-managed files simplifies the administration of the Oracle database and eliminates the need for the database administrator (DBA) to directly manage the operating system files that comprise the database. Using Oracle-managed files, the DBA specifies operations in terms of database objects rather than file names. The data file for the new tablespaces are named according to the Oracle-managed files conventions. The placement of these files is determined by the database initialization parameter DB_CREATE_FILE_DEST.

If the Oracle-Managed Files is not enabled, the data file is created in the same directory as the first data file of the tablespace in which Oracle Application Express is installed.

See Also: "Using Oracle Managed Files" in *Oracle Database Administrator's Guide*

Creating a Workspace Manually

Instance administrators can provision a workspace manually in either a full development environment or a runtime environment.

- Creating Workspace Manually in a Full Development Environment
- Creating a Workspace Manually in a Runtime Environment

Creating Workspace Manually in a Full Development Environment

To create a workspace manually:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

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.

   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 Workspace, enter a workspace name and description and click **Next**.

6. For Identify Schema, specify whether you are re-using an existing schema or creating a new one.

   If you are using an existing schema:

   a. Re-use existing schema - Select **Yes**.

   b. Schema Name - Select a schema from the list.

   c. Click **Next**.

   If you are creating a new schema:

   a. Re-use existing schema - Select **No**.

   b. Schema Name - Select a schema from the list.

   c. Schema Password - Enter a password.

   d. Space Quota (MB) - Enter a space quota.

   e. Click **Next**.

7. For Identify Administrator, enter the Workspace administrator information and click **Next**.

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

Creating a Workspace Manually in a Runtime Environment

To add a workspace in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
   ```

3. The following example demonstrates how to use the ADD_WORKSPACE procedure to add a new workspace named MY_WORKSPACE using the primary schema, SCOTT, along with additional schema mappings for HR and OE.

