Oracle® APEX
Release Notes

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Oracle APEX Release Notes, Release 24.2

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Preface

Oracle APEX Release Notes contains important information not included in the Oracle APEX documentation.

- Audience
- Documentation Accessibility
- Diversity and Inclusion
- Related Documents
- Conventions

Audience

This document is intended for users who are focused on the changes between the prior release of Oracle APEX and this release.

Documentation Accessibility

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

Access to Oracle Support

Oracle customer access to and use of Oracle support services will be pursuant to the terms and conditions specified in their Oracle order for the applicable services.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

Related Documents

For more information, see these Oracle resources:

- *Oracle APEX Installation Guide*
- *Oracle APEX App Builder User's Guide*

- *Oracle APEX Administration Guide*
- *Oracle APEX SQL Workshop Guide*
- *Oracle APEX API Reference*
- *Oracle APEX Accessibility Guide*
- *Oracle APEX End 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.

1

About These Release Notes

These release notes contain important information not included in the Oracle APEX documentation.

- Before You Begin

1.1 Before You Begin

Review the following to ensure your readiness for this version of Oracle APEX.

- Oracle Database Requirements
- Browser Requirements
  Oracle APEX requires a JavaScript-enabled browser and supports the current and prior major release of Google Chrome, Mozilla Firefox, Apple Safari, and Microsoft Edge.
- Web Server Requirements
  Oracle APEX requires Oracle REST Data Services (ORDS) 23.3 or later.
- About Release Numbering Conventions
  New releases of Oracle APEX correlate to the calendar year.
- About Checking for the Most Current Release
- About Upgrading to the Latest Oracle APEX Release
- About Determining Your Release Version
- Important Information if Updating from a Release Prior to 24.2

1.1.1 Oracle Database Requirements

Oracle APEX release 24.2 requires an Oracle Database release 19*c* or later. APEX runs on all database editions, including Enterprise Edition (EE), Standard Edition (SE) and Database 23ai Free. APEX can be installed in single-instance database and in Oracle Real Application Clusters (Oracle RAC) database.

> **See Also:**
>
> Oracle APEX Installation Requirements in *Oracle APEX Installation Guide*

1.1.2 Browser Requirements

Oracle APEX requires a JavaScript-enabled browser and supports the current and prior major release of Google Chrome, Mozilla Firefox, Apple Safari, and Microsoft Edge.

1.1.3 Web Server Requirements

Oracle APEX requires Oracle REST Data Services (ORDS) 23.3 or later.

Oracle REST Data Services (ORDS) is Java-based web server. Oracle REST Data Services features the ability to emit RESTful web services, offers improved file upload capability, and is certified with Oracle WebLogic Server and Apache Tomcat.

> **Tip:**
>
> APEX-based REST Services were desupported in release 22.1. Oracle REST Data Services (ORDS) release 21.4.2 and newer now ship with migration scripts that enable you to upgrade any remaining APEX-based REST Services to ORDS-based Services. To learn more, see Migration of Oracle APEX RESTful Service Modules in Oracle REST Data Services Release Notes.

1.1.4 About Release Numbering Conventions

New releases of Oracle APEX correlate to the calendar year.

In 2018 and starting with release 18.1 and 18.2, APEX introduced correlating the release number to the calendar year.

In addition, APEX now only offers full releases and no longer provides patch set releases (such as 5.1.1). Eliminating patch set releases reduces downtime when updating existing installations. APEX architecture also enables developers to revert releases if necessary.

Patch set exceptions (PSEs) may still be delivered for major defects. To learn more about PSEs, visit the Oracle APEX 24.2 Known Issues page or the Prior Release Archives for earlier releases.

1.1.5 About Checking for the Most Current Release

Oracle APEX is released more frequently than the Oracle Database. To view information about or download a more current release, see:

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

1.1.6 About Upgrading to the Latest Oracle APEX Release

If you already have Oracle APEX installed, Oracle strongly recommends that you regularly upgrade to the latest version available.

