Oracle® APEX
Administration Guide

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A DBMS_SCHEDULER Jobs

A.1 List of DBMS_SCHEDULER Jobs A-1

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Preface

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

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

- Audience
- Related Documents
- Conventions

Audience

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

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 APEX.

Related Documents

For more information, see these Oracle resources:

- Oracle APEX Documentation Library
- *Oracle AI Database Concepts*
- Working with SQLcl in *Oracle SQLcl User's Guide*

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.

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1

Changes in Release 26.1

All content in *Oracle APEX Administration Guide* has been updated to reflect release 26.1 functionality and user interface changes.

See *Oracle APEX Release Notes* for details on New Features and Changed Behavior.

Deprecated and Desupported Features

See Deprecated Features and Desupported Features in *Oracle APEX Release Notes*.

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2

Workspace and Application Administration

In an Oracle APEX development environment, users sign in to a shared work area called a workspace. Workspace administrators monitor and administer a shared work area called a workspace.

- Understanding Workspace Administration
  Use Workspace Administration to monitor and administer a workspace.
- Using the Manage Service Page
  Use the Manage Service page to manage service requests, configure workspace preferences, edit workspace messages, and view reports. Additionally, administrators use this page to clear log files, manage session state, clear cached content, and manage interactive report settings.
- Making a Service Request
  Workspace administrators use the Request Service page to request a schema, add storage space, terminate a workspace, or request another workspace.
- Configuring Workspace Preferences
  Workspace administrators can configure preferences for a workspace on the Set Workspace Preferences page.
- Defining a Workspace Message
  Workspace administrators can quickly communicate with other users by creating workspace messages.
- Configuring an Environment Banner for a Workspace
  Configure a environment banner for a workspace on the Workspace Administration page.
- Managing Links on the Extension Menu
  Workspace administrators can add custom links to the Extensions menu on the APEX menu bar.
- Managing Users in a Workspace
  Workspace administrators can create new user accounts, manage existing user accounts, and change user passwords.
- Accessing the Data Dictionary Cache Report from Workspace Administration
  Access the Data Dictionary Cache report from Workspace Administration to view statistics and data analysis of schema tables and caches in a workspace.
- Purging the Developer Activity and Click Count Log Files
  Manually purge developer logs and the External Count Clicks log on the Log files page. Log entries older than one month are automatically deleted.
- Managing Session State for a Workspace
  A session establishes persistence (or stateful behavior) across page views. Workspace 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.
- Managing User Preferences
  Developers can use preferences to store values for a specific user across distinct sessions. Once set, these preferences can be removed programmatically or manually. Administrators 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.

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- Managing Page and Region Caching
  Improve an application's performance by taking advantage of page and region caching.
- Changing Build Status for Multiple Applications
  Configure the Build Status attribute at the workspace-level to prevent an application from being modified by other developers.
- Viewing File Utilization
  Identify areas using excessive storage by viewing the File Utilization report.
- Monitoring Activity Within a Workspace
  Monitor developer activity and changes within a workspace by accessing the Monitor Activity page.
- Viewing Workspace Dashboards
  Use the Dashboard page to view details about the current workspace and monitor overall workspace activity.

Related Topics

- Oracle APEX Administration Services
  Instance administrators manage an entire hosted APEX instance using the Administration Services application.
- Understanding Developer Security Best Practices in *Oracle APEX App Builder User's Guide*

2.1 Understanding Workspace Administration

Use Workspace Administration to monitor and administer a workspace.

> **Note**
>
> Many configuration options are available at both the workspace and instance-level. Instance-level settings generally override similar settings found in Workspace Administration.

- What is a Workspace Administrator?
  Workspace administrators have all the rights and privileges available to developer and manage administrator tasks specific to a workspace.
- Accessing the Workspace Administration Page
  Use the Workspace Administration page to monitor and administer a workspace.
- Workspace Administration Page
  Use the Workspace Administration page to manage service requests, manage users and groups, monitor activity, view dashboards, view the Utilization Report, change your password, manage interactive report settings, manage the Export Repository, and request a new workspace.
- Resetting Your Password
  Reset your password by clicking Change My Password under Tasks on the Workspace Administration page.
- Viewing the About Oracle APEX Page
  Access the About Oracle APEX page to view basic product information, including product details, CGI environment details, database information, currently selected character sets, database initialization parameters, and Oracle legal notices.

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- Managing Export Files in the Current Workspace
  Use the Manage Export Repository to manage Export files in the current workspace.
- Managing Saved Interactive Reports
  View and delete saved interactive reports as well as manage interactive report subscriptions.
- Viewing a Workspace Summary
  Use the Workspace Utilization report to view a comprehensive summary of the current workspace, including summaries of schemas, applications, SQL Workshop scripts and results, Team Development details, application activity, developer activity, and counts of database objects.
- Requesting a Workspace in Workspace Administration
  Request a workspace on the Workspace Administration page.

2.1.1 What is a Workspace Administrator?

Workspace administrators have all the rights and privileges available to developer and manage administrator tasks specific to a workspace.

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

Within a workspace, **End users** can only run existing database or Websheet application. **Developers** can create and edit applications, monitor workspace activity, and view dashboards. APEX includes two administrator roles:

- **Workspace administrators** are users who perform administrator tasks specific to a workspace.
- **Instance administrators** are superusers that manage an entire hosted APEX instance which may contain multiple workspaces.

Workspace administrators can reset passwords, view product and environment information, manage the Export Repository, manage saved interactive reports, view the workspace summary report, and manage Websheet database objects. Additionally, workspace administrators manage service requests, configure workspace preferences, manage user accounts, monitor workspace activity, and view log files.

> **See Also**
>
> About Oracle APEX User Rolesand What Is an Instance Administrator?

2.1.2 Accessing the Workspace Administration Page

Use the Workspace Administration page to monitor and administer a workspace.

> **Tip**
>
> You can access many workspace administration functions from both the Administration menu and by clicking options on the Workspace Administration home page.

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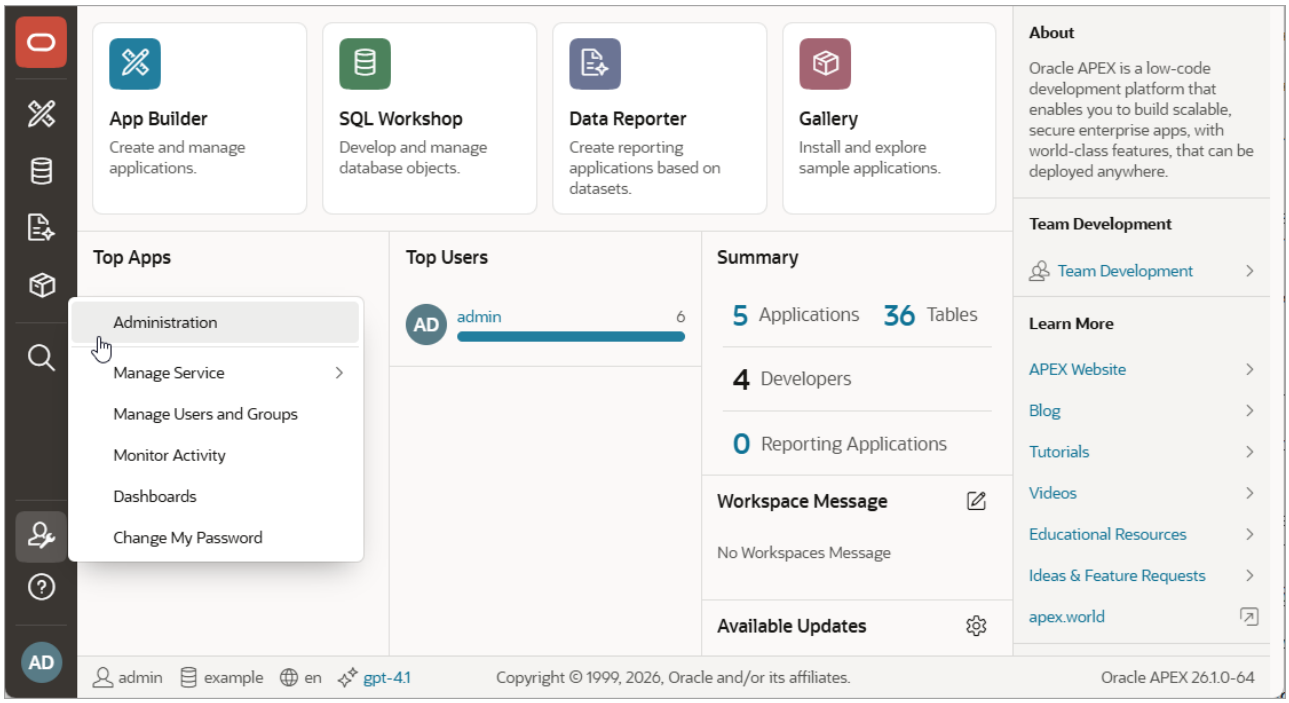
To access the Workspace Administration page:

1. Sign in to APEX.

   The Workspace home page appears.

2. From the menu bar, select the Administration menu and then **Administration**.



The Administration page appears.

Related Topics

- Workspace Administration Page
  Use the Workspace Administration page to manage service requests, manage users and groups, monitor activity, view dashboards, view the Utilization Report, change your password, manage interactive report settings, manage the Export Repository, and request a new workspace.

2.1.3 Workspace Administration Page

Use the Workspace Administration page to manage service requests, manage users and groups, monitor activity, view dashboards, view the Utilization Report, change your password, manage interactive report settings, manage the Export Repository, and request a new workspace.

System Message Region

The System Message region displays at the top of the page. Administrators can use this region to communicate with other users within an instance. See Defining a System Message.

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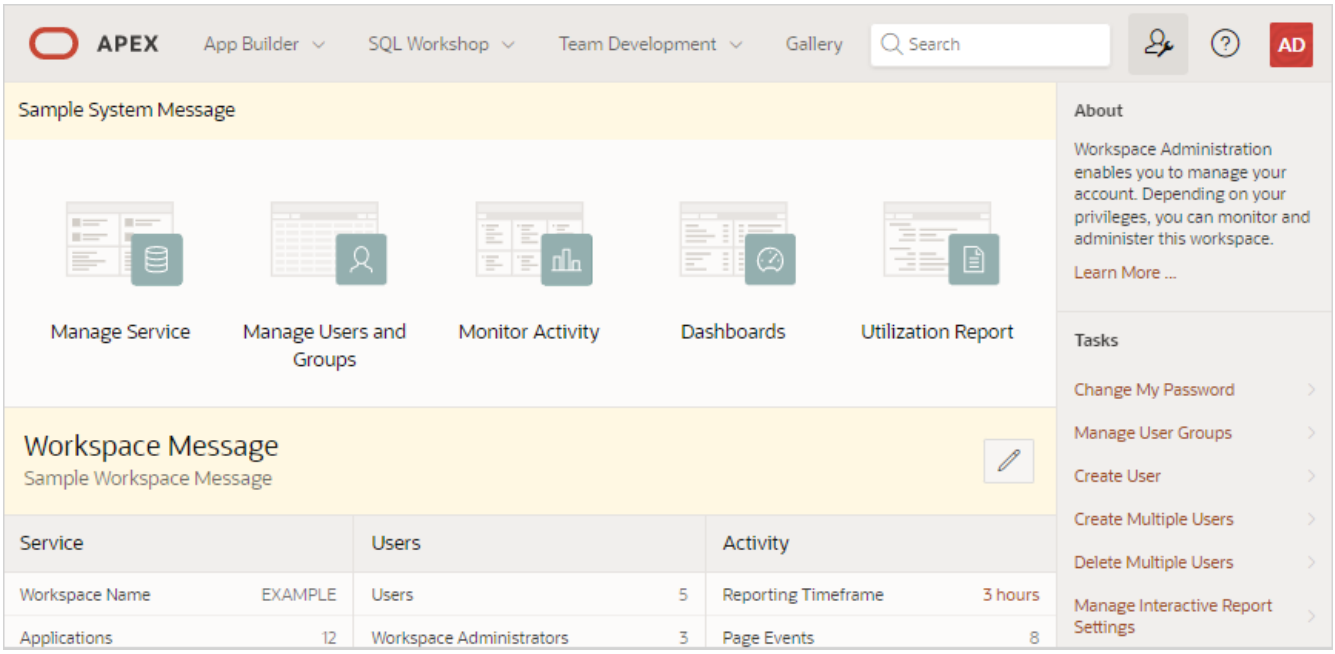

Workspace Administration Icons

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

- **Manage Service**. Manage service requests (including, schema requests, storage requests, and service termination), configure workspace preferences, define workspace messages, enable a workspace-level banner, view the Workspace Summary report, and configure Extension menu links. . See Manage Service Page.
- **Manage Users and Groups**. Manage Oracle APEX user accounts and user groups. See Managing Users in a Workspace.
- **Monitor Activity**. 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.
- **Dashboards**. View details about the current workspace and monitor users, activity, developer activity, performance, database application development, and view database details. See Viewing Workspace Dashboards.
- **Utilization Report**. View a comprehensive summary of the current workspace, including schemas, applications, SQL Workshop scripts and results, Team Development details, application activity, developer activity, and counts of database objects. See Viewing a Workspace Summary

Workspace Message

The Workspace Message region displays directly below the icons at the top of the Workspace Administration page. Use this region to communicate information to other users. See Defining a Workspace Message.

Tasks Region

A Tasks region displays on the right side of the Workspace Administration page and contains the following links:

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- **Change My Password**. Links to the Change Password section of the Edit Profile page. See Resetting Your Password.
- **About APEX**. Links to an About page that lists basic product information. See Viewing the About Oracle APEX Page.
- **Manage User Groups**. Links to the User groups page. Workspace administrators can use groups for categorization and to manage privileges. See Using Groups to Manage Oracle APEX Users.
- **Create User**. Links to a form where Workspace administrators can create new user. See Creating User Accounts.
- **Create Multiple Users**. Enables Workspace administrators to create multiple users once. See Creating Multiple Users Simultaneously.
- **Delete Multiple Users**. Enables Workspace administrators to delete multiple users at once. See Deleting Multiple Users at Once.
- **Manage Interactive Report Settings**. Enables Workspace administrators to manage saved reports and subscriptions. See Managing Saved Interactive Reports.
- **Manage Export Repository**. Displays to the Manage Export Repository. Use the Manage Export Repository page to manage files in the current workspace. See Managing Export Files in the Current Workspace.
- **Request a New Workspace**. Enables Workspace administrators to request a new workspace manually using the Request a Workspace wizard. See Requesting a Workspace in Workspace Administration.

2.1.4 Resetting Your Password

Reset your password by clicking Change My Password under Tasks on the Workspace Administration page.

To reset your password from the Administration page:

> **Tip**
>
> You can access many workspace administration functions (such as **Change My Password**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Tasks list, click **Change My 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.

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4. Click **Apply Changes**.

Related Topics

- Changing a User Account Password
  Change user account passwords on the Manage Users and Groups page.

2.1.5 Viewing the About Oracle APEX Page

Access the About Oracle APEX page to view basic product information, including product details, CGI environment details, database information, currently selected character sets, database initialization parameters, and Oracle legal notices.

To view the About Oracle APEX page:

1. Sign in to APEX.

   The Workspace home page appears.

2. Click the **Help** menu and select **About**.

   The About Oracle APEX page appears and is divided into the following sections:

   - **Details**:
     - 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** - Provides information about the currently installed web server software such as currently defined parameters and variables.
   - **Database Version**- Lists details about the currently installed database version.
   - **Character Set**- Lists currently selected character sets. The selected character set determines the encoding scheme used to display characters on screen.
   - **Database Initialization Parameters** - View the number of `JOB_QUEUE_PROCESSES`.
   - **Multilingual Engine** - Provides information if JavaScript in the database can be used for APEX applications and the schemas of the current workspace.

     The Multilingual Engine (MLE) is only available on Oracle Database 21c and later.
   - **Oracle Legal Notices**:
     - Copyright Notice
     - License Restrictions Warranty/Consequential Damages Disclaimer
     - Warranty Disclaimer
     - Restricted Rights Notice

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- Hazardous Applications Notice
- Trademark Notice
- Third-Party Content, Products, and Services Disclaimer
- Third-Party Notices

2.1.6 Managing Export Files in the Current Workspace

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

Use the Manage Export Repository page in Workspace Administration to download or delete Export files.

To access the Manage Export Repository page:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Tasks list, click **Manage Export Repository**.
3. To download a file, click the file name in the Download column..
4. To delete a file, select the file and click **Delete Checked**.

> **See Also**
>
> - Exporting and Importing a Workspace
> - Exporting an Application and Application Components, Importing Export Files, and Installing Export Files in *Oracle APEX App Builder User's Guide*

2.1.7 Managing Saved Interactive Reports

View and delete saved interactive reports as well as manage interactive report subscriptions.

- About Saved Interactive Reports
  APEX includes four types of saved interactive reports: Primary Default, Alternative Report, Public Report, and Private report. 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.
- Viewing and Deleting Saved Interactive Reports
  View and delete saved interactive reports on the Saved Reports page.
- 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.

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> **See Also**
>
> Developing Reports in *Oracle APEX App Builder User's Guide*

2.1.7.1 About Saved Interactive Reports

APEX includes four types of saved interactive reports: Primary Default, Alternative Report, Public Report, and Private report. 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.

APEX includes 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.

2.1.7.2 Viewing and Deleting Saved Interactive Reports

View and delete saved interactive reports on the Saved Reports page.

To manage saved interactive reports:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. From the Tasks list, click **Manage Interactive Report Settings**.
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 delete a report:
   a. Select the report to be removed.
   b. Click **Delete Checked**.

2.1.7.3 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:

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1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. From the Tasks list, click **Manage Interactive Report Settings**.
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**.

2.1.8 Viewing a Workspace Summary

Use the Workspace Utilization report to view a comprehensive summary of the current workspace, including summaries of schemas, applications, SQL Workshop scripts and results, Team Development details, application activity, developer activity, and counts of database objects.

- Viewing the Workspace Utilization Report
  View the Workspace Utilization Report which details workspace activity and contents.
- Emailing the Workspace Utilization Report
  Email specific recipients a workspace summary report by clicking the Email button while viewing the Workspace Utilization Report.

2.1.8.1 Viewing the Workspace Utilization Report

View the Workspace Utilization Report which details workspace activity and contents.

To view the Workspace Utilization report:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Workspace Administration page, click **Manage Service**.
3. Click **Workspace Utilization**.
4. From Show, select a time interval.
5. Scroll down to view the report.

2.1.8.2 Emailing the Workspace Utilization Report

Email specific recipients a workspace summary report by clicking the Email button while viewing the Workspace Utilization Report.

To email the Workspace Utilization report:

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1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Workspace Administration page, click **Manage Service**.
3. Click **Workspace Utilization**.
4. From Show, select a time interval.
5. To email the report:
   a. Click **Email**.
   b. In the Email form:
      - Reporting Periods - Select a time interval for the report.
      - To - Enter valid email addresses. Separate multiple entries with a comma.
      - Subject - Enter text that describes the message.
      - Body - Enter optional body text.
      - Click **Email**.

      The report is automatically emailed to the specified recipients.

2.1.9 Requesting a Workspace in Workspace Administration

Request a workspace on the Workspace Administration page.

> **Note**
>
> The **Request a New Workspace** option described in this topic only works if the workspace Provisioning Method is set to **Request** or **Automatic**. If the workspace Provisioning Method is set to **Manual**, an error displays. See Selecting a Workspace Provisioning Mode.

To request a new workspace in the Workspace Administration:

1. Sign in to APEX.
2. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
3. From **Tasks** on the right side of the page, click **Request a New Workspace**.

   The Request a Workspace Wizard appears.
4. For Identification:
   a. First Name - Enter your first name.
   b. Last Name - Enter your last name.
   c. Email - Enter the email address. A validation link will be sent to this email address.
   d. Workspace - Enter a workspace name that name uniquely identifies your development environment.

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e. Click **Next**.

5. Verify your request and click **Submit Request**.

   Once you complete the Identification form, the following events occur:

   a. You will receive an email containing a verification link.

   b. When you click the verification link, the workspace is created.

   c. You will receive another email containing Sign In credentials (that is, the workspace name, username, and password).

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

> **See Also**
>
> - Requesting Another Workspace
> - About the Workspace Request Approval Process
> - Creating Workspaces in Administration Services
> - Requesting a Workspace from the Sign In Dialog in *Oracle APEX Installation Guide*

2.2 Using the Manage Service Page

Use the Manage Service page to manage service requests, configure workspace preferences, edit workspace messages, and view reports. Additionally, administrators use this page to clear log files, manage session state, clear cached content, and manage interactive report settings.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Accessing the Manage Service Page
  Access the Manage Service page by selecting Administration from the Administration menu.
- Manage Service Page
  Use the Manage Service page to manage service requests, configure workspace preferences, define workspace messages or a workspace-level banner, view workspace utilization reports, and configure links on the Extension menu.

2.2.1 Accessing the Manage Service Page

Access the Manage Service page by selecting Administration from the Administration menu.

To access the Manage Service page:

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> **Tip**
>
> You can access many workspace administration functions (such as **Manage Service**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.

   The Manage Service page appears.

> **See Also**
>
> Manage Service Page

2.2.2 Manage Service Page

Use the Manage Service page to manage service requests, configure workspace preferences, define workspace messages or a workspace-level banner, view workspace utilization reports, and configure links on the Extension menu.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

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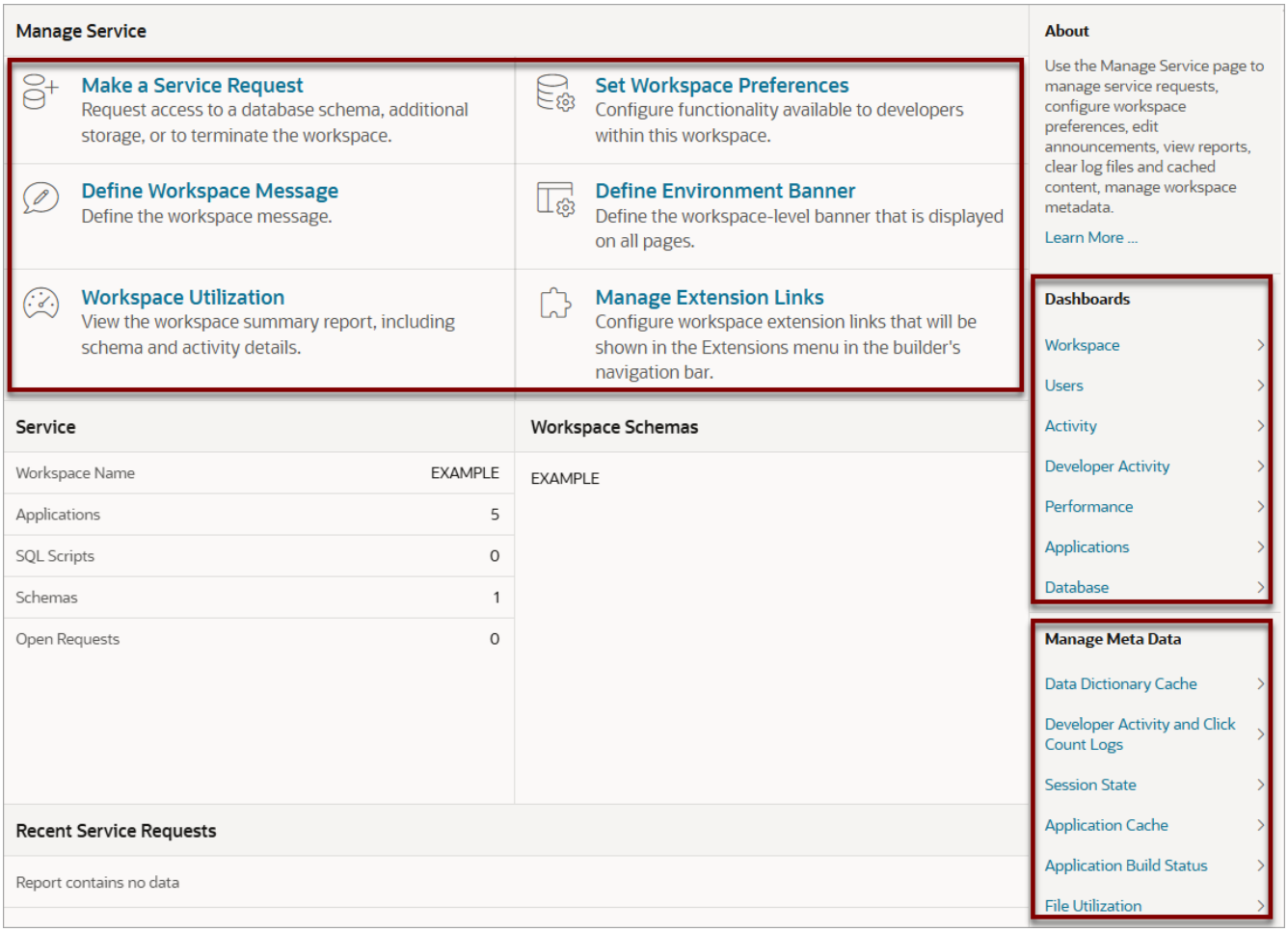

Links displaying under **Manage Service**:

- **Make a Service Request**. Request a new schema, request additional storage space, or terminate a workspace. See Making a Service Request.
- **Set Workspace Preferences**. Configure login controls, App Builder, SQL Workshop, PL/SQL editing capability, RESTful service support, and Team Development. See Configuring Workspace Preferences.
- **Define Workspace Message**. Define a workspace messages. See Defining a Workspace Message.
- **Define Environment Banner**. Define a workspace-level banner that displays on all pages. See Configuring an Environment Banner for a Workspace.
- **Workspace Utilization**. Define a workspace message. See Defining a Workspace Message.
- **Manage Extension Links**. Configure links that display on the Extensions menu on the APEX menu bar. See Managing Links on the Extension Menu.

Dashboards

The **Dashboards** region displays links to specific dashboards, including: Workspace, Users, Activity, Developer Activity, Performance, Applications, and Database. See Viewing Workspace Dashboards.

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Manage Meta Data

Links displaying under **Manage Meta Data**:

- **Data Dictionary Cache**. View the Data Dictionary Cache report to manually refresh the Data Dictionary Cache. See Accessing the Data Dictionary Cache Report from Workspace Administration.
- **Developer Activity and Click Count Logs** - Manually purge developer logs and the External Count Clicks log on the Log files page. See Purging the Developer Activity and Click Count Log Files.
- **Session State** - View session details for the current session or for recent sessions, purge the current session state, or purge sessions based on their age. See Managing Session State for a Workspace.
- **Application Cache** - View and purge cached regions and pages. See Managing Page and Region Caching.
- **Application Build Status** - Configure Build Status at the workspace-level. See Changing Build Status for Multiple Applications.
- **File Utilization** - Use the File Utilization report to identify areas using excessive storage. See Viewing File Utilization.
- **Interactive Report Settings** - View pages to view and manage saved interactive reports and manage email subscriptions. See Managing Saved Interactive Reports.

2.3 Making a Service Request

Workspace administrators use the Request Service page to request a schema, add storage space, terminate a workspace, or request another workspace.

> **Tip**
>
> You can access many workspace administration functions (such as **Manage Service, Make a Service Request**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

- Determining the Space Available in a Workspace
  View the Detailed Tablespace Utilization report to determine the amount of free space available in a workspace. Oracle recommends viewing this report prior to requesting additional storage.
- Viewing the Service Request History for the Workspace
  View the Service Request History report to determine the status of prior service requests in a workspace.
- Requesting a New Schema
  Request a new schema by making a service request and selecting Request Schema.
- Requesting More Storage
  Request more storage for a workspace by making a service request and selecting Request Storage.

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- Requesting Another Workspace
  Request another workspace using a service request.
- Terminating a Workspace
  Terminate a workspace by making a service request and selecting Request Termination.

> **See Also**
>
> Managing Requests

2.3.1 Determining the Space Available in a Workspace

View the Detailed Tablespace Utilization report to determine the amount of free space available in a workspace. Oracle recommends viewing this report prior to requesting additional storage.

- Viewing the Detailed Tablespace Utilization Report
  Determine the amount of space available in a workspace by viewing the Detailed Tablespace Utilization Report.

> **See Also**
>
> Requesting More Storage

2.3.1.1 Viewing the Detailed Tablespace Utilization Report

Determine the amount of space available in a workspace by viewing the Detailed Tablespace Utilization Report.

To view the Detailed Tablespace Utilization report:

1. Navigate to the Workspace Administration page:
   a. Sign in to Oracle APEX.
   b. Select the Administration menu and then **Administration**.

   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.

2.3.2 Viewing the Service Request History for the Workspace

View the Service Request History report to determine the status of prior service requests in a workspace.

Workspace developers and administrators can view the Service Request History report prior to requesting additional storage to determine whether prior storage requests have been declined due to some underlying error.

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To view the Service Request History report:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Make a Service Request**.
4. Expand **Service Request History**.

2.3.3 Requesting a New Schema

Request a new schema by making a service request and selecting Request Schema.

A schema is a named collection of database objects, including logical structures such as tables and indexes. A schema has the name of the database user who owns it.

To request a new schema:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Make a Service Request**.
4. Click **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**.

2.3.4 Requesting More Storage

Request more storage for a workspace by making a service request and selecting Request Storage.

To request more storage:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Make a Service Request**.
4. Click **Request Storage**.

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> **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**.

2.3.5 Requesting Another Workspace

Request another workspace using a service request.

To request a new workspace using a service request:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Make a Service Request**.
4. Click **Sign up for another workspace**.

   The Request a Workspace Wizard appears.
5. For Identification:
   a. First Name - Enter your first name.
   b. Last Name - Enter your last name.
   c. Email - Enter the email address. A link to activate your workspace will be sent to this email address.
   d. Workspace - Enter a workspace name that name uniquely identifies your development environment.
   e. Click **Next**.
6. If defined, review and accept the service agreement and click **Next**.
7. Verify your request and click **Submit Request**.

> **See Also**
>
> - Requesting a Workspace in Workspace Administration
> - About the Workspace Request Approval Process
> - Creating Workspaces in Administration Services
> - Requesting a Workspace from the Sign In Dialog in *Oracle APEX Installation Guide*

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2.3.6 Terminating a Workspace

Terminate a workspace by making a service request and selecting Request Termination.

To terminate a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Make a Service Request**.
4. Click **Request Termination**.
5. Confirm your request by clicking **Next**.

2.4 Configuring Workspace Preferences

Workspace administrators can configure preferences for a workspace on the Set Workspace Preferences page.

Use the Set Workspace Preferences page to configure account login controls, control access to App Builder, SQL Workshop, and Team Development, control support for PL/SQL editing in SQL Workshop, enable support for RESTful Services, configure email credentials, and configure Session Timeout.

Some workspace preferences can also be configured for an entire instance. If applicable, the section includes references to any instance-level settings.

> **Tip**
>
> You can access many workspace administration functions (such as **Manage Service, Set Workspace Preferences**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

- Managing Workspace Account Login Controls
  Configure workspace account login controls such as account expiration and locking, maximum number of failed login attempts, and end user account password lifetime.
- Controlling Access to App Builder
  Control whether developers can access App Builder.
- Controlling Access to SQL Workshop
  Control developer access to SQL Workshop.
- Configuring Email Credentials for a Workspace
  Configure email credentials for a workspace.
- Disabling PL/SQL Program Unit Editing for a Workspace
  Control whether developers can edit and compile PL/SQL program units from Object Browser.

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- Enabling RESTful Services and Defining a Path Prefix for a Workspace
  Workspace administrators can control whether RESTful Services are enabled in the current workspace.
- Configuring Team Development in an Existing Workspace
  Configure Team Development for a workspace.
- Configuring Session Timeout for a Workspace
  Use the Session Timeout attributes for a workspace to reduce exposure at the application-level for abandoned computers with an open web browser.

Related Topics

- Managing Component Availability for an Instance
  Control which components are available within an Oracle APEX instance, including App Builder, SQL Workshop, PL/SQL editing in SQL Workshop, Team Development, or Data Reporter.

2.4.1 Managing Workspace Account Login Controls

Configure workspace account login controls such as account expiration and locking, maximum number of failed login attempts, and end user account password lifetime.

- About Login Controls
  Workspace administrators can configure login controls for an individual workspace.
- Configuring Workspace Account Login Controls
  Configure login controls for an individual workspace.

Related Topics

- Configuring Authentication Controls for an Instance
  Administrators can configure authentication controls for an entire instance or for each individual workspace.

2.4.1.1 About Login Controls

Workspace administrators can configure login controls for an individual workspace.

Administrators can also configure login controls for an entire Oracle APEX instance. For example, if an Instance administrator configures account login controls in APEX Administration Services that configuration applies to all APEX 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

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> **Tip**
>
> This feature applies only to accounts created using the APEX user creation and management. Application Accounts Authentication provides additional authentication security for applications. See Managing Users in a Workspace.

2.4.1.2 Configuring Workspace Account Login Controls

Configure login controls for an individual workspace.

To configure login controls for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.
3. Account Login Control, Account Expiration and Locking - Determines whether APEX end user accounts can be expired or locked. This feature provides additional authentication security for applications and only applies to end-user accounts created using the APEX user management interface. Options include: **Enable** or **Disable**.

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

   If the Instance administrator sets the **Environment Setting Require User Account Expiration and Locking** to **Yes**, this means that this feature must be enabled for all workspaces, **Account Expiration and Locking** will display **Enable** and cannot be changed by the workspace administrator.
4. Account Login Control, 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.
5. Account Login Control, 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.
6. Click **Apply Changes**.

Related Topics

- Configuring Authentication Controls for an Instance
  Administrators can configure authentication controls for an entire instance or for each individual workspace.

2.4.2 Controlling Access to App Builder

Control whether developers can access App Builder.

To control access to App Builder:

1. Navigate to the Workspace Administration page:

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a. Sign in to APEX.

b. Select the Administration menu and then **Administration**.

The Workspace Administration home page appears.

2. Click **Manage Service**.
3. Click **Set Workspace Preferences**.
4. App Builder, Enable App Builder:
   - **Yes** - Enables App Builder
   - **Yes** - Disables App Builder.
5. Click **Apply Changes**.

> **Tip**
>
> These settings can be overridden by an Instance administrator. See Managing Component Availability for an Instance.

2.4.3 Controlling Access to SQL Workshop

Control developer access to SQL Workshop.

Deelopers use SQL Workshop to access tools for viewing and managing database objects.

To control access to SQL Workshop:

1. Navigate to the Workspace Administration page:

   a. Sign in to APEX.

   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.
3. SQL Workshop, Enable SQL Workshop - Specify whether to enable SQL Workshop in the current workspace. Use the SQL Workshop to access tools for viewing and managing database objects. Options include:
   - **Yes**- Enable access to SQL Workshop.
   - **No** - Disable access to SQL Workshop.
4. Click **Apply Changes**.

> **Tip**
>
> These settings can be overridden by an Instance administrator. See Managing Component Availability for an Instance.

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2.4.4 Configuring Email Credentials for a Workspace

Configure email credentials for a workspace.

> **Note**
>
> To enable APEX to send mail, an instance administrator must first configure instance-level email settings. To learn more, see Configuring Email.

Enabling the **Use Workspace SMTP Credentials** switch enables workspace administrators to configure a Web Credential that contains a SMTP Username and SMTP Password. APEX can then use these credentials to authenticate to the Email Server when sending emails for the current workspace.

To configure email credentials for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.

   Edit the following Email attributes.
3. Email, Instance SMTP Server - Displays the previously configured SMTP server used by APEX instance. To learn more, see Configuring Email
4. Email, Use Workspace SMTP Credentials - Specify whether to use workspace-specific credentials to authenticate with the SMTP server for sending email. If disabled, APEX will use credentials specified by the instance administrator.

   If enabled, the following additional attributes display.
5. Email, SMTP Authentication Credential - Select a Web Credential to use for authentication with the SMTP server. The list shows Web Credentials of the Basic Authentication type defined in the current workspace.

   To create new Web Credentials or edit an existing Web Credential, navigate to **Workspace Utilities**, **Web Credentials**. To learn more, see Managing Web Credentials.
6. Email, SMTP Web Credential Name - Provide a name for the new Web Credential. This name must be unique within the workspace.
7. Email, SMTP Username - Enter a username. If you enter a username, APEX authenticates against it when sending emails.
8. Email, SMTP Password - Enter a password. If you enter a password, APEX authenticates against it when sending emails.
9. Click **Apply Changes**.

> **Tip**
>
> Tip: You can use the **Test SMTP Credential** button to verify whether the credentials are correct.

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2.4.5 Disabling PL/SQL Program Unit Editing for a Workspace

Control whether developers can edit and compile PL/SQL program units from Object Browser.

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:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.
3. SQL Workshop, PL/SQL Editing - Select one of the following:
   - **Allow PL/SQL program unit editing**
   - **Do not allow PL/SQL program unit editing**

     Disabling this feature discourages developers from changing PL/SQL code directly from the Data Dictionary. If you select **Do not allow PL/SQL program unit editing**, developers can still create and replace PL/SQL program units using scripts or the SQL Command Processor.
4. Click **Apply Changes**.

Related Topics

- Disabling PL/SQL Program Unit Editing for an Instance
  Control if PL/SQL program unit editing is available in an instance.
- Managing Database Objects with Object Browser in *Oracle APEX SQL Workshop Guide*
- Using SQL Commands in *Oracle APEX SQL Workshop Guide*

2.4.6 Enabling RESTful Services and Defining a Path Prefix for a Workspace

Workspace administrators can control whether RESTful Services are enabled in the current workspace.

RESTful Services enable the declarative specification of RESTful services used to access the database. The definitions of RESTful services created within Oracle APEX are stored in the Oracle REST Data Services (ORDS) repository.

To configure RESTful access:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.

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3. SQL Workshop, Enable RESTful Services:
   - **Yes** - Enables developers to create and access RESTful Services mapped to SQL and PL/SQL.
   - **No** - Prevents developers from creating and accessing RESTful Services mapped to SQL and PL/SQL.
4. SQL Workshop, Path Prefix:

   > **Tip**
   >
   > **Path Prefix** only displays if **Enabled RESTful Services** is set to **Yes**.

   Specify the URI path prefix to be used to access RESTful Services in the current workspace. The default path prefix value is the name of the workspace.

   For example, a workspace named **QA_1** could have a path prefix set to **QA**. In this case, path to the RESTful service:

   `http://www.example.com/apex/qa/hr/employees/`
5. Click **Apply Changes**.

Related Topics

- Enabling RESTful Services for an Instance
  Controls the ability to create and access RESTful Services mapped to SQL and PL/SQL.
- Using SQL Commands in *Oracle APEX SQL Workshop Guide*

2.4.7 Configuring Team Development in an Existing Workspace

Configure Team Development for a workspace.

> **Tip**
>
> These settings described in this topic do not affect existing workspaces.

To enable users to attach files to issue comments in Team Development, you must set the **Enable Issue File Repository** attribute for the workspace to **Yes**.

To configure Team Development for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.
3. Team Development, Enable Team Development - Specify whether to enable Team Development in the current workspace. Select **Yes** or **No**.
4. Team Development, Enable Issue File Repository - Specify whether to enable file upload in the Team Development central file repository:
   - **Yes** - Select **Yes** to enable file upload to the Team Development central file repository.

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- **No** - Select **No** to disable file upload to the central file repository.

5. Team Development, Maximum Issue File Size (in MB) - Only displays if **Enable Issue File Repository** is set to **Yes**.

   Select the maximum file size for any file uploaded into the Team Development file repository. The default value is 15 MB.

6. Team Development, Enable Feedback File Repository - Specify whether to enable file upload for Feedback.

   > **Note**
   >
   > This attribute can only be modified if the feature configuration **Enable Feedback File Repository** is set to **Yes** in Administration Services.

   Options include:

   - **Yes** - Selecting **Yes** creates a local `APEX$` table to store the files.
   - **No** - Select **No** to disable file upload for Feedback.

7. Click **Apply Changes**.

Related Topics

- Configuring Team Development for New Workspaces
  Configure the following Team Development settings for new workspaces: Enable Issue File Repository, Maximum Issue File Size, Enable Feedback File Repository, and Maximum Feedback File Size.
- Managing Team Development in *Oracle APEX App Builder User's Guide*

2.4.8 Configuring Session Timeout for a Workspace

Use the Session Timeout attributes for a workspace to reduce exposure at the application-level for abandoned computers with an open web browser.

Workspace administrators configure Session Timeout for a workspace on the Set Workspace Preferences page.

> **Tip**
>
> This settings described in this topic are superseded by the corresponding application-level setting.

To configure Session Timeout attributes for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Select **Manage Service** and then **Set Workspace Preferences**.
3. Session Timeout, Maximum Session Length in Seconds - Define how long (in seconds) sessions can exist and be used by applications in this workspace.

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- Enter a positive integer to control how long a session can exist.
- Enter `0` to have sessions exist indefinitely.
- Leave the value empty in order to use the time defined at the instance-level.

4. Session Timeout, Maximum Session Idle Time in Seconds - The Session Idle Time is the time between the last page request and the next page request.
   - Enter a positive integer to control the default idle time for sessions used by applications in this workspace.
   - Leave the value empty in order to use the idle time defined at the instance-level.
5. Session Timeout, Session Timeout Warning in Seconds - The session timeout warning time defines (in seconds) how long before a session times out (either maximum session length, or maximum session idle time), to warn the user. For the maximum session idle time warning, the user will have the opportunity to extend the session. For maximum session length warning, the user will be prompted to save any work, to avoid loss of data when the session maximum time is reached.
   - Enter a positive integer to control the default idle time for sessions used by applications in this workspace.
   - Enter `0` to switch off session timeout warnings for sessions used by applications in this workspace.
   - Leave the value empty in order to use the warning time defined at instance level.
6. Click **Apply Changes**.

Related Topics

- Configuring Session Timeout for an Instance
  Use the Session Timeout attributes for an instance to reduce exposure at the application-level for abandoned computers with an open web browser.
- Session Management in *Oracle APEX App Builder User's Guide*

2.5 Defining a Workspace Message

Workspace administrators can quickly communicate with other users by creating workspace messages.

- About Workspace Messages
  Workspace messages enable administrators to quickly communicate with other users.
- Defining and Editing Workspace Messages
  Define or edit a workspace message from either the Workspace home or the Administration page.

> **See Also**
>
> Defining a Workspace Message in Administration Services

2.5.1 About Workspace Messages

Workspace messages enable administrators to quickly communicate with other users.