```
BEGIN
    APEX_INSTANCE_ADMIN.ADD_WORKSPACE (
        p_workspace_id => 8675309,
        p_workspace => 'MY_WORKSPACE',
        p_primary_schema => 'SCOTT',
        p_additional_schemas => 'SCOTT' );
END;
```

> **See Also:** "ADD_WORKSPACE Procedure" in *Oracle Application Express API Reference*

Creating Multiple Workspaces

Instance administrators can provision multiple workspaces by running the Create Multiple Workspaces Wizard.

To create multiple workspaces:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Create Multiple Workspaces**.

    The Create Multiple Workspaces Wizard appears.

4. Under Provision Workspace Using, select one of the following:

    - **System Generated Workspace Names**

    - **Statically Prefixed Workspace Name with Sequential Integer Suffix**

    - **Email Domain Name as Workspace Name, with Sequential Integer Suffix for duplicates**

5. Depending upon the option you select in the previous step, make the following selections:

    > **Tip:** To learn more about a specific field, see field-level Help.

    - **System Generated Workspace Names**
        - Workspace Count
        - Install Sample Application
        - Install Sample Websheet
        - Install Sample DEPT and EMP Tables
        - Space Quota (MB)
        - Resource Manager Consumer Group
        - Allow workspaces to be automatically purged
        - Workspace Description

    - **Statically Prefixed Workspace Name with Sequential Integer Suffix**
        - Workspace Prefix
        - Workspace Count
        - Install Sample Application

- Install Sample Websheet

- Install Sample DEPT and EMP Tables

- Space Quota (MB)

- Resource Manager Consumer Group

- Allow workspaces to be automatically purged

- Workspace Description

■ **Email Domain Name as Workspace Name, with Sequential Integer Suffix for duplicates**

- Install Sample Application

- Install Sample Websheet

- Install Sample DEPT and EMP Tables

- Space Quota (MB)

- Resource Manager Consumer Group

- Allow workspaces to be automatically purged

- Email Addresses

- Workspace Description

6. Click **Next**.

7. Confirm your choices and click **Provision Workspaces**.

Managing Existing Workspaces

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

This section describes how Instance administrators can manage existing workspaces within an Oracle Application Express instance.

■ Viewing Existing Workspace Information

■ Deleting a Workspace

■ Locking a Workspace

■ Managing Workspace to Schema Assignments

■ Managing Component Availability for an Instance

■ Defining a Workspace Message in Administration Services

■ Performing a Workspace Search

■ Isolating a Workspace to Prevent Browser Attacks

■ Viewing the Workspace Summary Report

■ Viewing Workspace Database Privileges

■ Viewing File Size and File Count by Workspace

■ Exporting and Importing a Workspace

■ Viewing Application Attributes

- Changing Application Build Status in Administration Services

- Viewing the Parsing Schemas Report

> **See Also:** "Creating Workspaces" on page 2-74, "Managing Schemas" on page 2-70, "Managing Users Across an Application Express Instance" on page 2-96, and "Monitoring Activity Across a Development Instance" on page 2-99

Viewing Existing Workspace Information

Use the Existing Workspaces report to view an interactive report of existing workspaces. From the Existing Workspaces report, you can view or edit workspace details.

To view and edit existing workspaces:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Existing Workspaces**.

   The Existing Workspaces page appears

4. To edit a workspace, click the workspace name.

   The Edit Workspace Information page appears.

> **See also:** "Isolating a Workspace to Prevent Browser Attacks" on page 2-89 and "Viewing the Workspace Summary Report" on page 2-91

Deleting a Workspace

This section describes how an Instance administrator deletes a workspace. Deleting a workspace does not remove any of the associated database objects. To remove the associated schemas, a database administrator (DBA) must use a standard database administration tool, such as Oracle Enterprise Manager or SQL*Plus.

> **See Also:** *SQL*Plus User's Guide and Reference*, "Viewing the Workspace Summary Report" on page 2-91, and "Creating Workspaces" on page 2-74

- Identifying Inactive Workspaces

- Deleting Workspaces in a Full Development Environment

- Deleting Workspaces in a Runtime Development Environment

Identifying Inactive Workspaces

This section describes how to identify inactive workspaces.

- How to Identify Inactive Workspaces

- Identifying Inactive Workspaces By Checking Recent Updates

- Viewing Workspaces with Only a Sample Application

- Removing the Resources Associated with Inactive Workspaces

- Deleting Inactive Workspaces

How to Identify Inactive Workspaces If you are managing a large hosted Oracle Application Express instance, manually deleting inactive workspaces can free up resources for other users. The process of manually deleting inactive workspaces consists of the following steps:

- **Step 1:** Identify inactive workspaces. See "Identifying Inactive Workspaces By Checking Recent Updates" on page 2-81 and "Viewing Workspaces with Only a Sample Application" on page 2-82.

- **Step 2:** Remove the resources (that is, the database schemas, tablespaces, and data files) associated with each inactive workspace. See "Removing the Resources Associated with Inactive Workspaces" on page 2-82.

- **Step 3:** Drop the inactive workspaces from Oracle Application Express. See "Deleting Inactive Workspaces" on page 2-83.

> **Tip:** To systematically purge inactive workspaces you must configure Workspace Purge settings. See "Purging Inactive Workspaces" on page 2-52.

Identifying Inactive Workspaces By Checking Recent Updates The first step in determining if a workspace is inactive is to establish some basic rules. A common approach is to base the rules on the Oracle Application Express activity records found in the current Application Express engine schema.

> **See Also:** "Determining the Oracle Application Express Engine Schema"

The following DDL (data definition language) creates a table of all workspaces requested before June 28, 2004 but that have been inactive since June 10, 2004. In this example, inactivity is determined by checking a key within the Application Express engine schema for the most recent updates by each workspace.

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
CREATE TABLE ws_to_purge AS
 SELECT c.security_group_id, c.company_name, c.admin_email, c.request_date,
 SYSDATE last_updated_on, 'Y' ok_to_delete
   FROM wwv_flow_provision_company c
  WHERE
c.request_date <= to_date('20040628','YYYYMMDD') AND
     (  not exists
 (SELECT NULL /* Activity Log */
       FROM wwv_flow_activity_log l
      WHERE l.security_group_id = c.security_group_id
        AND l.time_stamp > to_date('20040610','YYYYMMDD'))
 )
    AND NOT EXISTS
     (SELECT NULL /* workspace applications */
       FROM wwv_flows f
      WHERE f.security_group_id = c.security_group_id
        AND f.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Pages */
       FROM wwv_flow_steps s
      WHERE s.security_group_id = c.security_group_id
        AND s.last_updated_on > to_date('20040610','YYYYMMDD'))
    AND NOT EXISTS
     (SELECT NULL /* Regions */
       FROM wwv_flow_page_plugs p
```

```
        WHERE p.security_group_id = c.security_group_id
          AND p.last_updated_on > to_date('20040610','YYYYMMDD'))
AND NOT EXISTS
 (SELECT NULL /* Items */
    FROM wwv_flow_step_items i
   WHERE i.security_group_id = c.security_group_id
     AND i.last_updated_on > to_date('20040610','YYYYMMDD'))
AND NOT EXISTS
 (SELECT NULL /* Templates */
    FROM wwv_flow_templates t
   WHERE t.security_group_id = c.security_group_id
     AND t.last_updated_on > to_date('20040610','YYYYMMDD'))
AND NOT EXISTS
 (SELECT NULL /* Files uploaded */
    FROM wwv_flow_file_objects$ o
   WHERE o.security_group_id = c.security_group_id
     AND o.created_on > to_date('20040610','YYYYMMDD'))
AND NOT EXISTS
 (SELECT NULL /* SQL Workshop history */
    FROM wwv_flow_sw_sql_cmds s
   WHERE s.security_group_id = c.security_group_id
     AND s.created_on > to_date('20040610','YYYYMMDD'));
```