To learn more, see Upgrading from a Previous Oracle APEX Release in the *Oracle APEX Installation Guide*.

- About Upgrading to the Latest Version of Universal Theme

1.1.6.1 About Upgrading to the Latest Version of Universal Theme

APEX supports the current and prior APEX version of Universal Theme for each release. For example, APEX 24.2 supports Universal Theme 24.2 and 24.1.

It is highly recommended users refresh Universal Theme within their applications after each APEX release. While refreshing Universal Theme is not mandatory and your application will continue to work, older versions of Universal Theme do not have support for new features or bug fixes introduced in subsequent APEX releases. Therefore, it is important to refresh your theme regularly so your applications are on the latest (or one version prior) release of Universal Theme and remain supported.

Universal Theme moved to CSS variables in APEX 21.1. This means refreshing Universal Theme is easier to customize and manage. For more on refreshing Universal Theme, see Refreshing the Universal Theme in *Oracle APEX App Builder User's Guide* and the Migration Guides on the Oracle APEX Universal Theme app.

For the Universal Theme Change Log, see the Oracle APEX Universal Theme app.

1.1.7 About Determining Your Release Version

To determine which release of Oracle APEX you are currently running, do one of the following:

- View the release number on the Workspace home page:
  - Sign in to APEX.

    The Workspace home page appears. The current release version displays in the bottom right corner.
- View the About APEX page:
  1. Sign in to APEX.

     The Workspace home page appears.
  2. Click the **Help** menu at the top of the page and select **About**.

     The About APEX page appears.

> **See Also:**
>
> About Accessing Your Development Environment in *Oracle APEX App Builder User's Guide*

1.1.8 Important Information if Updating from a Release Prior to 24.2

If you are updating from a previous release of Oracle APEX, see the Changed Behavior sections in the following documents:

- *Oracle APEX Release Notes* release 24.1
- *Oracle APEX Release Notes* release 23.2
- *Oracle APEX Release Notes* release 23.1
- *Oracle APEX Release Notes* release 22.2
- *Oracle APEX Release Notes* release 22.1
- *Oracle Application Express Release Notes* release 21.2
- *Oracle Application Express Release Notes* release 21.1
- *Oracle Application Express Release Notes* release 20.2

- *Oracle Application Express Release Notes* release 20.1
- *Oracle Application Express Release Notes* release 19.2
- *Oracle Application Express Release Notes* release 19.1
- *Oracle Application Express Release Notes* release 18.2
- *Oracle Application Express Release Notes* release 18.1
- *Oracle Application Express Release Notes* release 5.1
- *Oracle Application Express Release Notes* release 5.0

2

New Features

Oracle APEX release 24.2 includes a number of new features. These new features are not present in APEX release 24.1 and earlier releases.

- JSON Sources
- JSON Duality Views
- Vector Search
- REST Source Enhancements
- Workflow Enhancements
- Database Object Dependencies
- Shared Component Utilization Reports
- Support for Fusion Integration
- BOSS REST Service Support
- Document Generator Enhancements
- Dynamic Action: Generate Text with AI
- Create Custom Data Models Using AI
- AI Configurations and RAG Sources
- Control Breaks for Template Components
- Unlimited Attributes for Item Plug-ins
- Export App Enhancements
- Default RTL Direction Based on Language
- Builder Extension Auto-Subscribe
- Text Messages Enhancements
- New Substitution String
- Application User Experience Data (OpenTelemetry)
- Generative AI Configuration Screen Enhancements
- Improved Content-Security-Policy Support
- Improved Popup LOV Functionality
- Accessibility Improvements
- Theme Metadata Decoupled from Application Metadata
- Select Many Improvements
- Universal Theme Enhancements
- PL/SQL API Updates
- JavaScript API Updates
- JavaScript Library Upgrades

2.1 JSON Sources

JSON Sources in APEX consist of information about the owner and name of a database table. You can use a plain table with columns containing JSON data or a JSON collection table. After picking the table and column to use, APEX either determines the data profile from the actual data or uses an uploaded JSON Schema file.