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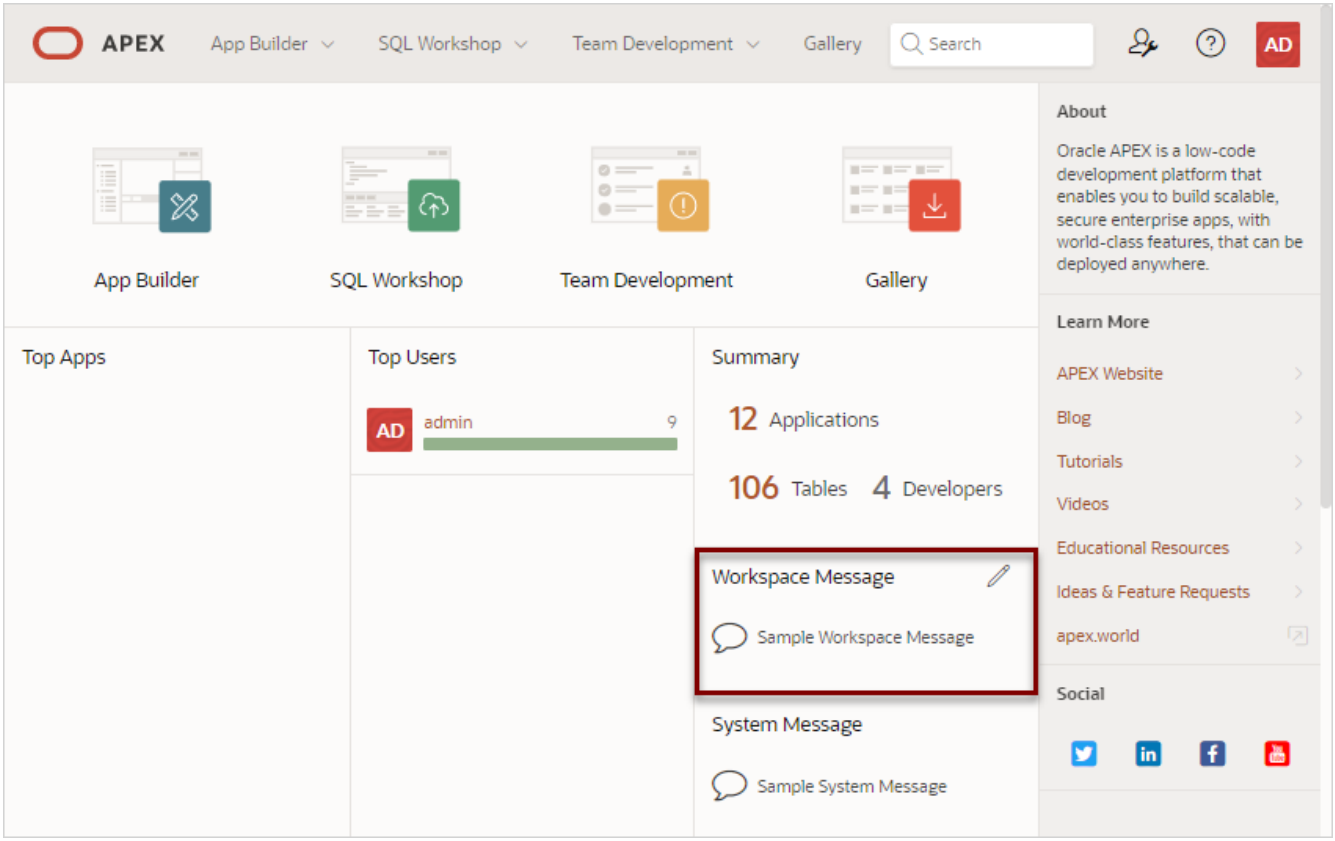
Workspace messages display both on the Workspace home page and on the Workspace Administration page.

On the Workspace home page (shown below) the Workspace Message displays beneath the Summary region and reads **Sample Workspace Message**.



The Workspace Message region also display in the center of the Workspace Administration page as shown in the next illustration. In the following example the Workspace Message also reads `Sample Workspace Message`. Administrators can update or edit a workspace message on either page by clicking the edit icon.

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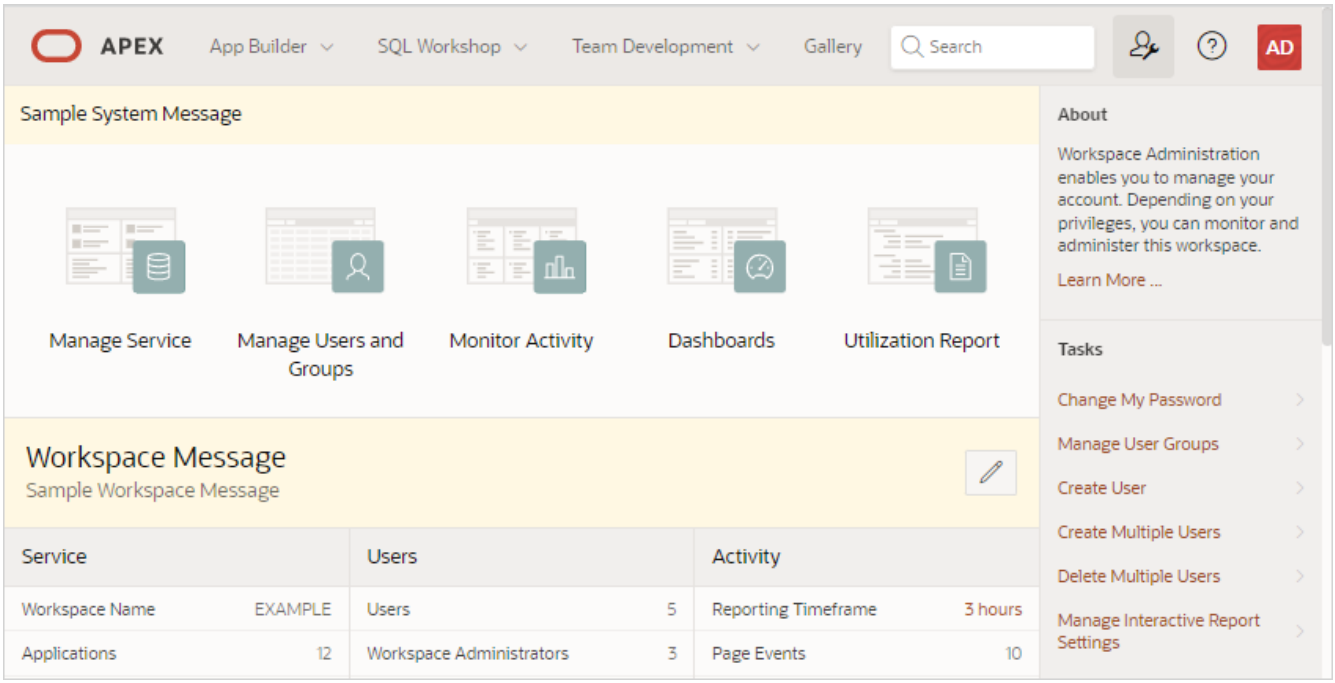

2.5.2 Defining and Editing Workspace Messages

Define or edit a workspace message from either the Workspace home or the Administration page.

To define or edit a workspace message:

1. To define a workspace message from Workspace home page:
   a. On the Workspace home page, find the Workspace Message region.
   b. Click the **Define Workspace Message** icon.
   c. In Message, enter or remove text. Use standard HTML tags to include formatting.
   d. Click **Apply Changes**.
2. To define a workspace message from the Workspace Administration page:
   a. Sign in to Oracle APEX.
   b. Select the Administration menu and then **Administration**.

      The Workspace Administration home page appears.
   c. Click the **Define Workspace Message** icon.
   d. In Message, enter or remove text. Use standard HTML tags to include formatting.
   e. Click **Apply Changes**.

> **See Also**
>
> Defining a Workspace Message in Administration Services

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2.6 Configuring an Environment Banner for a Workspace

Configure a environment banner for a workspace on the Workspace Administration page.

Environment banners can display at either the left or top of page. You can define an environment banner for a given workspace or an entire development instance. Workspace-level environment banners override those those defined at the instance-level.

> **Note**
>
> If a workspace or instance-level environment banner is enabled, the text and color is displays in App Builder pages and Runtime Developer toolbar in the application runtime.

To configure a environment banner for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Service**.
3. Click **Define Environment Banner**.
4. In the Workspace Environment Banner dialog:

   > **Note**
   >
   > If an instance-level environment banner already exists, a warning note appears. Workspace-level environment banners override those defined at the instance-level.

   a. Enable Banner - Specify whether to include an environment banner. Select **Yes** or **No**.
   b. Position - Select the banner display position. Select **Left** or **Top**.
   c. Label - Enter text to display as a label on the banner.
   d. Color - Select the banner color.
5. Click **Apply Changes**.

   A confirmation message appears that reads:

   `The workspace level environment banner saved.`

   The workspace-level environment banner displays on the left side of the page.

> **See Also**
>
> Configuring an Environment Banner in Administration Services

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2.7 Managing Links on the Extension Menu

Workspace administrators can add custom links to the Extensions menu on the APEX menu bar.

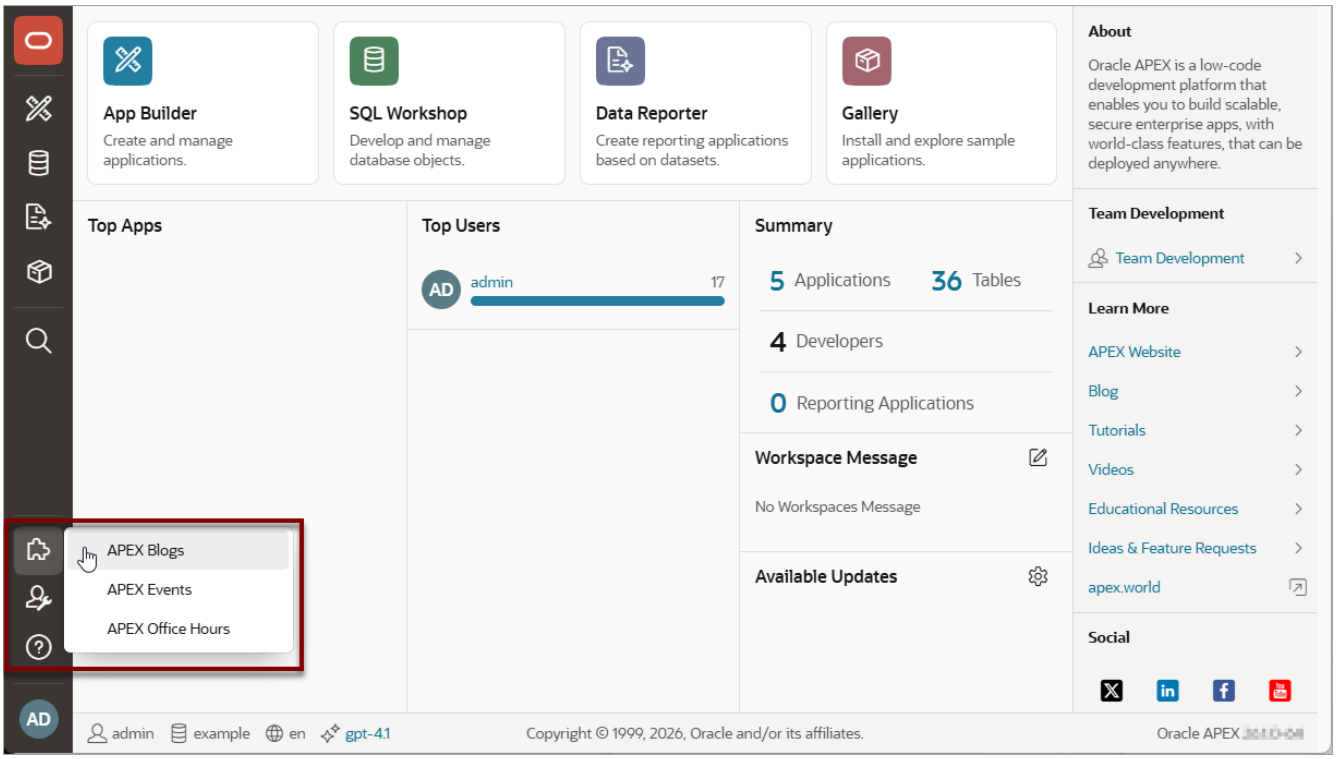
- About the Extension Menu
  View an sample Extension menu and learn about supported link substitution strings.
- Adding, Editing, and Deleting Extension Menu Links
  Add, edit, and delete Extension menu links in Workspace Administration.
- Managing Extension Subscriptions
  Create a subscription to utilize an Extension menu created in another workspace.

2.7.1 About the Extension Menu

View an sample Extension menu and learn about supported link substitution strings.

Workspace administrators can add custom links to the Extensions menu on the APEX menu bar. The Extension menu only appears on the menu bar if a Workspace Administrator has added links to it. When configured, the Extension menu displays on the APEX menu bar between the **Global Search** field and the **Administration** menu.

In the following example, the Extensions menu displays link to APEX Blogs, APEX Events, and APEX Office Hours.



Supported Link Substitution Strings

Links added to the Extension menu must point to a valid URL and can include substitution strings for the workspace name, workspace ID, username, session session ID, current

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application and current page as described in the following table. The link substitution strings described in this topic can only be used when defining URLs in the Extension menu and support Session State Substitution syntax (also called `&ITEM.` syntax). No other documented substitution variables will work in this context.

> **Tip**
>
> To learn more about Session State Substitution syntax, see About Using Substitution Strings in *Oracle APEX App Builder User's Guide*.

Substitution String	Description
`EXT_WORKSPACE_NAME`	Name of the workspace from where the link is opened.
`EXT_WORKSPACE_ID`	Workspace ID (or Security Group ID) of the workspace from where the link is opened.
`EXT_APP_ID`	Application ID of the app that the developer currently has open. If no application is open in session state, this value is empty.
`EXT_APP_NAME`	The Application Name of the app that the developer currently has open. If no application is open in session state, this value is empty.
`EXT_APP_ALIAS`	The Application Alias of the app that the developer currently has open. If no application is open in session state, this value is empty.
`EXT_PAGE_ID`	The Page ID of the app that the developer currently has open in the App Builder. If no page is open in session state, this value is empty.
`EXT_PAGE_NAME`	The Page Name of the app that the developer currently has open in the App Builder. If no application is open in session state, this value is empty.
`EXT_PAGE_ALIAS`	The Page Alias of the app that the developer currently has open in the App Builder. If no application is open in session state, this value is empty.
`APP_USER`	The current user (or developer).
`APP_SESSION_ID`	The current session state ID.

> **See Also**
>
> Using Substitution Strings

2.7.2 Adding, Editing, and Deleting Extension Menu Links

Add, edit, and delete Extension menu links in Workspace Administration.

- Adding Extension Menu Links
  Add links to the Extension menu in Workspace Administration on the Manage Service, Links page.
- Editing Extension Menu Links
  Edit links on the Extension menu on the Create / Edit Link page in Workspace Administration.

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- Deleting Extension Menu Links
  Delete links on the Extension menu on the Create / Edit Link page.

2.7.2.1 Adding Extension Menu Links

Add links to the Extension menu in Workspace Administration on the Manage Service, Links page.

> **Note**
>
> The Extension menu only appears on the menu bar if a Workspace Administrator has added Extension menu links.

To add links to the Extension menu:

1. Navigate to the Links page:
   a. Sign in to APEX.
   b. From the **Administration** menu, select **Manage Service** and then **Manage Extension Links**.

   The Links page appears and displays as an editable interactive gird.
2. To add a new link to the Extensions menu:
   a. Add a new row by clicking **Add Row**. Options include:
      - To add a new first row, do not select a row and click **Add Row**.
      - To add a new row after a selected row, select a row and click **Add Row**.
   b. Select and edit the cells in the new row:
      - Sequence - Specify the display sequence for the link entry. The sequence determines the display order in the Extensions menu.
      - Label - Enter the label for the link to display in the Extensions menu.
      - URL - Enter a valid URL target for this link. Links can include substitutions. See About the Extension Menu.
      - Public - Public - This attribute only dispslays in Workspaces that are configured to host Extension Applications. To make a link visible in the Extension menu of subscribing workspace, set **Public** to **Yes**.
      - Tab Identifier - Names the browser tab in which the URL opens. If a tab with the same name already exists, that Tab Identifier is reused when the user clicks the Extension Menu link.
        Multiple entries can have the same Tab Identifier and can share (that is, open or reuse) the same browser tab. If the Tab Identifier is empty or null, the Extension Menu link will open it's own tab and re-open reusing that same tab.
      - Description - Record comments about the link for informational purposes only.
   c. Click **Save**.

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> **See Also**
>
> - Enabling Extension Menu Subscriptions
> - Using Interactive Grids in *Oracle APEX App Builder User's Guide*

2.7.2.2 Editing Extension Menu Links

Edit links on the Extension menu on the Create / Edit Link page in Workspace Administration.

To edit links on the Extension menu:

1. Navigate to the Links page:
   a. Sign in to APEX.
   b. From the **Administration** menu, select **Manage Service** and then **Manage Extension Links**.

   The Links page appears and displays as an editable interactive grid.
2. Find the row and click the **Edit** icon.

   > **Tip**
   >
   > You can also edit the link information directly by clicking the **Edit** button on the toolbar, or double clicking on a cell. See Using an Editable Interactive Grid in *Oracle APEX End User's Guide*.
3. On the Create / Edit Link page:
   a. Name - Enter the label for the link to display in the Extensions menu.
   b. Sequence - Specify the display sequence for the link entry. The sequence determines the display order in the Extensions menu.
   c. URL - Enter a valid URL target for this link. Links can include substitutions. See About the Extension Menu.
   d. Public - This attribute only dispslays in Workspaces that are configured to host Extension Applications. To make a link visible in the Extension menu of subscribing workspace, set **Public** to **Yes**.
   e. Tab Identifier - Names the browser tab in which the URL opens. If a tab with the same name already exists, that Tab Identifier is reused when the user clicks the Extension Menu link.

      Multiple entries can have the same Tab Identifier and can share (that is, open or reuse) the same browser tab. If no Tab Identifier is provided, a unique identifier will be generated that will ensure the Extension Menu Link always opens in the same tab.
   f. Description - Record comments about the link for informational purposes only.
   g. Click **Apply Changes**.

> **See Also**
>
> Enabling Extension Menu Subscriptions

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2.7.2.3 Deleting Extension Menu Links

Delete links on the Extension menu on the Create / Edit Link page.

To delete links on the Extension menu:

1. Navigate to the Links page:
   a. Sign in to APEX.
   b. On Workspace home page, click the **Administration** menu and select **Manage Service** and then **Manage Extension Links**.

   The Links page appears and displays as an editable interactive gird.
2. To delete a row:
   a. Find the row containing the link to be deleted and click the **Edit** icon.
   b. On the Create / Edit Link page, click **Delete**.

      A confirmation dialog appears. Click **OK** to confirm the action.

> **Tip**
>
> You can also delete an specific rows by clicking the **Row Actions** menu and selecting **Delete**. See Deleting a Row in an Interactive Grid in *Oracle APEX End User's Guide*.

2.7.3 Managing Extension Subscriptions

Create a subscription to utilize an Extension menu created in another workspace.

> **Tip**
>
> Use the Builder Extension Sign-in authentication scheme to enable developers to open the extension app from a Builder session without having to sign-in with username/password. See About Builder Extension Sign-In in *Oracle APEX App Builder User's Guide*.

- Enabling Extension Menu Subscriptions
  Before you can subscribe to an Extension menu in another workspace, you must enable the Allow Hosting Extension attribute in Administration Services and make the links public.
- Subscribing to Extension Menu Links
  Subscribe to Extension menu links in another workspace.
- Editing or Unsubscribing to Extension Subscriptions
  Learn how to edit or unsubscribe to an Extension subscriptions.

2.7.3.1 Enabling Extension Menu Subscriptions

Before you can subscribe to an Extension menu in another workspace, you must enable the Allow Hosting Extension attribute in Administration Services and make the links public.

To enable Extension menu subscriptions:

1. Enable the **Allow Hosting Extension** attribute:

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a. Sign in to Administration Services.

b. Navigate to **Manage Workspaces**, **Existing Workspaces**, and click the workspace name.

c. Find Component Availability, Allow Hosting Extension - Select one of the following:

- **Yes - Manual Subscription** - The workspace can host and publish extensions. Manual Subscriptions require a Workspace Administrator to grant read access manually.
- **Yes - Automatic Subscription** - The workspace can host extensions and extension menu entries are automatically published to all other workspaces in the instance, without the need to subscribe and grant read access manually.

d. To save your changes, click **Apply Changes**.

> **Note**
>
> For more details on editing the **Allow Hosting Extension** attribute, see Viewing Existing Workspace Information.

2. Edit the links to be included in the subscription and make them public.

a. Sign in to the hosting workspace.

b. On Workspace home page, click the **Administration** menu and select **Manage Service** and then **Manage Extension Links**.

The Links page appears.

c. For each link to be included in the subscription, click the **Edit** icon.

d. Public - Select **Yes**.

e. Click **Apply Changes**.

2.7.3.2 Subscribing to Extension Menu Links

Subscribe to Extension menu links in another workspace.

> **Note**
>
> Before you can create a subscription, the administrator hosting the Extension menu links, must complete the tasks described in Enabling Extension Menu Subscriptions.

To subscribe to Extension menu links in another workspace:

1. Navigate to the Links page:

a. Sign in to the workspace.

b. On Workspace home page, click the **Administration** menu and select **Manage Service** and then **Manage Extension Links**.

The Links page appears.

2. Click the **Subscriptions** tab.
3. Click **Add Subscription**.
4. On Subscribe to Extension Workspace:

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a. Extension Workspace - Specify the workspace with published links you want to include in the Extension menu of your workspace.

b. Menu Label Overwrite - By default, the name of the extension workspace becomes the parent menu item of all published links. Use this attribute enter a different label for the parent menu item here.

c. Has Read Access - Indicate whether the specified extension workspace is allowed to access the metadata of your workspace through the APEX repository views.

   If read access is granted by the invoking workspace, you can also access the application metadata (views) of the invoking workspace.

d. Click **Subscribe**.

> **Tip**
>
> Use the `APEX_EXTENSION.SET_WORKSPACE` package to access repository data of workspaces that have granted read access to an Extension workspace in Automations or PL/SQL in APEX session context. See APEX_EXTENSION in *Oracle APEX API Reference*.

2.7.3.3 Editing or Unsubscribing to Extension Subscriptions

Learn how to edit or unsubscribe to an Extension subscriptions.

To edit or unsubscribe to an Extension subscription:

1. Navigate to the Links page:
   a. Sign in to the workspace.
   b. On Workspace home page, click the **Administration** menu and select **Manage Service** and then **Manage Extension Links**.

   The Links page appears.
2. Click the **Subscriptions** tab.
3. To edit the Extension subscription:
   a. Click workspace name.
   b. Menu Label Overwrite - By default, the name of the extension workspace becomes the parent menu item of all published links. Use this attribute enter a different label for the parent menu item here.
   c. Has Read Access - Indicate whether the specified extension workspace is allowed to access the metadata of your workspace through the APEX repository views.
   d. Click **Apply Changes**.
4. To delete the Extension subscription:
   a. Click workspace name.
   b. Click **Unsubscribe**.

2.8 Managing Users in a Workspace

Workspace administrators can create new user accounts, manage existing user accounts, and change user passwords.

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> **Tip**
>
> You can access many workspace administration functions (such as **Manage Service**, **Manage Users**, and **Groups**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

- About Oracle APEX Accounts Authentication
  Oracle APEX Accounts authentication is a built-in authentication method in which user accounts are created and managed in the APEX user repository. User accounts are particularly useful if your application is using Oracle APEX Accounts authentication.
- About Oracle APEX User Roles
  APEX users are divided into four roles.
- Creating User Accounts
  Workspace administrators can create new user accounts one at a time, or create multiple accounts in a single operation.
- Editing Existing User Accounts
  Edit existing user accounts on the Manage Users and Groups page.
- Locking and Unlocking a User Account
  Control access to a workspace by locking and unlocking a user account.
- Changing a User Account Password
  Change user account passwords on the Manage Users and Groups page.
- Deleting User Accounts
  Workspace administrators can delete user accounts one at a time or delete multiple accounts in a single operation.
- 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
- Using Groups to Manage Oracle APEX Users
  Workspace administrators can create and manage APEX users using groups. Groups enable administrators to categorize and manage user privileges.

Related Topics

- Managing Workspace Account Login Controls
  Configure workspace account login controls such as account expiration and locking, maximum number of failed login attempts, and end user account password lifetime.
- Managing Users Across an Oracle APEX Instance
  An Instance administrator manages all user accounts within an Oracle APEX instance on the Manage Developers and Users page.

2.8.1 About Oracle APEX Accounts Authentication

Oracle APEX Accounts authentication is a built-in authentication method in which user accounts are created and managed in the APEX user repository. User accounts are particularly useful if your application is using Oracle APEX Accounts authentication.

Related Topics

- Configuring Authentication Schemes for an Instance
  Instance administrators configure authentication schemes for an Oracle APEX instance.

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- Understanding Preconfigured Authentication Schemes in *Oracle APEX App Builder User's Guide*

2.8.2 About Oracle APEX User Roles

APEX users are divided into four roles.

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

- **End users** do not have access to development or administrative capabilities. End users cannot sign in to a workspace and create applications. End users can only run existing applications.
- **Developers** are users who create and edit applications, monitor workspace activity, and view dashboards.
- **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 APEX Administration Services application. Instance administrators create workspaces, configure features and instance settings, and manage security.

2.8.3 Creating User Accounts

Workspace administrators can create new user accounts one at a time, or create multiple accounts in a single operation.

- Creating a New User Account
  Create new user accounts from the Manage Users and Groups page.
- Creating Multiple Users Simultaneously
  Create multiple new user accounts simultaneously.

Related Topics

- Using Groups to Manage Oracle APEX Users
  Workspace administrators can create and manage APEX users using groups. Groups enable administrators to categorize and manage user privileges.

2.8.3.1 Creating a New User Account

Create new user accounts from the Manage Users and Groups page.

To create a new user account:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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:

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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 (.)

   The username may also be used to reference user activity using the monitor applications. The bind variable `:app_user` returns the value of the current user when building applications.

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) - 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.

   c. Uses are workspace administrators - Select **On** or **Off**.

      To enable Workspace administrator privileges, select **On**.

      Workspace administrator automatically have all developer privileges enabled. Additionally, workspace administrators can also manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.

   d. Users are developers - Select **On** or **Off**.

      Specify if these users should have developer privileges. Developers can create and modify applications and database objects.

      To enable developers privileges, select **On**.

      > **Tip**
      >
      > To create an End User account, disable both **User is an administrator** and **User is a developer**. End users can only run existing applications.

   e. Component access:
      - App Builder Access - Determines whether a developer has access to App Builder. Use App Builder to create and manage applications and application pages. Select **On** or **Off**.
      - SQL Workshop Access - Determines whether a developer has access to the SQL Workshop. SQL Workshop provides tools that enable you to view and manage database objects. Select **On** or **Off** .

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- Team Development Access - Determines whether a user has access to the Team Development. Use Team Development to track and manage issues in a conversational fashion. Select **On** or **Off**.
- Data Reporter Access - Determines whether a user has access to Data Reporter. An administrator always has access to Data Reporter. Select **On** or **Off**.

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

6. Under Password:
   a. Password - Enter a case-sensitive password.
   b. Confirm Password - Enter the password again.
   c. Require Change of Password On First Use - Select **Yes** to require the user to change the password immediately when logging in the first time. Select **No** to allow the user to use the same password until it expires.
7. 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**.

> **Tip**
>
> An Instance administrator can configure these settings for an entire Oracle APEX instance and define password complexity policies. See About Authentication Controls, About Strong Password Policies, and Configuring Password Policies.

2.8.3.2 Creating Multiple Users Simultaneously

Create multiple new user accounts simultaneously.

To create multiple users at once, enter or copy and paste email addresses separated by commas, semicolons, or new lines. Note that the password you specify will be assigned to each user and users will need to change their passwords upon login.

To create multiple user accounts simultaneously:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Users and Groups**.
3. Click **Create Multiple Users**.

   The Create Multiple Users page appears.
4. List of Email Addresses - Enter or copy and paste email addresses separated by commas, semicolons, or new lines. Note that if you copy and paste email addresses from email messages, extraneous text will be filtered out.
5. Usernames - Specify whether to include or exclude the domain name. Options include:

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- **Set username to full email address** - Includes the 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:

   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) - 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.

   c. Uses are workspace administrators - Select **Yes** or **No**.

      Workspace administrator automatically have all developer privileges enabled. Additionally, workspace administrators can also manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.

      To enable Workspace administrator privileges, select **Yes**.

   d. Users are developers - Select **Yes** or **No**.

      Specify if these users should have developer privileges. Developers can create and modify applications and database objects.

      To enable developers privileges, select **Yes**.

      > **Tip**
      >
      > To create an End User account, disable both **User is an administrator** and **User is a developer**. End users can only run existing applications.

   e. Component access:

      - App Builder Access - Determines whether a developer has access to App Builder. Use App Builder to create and manage applications and application pages. Select **Yes** or **No**.
      - SQL Workshop Access - Determines whether a developer has access to the SQL Workshop. SQL Workshop provides tools that enable you to view and manage database objects. Select **Yes** or **No** .
      - Team Development Access - Determines whether a user has access to the Team Development. Use Team Development to track and manage issues in a conversational fashion. Select **Yes** or **No**.
      - Data Reporter Access - Determines whether a user has access to Data Reporter. An administrator always has access to Data Reporter. Select **Yes** or **No**.

        > **Tip**
        >
        > Data Reporter Access is disabled when Data Reporter Access is disabled for the workspace by an instance administrator.

7. Under Password:

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- 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**.

2.8.4 Editing Existing User Accounts

Edit existing user accounts on the Manage Users and Groups page.

To edit an existing user account:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Users and Groups**.
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**.

2.8.5 Locking and Unlocking a User Account

Control access to a workspace by locking and unlocking a user account.

To lock or unlock a user account:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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 Privileges, Account Availability:
   - **Locked** - Select this option to make the account unavailable.
   - **Unlocked** - Select this option to make the account available.

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> **Tip**
>
> 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 APEX instance.

6. Click **Apply Changes**.

Related Topics

- Configuring Security
  Instance administrators can configure instance security, including service-level security, configuring support for Real Application Security, configuring session time out, preventing browser attacks by isolating workspaces, excluding domains from regions and Web services, configuring authentication controls, creating strong password policies, and managing authorized URLs.

2.8.6 Changing a User Account Password

Change user account passwords on the Manage Users and Groups page.

To change a user account password:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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. Under Password:
   a. Password - Enter a case-sensitive password.
   b. Confirm Password - Enter the password again.
   c. 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 of this account to change the password immediately after logging in the first time using the current password. This rule applies to the use of this account for workspace administration or development as well as to use of this account to sign in to running applications.
5. Click **Apply Changes**.

Related Topics

- Resetting Your Password
  Reset your password by clicking Change My Password under Tasks on the Workspace Administration page.

2.8.7 Deleting User Accounts

Workspace administrators can delete user accounts one at a time or delete multiple accounts in a single operation.

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- Deleting a Single User Account
  Delete single user accounts on the Manage Users and Groups page.
- Deleting Multiple Users at Once
  Delete multiple user accounts at once on the Manage Users and Groups page.

2.8.7.1 Deleting a Single User Account

Delete single user accounts on the Manage Users and Groups page.

To delete a user account:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Users and Groups**.
3. Select a user.

   The Edit User page appears.
4. Click **Delete User**.
5. Confirm your selection and click **OK**.

2.8.7.2 Deleting Multiple Users at Once

Delete multiple user accounts at once on the Manage Users and Groups page.

To delete multiple user accounts in a single operation:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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**.

2.8.8 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

To view the Users Dashboard:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.

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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.

Related Topics

- Viewing Workspace Dashboards
  Use the Dashboard page to view details about the current workspace and monitor overall workspace activity.

2.8.9 Using Groups to Manage Oracle APEX Users

Workspace administrators can create and manage APEX users using groups. Groups enable administrators to categorize and manage user privileges.

- About Groups
  Administrators can create user groups to restrict access to various parts of an application.
- Creating a Group
  Create user groups on the Groups page.
- Editing an Existing User Group
  Edit user groups on the Groups page.
- Adding and Removing Users from a Group
  Add and remove user groups on the Edit User page.
- Assigning a Group to Another Group
  Manage privileges by assigning application groups to user groups.
- Viewing Group Assignments
  The Group Assignments page lists groups assigned to users and other groups. Use groups to categorize and manage privileges.

Related Topics

- Managing Users in a Workspace
  Workspace administrators can create new user accounts, manage existing user accounts, and change user passwords.
- About Oracle APEX Accounts Authentication
  Oracle APEX Accounts authentication is a built-in authentication method in which user accounts are created and managed in the APEX user repository. User accounts are particularly useful if your application is using Oracle APEX Accounts authentication.

2.8.9.1 About Groups

Administrators can create user groups to restrict access to various parts of an application.

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Creating user groups enables administrators 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 APEX Account Credentials authentication.

2.8.9.2 Creating a Group

Create user groups on the Groups page.

To create a new group:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Users and Groups**.
3. Click **Groups**.
4. Click **Create User Group**.

   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**.
5. Click **Create Group**.

2.8.9.3 Editing an Existing User Group

Edit user groups on the Groups page.

To edit an existing group assignment:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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 a group.

   The User Group page appears.
5. Make the appropriate edits and click **Apply Changes**.

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2.8.9.4 Adding and Removing Users from a Group

Add and remove user groups on the Edit User page.

To add or remove a user from a group:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   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 Group Assignments.

   Each user belongs to the groups on the right.
5. To add a user to a group, select the group and click **Move**.
6. To remove a user from a group, select the group and click **Remove**.
7. Click **Apply Changes**.

2.8.9.5 Assigning a Group to Another Group

Manage privileges by assigning application groups to user groups.

To assign a group to another group:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Click the **Administration** menu and select **Administration**.

   The Workspace Administration home page appears.
2. Click **Manage Users and Groups**.
3. Click **Groups**.
4. Select the user 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**.

2.8.9.6 Viewing Group Assignments

The Group Assignments page lists groups assigned to users and other groups. Use groups to categorize and manage privileges.

To view group assignments:

1. Navigate to the Workspace Administration page:

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a. Sign in to APEX.

b. Click the **Administration** menu and select **Administration**.

The Workspace Administration home page appears.

2. Click **Manage Users and Groups**.
3. Click **Group Assignments**.
4. Select the grantee to edit.

2.9 Accessing the Data Dictionary Cache Report from Workspace Administration

Access the Data Dictionary Cache report from Workspace Administration to view statistics and data analysis of schema tables and caches in a workspace.

- About the Data Dictionary Cache Report
  Learn about the Data Dictionary Cache report.
- Viewing or Refreshing Data Dictionary Cache in Workspace Administration
  View or refresh the Data Dictionary Cache for a workspace in Workspace Administration.

> **See Also**
>
> Accessing the Data Dictionary Cache Report from Administration Services

2.9.1 About the Data Dictionary Cache Report

Learn about the Data Dictionary Cache report.

The Data Dictionary Cache report captures statistics and data analysis of schema tables and caches in the current workspace.

If the tables change due to DDL or DML modifications, the APEX nightly job `ORACLE_APEX_DICTIONARY_CACHE` refreshes the Data Dictionary Cache. If the Data Dictionary Cache is incorrect or out of date, you can update the cache manually by clicking **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.

The Create Application Wizard and Create Page Wizard also use this information when creating new applications and pages.

2.9.2 Viewing or Refreshing Data Dictionary Cache in Workspace Administration

View or refresh the Data Dictionary Cache for a workspace in Workspace Administration.

To view or refresh the Data Dictionary Cache report for a workspace:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.
2. On the The Workspace Administration home page, click **Manage Service**.

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3. Under **Manage Meta Data** on the right side of the page:
   a. Click **Data Dictionary Cache**.

      The Data Dictionary Cache report appears.

   b. To refresh the cache manually click either **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.

   c. Click the workspace name.
4. To view cache for table:
   a. Click the table name.

      The Table Column Cache report appears. The **Facets Search Score** and **Facet Display** columns indicate how the Create Application Wizard and Create Page Wizard will render facets when creating a Faceted Search page.

   b. To refresh the cache manually click either **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.

> **See Also**
>
> List of DBMS_SCHEDULER Jobs

2.10 Purging the Developer Activity and Click Count Log Files

Manually purge developer logs and the External Count Clicks log on the Log files page. Log entries older than one month are automatically deleted.

> **Tip**
>
> You can access many workspace administration functions (such as **Manage Service**) from both the Administration menu and the Workspace Administration home page. For consistency, this section navigates the user to the Workspace Administration home page.

- Purging the Developer Activity Log
  The Developer Activity Log tracks changes to applications within the current workspace.
- 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**
>
> Configuring and Deleting Logs and Log Entries

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2.10.1 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:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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**.

2.10.2 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.

To purge the external Click Count Log:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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 Counting Log** tab.
5. Click **Purge Click Log**.

> **See Also**
>
> Viewing Workspace Dashboards and COUNT_CLICK Procedure in *Oracle APEX API Reference*

2.11 Managing Session State for a Workspace

A session establishes persistence (or stateful behavior) across page views. Workspace 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
  A session is a logical construct that establishes persistence (or stateful behavior) across page views. Each session is assigned a unique ID, which the APEX engine uses to store

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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.

- Removing Session State After Reviewing Session Details
  Determine whether to remove existing sessions by first reviewing session details. From the Session Details page, administrators can remove the session record or session state.
- Viewing Session State for the Current Session
  View sessions state for the current session on the Session State page.
- Purging Sessions by Age
  Purge existing sessions by age on the Purge Sessions page.
- Purging Session State for the Current Session
  Purge session state for the current session on the Purge Session State page.

See Also

- Managing Session State for an Instance
- Understanding Session State Management in *Oracle APEX App Builder User's Guide*

2.11.1 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 APEX 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 Session State? in *Oracle APEX App Builder User's Guide*

2.11.2 Removing Session State After Reviewing Session Details

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

To view session details and remove session state:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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

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5. To view session details, select the session ID.
6. On the Sessions Details page, 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 to ensure a specific user can no longer access an Oracle APEX application.

> **See Also**
>
> Debugging an Application in *Oracle APEX App Builder User's Guide*

2.11.3 Viewing Session State for the Current Session

View sessions state for the current session on the Session State page.

To view session state for the current or recent sessions:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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

2.11.4 Purging Sessions by Age

Purge existing sessions by age on the Purge Sessions page.

To purge existing sessions by age:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.

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b. Select the Administration menu and then **Administration**.

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. On Purge Sessions, make a selection from the Sessions older than list.
6. Click one of the following buttons:
   - **Report Sessions** generates a report detailing the total number of sessions for the workspace, the number of users, and the number of old sessions.
   - **Purge Sessions** purges existing sessions by the age you selected.

> **See Also**
>
> Viewing Session State in *Oracle APEX App Builder User's Guide*

2.11.5 Purging Session State for the Current Session

Purge session state for the current session on the Purge Session State page.

To purge session state for the current session:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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.

2.12 Managing User Preferences

Developers can use preferences to store values for a specific user across distinct sessions. Once set, these preferences can be removed programmatically or manually. Administrators 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
  Developers can set user preferences within an application by creating a page process, creating a preference item, or programmatically using a PL/SQL API.
- Viewing Preferences by User
  View user preferences by user on the Preferences by User page.

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- Viewing Current User Preferences
  View current user preferences.
- Purging Preferences for a Specific User
  Purge preferences for a specific user on the Purge Preferences page.
- Purging Preferences for the Current User
  Purge preferences for the current user on the Current User Preferences page.
- Removing User Preferences Programmatically
  Remove user preferences programmatically using a PL/SQL API.
- Resetting User Preferences Using a Page Process
  Reset user preferences by creating a page process.

2.12.1 Setting User Preferences

Developers can set user preferences within an application by creating a page process, creating a preference item, or programmatically using a PL/SQL API.

- Setting User Preferences by Creating a Page Process
  Set user preference values by creating a page process.
- Setting the Source of an Item Based on a User Preference
  Set the source of an item based on a user preference by defining the item source type as Preference.
- Setting User Preferences Programmatically
  Set or reference user preferences programmatically using a PL/SQL API.

2.12.1.1 Setting User Preferences by Creating a Page Process

Set user preference values by creating a page process.

To set user preference values by creating a page process:

1. View the page in Page Designer and click the **Processing** tab.
2. Under Processes, right-click and select **Create Process**.

   Process attributes display in the Property Editor.
3. Under Identification:
   - Name - Enter the name of the process.
   - Type - Select **User Preferences**.
4. Under Settings, Type - Select **Reset Preferences (remove all preferences for current user)**.
5. Under Execution Options:
   a. Sequence - Specify the sequence for this component. The sequence determines the order of execution.
   b. Point - Select the point at which the process executes.
6. Review and complete any additional attributes.

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> **Tip**
>
> To learn more about an attribute, select the attribute in the Property Editor and click the **Help** tab in the center pane.

7. Click **Save**.

> **See Also**
>
> Creating Page Processes in *Oracle APEX App Builder User's Guide*

2.12.1.2 Setting the Source of an Item Based on a User Preference

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. View the page in Page Designer.
2. Click the **Rendering** tab.
3. Locate the region to contain the item, right-click and select **Create Page Item**.

   Item attributes display in the Property Editor.

> **Note**
>
> To learn more about an attribute, select the attribute and click the **Help** tab in the central pane.

4. Under Identification:
   - Name - Enter a name of the item.
   - Type - Select **Hidden**.
5. Under Settings, Value Protected - Specify whether the item is protected, preventing the value from being manipulated when the page is posted. Select **Yes**.
6. Under Layout:
   - Sequence - Enter the display sequence for this item. The sequence and other layout settings determine where the item displays in relation to other items within the region.
   - Region - Select the region in which the item displays. All items should be specified in a region.
7. Under Source:
   a. Type - Select the source type the value of this item is based on.
   b. Used - Select which value takes precedence (that is, the value from session state or the item source value).
8. Under Default, Type - Select a default value type for this item.

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9. Click **Save**.

2.12.1.3 Setting User Preferences Programmatically

Set or reference user preferences programmatically using 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 APEX API Reference*

2.12.2 Viewing Preferences by User

View user preferences by user on the Preferences by User page.

To view the preferences by user:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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.

2.12.3 Viewing Current User Preferences

View current user preferences.

To view current user preferences:

1. Navigate to the Workspace Administration page:

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a. Sign in to APEX.

b. Select the Administration menu and then **Administration**.

The Workspace Administration home page appears.

2. On the Administration page, 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.

2.12.4 Purging Preferences for a Specific User

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:

   a. Sign in to APEX.

   b. Select the Administration menu and then **Administration**.

   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 Preferences by User**.
5. On the Purge Preferences page, 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**.

2.12.5 Purging Preferences for the Current User

Purge preferences for the current user on the Current User Preferences page.

To purge preferences for the current user:

1. Navigate to the Workspace Administration page:

   a. Sign in to APEX.

   b. Select the Administration menu and then **Administration**.

   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 Preferences for Current User**.
5. Click **View Preferences** or **Reset Preferences**.
6. If you select **View Preferences**, the Current User Preferences page appears. To reset the user preferences, click **Reset**.

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2.12.6 Removing User Preferences Programmatically

Remove user preferences programmatically using a PL/SQL API.

To remove user preferences programmatically, 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 APEX API Reference*

2.12.7 Resetting User Preferences Using a Page Process

Reset user preferences by creating a page process.

To reset user preferences using a page process:

1. View the page in Page Designer and click the **Processing** tab.
2. Under Processes, right-click and select **Create Process**.

   Process attributes display in the Property Editor.

   > **Tip**
   >
   > To learn more about an attribute, select the attribute in the Property Editor and click the Help tab in the center pane.