Viewing Workspaces with Only a Sample Application Another way to identify potentially inactive workspaces is to view the Workspaces with Only Sample Application report.

To view a report or workspaces only containing only a sample application:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Workspaces with Only Sample Application**.

   The Workspaces with Only Sample Applications page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

Removing the Resources Associated with Inactive Workspaces After you have identified inactive workspaces in a single table, the next step is to remove them.

> **Note:**   Before removing the schemas, tablespaces, or data files associated with inactive workspaces, make sure these resources are not being used in any other workspace or application.

To remove the resources associated with inactive workspaces:

1. Identify the schemas used by the workspaces to be deleted by joining the table containing the identified inactive workspaces to `wwv_flow_company_schemas`.

2. Drop the schemas, tablespaces, and data files used exclusively by the inactive workspaces from the database. You can identify the schemas to drop by running a query similar to the following:

```
SELECT s.schema
  FROM ws_to_purge ws,
       wwv_flow_company_schemas s
WHERE s.security_group_id = ws.security_group_id
```

```
                AND ws.ok_to_delete = 'Y';
```

Deleting Inactive Workspaces Once you remove the resources associated with an inactive workspace, you can delete the workspace. You can delete inactive workspaces manually using the Oracle Application Express Administration Services application. Or, you can delete them programmatically as shown in the following PL/SQL example.

```
BEGIN
    FOR c1 IN (SELECT security_group_id
                 FROM ws_to_purge
                WHERE ok_to_delete = 'Y')
    LOOP
        WWV_FLOW_PROVISIONING.TERMINATE_SERVICE_BY_SGID(c1.security_group_id);
    END LOOP;
 END;
```

Deleting Workspaces in a Full Development Environment

To delete a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Existing Workspaces**.

   The Existing Workspaces page appears.

4. Under the Action column, click **Delete**.

5. Select the workspace to be deleted.

6. From Tasks, click **Remove Workspace**.

7. Follow the on-screen instructions.

Deleting Workspaces in a Runtime Development Environment

To delete a workspace in a runtime development environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

   ■ On Windows:

   ```
   SYSTEM_DRIVE:\ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

   ■ On UNIX and Linux:

   ```
   $ sqlplus /nolog
   SQL> CONNECT SYS as SYSDBA
   Enter password: SYS_password
   ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
   ```

3. Run the following statement:

```
BEGIN
APEX_INSTANCE_ADMIN.REMOVE_WORKSPACE(WORKSPACE_NAME, DROP_USER, DROP_
TABLESPACE)
END;
```

Where:

- `WORKSPACE_NAME` is the name of the workspace.

- `DROP_USER` is either Y or N. The default is N.

- `DROP_TABLESPACE` is either `Y` or `N`. The default is `N`.

Locking a Workspace

Instance administrators can lock a workspace to address security or performance issues. Locking a workspace immediately locks all workspace administrator, developer, and user accounts in the workspace. It also changes the status of all applications in the workspace to Unavailable.

> **Warning:** Locking a workspace makes it permanently inaccessible.

To lock a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Lock Workspace**.

4. For Workspace, select the workspace you want to lock and click **Next**.

5. Review the information about applications and users and click **Lock Workspace**.

Managing Workspace to Schema Assignments

When users sign in to Oracle Application Express, they access a shared work area called a **workspace**. Each workspace can have multiple associated (or mapped) schemas. By associating a workspace with a schema, developers in that workspace can create new database objects in that schema and build applications that interact with the database objects in that schema.

The section describes how Instance administrators can view, edit, and remove schema and workspace assignment, associate additional schemas with a workspace, and create new schemas.

- Viewing Schema and Workspace Assignments in a Development Environment

- Viewing Schema and Workspace Assignments in a Runtime Environment

- Editing Existing Schema and Workspace Assignments

- Associating an Existing Schema in a Full Development Environment

- Associating Additional Schemas in a Runtime Environment

- Removing a Schema Mapping from a Workspace in a Runtime Environment

- Creating a New Schema

> **See Also:** "Managing Schemas" on page 2-70 and "Viewing the Parsing Schemas Report" on page 2-95

Viewing Schema and Workspace Assignments in a Development Environment

To view an existing schema to workspace assignment:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Manage Workspace to Schema Assignments**.

The Manage Workspace to Schema Assignments page appears, listing all workspaces in your environment along with their associated schemas.

This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

Viewing Schema and Workspace Assignments in a Runtime Environment

To view the existing schema to workspace assignment in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
```