JSON Sources are available to page components, including reports, charts, and forms, and shared components, including lists of values and automations. For more on using JSON Sources, see Managing JSON Sources in *Oracle APEX App Builder User's Guide*.

JSON Sources are available on Oracle Database 19c and later.

2.2 JSON Duality Views

JSON-relational duality underpins collections of documents with relational storage: active, updatable, hierarchical documents based on a foundation of normalized relations. You can define a duality view using a local database or a REST Enabled SQL reference. After selecting a duality view, Oracle APEX retrieves a JSON schema from the database and builds a data profile. The data profile maps JSON attributes to columns with data types that APEX components can consume.

Duality views are available to page components, including reports, charts, and forms, and shared components, including lists of values and automations. For more on using Duality Views, see Managing Duality Views in *Oracle APEX App Builder User's Guide*.

Duality Views are available on Oracle Database 23ai or later.

2.3 Vector Search

Vector Search is now available for APEX instances running on Oracle Database 23ai. Create a Search Configuration on top of a table with columns of the `VECTOR` data type, and configure details including index usage, distance metrics, maximum vector distance, or maximum results. APEX returns search results in order of vector similarity.

To configure **Oracle Vector Search**, you must set up a **Vector Provider** to convert search expressions into vectors. Vector Providers are configured at the workspace level, and available in all applications. For more information, see Managing Vector Providers in *Oracle APEX App Builder User's Guide*.

2.4 REST Source Enhancements

Support for Token-Based Pagination in Simple HTTP REST Data Sources

The **Simple HTTP** REST Data Source type now supports REST services with token-based pagination, enhancing integration with APIs that use this pagination scheme.

Flexible Remote Servers

When editing a remote server, you can now use placeholders (for example, `#tenant#`) within the endpoint URL as well as within other attributes. At runtime, APEX can derive the placeholder values as well as the Base URL of a Remote Server object (used for REST Data Sources, REST Enabled SQL, and Authentication) dynamically with a PL/SQL **Configuration**

Procedure. This allows APEX to invoke the endpoints dynamically based on the current application, tenant, or environment settings.

For more information on flexible remote servers, see About Flexible Remote Servers in *Oracle APEX App Builder User's Guide*.

2.5 Workflow Enhancements

New Activity: Invoke Workflow

Use the new **Invoke Workflow** activity to invoke another workflow from a parent workflow.

You can now specify workflow parameter directions as **In**, **Out**, or **In/Out**. **Out** parameters can only be set when the workflow is used in the Invoke Workflow activity of another workflow. **Out** parameters do not show up when the workflow is used in a page process.

When adding or updating a workflow parameter, the component parameters in the workflow page process are automatically synchronized to reflect the changes. The **Synchronize Parameters** menu option from the Page Process is removed because the synchronization now happens automatically.

For existing workflows, you can regenerate the Workflow Details page from the Create Page wizard so that the **To Parent Workflow** button appears in the details of the invoked workflow.

CLOB Support for Variables and Parameters

Workflow parameters and workflow variables now support `CLOB` data types.

When a CLOB is displayed on the workflow details page, only the section of the CLOB that is accommodated within the `VARCHAR2` limit for SQL displays.

If the value of the CLOB exceeds the `VARCHAR2` limit, use `apex_workflow.update_variables` to update the variable instead of using the workflow details page.

Copy Workflow from Other Application

You can now copy a workflow from another application using **Copy From Other App** in **Shared Components**, **Workflows and Automations**.