3. Under Identification:
   - Name - Enter the name of the process.
   - Type - Select **Clear Session State**.
4. Under Settings, Type - Select **Clear Current Session**.
5. Under Execution Options:
   a. Sequence - Specify the sequence for this component. The sequence determines the order of execution.
   b. Point - Select the point at which the process executes.
   c. Run Process - Select the frequency at which the process executes.
6. Review and complete any additional attributes.
7. Click **Save**.

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> **See Also**
>
> Creating Page Processes in *Oracle APEX App Builder User's Guide*

2.13 Managing Page and Region Caching

Improve an application's performance by taking advantage of page and region caching.

Developers can configure page and region caching by setting the Caching attribute for a page or region. Workspace administrators can view and purge cached regions and pages.

- Purging Cached Regions and Pages
  View and purge cached regions and pages on the Manage Application Cache page.

> **See Also**
>
> Editing Page Attributes and Editing Region Attributes in *Oracle APEX App Builder User's Guide*

2.13.1 Purging Cached Regions and Pages

View and purge cached regions and pages on the Manage Application Cache page.

To view and purge cached regions:

1. Navigate to the Workspace Administration page:
   a. Sign in to Oracle APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Administration page, click **Manage Service**.
3. Under **Manage Meta Data**, click **Application Cache** and select a purge option.
4. On the **Application Cache** page, click one of the following options:
   - **Purge Cached Regions by Region** - Purge cache for a region by selecting one or more regions.
   - **Purge Cached Regions by Application** - Purge all cached regions for the specified application.
   - **Purge Cached Regions by Workspace** - Purge all cached regions for the current workspace.
   - **Purge Cached Regions by Page** - Purge all cached regions on a page by selecting one or more pages.
   - **Purge Cached Regions by Application** - Purge all cached pages for the specified application.
   - **Purge Expired Cached Regions by Application** - Purge only cached pages that have expired for the specified application.
5. Follow the on-screen instructions.

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2.14 Changing Build Status for Multiple Applications

Configure the Build Status attribute at the workspace-level to prevent an application from being modified by other developers.

- About Changing Application Build Status
  Use the Build Status attribute to prevent other developers from modifying an application.
- Managing Build Status in Workspace Administration
  Workspace administrators can change the Build Status of all applications within the current workspace on Application Build Status page.

> **See Also**
>
> Changing Build Status in Administration Services

2.14.1 About Changing Application Build Status

Use the Build Status attribute to prevent other developers from modifying an application.

The Build Status attribute has two settings:

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

  Selecting **Run Application Only** is an effective way to prevent other developers from modifying it.

Ways to Modify Build Status

You can modify the application Build Status in the following ways:

- **Application-level** - Developers and administrators can change the Build Status attribute on the Edit Application page. See Availability in *Oracle APEX App Builder User's Guide*.
- **Workspace-level** - Workspace administrators can change the Build Status of all applications within the current workspace on Application Build Status page. See Changing Build Status for Multiple Applications.
- **Instance-level** - Instance administrators can change the Build Status of an application on the Build Status page in the APEX Administration Services application. See Changing Application Build Status in Administration Services.

2.14.2 Managing Build Status in Workspace Administration

Workspace administrators can change the Build Status of all applications within the current workspace on Application Build Status page.

To manage application Build Status in Workspace Administration:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

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The Workspace Administration home page appears.

2. On the Administration page, 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 each application, select a **Status**. Options include:
   - **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 log into App 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. For each application, select a Build Status. Options include:
   - **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**.

2.15 Viewing File Utilization

Identify areas using excessive storage by viewing the File Utilization report.

Each Workspace is allocated a certain amount of storage. Use the File Utilization report to identify areas using excessive storage.

To view the File Utilization report:

1. Navigate to the Workspace Administration page:
   a. Sign in to Oracle APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. On the Administration page, click **Manage Service**.
3. Under **Manage Meta Data**, click **File Utilization**.
4. Review the report.

2.16 Monitoring Activity Within a Workspace

Monitor developer activity and changes within a workspace by accessing the Monitor Activity page.

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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 in Workspace Administration
  Use the Monitor Activity page in Workspace Administration to view developer activity and application change information.
- Viewing Application Changes by Developer
  Access 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.
- Viewing Application Changes by Day
  Access 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.
- Viewing Active Sessions
  A session is a logical construct that establishes persistence (or stateful behavior) across page views. Use the Active Sessions report to view active sessions in the current workspace.
- Viewing Schema Reports and Other Reports
  View reports that summarize of schema tablespace utilization including Schema Tablespace Utilization, Database Privileges by Schema, Workspace Schemas, Report Tablespace Utilization, and Web Service Activity Log.

See Also

- Monitoring Activity Across an Instance
- Viewing Workspace Dashboards
- Creating Custom Activity Reports Using APEX_ACTIVITY_LOG in *Oracle APEX App Builder User's Guide*

2.16.1 Accessing the Monitor Activity Page in Workspace Administration

Use the Monitor Activity page in Workspace Administration to view developer activity and application change information.

To access the Monitor Activity page in Workspace Administration:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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 including: By View, By User, By User and Hour, By Application, By Application and Page, By Day, and By Hour.

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- **Developer Activity** - Offers reports of developer activity including: By Developer, By Developer Bar Chart, By Developer by Hour, By Day, By Application, Application Changes (detailed), By Day (Monthly View), and Component Utilitzation Chart.
- **Sessions** - Lists active sessions with the current workspace such as Active Sessions and Bar Chart of Active Session by Hour.
- **Page View Analysis** - Contains reports analyzing page views, such as Most Viewed Pages over All Applications, Monthly Calendar of Page Views by Day, Line Chart of Usage by Day, and By Weighted Page Performance.
- **Environment** - Contains reports of environments including By User Agent, By Browser, By External Click, and By Operating System.
- **Login Attempts** - Offers reports listing login attempts such as Login Attempts, Login Attempts by Authentication Result, and Developer Login Summary.
- **Application Errors** - Links to the Application Errors report.
- **Workspace Schema Reports and Other Reports** - Includes the following reports: Schema Tablespace Utilization, Database Privileges by Schema, Workspace Schemas, Report Tablespace Utilization, Web Service Activity Log, and Archive of Purged Task Files.
- **Archived Activity Report** - Includes the following reports: By Application by Month, By Application by Day, Application Hash by Day, By Application, and Chart of Workspace Activity by Day.

3. Select a report to review.

2.16.2 Viewing Application Changes by Developer

Access 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:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   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.

2.16.3 Viewing Application Changes by Day

Access 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:

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a. Sign in to APEX.

b. Select the Administration menu and then **Administration**.

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.

2.16.4 Viewing Active Sessions

A session is a logical construct that establishes persistence (or stateful behavior) across page views. Use the Active Sessions report to view active sessions in the current workspace.

- What is an Active Session?
  An active session is a session that has not yet been purged from the sessions table.
- Viewing the Active Sessions Report
  View the Session Detail report to review session information and configure Debug Level and Trace Mode for the an active session.

> **See Also**
>
> Understanding Session State Management in *Oracle APEX App Builder User's Guide*

2.16.4.1 What is an Active Session?

An active session is a session that has not yet been purged from the sessions table.

Whenever an application is run, the APEX engine maintains a record in a database table in the APEX 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.

2.16.4.2 Viewing the Active Sessions Report

View the Session Detail report to review session information and configure Debug Level and Trace Mode for the an active session.

To view the Session Detail report:

1. Navigate to the Workspace Administration page:

   a. Sign in to APEX.

   b. Select the Administration menu and then **Administration**.

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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.

   Use the Session Detail page to inspect session information and control and configure Debug mode.
5. Session Attributes - View active session attributes. Configurable attributes include:
   - **Enable Debug** - Enable and disable Debug mode. Options include:
     - **Disabled** - Disables Debug mode.
     - **Error** (LEVEL1) - Logs error messages.
     - **Warn** (LEVEL2) - Logs warning messages.
     - **Info** (LEVEL4) - Logs informational messages. This is the default level when debugging is enabled but not set to a specific level.
     - **Application Enter** (LEVEL5) - Logs messages when entering (starting) and leaving (finishing) specific methods and operations specific to the application.
     - **Application Trace** (LEVEL6) - Logs detailed information about methods and operations specific to the application.
     - **APEX Enter** (LEVEL8) - Logs messages when entering (starting) and leaving (finishing) specific methods and operations from the APEX engine.
     - **APEX Trace** (LEVEL9) - Logs detailed information about methods and operations from the APEX engine.

     > **Note**
     >
     > APEX engine will generate a substantial amount of messages at higher debug levels, which will impact application performance and require more time to review and analyze. Oracle recommends debugging applications at the **Application Trace (LEVEL6)** level or lower unless directed by Oracle Support.

   - Trace Mode - Options include:
     - **Disabled** - Disables Trace mode.
     - **SQL Trace** - Creates a temporary file you can then analyze using the TKPROF utility.
6. Click **Apply Changes** to update the session.
7. The Session Details report includes the following additional session information:
   - Page Views
   - Background Processing
   - Session State Item Values
   - Browser Information

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2.16.5 Viewing Schema Reports and Other Reports

View reports that summarize of schema tablespace utilization including Schema Tablespace Utilization, Database Privileges by Schema, Workspace Schemas, Report Tablespace Utilization, and Web Service Activity Log.

To view Schema Reports:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click **Monitor Activity**.
3. Under Workspace Schema & Other Reports, click one of the following reports:
   - **Schema Tablespace Utilization**
   - **Database Privileges by Schema**
   - **Workspace Schemas**
   - **Report Tablespace Utilization** (popup)
   - **Web Service Activity Log**
   - **Archive of Purged Task Files**

> **Note**
>
> With the exception of Report Tablespace Utilization, you can search or customize the reports using the Search bar and Actions menu at the top of the page.

2.17 Viewing Workspace Dashboards

Use the Dashboard page to view details about the current workspace and monitor overall workspace activity.

- Accessing the Workspace Dashboards
  Use the Dashboard page to view details about the current workspace and monitor overall workspace activity.
- Workspace Dashboard
  View a summary of workspace users. Activity attributes display based on the selected time frame.
- Users Dashboard
  View a summary of workspace users. Activity attributes display based on the selected time frame.
- Activity Dashboard
  View a summary of workspace user activity for the selected time frame.
- Developer Activity Dashboard
  View a summary of developer application and page changes for the selected time frame.

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- Performance Dashboard
  View pages having the worst page performance.
- Applications Dashboard
  View a summary of database applications.
- Database Dashboard
  View a summary of database objects by schema. Row counts are based on database table statistics.

> **See Also**
>
> - Monitoring Activity Across an Instance
> - Creating Custom Activity Reports Using APEX_ACTIVITY_LOG in *Oracle APEX App Builder User's Guide*

2.17.1 Accessing the Workspace Dashboards

Use the Dashboard page to view details about the current workspace and monitor overall workspace activity.

To view the Administration Dashboard:

1. Navigate to the Workspace Administration page:
   a. Sign in to APEX.
   b. Select the Administration menu and then **Administration**.

   The Workspace Administration home page appears.
2. Click the **Dashboards** icon.

   The Dashboard page appears.
3. Select a dashboard to review:
   - **Workspace** - See Workspace Dashboard.
   - **Users** - See Users Dashboard.
   - **Activity** - See Activity Dashboard.
   - **Developer Activity** - See Developer Activity Dashboard.
   - **Performance** - See Performance Dashboard.
   - **Applications** - See Applications Dashboard.
   - **Database** - See Database Dashboard.

2.17.2 Workspace Dashboard

View a summary of workspace users. Activity attributes display based on the selected time frame.

The **Workspace** 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.

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- Files - Details the space used by specific file types.
- Recent Service Requests lists pending service requests.

2.17.3 Users Dashboard

View a summary of workspace users. Activity attributes display based on the selected time frame.

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.

> **See Also**
>
> Managing Users in a Workspace

2.17.4 Activity Dashboard

View a summary of workspace user activity for the selected time frame.

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 APEX activity log.

2.17.5 Developer Activity Dashboard

View a summary of developer application and page changes for the selected time frame.

The **Developer Activity** dashboard displays a summary of developer application and page changes for the selected time frame, 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.

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- Recent Application Edits - Lists edits by application.

2.17.6 Performance Dashboard

View pages having the worst page performance.

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.

2.17.7 Applications Dashboard

View a summary of database applications.

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.

2.17.8 Database Dashboard

View a summary of database objects by schema. Row counts are based on database table statistics.

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

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3

Oracle APEX Administration Services

Instance administrators manage an entire hosted APEX instance using the Administration Services application.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Understanding Administration Services
  Use Administration Services to monitor and administer all workspaces in a hosted instance.
- Managing Requests
  Approve and decline workspace service requests and change requests on the Manage Request page.
- Managing Feature Configuration
  Use the Feature Configuration page to configure the Application Development settings, Application Installation Options, SQL Workshop functionality, database and activity monitoring, RESTful service, service requests, and Team Development.
- Configuring Security
  Instance administrators can configure instance security, including service-level security, configuring support for Real Application Security, configuring session time out, preventing browser attacks by isolating workspaces, excluding domains from regions and Web services, configuring authentication controls, creating strong password policies, and managing authorized URLs.
- Configuring Instance Settings
  Control a variety of general settings for a development instance including configuring workspace provisioning behavior, email provisioning, storage, email, wallet information, report printing, workflow settings, Application Gallery settings, Help menu, workspace size options, application ID ranges, and background jobs.
- Managing Meta Data
  Use the links under Manage Meta Data to view and manage session state, the mail queue, installed translations, and interactive report descriptions.
- Communicating Using Messages, Banners, and Resources List
  Administrators can communicate with systsem users by creating messages (including login, system messages, and workspace messages), banners, and the Site-Specific Resources list.
- Creating a Service Signup Wizard
  Instance administrators can create a Service Signup Wizard that users must complete before new workspace requests are submitted.
- Managing Schemas
  Manage the schemas within an Oracle APEX instance.

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- Creating Workspaces in Administration Services
  Users access Oracle APEX by signing in to a shared work area called a workspace. An administrator can create workspaces manually in Administration Services or take advantage of an automated approach in which users click a link a login page.
- Managing Existing Workspaces
  Instance administrators can manage existing workspaces within an Oracle APEX instance.
- Managing Users Across an Oracle APEX Instance
  An Instance administrator manages all user accounts within an Oracle APEX instance on the Manage Developers and Users page.
- Monitoring Activity Across an Instance
  Use the links on the Monitor Activity page to access various reports on application, developer, and session activity in all workspaces.
- Configuring and Deleting Logs and Log Entries
  Configure log intervals and delete logs and log entries.

Related Topics

- Understanding Administrator Security Best Practices in *Oracle APEX App Builder User's Guide*
- Workspace and Application Administration
  In an Oracle APEX development environment, users sign in to a shared work area called a workspace. Workspace administrators monitor and administer a shared work area called a workspace.

3.1 Understanding Administration Services

Use Administration Services to monitor and administer all workspaces in a hosted instance.

> **Note**
>
> Many configuration options are available at both the workspace and instance-level. Instance-level settings generally override similar settings found in Workspace Administration.

- What Is an Instance Administrator?
  Instance administrators manage an entire Oracle APEX hosted instance.
- Signing In To Administration Services
  Sign in to Oracle APEX Administration Services using the Instance administrator account and password created or reset during the installation process.
- Overview: Administration Services UI
  Key pages in Administration Services include the Administration Services, Manage Instance, and Manage Workspaces.

3.1.1 What Is an Instance Administrator?

Instance administrators manage an entire Oracle APEX hosted instance.

In Oracle APEX, users sign in to a shared work area called a workspace. A workspace enables multiple users to work within the same APEX installation while keeping their objects, data, and

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applications private. This flexible architecture enables a single database instance to manage thousands of applications.

Within a workspace, **End users** can only run existing database applications. **Developers** can create and edit applications, monitor workspace activity, and view dashboards. APEX includes two administrator roles:

- **Workspace administrators** are users who perform administrator tasks specific to a workspace.
- **Instance administrators** are superusers that manage an entire hosted APEX instance which may contain multiple workspaces.

Instance administrators have all the rights and privileges available to developers and workspace administrators. In addition, instance administrators are responsible for managing an entire APEX instance using the Oracle APEX Administration Services application. Instance administrators create workspaces, configure features and instance settings, and manage security.

Tip

To learn more about creating an Instance Administrator account in a new installation, see Creating or Updating Your Instance Administration Account in *Oracle APEX Installation Guide*.

See Also

- Signing In To Administration Services
- Overview: Administration Services UI
- About Oracle APEX User Roles
- What is a Workspace Administrator?

3.1.2 Signing In To Administration Services

Sign in to Oracle APEX Administration Services using the Instance administrator account and password created or reset during the installation process.

Note

Accessing Administration Services differs slightly if you are running Oracle APEX in Oracle Cloud. For Oracle APEX AI Application Generator Service (APEX Service), see Sign In To Administration Services in *Getting Started with Oracle APEX in Oracle Cloud*. For Oracle APEX AI Application Generator on Autonomous AI Database, see Access Oracle APEX Administration Services in *Using Oracle Autonomous AI Database Serverless*.

To manually create a workspace and user accounts, you sign in to a separate application for managing an entire Oracle APEX instance called Oracle APEX Administration Services.

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> **Tip**
>
> You can also access Administration Services from the Oracle APEX Sign In page. On the Oracle APEX Sign In page, scroll down and click **Administration**. The Administration Services Sign In page appears.

To sign Oracle APEX Administration Services:

1. In a Web browser, navigate to the Administration Services Sign In page:

   > **Tip**
   >
   > By default, the context root for accessing Oracle APEX through Oracle REST Data Services is `/ords`. If you wish to have a context root of `/apex` for accessing Oracle APEX, rename the `ords.war` file to `apex.war` before installing Oracle REST Data Services. See Installing and Configuring Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide*.

   By default, Administration Services installs to the following location:

   `http://hostname:port/ords/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 Oracle REST Data Services. In a default installation, this number is 8080. To learn more, see Installing and Configuring Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide*
   - *ords* is the service name defined when configuring Oracle REST Data Services.

   The Administration Services Sign In page appears.

2. On the Sign In page:
   a. Username - Enter the Instance administrator account username.
   b. Password - Enter your Instance administrator account password.
   c. Click **Sign In to Administration**.

      Oracle APEX Administration Services appears.

> **See Also**
>
> - Creating or Updating Your Instance Administration Account in *Oracle APEX Installation Guide*
> - Creating New User Accounts in Administration Services

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3.1.3 Overview: Administration Services UI

Key pages in Administration Services include the Administration Services, Manage Instance, and Manage Workspaces.

- Administration Services Home Page
  The Administration Services home page is the starting point for managing an entire Oracle APEX instance.
- Manage Instance Page
  Instance administrators use the Manage Instance page to control and configure key features of an APEX instance. Many of these links also display on the Administration Services home page.
- Manage Workspaces Page
  Instance administrators use the Manage Workspaces page to manage workspaces for an APEX instance. A workspace is a shared work area where multiple developers can create applications. Each workspace has the privilege to parse as one or more database schemas.

> **See Also**
>
> - Managing Requests
> - Monitoring Activity Across an Instance

3.1.3.1 Administration Services Home Page

The Administration Services home page is the starting point for managing an entire Oracle APEX instance.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

The top of the Administration Services home page features the following:

- **Manage Requests**. Approve and decline workspace service requests and change requests. See Managing Requests.
- **Manage Instance**. Control and configure key features of the APEX instance. See Manage Instance Page.
- **Manage Workspaces**. Create, remove and lock workspaces, manage workspace schema assignments, manage developers and users, view workspace reports, import and export workspaces, and manage application behaviors. See Manage Workspaces Page.
- **Monitor Activity**. View various reports on applications, developers, and session activity. See Monitoring Activity Across an Instance.

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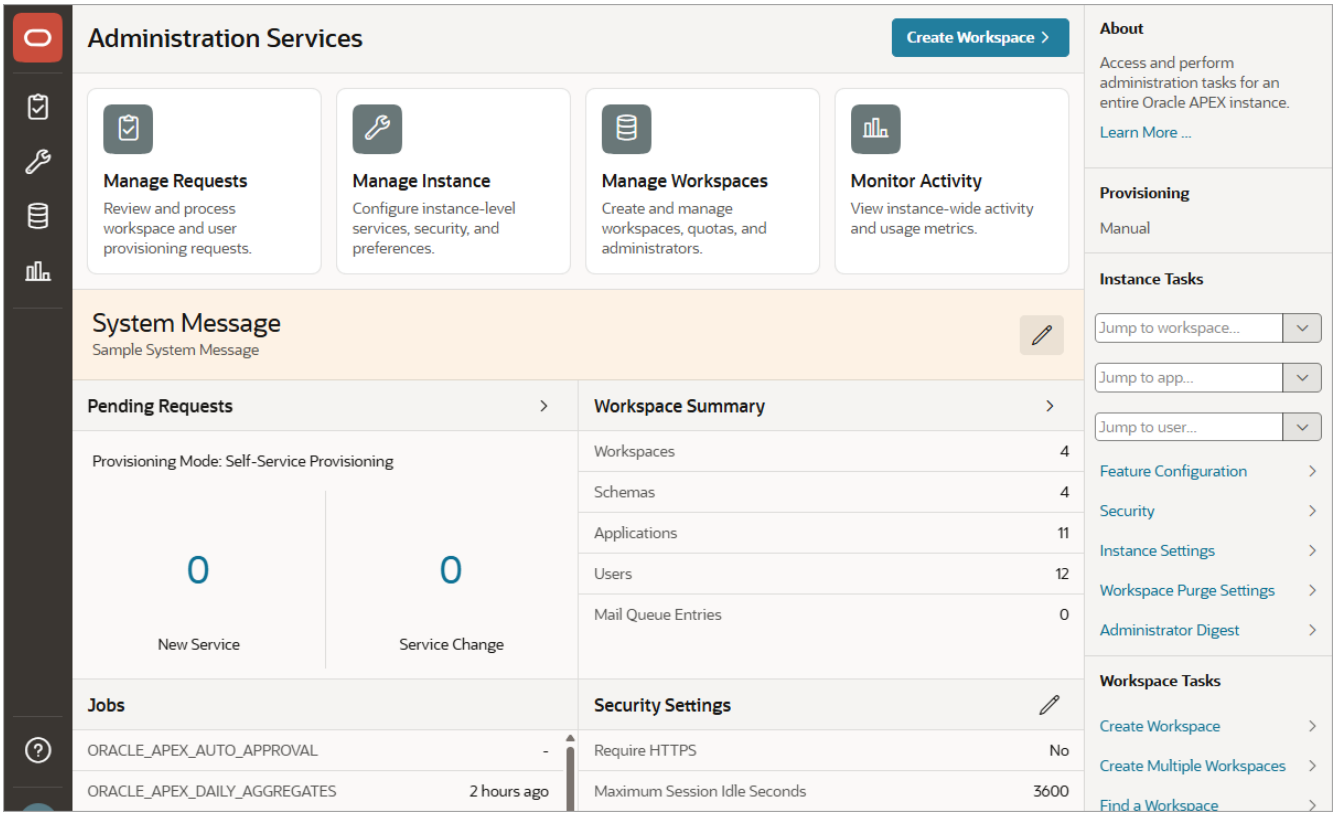

System Message Region

The System Message region displays at the center of the page. Administrators can create a system message to communicate with other users within an instance. See Defining a System Message.

Instance Tasks

The Instance Tasks region displays on the right side of the page and features the following links:

- **Jump to workspace**. Enter a workspace name to quickly access the Edit Workspace Information page. See Managing Existing Workspaces.
- **Jump to app**. Enter a app name or identification number (ID) to quickly access Manage Workspaces, Application Attributes. See Viewing the Application Attributes Report.
- **Jump to user**. Enter a user name to quickly access Manage Workspaces, Manage Developers and Users. See Managing Users Across an Oracle APEX Instance.
- **Feature Configuration**. Manage configuration settings that apply to an entire APEX instance. See Managing Feature Configuration.
- **Security**. Manage security settings that apply to an entire APEX instance. See Configuring Security.
- **Instance Settings**. Manage settings that apply to an entire APEX instance such as selecting the provisioning method for workspace creation, configuring storage, and configuring support for email, wallets, and report printing. See Configuring Instance Settings.

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- **Workspace Purge Settings**. Configure purge behavior for inactive workspaces. See Purging Inactive Workspaces.

Workspace Tasks

The Workspace Tasks region also displays on the right side of the page and features the following links:

- **Create Workspace**. Links to the Create Workspace Wizard. See Creating Workspaces in Administration Services.

> **Note**
>
> You can also access the Create Workspace Wizard by clicking the **Create Workspace** button at the top of the page.

- **Create Multiple Workspaces**. Links to the Create Multiple Workspace Wizard. See Creating Multiple Workspaces.
- **Find a Workspace**. Displays a searchable report of all workspaces. See Performing a Workspace Search.
- **Manage Workspaces**. Links to the Manage Workspaces page. See Managing Existing Workspaces.
- **Create User**. Enables you to create a new user. See Creating New User Accounts in Administration Services.
- **Find a User**. Displays a searchable report of all users in the current instance. See Managing Users Across an Oracle APEX Instance.
- **Reset User Password**. Links to the Manage Developer and Users page. To reset a user, click the user, edit the attributes under Password, and click Apply Changes. See Editing an Existing User Account in Administration Services.

Available Updates

The Available Updates region indicates if updates are available for APEX 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 and displays to the right of the Available Updates region title. 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, APEX transmits the version number of APEX 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

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3.1.3.2 Manage Instance Page

Instance administrators use the Manage Instance page to control and configure key features of an APEX instance. Many of these links also display on the Administration Services home page.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

Instance Settings

Instance Settings contains the following links:

- **Feature Configuration**. Manage configuration settings that apply to an entire APEX instance. See Managing Feature Configuration.
- **Security**. Manage security settings that apply to an entire APEX instance. See Configuring Security.
- **Instance Settings**. Manage settings that apply to an entire APEX instance such as selecting the provisioning method for workspace creation, configuring storage, and configuring support for email, wallets, and report printing. See Configuring Instance Settings.
- **Workspace Purge Settings**. Configure purge behavior for inactive workspaces. See Purging Inactive Workspaces.

Manage Meta Data

Manage Meta Data contains the following links:

- **Session State**. Monitor and manage the session state repository. See Managing Session State for an Instance.
- **Mail Queue**. Monitor the email messages in the mail queue. See Managing the Mail Queue.
- **Installed Translations**. Links to the Installed Translation report which indicates which translations have been loaded for the APEX instance. See Viewing Installed Translations.
- **Interactive Report Subscriptions**. View and manage subscriptions created by end users using interactive reports in the instance. See Deleting Interactive Report Subscriptions.

Messages

Messages contains the following links:

- **Define Environment Banner**. Configure a environment banner for an instance. See Configuring an Environment Banner in Administration Services.
- **Define Login Message**. Enables an instance administrator to create and manage login message. See Defining a Login Message.
- **Define System Message**. Enables an instance administrator to create and manage system message. See Defining a System Message.

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- **Manage Site-Specific Resources**. Create and manage a Site-Specific Resources lists. These links display on the Workspace home page and on the Workspace Login page. See Managing a Site-Specific Resources List.

Manage Logs and Files

Manage Logs and Files contains the following links:

- **Manage Log Interval**. Use the Manage Log Interval page to set the minimum number of days to retain log information for log files. See Managing Log Intervals.
- **Archive Activity Log**. takes the Oracle APEX Activity log, summarizes it, and writes the results to an archived activity log. See Archiving the Activity Log.
- **SQL Workshop Log**. View SQL Workshop logs and delete log entries. See Deleting SQL Workshop Log Entries.
- **Page View Activity Log**. View and delete User Activity log entries. See Deleting Page View Activity Log Entries.
- **Developer Activity Log**. View and delete Developer Activity log entries. See Managing the Developer Activity Log.
- **External Click Counting Log**. View and delete External Click Counting log entries. See Deleting Click Counting Log Entries.
- **Login Access Log**. View and delete Login Access log entries. See Deleting the Login Access Log.
- **Web Service Activity Log**. Create an archive of Web Service activity.
- **REST Synchronization Log**. Configure when entries are purged or delete the REST Source Synchronization log. See Deleting REST Synchronization Log Entries.
- **Automation Log**. Configure when entries are purged or delete the Automation log. See Deleting Automation Log Entries.
- **Install / Upgrade Logs**. View a log of installation or upgrade phases and their corresponding metrics. See Viewing Install and Upgrade Logs.

Self Service Sign Up

Self Service Sign Up contains the following links:

- **Manage New Service Signup Wizard**. Create and manage the New Service Signup Wizard. You can require users fill out a justification and accept an agreement and optionally respond to survey questions before the New Service Signup Wizard submits a request. See Creating a Service Signup Wizard.
- **Run New Service Signup Wizard**. Run the New Service Signup Wizard. See Running a New Service Signup Wizard.
- **Configure Email Restrictions**. Add restrictions for email patterns used to auto/self provision a workspace. See Configuring Service Signup Wizard Email Restrictions.

3.1.3.3 Manage Workspaces Page

Instance administrators use the Manage Workspaces page to manage workspaces for an APEX instance. A workspace is a shared work area where multiple developers can create applications. Each workspace has the privilege to parse as one or more database schemas.

Workspace Actions

Links displaying under **Workspace Actions**:

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- **Create Workspace**. Create a new workspace using the Create Workspace wizard. See Creating Workspaces in Administration Services.
- **Create Multiple Workspaces**. Create multiple workspaces using the Create Multiple Workspaces wizard. See Creating Multiple Workspaces.
- **Remove Workspace**. Remove a workspace. See Deleting a Workspace.
- **Lock Workspace**. Lock a workspace. Locking a workspace disables all workspace administrator, developer, and user accounts in the workspace and makes all applications unavailable. See Locking a Workspace.
- **Manage Workspace to Schema Assignments**. View a report that lists the schemas in which a given workspace can build. When developers create new applications they must choose a schema from the list of schemas assigned to the workspace. See Managing Workspace to Schema Assignments.
- **Manage Developers and Users**. To access the APEX development environment, users sign in to a shared work area called a workspace. Use the Manage Developers and Users page to create, edit, and delete users. See Managing Users Across an Oracle APEX Instance.
- **Manage Component Availability**. View a report of Workspace Settings by workspace. To override the current settings, click the workspace name and edit the setting on the Workspace Settings page. See Managing Component Availability for an Instance.

Workspace Reports

Links displaying under **Workspace Reports**:

- **Existing Workspaces**. View a report of provisioned workspaces. Click the workspace name to view details about a specific workspace. Click **Delete** in the action column to start the Remove Workspace Wizard. See Managing Existing Workspaces.
- **Workspace Details**. Select a workspace and click **Edit**, **Schema Assignments**, and **Manage Users** to view key attributes about the workspace. See Viewing the Workspace Details Report.
- **Workspace Database Privileges**. View a report of workspace database privilege details. To edit a workspace, click the workspace name. See Viewing Workspace Database Privileges.
- **Manage File Utilization**. View the File Utilization by Workspace report. This report lists the workspace name, total file size, file counts, and the relative age of the newest and oldest files. Use this report to gauge workspace activity. See Viewing File Size and File Count by Workspace.
- **Find and Email Workspace Summary**. View the Workspace Search report. Click the workspace name to view workspace details and email the report. See Performing a Workspace Search.
- **Data Dictionary Cache**. View the Data Dictionary Cache report to manually refresh the Data Dictionary Cache. Wizards use this information when creating new applications and pages. See Viewing or Refreshing the Data Dictionary Cache.

Export Import

Links displaying under **Export Import**:

- **Import Workspaces**. Links to the Import Workspace Wizard. Use this wizard to import a workspace into the export repository. See Importing a Workspace in Administration Services.

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- **Export Workspaces**. Links to the Export Workspace page. Use this page to select a workspace and access the Export Workspace Wizard. See Exporting a Workspace in Administration Services.

Manage Applications

Links displaying under **Manage Applications**:

- **Application Attributes**. Links to the Application Attributes page key application attributes including the workspace name and ID, application ID, parsing schema, number of application pages, logging status, build status, application status, and application alias. See Viewing the Application Attributes Report.
- **Build Status**. Displays the Build Status report. Use this report to review and change the Build Status attribute of any application in any workspace. See Changing Application Build Status in Administration Services.
- **Parsing Schema**. Displays the Parsing Schema report. Use this report to identify the current parsing schema of each application in any workspace. See Viewing the Parsing Schemas Report.

3.2 Managing Requests

Approve and decline workspace service requests and change requests on the Manage Request page.

- About Workspace Requests and Change Requests
  Instance administrators are responsible for approving or declining service requests made by workspace administrators.
- Viewing Requests on the Administration Services Home Page
  View a summary of pending new service and change requests on the Administration Services home page. The total number of pending requests displays in the Pending Requests region.
- Viewing Pending Requests
  View pending service requests on the Manage Requests page.
- Managing Workspace Requests
  A Workspace Request enables a user to request a workspace by clicking a link on the Sign In page to access a request form.
- 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

> **See Also**
>
> Enabling Service Requests

3.2.1 About Workspace Requests and Change Requests

Instance administrators are responsible for approving or declining service requests made by workspace administrators.

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Service requests fall into one of two categories. A **Workspace Request** enables users to request workspaces directly in a self-service fashion. For example, users could click a link on the Sign In 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 Provisioning Method **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
- Making a Service Request

3.2.2 Viewing Requests on the Administration Services Home Page

View a summary of pending new service and change requests on the Administration Services home page. The total number of pending requests displays in the Pending Requests region.

To view a summary of new service and change requests on the Administration Services home page:

1. Sign in to APEX Administration Services.

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

2. To view pending new service requests, click the **New Service** number.

   The All Workspace Requests report appears listing the workspace name, schema, size, request date, and status.

   - To approve or decline the request, click **Provision** in the Action column.
   - To edit the provisioning request, click the Workspace name.

3. To view pending change requests, click the **Service Change** number.

   The All Change Requests report displays.

   - To view a pending change requests, click **View Request**.
   - Approve and deny the request as is appropriate.

3.2.3 Viewing Pending Requests

View pending service requests on the Manage Requests page.

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

1. Sign in to APEX Administration Services.
2. Click **Manage Requests**.

   The Manage Service Requests page appears and has three tabs:

   - **Open Requests** displays all pending service requests and change requests.
   - **All Workspace Requests** displays pending workspace requests.

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- **All Change Requests** displays pending change requests.

3. Click **Open Requests** to view a pending new service requests and change requests.
   - To approve or decline a new request, click the **Edit** icon to the left of the request description.
   - Approve and deny the request as is appropriate.
4. Click **All Workspace Requests** to view a pending workspace requests.

   The All Workspace Requests report appears listing the workspace name, schema, size, request date, and status.
   - To approve or decline the request, click **Provision** in the Action column.
   - To edit the provisioning request, click the Workspace name.
5. Click **All Change Requests** to view pending changes to existing services.

   All Change Requests report appears listing the workspace name, request change description, requestor, and status.
6. To view a request, click **View Request**.

   The View Change Request page appears.
   - To approve the request, click **Assign Schema**.
   - To deny a request, click **Deny Request**.
   - To deny and delete a request, select **Delete this request if denying?** and then click **Deny Request**.

> **See Also**
>
> Managing Workspace Requests and Managing Change Requests

3.2.4 Managing Workspace Requests

A Workspace Request enables a user to request a workspace by clicking a link on the Sign In page to access a request form.

- About the Workspace Request Approval Process
  The Instance administrator specifies a Provisioning Method to determine how the workspace request process work.
- Approving or Declining a Pending Workspace Request
  Approve or decline pending workspace requests on the All Workspace Requests page.
- Changing the Status of an Existing Workspace Request
  Change the status of an existing workspace request on the All Workspace Requests page.
- Deleting a Workspace Request
  Delete workspace requests on the All Workspace Requests page.

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> **See Also**
>
> About Workspace Requests and Change Requests and About Specifying How Workspaces Are Created

3.2.4.1 About the Workspace Request Approval Process

The Instance administrator specifies a Provisioning Method to determine how the workspace request process work.

To determine how provisioning works, an Instance Administrator selects a Provisioning Method on the Instance Settings page:

- **Manual** - An Instance administrator creates new workspaces and notifies the Workspace administrator regarding the Sign In credentials.
- **Request** - Users request a workspace. Once an administrator approves the request, the user receives an email containing an email verification link. After the user clicks the email verification link, the workspace is created.
- **Automatic** - Works similar to **Request** except requests are automatically approved with no administrator review required.

> **Note**
>
> To enable users to request a workspace using a link on the Sign In page, the Instance administrator must choose either the Provisioning Method **Request** or **Automatic** and configure email. If the Provisioning Method is set to **Manual**, no link appears on the Sign In page.

About Request and Automatic Provisioning

If a workspace uses the Provisioning Methods **Request** or **Automatic**, the following events occur:

1. The user receives an email containing an email verification link.
2. When user clicks the verification link, the workspace is created.
3. The user receives another email containing Sign In credentials (that is, the workspace name, username, and password).
4. The status of the workspace request changes from `Accepted` to `Approved`.

> **Note**
>
> To use the **Request** or **Automatic** Provisioning Methods, you must configure email. See Configuring Email.