3. Run the following statement:

```
SELECT APEX_INSTANCE_ADMIN.GET_SCHEMAS(WORKSPACE_NAME)
FROM DUAL;
```

Where `WORKSPACE_NAME` is the name of the workspace.

Editing Existing Schema and Workspace Assignments

To edit an existing schema and workspace assignment:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Manage Workspace to Schema Assignments**.

The Manage Workspace to Schema Assignments page appears.

4. To edit an existing workspace to schema assignment:

a. Select the workspace name.

The Edit Schema to Workspace Assignment page appears.

b. Select a new workspace or schema.

c. Click **Apply Changes**.

Associating an Existing Schema in a Full Development Environment

To associate an existing schemas with a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Manage Workspace to Schema Assignments**.

    The Manage Workspace to Schema Assignments page appears.

4. Click **Add Schema**.

    The Add Schema wizard appears.

5. For The schema is select **Existing Schema** and click **Next**.

6. Follow the on-screen instructions to associate the existing schema to a workspace.

7. To verify that the new schema is added to the workspace:

    a. Sign in to the workspace on Oracle Application Express.

    b. Review the Workspace Schemas list on the Workspace home page. The list shows all schemas currently associated with this workspace.

Associating Additional Schemas in a Runtime Environment

To associate additional schemas with a workspace in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as `SYS`. For example:

    - On Windows:

    ```
    SYSTEM_DRIVE:\ sqlplus /nolog
    SQL> CONNECT SYS as SYSDBA
    Enter password: SYS_password
    ```

    - On UNIX and Linux:

    ```
    $ sqlplus /nolog
    SQL> CONNECT SYS as SYSDBA
    Enter password: SYS_password
    ```

2. Run the following statement:

    ```
    ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
    ```

3. Run the following statement:

    ```
    BEGIN
    APEX_INSTANCE_ADMIN.ADD_SCHEMA(WORKSPACE_NAME, SCHEMA_NAME)
    END;
    ```

    Where:

    - `WORKSPACE_NAME` is the name of the workspace.

    - `SCHEMA_NAME` is the name of the schema.

Removing a Schema Mapping from a Workspace in a Runtime Environment

To remove a schema mapping from a workspace in a runtime environment:

1. Start SQL*Plus and connect to the database where Oracle Application Express is installed as SYS. For example:

   - On Windows:

     ```
     SYSTEM_DRIVE:\ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

   - On UNIX and Linux:

     ```
     $ sqlplus /nolog
     SQL> CONNECT SYS as SYSDBA
     Enter password: SYS_password
     ```