When you copy a workflow, you also copy:

- the workflow versions, parameters, activities, participants, and variables
- other shared components referenced in the workflow, including email templates, tasks, and REST sources
- all invoked workflows, if they are not already present in the current application

Resume Workflow at Any Activity

Suspended workflows can now resume at any activity by using the API `APEX_WORKFLOW.RESUME`. For more information on how to configure this, including an example of how to expose relevant information in the workflow detail page, see Resuming Suspended Workflows in *Oracle APEX App Builder User's Guide*.

Support for Workflow and Human Task Runtime Instance Export

You can now export workflow and human task runtime instances when exporting an application. You can use this functionality to move instance data from one environment to

another. For more information, see APEX_EXPORT.GET_APPLICATION Function in *Oracle APEX API Reference*.

2.6 Database Object Dependencies

The new **Database Object Dependencies** report makes it easy to scan and report database object dependencies for applications in your workspace. Scan the whole application at once or one page at a time to view the dependencies, including:

- tables and table columns
- views
- packages, procedures, and functions
- links to the component property of each dependency
- system dependencies, including references to Oracle Database APIs and APEX Views

The report also contains a section for **System Dependencies**, including references to Oracle Database APIs and APEX Views. You can use the report to review application code that references any selected database object.

The new **Database Object Dependencies** report improves the `APEX_APP_OBJECT_DEPENDENCY` API introduced in APEX 24.1 with bug fixes and performance improvements. The **Database Object Dependencies** report can now detect dependencies from:

- SQL expressions in report columns
- REST Service queries (`#APEX$SOURCE_DATA#`)
- Data Profile SQL expressions

For more information on the Database Object Dependencies report, see Viewing Database Object Dependencies in *Oracle APEX App Builder User's Guide*.

2.7 Shared Component Utilization Reports

Shared Component utilization reports for Task Definitions, Email Templates, and REST Data Sources are now enhanced to show usage of workflows and tasks.

2.8 Support for Fusion Integration

You can now create an application from the Create Application Wizard with pre-configured integrations to Oracle Fusion Applications. This automates the manual steps previously necessary to set up federated authentication and identity propagation between APEX and Fusion.

Select **Create Fusion Integration** in the Create Application Wizard to create:

- a starter application
- a Remote Server, pre-configured to reference the base URL of your Fusion REST API endpoints
- a Web Credential for the Authentication Scheme and the sample REST Data Source
- a pre-configured Authentication Scheme
- a sample REST Data Source

For more information, see Integrating APEX with Fusion Applications in *Oracle APEX App Builder User's Guide*. You must have an OCI Database Tools Connection configured in order to see the **Create Fusion Integration** option.

2.9 BOSS REST Service Support

You can now easily use Fusion Apps REST APIs with URLs that contain `/api/boss` in any APEX region:

- Discover all supported operations and attributes during REST Data Source creation.
- Automatically delegate filtering and sorting to the BOSS service API.
- Optimize performance by only retrieving and sending attributes the current region uses.
- Work programmatically with BOSS endpoints using `APEX_EXEC`.

For more information on BOSS REST Service Support, see About Oracle Cloud Applications BOSS REST Services in *Oracle APEX App Builder User's Guide*.

2.10 Document Generator Enhancements

When **Document Generator** is configured as print server, you can now also upload XLSX files. **Document Generator** now supports these additional output types:

- DOCX to DOCX
- XLSX to PDF
- XLSX to XLSX

2.11 Dynamic Action: Generate Text with AI

You can now use the Dynamic Action **Generate Text With AI** to call the configured Generative AI Service and generate a one-time response based on user content. This action is ideal for tasks like summarizing or translating text, extracting keywords, or drafting emails. For more information on using this dynamic action, see Creating a Dynamic Action to Generate Text with AI in *Oracle APEX App Builder User's Guide*.

2.12 Create Custom Data Models Using AI

A new SQL Workshop utility, **Create Data Model using AI**, uses AI to help you create your own schemas. The APEX Assistant generates a script to create tables, triggers, and constraints in either Oracle SQL or Quick SQL.