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:

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```
Please contact administrator.
```

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

> **See Also**
>
> Selecting a Workspace Provisioning Mode

3.2.4.2 Approving or Declining a Pending Workspace Request

Approve or decline pending workspace requests on the All Workspace Requests page.

To approve or decline a pending workspace request:

1. Sign in to APEX Administration Services.
2. Click **Manage Requests**.
3. Click the **All Workspace Requests** tab.

   The All Workspace Requests report appears listing the workspace name, schema, size, request date, and status.
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**.
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. If needed, update the message, for example to add the reason for declining a request, and click **Decline and Send Email**.

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

> **Tip**
>
> If the instance has the Provisioning Status, **Request**, 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.

3.2.4.3 Changing the Status of an Existing Workspace Request

Change the status of an existing workspace request on the All Workspace Requests page.

To change the status of an existing workspace request:

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1. Sign in to APEX Administration Services.
2. Click **Manage Requests**.
3. Click the **All Workspace Requests** tab.

   The All Workspace Requests report appears listing the workspace name, schema, size, request date, and status.
4. To review all workspace requests, deselect the filter **Status_Code = '1'**.
5. Locate a request to review.
6. Click **Adjust** 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.

3.2.4.4 Deleting a Workspace Request

Delete workspace requests on the All Workspace Requests page.

To delete a workspace request:

1. Sign in to APEX Administration Services.
2. Click **Manage Requests**.
3. Click the **All Workspace Requests** tab.

   The All Workspace Requests report appears listing the workspace name, schema, size, request date, and status.
4. Click the workspace name.
5. On the Edit Provisioning Request page, select 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**.

3.2.5 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

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- Approving or Declining a Pending Change Request
  Approve or decline pending change requests on the All Workspace Requests page.

> **See Also**
>
> About Workspace Requests and Change Requests

3.2.5.1 Approving or Declining a Pending Change Request

Approve or decline pending change requests on the All Workspace Requests page.

To approve or decline a pending change request:

1. Sign in to APEX Administration Services.
2. Click **Manage Requests**.
3. 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.

3.3 Managing Feature Configuration

Use the Feature Configuration page to configure the Application Development settings, Application Installation Options, SQL Workshop functionality, database and activity monitoring, RESTful service, service requests, and Team Development.

- Configuring Application Development Settings
  Configure Application Development settings including: Allow PL/SQL Program Unit Editing, Create demonstration objects in new workspaces, and Number of backups per application.
- Configuring SQL Workshop
  Configure basic SQL Workshop behavior for an instance.
- Configuring Monitoring
  Configure monitoring including: Database Monitoring (SQL Workshop), Application Activity Logging, Web Service Activity Logging, and Web Service Activity Logging.
- Enabling RESTful Services for an Instance
  Controls the ability to create and access RESTful Services mapped to SQL and PL/SQL.
- Enabling Service Requests
  Determine if workspace administrators to make service requests from Workspace Administration.

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- Configuring Team Development for New Workspaces
  Configure the following Team Development settings for new workspaces: Enable Issue File Repository, Maximum Issue File Size, Enable Feedback File Repository, and Maximum Feedback File Size.

> **See Also**
>
> Managing Component Availability for an Instance

3.3.1 Configuring Application Development Settings

Configure Application Development settings including: Allow PL/SQL Program Unit Editing, Create demonstration objects in new workspaces, and Number of backups per application.

- Disabling PL/SQL Program Unit Editing for an Instance
  Control if PL/SQL program unit editing is available in an instance.
- Enabling the Creation of Demonstration Objects in New Workspaces
  Enable the creation of demonstration applications and demonstration database objects when creating new workspaces.
- Configuring the Number of Application Backups
  Configure the number of application backups.

3.3.1.1 Disabling PL/SQL Program Unit Editing for an Instance

Control if PL/SQL program unit editing is available in an instance.

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

To disable PL/SQL program unit editing:

1. Sign in to APEX Administration Services.
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

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3.3.1.2 Enabling the Creation of Demonstration Objects in New Workspaces

Enable the creation of demonstration applications and demonstration database objects when creating new workspaces.

When creating a new workspace, an Instance administrators can create demonstration objects by enabling the **Create demonstration objects in new workspaces** attribute. Setting this attribute to **Yes** creates demonstration applications and demonstration database objects in new workspaces.

To enable the creation of demonstration database objects in a new workspace:

1. Sign in to APEX Administration Services.
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 **Yes** to include demonstration applications and demonstration database objects when creating new workspace. To disable the creation of demonstration applications, select **No**.
6. Click **Apply Changes**.

3.3.1.3 Configuring the Number of Application Backups

Configure the number of application backups.

Backups provide a simple means for developers to recover applications that may have been unexpectedly modified or deleted. Older backups are deleted during daily maintenance to make room for new ones. A value of null or zero (0) disables the automated backup feature. No more than 30 backups are kept per application.

To configure the number of application backups:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Application Development** section.
5. For **Number of backups per application**, enter the maximum number of backups to keep per application. Enter a value of null or zero (0) to disable automated backup.
6. Click **Apply Changes**.

See Also

- Viewing the Backup Log
- Managing Application Backups in *Oracle APEX App Builder User's Guide*

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3.3.2 Configuring SQL Workshop

Configure basic SQL Workshop behavior for an instance.

Instance administrators can configure SQL Workshop behavior for an instance.

To configure SQL Workshop:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **SQL Workshop** section.
5. Under SQL Workshop, configure the following attributes described in the following table:

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. Run SQL scripts in 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 SQL command processor.
SQL Scripts Maximum Script Size in bytes	Identify the maximum size of a SQL script used within the SQL Workshop.
Enable Transactional SQL Commands	Enable Transactional SQL Commands for the entire instance. Enabling this feature permits users of SQL Commands to issue multiple SQL Commands within the same physical database transaction. Select **Yes** or **No**. Setting **Enable Transactional SQL Commands** to **Yes** adds an **Autocommit** check box in SQL Commands.
Maximum File size for Data Loading in bytess	Provide the overall maximum file size for SQL Workshop Data Loading. Note that smaller limits exist for XML and XSLX files as well as for JSON files on Oracle Database 11.2 and 12.1. This setting configures the overall file size limitation for all file types.
Data Loading Job Class	Identify the DBMS_SCHEDULER Job Class for SQL Workshop Data Loading jobs. This setting enables you to assign Data Loading jobs to a specific Resource Manager Consumer group. If not set, the job class `SYS.DEFAULT_JOB_CLASS` is used. To see an example, see field-level Help. For more information on job classes, see the *Oracle AI Database Administrator's Guide*.

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Attribute	Description
Enable SQL Developer Web	SQL Developer Web (also known as Database Actions) provides a web-based interface that enables you to execute queries and scripts, create database objects, load data, build data models, and monitor database performance. When enabled, the **SQL Developer Web** menu entry displays on the SQL Workshop menu in the menu bar. This feature requires Oracle REST Data Services (ORDS) 23.1.0 or later with HTTPS. **See Also**: • Accessing SQL Developer Web Directly from APEX in *Oracle APEX SQL Workshop Guide* • About Database Actions in *Using Oracle AI Database Actions*

6. Click **Apply Changes**.

> **See Also**
> - Job Classes in *Oracle AI Database Administrator's Guide*
> - Getting Started with SQL Workshop in *Oracle APEX SQL Workshop Guide*

3.3.3 Configuring Monitoring

Configure monitoring including: Database Monitoring (SQL Workshop), Application Activity Logging, Web Service Activity Logging, and Web Service Activity Logging.

- Enabling Database Monitoring
  Enabling database monitoring in SQL Workshop.
- Enabling Application Activity Logging
  Configure application activity logging for all applications on the instance.
- Enabling Web Service Activity Logging
  Configure web service activity logging for all workspaces on the instance.
- Enabling Application Tracing
  Control application tracing at the instance-level.

3.3.3.1 Enabling Database Monitoring

Enabling database monitoring in SQL Workshop.

Before you can access the Database Monitoring page in SQL Workshop, an Instance administrator must enable database monitoring. See Monitoring the Database in *Oracle APEX SQL Workshop Guide*

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

Setting **Enable Database Monitoring** to **Yes** enables monitoring within SQL Workshop.

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To enable database monitoring:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Monitoring** section.
5. For **Enable Database Monitoring**, select **Yes**.
6. Click **Apply Changes**.

3.3.3.2 Enabling Application Activity Logging

Configure application activity logging for all applications on the instance.

To configure application activity logging:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Monitoring** section.
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.
6. Click **Apply Changes**.

> **Tip**
>
> You can configure logging at the application-level by editing the Logging attribute under Properties in the Application Definition. See Editing the Application Definition in *Oracle APEX App Builder User's Guide*.

> **See Also**
>
> Monitoring Activity Across an Instance

3.3.3.3 Enabling Web Service Activity Logging

Configure web service activity logging for all workspaces on the instance.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

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To configuring web service activity logging:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Monitoring** section.
5. For **Web Service Activity Logging**, select one of the following:
   - **Use Application Settings (default)** - Use the Web Service Logging attribute of each workspace to determine if activity is logged.
   - **Never** - Disable web service activity logging for all workspaces in the instance.
   - **Always** - Enable web service activity logging for all workspaces in the instance.
6. Click **Apply Changes**.

> **See Also**
>
> Monitoring Activity Across an Instance

3.3.3.4 Enabling Application Tracing

Control application tracing at the instance-level.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

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 **Debug** is enabled for the application.

To configure application tracing

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Scroll down to Monitoring.
5. From **Enable Application Tracing**, select one of the following:
   - **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.
   - **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**.

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See Also

- Monitoring Activity Across an Instance
- Enabling SQL Tracing and Using TKPROF in *Oracle APEX App Builder User's Guide*
- Available Parameter Values in *Oracle APEX API Reference* to learn about the `TRACING_ENABLED` parameter

3.3.4 Enabling RESTful Services for an Instance

Controls the ability to create and access RESTful Services mapped to SQL and PL/SQL.

To enable RESTful Services:

1. Sign in to APEX Administration Services.
2. Click **Sign in to Oracle APEX**.
3. Click **Manage Instance**.
4. Under Instance Settings, click **Feature Configuration**.
5. Locate the **REST** section.
6. Under **REST**, edit the following attributes:

Attribute	Description
Enable RESTful Services	Controls the ability to create and access RESTful Services mapped to SQL and PL/SQL.
Swagger UI URL	Defines a URL pointing to the SWAGGER UI 2.0+ server used by the ORDS REST Workshop when generating documentation for a module. If a URL is specified, the URI to the web service's swagger documentation is passed to the Swagger UI server. If a there is no URL specified, raw JSON is produced. **Note**: In order to generate the documentation the Swagger UI server must be able to reach the referenced web service URI. When using a third party Swagger UI service, review its privacy policy to understand how information it collects may be used and shared.

7. Click **Apply Changes**.

See Also

- Enabling RESTful Services and Defining a Path Prefix for a Workspace
- Enabling Data Exchange with RESTful Services in *Oracle APEX SQL Workshop Guide*

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3.3.5 Enabling Service Requests

Determine if 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 APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Workspace Administration** section.
5. For **Enable Service Requests**, select **Yes**.
6. Click **Apply Changes**.

> **See Also**
>
> Managing Requests

3.3.6 Configuring Team Development for New Workspaces

Configure the following Team Development settings for new workspaces: Enable Issue File Repository, Maximum Issue File Size, Enable Feedback File Repository, and Maximum Feedback File Size.

These attributes only impact Team Development when creating new workspaces. These settings do not affect existing workspaces.

To configure Team Development settings for new workspaces:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Feature Configuration**.
4. Locate the **Team Development** section.
5. Configure the following:
   a. **Enable Issue File Repository** - Specify whether to enable file upload on the Issues page to the Team Development central file repository:
      - **Yes** - Select **Yes** to enable file upload for Issues in Team Development.
      - **No** - Select **No** to disable file upload for Issues in Team Development.
   b. **Maximum File Size (in MB)** - Select the maximum file size for any file uploaded for Issues in the Team Development file repository. The default value is 15 MB.
   c. **Enable Feedback File Repository** - Specify whether to enable file upload for User Feedback within Team Development:
      - **Yes** - Select **Yes** to allow files to be uploaded into the Feedback repository in a new workspace.

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- **No** - Select **No** to disable file upload into the Feedback repository in a new workspace.

d. **Maximum Feedback File Size (in MB)** - Select the maximum file size for any file upload for User Feedback into the Feedback file repository. The default value is 15 MB.

6. Click **Apply Changes**.

> **See Also**
>
> - Configuring Team Development in an Existing Workspace
> - Managing Team Development in *Oracle APEX App Builder User's Guide*

3.4 Configuring Security

Instance administrators can configure instance security, including service-level security, configuring support for Real Application Security, configuring session time out, preventing browser attacks by isolating workspaces, excluding domains from regions and Web services, configuring authentication controls, creating strong password policies, and managing authorized URLs.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Configuring Service-level Security Settings
  Instance administrators can configure service-level security in Manage Instance, Security, Security Settings, Security.
- Configuring HTTP Protocol Attributes
  Determine HTTPS requirements for an Oracle APEX instance and all related applications.
- Enabling Real Application Security
  Enable Oracle Real Application Security.
- Configuring Session Timeout for an Instance
  Use the Session Timeout attributes for an instance to reduce exposure at the application-level for abandoned computers with an open web browser.
- Isolating All Workspaces in an Instance
  Instance administrators can configure limits to isolate all workspaces and prevent browser attacks. Workspace administrators can override these default values at the workspace-level.
- Defining Excluded Domains for Regions and Web Services
  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.

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- Configuring Authentication Controls for an Instance
  Administrators can configure authentication controls for an entire instance or for each individual workspace.
- Creating Strong Password Policies
  Instance administrators can create strong password policies for an Oracle APEX instance.
- Managing Authorized URLs
  Create and manage a list of authorized URLs.

3.4.1 Configuring Service-level Security Settings

Instance administrators can configure service-level security in Manage Instance, Security, Security Settings, Security.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Controlling Workspace Cookies
  Determine if Oracle APEX saves persistent cookies in the browser
- Controlling Persistent Authentication
  Control if Persistent Authentication is enabled. Enabling Persistent Authentication enables developers to use a built-in API to let users choose to re-login to an application without having to provide credentials.
- Disabling Access to Administration Services
  Prevent a user from logging in to Oracle APEX Administration Services.
- Enabling Access to Oracle APEX Administration Services
  If access to Oracle APEX Administration Services has been disabled, an Instance administrator can re-enable again by running the following SQL statements.
- Disabling Workspace Login Access
  Restrict user access to APEX by disabling workspace login. Disabling workspace login in production environments prevents users from running APEX applications such as App Builder.
- Disabling App Login Access
  Restrict access to all or specific customer built applications by configuring the Disable Apps Login attribute.
- 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.
- Managing Support for AI Services for an Instance
  Use the AI Enabled attribute in Instance Settings, Security to enable or disable AI Services in a APEX instance.
- Restricting User Access by IP Address
  Restrict user access to the APEX development environment and Administration Services by specifying a comma-delimited list of allowable IP addresses.
- Configuring App Builder Proxy for AI Services
  Specify a proxy server to be used by Generative AI Services in App Builder.

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- Enabling Allow DBMS Credentials Usage
  Enable database credentials to be used in all workspace on the current instance.
- Configuring a Proxy Server for an Instance
  Configure an entire APEX instance to use a proxy for all outbound HTTP traffic.
- Selecting a Checksum Hash Function
  Select a hash function that APEX uses to generate one way hash strings for checksums.
- Configuring Rejoin Sessions for an Instance
  Controls at the application-level whether URLs in this application contain session IDs.
- Configuring Unhandled Errors
  Control how Oracle APEX displays the results of unhandled errors.

3.4.1.1 Controlling Workspace Cookies

Determine if Oracle APEX saves persistent cookies in the browser

Oracle APEX uses the following persistent cookies:

- `ORA_WWV_REMEMBER_UN` - The development environment login page stores the Workspace and Username data in this cookie. It is used to populate these attributes with default values, when you log in again.
- `LOGIN_USERNAME_COOKIE` - Customer application login pages use this cookie to store the Username. It is used to populate the attribute with a default value, when customers log in again.
- `ORA_WWV_REMEMBER_LANG` - When using language selection in the development environment, APEX stores the language and territory in this cookie. It is used to automatically show the application in the selected language when the application is used next time.

If your system has received cookies, you can physically remove it from its persistent location on disk using browser tools or system utilities.

To configure if APEX saves persistent cookies:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. For Set Workspace Cookie, select one of the following:
   - **Yes** - Enables APEX to save persistent cookies in the browser.
   - **No** - Prevents persistent cookies from being sent.
6. Click **Apply Changes**.

3.4.1.2 Controlling Persistent Authentication

Control if Persistent Authentication is enabled. Enabling Persistent Authentication enables developers to use a built-in API to let users choose to re-login to an application without having to provide credentials.

If **Allow Persistent Authentication** option is set to **Yes**, Oracle APEX sends a persistent cookie that:

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- Contains a hash value
- Has a lifetime as configured in Persistent Authentication Lifetime Days
- Is read to compare to the value that is stored in the database.

If your system has received cookies, you can physically remove it from its persistent location on disk using browser tools or system utilities.

To control Persistent Authentication:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. For Allow Persistent Authentication, select one of the following:
   - **Yes** - Enables the APEX Persistent Authentication API for the login page to send a persistent cookie.

     The additional configuration option Persistent Authentication Lifetime Days controls the lifetime of this cookie.
   - **No** - Disables persistent authentication on this instance.
6. For Persistent Authentication Lifetime Days - Enter the maximum number of days users can login using Persistent Authentication before having to enter credentials again.
7. Click **Apply Changes**.

> **Note**
>
> If your system has received this cookie, you can physically remove it from its persistent location on disk using browser tools, system utilities. The cookie will have the same name as the session cookie, post-fixed with `$P`. It may exist for each application accessed having Persistent Authentication enabled.

> **See Also**
>
> APEX_AUTHENTICATION in *Oracle APEX API Reference*

3.4.1.3 Disabling Access to Administration Services

Prevent a user from logging in to Oracle APEX Administration Services.

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

To disable user access to APEX Administration Services:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.

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4. Locate the Security section.
5. For Disable Administrator Login, select **Yes**.

> **Note**
>
> Selecting **Yes** and signing out prevents anyone from accessing Administration Services.

6. Click **Apply Changes**.

> **See Also**
>
> Enabling Access to Oracle APEX Administration Services

3.4.1.4 Enabling Access to Oracle APEX Administration Services

If access to Oracle APEX Administration Services has been disabled, an Instance administrator can re-enable again by running the following SQL statements.

To enable user access to Administration Services if it has been disabled:

1. Start Oracle SQL Developer Command Line (SQLcl) and connect to the database where Oracle APEX is installed as SYS, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_260100;
   ```

3. Run the following statement:

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

3.4.1.5 Disabling Workspace Login Access

Restrict user access to APEX by disabling workspace login. Disabling workspace login in production environments prevents users from running APEX applications such as App Builder.

To disable user access to the Internal workspace:

1. Sign in to APEX Administration Services.

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2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. From Disable Workspace Login, select **Yes**.

   Selecting **Yes** effectively sets a Runtime-Only environment while still allowing Instance administrators to sign in to Administration Services. Selecting **Yes** in production environments prevents developers from changing applications or data.
6. Click **Apply Changes**.

3.4.1.6 Disabling App Login Access

Restrict access to all or specific customer built applications by configuring the Disable Apps Login attribute.

To disable user access to customer built applications:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. Configure **Disable Apps Login**. Options include:
   - **Yes** - Disables login access to all customer built applications.
   - **Only for Specific Apps** - Disables login access for the applications specified. In **Disabled Apps**, enter a comma-separated list of application IDs, for example:

     `100,101,102`
   - **No** - Login access to customer built applications is not disabled. No is the default setting.
6. Click **Apply Changes**.

3.4.1.7 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 APEX Administration Services.
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 that provide file upload controls.
   - **No** - Prevents unauthenticated users from uploading files in applications that provide file upload controls.
6. Click **Apply Changes**.

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3.4.1.8 Managing Support for AI Services for an Instance

Use the AI Enabled attribute in Instance Settings, Security to enable or disable AI Services in a APEX instance.

> **Note**
>
> You can enable AI Services at the workspace or instance-level. To enable AI Services for a workspace, see Viewing Existing Workspace Information.

To manage AI Services in an APEX instance:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. From AI Enabled, select one of the following:
   - **Yes** - Enable the usage of AI Services in this APEX instance.
   - **No** - Disable the usage of AI Services in this APEX instance.
6. Click **Apply Changes**.

> **See Also**
>
> Managing Generative AI Services in *Oracle APEX App Builder User's Guide*

3.4.1.9 Restricting User Access by IP Address

Restrict user access to the APEX development environment and Administration Services by specifying a comma-delimited list of allowable IP addresses.

To restrict user access by IP address:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section and edit the following attributes:
   a. Disable Administrator Login - Select **No**.
   b. Restrict Access by IP Address - To restrict access to the Oracle APEX development environment and Administration Services to a specific range of IP addresses, enter a comma-delimited list of IP addresses.

      If necessary, use an asterisk (*) as a wildcard. However, do not include additional numeric values after wildcard characters. For example, `138.*.41.2` is *not* a valid value.

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

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

5. Click **Apply Changes**.

3.4.1.10 Configuring App Builder Proxy for AI Services

Specify a proxy server to be used by Generative AI Services in App Builder.

To specify a proxy server to be used by by Generative AI Services in App Builder.

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. From App Builder Proxy for AI Services - Specify a proxy server to be used by Generative AI Services in App Builder.

   For example:

   `http://www-proxy.example.com`

   `http://www-proxy.example.com:8080`

   If no proxy server is configured, the Instance Proxy is used.
6. Click **Apply Changes**.

> **See Also**
>
> Managing Generative AI Services in *Oracle APEX App Builder User's Guide*

3.4.1.11 Enabling Allow DBMS Credentials Usage

Enable database credentials to be used in all workspace on the current instance.

In order for database credentials to be accessible to the APEX engine, the `APEX_NNNNNN` schema must have execute premissions to the credential and a public synonoym must be created such that the APEX engine can access the credentials with the `SYS` prefix.

Any database credentials which do not meet this criteria will not be available to all workspaces if **Allow DBMS Credentials Usage** is enabled.

> **Note**
>
> Enabling this option is required when integrating APEX with Fusion Applications. See Integrating APEX with Fusion Applications in *Oracle APEX App Builder User's Guide*

To enable database credentials for all workspaces on the current instance:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.

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4. Locate the Security section.
5. From Allow DBMS Credentials Usage - Select **Yes** to enable database credentials. These credentials are accessible to APEX engine and can be used in all workspaces on this instance.
6. Click **Apply Changes**.

3.4.1.12 Configuring a Proxy Server for an Instance

Configure an entire APEX instance to use a proxy for all outbound HTTP traffic.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

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 APEX instance:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section and edit the following attributes:
   a. Instance Proxy - To require that all outbound HTTP(s) traffic from an Oracle APEX instance to use a specific proxy server, enter the proxy server address and port in this field.

      For example: `www-proxy.example.com:80`

   b. Instance No Proxy Domains - Provide a comma-separated list of domains for which the Instance Proxy should not be used.
5. Click **Apply Changes**.

3.4.1.13 Selecting a Checksum Hash Function

Select a hash function that APEX uses to generate one way hash strings for checksums.

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 APEX 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.

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> **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 APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate the Security section.
5. From Checksum Hash Function, select a hash function that APEX uses to generate one way hash strings for checksums.

   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**.

3.4.1.14 Configuring Rejoin Sessions for an Instance

Controls at the application-level whether URLs in this application contain session IDs.

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

To use Rejoin Sessions at the application or page-level, an administrator must enable **Rejoin Sessions** at the instance-level. A more restrictive instance-level setting overrides application and page settings.

> **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 and Isolating All Workspaces in an Instance.

> **Note**
>
> Enabling rejoin sessions may expose your application to possible security breaches by enabling attackers to take over existing end user sessions. To learn more, see About Rejoin Sessions in *Oracle APEX App Builder User's Guide*.

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To configure Rejoin Sessions:

1. Sign in to APEX Administration Services.
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, APEX creates a new session.
   - **Enabled for Public Sessions** - If the URL goes to a public page and does not contain a session ID, APEX attempts to utilize the existing session cookie established for that application. For applications with both public and authenticated pages, a session ID is defined after the end user authenticates. APEX only joins via the cookie when the session is not yet authenticated.
   - **Enabled for All Sessions** - If the URL does not contain a session ID, APEX 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 All 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**
> - Configuring Rejoin Sessions for a Page in *Oracle APEX App Builder User's Guide*
> - Session Management in *Oracle APEX App Builder User's Guide* to learn how to configure Rejoin Sessions at the application-level

3.4.1.15 Configuring Unhandled Errors

Control how Oracle APEX displays the results of unhandled errors.

> **Note**
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

When Oracle APEX 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.

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To configure Unhandled Errors:

1. Sign in to APEX Administration Services.
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 APEX engine encounters an unhandled error.
6. Click **Apply Changes**.

3.4.2 Configuring HTTP Protocol Attributes

Determine HTTPS requirements for an Oracle APEX instance and all related applications.

> **Note**
>
> Require HTTPS makes APEX unreachable by the HTTP protocol. Before enabling this setting, ensure that the HTTPS protocol is enabled and configured correctly on your server.

- About SSL
  Learn about Secure Sockets Layer (SSL).
- Requiring HTTPS
  Configure both the APEX instance and all related applications to require HTTPS by configuring the Require HTTPS and Require Outbound HTTPS attributes.
- Reversing Require HTTPS
  If you enable Require HTTPS, an Instance administrator can disable it by running the following SQL statements.
- Reversing Require Outbound HTTPS
  If you enable Require Outbound HTTPS, an Instance administrator can disable it by running the following SQL statements.
- Configuring Additional Response Headers
  Enter additional HTTP response headers that APEX should send on each request, for all applications.

3.4.2.1 About SSL

Learn about Secure Sockets Layer (SSL).

Secure Sockets 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 APEX applications using SSL (HTTPS protocol) to prevent any sensitive data from being sent over an unencrypted (cleartext) communication channel.

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3.4.2.2 Requiring HTTPS

Configure both the APEX instance and all related applications to require HTTPS by configuring the Require HTTPS and Require Outbound HTTPS attributes.

> **Important**
>
> If you enable **Require HTTPS**, it makes APEX unreachable by the HTTP protocol. Before enabling this setting, ensure that the HTTPS protocol is enabled and configured correctly on your server.

To require HTTPS in APEX:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under HTTP Protocol, configure the following:
   a. Require HTTPS:
      - **Always** - Enforces HTTPS for all applications (including the APEX development and administration applications) to require HTTPS.

        If set to **Always**, the 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 APEX (that is, App Builder, SQL Workshop, Administration Services 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 APEX instance to use the HTTPS protocol.

   c. HTTP Response Headers - Enter additional HTTP response headers that APEX should send on each request for all applications. Developers can specify additional headers at the 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**.

3.4.2.3 Reversing Require HTTPS

If you enable Require HTTPS, an Instance administrator can disable it by running the following SQL statements.

To reverse Require HTTPS:

1. Connect in SQLcl or SQL Developer with the APEX engine schema as the current schema, for example:
   - On Windows:

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

- On UNIX and Linux:

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

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_260100;
```

3. Run the following statement:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER('REQUIRE_HTTPS', 'N');
    commit;
end;
/
```

3.4.2.4 Reversing Require Outbound HTTPS

If you enable Require Outbound HTTPS, an Instance administrator can disable it by running the following SQL statements.

To reverse Require Outbound HTTPS:

1. Connect in SQLcl or SQL Developer with the APEX engine schema as the current schema, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_260100;
```

3. Run the following statement:

```
BEGIN
    APEX_INSTANCE_ADMIN.SET_PARAMETER('REQUIRE_OUT_HTTPS', 'N');
    commit;
end;
/
```

3.4.2.5 Configuring Additional Response Headers

Enter additional HTTP response headers that APEX should send on each request, for all applications.

To configure additional response headers:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.

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3. Under Instance Settings, click **Security**.
4. Locate **HTTP Protocol**.
5. Require HTTPS - Makes Oracle APEX unreachable by the HTTP protocol. Options include:

> **Note**
>
> Before enabling **Require HTTPS**, ensure that the HTTPS protocol is enabled and configured correctly on your server.

   - **Always** - Enforces HTTPS for all applications (including the Oracle APEX development and administration applications) to require HTTPS.

     If set to **Always**, the **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.
   - **For Development and Administration** - Forces all internal applications within Oracle APEX (such as App Builder, SQL Workshop, Oracle APEX Administration Services (Administration Services) and so on) to require HTTPS.
   - **Application specific** - Makes HTTPS dependent on the Secure session cookie attribute in the authentication schemes of your applications.
6. Require Outbound HTTPS - Select **Yes** to require all outbound traffic from an Oracle APEX instance to use the HTTPS protocol.
7. HTTP Response Headers - Enter additional HTTP response headers that APEX should send on each request for all applications. Developers can also specify additional headers at application-level. Each header has to start on a new line. Support for various headers differs between browsers. To learn more, see item Help.
8. Click **Apply Changes**.

> **Tip**
>
> APEX supports Content Security Policy (CSP) through the use of HTTP response headers. To learn more about cofigurng CSP, see Configuring Content Security Policy (CSP) in *Oracle APEX App Builder User's Guide*.

3.4.3 Enabling Real Application Security

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.

To enable Real Application Security:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Locate Real Application Security.

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5. For Allow Real Application Security.
    - **Yes** - Enables Oracle AI Database Real Application Security support for applications. If Real Application Security is configured in an application's authentication scheme, APEX creates a Real Application Security session for a new APEX session and automatically attaches to it.
    - **No** - Disables Oracle AI Database Real Application Security.
6. Click **Apply Changes**.

Related Topics

- Introducing Oracle Database Real Application Security in *Oracle AI Database Real Application Security Administrator's and Developer's Guide*

3.4.4 Configuring Session Timeout for an Instance

Use the Session Timeout attributes for an instance to reduce exposure at the application-level for abandoned computers with an open web browser.

Instance administrators can Session Timeout for an instance on the Instance Settings, Security page.

To configure Session Timeout attributes for an instance:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Session Timeout:
    a. **Maximum Session Length in Seconds** - Defines how long (in seconds) sessions can exist and be used by applications in this APEX instance. This setting is superseded by the corresponding workspace-level setting and application-level setting.
        - Enter a positive integer to control how long a session can exist.
        - Enter `0` to have the session exist indefinitely.
        - Leave the value empty in order to revert to the default value of 8 hours (28800 seconds).
    b. **Maximum Session Idle Time in Seconds** - Session Idle Time is the time between the last page request and the next page request. This setting is superseded by the corresponding workspace-level setting and application-level setting.
        - Enter a positive integer to control the default idle time for sessions used by applications in this APEX instance.
        - Leave the value empty in order to revert to the default value of 1 hour (3600 seconds).
    c. **Session Timeout Warning in Seconds** - The session timeout warning time defines (in seconds) how long before a session times out (either maximum session length, or maximum session idle time), to warn the user. For the maximum session idle time warning, the user will have the opportunity to extend the session. For maximum session length warning, the user will be prompted to save any work, to avoid loss of data when the session maximum time is reached. This setting is superseded by the corresponding workspace-level setting and application-level setting.
        - Enter a positive integer to control the warning time for sessions used by applications in this APEX instance.

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- Enter 0 to switch off session timeout warnings.
- Leave the value empty in order to revert to the default value of 5 minutes (300 seconds).

5. Click **Apply Changes**.

> **See Also**
>
> - Configuring Session Timeout for a Workspace
> - About Utilizing Session Timeout and Session Management in *Oracle APEX App Builder User's Guide*

3.4.5 Isolating All Workspaces in an Instance

Instance administrators can configure limits to isolate all workspaces and prevent browser attacks. Workspace administrators can override these default values at the workspace-level.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- About Isolating Workspaces to Prevent Browser Attacks
  Isolating workspaces is an effective approach to preventing browser attacks.
- Configuring Instance-Level Workspace Isolation Attributes
  Configure isolation and resource limitation default values for all workspaces in an instance.

3.4.5.1 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.

Workspace isolation by configuring Allow Hostnames is a counter measure against client side attacks that attempt to cross workspace boundaries. This security measure is not necessary if you trust all applications that are accessible using the instance's host which includes applications that are written in other frameworks and languages such as Oracle Application Development Framework (ADF) and Java.

Instance administrators can configure the Allow Hostnames attribute at the instance-level. Workspace administrators can override the instance-level setting for a specific workspace.

> **See Also**
>
> Isolating a Workspace to Prevent Browser Attacks

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3.4.5.2 Configuring Instance-Level Workspace Isolation Attributes

Configure isolation and resource limitation default values for all workspaces in an instance.

> **Tip**
>
> Workspace administrators can override many default values at the workspace-level. See Isolating a Workspace to Prevent Browser Attacks.

To configure instance-level Workspace Isolation attributes:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Workspace Isolation, configure the following attributes:

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

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. For example, you can register the DNS alias `hr.example.com` for your web server `www.example.com`. The instance value of Allowed Hostnames can be set to `www.example.com`. If you then set the HR workspace's Allow Hostnames to `hr.example.com`, users have to access HR applications using `hr.example.com` and all other applications of this instance using `www.example.com`. With this configuration, the browser's Same Origin security policy provides a client-side barrier between HR applications and other applications of the instance, which run in another browser tab or window.

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Attribute	Description
Resource Consumer Group	Specify the Database Resource Manager consumer group to be used for all page events on the instance. The Resource Consumer Group provides more control of hardware resources such as CPU and I/O requests. Workspace-level settings override instance-level settings to enable administrators to provide more or less resources depending on the needs or importance of a workspace. At the beginning of every request, the APEX 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 APEX development environment. These limitations apply to all page requests where application code executes using the APEX engine which enables the assigned Resource Manager settings. However, these limitations do not apply to Oracle Scheduler jobs that workspace developers create, or to ORDS REST requests, where APEX is not in the code path. A call to set the workspace, such as `apex_util.set_workspace('MY_WORKSPACE');` at the beginning of the scheduler job, enables the right consumer group. However, there is often no reason for developers to add this type call. Therefore, administrators should apply the Resource Manager consumer groups to both the APEX workspaces and to the workspace schemas (that is, the underlying database users). You must grant privilege to switch to a consumer group to either `PUBLIC` or the APEX schema. This privilege is typically granted using the procedure `DBMS_RESOURCE_MANAGER_PRIVS.GRANT_SWITCH_CONSUMER_GROUP`. **See Also**: Managing Resources with Oracle Database Resource Manager in *Oracle AI Database Administrator's Guide*
Maximum Concurrent Workspace Requests	Enter the maximum number of concurrent page events that APEX supports for all applications. You can configure a specific value at the workspace-level. Instead of processing a page event, APEX shows an error message when the limit is already reached. APEX keeps track of workspace requests by querying the `CLIENT_INFO` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_INFO`, for example, with a call to `DBMS_APPLICATION_INFO.SET_CLIENT_INFO`.
Maximum Concurrent Session Requests	Enter the maximum number of concurrent page events that APEX supports for each session for applications in this instance. You can configure a specific value at the workspace-level. Instead of processing a new page event, APEX shows an error message when the limit is already reached. Alternatively, you can use the Concurrent Session Requests Kill Timeout attribute to kill an active database session, to process the new page event. APEX keeps track of session requests by querying the `CLIENT_IDENTIFIER` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_IDENTIFIER`, for example, with a call to `DBMS_SESSION.SET_IDENTIFIER`.

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Attribute	Description
Concurrent Session Requests Kill Timeout	If a new page event comes in that is outside the limits of Maximum Concurrent Session Requests, APEX can execute `alter system kill session` on the oldest active database session which processes another page event for this APEX 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, APEX 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.
Maximum Web Service Requests	Enter the maximum number of web service requests, within a rolling 24-hour period, that APEX supports for each workspace in this instance. You can configure a more specific value at the workspace-level.
Maximum AI Tokens	Enter the maximum number of AI Tokens per 24 hour period that APEX can use for Generative AI Services for each workspace in this instance. You can configure a more specific value at the workspace level or at the AI Service/Vector Provider level.

5. Click **Apply Changes**.

Related Topics

- Managing Generative AI Services in *Oracle APEX App Builder User's Guide*
- Viewing Existing Workspace Information
  View or edit existing workspace information and behavior including workspace details, support for AI Services, display name, login controls, component availability, session timeout, and component availability.

3.4.6 Defining Excluded Domains for Regions and Web Services

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 APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Find **Region and Web Service Excluded Domains**.
5. In Domain Must Not Contain, enter domains (not including the port), separated by colons, that should not be allowed in regions of type URL or accessed as a Web service. For example:

   ```
   example1.com:example2.com:example3.com
   ```

6. Click **Apply Changes**.

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3.4.7 Configuring Authentication Controls for an Instance

Administrators can configure authentication controls for an entire instance or for each individual workspace.

- About Authentication Controls
  Administrators can configure authentication controls for an entire instance or for each individual workspace.
- Configuring Authentication Control General Settings
  Use Authentication Control, General Settings to configure security settings for developer and end user login.
- Configuring Authentication Control Development Environment Settings
  Use Authentication Control, Development Environment Settings to configure security settings for workspace administrator and workspace developer accounts.
- Configuring Authentication Schemes for an Instance
  Instance administrators configure authentication schemes for an Oracle APEX instance.
- Configuring an Authentication Scheme for Data Reporter
  Learn how to configure an authentication scheme for Data Reporter.

See Also

- Managing Workspace Account Login Controls
- Establishing User Identity Through Authentication in *Oracle APEX App Builder User's Guide*

3.4.7.1 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 APEX Administration Services, that configuration applies to all APEX 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 APEX user creation and management. It provides additional authentication security for applications. See Managing Users in a Workspace.

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See Also

- Managing Workspace Account Login Controls
- Configuring Authentication Control General Settings
- Configuring Authentication Control Development Environment Settings

3.4.7.2 Configuring Authentication Control General Settings

Use Authentication Control, General Settings to configure security settings for developer and end user login.

To configure Authentication Control, General Settings:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Authentication Control, General Settings:
   a. Delay after failed login attempts in Seconds - After failed logins, APEX displays a countdown of the number of failed login attempts before it accepts new login attempts with the same username. Enter `0` to disable the countdown and allow immediate access.
   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. APEX 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 APEX redirects to trigger a logout from the Single Sign-On server. APEX automatically appends `?p_done_url=...login url....`

      Example:

      ```
      https://login.example.com/pls/orasso/orasso.wwsso_app_admin.ls_logout
      ```
5. Click **Apply Changes**.

3.4.7.3 Configuring Authentication Control Development Environment Settings

Use Authentication Control, Development Environment Settings to configure security settings for workspace administrator and workspace developer accounts.

To configure security settings for workspace administrator and workspace developer accounts:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Authentication Control, Development Environment Settings:

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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 - Applies to end user accounts created using the APEX account management interface. Options include:

- **Yes** - EnablesAPEX user account expiration and locking features across all workspaces. This selection prevents the same feature from being disabled at the workspace-level.
- **No** - Relinquishes control to each Workspace administrator.

c. Maximum Login Failures Allowed - Enter an 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 APEX 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 which workspace administrators can change. The workspace-level preference applies to the accounts within that workspace.

e. Current Workspace Authentication Scheme - Displays the current authentication scheme for Oracle APEX Administration Services and the Oracle APEX development environment.

f. Data Reporter Authentication Scheme - Select an authentication scheme for Data Reporter. Supported authentication schemes include: **SAML**, **Social Sign-In**, or **HTTP Header Variable**. To learn more, see Configuring an Authentication Scheme for Data Reporter.

5. Click **Apply Changes**.

3.4.7.4 Configuring Authentication Schemes for an Instance

Instance administrators configure authentication schemes for an Oracle APEX instance.

- About Configuring Authentication Schemes
  Learn about configuring an authentication schemes for an Oracle APEX instance.
- Editing Oracle APEX Accounts
  Edit the Oracle APEX Accounts authentication scheme for an instance.
- Editing Database Accounts
  Edit the Database Accounts authentication scheme for an instance.
- Editing HTTP Header Variable
  Edit the HTTP Header Variable authentication scheme for an instance.

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- Editing LDAP Directory
  Edit the LDAP Directory authentication scheme for an instance.
- Editing Oracle Application Server Single Sign-On
  Edit the Oracle Application Server Single Sign-On for an instance.
- Editing SAML Sign In
  Delegates authentication to the Security Assertion Markup Language (SAML) Sign In authentication scheme.
- Editing Social Sign-In
  Edit the Social Sign-In authentication scheme for an instance.

3.4.7.4.1 About Configuring Authentication Schemes

Learn about configuring an authentication schemes for an Oracle APEX instance.

An Instance administrator configures the authentication scheme for a given Oracle APEX instance as follows:

1. Navigate to Manage Instance, Security:
   a. Sign in to APEX Administration Services.
   b. Click **Manage Instance**.
   c. Under Instance Settings, click **Security**.
2. Find **Authentication Control**.
3. **Development Environment Authentication Schemes** displays all available authentication schemes for the instance.
   The Status column lists each as either **Not Current** or **Current**. The authentication scheme designated as **Current** determines how Oracle APEX identifies and verifies instance administrators, workspace administrators, and developers. Depending upon the selected authentication scheme type, you can configure various settings to fine-tune authentication behavior.
4. To configure a new an authentication scheme for an instance, edit the settings and click **Make Current Scheme**.

> **Tip**
>
> For all authentication schemes (even for external authentication schemes such as HTTP Header Variable) make sure that all users exist as developers or administrators in your workspace. Otherwise, APEX will not be able to verify in which workspace a user is allowed to work.

> **Tip**
>
> You can also change the authentication scheme using the `APEX_BUILDER_AUTHENTICATION` parameter in `APEX_INSTANCE_ADMIN` package. See `APEX_INSTANCE_ADMIN`, Available Parameter Values in *Oracle APEX API Reference*.

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> **See Also**
>
> - Establishing User Identity Through Authentication in *Oracle APEX App Builder User's Guide*
> - Editing an Existing Authentication Scheme in *Oracle APEX App Builder User's Guide*

3.4.7.4.2 Editing Oracle APEX Accounts

Edit the Oracle APEX Accounts authentication scheme for an instance.

> **Note**
>
> Oracle does not recommend Oracle APEX Accounts authentication in production environments. The credentials used to log in to an application may be the same as the credentials used to log in to a workspace. In production environments, Oracle recommends using a full-featured external identity provider such as Oracle Identity Cloud Service (IDCS).

Oracle APEX Accounts authentication uses a native user repository within APEX. When using this authentication method, the user name and password are validated against this repository.

To edit Oracle APEX Accounts:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme designated as **Current**.
5. Find **Oracle APEX Accounts** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of Oracle APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.

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- Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the Oracle APEX `LOGIN` procedure after the authentication step (login credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.

8. To save your changes, click **Apply Changes**.

3.4.7.4.3 Editing Database Accounts

Edit the Database Accounts authentication scheme for an instance.

Database Accounts Credentials authentication requires that a database user (schema) exist in the local database and is unlocked. This authentication method validates user's credentials against the database accounts repository. Unlike database clients such as SQL Developer, this authentication method does not establish a new database session for this user.

Choose Database Accounts Credentials if having one database account for each named developer and administrator is feasible and account maintenance using database tools meets your needs (for example, changing user's password using an `ALTER USER` statement).

To edit Database Accounts:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme is designated as **Current**.
5. Find **Database Accounts** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:

   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On, and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.
   - Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the APEX `LOGIN` procedure after the authentication step (login credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.

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8. To save your changes, click **Apply Changes**.

3.4.7.4.4 Editing HTTP Header Variable

Edit the HTTP Header Variable authentication scheme for an instance.

HTTP Header Variable supports the use of header variables to identify a user and to create an Oracle APEX user session. Use HTTP Header Variable authentication scheme if your company employs a centralized web authentication solution like Oracle Access Manager which provides single sign-on across applications and technologies. User credential verification is performed by these systems and they pass the user's name to Oracle APEX using a HTTP header variable such as "REMOTE_USER" (which is the default).

To edit HTTP Header Variable:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme designated as **Current**.
5. Find **HTTP Header Variable** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of Oracle APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.
   - Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the Oracle APEX `LOGIN` procedure after the authentication step (login credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.
8. Under Authentication Scheme Attributes:

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

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- HTTP Header Variable Name - Specifies the name of the HTTP header variable which contains the username. The default `OAM_REMOTE_USER` is used by Oracle Access Manager and has to be changed if another authentication provider is used.
- Action if Username is Empty - Specifies the action to be performed if the username stored in the HTTP header variable is empty.
- Verify Username - Specifies how often the username stored in the HTTP header variable is verified
- Logout URL of SSO Server - If the authentication scheme is based on Oracle Access Manager or similar servers, use this attribute to specify a URL to log out of the central single sign-on server.
  Oracle Access Manager based SSO example:

  `/oamsso/logout.html?end_url=%POST_LOGOUT_URL%`

  The substitution parameter *`%POST_LOGOUT_URL%`* will be replaced by an encoded URL to the login page of your application.

9. To save your changes, click **Apply Changes**.

3.4.7.4.5 Editing LDAP Directory

Edit the LDAP Directory authentication scheme for an instance.

You can configure any authentication scheme that uses a login page to use Lightweight Directory Access Protocol (LDAP) to verify the user name and password submitted on the login page.

An LDAP Credentials authentication scheme, requires an LDAP host name, LDAP port, Distinguished Name (DN) string, and determines whether to use SSL, exact DN, and optionally a search filter if not using exact DN. An optional preprocessing function can be specified to adjust formatting of the user name passed to the API.

To edit LDAP Directory:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme designated as **Current**.
5. Find **LDAP Directory** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database.

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Authentication schemes where user credentials checking is done outside of Oracle APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.

- Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the Oracle APEX `LOGIN` procedure after the authentication step (login credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.

8. Under Authentication Scheme Attributes:

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

- Host - Enter the hostname of your LDAP directory server.
- Port - Specify the port number of your LDAP directory host. The default is 389.
- Use SSL - Choose whether to use SSL to bind to the LDAP directory. If SSL with Authentication is chosen, a wallet must be configured for the Oracle APEX instance.
- Distinguished Name (DN) String - Enter the pattern used to construct the fully qualified distinguished name (DN) string to `DBMS_LDAP.SIMPLE_BIND_S` if using exact DN or the search base if using non-exact DN. Use `%LDAP_USER%` as a placeholder for the username. Examples:
  Exact DN:

  ```
  cn=%LDAP_USER%,l=amer,dc=yourdomain,dc=com
  ```

  Non-Exact DN (Search Base)

  ```
  dc=yourdomain,dc=com
  ```

- Search Filter - Enter the search filter when not using an exact distinguished name (DN). Use `%LDAP_USER%` as a place-holder for the username. For example:
  `cn=%LDAP_USER%`
- LDAP Username Edit Function - You may provide additional code to be executed to transform the username into a format perfectly suited to the LDAP directory entry or LDAP username. The bind variable `:USERNAME` contains the name the end user specified. For example, the following code calls a function which replaces all `"."'s` with `"_"'s` in the DN string:

  ```
  return apex_custom_auth.ldap_dnprep(p_username => :USERNAME);
  ```

  `&PRODUCT_NAME.` will escape the returned username based on the authentication attribute Username Escaping.
- Username Escaping - Before replacing `%LDAP_USER%` in the LDAP distinguished name and search string, Oracle APEX can automatically escape special characters in the username. Options include:
  - **Standard** - Escape special characters based on RFC 4514 (for distinguished names) and RFC 4515 (for search strings). Additionally, escape Unicode characters. This is the most secure setting, but may cause problems with some LDAP servers.

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- **Only special characters** - Escape special characters based on RFC 4514 (for distinguished names) and RFC 4515 (for search strings). Do not escape unicode characters.
- **No escaping** - Do not escape any characters. This setting is potentially insecure, unless a Username Edit Function is employed that already escapes the username (for example with `apex_escape.ldap_dn or apex_escape.ldap_search_filter`).

9. To save your changes, click **Apply Changes**.

3.4.7.4.6 Editing Oracle Application Server Single Sign-On

Edit the Oracle Application Server Single Sign-On for an instance.

To have an Oracle APEX application operate as partner application with Oracle Application Server's Single Sign-On (SSO) infrastructure, you must register your application (or register the Oracle APEX engine) as the partner application by following the Oracle Application Server instructions for registering partner applications and install the OracleAS PL/SQL SSO Software Development Kit (SDK).

If you choose this approach, your application will not use an integrated login page. Instead, when a user accesses your application in a new browser session, the Oracle APEX engine redirects to the Single Sign-On login page. After the user is authenticated by SSO, the SSO components redirect back to your application, passing the user identity and other information to the Oracle APEX engine. The user can then continue to use the application until they log off, terminate their browser session, or until some other session-terminating event occurs.

To edit Oracle Application Server Single Sign-On:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme designated as **Current**.
5. Find **Oracle Application Server Single Sign-On** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of Oracle APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.
   - Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the Oracle APEX `LOGIN` procedure after the authentication step (login

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credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.

8. To save your changes, click **Apply Changes**.

3.4.7.4.7 Editing SAML Sign In

Delegates authentication to the Security Assertion Markup Language (SAML) Sign In authentication scheme.

- About SAML Sign In
  Learn about SAML Sign In authentication.
- About Response Signing when Using SAML
  Learn about the authentication response signing requirements when using SAML.
- About Cross-Origin Resource Sharing when Using SAML
  Learn about cross-origin resource sharing when using SAML.
- Configuring SAML Sign-In
  Edit the SAML Sign-In authentication scheme for an instance.

3.4.7.4.7.1 About SAML Sign In

Learn about SAML Sign In authentication.

Oracle APEX supports the use of Security Assertion Markup Language (SAML). SAML is an XML-based protocol for exchanging security information between software entities on the Web. SAML security is based on the interaction of asserting and relying parties. SAML provides single sign-on capabilities; users can authenticate at one location and then access service providers at other locations without having to log in multiple times.

> **Note**
>
> SAML support requires Oracle Database 19c (Database Release Update 19.9.0.0.0 or newer) or Oracle AI Database 26ai. If your database does not meet these requirements, SAML Sign-In authentication scheme will not display.

3.4.7.4.7.2 About Response Signing when Using SAML

Learn about the authentication response signing requirements when using SAML.

Oracle APEX requires the Identity Provider to digitally sign both the SAML Assertion and SAML Response. It is common for Identity Providers to only sign the SAML Assertion by default. When only the SAML Assertion is signed, APEX will reject the SAML payload with the `Invalid value for parameter` error. You must ensure your Identity Provider is signing both the SAML Assertion and SAML Response.

3.4.7.4.7.3 About Cross-Origin Resource Sharing when Using SAML

Learn about cross-origin resource sharing when using SAML.

The SAML authentication end user flow requires Oracle REST Data Services (ORDS) to permit cross-origin requests from your Identity Provider to Oracle APEX. By default, ORDS does not allow cross-origin requests to its PL/SQL gateway including to Oracle APEX. You must

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configure ORDS to designate your Identity Provider as a trusted origin by setting `security.externalSessionTrustedOrigins` configuration parameter.

> **See Also**
>
> Cross-Origin Resource Sharing Feature in *Oracle REST Data Services Developer's Guide*

3.4.7.4.7.4 Configuring SAML Sign-In

Edit the SAML Sign-In authentication scheme for an instance.

To edit SAML Sign-In:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Authentication Control, scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates if the authentication scheme designated as **Current**.
5. Find **SAML** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of Oracle APEX typically do not execute the Pre-Authentication procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.
   - Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the Oracle APEX LOGIN procedure after the authentication step (login credentials verification). The LOGIN procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.
8. Under SAML for Internal and Workspace Applications: APEX Attributes:
   - Enable SAML for Applications - Enable if workspace applications should be able to use SAML authentication. Note that you can enable any other authentication scheme for internal applications, but still use SAML in applications if this attribute is enabled.

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- Username Attribute - SAML responses can contain additional attributes about the user. If set, APEX uses that attribute's value as the username. By default, APEX uses the assertion subject's NameID attribute.
- NameID Format - Enter the expected format of the NameID attribute. If empty, APEX assumes `urn:oasis:names:tc:SAML:2.0:nameid-format:persistent`.
- Issuer - Enter the `Issuer` attribute that Oracle APEX sends. This attribute defaults to the callback URL (`https://apex.example.com/ords/apex_authentication.saml_callback`), which is normally sufficient.
- Certificate - Enter the primary certificate of the APEX side.
- Private Key - Enter the private key of the APEX side. Note that APEX does not display an existing private key, but you can enter a new one.
- Alternative Certificate - Enter the alternative certificate of the APEX side.
- Alternative Private Key - Enter the alternative private key of the APEX side. Note that APEX does not display an existing private key, but you can enter a new one.
- Supported Callback URLs - Enter APEX callback URLs (separated by new lines) if this APEX instance should support integration using multiple domains. When redirecting to the identify provider for login APEX sends `AssertionConsumerServiceIndex="nnn"` in the authentication request, where `nnn` is the index of the current callback URL in this list, starting with 0. This attribute is optional if the APEX instance only needs to support integration with a single domain.

9. Under SAML for Internal and Workspace Applications: Identity Provider Attributes:
   - Issuer - Enter the Issuer attribute from the identity provider's metadata, for example: `https://login.example.com/oam/fed`
   - Signing Certificate - Enter the certificate from the identity provider's metadata.
   - Alternative Signing Certificate - Enter an alternative certificate from the identity provider's metadata.
   - Sign-In URL - Enter the identity provider's sign in URL.
   - Sign-Out URL - Enter the identity provider's sign out URL. If empty, it defaults to the sign in URL, which is normally sufficient.
10. To save your changes, click **Apply Changes**.

> **Tip**
>
> If your APEX instance is using the prerequisite database release and Database Release Update and the SAML Sign-In authentication scheme does not appear, execute the following while connected to the database (or pluggable database) as SYSDBA:
>
> ```
> set serveroutput on
> exec sys.validate_apex
> ```


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3.4.7.4.8 Editing Social Sign-In

Edit the Social Sign-In authentication scheme for an instance.

Social Sign-In supports authentication with Google, Facebook, and other social networks and enterprise identity providers that support OpenID Connect or OAuth2 standards.

To edit Social Sign-In:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Scroll down to **Development Environment Authentication Schemes**.

   The Status column indicates the authentication scheme designated as **Current**.
5. Find **Social Sign-In** and click **Edit**.

   The Edit Scheme page appears.
6. Click **Make Current Scheme** to have applications identify and verify the user using this authentication scheme.
7. Under Edit Authentication Scheme:
   - PL/SQL Code - Enter a PL/SQL anonymous block of code that contains procedures for pre- and post-authentication entry points. To improve performance, you can also store this code in a PL/SQL package in the database.
   - Pre-Authentication Procedure Name - Specify the name of a procedure to be executed after the login page is submitted and just before credentials verification is performed. The procedure can be defined in the PL/SQL Code attribute or within the database. Authentication schemes where user credentials checking is done outside of APEX typically do not execute the Pre-Authentiation procedure. Examples include HTTP Header Variable, Oracle Application Server Single Sign-On and custom authentication schemes that use `APEX_AUTHENTICATION.POST_LOGIN` instead of `APEX_AUTHENTICATION.LOGIN`.
   - Post-Authentication Procedure Name - Specify the name of a procedure to be executed by the APEX `LOGIN` procedure after the authentication step (login credentials verification). The `LOGIN` procedure will execute this code after it performs its normal duties, which include setting a cookie and registering the session, but before it redirects to the desired application page. The procedure can be defined in the PL/SQL Code attribute or within the database.
8. Under OAuth2 Credentials:
   - Client ID - Enter the client ID of your authentication provider.
   - Client Secret - Enter the client secret of your authentication provider.
   - Confirm Client Secret - Enter the client secret of your authentication provider.
9. Under Authentication Scheme Attributes:

   Tip

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

   - Authentication Provider - Select a provider.

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- Discovery URL - Enter the OpenID Connect provider's discovery URL. Example: `https://accounts.example.com/.well-known/openid-configuration`
- Scope - Enter a comma separated list of permissions to request for the user who is logging in. The acceptable values depend on your authentication provider. For OpenID Connect and Google, APEX automatically adds the "openid" scope. The authentication provider returns user attributes based on these permissions. You can use a Post Authentication procedure to process these attributes, using the `APEX_JSON.GET_%` functions.
- Authentication URI Parameters - Enter optional parameters for the authentication URI. Consult the authentication provider's documentation for supported parameters.
- Username Attribute - Enter the attribute which contains the username. Consult the authentication provider's documentation for supported attributes.
- Verify Username - If enabled, APEX will look for an attribute "#username#_verified" (for example, "email_verified" for Username Attribute "email"). If this is set to false, the username will not be accepted.
- Additional User Attributes - Enter a comma separated list of additional user data attributes. Consult the authentication provider's documentation for supported attributes.
- Logout URL - Use this attribute to specify a URL to log out from your authentication provider. For OpenID Connect, APEX automatically uses the end_session endpoint, if that is defined in the Discovery URL. For others, you can use `#ID_TOKEN#` and `#REDIRECT_URI#` in the URL, to substitute the ID token that was returned when logging in and the full URL to /apex on your instance (for example, `https://www.example.com/apex/apex`). Note that the redirect URI often has to be registered with your authentication provider.

10. To save your changes, click **Apply Changes**.

3.4.7.5 Configuring an Authentication Scheme for Data Reporter

Learn how to configure an authentication scheme for Data Reporter.

In order to access Data Reporter, you must configure one of the following authentication schemes: **SAML**, **Social Sign-In**, or **HTTP Header Variable**.

To configure an authentication schemes for Data Reporter:

1. Navigate to Manage Instance, Security:
   a. Sign in to APEX Administration Services.
   b. Click **Manage Instance**.
   c. Under Instance Settings, click **Security**.
2. Find **Authentication Control**.
3. Development Environment Authentication Schemes - Configure a supported authentication schemes for the Oracle APEX instance.

   Data Reporter, requires one of the following authentication schemes: **SAML**, **Social Sign-In**, or **HTTP Header Variable**. To learn more, see Configuring Authentication Schemes for an Instance.
4. Development Environment Settings, Data Reporter Authentication Scheme - Select the appropriate authentication schemes.
5. Click **Apply Changes**.

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Related Topics

- Introduction to Data Reporter

3.4.8 Creating Strong Password Policies

Instance administrators can create strong password policies for an Oracle APEX instance.

- About Strong Password Policies
  Manage password policy for APEX users (workspace administrators, developers, and end users) in all workspaces.
- Configuring Password Policies
  Manage password policy for APEX users (workspace administrators, developers, and end users) in all workspaces.

3.4.8.1 About Strong Password Policies

Manage password policy for APEX users (workspace administrators, developers, and end users) in all workspaces.

Password policies can:

- Apply to all users (including, Workspace administrators, developers, and end users) in an APEX instance.
- Include restrictions on characters, password length, specific words, and differences in consecutive passwords.
- Apply to users signing in to APEX Administration Services.

The APEX 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.

  Password policies add another layer of security to prevent hackers from determining an administrator's password.

3.4.8.2 Configuring Password Policies

Manage password policy for APEX users (workspace administrators, developers, and end users) in all workspaces.

To configure password policies:

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1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Under Password Policy and specify the following attributes:

Table 3-1 Workspace Password Policy Attributes

Attribute	Description
Password Hash Function	Select a hash function that APEX 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 the number of differences required between old and new passwords. The passwords are compared character by character, and each difference that occurs in any position 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 set of characters must be used in password validations involving punctuation characters.

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5. For Service Administrator Password Policy, select an option:
   - **Use policy specified in Workspace Password Policy** - Applies the password rules specified above in Workspace Password Policy to service administrator passwords.
   - **Use default strong 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 field specified above in Workspace Password P
6. Click **Apply Changes**.

3.4.9 Managing Authorized URLs

Create and manage a list of authorized URLs.

Authorized URLs identify the list of URLs that can be used as parameter values of certain Oracle APEX procedures. This includes the `APEX_UTIL.COUNT_CLICK` procedure, which has an input parameter named `P_NEXT_URL`.

If the parameter value to `P_NEXT_URL` is not a relative URL and not to the current host name, then it must be contained in this list of Authorized URLs.

- Defining a List of Authorized URLs
  Define a list of authorized URLs.
- Editing a Defined Authorized URL
  Edit a URL included in the list of authorized URLs.
- Deleting Defined Authorized URL
  Delete a URL included in the list of authorized URLs.

3.4.9.1 Defining a List of Authorized URLs

Define a list of authorized URLs.

To define a list of Authorized URLs:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Click the **Authorized URLs** tab.
5. Click **Create Authorized URL.**
6. In Authorized URL, identify an authorized URL that can be used as the parameter value to certain APEX procedures, including `APEX_UTIL.COUNT_CLICK`.

   The entire Authorized URL value will be compared with the URL parameter value in these procedures. If there is an exact match up to and including the entire length of the Authorized URL value, then the URL parameter value will be permitted.

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7. Enter **Create Authorized URL**.

3.4.9.2 Editing a Defined Authorized URL

Edit a URL included in the list of authorized URLs.

To edit an existing URL:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Click the **Authorized URLs** tab.
5. Click the **Edit** icon adjacent to the URL.
6. Edit the Authorized URL and Description fields.
7. Click **Apply Changes**.

3.4.9.3 Deleting Defined Authorized URL

Delete a URL included in the list of authorized URLs.

To delete a URL included in the list of authorized URLs:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Security**.
4. Click the **Authorized URLs** tab.
5. Click the **Edit** icon adjacent to the URL.
6. Click **Delete**.
7. Click **OK** to confirm your selection.

3.5 Configuring Instance Settings

Control a variety of general settings for a development instance including configuring workspace provisioning behavior, email provisioning, storage, email, wallet information, report printing, workflow settings, Application Gallery settings, Help menu, workspace size options, application ID ranges, and background jobs.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- About Configuring Workspace Provisioning
  The Instance administrator determines the amount of automation when provisioning (or creating) a workspace.

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- Disabling Email Provisioning
  Use Email Provisioning in conjunction with the Provisioning Method, Automatic, to disable workspace provisioning and send users a message.
- Configuring Storage
  Instance administrators can configure the following Storage options: require a new schema when requesting a workspace, auto extend tablespaces, automaticaly approve storage requests, or delete uploaded files in a specified number of days.
- Configuring Email
  To enable APEX to send mail, an instance administrator must configure instance-level email settings.
- Configuring Wallet Information
  Configure wallet information (which store authentication and signing credentials) for an APEX instance.
- Configuring Report Printing for an Instance
  Enable end users to download and print reports in various formats, including PDF.
- Configuring Workflow Settings
  Configure retention periods for tasks and workflows.
- Configuring the Application Gallery
  Configure the location used as the installation source for Application Gallery.
- Configuring the Help Menu
  Configure the target URL of the Help menu that displays in the upper right corner of the APEX development environment.
- Configuring Workspace Size Requests
  Configure the size options available to users when they request a new workspace and schema or request additional storage for an existing workspace.
- Managing Application ID Range
  Control the range for IDs of new applications.
- Configuring Background Jobs
  Configure the Background Job Class and the Minimum Execution Cadence settings.

Related Topics

- Creating Workspaces in Administration Services
  Users access Oracle APEX by signing in to a shared work area called a workspace. An administrator can create workspaces manually in Administration Services or take advantage of an automated approach in which users click a link a login page.

3.5.1 About Configuring 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 Methods on the Instance Settings page:

- **Manual** - An Instance administrator creates new workspaces and notifies the Workspace administrator regarding the Sign In credentials.
- **Request** - Users request a workspace. Once an administrator approves the request, the user receives an email containing an email verification link. After the user clicks the email verification link, the workspace is created.

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- **Automatic** - Works similar to **Request** except requests are automatically approved with no administrator review required.

To enable users to request a workspace using a link on the Sign In page, the Instance administrator must choose either the **Request** or **Automatic** Provisioning Method. If the Provisioning Method is set to **Manual**, no link appears on the Sign In page.

> **Note**
>
> An instance administrator must configure instance-level email in order for Oracle APEX to send the emails required for the **Request** or **Automatic** Provisioning Methods.

> **See Also**
>
> - Selecting a Workspace Provisioning Mode
> - Configuring Email
> - Disabling Email Provisioning
> - Managing Requests

3.5.2 Disabling Email Provisioning

Use Email Provisioning in conjunction with the Provisioning Method, Automatic, to disable workspace provisioning and send users a message.

Selecting **Disabled for Email Provisioning** enables you to display message to users that explains why workspace provisioning is disabled.

To disable email provisioning:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. From **Email Provisioning**, select **Disabled**.

   Selecting **Disabled** completely disables workspace provisioning.
5. In Message, enter a message that explains why email provisioning is disabled.
6. Click **Apply Changes**.

> **See Also**
>
> Selecting a Workspace Provisioning Mode

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3.5.3 Configuring Storage

Instance administrators can configure the following Storage options: require a new schema when requesting a workspace, auto extend tablespaces, automaticaly approve storage requests, or delete uploaded files in a specified number of days.

- Requiring a New Schema
  Control if a user requesting a workspace can select an existing schema or must request a new schema.
- Configuring Instance Tablespace
  Specify the name of an existing data tablespace to use for the database user for all new workspaces.
- Enabling Auto Extend Tablespaces
  Enable Auto Extend Tablespaces.
- Enabling Bigfile Tablespaces
  Enable support for bigfile tablespaces.
- Enabling Encrypted Tablespaces
  Enable support for encrypted tablespaces.
- Enabling Automatic Approval of Storage Requests
  Automatically enable the approval of storage requests up to the selected size.
- Deleting Uploaded Files
  Specify the number of days after which APEX automatically deletes uploaded files.

3.5.3.1 Requiring a New Schema

Control if a user requesting a workspace can select an existing schema or must request a new schema.

To require a new schema when creating a workspace:

1. Sign in to APEX Administration Services.
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. Click **Apply Changes**.

> **See Also**
>
> Enabling Auto Extend Tablespaces.

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3.5.3.2 Configuring Instance Tablespace

Specify the name of an existing data tablespace to use for the database user for all new workspaces.

To configure Instance Tablespace:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Scroll down to **Storage**.
5. **Instance Tablespace** - Enter the name of an existing data tablespace, or comma separated list of tablespaces, to use for the database user for all new workspaces. When not set, a new tablespace is created.
6. Click **Apply Changes**.

3.5.3.3 Enabling Auto Extend Tablespaces

Enable Auto Extend Tablespaces.

If Auto Extend Tablespaces is enabled, tablespaces provisioned with APEX 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 APEX Administration Services.
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**.

3.5.3.4 Enabling Bigfile Tablespaces

Enable support for bigfile tablespaces.

When a workspace is provisioned, APEX creates the associated database user, tablespace, and data file. If Bigfile Tablespaces is enabled, tablespaces provisioned with APEX 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.

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To enable bigfile tablespaces:

1. Sign in to APEX Administration Services.
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 APEX API Reference* to learn about the `BIGFILE_TABLESPACES_ENABLED` parameter

3.5.3.5 Enabling Encrypted Tablespaces

Enable support for encrypted tablespaces.

If Encrypted Tablespaces is enabled, tablespaces provisioned with APEX are created as encrypted tablespaces using the 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 APEX, an encryption wallet must be created and with a master encryption key set. Additionally, the encryption wallet must be open before provisioning a new APEX workspace.

To enable Encrypted Tablespaces:

1. Sign in to Oracle APEX Administration Services.
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**.

> **Tip**
>
> Available Parameter Values in *Oracle APEX API Reference* to learn about the `ENCRYPTED_TABLESPACES_ENABLED` parameter.

3.5.3.6 Enabling Automatic Approval of Storage Requests

Automatically enable the approval of storage requests up to the selected size.

To use this option, the workspace Provisioning Method must be set to **Automatic**. If the workspace Provisioning Method is set to **Manual** or **Request** then storage requests cannot be automatically approved.

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To automatically enable the approve storage requests:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Scroll down to **Storage**.
5. For **Automatically Approve Requests**, select a value.
6. Click **Apply Changes**.

> **See Also**
>
> Selecting a Workspace Provisioning Mode

3.5.3.7 Deleting Uploaded Files

Specify the number of days after which APEX automatically deletes uploaded files.

Use Delete Uploaded Files After (days) to specify the number of days after which APEX automatically deletes uploaded files. Note this automatic deletion process applies to all workspaces in an APEX 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 APEX Administration Services.
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 APEX deletes uploaded files.

   Enter a positive, whole number. If this setting is null, then no files are automatically deleted.

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6. Click **Apply Changes**.

> **Tip**
>
> To view a summary of deleted files, see the Automatic File Delete Log. See Monitoring Activity Across an Instance

3.5.4 Configuring Email

To enable APEX to send mail, an instance administrator must configure instance-level email settings.

You can configure APEX to automatically email users their login credentials when a new workspace request has been approved. To learn more, see About Specifying How Workspaces Are Created and Selecting a Workspace Provisioning Mode.

> **Note**
>
> To learn more about configuring email in Oracle APEX with Autonomous AI Database, see Send Email from APEX in *Using Oracle Autonomous AI Database Serverless*.

- About Enabling Network Services
  Enabling network services enables support for sending outbound mail in Oracle APEX, use of Web services in APEX, and PDF report printing with BI Publisher.
- Configuring Email in a Full Development Environment
  In a full development environment, an Instance administrator must configure Oracle APEX to send mail.
- Configuring Email in a Runtime Environment
  In a runtime environment, an Instance administrator must configure Oracle APEX to send mail .
- Determining Email Settings in a Runtime Environment
  Determine email settings in runtime environment.

Related Topics

- Configuring Email Credentials for a Workspace
  Configure email credentials for a workspace.
- Managing the Mail Queue
  Manage email sent from applications by monitoring email messages in the mail queue.
- APEX_MAIL in *Oracle APEX API Reference*

3.5.4.1 About Enabling Network Services

Enabling network services enables support for sending outbound mail in Oracle APEX, use of Web services in APEX, and PDF report printing with BI Publisher.

By default, the ability to interact with network services is disabled in Oracle Database 11g Release 2 or later. Therefore, if you are running Oracle APEX with Oracle Database 11g Release 2 or later, you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_260100` database user. Failing to grant these privileges results in issues with:

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- Sending outbound mail in Oracle APEX.

  Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Consuming web services from APEX.
- Making outbound LDAP calls from APEX.
- PDF report printing with BI Publisher.

Related Topics

- Enabling Network Services in Oracle Database in *Oracle APEX Installation Guide*

3.5.4.2 Configuring Email in a Full Development Environment

In a full development environment, an Instance administrator must configure Oracle APEX to send mail.

To configure Oracle APEX to send mail in a full development environment:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Edit the following Email attributes:
   a. Email, Oracle APEX Instance URL - Specify the URL to this APEX instance, including the trailing slash after the Database Access Descriptor or Context Root. This setting is used for system-generated emails. For example:

      ```
      https://www.example.com/apex/
      ```

   b. Email, Oracle APEX Images URL - Specify the full URL to the images directory of this APEX instance, including the trailing slash after the images directory. This setting is used for system-generated emails..

      ```
      https://www.example.com/i/
      ```

   c. Email, 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. Email, SMTP Host Port - Defines the port the SMTP server listens to for mail requests. The default setting is 25.

   e. Email, SMTP Authentication Username - Enter a username if your SMTP server requires authentication. This username can be overridden at the workspace-level using a Web Credential.

   f. Email, SMTP Password - Enter a password if your SMTP server requires authentication. This password can be overridden at the workspace-level using a Web Credential.

   g. Email, Confirm SMTP Password - Enter the SMTP password again to confirm.

   h. Email, Use SSL/TLS - Oracle APEX supports secure SMTP connections. Options include:

      - **Yes** - A secure connection with SSL/TLS is made before SMTP communication.
      - **After connection is established** - APEX sends the SMTP command `STARTTLS` immediately after the connection is opened.

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- **No** - A non-secure connection is opened.

i. Email, Default Email From Address - Defines the `from` address for tasks that generate email, such as approving a provision request or resetting a password.

j. Email, 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.

k. Email, Maximum Emails Processed per Workspace - Defines the number of email messages that can be processed from the queue per workspace during each invocation of the mail job, `ORACLE_APEX_MAIL_QUEUE`.

5. Click **Apply Changes**.

Related Topics

- Configuring Email Credentials for a Workspace
  Configure email credentials for a workspace.

3.5.4.3 Configuring Email in a Runtime Environment

In a runtime environment, an Instance administrator must configure Oracle APEX to send mail .

To configure APEX to send mail in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:

   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   BEGIN
      APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
      COMMIT;
   END;
   ```

   Tip

   For a description of email parameters, see Configuring Email in a Full Development Environment.

3. Once all parameters have been configured, validate the configuration:

   ```
   BEGIN
       APEX_INSTANCE_ADMIN.VALIDATE_EMAIL_CONFIG;
   END;
   ```


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Related Topics

- SET_PARAMETER Procedure in *Oracle APEX API Reference*

3.5.4.4 Determining Email Settings in a Runtime Environment

Determine email settings in runtime environment.

To determine email settings in runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   SELECT
   APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
   FROM DUAL;
   ```

> **Tip**
>
> For a description of email parameters, see Configuring Email in a Full Development Environment.

> **See Also**
>
> GET_PARAMETER Function in *Oracle APEX API Reference*

3.5.5 Configuring Wallet Information

Configure wallet information (which store authentication and signing credentials) for an APEX instance.

> **Note**
>
> If you are using Oracle AI Database 26ai or later, wallet configuration can remain empty. To learn more, see SET_WALLET Procedure in *Oracle AI Database PL/SQL Packages and Types Reference*

- About SSL and Wallet Creation
  A wallet is a password-protected container that stores authentication and signing credentials (including private keys, certificates, and trusted certificates) needed by SSL.

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- Configuring a Wallet in a Full Development Environment
  Configure wallet settings a full development environment on the Instance Settings page.
- Configuring a Wallet in a Runtime Environment
  Configure wallet settings a runtime environment by starting SQLcl and running the following SQL statements.
- Determining Wallet Settings in a Runtime Environment
  Configure wallet settings in a runtime environment by starting SQLcl and running the following SQL statements.

3.5.5.1 About SSL and Wallet Creation

A wallet is a password-protected container that stores authentication and signing credentials (including private keys, certificates, and trusted certificates) needed by SSL.

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.

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 APEX database instance.
2. The instance administrator configures the Wallet attributes on the Instance Settings page to specify the file system path to the wallet and the wallet password (if required).

> **See Also**
>
> - Using Oracle Wallet Manager in *Oracle AI Database Enterprise User Security Administrator's Guide*
> - About Working with SSL Enabled Web Services in *Oracle APEX App Builder User's Guide*

3.5.5.2 Configuring a Wallet in a Full Development Environment

Configure wallet settings a full development environment on the Instance Settings page.

To specify wallet settings in a full development environment:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.

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4. Click **Wallet**.
5. Under Wallet:
   a. Wallet Path - Enter the path on the file system where the wallet is located using the following format:

      `file:`*`directory-path`*

      Examples:

      - Windows-based system:

        `file:c:\WINNT\Profiles\<`*`username`*`>\WALLETS`

      - UNIX-based system:

        `file:/home/<`*`username`*`>/wallets`

   b. Auto-login Wallet - Select this option if your Oracle wallet is an auto-login wallet. Auto-login wallets do not require a password to open. If you enable this option, **Wallet Password** and **Confirm Wallet Password** are disabled.
   c. Wallet Password - Enter the password needed to open the wallet.
   d. Confirm Wallet Password - Enter the wallet password again to confirm.
6. Click **Apply Changes**.

3.5.5.3 Configuring a Wallet in a Runtime Environment

Configure wallet settings a runtime environment by starting SQLcl and running the following SQL statements.

To specify wallet settings in a runtime environment:

1. Start SQLcl and connect to the database where APEX is installed as `SYS`. For example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   BEGIN
       APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
       COMMIT;
   END;
   ```

   See the table that follows for a description of wallet parameters.

Table 3-2 Wallet Parameters

Parameter Name	Description
`WALLET_PATH`	The path to the wallet on the file system, for example: `file:/home/username/wallets`

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Table 3-2 (Cont.) Wallet Parameters

Parameter Name	Description
WALLET_PWD	The password associated with the wallet. Use an empty/null value for auto-login wallets.

> **See Also**
>
> SET_PARAMETER Procedure in *Oracle APEX API Reference*

3.5.5.4 Determining Wallet Settings in a Runtime Environment

Configure wallet settings in a runtime environment by starting SQLcl and running the following SQL statements.

To determine wallet settings in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as SYS, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   SELECT
   APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
   FROM DUAL;
   ```

   For a description of wallet parameters, see Table 3-2.

> **See Also**
>
> SET_PARAMETER Procedure in *Oracle APEX API Reference*

3.5.6 Configuring Report Printing for an Instance

Enable end users to download and print reports in various formats, including PDF.

- About Configuring Report Printing
  Enable report printing by configuring printing settings at the instance level, application level, and page and region level.
- Configuring Report Printing in a Full Development Environment
  Configure the print server type for an instance by editing the Print Server Type attribute on the Instance Settings page.

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- Configuring Report Printing Settings in a Runtime Environment
  Configure report printing settings in a runtime environment by starting SQLcl and running the following SQL statements.
- Determining Report Printing Settings in a Runtime Environment
  Determine report printing settings in a runtime environment.

3.5.6.1 About Configuring Report Printing

Enable report printing by configuring printing settings at the instance level, application level, and page and region level.

To set up report printing functionality, you must configure the following printing settings:

1. **Instance Level**: For full development environments, instance administrators must select a Print Server under Instance Settings, Report Printer. In runtime environments, instance administrators must specify the level of functionality (Standard or Advanced) for an entire APEX instance, as described in this section.
2. **Application Level**: Developers can specify a Print Server at the application-level by editing the **Print Server Type** attribute on the Application Definition page. Alternatively, 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 enables end users to print regions as reports in various formats.

> **See Also**
>
> Printing Report Regions in *Oracle APEX App Builder User's Guide*

When using the **Oracle Document Generator Pre-built Function**, your APEX instance must run off a database with `DBMS_CLOUD` installed. Prior to configuring report printing, you must create the `DBMS_CLOUD` credential in the database, and configure **Document Generator** as a Remote Print Server through the OCI Pre-built Function Page.

> **Tip**
>
> For more information on configuring the `DBMS_CLOUD` credential, see Understanding Web Credentials in *Oracle APEX App Builder User's Guide*.
>
> For more information on configuring **Document Generator** as a Remote Print Server, see Document Generator Function in *Oracle Cloud Infrastructure Documentation*.

3.5.6.2 Configuring Report Printing in a Full Development Environment

Configure the print server type for an instance by editing the Print Server Type attribute on the Instance Settings page.

To configure the printing of reports in a full development environment:

1. Sign in to Administration Services.
2. Click **Manage Instance**.

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3. Under Instance Settings, click **Instance Settings**.
4. Click **Report Printing**.
5. For Printer Server, select an option:
   - **None (Native)** - Select this option if you do not use an external print server. This option enables you to use the basic printing functionality, which includes CSV, HTML, PDF, and XLSX.
   - **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 APEX and using your own customized XSL-FO templates.
   - **Oracle BI Publisher** - This option requires a valid license for 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 APEX.
   - **APEX Office Print** - Select this option if you are using APEX Office Print. This option enables you to take report query results and convert them from JSON to PDF/MS Office formats using APEX Office Print. Select this option to upload your own MS Office templates for printing reports within APEX.
   - **Oracle Document Generator Pre-built Function** - Select this option if you are using the Document Generator function on Oracle Cloud Infrastructure (OCI). This option enables you to take report query results and convert them from JSON to PDF/ Microsoft Office format using Oracle Document Generator Pre-built Function. Select this option to upload your own Microsoft Office templates for printing reports within APEX.

   What appears next depends upon the **Print Server** you select.
6. If the **Print Server** is **External (Apache FOP)**:
   a. Protocol - Select whether the print server uses **HTTP** or **HTTPS** protocol.
   b. Host Address - Specify the host address of the print server converting engine. By default, this is set to `localhost`.
   c. Port - Specify the host address of the print server converting engine. The default setting is `8888`.
   d. Script - Defines the script that is the print server engine. The default setting is:

      ```
      /xmlpserver/convert
      ```

   e. Print Timeout - Enter the number of seconds. Defines the transfer timeout for communicating with the print server in seconds.
7. If the **Print Server** is **Oracle BI Publisher**:
   a. Protocol - Select whether the print server uses **HTTP** or **HTTPS** protocol.
   b. Host Address - Specify the host address of the print server converting engine. By default, this is set to `localhost`.
   c. Port - Specify the host address of the print server converting engine. The default setting is `8888`.
   d. Script - Defines the script that is the print server engine. The default setting is:

      ```
      /xmlpserver/convert
      ```


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e. Username - Enter a username if your print server requires authentication.

f. Password - Enter a password if your print server requires authentication.

g. Confirm Password - Enter the print password again to confirm.

h. Print Timeout - Enter the number of seconds. Defines the transfer timeout for communicating with the print server in seconds.

8. If the **Print Server** is **Oracle Document Generator Pre-built Function**:

a. Cloud Credential - Specifies the cloud credential to use for Oracle Object Storage bucket management and use of the Oracle Document Generator Pre-built function.

Note: The Cloud credential can be created using the `APEX_INSTANCE_ADMIN.CREATE_CLOUD_CREDENTIAL` API.

b. Object Storage Namespace - Specifies the top-level container for all buckets and objects. At account creation time, each Oracle Cloud Infrastructure (OCI) tenant is assigned one unique system-generated and immutable Object Storage namespace name. This information can be found in the OCI console.

c. Object Storage Bucket Compartment OCID - Specifies the Oracle Cloud Identifier (OCID) of the compartment where the Oracle Document Generator Pre-built function is located.

d. Object Storage Bucket Endpoint - Specifies the base URL endpoint for the Oracle Object Storage bucket.

e. Function OCID - Specifies the Oracle Cloud Identity (OCID) of the Oracle Document Generator Pre-built function. This can be found in the Oracle Cloud Infrastructure (OCI) console.

f. Function Endpoint - Specifies the base URL endpoint of the Oracle Document Generator Pre-built function. This can be found in the Oracle Cloud Infrastructure (OCI) console.

9. For **APEX Office Print**, specify the following:

a. Protocol - Select whether the print server uses **HTTP** or **HTTPS** protocol.

b. Host Address - Specify the host address of the print server converting engine. By default, this is set to `localhost`.

c. Port - Specify the host address of the print server converting engine. The default setting is `8888`.

d. Script - Defines the script that is the print server engine.

e. API Key - If you are using APEX Office Print Cloud Server, enter the Print Server API Key. Do not enter an API Key if you running APEX Office Print locally.

f. Print Timeout - Enter the number of seconds. Defines the transfer timeout for communicating with the print server in seconds.

10. Click **Apply Changes**.

Tip

You can override the Print Server Type instance-level setting at the application-level by editing the **Print Server Type** attribute on the Application Definition page. See Configuring Report Printing at the Application Level in *Oracle APEX App Builder User's Guide*

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3.5.6.3 Configuring Report Printing Settings in a Runtime Environment

Configure report printing settings in a runtime environment by starting SQLcl and running the following SQL statements.

To configure report printing settings in a runtime environment:

1. Start SQLcl and connect to the database where APEX is installed as SYS. For example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   BEGIN
       APEX_INSTANCE_ADMIN.SET_PARAMETER(PARAMETER_NAME, PARAMETER_VALUE);
       COMMIT;
   END;
   ```

   Available parameters are as follows:

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 • DOCUMENT_GENERATOR • AOP • NONE
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.
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

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> **See Also**
>
> SET_PARAMETER Procedure in *Oracle APEX API Reference*

3.5.6.4 Determining Report Printing Settings in a Runtime Environment

Determine report printing settings in a runtime environment.

To determine report printing settings in a runtime environment:

1. Start SQLcl and connect to the database where APEX is installed as SYS. For example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   SELECT
   APEX_INSTANCE_ADMIN.GET_PARAMETER(PARAMETER_NAME)
   FROM DUAL;
   ```

> **See Also**
>
> - See Configuring Report Printing Settings in a Runtime Environment for a description of available parameters.
> - GET_PARAMETER Function in *Oracle APEX API Reference*

3.5.7 Configuring Workflow Settings

Configure retention periods for tasks and workflows.

- Configuring Task Retention
  Specify the number of days completed human tasks are retained.
- Configuring Workflow Retention
  Specify the number of days completed workflow instances are retained.

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3.5.7.1 Configuring Task Retention

Specify the number of days completed human tasks are retained.

Use the Retention Period in Days attribute to specify the retention period in days for human tasks. Tasks are kept until their retention period is up, and then purged. To learn more about task retention and purging, see About Task Retention and Task Purging in *Oracle APEX App Builder User's Guide*.

To specify the retention period for tasks:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Find **Workflow Settings**.
5. In **Retention Period Days**, enter the number of days completed human tasks are retained in the instance before being purged. The value cannot be greater than 30 days. The default value is 7 days.
6. Click **Apply Changes**.

3.5.7.2 Configuring Workflow Retention

Specify the number of days completed workflow instances are retained.

Use the Retention Period in Days attribute to specify the retention period in days for workflow instances. Completed workflows are kept until their retention period is up, and then purged. Terminated and canceled workflows are purged the next time the purge job runs. Active, suspended, and faulted workflow instances are not purged. To learn more about workflow retention and purging, see Workflow Instance Retention in *Oracle APEX App Builder User's Guide*.

To specify the retention period for workflows:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Find **Workflow Settings**.
5. In **Workflow Retention Period Days**, enter the number of days completed workflows are retained in the instance before being purged. The value cannot be greater than 100 days. The default value is 30 days.
6. Click **Apply Changes**.

3.5.8 Configuring the Application Gallery

Configure the location used as the installation source for Application Gallery.

- About the Application Gallery
  The Application Gallery is accessible from the Workspace home page and contains links to Sample Apps, Starter Apps, and Custom Apps.
- Disabling Background Installations
  Control if the Application Gallery supports the installation of applications in the background.

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- Special Use Cases
  Instance admnistrators can modify the installation source used for of Sample and Starter Apps and add Custom Apps to the Gallery.

> **See Also**
>
> Using the Gallery in *Oracle APEX App Builder User's Guide*

3.5.8.1 About the Application Gallery

The Application Gallery is accessible from the Workspace home page and contains links to Sample Apps, Starter Apps, and Custom Apps.

Access the Application Gallery from the top menu, or by typing `Gallery` in the spotlight search. Apps in the Gallery are listed as cards and can be installed directly from APEX.

Sample and Starter Apps are hosted on GitHub by default. When you click the **Install** button, APEX fetches the ZIP file from GitHub in the background, and opens a modal dialog that displays:

- App icon, title, and description
- Advanced settings
  - Application ID - can be auto-generated (default) or manually entered
  - Parsing schema for the app and supporting DB objects

The instance administrator can edit the default installation source, enabling you to host Sample and Starter Apps locally. It also lets you make Custom Apps available across all workspaces on the instance.

3.5.8.2 Disabling Background Installations

Control if the Application Gallery supports the installation of applications in the background.

The **Enable Background Installation** setting is enabled by default. If for some reason database jobs have been disabled for an APEX instance, consider disabling this setting so users can still install applications in the Application Gallery.

To disable background installations in the Application Gallery:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Find **Application Gallery**.
5. Turn the **Enable Background Installation** setting off.
6. Click **Apply Changes**.

3.5.8.3 Special Use Cases

Instance admnistrators can modify the installation source used for of Sample and Starter Apps and add Custom Apps to the Gallery.

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- Advanced Configuration
  The default installation source for the Gallery is the Oracle APEX GitHub repository. You can change the installation source or add new apps to the Gallery by editing the `manifest.json` file and updating the instance settings.
- Hosting APEX Sample and Starter Apps Internally
  Learn how to host APEX Sample and Starter Apps internally.
- Including Custom Apps in the Gallery
  Learn how to include custom apps in the Gallery.
- manifest.json Example
  View an example of the information needed in the `manifest.json` for each app that shows in the Gallery.

3.5.8.3.1 Advanced Configuration

The default installation source for the Gallery is the Oracle APEX GitHub repository. You can change the installation source or add new apps to the Gallery by editing the `manifest.json` file and updating the instance settings.

Developers can install Sample Apps, Starter Apps, and Custom Apps directly from the Gallery. The location of the apps is controlled by the `manifest.json` file.

There are two scenarios where you may want to modify the installation source:

- Network restrictions prevent the client browser from accessing `apex.oracle.com` or `raw.githubusercontent.com`
- You want to add custom apps to the Gallery

In order to make changes to the installation source, you will need to modify the `manifest.json` file. This file dictates the location of the Sample Apps and Starter Apps. An additional `manifest.json` file can be added to indicate the location of the Custom Apps.

To edit the installation source:

1. Sign in to APEX Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Find **Application Gallery**:
   - The location of the `manifest.json` file displays in the text box.
5. Modify the `manifest.json` file.
   a. Download the file from its current location.
   b. Edit the file to change links to the installation source(s).
   c. Upload it to a web server or web resource that can be accessed by the browser over HTTP(s).
6. Under **Application Gallery**, **File URLs**, modify the link for `manifest.json`.
   - If the Sample and Starter Apps installation source has not been modified, add a line break to the text box and add a link to the `manifest.json` file that specifies the location of the Custom Apps.
   - If the Sample and Starter Apps installation source has been modified, remove the link to the existing `manifest.json` file, and add a link to the `manifest.json` file that specifies their new location.

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7. Select **Apply Changes**.

The installation source is modified.

3.5.8.3.2 Hosting APEX Sample and Starter Apps Internally

Learn how to host APEX Sample and Starter Apps internally.

GitHub is the default hosting location for Sample and Starter Apps. If network restrictions mean this location is not accessible by the customer, you can download the apps, host them internally, and modify the installation source to make them accessible.

To host APEX Sample and Starter Apps internally:

1. Go to https://github.com/oracle/apex.
2. Click **branches** and change the branch to the currently installed APEX version.

   For example, from "22.1" to "21.2".
3. Click the **Code** button and select **Download ZIP**.
4. Unzip the file.
5. Deploy the unzipped `apex` folder and its content to a web server that can be reached over HTTP(S).
6. In **Instance Settings**, **Application Gallery**, **File URLs**, remove the existing link, and add the link to the deployed `manifest.json` file.
7. Click **Apply Changes**.
8. Edit the `manifest.json` file and change the links for Starter Apps and Sample Apps to the new location.
9. Visit the **Gallery** page and confirm there are no errors.

> **Tip**
>
> Because of Cross-Origin Resource Sharing (CORS), the web server must be configured to include the `Access-Control-Allow-Origin` HTTP header to tell the browser that a certain resource is allowed to load from a given host/domain.

Starter and Sample Apps are now hosted internally.

3.5.8.3.3 Including Custom Apps in the Gallery

Learn how to include custom apps in the Gallery.

The Custom Apps section of the Gallery allows instance administrators to include their own apps. You upload the apps locally, and then add an installation source file to point to the custom app location.

Before beginning, export the apps you want to include in Custom Apps as zip files.

To include Custom Apps in the Gallery:

1. Host the exported apps on a web server or resource that can be accessed by the browser over HTTP(S).
2. Create a `manifest.json` file that contains information for each Custom App.

   See manifest.json Example.

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3. Host the `manifest.json` file on a web server or resource that can be accessed by the browser over HTTP(S).
4. In **Instance Settings**, **Application Gallery**, **File URLs**, add a new line and then the link to the `manifest.json` file.

   Each URL must be on its own line.
5. Click **Apply Changes**.
6. Visit the **Gallery** page to confirm apps are shown and there are no errors.

> **Tip**
>
> Because of Cross-Origin Resource Sharing (CORS), the web server must be configured to include the `Access-Control-Allow-Origin` HTTP header to tell the browser that a certain resource is allowed to load from a given host/domain.

Custom Apps display in the **Gallery**.

3.5.8.3.4 manifest.json Example

View an example of the information needed in the `manifest.json` for each app that shows in the Gallery.

This example demonstrates the information you must include in the `manifest.json` file when modifying the installation source for apps in the Gallery.

Each app that has had its installation source modified needs the below code block. You can include multiple `manifest.json` files in the **Instance Settings**, **Application Gallery**, **File URLs** attribute. For example, if Sample and Starter Apps remain hosted on GitHub, a new `manifest.json` file can be added to the **File URLs** attribute that only dictates the location of Custom Apps.