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_050000
   ```

3. Run the following statement:

   ```
   BEGIN
   APEX_INSTANCE_ADMIN.REMOVE_SCHEMA(WORKSPACE_NAME, SCHEMA_NAME)
   END;
   ```

   Where:

   - WORKSPACE_NAME is the name of the workspace.
   - SCHEMA_NAME is the name of the schema.

Creating a New Schema

Instance administrators can create a new schema and associate it with a workspace.

To create a new schema for a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Manage Workspace to Schema Assignments**.

   The Manage Workspace to Schema Assignments page appears.

4. Click **Add Schema**.

   The Add Schema wizard appears.

5. For The Schema is, select **New** and click **Next**.

6. For Choose Workspace, select the workspace to associate the new schema with and click **Next**.

7. For Identify Schema:

   a. Schema - Enter a unique name containing only letters.

      Tip: To verify that the new schema name is unique, open the select list and search for the name.

   b. Password - Enter a case-sensitive password.

    c. Default Tablespace - Identify the default tablespace that you want this schema to use.

    d. Temporary Tablespace - Identify the temporary tablespace you want this schema to use.

    e. Click **Next**.

8. Confirm the information and click **Add Schema**.

9. To verify that the new schema is added to the workspace:

    a. Sign in to the workspace on Oracle Application Express.

    b. Review the Workspace Schemas list on the Workspace home page. The list shows all schemas associated with this workspace.

Managing Component Availability for an Instance

This section describes how an Instance administrator can control which components are available within an Oracle Application Express instance. Configurable components include: Websheets, SQL Workshop, Application Builder, and Team Development.

To configure component availability:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Manage Component Availability**.

The Component Availability page appears.

This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. Locate the workspace for which you want to enable or disable components.

5. Click the **Edit** icon adjacent to the workspace name.

The Workspace Settings page appears.

6. Under Workspace Settings, select **Yes** to enable a component or **No** to disable it. Options include:

- Enable Application Builder
- Enable SQL Workshop
- Enable PL/SQL Editing in SQL Workshop
- Enable Team Development

7. Click **Apply Changes**.

> **See Also:** "Configuring Workspace Preferences" on page 1-15

Defining a Workspace Message in Administration Services

Instance administrators can create a workspace message in Administration Services.

To define a workspace message:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Actions, click **Manage Component Availability**.

The Component Availability page appears.

This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. Locate the workspace for which you want to define a workspace message.

5. Under Workspace Message, enter a message in the Message field. To format the display, include standard HTML tags.

6. Click **Apply Changes**.

> **See Also:** "Defining a Workspace Announcement" on page 1-19

Performing a Workspace Search

To perform a workspace search:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

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

The Workspace Search page appears

This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

3. To view workspace details, click the workspace name.

The Workspace Details report appears.

4. To email the report to other users, click **Email** and follow the on-screen instructions.

> **See also:** "Viewing the Workspace Summary Report" on page 2-91

Isolating a Workspace to Prevent Browser Attacks

This section describes how Instance administrators configure limits to isolate a workspace and prevent browser attacks.

- About Isolating a Workspace to Prevent Browser Attacks

- Configuring Workspace Isolation Attributes

> **See Also:** "Isolating All Workspaces in an Instance" on page 2-28 and "About Isolating Workspaces" in *Oracle Application Express Application Builder User's Guide*

About Isolating a Workspace to Prevent Browser Attacks

Isolating workspaces is an effective approach to preventing browser attacks. The only way to truly isolate a workspace is to enforce different domains in the URL by configuring the Allow Hostnames attribute. When the URLs of the attacker and the victim have different domains and hostnames, the browser's same-origin policy prevents attacks.

Configuring Workspace Isolation Attributes

To configure Workspace Isolation attributes:

1. View the existing workspace. See "Viewing Existing Workspace Information" on page 2-80.

   The Edit Information page appears.

2. Locate Workspace Isolation and edit the attributes as described in Table 2–6.

   > **Tip:** To learn more about an attribute, see field-level Help.

Table 2–6   Workspace Isolation Attributes

Attribute	Description
Allow Hostnames	Enter a comma separated list of hostnames that can be used to access this workspace. If you leave this attribute empty, the instance-level value applies. If you enter one or more hostnames, the incoming HTTP request URL's hostname part must match one of the listed hostnames.
Resource Consumer Group	Specify the Database Resource Manager consumer group to be used for all page events associated with this workspace. If you leave this attribute empty, the instance-level value applies. At the beginning of every request, the Application Express engine switches the current consumer group of the current database session to the workspace's consumer group. This applies to both executing applications and any of the applications used within the Application Express development environment.
	The privilege to switch to this consumer group must be granted to either PUBLIC or the Application Express schema. This privilege is typically granted using the procedure `DBMS_RESOURCE_MANAGER_PRIVS.GRANT_SWITCH_CONSUMER_GROUP`.
Maximum Concurrent Workspace Requests	Enter the maximum number of concurrent page events that Oracle Application Express supports for all applications of this workspace. If you leave this attribute empty, the instance-level value applies. Instead of processing a page event, Application Express shows an error message when the limit is already reached.