Before you can use this feature, you must create a Generative AI Service and enable the **Used by App Builder** setting. For more information, see Creating a Data Model Using AI in *Oracle APEX SQL Workshop Guide*.

2.13 AI Configurations and RAG Sources

AI Configuration is a reusable component that centralizes key Generative AI settings, including System Prompt, Welcome Message, and RAG (Retrieval-Augmented Generation) Sources, for use across AI-enabled features in APEX.

With this release, RAG Sources allow applications to dynamically add relevant data to AI responses, with flexible conditions to control inclusion based on user prompts or security

settings. See Managing AI Configurations and RAG Sources in *Oracle APEX App Builder User's Guide*.

2.14 Control Breaks for Template Components

APEX now supports **control breaks** (grouping) for Template Component Reports. You can configure groups declaratively for Template Component Report Regions in Page Designer.

APEX also supports grouping for:

- the `APEX_EXEC` API
- Content Row template components

2.15 Unlimited Attributes for Item Plug-ins

In APEX 24.1, the custom attribute limit for Region plug-ins was lifted. In 24.2, this is extended to Item plug-ins as well. New item plug-ins automatically have unlimited attributes.

Modifying Existing Plug-ins

To modify existing plug-ins to have unlimited attributes:

1. Edit your item plug-in and set the **API Interface** attribute to `Procedure`.
2. Update your custom attributes:

```
-- old
l_my_attribute varchar2(32767) := p_item.attribute_01;
l_my_number    number          := p_item.attribute_02;
l_my_boolean   boolean         := p_item.attribute_03 = Y;

-- new
l_my_attribute varchar2(32767) :=
p_item.attributes.get_varchar2( 'attribute_01');
l_my_number    number          := p_item.attributes.get_number
( 'attribute_02');
l_my_boolean   boolean         := p_item.attributes.get_boolean
( 'attribute_03', true);
```

3. The **Substitute Attribute Values** switch is deprecated. When you move to the Procedure interface, this switch disappears. To perform substitutions on the attribute values, use new parameters in the `get_varchar2` function:
   - `p_do_substitutions`
   - `p_do_serveronly_substitutions`
   - `p_substitution_escape_mode`

```
procedure render (
    p_item   in            apex_plugin.t_item,
    p_plugin in            apex_plugin.t_plugin,
    p_param  in            apex_plugin.t_item_render_param,
    p_result in out nocopy apex_plugin.t_item_render_result )
as
    -- Old
    l_my_attribute varchar2(32767) := p_item.attribute_01;
```

```
    -- NEW
    l_my_attribute varchar2(32767) := p_item.attributes.get_varchar2 (
                                      p_static_id                =>
'my_static_id',
                                      p_do_substitution          => true,
                                      p_substitution_escape_mode =>
apex_session_state.c_escape_mode_html );
begin
...
...
end;
```

When upgrading to APEX 24.2, custom attributes receive the new Static ID when migrated. For example, an attribute with sequence 1 gets the ID "`attribute_01`", an attribute with sequence 2 gets ID "`attribute_02`", and so on. This simplifies your code migration.

Creating New Attributes

For new attributes created after moving to APEX 24.2, use whatever Static ID you wish. We recommend keeping the Static ID short, lowercase, and descriptive of the purpose. For example, "`css_classes`", "`page_item_name`", or "`plsql_code`".

The new **attributes** construct is also available for `t_plugin` in order to read application-scope attributes.

Public Dictionary Views

Public dictionary views are changed. Querying item plug-in attributes is now done by reading the attribute's JSON column.

```
select
i.attributes.my_static_id
  from apex_application_page_items
i
 where ...
```

This also applies when reading application-scope and Interactive Grid column attributes, Faceted Search filters, and Smart Filters filters.

2.16 Export App Enhancements

When you export a translated application, APEX checks the application to ensure that the translations are in sync. If the translations are out of sync, a warning message displays on the Application Export Page.

Select **View Application Translations** to check the translations for the application, and update them as needed. For more on translating applications, see Translating Messages in *Oracle APEX App Builder User's Guide*.