```
{
    "sampleApps": [
        {
            "internalName": "MY_SAMPLE_APP",
            "name": "Sample App",
            "description": "This app is a sample app.",
            "author": "John Doe",
            "version": "1.0.0",
            "icon": "https://example.com/apex/apps/sample_app/app-icon.svg",
"url": "https://example.com/apex/apps/sample_app",
"source": "https://example.com/apex/apps/sample_app/sample_app.sql",
"zip": "https://example.com/apex/apps/sample_app/sample_app.zip"
        }
    ],
    "starterApps": [
        {
            "internalName": "MY_STARTER_APP",
            "name": "Starter App",
            "description": "This app is a starter app.",
            "author": "John Doe",
            "version": "1.0.0",
            "icon": "https://example.com/apex/apps/starter_app/app-icon.svg",
"url": "https://example.com/apex/apps/starter_app",
"source": "https://example.com/apex/apps/starter_app/starter_app.sql",
```


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```
"zip": "https://example.com/apex/apps/starter_app/starter_app.zip"
        }
    ],
    "customApps": [
        {
            "internalName": "MY_CUSTOM_APP",
            "name": "Custom App",
            "description": "This app is a custom app.",
            "author": "John Doe",
            "version": "1.0.0",
            "icon": "https://example.com/apex/apps/custom_app/app-icon.svg",
"url": "https://example.com/apex/apps/custom_app",
"source": "https://example.com/apex/apps/custom_app/custom_app.sql",
"zip": "https://example.com/apex/apps/custom_app/custom_app.zip"
        }
    ]
}
```

3.5.9 Configuring the Help Menu

Configure the target URL of the Help menu that displays in the upper right corner of the APEX development environment.

By default, the Help menu in APEX points to the current APEX online documentation library. You can change the target URL under Instance Settings, Help.

To configure the Help menu:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Click **Help**.
5. In Help URL, edit the URL.

   The URL defined here displays when users click the Help link from within APEX.
6. Click **Apply Changes**.

> **See Also**
>
> Using Oracle APEX Documentation in *Oracle APEX App Builder User's Guide*

3.5.10 Configuring Workspace Size Requests

Configure the size options available to users when they request a new workspace and schema or request additional storage for an existing workspace.

To configure workspace size options:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.

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4. Under **New Workspace Request Size**, specify the following:
   a. Size in Megabytes - Edit the default numbers to change the size options.
   b. Display - Select **Yes** for all the size options you want to appear in the select list for workspace size.
   c. Default - Select the default value to appear in the storage field for workspace and change requests.
5. Under **Workspace Change Request Size**, specify the following:
   a. Size in Megabytes - Edit the default numbers to change the size options.
   b. Display - Select **Yes** for all the size options you want to appear in the select list for workspace size.
   c. Default - Select the default value to appear in the storage field for workspace and change requests.
6. Click **Apply Changes**.

> **See Also**
>
> Enabling Auto Extend Tablespaces

3.5.11 Managing Application ID Range

Control the range for IDs of new applications.

You can separate ID ranges in large multi-instance installations to easily move workspaces between the instances and still 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 Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Click **Application ID Range** and specify the following:
   - ID Minimum - Enter the lower range for database application IDs.
   - ID Maximum - Enter the maximum range for database application IDs.
5. Click **Apply Changes**.

3.5.12 Configuring Background Jobs

Configure the Background Job Class and the Minimum Execution Cadence settings.

To configure Background Jobs settings:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Instance Settings, click **Instance Settings**.
4. Click **Background Jobs**, specify the following:

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- Background Job Class - Identify the `DBMS_SCHEDULER` Job Class for Automation, REST Synchronization, and Report Notification jobs to run in. This enables you to assign Data Loading jobs to a specific Resource Manager Consumer group. If not set, the job class `SYS.DEFAULT_JOB_CLASS` is used. To view an example, see item Help.
- Minimum Execution Cadence (Minutes) - Identify the minimal execution cadence (in minutes) for Automation and REST Data Source Synchronization jobs.

5. Click **Apply Changes**.

> **See Also**
>
> - "Configuring Limits for Concurrently Running Scheduler Jobs" section in About Background Page Processes in *Oracle APEX App Builder User's Guide*
> - Job Classes in *Oracle AI Database Administrator's Guide*

3.6 Managing Meta Data

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
  View session state statistics and purge the session state on the Session State page.
- Managing the Mail Queue
  Manage email sent from applications by monitoring email messages in the mail queue.
- Managing the Push Notifications Queue
  Manage push notifications sent from applications in the Push Notifications Queue.
- Viewing Installed Translations
  Access the Installed Translations page to view which translated languages have been installed in this Oracle APEX instance.
- Deleting Interactive Report Subscriptions
  Manage the interactive report subscriptions within the current development instance.

3.6.1 Managing Session State for an Instance

View session state statistics and purge the session state on the Session State page.

- About Session State
  A session is a logical construct used to establish persistence (or stateful behavior) across page views.
- 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.
- Purging Sessions by Age
  Purge sessions by age on the Purge Session page.
- Viewing Session Statistics Before Purging
  View statistics about current sessions before purging on the Session State Statistics page.

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> **See Also**
>
> Managing Session State for a Workspace and Managing Session State Values in *Oracle APEX App Builder User's Guide*

3.6.1.1 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 Oracle APEX 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 APEX App Builder User's Guide*

3.6.1.2 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 Administration Services.
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.

3.6.1.3 Purging Sessions by Age

Purge sessions by age on the Purge Session page.

To purge sessions by age:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Meta Data, click **Session State**.

   The Session State page appears.
4. Click **Purge Sessions**.

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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**.

3.6.1.4 Viewing Session Statistics Before Purging

View statistics about current sessions before purging on the Session State Statistics page.

To view session state statistics:

1. Sign in to Administration Services.
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**.

3.6.2 Managing the Mail Queue

Manage email sent from applications by monitoring email messages in the mail queue.

> **Tip**
>
> To view the Mail Log, see Monitoring Activity Across an Instance

- Sending and Deleting Messages in the Mail Queue
  Use the Mail Queue to push, delete, or reset messages in the mail queue.

3.6.2.1 Sending and Deleting Messages in the Mail Queue

Use the Mail Queue to push, delete, or reset messages in the mail queue.

To send and delete messages in the mail queue:

1. Sign in to Administration Services.
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. The Oracle APEX instance will automatically attempt to resend this mail message up to 14 times. For every subsequent attempt to send the email, the gap in time between send attempts exponentially increases (2 minutes, 4 minutes, 8 minutes, 16 minutes, and so on). If the delivery remains unsuccessful, the mail message is removed from the queue and the latest error is captured in the `apex_mail_log` dictionary view.
4. Use the following buttons to manage messages in the mail queue:

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- **Delete** - Deletes selected messages.
- **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.
- **Send All Mail** - Pushes the messages in the queue. The calculated delay for messages which encounter an error is observed.

See Also

- Configuring Email
- Sending Email from an Application in *Oracle APEX App Builder User's Guide*

3.6.3 Managing the Push Notifications Queue

Manage push notifications sent from applications in the Push Notifications Queue.

- Monitoring the Push Notifications Queue
  Monitor the Push Notifications Queue by sending notifications or deleting notifications in the queue.

See Also

Creating a Progressive Web App (PWA) in *Oracle APEX App Builder User's Guide*

3.6.3.1 Monitoring the Push Notifications Queue

Monitor the Push Notifications Queue by sending notifications or deleting notifications in the queue.

To monitor the Push Notifications Queue:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Meta Data, click **Push Notifications Queue**.

   The Push Notifications Queue page appears.
4. Use the following buttons to manage push notifications in the queue:
   - **Force Push Queue** - The calculated delay for notifications which encounter an error is ignored and an attempt is made to push all notifications in the queue
   - **Push Queue** - Pushes all notifications in the queue. The calculated delay for notifications which encounter an error is observed.
5. To delete a notification:
   - Click the **Row Actions** menu and select **Delete Row**.

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3.6.4 Viewing Installed Translations

Access the Installed Translations page to view which translated languages have been installed in this Oracle APEX instance.

To view the list of installed translations:

1. Sign in to Administration Services.
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

- Installing Translated Versions of APEX in *Oracle APEX Installation Guide*
- Managing Application Globalization in *Oracle APEX App Builder User's Guide*

3.6.5 Deleting Interactive Report Subscriptions

Manage the interactive report subscriptions within the current development instance.

To delete an interactive report subscription:

1. Sign in to Administration Services.
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 Report Updates by Email in *Oracle APEX End User's Guide*
- REMOVE_SUBSCRIPTION Procedure in *Oracle APEX API Reference*

3.7 Communicating Using Messages, Banners, and Resources List

Administrators can communicate with systsem users by creating messages (including login, system messages, and workspace messages), banners, and the Site-Specific Resources list.

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> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Defining a Login Message
  Create a message that displays on the Oracle APEX Sign In page.
- Defining a System Message
  Create a system message to communicate with other users within an instance.
- Defining a Workspace Message in Administration Services
  Create a workspace message in Administration Services on the Workspace Settings page.
- Configuring an Environment Banner in Administration Services
  Configure a environment banner for an instance in Administration Services.
- Managing a Site-Specific Resources List
  Add links the Site-Specific Resources list to communicate important user information such as training, discussion forums, and user feedback applications.

3.7.1 Defining a Login Message

Create a message that displays on the Oracle APEX Sign In page.

- About Login Messages
  Login messages display directly below the Oracle APEX Sign In page.
- Creating or Editing the Login Message
  Instance administrators create or edit the login messages under Messages on the Manage Instance page.

3.7.1.1 About Login Messages

Login messages display directly below the Oracle APEX Sign In page.

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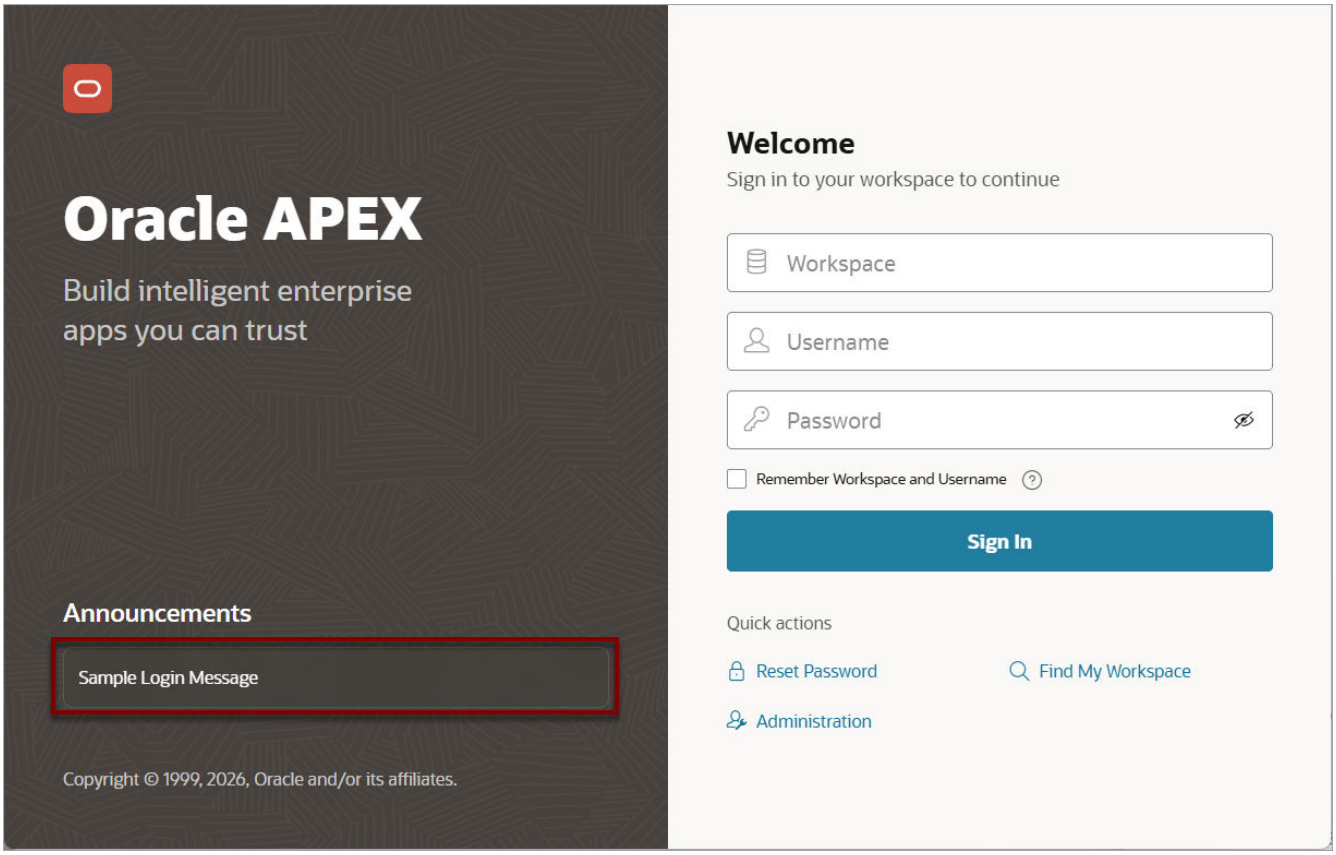

3.7.1.2 Creating or Editing the Login Message

Instance administrators create or edit the login messages under Messages on the Manage Instance page.

To create or edit a login message:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Messages, click **Define Login Message**.
4. In Message, edit the message text. To delete a login message, delete the message text.

   The message can contain any text and can optionally include HTML formatting.
5. Click **Apply Changes**.

3.7.2 Defining a System Message

Create a system message to communicate with other users within an instance.

- About System Messages
  System messages display on the Workspace home page, Workspace Administration page, and Administration Services home page.
- Creating and Editing a System Message
  Instance administrators create and edit system message.

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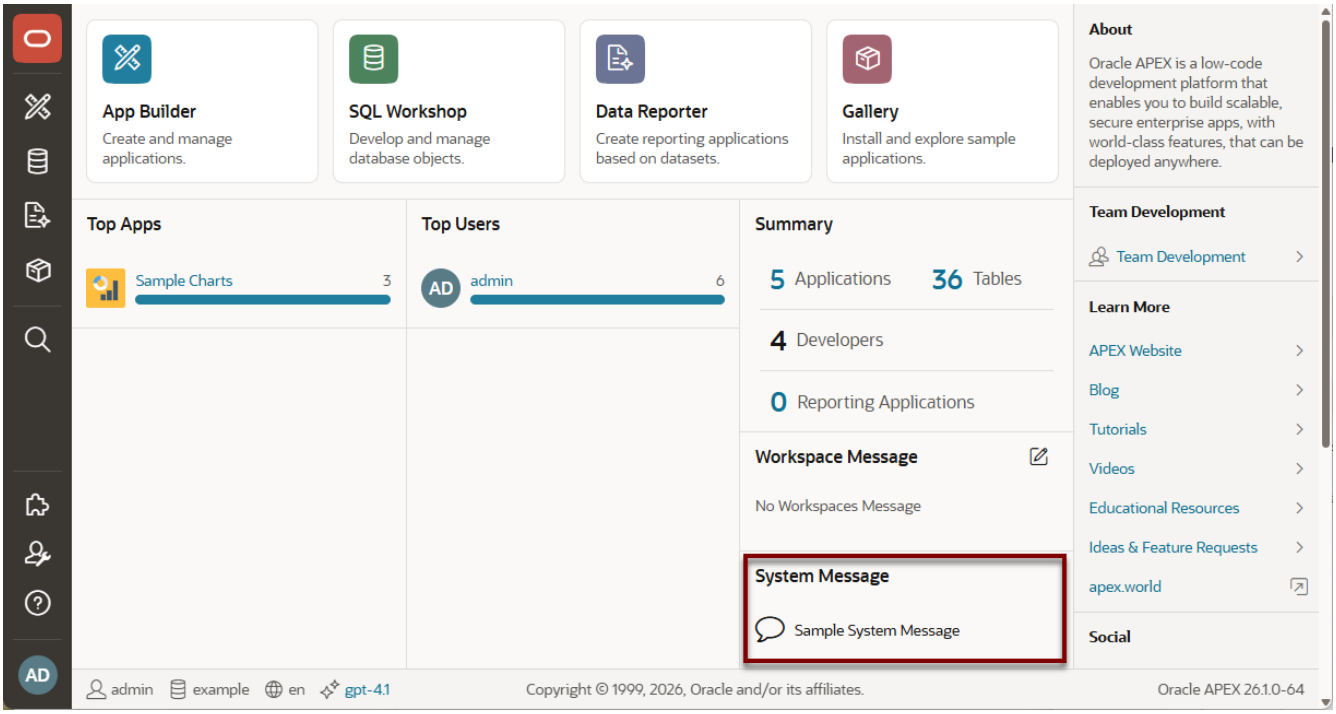
3.7.2.1 About System Messages

System messages display on the Workspace home page, Workspace Administration page, and Administration Services home page.

On the Workspace home page (shown below), the System Message displays the text, `Sample System Message`.



3.7.2.2 Creating and Editing a System Message

Instance administrators create and edit system message.

To create a system message:

1. Sign in to Administration Services.
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 include HTML formatting.
5. Click **Apply Changes**.

3.7.3 Defining a Workspace Message in Administration Services

Create a workspace message in Administration Services on the Workspace Settings page.

Workspace messages display both on the Workspace home page and on the Workspace Administration page. On the Workspace home page, workspace message display in the News and Messages region.

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To create or edit a workspace message in Administration Services:

1. Sign in to Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Component Availability**.

   The Component Availability page appears. To customize the report, use the Search bar at the top of the page.
4. Locate and select the workspace for which you want to define a workspace message.

   The Workspace Settings page appears.
5. Under Workspace Message, enter or remove in the Message field. To format the display, include standard HTML tags.
6. Click **Apply Changes**.

> **See Also**
>
> Defining a Workspace Message

3.7.4 Configuring an Environment Banner in Administration Services

Configure a environment banner for an instance in Administration Services.

Environment banners can display at either the left or top of the page. You can define an environment banner for a given workspace or an entire development instance. Workspace-level environment banners override those defined at the instance-level.

> **Note**
>
> If a workspace or instance-level environment banner is enabled, the text and color displays in App Builder pages and Runtime Developer toolbar in the application runtime.

To define a environment banner in Administration Services:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Messages, click **Define Environment Banner**.
4. In the Environment Banner dialog:
   a. Enable Banner - Specify whether to include an environment banner. Select **Yes** or **No**.
   b. Position - Select the banner display position. Select **Left** or **Top**.
   c. Label - Edit the text to display as a label on the banner.
   d. Color - Select the banner color.
5. Click **Apply Changes**.

   A confirmation message appears that reads:

   ```
   Environment banner settings saved.
   ```


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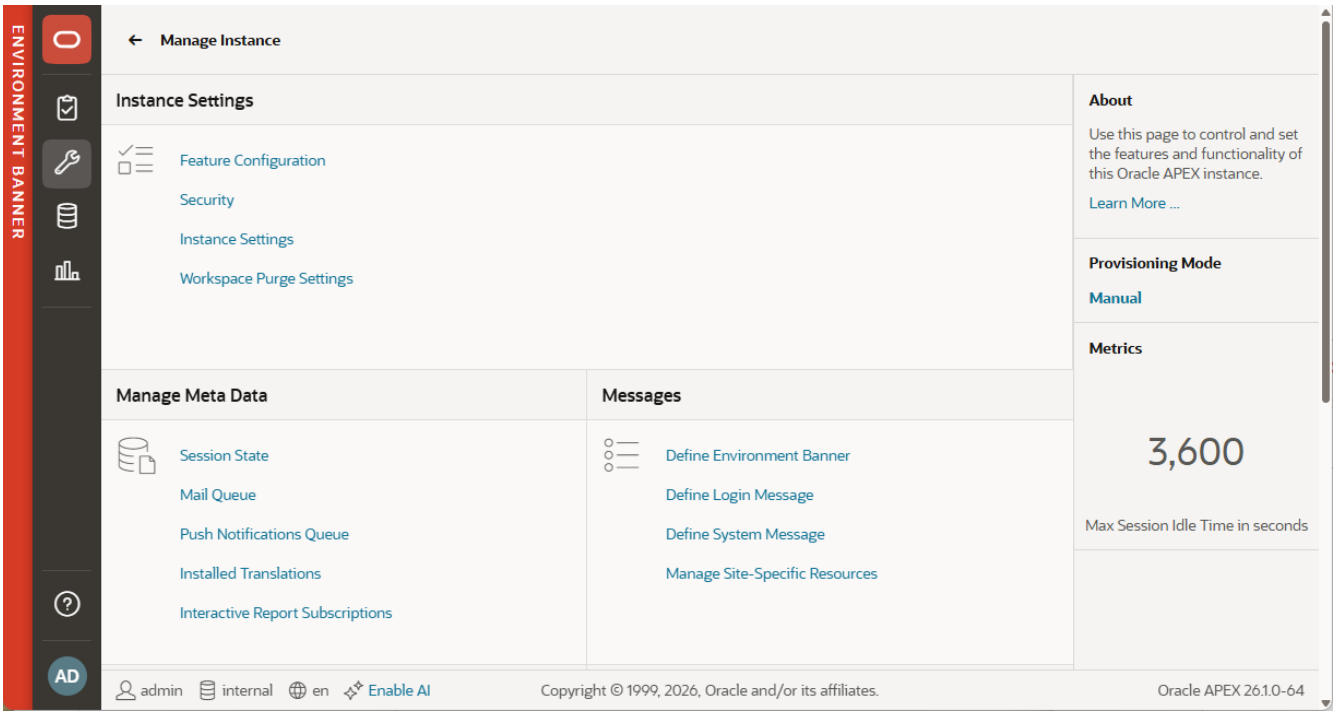
The following illustration shows an instance-level environment displaying on the left.



> **See Also**
>
> Configuring an Environment Banner for a Workspace

3.7.5 Managing a Site-Specific Resources List

Add links the Site-Specific Resources list to communicate important user information such as training, discussion forums, and user feedback applications.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

The Site-Specific Resources list only appears on the Workspace Home page and on the Workspace Login and only appears if you have added links.

- Adding a New Task
  Instance administrators create a Site-Specific Resources list under Manage Site-Specific Tasks on the Manage Instance page.
- Editing an Existing Task
  Instance administrators edit existing task on the Site-Specific Resources page.
- Deleting a Task
  Instance administrators can delete existing task on the Site-Specific Resources page.

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3.7.5.1 Adding a New Task

Instance administrators create a Site-Specific Resources list under Manage Site-Specific Tasks on the Manage Instance page.

To add a new task to a Site-Specific Resources list:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Messages, click **Manage Site-Specific Resources**.

   The Site-Specific Resources page appears.
4. To create a new link, click **Create**.
5. On the Create/Edit Site-Specific Resources 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. Options include:
      - **Workspace Login**
      - **Workspace Home**
   c. Name - Enter a name for this task.
   d. 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 `https://www.oracle.com`).
   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 APEX App Builder User's Guide*

3.7.5.2 Editing an Existing Task

Instance administrators edit existing task on the Site-Specific Resources page.

To edit an existing task:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Messages, click **Manage Site-Specific Resources**.

   The Site-Specific Resources page appears.
4. Select a task name.
5. On the Create/Edit Site-Specific Resources page, edit the appropriate attributes.
6. Click **Apply Changes**.

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3.7.5.3 Deleting a Task

Instance administrators can delete existing task on the Site-Specific Resources page.

To delete an existing task:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Messages, click **Manage Site-Specific Resources**.

   The Site-Specific Resources page appears.
4. Select the task name.
5. Click **Delete**.

3.8 Creating a Service Signup Wizard

Instance administrators can create a Service Signup Wizard that users must complete before new workspace requests are submitted.

When users request a new workspace, administrators can create a wizard that requires the user provide a justification, accept an agreement, or optionally respond to survey questions. In addition, administrators can specify whether to support Productivity App Only workspaces, define blocked email domains and provide a message that displays when a user enters an email address containing a blocked domain, and create a custom success message.

- Defining a Service Signup Wizard
  Instance administrators define a Service Signup Wizard on the Service Signup Wizard page.
- Configuring Service Signup Wizard Email Restrictions
  Instance administrators can add restrictions for email patterns used to auto (or self provision) a workspace.
- Running a New Service Signup Wizard
  Instance administrators can run the Signup Wizard by clicking **Run New Service Signup Wizard** on the Manage Instance page.

> **See Also**
>
> Viewing the Signup Survey Report

3.8.1 Defining a Service Signup Wizard

Instance administrators define a Service Signup Wizard on the Service Signup Wizard page.

When users request a new workspace, administrators can create a wizard that requires the user provide a justification, accept an agreement, or optionally respond to survey questions. In addition, administrators can specify whether to support Productivity App Only workspaces, define blocked email domains and provide a message that displays when a user enters an email address containing a blocked domain, and create a custom success message.

To define a New Service Signup Wizard:

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1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Self Service Sign Up, click **Manage New Service Signup Wizard**.
4. Under Options:
   a. Enable Schema Selection - Determines whether the user is prompted for the database schema information or whether the schema is defaulted.
   b. Require Justification - Determines whether to prompt the user for a justification for creating the workspace.
   c. Enable Agreement - Determines whether to include or exclude an agreement. Select **Yes** to display an agreement.
   d. Agreement Text - Enter the text of the agreement.
   e. Request Success Message - Message to be shown to the user when they get to the Workspace Request successful page. This message replaces the standard message provided.
5. Under Survey Questions:
   a. Enable Survey - Determines whether to include or exclude the survey. Select **Yes** to display the survey questions you define during the New Service Signup Wizard.
   b. Questions - Each question can have any number of answers. Enter all answers for each question in one field, delimited by a new line.
   c. Pre Text - Enter introductory text.
   d. Post Text - Enter closing text.
6. Click **Apply Changes**.

3.8.2 Configuring Service Signup Wizard Email Restrictions

Instance administrators can add restrictions for email patterns used to auto (or self provision) a workspace.

To add restrictions for email patterns:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Self Service Sign Up, click **Configure Email Restrictions**.
4. Click **Add Pattern**.
5. On Email Pattern:
   a. Pattern - Enter a block pattern using the following format:

      ```
      %@example.com
      ```

      This pattern prevents auto provisioning of a workspace for an email address using the listed pattern.
   b. Comments - Enter a description for this pattern.
6. Click **Add Pattern**.

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3.8.3 Running a New Service Signup Wizard

Instance administrators can run the Signup Wizard by clicking **Run New Service Signup Wizard** on the Manage Instance page.

To run a new Service Signup Wizard:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Self Service Sign Up, click **Run New Service Signup Wizard**.
4. Follow the on-screen instructions.

3.9 Managing Schemas

Manage the schemas within an Oracle APEX instance.

- What Is the Oracle APEX Engine Schema?
  A schema is a logical container for the database objects.
- Determining the Oracle APEX Engine Schema
  Determine the current APEX engine schema for an instance.
- Understanding Oracle Default Schema Restrictions
  A database administrator (DBA) grants and revokes privileges within an APEX instance.

Related Topics

- Viewing the Parsing Schemas Report
  Use the Parsing Schemas report to identify the current parsing schema of each application in any workspace.
- Managing Workspace to Schema Assignments
  Instance administrators can view, edit, and remove schema and workspace assignment, associate additional schemas with a workspace, and create new schemas.

3.9.1 What Is the Oracle APEX Engine Schema?

A schema is a logical container for the database objects.

Instance administrators may need to perform certain actions within the Oracle APEX 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_INSTANCE_ADMIN.UNRESTRICT_SCHEMA` procedure within the APEX engine.

> **See Also**
>
> Understanding Oracle Default Schema Restrictions for information about the `APEX_INSTANCE_ADMIN.UNRESTRICT_SCHEMA` procedure

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3.9.2 Determining the Oracle APEX Engine Schema

Determine the current APEX engine schema for an instance.

> **See Also**
>
> Understanding Oracle Default Schema Restrictions for information about the `APEX_INSTANCE_ADMIN.UNRESTRICT_SCHEMA` procedure

To determine the current APEX engine schema for your APEX instance:

1. Start SQLcl and connect to the database where APEX is installed as `SYS`, for example:
   - On Windows:

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

   - On UNIX and Linux:

     ```
     $ sql /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'
   ```

3.9.3 Understanding Oracle Default Schema Restrictions

A database administrator (DBA) grants and revokes privileges within an APEX instance.

- About Assigning Oracle Default Schemas to Workspaces
  In order for an Instance administrator to assign most Oracle default schemas to workspaces, a DBA must explicitly grant the privilege.
- Granting the Privilege to Assign Oracle Default Schemas
  DBAs can grant an Instance administrator the ability to assign Oracle schemas to workspaces.
- Revoking the Privilege to Assign Oracle Default Schemas
  DBAs can revoke the privilege to assign default schemas.
- Working with Restricted Schemas
  DBAs can work with restricted schemas by designating specific workspaces as exceptions, remove all workspaces exceptions for a schema, or remove all schema exceptions for a workspace.
- Determining the Privilege Status
  DBAs can determine the current status of the privileges.

3.9.3.1 About Assigning Oracle Default Schemas to Workspaces

In order for an Instance administrator to assign most Oracle default schemas to workspaces, a DBA must explicitly grant the privilege.

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When APEX 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 DBA must explicitly grant the privilege using SQLcl to run a procedure within the APEX_INSTANCE_ADMIN package.

Tip

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.

3.9.3.2 Granting the Privilege to Assign Oracle Default Schemas

DBAs can grant an Instance administrator the ability to assign Oracle schemas to workspaces.

A DBA grants an Instance administrator the ability to assign Oracle schemas to workspaces by using SQLcl to run the APEX_INSTANCE_ADMIN.UNRESTRICT_SCHEMA procedure from within the APEX 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 APEX Engine Schema

3.9.3.3 Revoking the Privilege to Assign Oracle Default Schemas

DBAs can revoke the privilege to assign default schemas.

A DBA revokes the privilege to assign default schemas using SQLcl to run the APEX_INSTANCE_ADMIN.RESTRICT_SCHEMA procedure from within the APEX engine schema. For example:

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```
EXEC 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 APEX Engine Schema

3.9.3.4 Working with Restricted Schemas

DBAs can work with restricted schemas by designating specific workspaces as exceptions, remove all workspaces exceptions for a schema, or remove all schema exceptions for a workspace.

- Removing Workspace Exceptions for a Schema
  DBAs can remove all workspace exceptions for a schema.
- Removing Schema Exceptions for a Workspace
  DBAs can remove all schema exceptions for a workspace.
- Designating Specific Workspaces as Exceptions
  DBAs can designate specific workspaces as exceptions.

3.9.3.4.1 Removing Workspace Exceptions for a Schema

DBAs can remove all workspace exceptions for a schema.

A DBA can remove all workspace exceptions for a schema by using SQLcl to run the `APEX_INSTANCE_ADMIN.REMOVE_SCHEMA_EXCEPTIONS` procedure from within the APEX engine schema. For example:

```
EXEC 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.

3.9.3.4.2 Removing Schema Exceptions for a Workspace

DBAs can remove all schema exceptions for a workspace.

DBAs can remove all schema exceptions for a workspace by using SQLcl to run the `APEX_INSTANCE_ADMIN.REMOVE_WORKSPACE_EXCEPTIONS` procedure from within the APEX engine schema. For example:

```
EXEC 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.

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3.9.3.4.3 Designating Specific Workspaces as Exceptions

DBAs can designate 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_INSTANCE_ADMIN.CREATE_SCHEMA_EXCEPTION(p_schema => 'RMAN', p_workspace=>
'DBA_WORKSPACE');
EXEC 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.

3.9.3.5 Determining the Privilege Status

DBAs can determine the current status of the privileges.

A DBA can determine the current status of the privileges by using SQLcl 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 SQLcl and connect to the database where APEX is installed as `SYS`, for example:

   - On Windows:

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

   - On UNIX and Linux:

     ```
     $ sql /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 APEX instance, including restricted schemas and schema exceptions.

3.10 Creating Workspaces in Administration Services

Users access Oracle APEX by signing in to a shared work area called a workspace. An administrator can create workspaces manually in Administration Services or take advantage of an automated approach in which users click a link a login page.

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- About Workspaces
  A workspace enables multiple users to work within the same APEX installation while keeping their objects, data and applications private. Each workspace has a unique numeric ID and name.
- About Specifying How Workspaces Are Created
  The Instance administrator determines how the process of provisioning (or creating) a workspace works for a specific APEX instance.
- Selecting a Workspace Provisioning Mode
  An Instance Administrator selects a Provisioning Method to determine how workspace provisioning works.
- How Oracle-Managed Files Affects 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.
- Creating a Workspace Manually
  Instance administrators can provision a workspace manually in either a full development environment or a runtime environment.
- Creating Multiple Workspaces
  Provision multiple workspaces by running the Create Multiple Workspaces Wizard

Related Topics

- Requesting a Workspace in Workspace Administration
  Request a workspace on the Workspace Administration page.
- Requesting Another Workspace
  Request another workspace using a service request.
- Managing Existing Workspaces
  Instance administrators can manage existing workspaces within an Oracle APEX instance.

3.10.1 About Workspaces

A workspace enables multiple users to work within the same APEX 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 and Managing Requests

3.10.2 About Specifying How Workspaces Are Created

The Instance administrator determines how the process of provisioning (or creating) a workspace works for a specific APEX instance.

To determine how provisioning works, an Instance Administrator selects a Provisioning Method on the Instance Settings page:

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- **Manual** - An Instance administrator creates new workspaces and notifies the Workspace administrator regarding the Sign In credentials.
- **Request** - Users request a workspace. Once an administrator approves the request, the user receives an email containing an email verification link. After the user clicks the email verification link, the workspace is created.
- **Automatic** - Works similar to **Request** except requests are automatically approved with no administrator review required.

> **Note**
>
> To enable users to request a workspace using a link on the Sign In page, the Instance administrator must choose either the Provisioning Method **Request** or **Automatic** and configure email. If the Provisioning Method is set to **Manual**, no link appears on the Sign In page.

About Request and Automatic Provisioning

If a workspace uses the Provisioning Methods **Request** or **Automatic**, the following events occur:

1. The user receives an email containing an email verification link.
2. When user clicks the verification link, the workspace is created.
3. The user receives another email containing Sign In credentials (that is, the workspace name, username, and password).
4. The status of the workspace request changes from `Accepted` to `Approved`.

> **See Also**
>
> - Disabling Email Provisioning
> - Configuring Email
> - Managing Requests

3.10.3 Selecting a Workspace Provisioning Mode

An Instance Administrator selects a Provisioning Method to determine how workspace provisioning works.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

To select a Provisioning Method:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.

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3. Under Instance Settings, click **Instance Settings**.
4. Under **Workspace Creation**, select a Provisioning Method:
   - **Manual** - An Instance administrator creates new workspaces and notifies the Workspace administrator regarding the Sign In credentials.
   - **Request** - Users request a workspace. Once an administrator approves the request, the user receives an email containing an email verification link. After the user clicks the email verification link, the workspace is created.
   - **Automatic** - Works similar to **Request** except requests are automatically approved with no administrator review required.

> **Note**
>
> To enable users to request a workspace using a link on the Sign In page, the Instance administrator must choose either the Provisioning Method **Request** or **Automatic** and configure email. If the Provisioning Method is set to **Manual**, no link appears on the Sign In page.

5. Notification Email Address - Enter the email address to receive notification email messages for new workspace requests and change workspace requests. If not specified, no workspace request notification email messages is sent.
6. Click **Apply Changes**.

> **Tip**
>
> If you select **Automatic**, you can disable workspace provisioning and send users a message. See Disabling Email Provisioning.

> **See Also**
>
> - Configuring Email
> - Managing Requests

3.10.4 How Oracle-Managed Files Affects 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 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 APEX is installed.

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Related Topics

- Using Oracle Managed Files in *Oracle AI Database Administrator's Guide*

3.10.5 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
  Instance administrators can create workspaces manually in a full development environment by running the Create Workspace Wizard.
- Creating a Workspace Manually in a Runtime Environment
  Instance administrators can create workspaces manually in a runtime environment starting SQLcl and running the following SQL statements.

3.10.5.1 Creating Workspace Manually in a Full Development Environment

Instance administrators can create workspaces manually in a full development environment by running the Create Workspace Wizard.

> **Note**
>
> This topic does not apply to Oracle APEX instances running in Oracle Cloud. See the documentation for your Oracle Cloud service.

To create a workspace manually:

1. Sign in to Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Create Workspace**.

   The Create Workspace Wizard appears.
4. For Identify Workspace:
   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 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. Inspect the information in the report **Information on Schema**. If the report shows **Suggested Additional Privileges**, consider granting these privileges to the schema, to avoid privilege errors when using it as an application parsing schema.

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d. 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) - If creating a new schema, select the maximum size of the tablespace to be associated with that schema. You can adjust this limit later.

e. Click **Next**.

6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create Workspace**.

3.10.5.2 Creating a Workspace Manually in a Runtime Environment

Instance administrators can create workspaces manually in a runtime environment starting SQLcl and running the following SQL statements.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

To add a workspace in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_260100
   ```