	Application Express keeps track of session requests by querying the `CLIENT_INFO` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_INFO`, e.g. with a call to `DBMS_APPLICATION_INFO.SET_CLIENT_INFO`.
Maximum Concurrent Session Requests	Enter the maximum number of concurrent page events that Oracle Application Express supports for each session of this workspace's applications. Instead of processing a new page event, Application Express shows an error message when the limit is already reached. Alternatively, use the Concurrent Session Requests Kill Timeout attribute to kill an active database session, to process the new page event.
	Application Express keeps track of session requests by querying the `CLIENT_IDENTIFIER` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_IDENTIFIER`, for example with a call to `DBMS_SESSION.SET_IDENTIFIER`.

Table 2–6   (Cont.) Workspace Isolation Attributes

Attribute	Description
Concurrent Session Requests Kill Timeout	If a new page event comes in that is outside the limits of Maximum Concurrent Session Requests, Application Express can execute `alter system kill session` on the oldest active database session which processes another page event for this Application Express session. This attribute specifies the number of seconds a database process has to be active, before it can be killed. If you leave this attribute empty, the instance-level value applies.
	Warning: Killing sessions can cause problems with the application server's database session pool.
Maximum Size of Files in Workspace	Enter the total size (in bytes) of all files that can be uploaded to this workspace.
Maximum Email Messages	Enter the maximum number of email messages that can be sent with the `APEX_MAIL` API per 24 hour period. This value overrides the instance-level setting.

3. Click **Apply Changes**.

Viewing the Workspace Summary Report

Instance administrators can view workspace information by viewing the Workspace Summary Report.

To view the Workspace Summary Report:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Workspace Details**.

The Workspace Details page appears.

4. Make a selection from the Workspace list at the top of the page and click **Set**.

The Workspace Summary Report page appears.

The following buttons display above the report:

- **Remove** - Click **Remove** to remove the current workspace.

- **Edit** - Click **Edit** to link to the Edit Workspace Information page. See "Isolating a Workspace to Prevent Browser Attacks" on page 2-89.

- **Schema Assignments** - Click **Schema Assignments** to manage workspace schema assignments. See "Managing Schemas" on page 2-70.

- **Manage Users** - Click **Manage Users** to edit or create new users. See "Managing Users Across an Application Express Instance" on page 2-96.

- **Email** - Click **Email** send this report by email.

The Workspace Summary Report is divided into the following major sections:

- **Workspace**. Displays high-level information about selected workspace.

- **Workspace Schemas**. Displays the schema name, and default tablespace, privileges granted, and database role privileges.

When users sign in to Oracle Application Express, they sign in to a shared work area called a workspace. Each workspace can have multiple associated schemas. By associating a workspace with a schema, developers can build applications that interact with the objects in that schema and create new database objects in that schema. To edit workspace to schema assignments, click **Workspace to Schema Assignments**. See "Managing Schemas" on page 2-70.

- **Database Applications**. Lists details about the database applications within the workspace.

- **Websheet Applications**. Lists details about the websheets within the workspace.

- **Packaged Applications**. Lists packaged application within the workspace.

- **SQL Workshop**. Lists the number of SQL scripts, SQL script results, and SQL Command history.

- **Team Development**. Lists the number of features, milestones, bugs, To Dos, feedback entries, news entries, and links.

- **Workspace Application Activity Summary**. Details statistics about workspace applications.

Other sections include:

- Developer Activity Summary

- Database Object Counts by Object Type

- 5 Top Tables by Row Count, Reported by Schema

Viewing Workspace Database Privileges

Instance administrators can view a summary of workspace database privileges on the Workspace Database Privileges page.

To view workspace database privileges:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Workspace Database Privileges**.

   The Workspace Database Privileges page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. To view workspace details, click the workspace name.

   The Workspace Summary report appears.

   > **See Also:** "Viewing the Workspace Summary Report" on page 2-91

Viewing File Size and File Count by Workspace

To view total file size and file count by workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Workspace Reports, click **Manage File Utilization**.

   The File Utilization by Workspace page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

Exporting and Importing a Workspace

This section explains how an instance administrator can move a workspace and all associated users to a new Oracle Application Express instance.

- About Exporting and Importing a Workspace

- Exporting a Workspace in Administration Services

- Importing a Workspace in Administration Services

> **Tip:** You can also export workspaces, applications, and related files from a command-line using the APEXExport program located in the Utilities folder in the downloaded installation zip file. To learn more, see the Readme.txt file in the Utilities folder.

About Exporting and Importing a Workspace

To move a workspace and all associated users to a new Oracle Application Express instance, an instance administrator must export the workspace. When you export a workspace, Oracle Application Express generates a text file. This file contains information about your workspace, all the users in your workspace, and any groups in your workspace (if applicable). You can use this file to import your workspace into another Oracle Application Express instance.

Exporting a workspace and importing it into a new database instance enables developers to import application components. Therefore, to provide maximum capabilities Oracle recommends that when building new environments (for example, for production or testing) create these workspaces by importing the development workspaces.