2.17 Default RTL Direction Based on Language

The **Document Direction** attribute on the Application Globalization page and Translation Language Mappings page now defaults to `Language Default` instead of `left-to-right`. When an application set to `Language Default` runs, the direction is now derived from the language.

There is no change of functionality for existing applications.

2.18 Builder Extension Auto-Subscribe

Instance Administrators can now configure the **Allow Hosting Extensions** option to allow **Automatic Subscription**. When a workspace is set up for automatic subscription, APEX automatically publishes all extensions and extension menu entries to all other workspaces in the instance. Individual workspaces no longer have to subscribe and grant read access to extensions manually.

2.19 Text Messages Enhancements

Comments and Metadata

The **Create/Edit Text Message** dialog now includes **Comments** and **Metadata**.

Use the **Comments** text area field to capture developer comments associated with a specific text message.

Use the **Metadata** region to capture any additional data for the text message, including:

- structured attributes that provide JSON name/value pairs to identify details about the text message related to an external central string repository
- unstructured data that provides further context to the text message to assist with translation

The **Metadata** region is a Collapsible region that only displays if metadata has been loaded via the PL/SQL API. Otherwise, the region is not visible.

Display Text Message Values

In Page Designer, the new **Text Messages Picker** (Page Designer, Utilities, Show) controls the visibility of the Text Messages dialog buttons (globe icon). If enabled, this button opens a Text Messages dialog that lists all available Text Messages in the current application.

When a text message is used in these properties, APEX displays a preview of the content below the input field.

The available text messages also display in the Suggestion box after typing `&{` in Code Editor.

This functionality requires the compatibility mode of the application to be set to **24.2** or higher.

2.20 New Substitution String

The new substitution string **`MAIN_APP_ID`** identifies the main application ID if the current application is a working copy. Otherwise, it shows the current application ID.

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

2.21 Application User Experience Data (OpenTelemetry)

You can now use **OpenTelemetry** for collecting user experience data, including page load times and user interactions. Configure OpenTelemetry through Workspace Utilities, and then add it to specific applications to make it easier to monitor and analyze how users engage with your app.

OpenTelemetry requires the latest version of Universal Theme.

2.22 Generative AI Configuration Screen Enhancements

The **Generative AI Service Details** page in Workspace Utilities now includes a **Test Connection** button that validates the information used for creating a Generative AI service connection. **Test Connection** performs a pre-validation of configuration parameters such as API keys, URLs, and model identifiers depending on the provider used. By running this check, you can quickly identify and edit any missing or incorrect fields before proceeding.

For more information, see Creating a Generative AI Service Object in *Oracle APEX App Builder User's Guide*.

2.23 Improved Content-Security-Policy Support

The APEX runtime engine adheres more strictly to Content-Security-Policy (CSP) standards by minimizing the use of unsafe-inline directives:

- Inline JavaScript: Inline event handlers are moved to external JavaScript files wherever possible. When not feasible, they are securely emitted using a unique identifier called a **nonce**.
- Inline CSS: Inline styles are now either moved to external CSS files, replaced with placeholder strings, or securely emitted using a nonce.
- Style Tags: `<style>` tags are securely emitted using a nonce.
- Script Tags: `<script>` tags are securely emitted using a nonce.

These changes enhance security by reducing risks associated with inline code.

For more information on configuring CSP in APEX, see Configuring Content Security Policy (CSP) in *Oracle APEX Administration Guide*.

2.24 Improved Popup LOV Functionality

The appearance and behavior of Popup LOVs is now similar to searchable LOV items such as Select One, Select Many, and Combobox. This creates a unified and intuitive user experience when searching.

Popup LOVs have a new attribute **Match Type**, which you can set to **Contains** (default) or **Starts With**. There is also a control for **Case-Sensitive Search**.