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 => 'HR:OE' );
   END;
   ```


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> **See Also**
>
> ADD_WORKSPACE Procedure in *Oracle APEX API Reference*

3.10.6 Creating Multiple Workspaces

Provision multiple workspaces by running the Create Multiple Workspaces Wizard

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

To create multiple workspaces:

1. Sign in to Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Create Multiple Workspaces**.

   The Create Multiple Workspaces Wizard appears.
4. For 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**

   What displays next depends upon the option you select.

   > **Tip**
   >
   > To learn more about a specific field, see field-level Help.
5. If you select **System Generated Workspace Names**, specify the following:
   a. Workspace Count - Enter the total number of workspaces to create.
   b. Install Sample EMP and DEPT Tables - Determine whether to install the sample `EMP` and `DEPT` tables into each workspace.
   c. Space Quota (MB) - If creating a new schema, select the maximum size of the tablespace to be associated with that schema. You can adjust this limit later.
   d. Resource Manager Consumer Group - Specify the Database Resource Manager consumer group to be used for all page events associated with this workspace. To learn more, see field-level Help.
   e. Allow workspaces to be automatically purged - Determines if the workspace is a candidate for automatic purging of unused workspaces.
   f. Workspace Description - Enter an optional comment or description of the workspace.
6. If you select **Statically Prefixed Workspace Name with Sequential Integer Suffix**, specify the following:

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a. Workspace Prefix - Enter the prefix to use when generating workspaces names. For example, if a prefix of 'DB' is specified, then the generated workspace names will be like DB_001, DB_002, DB_003.

b. Workspace Count - Enter the total number of workspaces to create.

c. Install Sample EMP and DEPT Tables - Determine whether to install the sample `EMP` and `DEPT` tables into each workspace.

d. Space Quota (MB) - If creating a new schema, select the maximum size of the tablespace to be associated with that schema. You can adjust this limit later.

e. Resource Manager Consumer Group - Specify the Database Resource Manager consumer group to be used for all page events associated with this workspace. To learn more, see field-level Help.

f. Allow workspaces to be automatically purged - Determines if the workspace is a candidate for automatic purging of unused workspaces.

g. Workspace Description - Enter an optional comment or description of the workspace.

7. If you select **Email Domain Name as Workspace Name, with Sequential Integer Suffix for duplicates**, specify the following:

a. Install Sample EMP and DEPT Tables - Determine whether to install the sample `EMP` and `DEPT` tables into each workspace.

b. Space Quota (MB) - If creating a new schema, select the maximum size of the tablespace to be associated with that schema. You can adjust this limit later.

c. Resource Manager Consumer Group - Specify the Database Resource Manager consumer group to be used for all page events associated with this workspace. To learn more, see field-level Help.

d. Allow workspaces to be automatically purged - Determines if the workspace is a candidate for automatic purging of unused workspaces.

e. Email Addresses (cut and paste any text that contains email addresses)

f. Workspace Description - Enter an optional comment or description of the workspace.

8. Click **Next**.

9. Confirm your choices and click **Provision Workspaces**.

3.11 Managing Existing Workspaces

Instance administrators can manage existing workspaces within an Oracle APEX instance.

- Performing a Workspace Search
  Perform a workspace search by clicking Find a Workspace on the Workspace Tasks page.
- Viewing Existing Workspace Information
  View or edit existing workspace information and behavior including workspace details, support for AI Services, display name, login controls, component availability, session timeout, and component availability.
- Isolating a Workspace to Prevent Browser Attacks
  Workspace administrators can prevent browser attacks by isolating a specific workspace. Workspace-level settings override those configured for an entire instance.
- Deleting 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 SQLcl.

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- Locking a Workspace
  Instance administrators can lock a workspace to address security or performance issues.
- Purging Inactive Workspaces
  Inactive workspaces consume valuable storage space and degrade system performance. Instance administrator can configure an instance to periodically purge inactive workspaces.
- Managing Workspace to Schema Assignments
  Instance administrators can view, edit, and remove schema and workspace assignment, associate additional schemas with a workspace, and create new schemas.
- Managing Component Availability for an Instance
  Control which components are available within an Oracle APEX instance, including App Builder, SQL Workshop, PL/SQL editing in SQL Workshop, Team Development, or Data Reporter.
- Exporting and Importing a Workspace
  Move a workspace and all associated users to a new Oracle APEX instance by exporting and importing.
- Installing Exported Applications in a Runtime Environment
  Instance administrators manage the APEX runtime environment using SQLcl and the `APEX_INSTANCE_ADMIN` API.
- Exporting and Importing from a Command Line
  Export and import workspaces, applications, and related files from a command line.
- Changing Application Build Status in Administration Services
  An Instance administrator can change the build status of an application.
- Viewing the Application Attributes Report
  View applications by workspace on the Application Attributes page.
- Viewing the Parsing Schemas Report
  Use the Parsing Schemas report to identify the current parsing schema of each application in any workspace.
- Accessing Workspace Reports
  Instance administrators can view workspace reports from Manage Workspaces, Workspace Reports.

Related Topics

- Creating Workspaces in Administration Services
  Users access Oracle APEX by signing in to a shared work area called a workspace. An administrator can create workspaces manually in Administration Services or take advantage of an automated approach in which users click a link a login page.
- Managing Schemas
  Manage the schemas within an Oracle APEX instance.
- Managing Users Across an Oracle APEX Instance
  An Instance administrator manages all user accounts within an Oracle APEX instance on the Manage Developers and Users page.
- Monitoring Activity Across an Instance
  Use the links on the Monitor Activity page to access various reports on application, developer, and session activity in all workspaces.

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3.11.1 Performing a Workspace Search

Perform a workspace search by clicking Find a Workspace on the Workspace Tasks page.

To perform a workspace search:

1. Sign in to Oracle APEX Administration Services.
2. Under Workspace Tasks, click **Find a Workspace**.

   The Workspace Search page appears. To customize the report, use the Search bar at the top of the page.
3. To view workspace details, click a 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 Details Report

3.11.2 Viewing Existing Workspace Information

View or edit existing workspace information and behavior including workspace details, support for AI Services, display name, login controls, component availability, session timeout, and component availability.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

To view and edit existing workspace information:

1. Sign in to Oracle APEX Administration Services.
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.
5. Under Edit Workspace Information:
   - Workspace Name - View or update the workspace name.
   - Feedback Synchronization Source Identifier - Identifies the source of application feedback.
     For example, if you are synchronizing feedback from a production system to your development system, you can identify the source of the feedback and prevent feature number collisions.

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- Allow workspace to be automatically purged - Determines if this workspace is a candidate for automatic purging of unused workspaces.
- Log Web Service Requests - Determines if web service requests are logged for this workspace.
  This setting is only relevant if **Manage Instance**, **Feature Configuration**, **Monitoring**, **Web Service Activity Logging** is set to **Use Workspace Settings**.
- Workspace Message - Enter a message to be displayed on the home page of this workspace and in the App Builder.

6. Under AI Services,
   - AI Enabled - Determines if AI Services are supported for the current workspace. Options include:
     - **Yes** - Enable the usage of AI Services for this workspace.
     - **No** - Disable the usage of AI Services for this workspace.

     > **Tip**
     >
     > You can also enable AI Services for an entire APEX instance. See Managing Support for AI Services for an Instance.

   - Maximum AI Tokens - Enter the maximum number of AI Tokens per 24 hour period that APEX can use for Generative AI Services in this instance. You can configure a more specific value at the AI Service/Vector Provider level.
7. Under Workspace Appearance:
   - Display Name - Enter a message to be displayed on the home page of this workspace and in App Builder.
8. Under Login Control:

   > **Note**
   >
   > To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

   - Account Expiration and Locking - Make a selection to determine whether Oracle APEX end user accounts can be expired or locked. This feature applies only to end-user accounts created using the Oracle APEX user management interface.
   - Maximum Login Failures Allowed - Enter a positive integer to be used as 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 site-level **Maximum Login Failures Allowed Environment Setting** is used.
   - End User Account Lifetime (days) - Enter a positive integer to be used as the maximum number of days an end-user account password may be used before the account is expired.
     If you do not specify a value in this field, the site-level **Account Password Lifetime Environment Setting** will be used.
9. Under Component Availability:
   - Allow App Builder - Enables App Builder for this workspace.

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- Allow SQL Workshop - Enables SQL Workshop for this workspace.
- Allow PL/SQL Editing in SQL Workshop - Allows PL/SQL procedures, packages, functions, and triggers to be edited in the browser.
- Allow RESTful Services - Controls the ability to create and access RESTful Services in the current workspace. This
- RESTful Path Prefix - Specifies the unique URI path prefix to be used to access RESTful Services in the current workspace. The default path prefix value is the name of the workspace.
- Allow Team Development - Enables Team Development in this workspace.
- Allow Data Reporter - Enable Data Reporter in this workspace.
- Allow Hosting Extensions - Determines whether a workspace can host extensions and publish links to other workspaces. Options include:
  - **No** (default) - Workspace cannot host and publish extensions.
  - **Yes - Manual Subscription** - The workspace can host and publish extensions. Other workspaces have to subscribe and grant read access manually.
  - **Yes - Automatic Subscription** - The workspace can host extensions and extension menu entries are automatically published to all other workspaces, without these having to subscribe and grant read access manually.

10. Under Session Timeout:

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Maximum Session Length in Seconds - Defines how long (in seconds) sessions can exist and be used by applications in this APEX instance. This setting is superseded by the corresponding workspace-level setting and application-level setting.
  - Enter a positive integer to control how long a session can exist.
  - Enter `0` to have the session exist indefinitely.
  - Leave the value empty in order to revert to the default value of 8 hours (28800 seconds).
- Maximum Session Idle Time in Seconds - Session Idle Time is the time between the last page request and the next page request. This setting is superseded by the corresponding workspace-level setting and application-level setting.
  - Enter a positive integer to control the default idle time for sessions used by applications in this APEX instance.
  - Leave the value empty in order to revert to the default value of 1 hour (3600 seconds).
- Session Timeout Warning in Seconds - The session timeout warning time defines (in seconds) how long before a session times out (either maximum session length, or maximum session idle time), to warn the user. For the maximum session idle time warning, the user will have the opportunity to extend the session. For maximum session length warning, the user will be prompted to save any work, to avoid loss of data when the session maximum time is reached. This setting is superseded by the corresponding workspace-level setting and application-level setting.

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- Enter a positive integer to control the warning time for sessions used by applications in this APEX instance.
- Enter 0 to switch off session timeout warnings.
- Leave the value empty in order to revert to the default value of 5 minutes (300 seconds).

11. Under Workspace Isolation - Configure these attributes to prevent browser attacks by isolating a specific workspace. See Isolating a Workspace to Prevent Browser Attacks.
12. Email, SMTP Authentication Credential - Pick a Web Credential to use for authentication with the SMTP server. The list shows Web Credentials defined in the workspace of the Basic Authentication type. If nothing is configured, the instance configuration will be used..
13. To save your changes, click **Apply Changes**.

Related Topics

- Disabling PL/SQL Program Unit Editing for a Workspace
  Control whether developers can edit and compile PL/SQL program units from Object Browser.
- Configuring Session Timeout for a Workspace
  Use the Session Timeout attributes for a workspace to reduce exposure at the application-level for abandoned computers with an open web browser.
- Managing Generative AI Services in *Oracle APEX App Builder User's Guide*
- Configuring Email Credentials for a Workspace
  Configure email credentials for a workspace.
- Isolating All Workspaces in an Instance
  Instance administrators can configure limits to isolate all workspaces and prevent browser attacks. Workspace administrators can override these default values at the workspace-level.

3.11.3 Isolating a Workspace to Prevent Browser Attacks

Workspace administrators can prevent browser attacks by isolating a specific workspace. Workspace-level settings override those configured for an entire instance.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

- About Isolating a Workspace to Prevent Browser Attacks
  Isolating workspaces is an effective approach to preventing browser attacks.
- Configuring Workspace Isolation Attributes
  Configure Workspace Isolation attributes.

3.11.3.1 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.

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Workspace isolation by configuring Allow Hostnames is a counter measure against client side attacks that attempt to cross workspace boundaries. This security measure is not necessary if you trust all applications that are accessible using the instance's host which includes applications that are written in other frameworks and languages such as Oracle Application Development Framework (ADF) and Java.

Instance administrators can cofigure the Allow Hostnames attribute at the instance-level. Workspace administrators can override the instance-level setting for a specific workspace.

> **See Also**
>
> Isolating All Workspaces in an Instance

3.11.3.2 Configuring Workspace Isolation Attributes

Configure Workspace Isolation attributes.

To configure Workspace Isolation attributes:

1. View the existing workspace:
   a. Sign in to Oracle APEX Administration Services.
   b. Click **Manage Workspaces**.
   c. Under Workspace Reports, click **Existing Workspaces**.
   d. Click a workspace name.
2. On the Edit Information page, locate Workspace Isolation and edit the attributes as described in the following table.

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

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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. For example, you can register the DNS alias `hr.example.com` for your web server `www.example.com`. If you set the HR workspace's **Allow Hostnames** to `hr.example.com`, users have to access HR applications using `hr.example.com` and all other applications of this instance using`www.example.com`. With this configuration, the browser's **Same Origin security policy** provides a client-side barrier between HR applications and other applications of the instance, which run in another browser tab or window. If your workspace uses RESTful services, you have to additionally configure a pool in the `url-mapping.xml` configuration file of Oracle REST Data Services for isolation. Note that Oracle REST Data Services will ignore the **RESTful Path Prefix** workspace attribute if **Allow Hostnames** is configured. The configuration example below specifies that RESTful services of the HR workspace can only be accessed using `https://hr.example.com/apex/`*`resource-handler`*: `<pool base-url="https://hr.example.com/apex" name="apex" workspace-id="hr" />`

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Attribute	Description
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. The Resource Consumer Group provides more control of hardware resources such as CPU and I/O requests. Workspace-level settings override instance-level settings to enable administrators to provide more or less resources depending on the needs or importance of a workspace. At the beginning of every request, the APEX 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 APEX development environment. These limitations apply to all page requests, where application code executes using the APEX engine which enables the assigned Resource Manager settings. However, they do not apply to Oracle Scheduler jobs that workspace developers create, or to ORDS REST requests where APEX is not in the code path. A call to set the workspace, such as `apex_util.set_workspace('MY_WORKSPACE');` at the beginning of the scheduler job, enables the right consumer group. However, there is often no reason for developers to add this type call. Therefore, administrators should apply the Resource Manager consumer groups both to APEX workspaces and to the workspace schemas (that is, the underlying database users). You must grant privilege to switch to a consumer group to either `PUBLIC` or the APEX schema. This privilege is typically granted using the procedure `DBMS_RESOURCE_MANAGER_PRIVS.GRANT_SWITCH_CONSUMER_GROUP`. **See Also**: Managing Resources with Oracle Database Resource Manager in *Oracle AI Database Administrator's Guide*
Maximum Concurrent Workspace Requests	Enter the maximum number of concurrent page events that APEX supports for all applications of this workspace. If you leave this attribute empty, the instance-level value applies. Instead of processing a page event, APEX shows an error message when the limit is already reached. APEX keeps track of session requests by querying the `CLIENT_INFO` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_INFO`, for example, with a call to `DBMS_APPLICATION_INFO.SET_CLIENT_INFO`.
Maximum Concurrent Session Requests	Enter the maximum number of concurrent page events that APEX supports for each session for applications in this workspace. Instead of processing a new page event, APEX shows an error message when the limit is already reached. Alternatively, use the Concurrent Session Requests Kill Timeout attribute to kill an active database session, to process the new page event. APEX keeps track of session requests by querying the `CLIENT_IDENTIFIER` column of `GV$SESSION`. This tracking will not work if developers overwrite `CLIENT_IDENTIFIER`, for example with a call to `DBMS_SESSION.SET_IDENTIFIER`.

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Attribute	Description
Concurrent Session Requests Kill Timeout	If a new page event comes in that is outside the limits of **Maximum Concurrent Session Requests**, APEX can execute `alter system kill session` on the oldest active database session which processes another page event for this APEX 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.
Maximum Web Service Requests	Enter the maximum number of email messages that can be sent with the `APEX_MAIL API` per 24 hour period. This value will override the instance-level setting.
Content Cache target size	Denotes the target size for the content cache on workspace-level. The content cache can currently being used by Web Source and REST Enabled SQL services. The Cache Size Target acts as a soft limit, which, for performance reasons, is only maintained by the APEX scheduler jobs. In other words, APEX might exceed the specified limit during normal operations. With the next run of the maintenance job, cached content with the shortest remaining validity will be removed until the cache size is below the specified limit.
Content Cache maximum entry size	Denotes the maximum size for content to be placed into the content cache. This value will override the instance-level setting. This value overrides the instance-level setting.
Maximum Background Page Process Jobs	Specifies the maximum amount of scheduler jobs being available for background execution of page processes for this workspace (applies to all applications). Only the configured amount of jobs will run at the same time to execute page processes in the background. If the configured maximum amount of scheduler jobs is active, new submitted executions will wait until a job becomes available. **See Also**: "Configuring Limits for Concurrently Running Scheduler Jobs" section in About Background Page Processes in *Oracle APEX App Builder User's Guide*

3. Click **Apply Changes**.

3.11.4 Deleting 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 SQLcl.

- Identifying and Deleting Inactive Workspaces
  Learn how to identify and delete inactive workspaces.

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- Deleting Workspaces in a Full Development Environment
  Delete workspaces in a full development environment.
- Deleting Workspaces in a Runtime Development Environment
  Delete workspaces in a runtime development environment.

> **See Also**
>
> Viewing the Workspace Details Report and Creating Workspaces in Administration Services

3.11.4.1 Identifying and Deleting Inactive Workspaces

Learn how to identify and delete inactive workspaces.

- How to Identify Inactive Workspaces
- Identifying Inactive Workspaces By Checking Recent Updates
- Removing the Resources Associated with Inactive Workspaces
- Deleting Inactive Workspaces

3.11.4.1.1 How to Identify Inactive Workspaces

If you are managing a large hosted Oracle APEX 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.
- **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.
- **Step 3:** Drop the inactive workspaces from APEX. See Deleting Inactive Workspaces.

> **Tip**
>
> To systematically purge inactive workspaces, you must configure Workspace Purge settings. See Purging Inactive Workspaces.

3.11.4.1.2 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 APEX activity records found in the current APEX 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 APEX engine schema for the most recent updates by each workspace.

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_260100;
CREATE TABLE ws_to_purge AS
```


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```
 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'));
```

See Also

Determining the Oracle APEX Engine Schema

3.11.4.1.3 Removing the Resources Associated with Inactive Workspaces

After you have identified inactive workspaces in a single table, the next step is to remove them.

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> **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';
```

3.11.4.1.4 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 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;
```

3.11.4.2 Deleting Workspaces in a Full Development Environment

Delete workspaces in a full development environment.

To delete a workspace:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. From Workspace Actions:
   a. Under Workspace Actions, click **Remove Workspace**.

      The Remove Workspace page appears.
   b. Workspace - Select the workspace to be removed and click **Next**.
   c. On the Remove Workspace page:
      - Review the workspace name and the number of applications and users.
      - Select **Check to confirm that you wish to proceed with the removal**.
      - Click **Next**.

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d. Confirm the displayed information and click **Remove Workspace**.

4. From the Existing Workspaces page:
   a. Under Workspace Reports, click **Existing Workspaces**.

      The Existing Workspaces page appears.

   b. Under the Action column, click **Delete**.

      The Remove Workspace page appears.

   c. On the Remove Workspace page:
      - Review the workspace name and the number of applications and users.
      - Select **Check to confirm that you wish to proceed with the removal**.
      - Click **Next**.

   d. Confirm the displayed information and click **Remove Workspace**.

3.11.4.3 Deleting Workspaces in a Runtime Development Environment

Delete workspaces in a runtime development environment.

To delete a workspace in a runtime development environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_260100
   ```

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`.

3.11.5 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.

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> **Warning**
>
> Locking a workspace makes it permanently inaccessible.

To lock a workspace:

1. Sign in to Oracle APEX Administration Services.
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**.

3.11.6 Purging Inactive Workspaces

Inactive workspaces consume valuable storage space and degrade system performance. Instance administrator can configure an instance to periodically purge inactive workspaces.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

By enabling Workspace Purge Settings, you can configure Oracle APEX to purge inactive workspaces. If a workspace is designated as inactive, Oracle APEX sends a notification email 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.

- Configuring Workspace Purge Settings
  Configure workspace purge settings on the Workspace Purge Settings page.

> **See Also**
>
> Monitoring Activity Across an Instance to view reports concerning purging workspaces and Sending Email from an Application in *Oracle APEX App Builder User's Guide*

3.11.6.1 Configuring Workspace Purge Settings

Configure workspace purge settings on the Workspace Purge Settings page.

If a workspace is designated as inactive, Oracle APEX sends a notification email to each workspace administrator explaining that the workspace will be purged in a specific number of days. In order for this email notification to work, you must configure email for your instance. See Configuring Email.

To configure workspace purge settings:

1. Sign in to APEXAdministration Services.

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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**.

3.11.7 Managing Workspace to Schema Assignments

Instance administrators can view, edit, and remove schema and workspace assignment, associate additional schemas with a workspace, and create new schemas.

When users sign in to Oracle APEX, 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.

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- Viewing Schema and Workspace Assignments in a Development Environment
  View an existing schema to workspace assignments in a full development environment.
- Viewing Schema and Workspace Assignments in a Runtime Environment
  View the existing schema to workspace assignments in a runtime environment.
- Editing Existing Schema and Workspace Assignments
  Edit existing schema and workspace assignments.
- Associating Schemas in a Full Development Environment
  Associate existing or new schemas with a workspace on the Manage Workspace to Schema Assignments page.
- Associating Additional Schemas in a Runtime Environment
  Associate additional schemas with a workspace in a runtime environment.
- Removing a Schema Mapping from a Workspace in a Runtime Environment
  Remove a schema mapping from a workspace in a runtime environment.

See Also

Managing Schemas and Viewing the Parsing Schemas Report

3.11.7.1 Viewing Schema and Workspace Assignments in a Development Environment

View an existing schema to workspace assignments in a full development environment.

To view an existing schema to workspace assignment:

1. Sign in to Oracle APEX Administration Services.
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.

3.11.7.2 Viewing Schema and Workspace Assignments in a Runtime Environment

View the existing schema to workspace assignments in a runtime environment.

To view the existing schema to workspace assignment in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as SYS, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_260100
```

3. Run the following statement:

```
SELECT APEX_INSTANCE_ADMIN.GET_SCHEMAS(WORKSPACE_NAME)
FROM DUAL;
```

Where `WORKSPACE_NAME` is the name of the workspace.

3.11.7.3 Editing Existing Schema and Workspace Assignments

Edit existing schema and workspace assignments.

To edit an existing schema and workspace assignment:

1. Sign in to Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, 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.
   b. Select a new workspace or database schema.
   c. Click **Apply Changes**.

3.11.7.4 Associating Schemas in a Full Development Environment

Associate existing or new schemas with a workspace on the Manage Workspace to Schema Assignments page.

To associate additional schemas with a workspace:

1. Sign in to Administration Services.
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. The schema is a - Identify if the schema to be provisioned for the workspace exists or is new.
   a. Select **Existing** or **New**.
   b. Click **Next**.

   The UI changes depending upon your selection.
6. If **The schema is a** is **Existing**:
   a. Workspace - Enter the name of the workspace, or select one from the list.

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b. Click **Next**.

c. Schema - Enter new schema name.

d. Grant APEX Privileges - Leave **Grant APEX Privileges** on to grant all privileges needed by APEX to the schema.

e. Click **Next**.

7. If **The schema is a** is **New**:

a. Workspace - Enter the name of the workspace, or select one from the list.

b. Click **Next**.

c. Schema - Enter new schema name.

d. Password - Enter a password for schema.

e. Default Tablespace - Enter the default tablespace for the provisioned schema, or select one from the list.

f. Temporary Tablespace - Enter the temporary tablespace for the provisioned schema, or select one from the list.

g. Grant APEX Privileges - Leave **Grant APEX Privileges** on to grant all privileges needed by APEX to the schema.

h. Click **Next**.

8. Review your selections and click **Add Schema**.

3.11.7.5 Associating Additional Schemas in a Runtime Environment

Associate additional schemas with a workspace in a runtime environment.

To associate additional schemas with a workspace in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:

- On Windows:

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

- On UNIX and Linux:

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

2. Run the following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_260100
```

3. Run the following statement:

```
BEGIN
APEX_INSTANCE_ADMIN.ADD_SCHEMA(WORKSPACE_NAME, SCHEMA_NAME, 'Y') END;
```

Where:

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- `WORKSPACE_NAME` is the name of the workspace.
- `SCHEMA_NAME` is the name of the schema.
- `'Y'` grants privileges needed by APEX to the schema. `'N'` is the default.

3.11.7.6 Removing a Schema Mapping from a Workspace in a Runtime Environment

Remove a schema mapping from a workspace in a runtime environment.

To remove a schema mapping from a workspace in a runtime environment:

1. Start SQLcl and connect to the database where Oracle APEX is installed as `SYS`, for example:
   - On Windows:

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

   - On UNIX and Linux:

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

2. Run the following statement:

   ```
   ALTER SESSION SET CURRENT_SCHEMA = APEX_260100
   ```

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.

3.11.8 Managing Component Availability for an Instance

Control which components are available within an Oracle APEX instance, including App Builder, SQL Workshop, PL/SQL editing in SQL Workshop, Team Development, or Data Reporter.

To configure component availability:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Component Availability**.

   The Component Availability page appears. To customize the report, use the Actions menu at the top of the page.
4. Locate the workspace for which you want to enable or disable components.
5. Click the workspace name.

   The Workspace Settings page appears.

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6. Under Workspace Settings, select **Yes** to enable a component or **No** to disable it within the current workspace. Options include:
   - Enable App Builder - Determines the availability of App Builder.
   - Enable SQL Workshop - Determines the availability of SQL Workshop.
   - Allow PL/SQL Editing in SQL Workshop - Allows PL/SQL procedures, packages, functions, and triggers to be edited in the browser.
   - Enable Team Development - Determines the availability of Team Development.
   - Enable Data Reporter - Determines the availability of Data Reporter.
7. Click **Apply Changes**.

Related Topics

- Configuring Workspace Preferences
  Workspace administrators can configure preferences for a workspace on the Set Workspace Preferences page.

3.11.9 Exporting and Importing a Workspace

Move a workspace and all associated users to a new Oracle APEX instance by exporting and importing.

- About Exporting and Importing a Workspace
  To move a workspace and all associated users to a new Oracle APEX instance, you export the workspace.
- Exporting a Workspace in Administration Services
  Create a Workspace Export by navigating to Manage Workspaces and selecting Export Workspace.
- Importing a Workspace in Administration Services
  Import a Workspace Export by navigating to Manage Workspaces and selecting Import Workspace.

> **See Also**
>
> Deploying an Application in *Oracle APEX App Builder User's Guide*

3.11.9.1 About Exporting and Importing a Workspace

To move a workspace and all associated users to a new Oracle APEX instance, you export the workspace.

When you export a workspace, Oracle APEX generates readable script file with a `.SQL` extension. This file contains information about your workspace, all the users in your workspace, and any groups in your workspace (if applicable). You can import this file into another Oracle APEX instance.

Exporting a workspace and importing it into a new database instance enables developers to import application components. When building new environments (for example, moving from development to testing or testing to production), Oracle recommends creating workspaces by importing them.

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Keep in mind, this method only imports the 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**
>
> Exporting an Application and Application Components in *Oracle APEX App Builder User's Guide*

3.11.9.2 Exporting a Workspace in Administration Services

Create a Workspace Export by navigating to Manage Workspaces and selecting Export Workspace.

To create a Workspace Export:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under **Export Import**, click **Export Workspace**.

   > **Tip**
   >
   > To view a list of existing Workspace Imports, click **View Imported Workspace Export Files** under **Tasks**.

4. Select a workspace and then click **Export Workspace**.
5. On Export Workspace:
   a. Include Team Development - Set to **Yes** to include Team Development data. Otherwise, select **No**.
   b. Export Type:
      - **Minimal** - In most cases, accept the default value **Minimal**. **Minimal** includes the Workspace meta data, User Groups, and User definitions.
      - **Full** - Select **Full** to replicate to another instance all workspace artifacts including SQL Scripts, SQL Command History, saved SQL, user preferences, developer login history, email logs, and user interface defaults.
   c. File Character Set - Identifies the specified character set the for export file. When importing this file, you will need to specify the same character set.
6. To export the selected workspace, click **Save File**.

3.11.9.3 Importing a Workspace in Administration Services

Import a Workspace Export by navigating to Manage Workspaces and selecting Import Workspace.

To import a Workspace Export:

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1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under **Export Import**, click **Import Workspace**.

> **Tip**
>
> To view a list of existing Workspace Imports, click **View Imported Workspace Export Files** under **Tasks**.

4. Locate the import file and click **Next**.
5. To install the workspace, click **Install**.
6. Follow the on-screen instructions.

3.11.10 Installing Exported Applications in a Runtime Environment

Instance administrators manage the APEX runtime environment using SQLcl and the `APEX_INSTANCE_ADMIN` API.

> **Note**
>
> To ensure the security and performance of your development environment, this functionality is not available in Oracle APEX instances running in Oracle Cloud.

- About the Advantages of Using Runtime Environment
  A runtime environment enables you to run production applications, but does not provide a web interface for administration or direct development of these applications.
- Installing an Exported Application in to a Runtime Environment
  You administer the Oracle APEX runtime environment using SQLcl and the `APEX_INSTANCE_ADMIN` API.

3.11.10.1 About the Advantages of Using Runtime Environment

A runtime environment enables you to run production applications, but does not provide a web interface for administration or direct development of these applications.

Oracle recommends that you run any sensitive production APEX applications with a runtime installation ofAPEX. A runtime installation does not expose the web-based application development environment, thus preventing the use of App Builder, SQL Workshop, and related utilities on a production installation. Additionally, a runtime environment only includes the APEX database objects and privileges necessary to run applications, making it a more hardened environment.

> **See Also**
>
> APEX_INSTANCE_ADMIN in *Oracle APEX API Reference*

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3.11.10.2 Installing an Exported Application in to a Runtime Environment

You administer the Oracle APEX runtime environment using SQLcl and the `APEX_INSTANCE_ADMIN` API.

To install an exported application into a runtime installation, you must:

1. Export the workspace from the Oracle APEX instance where the application was developed as described in Exporting and Importing a Workspace.
2. Use SQLcl to import your workspace in to the runtime environment:
   - Connect as `APEX_260100`, `SYS`, `SYSTEM`, or any schema to which the role `APEX_ADMINISTRATOR_ROLE` has been granted.
   - Run the workspace import file.

     If the workspace export file was created with a version of Oracle APEX lower than 3.2, you must connect as `APEX_260100`.
3. Export and then import your application using SQLcl in to the runtime environment.

> **See Also**
>
> - Exporting an Application and Application Components in *Oracle APEX App Builder User's Guide*
> - Creating a Workspace Manually in a Runtime Environment
> - Managing Workspace to Schema Assignments
> - Removing a Schema Mapping from a Workspace in a Runtime Environment
> - Deleting Workspaces in a Runtime Development Environment

3.11.11 Exporting and Importing from a Command Line

Export and import workspaces, applications, and related files from a command line.

> **Note**
>
> The `APEXExport` utility has been desupported and is no longer included with Oracle APEX.

- Exporting and Importing Using SQLcl
  Export workspaces, applications, and related files from a command line using Oracle SQL Developer Command Line (SQLcl) release 22.1 and later.

3.11.11.1 Exporting and Importing Using SQLcl

Export workspaces, applications, and related files from a command line using Oracle SQL Developer Command Line (SQLcl) release 22.1 and later.

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SQLcl is a free Java-based command-line interface for Oracle AI Database. Use SQLcl to execute SQL and PL/SQL statements interactively or as as a batch file. SQLcl provides inline editing, statement completion, command recall, and also supports existing SQL*Plus scripts.

- Downloading and Installing SQLcl
  Download and install Oracle SQL Developer Command Line (SQLcl) for free.
- Starting SQLcl and Connecting to the Database
  Learn how to start SQLcl and connect to the database.
- Exiting SQLcl
  Learn how to exit SQLcl.
- Listing Applications
  Use SQLcl to list all or selected APEX applications in a workspace.
- Listing Components in an Application
  Use SQLcl to list all or selected components in an APEX application.
- Exporting One or More Applications
  Use SQLcl to export a single APEX application or all applications in a workspace.
- Exporting a Workspace
  Export a workspace using the `apex export` command with the `-expWorkspace` option.
- Exporting Workspace Static Files
  Export a workspace static files using the `apex export` command and `-expFiles` option.
- Installing an Application
  Install an APEX application into a target environment by running a SQL script.
- Importing a Workspace
  Import an APEX workspace into a target environment.
- Importing Workspace Static Files
  Import APEX workspace static files into a target environment.
- Synchronizing Feedback Among Environments
  Learn about best practices for synchronizing feedback from development, test, and production environments.
- Displaying Application Usage
  View a summary of APEX application usage.

Related Topics

- Working with SQLcl in *Oracle SQLcl User's Guide*
- Deploying an Application in *Oracle APEX App Builder User's Guide*

3.11.11.1.1 Downloading and Installing SQLcl

Download and install Oracle SQL Developer Command Line (SQLcl) for free.

To download and install SQLcl:

1. Download SQLcl. See Oracle SQLcl.

   Tip

   To download the latest version using a direct link, go to https://download.oracle.com/otn_software/java/sqldeveloper/sqlcl-latest.zip

2. To install SQLcl:

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- Select the ZIP file and extract the files.

A `sqlcl` folder appears. The SQLcl utility resides in the `./sqlcl/bin` subdirectory and named as follows:

- Microsoft Windows - `sql.exe`
- MacOS,Linux, Unix - `sql`

3.11.11.1.2 Starting SQLcl and Connecting to the Database

Learn how to start SQLcl and connect to the database.

To start SQLcl and connect to the database:

1. Set your operating system's path so that it contains the location of `./sqlcl/bin` subdirectory where you expanded the SQLcl ZIP file.
2. Connect to the database using the database user account that corresponds to the schema assigned to your APEX workspace, or a database user with `DBA` or `APEX_ADMINISTRATOR_ROLE` roles.
3. Enter the command:

   ```
   $ sql apex_admin/password
   ```

   For example:

   ```
   $ sql apex_admin/password

   SQLcl: Release 21.4 Production on Mon Jan 31 12:20:12 2022
   Copyright (c) 1982, 2022, Oracle.  All rights reserved.
   Connected to:
   Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
   Version 21.3.0.0.0
   SQL>
   ```

4. If you do not enter a username and password, the program prompts you to enter them. Note that the characters in the password do not display in the terminal window.

   You can also enter an extended connection string if necessary indicating the hostname, port, and SID or service of the database to which you want to connect.

   For example:

   ```
   $ sql apex_admin/password@examplehost:1522/yourservicename
   ```

5. Once connected, you can execute any of the commands covered in this chapter from the `SQL>` command prompt.

3.11.11.1.3 Exiting SQLcl

Learn how to exit SQLcl.

To exit SQLcl:

- At the `SQL>` command prompt enter the command:

  ```
  exit
  ```


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For example:

```
SQL> exit
Disconnected from Oracle Database 21c Express Edition Release 21.0.0.0.0 -
Production
Version 21.3.0.0.0
```

3.11.11.1.4 Listing Applications

Use SQLcl to list all or selected APEX applications in a workspace.

- Listing All Applications
  List all installed APEX applications in a workspace.
- Listing Applications in a Workspace To See Last Changed Date and Time
  List all APEX applications in a workspace along with the date and time they last changed.
- Listing Only Applications in a Workspace Changed On or After a Given Date
  List all APEX applications in a workspace along with the date and time they were last changed on or after a given date.
- Listing Only Applications in a Workspace Changed by a Given User
  List all APEX applications in a workspace along with the date and time they were last changed by a particular user.

3.11.11.1.4.1 Listing All Applications

List all installed APEX applications in a workspace.

To list all installed applications to which the logged-in use has access, use the command `apex list`.

For example:

```
SQL> apex list

WORKSPACE_ID     WORKSPACE APPLICATION_ID APPLICATION_NAME
BUILD_STATUS    LAST_UPDATED_ON
1908816359534887 EXAMPLES  106            Sample Interactive Grids Run and
Develop 24-SEP-21
1908816359534887 EXAMPLES  113            List Examples            Run and
Develop 17-JAN-22
1908816359534887 EXAMPLES  110            Books with Tags          Run and
Develop 04-JAN-22
```

3.11.11.1.4.2 Listing Applications in a Workspace To See Last Changed Date and Time

List all APEX applications in a workspace along with the date and time they last changed.

To list all applications in a workspace along with the date and time they were last changed, use the command `apex` with the `list` option and provide the workspace ID.

For example:

```
LAST_UPDATED_ON APPLICATION_ID APPLICATION_NAME
SQL> apex list -workspaceid 1908816359534887

LAST_UPDATED_ON  APPLICATION_ID   APPLICATION_NAME
```


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```
2021-09-24 09:19 106              Sample Interactive Grids
2022-01-04 15:53 110              Books with Tags
2022-01-17 13:50 113              List Examples
```

3.11.11.1.4.3 Listing Only Applications in a Workspace Changed On or After a Given Date

List all APEX applications in a workspace along with the date and time they were last changed on or after a given date.

To list only applications in a workspace that were changed on or after a given date, use the command `export` with the `list` option and provide the workspace ID and date in the `YYYY-MM-DD` format.

For example:

```
SQL> apex list -workspaceid 1908816359534887 -changesSince 2022-01-15

LAST_UPDATED_ON  APPLICATION_ID   APPLICATION_NAME
2022-01-17 13:50 113              List Examples
```

3.11.11.1.4.4 Listing Only Applications in a Workspace Changed by a Given User

List all APEX applications in a workspace along with the date and time they were last changed by a particular user.

To list all applications in a workspace that were last changed by a particular user, use the command `apex` with the `list` option with the workspace ID and a username.

The following example shows applications last changed in workspace `1908816359534887` by user `jane.green`:

```
SQL> apex list -workspaceid 1908816359534887 -changesBy jane.green

LAST_UPDATED_ON  APPLICATION_ID   APPLICATION_NAME
2021-09-24 09:19 106              Sample Interactive Grids
2022-01-17 13:50 113              List Examples
```

You can also combine the date-based and user-based filters.

For example:

```
SQL> apex list -workspaceid 1908816359534887 -changesBy jane.green -
changesSince 2022-01-15

LAST_UPDATED_ON  APPLICATION_ID   APPLICATION_NAME
2022-01-17 13:50 113              List Examples
```

3.11.11.1.5 Listing Components in an Application

Use SQLcl to list all or selected components in an APEX application.

- Listing Components in an Application
  List all components in an APEX application.
- Listing Components in an Application Changed On or After a Given Date
  List components in an APEX application changed on or after a given date.

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- Listing Components in an Application Changed by a Given User
  List components in an APEX application changed by a given user.

3.11.11.1.5.1 Listing Components in an Application

List all components in an APEX application.

To list all components in an application, use the command `apex` with the `list` option and provide the application ID.

For example:

```
SQL> apex list -applicationid 113

LAST_UPDATED_ON  ID                                          NAME
2022-01-16 13:27 AUTHENTICATION:8357166163330009            Application Express
Accounts
2022-01-16 13:27 AUTHORIZATION:8548023343331081             Administration Rights
2022-01-16 13:27 BREADCRUMB:8357461593330012                Breadcrumb
:
2022-01-16 13:27 PAGE:0                                     0. Global Page
2022-01-16 13:27 PAGE:9999                                  9999. Login Page
2022-01-16 13:27 PAGE_TEMPLATE:8358297610330029             Drawer
:
2022-01-16 13:27 POPUP_LOV_TEMPLATE:8522686443330703        Search Dialog
2022-01-16 13:27 REGION_TEMPLATE:8388699844330160           Alert
```

> **Tip**
>
> The `COMPONENT_TYPE:ID` values returned in the `ID` column can be useful as input to the `-expComponents` option described in Exporting Only Selected Application Components.

3.11.11.1.5.2 Listing Components in an Application Changed On or After a Given Date

List components in an APEX application changed on or after a given date.

To list components in an application changed on or after a given date, use the the command `apex` with the `list` option and provide the application `ID` and date in the `YYYY-MM-DD` format.

For example:

```
SQL> apex list -applicationid 113 -changesSince 2022-01-14

LAST_UPDATED_ON  ID                                          NAME
2022-01-14 13:27 BREADCRUMB:8357461593330012                Breadcrumb
2022-01-16 13:27 AUTHENTICATION:8357166163330009            Application Express
Accounts
2022-01-16 13:27 AUTHORIZATION:8548023343331081             Administration Rights
:
2022-01-16 13:27 PAGE:0                                     0. Global Page
2022-01-16 13:27 PAGE:9999                                  9999. Login Page
2022-01-16 13:27 PAGE_TEMPLATE:8358297610330029             Drawer
```


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> **Tip**
>
> The `COMPONENT_TYPE:ID` values returned in the `ID` column can be useful as input to the `-expComponents` option described in Exporting Only Selected Application Components.

3.11.11.1.5.3 Listing Components in an Application Changed by a Given User

List components in an APEX application changed by a given user.

To list components in an APEX application changed by a particular user, use the command `apex` with the `list` option and include the application ID and a username.

The following example lists changed components in the application `113` by `jane.green`:

```
SQL> apex list -applicationid 113 -changesBy jane.green

LAST_UPDATED_ON  ID                                        NAME
2022-01-14 13:27 BREADCRUMB:8357461593330012               Breadcrumb
2022-01-16 13:27 PAGE:0                                    0. Global Page
2022-01-16 13:27 PAGE:9999                                 9999. Login Page
```

You can also combine the date-based and user-based filters as follows:

```
SQL> apex list -applicationid 113 -changesBy jane.green -changesSince
2022-01-15

LAST_UPDATED_ON  ID                                        NAME
2022-01-16 13:27 PAGE:0                                    0. Global Page
2022-01-16 13:27 PAGE:9999                                 9999. Login Page
```

> **Tip**
>
> The `COMPONENT_TYPE:ID` values returned in the ID column can be useful as input to the `-expComponents` option described in Exporting Only Selected Application Components.

3.11.11.1.6 Exporting One or More Applications

Use SQLcl to export a single APEX application or all applications in a workspace.

- Exporting an Application to a Single File
  Export an APEX application to a single file.
- Exporting All Applications from a Workspace
  Export all APEX applications in a workspace.
- Exporting an Application Split into Multiple Files
  Export an APEX APEX application as a directory which contains all the application components as separate files.
- Why the Split Option is Preferable for Source Control
  Learn about the advantages of using `apex export` with the `-split` option with source control.
- Exporting Only Selected Application Components
  Export some application components by specifically listing the components by type and ID.

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- Additional Options for Controlling APEX Application Export
  Learn about additional `apex export` command options.

3.11.11.1.6.1 Exporting an Application to a Single File

Export an APEX application to a single file.

To export an APEX application to a single file, use the `apex export` command and provide the application ID.

In this example, the application ID is `113`.

```
SQL> apex export -applicationid 113
```

3.11.11.1.6.2 Exporting All Applications from a Workspace

Export all APEX applications in a workspace.

To export all applications in a workspace, use the `apex export` command and provide the workspace ID.

In this example, the workspace ID is `1908816359534887`.

```
SQL> apex export -workspaceid 1908816359534887

Exporting Application 106:'Sample Interactive Grids'
Exporting Application 110:'Books with Tags'
Exporting Application 113:'List Examples'
Exporting Application 117:'HR App'
```

3.11.11.1.6.3 Exporting an Application Split into Multiple Files

Export an APEX APEX application as a directory which contains all the application components as separate files.

To export an application as a directory with each application component split into a separate file, use the `apex export` command and include the application ID and the `-split` option.

In this example, the application ID is `113`.

```
SQL> apex export -applicationid 113 -split
```

The previous example would create the `f113` directory (in the current directory) containing the `install.sql` script and an application directory. This applcation directory contains all the application components organized into logical subdirectories. Each distinct component is exported to a separate file.

3.11.11.1.6.4 Why the Split Option is Preferable for Source Control

Learn about the advantages of using `apex export` with the `-split` option with source control.

Using `apex export` with `-split` option offers a more granular approach for exporting an application. This approach also makes source control change tracking tools more useful by enabling developers to see and review changes made to their application at the component level.

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For example, suppose you add a new application feature on a new page (for example, page 11), modify the existing page 3, and modify an existing shared LOV named `tags_lov`. Exporting the application using the `-split` option enables your source control system to list the specific pages and LOV separately in its "what's changed?" report.

Then, suppose you are using the popular source control system Git. You could see what changes are pending using the `git status` command as shown in the the following example:

```
[./f113]$ git status
On branch main
Changes to be committed:
        new file:   application/pages/page_00011.sql
        modified:   application/pages/page_00003.sql
        modified:   application/shared_components/user_interface/lovs/
tags_lov.sql
        modified:   application/create_application.sql
        modified:   install.sql
```

Notice that the list of changed files indicates that page 11 was added, page 3 was modified, and the existing shared components LOV named `tags_lov` was also modified. Also notice that the `install.sql` file and `create_application.sql` file also were modified to reflect the addition of a new page to the application.

In contrast, if you export the application as a single file, the source control system can only list that one file as being modified, making it less clear what aspects of the application have changed. Similarly, reviewing changes made by colleagues becomes easier when you consider the changes in the context of a smaller amount of surrounding text and a meaningfully named subdirectory that explains the purpose of the file being reviewed.

3.11.11.1.6.5 Exporting Only Selected Application Components

Export some application components by specifically listing the components by type and ID.

You can perform a partial export of application components by specifically listing the component by type and ID.

The following example demonstrates how to list the components changed in application 113 made on or after January 22, 2022 and then export only those components split into separate files using the `-expComponents` option.

```
SQL> apex list -applicationid 113 -changesSince 2022-01-22
LAST_UPDATED_ON  ID                                          NAME
2022-01-22 14:59 LOV:23618973754424510000                   TAGS_LOV
2022-01-22 14:59 PAGE:3                                     3. Book
2022-01-22 15:00 PAGE:11                                    11. Library Search

SQL> apex export -applicationid 113 -expComponents "LOV:23618973754424510000
PAGE:3 PAGE:11"
Exporting Application 113
```

The previous example produces a single `f113.sql` file containing only the necessary contents to install the three indicated components.

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You can also use the `-split` option as shown in the following example:

```
SQL> apex export -applicationid 113 -split -expComponents
"LOV:2361897375442451000 PAGE:3 PAGE:11"
Exporting Application 113
```

This produces the `f113` directory and just the necessary files to install these three components. Notice that in this example the main SQL script is named `install_component.sql` instead of `install.sql`.

```
[./f113]$ find . | grep \.sql
./application/pages/page_00003.sql
./application/pages/page_00011.sql
./application/shared_components/user_interface/lovs/tags_lov.sql
./application/pages/delete_00003.sql
./application/pages/delete_00011.sql
./application/set_environment.sql
./application/end_environment.sql
./install_component.sql
```

3.11.11.1.6.6 Additional Options for Controlling APEX Application Export

Learn about additional `apex export` command options.

Use the following `apex export` command options to adjust what gets exported along with your application.

Option	Description
`-expFiles`	Export all workspace files identified by `-workspaceid`
`-expType`	Comma delimited list of export types: `APPLICATION_SOURCE (default), READABLE_YAML, EMBEDDED_CODE, CHECKSUM-SH1 or CHECKSUM-SH256`
`-skipExportDate`	Exclude export date from application export files
`-expPubReports`	Export all user saved public interactive reports
`-expSavedReports`	Export all user saved interactive reports
`-expIRNotif`	Export all interactive report notifications
`-expTranslations`	Export the translation mappings and all text from the translation repository
`-expOriginalIds`	Export will emit IDs as they were when the application was imported
`-expNoSubscriptions`	Do not export references to subscribed components
`-expComments`	Export developer comments
`-expSupportingObjects`	Pass `Y` for yes, `N` for no, or the letter `I` to export and automatically install supporting objects on import
`-dir`	Save all files in the given directory, e.g. -dir some/sub/directory
`-expComponents`	Export application components. All remaining parameters must be of form `TYPE:ID`
`-debug`	Print debug output

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Option	Description
`-nochecksum`	Overwrite existing files even if the contents have not changed
`-split`	Split applications into multiple files

3.11.11.1.7 Exporting a Workspace

Export a workspace using the `apex export` command with the `-expWorkspace` option.

To export an workspace, use the `apex export` command with the `-expWorkspace` option and provide the workspace ID. This command exports all relevant workspace metadata, including groups, group grants, users, RESTful services, user interface defaults, attribute dictionary, and so on.

In the following example, the workspace ID is `1908816359534887` and would create a file named `w1908816359534887.sql` in the current directory.

```
SQL> apex export -expWorkspace -workspaceId 1908816359534887
```

Additional Workspace Export Options

Include the following additional options to your workspace export to control what workspace information is included in the workspace export:

- `-expMinimal` - Only export workspace definition, users, and groups.
- `-debug` - Print debug output.

3.11.11.1.8 Exporting Workspace Static Files

Export a workspace static files using the `apex export` command and `-expFiles` option.

To export workspace static files, use the `apex export` command with the `-expFiles` option and provide the workspace ID.

In the following example, the workspace ID is `1908816359534887` and would create a file named`files_1908816359534887.sql` in the current directory.