Keep in mind, this method only imports workspace, users, and groups. This file does not contain:

- The schemas associated with this workspace or the objects in those schemas.

- Any applications, images, cascading style sheets, and static text files.

These items must be exported separately.

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

Exporting a Workspace in Administration Services

To export a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Export Import, click **Export Workspace**.

4. Select a workspace and then click **Export Workspace**.

5. To export the selected workspace, click **Save File**.

6. Follow the on-screen instructions.

Importing a Workspace in Administration Services

To import a workspace:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Export Import, click **Import Workspace**.

4. Locate the import file and click **Next**.

5. To install the workspace, click **Install**.

6. Follow the on-screen instructions.

Viewing Application Attributes

Instance administrators can view applications by workspace on the Application Attributes page.

To view the Application Attributes page:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Applications, click **Application Attributes**.

   The Application Attributes page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

Changing Application Build Status in Administration Services

This section describes how an instance administrator can change the build status of an application.

- About Changing Application Build Status

- Changing Build Status in Administration Services

  See Also: "Managing Build Status in Workspace Administration" on page 1-38

About Changing Application Build Status

Every Oracle Application Express application has an application-level attribute called Build Status. You can use this attribute to prevent an application from being modified by other developers. Build Status has two settings:

- **Run and Build Application** - Developers can both run and edit an application.

- **Run Application Only** - Developers can only run an application.

Setting the Build Status to **Run Application Only** is an effective way to prevent other developers from modifying it.

You can change the Build Status of an application as follows:

- Developers and administrators can change the Build Status attribute on the Edit Application page. See "Availability" in *Oracle Application Express Application Builder User's Guide*.

- Workspace administrators can change the Build Status of applications within the current workspace on the Manage Application Build Status page. See "Changing Build Status for Multiple Applications" on page 1-38.

- Instance administrators can change the Build Status of an application on the Build Status page as described in "Changing Build Status in Administration Services" on page 2-95.

Changing Build Status in Administration Services

To change a Build Status in Administration Services:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Applications, click **Build Status**.

   The Build Status page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. Click the **Edit** icon adjacent to the appropriate workspace.

   The Edit Build Status page appears.

5. Select an alternate build status and click **Apply Changes**.

   > **Tip:** Note that if you select **Build Application Only** during deployment, the only way to change this setting is change it on the Build Status page in Oracle Application Express Administration Services.

Viewing the Parsing Schemas Report

Instance administrators can use the Parsing Schemas report to identify the current parsing schema of each application in any workspace. This attribute identifies the Oracle database schema whose privileges are used when Application Express dynamically executes the application's SQL and PL/SQL code at runtime.

To view the Parsing Schemas report:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Applications, click **Parsing Schemas**.

   The Parsing Schemas page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

   > **See Also:** "Managing Schemas" on page 2-70 and "Managing Workspace to Schema Assignments" on page 2-84

Managing Users Across an Application Express Instance

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

An instance administrator can manage all user accounts within an Oracle Application Express instance.

- About the Advantages of Managing Users at the Instance Level
- About Application Accounts Authentication
- About Application Express User Roles
- Creating New User Accounts in Administration Services
- Editing an Existing User Account in Administration Services
- Deleting User Accounts in Administration Services

> **See Also:** "Workspace and Application Administration" on page 1-1, "Managing Users in a Workspace" on page 1-21, and "Application Express Account Credentials" in *Oracle Application Express Application Builder User's Guide*

About the Advantages of Managing Users at the Instance Level

When setting up user accounts, instance administrators can take advantage of security capabilities such locking accounts, configuring password to have a fixed lifetime, and requiring user passwords be changed on first use.

> **See Also:** "Configuring Security" on page 2-18

About Application Accounts Authentication

User accounts are particularly useful if your application is using Application Express Accounts authentication. Application Express Accounts is a built-in authentication method in which user accounts are created and managed in the Oracle Application Express user repository.

> **See Also:** "Application Express Account Credentials" in *Oracle Application Express Application Builder User's Guide*

About Application Express User Roles

To access the Oracle Application Express development environment, users sign in to a shared work area called a workspace. Users are divided into four primary roles:

- **End users** do not have access to development or administrative capabilities. End cannot sign into a workspace and create applications. End users can only run existing database or Websheet applications.

- **Developers** are users who create and edit applications.

- **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. Instance

administrators manage workspace provisioning, configure features and instance settings, and manage security.

Creating New User Accounts in Administration Services

To create a new user account in Administration Services:

> **Tip:** You can also access the Create/Edit User page by clicking **Create User** on the Workspace Tasks list on the Instance Administration home page.

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Manage Developers and Users**.

    The Manage Developers and Users page appears.

4. Click **Create User**.

    The Create/Edit User page appears.

5. Under User Attributes, enter:

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

       – Maximum length of 100 characters

       – No spaces

       – Only these special characters are permitted: amerpsand (&) 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).

    f. **Default Date Format** - Specify the default Oracle date format for the user. This option controls the default date format within SQL Workshop.

6. Under Account Privileges:

    a. **Workspace** - Select a workspace in which to create the user.

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

    c. **User is an administrator** - Select **Yes** or **No** to 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** - Select **Yes** or **No** to specify if this user should have developer privileges. Developers create and modify applications and database objects and view developer activity, session state, workspace activity, application, and schema reports.

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. **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 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. Click **Create** or **Create and Create Another**.

> **Tip:** An instance administrator can configure these settings for an entire Oracle Application Express instance and define password complexity policies. See "About Authentication Controls" on page 2-30, "About Strong Password Policies" on page 2-33, and "Configuring Password Policies" on page 2-33.

Editing an Existing User Account in Administration Services

To edit an existing user account in Administration Services:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Manage Developers and Users**.

The Manage Developers and Users page appears.

This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. To edit account details, click the **Edit** icon adjacent to the user name.

To learn more about an attribute, see field-level Help.

5. Make the appropriate changes.

6. Click **Apply Changes**.

> **See Also:** "Creating New User Accounts in Administration Services" on page 2-97

Deleting User Accounts in Administration Services

To delete a user account in Administration Services:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Manage Developers and Users**.

   The Manage Developers and Users page appears.

   This page displays as an interactive report. To customize the report, use the Search bar at the top of the page.

4. Select a user.

   The Create/Edit User page appears.

5. Click **Delete User**.

6. Confirm your selection and click **OK**.

Monitoring Activity Across a Development Instance

> **Note:** Functionality in the Administration Services application is not available in Oracle Database Cloud Service (Database Schema).

Instance administrators can monitor end user and developer activity for an Oracle Application Express instance on the Monitor Activity page.

> **See Also:** "Viewing Workspace Dashboards" on page 1-39

- Monitoring Activity
- Viewing the Signup Survey Report

Monitoring Activity

To monitor activity:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Monitor Activity**.

   The Monitor Activity page appears.

   The Monitor Activity page is divided into the following sections:

   - **Page Views** - View activity by view, application and user, user, application, or workspace.

   - **Service Requests** - View new service requests or signup survey activity.

   - **Workspace Purge** - View a dashboard summary, inactive workspaces, workspaces purged, workspaces that became active, or a workspace purge log.

   - **Logs** - View the mail log, jobs log, automatic delete log, or monitor packaged application installations.

   - **Environment Reports** - View a summary of used operating systems, browser types, user agent, or external sites.

   - **Login Attempts** - View login attempts or developer last login.

- **Calendar Reports** - View workspaces by date last used, page views by day and then by application and user, or by hour.

- **Developer Activity** - View application changes by developer or workspace.

- **Archived Activity** - View archived activity reports.

3. Click the appropriate link to view reports across all workspaces.

Viewing the Signup Survey Report

Instance administrators can also include survey questions users must complete when running the New Service Signup Wizard.

> **See Also:** "Defining a Signup Survey" on page 2-69

To view the Signup Survey report:

1. Sign in to Oracle Application Express Administration Services. See "Accessing Oracle Application Express Administration Services" on page 2-2.

2. Click **Monitor Activity**.

   The Monitor Activity page appears.

3. Under Service Requests, click the **Signup Survey**.

   The Signup Survey appears displaying the survey questions, answers, and the number of responses.

4. To clear the Signup Survey report, click **Reset Report**.

A

DBMS_SCHEDULER Jobs

The `DBMS_SCHEDULER` package provides a collection of scheduling functions and procedures that can be called from any PL/SQL program. Table A–1, " DBMS_SCHEDULER Jobs" lists `DBMS_SCHEDULER` jobs that are created in the database when you install Oracle Application Express.

List of DBMS_SCHEDULER Jobs

Table A–1 describes `DBMS_SCHEDULER` jobs that are created in the database when you install Oracle Application Express.

Table A–1   DBMS_SCHEDULER Jobs

Job Name	Description
ORACLE_APEX_PURGE_SESSIONS	Purges sessions older than 12 hours (the default). This job runs every hour.
	See Also: "Managing Session State for an Instance" on page 2-58
ORACLE_APEX_MAIL_QUEUE	Sends mail that is in the mail queue every 5 minutes.
	See Also: "APEX_MAIL" in *Oracle Application Express API Reference* and "Configuring Email" on page 2-42
ORACLE_APEX_WS_NOTIFICATIONS	Determines Websheet notifications that must be sent every 30 minutes.
	See Also: "About Websheet Applications" in *Oracle Application Express Application Builder User's Guide*
ORACLE_APEX_DAILY_MAINTENANCE	Performs nightly maintenance, every day at 0100. This job archives the activity summary and runs the workspace purge process.
	See Also: "Purging Inactive Workspaces" on page 2-52

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