```
SQL> apex export -expFiles -workspaceid 1908816359534887
```

3.11.11.1.9 Installing an Application

Install an APEX application into a target environment by running a SQL script.

Note that you can handle special cases by first configuring installation context information and then running the SQL script. This topic explains both scenarios.

- Installing an Application from an APEXlang Export
  Learn about installing an APEXlang application export.
- Installing an Application When Target Environment Mirrors the Source
  Learn about installing an application when the target environment mirrors the source.
- Installing an Application When Target Environment Differs From Source
  Learn about installing an application when the target environment differs from the source.

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3.11.11.1.9.1 Installing an Application from an APEXlang Export

Learn about installing an APEXlang application export.

> **Tip**
>
> Importing an APEXlang export requires a version of Oracle SQLcl that supports the `apex import` command. Before importing, download and install the latest version of Oracle SQLcl. See Downloading and Installing SQLcl.

To install an application from an APEXlang export, run the `apex import` command.

Consider the following examples:

- Install an application from an APEXlang ZIP export:

  ```
  apex import -input myapp.zip
  ```

- Install an application from a directory containing an APEXlang application:

  ```
  apex import -input path-to-folder/myapp
  ```

> **Note**
>
> To display all options for the `apex import` command, run `help apex import` in SQLcl.

3.11.11.1.9.2 Installing an Application When Target Environment Mirrors the Source

Learn about installing an application when the target environment mirrors the source.

You export an APEX application from a source environment as a single SQL file or a set of individual SQL files split into subdirectories. To install the export into a target environment that uses the same workspace name, workspace ID, workspace schema name, and application Alias, simply run the SQL script created by the export procedure.

The application being installed overwrites the application of the same ID in the target environment. If the application export was a partial export containing only selected components, then only those components are overwritten in the target environment.

If the export was a single SQL file, such as `f1234.sql`, then run that script to install the application. If instead the export used the `-split` option to create a directory, such as `f1234` which containing individual component SQL files organized into subdirectories, then run the `./f1234/install.sql` script to install the application. If you used the `-split` option to export a partial set of components, then run the `./f1234/install_component.sql` script.

3.11.11.1.9.3 Installing an Application When Target Environment Differs From Source

Learn about installing an application when the target environment differs from the source.

If the target environment into which you need to import does not use the same workspace name, workspace ID, workspace schema name, and application Alias, then installing the

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application requires a SQL script that performs the following additional steps as shown in the following example:

```
REM First setup the installation context in the target environment
begin
    -- Add necessary calls to apex_application_install package procedures here
end;
/
REM Then install the application by running its exported SQL script
REM For "split" export run @f1234/install.sql
REM or @f1234/install_component.sql instead
@f1234.sql
```

Setting Up the Installation Context

The installation context includes:

- Workspace name (for example, `TARGET_WORKSPACE`)
- Application ID (for example, `5678`)
- Workspace schema (for example, `HRAPP_PROD`)
- Application alias (for example, `hrapp`, used in friendly URLs)

If the name or ID of the target workspace is different than the workspace from which the application was exported, then you need to add a call to the `set_workspace()` procedure to the anonymous block in your installation script:

```
apex_application_install.set_workspace('TARGET_WORKSPACE');
```

Similarly, other calls to `apex_application_install` package procedures are only required when their value in the target environment differs from the corresponding value in the source environment from which the application was exported.

To set a specific application ID in the target environment, add a call to `set_application_id()` as shown below, along with the additional call to `generate_offset()`.

```
apex_application_install.set_application_id(5678);
apex_application_install.generate_offset();
```

To generate an available application ID instead of supplying a specific one, add a call to `generate_application_id` instead of `calling set_application_id`.

```
apex_application_install.generate_application_id;
apex_application_install.generate_offset;
```

To set the name of the workspace schema for the application to be installed, add a call to `set_schema()` as shown here:

```
apex_application_install.set_schema('HRAPP_PROD');
```


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To set the application alias (used in friendly URLs), add a call to `set_application_alias()` procedure as shown here:

```
apex_application_install.set_application_alias('hrapp');
```

Running the SQL Script to Install an Application

This section includes a complete example of an installation script for single-file and "split" exports.

This example assumes you have previously exported an application with ID 1234 to a single file named `f1234.sql`. This example also shows the SQL script you would run using SQLcl to install the APEX application into a target environment with workspace `HRAPP_PROD`, using application ID 5678, workspace schema `HRAPP_PROD`, and application alias `hrapp`.

```
REM First setup the installation context in the target environment
begin
    apex_application_install.set_workspace('TARGET_WORKSPACE');
    apex_application_install.set_application_id(5678);
    apex_application_install.generate_offset();
    apex_application_install.set_schema('HRAPP_PROD');
    apex_application_install.set_application_alias('hrapp');
end;
/
REM Then install the application by running its exported SQL script
REM For "split" export run @f1234/install.sql
REM or @f1234/install_component.sql instead
@f1234.sql
```

3.11.11.1.10 Importing a Workspace

Import an APEX workspace into a target environment.

To importing an APEX workspace into a target environment:

1. Connect SQLcl to the target environment's database as a user with the `APEX_ADMINISTRATOR_ROLE` privilege or as a DBA account.
2. Run the script produced by the workspace export into a target environment.

Workspace export script in the following example is is named `w1908816359534887.sql` .

```
SQL> show user
USER is "ADMIN"
@w1908816359534887.sql
```

This script would produce output similar to the following:

```
--application/set_environment
WORKSPACE 1908816359534887
Creating workspace EXAMPLES...
Creating Groups...
Creating group grants...
Creating Users...
...RESTful Services
SCHEMA EXAMPLES - User Interface Defaults, Table Defaults
```


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```
User Interface Defaults, Attribute Dictionary
...done
```

3.11.11.1.11 Importing Workspace Static Files

Import APEX workspace static files into a target environment.

To import APEX workspace static files into a target environment:

1. Connect SQLcl to the target environment's database as a user with the `APEX_ADMINISTRATOR_ROLE` privilege or as a DBA account.
2. Run the script produced by the workspace static files export into a target environment.

   In the following example, the workspace static files export is named `files_1908816359534887.sql` .

```
SQL> show user
USER is "ADMIN"
@files_1908816359534887.sql
```

3.11.11.1.12 Synchronizing Feedback Among Environments

Learn about best practices for synchronizing feedback from development, test, and production environments.

- About Synchronizing Feedback Among Environments
- Distinguishing Between DEV, TEST, and PROD Environments
- Exporting Feedback from Testing or Production
- Exporting Feedback from Development to Sync Back to Testing or Production
- Performing Incremental Feedback Export

3.11.11.1.12.1 About Synchronizing Feedback Among Environments

APEX applications application enable end users to report feedback that can be useful input to the development process. You can use SQLcl to export the feedback from your testing or production environments and import it into your development environment. After responding to and addressing the feedback as appropriate in development, you can later use SQLcl again in the development environment to separately export:

- Feedback that originated from the testing environment
- Feedback that originated from the production environment

This approach enables you to then import the appropriate feedback back into its originating environment, keeping that environment's feedback information in sync so testers and end users can appreciate the impact their feedback has had on the evolution of your application.

3.11.11.1.12.2 Distinguishing Between DEV, TEST, and PROD Environments

Distinguish between active development (`DEV`), testing (`TEST`), and production (`PROD`) environments by specifying a `Feedback Synchronization Source Identifier` and a workspace environment banner.

APEX development teams typically provision three environments that share the same workspace name and workspace ID. One is used for active development, another for testing

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purposes, and the third environment contains the production application and data used by end-users.

Since all three environments share the same workspace ID, you can easily distinguish them by configuring each workspace instance to have:

- A distinct value of the `Feedback Synchronization Source Identifier` to use for synchronizing feedback.
- A workspace environment banner to visually distinguish them while working in the App Builder.

For example, suppose you have a workspace named `TEAMWORK` in each of the three environments. Since all three workspace environments have the same workspace name (`TEAMWORK`) and workspace ID (`1908816359534887`), you could use the values shown in the following table to distinguish them from one another.

Message Name	English Text
DEV	Development
TEST	Testing
PROD	Production

See Also

- Configuring an Environment Banner for a Workspace
- Configuring an Environment Banner in Administration Services

3.11.11.1.12.3 Exporting Feedback from Testing or Production

To export feedback from the testing or production environment, connect to the appropriate database user with SQLcl and use `apex export` with the `-expFeedback` option and provide the workspace ID.

```
SQL> apex export -expFeedback -workspaceid 1908816359534887
Exporting Feedback for Workspace 1908816359534887:'TEAMWORK'
```

The previous example produces a file named `fb1908816359534887.sql` in the current directory. This file contains a line that reflects the PROD value of the `Feedback Synchronization Source Identifier` of the production environment, for example:

```
:
wwv_flow_api.set_feedback_origin('PROD', 'DEVELOPMENT');
:
```

If this example been done in the Testing environment, this value would have been `TEST` in the exported SQL file.

To import the feedback into the development environment, run this SQL script when connected to the workspace schema user of the development environment's database.

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3.11.11.1.12.4 Exporting Feedback from Development to Sync Back to Testing or Production

Once your development team has processed any imported feedback entries in the Development environment, you can export the feedback entries specific to a particular target environment by using the `-deploymentSystem` option. For example, to export the feedback from Development that originated from the PROD environment, the feedback export command would look similar to the following:

```
SQL> apex export -expFeedback -workspaceid 1908816359534887 -deploymentSystem
PROD
Exporting Feedback for Workspace 1908816359534887:'TEAMWORK'
```

This example would produce a `fb1908816359534887.sql` file in the current directory. This file would contain only the feedback entries that are appropriate to import back into the Production environment to update it with the latest status of the feedback for the items that originated there. To import the feedback into the production environment, run this script when connected to the workspace schema user of the production environment's database.

3.11.11.1.12.5 Performing Incremental Feedback Export

When working with a lot of feedback entries, you consider exporting only feedback entries created or changed on or after a particular date. To perform this incremental feedback export, add the `-expFeedbackSince` option to your `apex export -expFeedback` command line, indicating the date is the format `YYYYMMDD`.

For example, to export feedback entries from production made on or after January 22, 2022, the command becomes:

```
SQL> apex export -expFeedback -workspaceid 1908816359534887 -expFeedbackSince
20220122
```

To perform an incremental export of updated feedback entries in the Development environment that originated from the Production environment for the purposes of synchronizing the changes back to Production, then add the `-expFeedbackSince` option.

For example, to export feedback entries from development that originated in the production environment that were updated on or after March 21, 2022, the command becomes:

```
SQL> apex export -expFeedback -workspaceid 1908816359534887 -deploymentSystem
PROD -expFeedbackSince 20220321
```

3.11.11.1.13 Displaying Application Usage

View a summary of APEX application usage.

To see summary information about recent usage of your APEX applications, use the command `apex log`.

```
SQL> apex log

WORKSPACE APPLICATION_ID APPLICATION_NAME PAGE_VIEWS TOTAL_ELAPSED_TIME
AVERAGE_ELAPSED_TIME MINIMUM_ELAPSED_TIME MAXIMUM_ELAPSED_TIME
EXAMPLES  4000                           290        335.007
1.15519655172413793  0.017               45.768
```


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```
EXAMPLES  4550                          7          4.344
0.62057142857142857  0.391              0.93
EXAMPLES  4350                          5          6.192
1.2384               0.042              2.689
EXAMPLES  4500                          5          4.399
0.8798               0.167              2.335
EXAMPLES  4020                          24         20.102
0.83758333333333333  0.037              15.437
EXAMPLES  113            List Examples  71         15.63
0.22014084507042214  0.025              2.21
```

Information also appears for the APEX applications comprising the App Builder itself. These internal applications have ID numbers in the 4000's range. You can gain additional usage insights by directly querying the APEX dictionary view `APEX_WORKSPACE_LOG_SUMMARY`.

3.11.12 Changing Application Build Status in Administration Services

An Instance administrator can change the build status of an application.

- About Changing Application Build Status
  Use the Build Status attribute to prevent an application from being modified by other developers.
- Changing Build Status in Administration Services
  Change a Build Status in Administration Services under Manage Workspaces, Manage Applications.

> **See Also**
>
> Managing Build Status in Workspace Administration

3.11.12.1 About Changing Application Build Status

Use the Build Status attribute to prevent an application from being modified by other developers.

The Build Status attribute 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.

Ways to Modify Build Status

You can change the Build Status of an application as follows:

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

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- **Instance-level** -Instance administrators can change the Build Status of an application on the Build Status page as described in Changing Build Status in Administration Services.

3.11.12.2 Changing Build Status in Administration Services

Change a Build Status in Administration Services under Manage Workspaces, Manage Applications.

To change a Build Status in Administration Services:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Manage Applications, click **Build Status**.

   The Build Status page appears. 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:.
   - **Run Application Only** - Developers can only run an application. Application will not appear in the list of applications shown in the App Builder for the workspace.
   - **Run and Build Application** - Developers can both run and edit an application. Application will appear in the App Builder's list of applications for the workspace.
6. 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 Administration Services.

3.11.13 Viewing the Application Attributes Report

View applications by workspace on the Application Attributes page.

Application Attributes page is an interactive report that displays application by workspace and includes the following columns: Parsing Schema, Application Name, Pages, Language, Logging, Build Status, Application Status, and Alias.

To view the Application Attributes page:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Manage Applications, click **Application Attributes**.

   The Application Attributes page appears.
4. To edit workspace information:
   a. Click the Workspace name.

      The Edit Workspace Information page appears.

   b. To learn more about the Edit Workspace Information page, see Viewing Existing Workspace Information.

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3.11.14 Viewing the Parsing Schemas Report

Use the Parsing Schemas report to identify the current parsing schema of each application in any workspace.

The Parsing Schemas report identifies the database schema whose privileges are used when Oracle APEX dynamically executes the application's SQL and PL/SQL code at runtime.

To view the Parsing Schemas report:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Manage Applications, click **Parsing Schemas**.

   The Parsing Schemas report appears. To customize the report, use the Search bar at the top of the page.

> **See Also**
>
> Managing Schemas and Managing Workspace to Schema Assignments

3.11.15 Accessing Workspace Reports

Instance administrators can view workspace reports from Manage Workspaces, Workspace Reports.

- Viewing the Workspace Details Report
  View workspace information on the Workspace Details page.
- Viewing Workspace Database Privileges
  View a summary of workspace database privileges on the Workspace Database Privileges page.
- Viewing File Size and File Count by Workspace
  View total file size and file count by workspace on the File Utilization by Workspace page.
- Finding and Emailing Workspace Summary
  View total file size and file count by workspace on the File Utilization by Workspace page.
- Accessing the Data Dictionary Cache Report from Administration Services
  Access the Data Dictionary Cache report from Administration Services to view statistics and data analysis of all workspace schema tables and caches in an instance.

3.11.15.1 Viewing the Workspace Details Report

View workspace information on the Workspace Details page.

To view the Workspace Details page:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Reports, click **Workspace Details**.

   The Workspace Details page appears and displays the Workspace Summary Report.

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4. Configure the report:
   a. From the Workspace list, select a workspace.
   b. From the Reporting Period list, select a period.
   c. Click **Set**.

      The Workspace Details report page appears. The following buttons display at the top of the report:

      - **Remove** - Removes the current workspace.
      - **Edit** - Edit workspace information and click **Apply Changes**.
      - **Schema Assignments** - Links to Manage Workspace to Schema Assignments. See Managing Workspace to Schema Assignments.
      - **Email** - Send this report by email.

      The Workspace Details 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 APEX, 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.
      - **Database Applications** - Lists details about the database applications within the workspace.
      - **SQL Workshop** - Lists the number of SQL scripts, SQL script results, and SQL Command history.
      - **Team Development** - Lists the number of labels, milestones, issues, attachments, and feedback entries.
      - **Workspace Application Activity Summary** - Details statistics about workspace applications.

      Other sections include:

      - 5 Most Active Applications
      - Developer Activity Summary
      - Database Object Counts by Object Type
      - 5 Top Tables by Row Count, Reported by Schema
5. From the Reporting Period list, select a period and click **Set**.

See Also

- Isolating a Workspace to Prevent Browser Attacks
- Managing Schemas
- Managing Users Across an Oracle APEX Instance
- Managing Schemas

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3.11.15.2 Viewing Workspace Database Privileges

View a summary of workspace database privileges on the Workspace Database Privileges page.

To view workspace database privileges:

1. Sign in to Oracle APEX Administration Services.
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 Details Report

3.11.15.3 Viewing File Size and File Count by Workspace

View total file size and file count by workspace on the File Utilization by Workspace page.

To view total file size and file count by workspace:

1. Sign in to Oracle APEX Administration Services.
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.
4. To customize the report, use the Search bar at the top of the page.

3.11.15.4 Finding and Emailing Workspace Summary

View total file size and file count by workspace on the File Utilization by Workspace page.

To find and email a workspace summary:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Reports, click **Find and Email Workspace Summary**.

   The Workspace Search page appears.
4. Cick a workspace name.

   The Workspace Details report appears.
5. To configure the reporting period, select a reporting period and click **Set**.

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6. To edit workspace information:
   a. Click Edit Workspace.

      The Edit Workspace Information page appears.

   b. To learn more about the Edit Workspace Information page, see Viewing Existing Workspace Information.
7. To email the Workspace Details report:
   a. Click **Email**.
   b. On the Email page, enter content in the **Body** field.
   c. Click **Email**.

3.11.15.5 Accessing the Data Dictionary Cache Report from Administration Services

Access the Data Dictionary Cache report from Administration Services to view statistics and data analysis of all workspace schema tables and caches in an instance.

- Viewing or Refreshing the Data Dictionary Cache
  View or refresh the Data Dictionary Cache.

> **See Also**
>
> Accessing the Data Dictionary Cache Report from Workspace Administration

3.11.15.5.1 Viewing or Refreshing the Data Dictionary Cache

View or refresh the Data Dictionary Cache.

The Create Application Wizard and Create Page Wizard use this information when creating new applications and pages. If the tables change due to DDL or DML modifications, the Oracle APEX nightly job `ORACLE_APEX_DICTIONARY_CACHE` refreshes the Data Dictionary Cache. If the Data Dictionary Cache is incorrect or out of date, you can update the cache manually by clicking **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.

To view or refresh the Data Dictionary Cache:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Reports, click **Data Dictionary Cache**.

   The Data Dictionary Cache page appears listing the workspace, cached objects, schema count, last data definition, last dictionary cache, and workspace ID
4. To view cache for a workspace:
   a. Click the workspace name.

      The Workspace Cache report appears.

   b. To refresh the cache manually click either **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.
5. To view cache for table:
   a. Click the table name.

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The Table Column Cache report appears. The **Facets Search Score** and **Facet Display** columns indicate how the Create Application Wizard and Create Page Wizard will render facets when creating a Faceted Search page.

b. To refresh the cache manually click either **Gather Statistics and Refresh Cache** or **Refresh Cache Only**.

> **See Also**
>
> List of DBMS_SCHEDULER Jobs

3.12 Managing Users Across an Oracle APEX Instance

An Instance administrator manages all user accounts within an Oracle APEX instance on the Manage Developers and Users page.

- About the Advantages of Managing Users at the Instance Level
  When setting up user accounts, instance administrators can take advantage of security capabilities such as locking accounts, configuring password to have a fixed lifetime, and requiring user passwords be changed on first use.
- About Oracle APEX Accounts Authentication
  User accounts are particularly useful if your application is using Oracle APEX Accounts authentication. APEX Accounts is a built-in authentication method in which user accounts are created and managed in the APEX user repository.
- About Oracle APEX User Roles
  Oracle APEX users are divided into four roles.
- Creating New User Accounts in Administration Services
  Create new user accounts in Administration Services on the Manage Developers and Users page.
- Editing an Existing User Account in Administration Services
  Edit user accounts in Administration Services on the Manage Developers and Users page.
- Deleting User Accounts in Administration Services
  Delete user accounts in Administration Services on the Manage Developers and Users page.

Related Topics

- Managing Users in a Workspace
  Workspace administrators can create new user accounts, manage existing user accounts, and change user passwords.

3.12.1 About the Advantages of Managing Users at the Instance Level

When setting up user accounts, instance administrators can take advantage of security capabilities such as locking accounts, configuring password to have a fixed lifetime, and requiring user passwords be changed on first use.

Related Topics

- Configuring Security
  Instance administrators can configure instance security, including service-level security, configuring support for Real Application Security, configuring session time out, preventing

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browser attacks by isolating workspaces, excluding domains from regions and Web services, configuring authentication controls, creating strong password policies, and managing authorized URLs.

3.12.2 About Oracle APEX Accounts Authentication

User accounts are particularly useful if your application is using Oracle APEX Accounts authentication. APEX Accounts is a built-in authentication method in which user accounts are created and managed in the APEX user repository.

Related Topics

- Editing Oracle APEX Accounts
  Edit the Oracle APEX Accounts authentication scheme for an instance.

3.12.3 About Oracle APEX User Roles

Oracle APEX users are divided into four roles.

To access the APEX 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 in to a workspace and create applications. End users can only run existing applications.
- **Developers** are users who create and edit applications, monitor workspace activity, and view dashboards.
- **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 Oracle APEX Administration Services application. Instance administrators create workspaces, configure features and instance settings, and manage security.

3.12.4 Creating New User Accounts in Administration Services

Create new user accounts in Administration Services on the Manage Developers and Users page.

> **Tip**
>
> You can also access the Create/Edit User page by clicking **Create User** on the Workspace Tasks list on the Administration Services home page.

To create a new user account:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Developers and Users**.

   The Manage Developers and Users page appears.
4. Click **Create User**.

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The Create/Edit User page appears.

5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

> **Tip**
>
> Most attributes in APEX include field-level Help. Attributes with field-level Help, have light gray icon that resembles a question mark (?). To view field-level Help, click the Help icon.

   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.

6. Under Account Privileges:
   a. **Workspace** - Select a workspace from the list.
   b. **Default Schema** - Specify the default schema used for this user.

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

      Administrators are given access to all components. Additionally, they can manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.
   e. **User is a developer** - Specify if this user should have developer privileges.

      Developers must have access to either App Builder, SQL Workshop, or Data Reporter. These components may not be available if they are switched off by the Instance Administrator.
   f. **App Builder Access** - Determines whether a developer has access to the App Builder.

      An Administrator will always have access to the App Builder.This attribute is always disabled when App Builder Access is disabled for the workspace by an Administrator.
   g. **SQL Workshop Access** - Determines whether a developer has access to the SQL Workshop.

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An Administrator will always have access to SQL Workshop.This attribute is always disabled when SQL Workshop Access is disabled for the workspace by an Administrator.

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

   An Administrator will always have access to Team Development.This attribute is always disabled when Team Development Access is disabled for the workspace by an Administrator.

i. **Data Reporter Builder Access** - Determines whether a user has access to Data Reporter.

   An Administrator will always have access to Data Reporter.This attribute is always disabled when Data Reporter Access is disabled for the workspace by an Administrator.

j. **Data Reporter Role** - Displays the role for Data Reporter.Instance user management allows defining a data reporter administrator only. Use Data Reporter Manage Users to define other data reporter role for this user.

k. **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 log in failures allowed, specified in Workspace Preferences, then their account will be locked automatically.

7. Under Password:

   a. Password - Enter a case-sensitive password if you are creating a new account with a password, or are updating the password for an existing account.

   b. Confirm Password - Enter the password again if you are creating a new account with a password, or are updating the password for an existing account.

   c. Require Change of Password On First Use - Select **Yes** to require the user to change the password immediately after logging in the first time.

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

3.12.5 Editing an Existing User Account in Administration Services

Edit user accounts in Administration Services on the Manage Developers and Users page.

To edit an existing user account in Administration Services:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Developers and Users**.

   The Manage Developers and Users page appears.
4. To edit account details, click a user.
5. Edit the appropriate attributes.

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

6. Click **Apply Changes**.

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3.12.6 Deleting User Accounts in Administration Services

Delete user accounts in Administration Services on the Manage Developers and Users page.

To delete a user account in Administration Services:

1. Sign in to Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Developers and Users**.

   The Manage Developers and Users page appears.
4. Click the user to be deleted.
5. Click **Delete User**.
6. Confirm your selection and click **OK**.

3.13 Monitoring Activity Across an Instance

Use the links on the Monitor Activity page to access various reports on application, developer, and session activity in all workspaces.

This section only highlights some of the reports available from the Monitor Activity page.

> **Note**
>
> To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- About Web Server Logs
  URLs from the Web Server Access Logs and Error Logs can pinpoint the request to a specific application, page, and session.
- Accessing the Monitor Activity Page in Administration Services
  Access the Monitor Activity page in Administration Services to view reports on application, developer, and session activity in all workspaces.
- Viewing the Administrator Digest
  Access the Administrator Digest dashboard to view the key instance activity metrics and how these metrics change over time.
- Viewing the Signup Survey Report
  View the Signup Survey report to view the survey questions, answers, and the number of responses.
- Viewing the Backup Log
  Monitor the performance of a backup job by reviewing the Backup Log.

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> **See Also**
>
> - Monitoring Activity Within a Workspace
> - Viewing Workspace Dashboards
> - Configuring and Deleting Logs and Log Entries

3.13.1 About Web Server Logs

URLs from the Web Server Access Logs and Error Logs can pinpoint the request to a specific application, page, and session.

For page GET requests, application, page and session details are part of APEX URL. For POST requests (such as when the page is submitted) or for AJAX requests, application, page and session information can be found in the `p_context` query parameter in the URL. Whether the Friendly URLs attribute is enabled determines what the `p_context` query parameter contains.

If the Friendly URLs is enabled `p_context` contains:

`app-alias/page-alias/session-id`

If the Friendly URLs is disabled (that is, you are using legacy f?p URL Syntax), `p_context` contains:

`app_id``:`*`page_number`*`:`*`session_id`*

> **Note**
>
> The location of the Web Server Access Logs and Error Logs depends on which Web Server you are using (for example, Apache, Tomcat, Jetty and so on). For more information, see the appropriate web server documentation .

> **See Also**
>
> Understanding URL Syntax in *Oracle APEX App Builder User's Guide*

3.13.2 Accessing the Monitor Activity Page in Administration Services

Access the Monitor Activity page in Administration Services to view reports on application, developer, and session activity in all workspaces.

To access the Monitor Activity page in Administration Services:

1. Sign in to Oracle APEX Administration Services.
2. Click **Monitor Activity**.

   The Monitor Activity page appears.
3. Click the appropriate link to view reports across all workspaces.

   The Monitor Activity page is divided into the following sections:

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- **Activity Summary**:
  - **Administrator Digest** - Displays various reports on instance, workspace and schema metrics as well as other user activity views within the instance.
  - **Top Applications** - Displays a graph and report of top applications.
  - **Top Workspaces** - Displays a bar graph of most active workspaces based on the criteria specified and a report workspace activity.
  - **Activity Summary** - Displays top applications and development activity from the daily summarized activity log.
- **Page Views** - Dashboard, By View, By Application and User, By User, Page Views by User by Day, By Application, By Workspace, and By Workspace Faceted Search.
- **Service Requests** - New Service Requests and Signup Survey.
- **Workspace Purge** - Dashboard, Inactive Workspaces, Workspaces Purged, Workspaces that became Active, and Workspace Purge Log.
- **Logs** - Mail Log, Web Service Activity Log, Automation Log, REST Synchronization Log, Jobs, Automatic File Delete Log, and Backup Log.
- **Environment Reports** - By Operating System, By Browser, By User Agent, or By External Site.
- **Login Attempts** - Login Attempts or Developer Last Login.
- **Calendar Reports** - Workspace Last Used, Page Views by Day by Application and User, and User, and By Hour.
- **Developer Activity** - Application Changes by Developer, Application Changes by Workspace, Native Component Utilization Chart, Native Component Utilization Report, and Data Loading Jobs.
- **Archived Activity** - View archived activity reports.

3.13.3 Viewing the Administrator Digest

Access the Administrator Digest dashboard to view the key instance activity metrics and how these metrics change over time.

The Administrator Digest page gathers information about workspaces, applications, schemas, workspace users, user and system scheduler jobs, and database links.

To access the Administrator Digest page:

1. Sign in to Oracle APEX Administration Services.
2. Click **Monitor Activity**.

   The Monitor Activity page appears.
3. Click **Administrator Digest**.

   The Administrator Digest page features the following icons, charts, and links:

   - **Instance Metrics** - Displays a report in which each record includes the overall metrics for the entire instance in a day (for example, created or removed workspaces and database links).
   - **Workspace Metrics** - Displays a report in which each record includes the overall activity at the workspace level in a day (for example, user accounts, distinct users, page events, login attempts, created or removed applications, web service requests, and so on).

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- **Schema Metrics** - Displays a report in which each record includes the overall metrics at the schema level in a day (for example, database links, different aggregations for user scheduler jobs, and information about the used versus free space).
- **Summary Dashboard** - Displays a series of reports and charts incorporating the main activities over all workspaces within a certain time interval. To change the number of days, select a new value from the Since list and click **Set**.
- **Additional Metrics** - Additional regions feature charts that display the metric aggregations within the default reporting period. Click the right arrow (>) to view more details. Available regions include:
  - Workspaces
  - Applications
  - Workspace Users
  - User Scheduler Jobs
  - System Scheduler Jobs
  - Database Links
  - Workspaces with 10% Free Space Remaining, where percentage value can be updated using the Instance Parameter: `WORKSPACE_FREE_SPACE_LIMIT`
- Top Activity - View activity reports for Top Workspaces, Top Applications, or Top Users.

3.13.4 Viewing the Signup Survey Report

View the Signup Survey report to view the survey questions, answers, and the number of responses.

Instance administrators can also include survey questions users must complete when running the New Service Signup Wizard.

To view the Signup Survey report:

1. Sign in to Administration Services.
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**.

> **See Also**
>
> Defining a Service Signup Wizard

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3.13.5 Viewing the Backup Log

Monitor the performance of a backup job by reviewing the Backup Log.

The Backup Log reports when a backup job ran, the number of applications backed up by the job, and the elapsed time required to backup the applications.

To view the Backup Log:

1. Sign in to Administration Services.
2. Click **Monitor Activity**.

   The Monitor Activity page appears.
3. Under Logs, click the **Backup Log**.

   The Backup Log appears displaying when a backup job ran, the number of applications backed up by the job, and the elapsed time required to backup the applications.

   The elapsed time displays as Hours, Minutes, Seconds, Milliseconds (HH:MI:SS.FF). For example, a job with a duration of 00:00:00.812 took eight-hundred-twelve milliseconds. A job with a duration of 00:02:16.956 took two minutes, 16 seconds, nine-hundred-fifty-six milliseconds.
4. Click the Batch number to display the details.

   The Backup Log dialog appears displaying the IDs of the applications backed up in the job and the duration.
5. To remove Backup Log data, click **Truncate**.

   All Backup Log information is immediately removed.

See Also

- Configuring the Number of Application Backups
- Managing Application Backups in *Oracle APEX App Builder User's Guide*

3.14 Configuring and Deleting Logs and Log Entries

Configure log intervals and delete logs and log entries.

Note

To ensure the security and performance of your development environment, some administration functionality is not available in Oracle APEX instances running in Oracle Cloud.

- Managing Log Intervals
  Use the Manage Log Interval page to set the minimum number of days to retain log information for log files.

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- Archiving the Activity Log
  Archiving the Activity log takes the Oracle APEX Activity log, summarizes it, and writes the results to an archived activity log.
- Deleting SQL Workshop Log Entries
  Delete SQL Workshop log entries.
- Deleting Page View Activity Log Entries
  Delete Page View Activity log entries. Page View Activity Logs track user activity for an application.
- Managing the Developer Activity Log
  Manage the Developer Activity Log by deleting log entries and configuring the number of days to retain log entries.
- Deleting Click Counting Log Entries
  Delete External Clicks Counting Log entries.
- Deleting the Login Access Log
  Delete Login Access Log entries.
- Deleting Web Service Activity Log Entries
  Delete Web Service Activity log entries.
- Deleting REST Synchronization Log Entries
  Delete REST Synchronization log entries.
- Deleting Automation Log Entries
  Delete the Automation log entries.
- Viewing Install and Upgrade Logs
  View a log of installation or upgrade phases and their corresponding metrics.

See Also

Purging the Developer Activity and Click Count Log Files

3.14.1 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 Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Manage Log Interval**.

   The Manage Log Interval page appears displaying the following logs:

   - **Access Log** - Records authentication events by developers and administrators accessing the APEX environment and by end users of APEX applications that use the built-in login APIs available to developers.
   - **Activity Log** - Records application page views including page submit actions and partial page refreshes. Application logging must be enabled.
   - **Automation** - Records execution of automations defined in applications.
   - **Debug Messages Records** - Debug messages emitted by applications while debugging is enabled.

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- **Events** - Records operational events performed by instance administrators. You can view these events in the Administrator Digest or by querying `APEX_EVENTS_LOG` dictionary view.
- **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.
- **REST Synchronization** - Records details of previously executed REST synchronizations.
- **Web Service** - Records all web service requests initiated from the APEX instance if web service activity logging is enabled.

4. For each log, 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

- Enabling Application Activity Logging
- Viewing the Administrator Digest
- Enabling Web Service Activity Logging
- SET_LOG_SWITCH_INTERVAL Procedure in *Oracle APEX API Reference*

3.14.2 Archiving the Activity Log

Archiving the Activity log takes the Oracle APEX Activity log, summarizes it, and writes the results to an archived activity log.

To archive the Oracle APEX log:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Archive Activity Log**.

   The Archive Activity Log page appears listing the **Date of Last Archive**, **Archive Day Count**, and **Workspace Count**.

4. Click **Archive Activity Summary**.

3.14.3 Deleting SQL Workshop Log Entries

Delete SQL Workshop log entries.

The SQL Workshop log maintains a history of SQL statements. This history is available in SQL Commands by clicking the History tab. This table can be truncated to reduce space utilization.

To delete SQL Workshop log entries:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **SQL Workshop Log**.

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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, click one of the following:
   a. Delete entries this number of days and older - Select the number of days.
   b. Click one of the following:
      - **Truncate Log** - Deletes all entries.
      - **Delete Entries** - Deletes entries by age, specify the age of the entries to be deleted.

> **See Also**
>
> Using SQL Command History in *Oracle APEX SQL Workshop Guide*

3.14.4 Deleting Page View Activity Log Entries

Delete Page View Activity log entries. Page View Activity Logs track user activity for an application.

The APEX engine uses two logs to track user activity. At any given time, one log is designated as current. For each rendered page view, the APEX 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 APEX engine removes all entries in the noncurrent log and designates it as current.

> **Tip**
>
> Developers enable logging within their application using the Logging attribute on the Edit Application Definition page. See Editing the Application Definition in *Oracle APEX App Builder User's Guide*.

To delete Page View Activity log entries:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Page View Activity Log**.

   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

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3.14.5 Managing the Developer Activity Log

Manage the Developer Activity Log by deleting log entries and configuring the number of days to retain log entries.

The Developer Activity log tracks changes to applications within an individual workspace. You can specify the number of days to retain log entries.

To delete log entries manually or configure log entry retention:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Developer Activity Log**.

   The Developer Activity Log page appears displaying the number log entries.
4. To delete log entries:
   a. Delete entries this number of days and older - Specify the age of the entries to be deleted.
   b. Click **Delete Entries**.
5. To specify the number of days to retain log entries:
   a. Developer Log Retention Days - Enter the number of days to retain developer log entries. Entries older than this setting are deleted during daily maintenance.
   b. Click **Save Retention Setting**.

> **See Also**
>
> Developer Activity Dashboard for information about the Developer Activity Log

3.14.6 Deleting Click Counting Log Entries

Delete External Clicks Counting Log entries.

The External Clicks Counting log counts clicks from an APEX 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 Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **External Click Counting Log**.

   The External Click Counting Log page appears displaying the number of log entries.
4. On the External Click Counting Log page:
   a. Delete entries this number of days and older - Specify the age of the entries to be deleted.
   b. Click **Delete Entries**.

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> **See Also**
>
> COUNT_CLICK Procedure in *Oracle APEX API Reference*

3.14.7 Deleting the Login Access Log

Delete Login Access Log entries.

The Login Access log records authentication events by developers and administrators accessing the APEX environment and by end users of APEX applications that use the built-in login APIs available to developers. Log entries are aged out of the log tables and purged periodically.

To delete Login Access Log entries:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Login Access Log**.

   The Login Access Log page appears displaying the number of log entries.
4. On the Login Access Log Entries page:
   a. Delete entries this number of days and older - Specify the age of the entries to be deleted.
   b. Click **Delete Entries**.

3.14.8 Deleting Web Service Activity Log Entries

Delete Web Service Activity log entries.

The Web Service Activity log records all web service requests initiated from the APEX instance.

To delete Web Service Activity log entries:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Web Service Activity Log**.

   The Web Service Activity Log page appears displaying the number of log entries.
4. On the Web Service Activity Log page:
   a. Delete entries this number of days and older - Specify the age of the entries to be deleted.
   b. Click **Delete Entries**.

3.14.9 Deleting REST Synchronization Log Entries

Delete REST Synchronization log entries.

The REST Synchronization log contains details about previously executed synchronizations such as the status (that is, Success or Failure), the amount of processed rows, and the amount of HTTP requests being made. You can drill down from the Synchronization log to the Web Services log to review each individual HTTP request which was made for this synchronization.

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To delete REST Synchronization log entries:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **REST Synchronization Log**.

   The REST Synchronization Log page appears displaying the current number of log entries.
4. On the REST Synchronization Log page:
   a. Delete entries this number of days and older - Enter the number of days after which the log is purged.
   b. Click **Delete Entries**.

> **See Also**
>
> Managing Data Synchronization and Managing the REST Data Source Synchronization Log in *Oracle APEX App Builder User's Guide*

3.14.10 Deleting Automation Log Entries

Delete the Automation log entries.

To delete the Automation log entries:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Automation Log**.

   The Automation Log page appears displaying the current number of log entries.
4. Delete entries this number of days and older - Enter the number of days after which the log is purged.
5. Click **Delete Entries**.

> **Note**
>
> Managing Automations in *Oracle APEX App Builder User's Guide*

3.14.11 Viewing Install and Upgrade Logs

View a log of installation or upgrade phases and their corresponding metrics.

To view Install and Upgrade Logs:

1. Sign in to Administration Services.
2. Click **Manage Instance**.
3. Under Manage Logs and Files, click **Install / Upgrade Logs**.

   The Install / Upgrade Logs page appears displaying a report.
4. To view log details, click the **View** icon in the Details column.

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The Details report displays all actions and potential errors listed during a certain installation or upgrade phase.

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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.

- List of DBMS_SCHEDULER Jobs
  The following table describes DBMS_SCHEDULER jobs that are created in the database when you install Oracle APEX.

A.1 List of DBMS_SCHEDULER Jobs

The following table describes DBMS_SCHEDULER jobs that are created in the database when you install Oracle APEX.

Job Name	Description	To Learn More
ORACLE_APEX_AUTOMATIONS	Executes due automations every 2 minutes.	See Managing Automations in *Oracle APEX App Builder User's Guide*
ORACLE_APEX_BACKUP	Performs backups of applications that have been modified. Purges backups according to limit defined by the "Number of backups per application" instance setting. The backup job will be disabled when the setting is zero (0). The backup job runs every day starting at 0200.	See Configuring the Number of Application Backups
ORACLE_APEX_BG_PROCESSES	Kicks off background page process executions. Runs every 2 minutes for a duration of 1 minute and about 57 seconds	See Understanding Background Page Processing in *Oracle APEX App Builder User's Guide*
ORACLE_APEX_DICTIONARY_CACHE	This job runs nightly at 0100 to gather statistics and data analysis of all workspace schema tables and caches into the Oracle APEX Data Dictionary. If the Data Dictionary Cache is incorrect or out of date, you can update Data Dictionary Cache manually from the Workspace Cache report.	See Viewing or Refreshing the Data Dictionary Cache
ORACLE_APEX_DAILY_METRICS	Performs nightly maintenance, every day at 0100. This job archives the activity summary and runs the workspace purge process.	n/a
ORACLE_APEX_DAILY_MAINTENANCE	This job inserts the overall metrics at instance, workspace and schema level on a daily basis. Runs every day at 02:00 AM.	See Purging Inactive Workspaces in *Oracle APEX App Builder User's Guide*

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Job Name	Description	To Learn More
`ORACLE_APEX_DTLD${job-id}`	SQl Workshop data loading processes spawn jobs named `ORACLE_APEX_DTLD${job-id}`. Jobs are purged after completion. While the jobs are running, you can view them in Oracle APEX Administration Services under **Monitor Activity**, **Developer Activity**, **Data Loading Jobs**.	See Monitoring Activity Across an Instance and Using Data Workshop in *Oracle APEX SQL Workshop Guide*
`ORACLE_APEX_ISSUE_EMAILS`	Determines Team Development notifications that must be sent. This job runs every hour.	See Configuring the Number of Application Backups in *Oracle APEX App Builder User's Guide*
`ORACLE_APEX_MAIL_QUEUE`	Sends mail that is in the mail queue every 5 minutes.	See APEX_MAIL in *Oracle APEX API Reference*and Configuring Email
`ORACLE_APEX_PURGE_SESSIONS`	Purges sessions older than 12 hours (the default). This job runs every hour.	See Managing Session State for an Instance
`ORACLE_APEX_PWA_PUSH_QUEUE`	Sends Push Notifications every 2 minutes.	See Creating a Progressive Web App (PWA) in *Oracle APEX App Builder User's Guide*
`ORACLE_APEX_REST_SOURCE_SYNC`	Executes due REST Source Synchronizations every 10 minutes.	See Managing Data Synchronization in *Oracle APEX App Builder User's Guide*
`ORACLE_APEX_TASKS_EXPIRE`	Expires any task in the task instance table that is past the due date with an expiration policy set to Expire or Renew. Creates a new task for any task set to Renew, as long as the maximum number of renewals is not exceeded. Executes any Before Expire or Expire actions. This job runs hourly.	See Creating a Task Definition in *Oracle APEX App Builder User's Guide*.
`ORACLE_APEX_TASKS_PURGE`	Purges completed tasks with a retention period that is less than or equal to the current date. Purges errored, expired, and canceled tasks. Saves the purged task details as a JSON document. This job runs nightly at 0200 hours.	See About Task Retention and Task Purging in *Oracle APEX App Builder User's Guide* and Configuring Workflow Settings.
`ORACLE_APEX_WFS_PURGE`	Purges completed workflows with a retention period that is less than or equal to the current date. Purges terminated workflows. This job runs nightly at 0300 hours.	See Workflow Instance Retention in *Oracle APEX App Builder User's Guide*.
`ORACLE_APEX_WF_TIMEOUT`	Runs every 5 minutes to check for workflow activites for which the specified due date has elapsed, and performs timeout-handling for these activities.	See Defining Activity Timeout in *Oracle APEX App Builder User's Guide*.
`ORACLE_APEX_WS_NOTIFICATIONS`	Sends interactive report subscription that is in the queue every 30 minutes.	n/a

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