2.25 Accessibility Improvements

Workflow Designer Keyboard Improvement

When navigating through Workflow Designer using keyboard shortcuts, the diagram viewport now follows the keyboard focus. It is no longer possible for the focused node to be outside the diagram viewport.

2.26 Theme Metadata Decoupled from Application Metadata

Starting with Universal Theme 24.2, theme metadata (templates, theme styles, template components, etc.) is now stored in a central workspace, decoupled from applications. This improves performance with faster application export/import, smaller file sizes, and optimized storage in version control systems.

Related updates include:

- The Refresh Theme button is now on the Application Home Page for better visibility.
- Outdated APEX Builder pages related to theme management have been updated or removed, simplifying the interface.
- Active theme style selection has moved from the theme style level to the theme level.

> **Important:**
>
> If your app uses translations, republish them after refreshing your theme, or translations will not work.

2.27 Select Many Improvements

If you set **Display Values As** to **Comma-separated List**. there is now a counter icon on the item that displays the current number of selected values. Clicking on the counter opens the dropdown, displaying only the selected values.

2.28 Universal Theme Enhancements

Font APEX 2.4

Font APEX now includes 244 country flag icons to easily display flags within your APEX application. Display the new icons with `.fa-flag-##`, where `##` is the country code.

See Accessing Font APEX in the *Oracle APEX App Builder User's Guide*.

Password Item Enhancements

Password type page items now include a **Show Password** button. Users can select **Show Password** to reveal the entered password, and select **Hide Password** to conceal the password again.

This button is enabled by default for all application using Universal Theme 24.2 and later. To disable this button, edit the template options for the **Password** item, and select **Hide Password Visibility**.

Other Changes

Other changes for Universal Theme 24.2 include:

- new utility classes for Typography, Shadows, Flex Order, and Padding/Margin
- support for grouping in Content Row (title and icon)
- display for multiple Avatars in the Avatar Template Component
- better support for mobile browsers with dynamic toolbars
- miscellaneous updates to Redwood Light, including adjustment of page padding to be consistent with Vita

2.29 PL/SQL API Updates

APEX_APPLICATION_ADMIN

The new procedure `APEX_APPLICATION_ADMIN.SET_REMOTE_SERVER` changes the base URL of a Remote Server object after deployment of an application.

APEX_CREDENTIAL

The `APEX_CREDENTIAL` API is extended with a new procedure: `SET_SCOPE`. This procedure programmatically changes the "scope" attribute of a web credential.

APEX_LANG

The existing procedure `CREATE_MESSAGE` is enhanced with two new parameters:

- `p_comment`, for developer comments or notes only visible in the App Builder
- `p_metadata`, for additional data stored alongside the message

A new procedure, `UPDATE_MESSAGE`, can update all attributes of a text message.

APEX_PAGE

The `GET_URL` procedure has a new boolean parameter: `p_absolute_url`. When set to `FALSE`, the function determines whether an absolute URL is needed. When set to `TRUE`, the function always generates an absolute URL.

APEX_REGION

Many APEX API functions take `p_region_id` as an input. The new function `GET_ID` retrieves the region id from the APEX dictionary views.

APEX_SHARED_COMPONENT

The new `APEX_SHARED_COMPONENT` package contains two APIs for working with shared components: `REFRESH` and `PUBLISH`. This package is only available in full APEX installations, and does not apply to theme refresh and publish.

2.30 JavaScript API Updates

New and Updated APIs

This release contains new and updated APIs:

- New `apex.message` namespace functions:
  - `ariaAlertMessage`
  - `ariaMessage`
- New `actions` interface `action` property `convertBindingArguments`.
- New syntax for text messages added to `apex.util.applyTemplate`. This syntax requires compatibility mode 24.2.
- Interface `region refresh` method documents `pKeepPagination` parameter used by some regions.
- Widget `interactiveGrid` now documents the `text` option including new property `noParentSelected`.
- Changes to `facetsRegion` interface for new Faceted Search Add Filter feature:
  - Removed control property `displayed` and replaced it with new property `displayAs`.
  - Methods `addChart`, `hideFacet`, and `showFacet` only work when `displayAs` is "INLINE".
- Changes related to reports based on `grid` or `tableModelView` widgets not clearing old content while fetching new content:
  - New `model` option `delayClearData` added to `apex.model.create`, which can also be set by `model` method `setOption`.
  - The `check` and `clearData` methods describe the new behavior related to `delayClearData`.
  - Interface `model refresh` notification has new `changes` property `clearDataPending`.
  - Interface `model` method `forEachInPage pCallback` function can receive a false value for the `pError` parameter.
- Changes related to nested markup for control breaks
  - New `model` interface methods `getControlBreakId` and `hasControlBreaks`.
  - Interface `model` method `insertNewRecord` now initializes control break fields.
  - New `model FieldMeta` property `controlBreakIndex`.
  - Interface `model` method `setSelectionState` has a new value for `pAction` parameter.
  - Widget `tableModelView` adds options `controlBreakAfterTemplate`, `controlBreakBeforeTemplate`, and `controlBreakSelector`. Option `controlBreakTemplate` has new substitutions and now requires setting the `controlBreakSelector` option.
  - Widget `tableModelView` methods `getCurrentItem`, `getCurrentItemValue`, `setCurrentItem` apply when focus is on a group heading.

Updated Descriptions, Examples, or Typos Fixed

This release includes various improvements to descriptions and examples.

2.31 JavaScript Library Upgrades

- @opentelemetry/api 1.9.0
- @opentelemetry/core 1.26.0

- @opentelemetry/instrumentation 0.53.0
- @opentelemetry/instrumentation-document-load 0.39.0
- @opentelemetry/instrumentation-fetch 0.53.0
- @opentelemetry/instrumentation-xml-http-request 0.53.0
- @opentelemetry/sdk-trace-base 1.26.0
- @opentelemetry/sdk-trace-web 1.26.0
- Cohere API Spec 7.9.5
- cropperjs 1.6.2
- DomPurify 3.1.6
- FullCalendar 6.1.15
- JavaScript Extension Toolkit (JET) 17.0.2
- jquery-migrate 3.5.2
- mapbox-gl-rtl-text 0.3.0
- MapLibre GL 4.6.0
- Marked 14.1.0
- Monaco Editor 0.51.0
- OpenAI Open AI Spec 2.0.0
- Oracle Rich Text Library (ORTL) 2.0.1
- Pako 2.1.0
- Terser 5.31.3
- Turndown 7.2.0

3
Changed Behavior

Some existing behaviour changes in this release.

- Theme Style Selection
- Unified Task List and Workflow Console Compatibility Mode
- Improved Search Input Field on Search Pages
- Improved Map Labels
- Change to Interactive Grid Report Display During Refresh
- Page Import Changes
- Changes to Modal Dialog Page URLs
- Refresh Dynamic Action Changes
- Shared Component Navigation Changes
- Changes to Public Dictionary Views
- Control Break Customization (tableModelView)
- Changes to Faceted Search Arbitrary Filters
- Show AI Assistant Dynamic Action
- Edit List Simplified
- Text Message Substitution Strings
- Column Toggle Report, List View, and Reflow Report now Legacy
- App Builder UI Changes
- Compatibility Mode
- Enabling Network Services in Oracle Database
  Database administrators must enable network services in Oracle Database to send outbound mail, invoke web services, or use template-based PDF report printing with external print servers in Oracle APEX.

3.1 Theme Style Selection

In APEX Builder under **Shared Components**, **User Interface Attributes**, the option **Enable End Users to Choose Theme Style** lets users select from the available theme styles by using **Customize** in the runtime app footer.

Starting with APEX 24.2, if your app subscribes to Universal Theme 24.2, you can no longer use the **Public** flag to control the visibility of Oracle-provided theme styles like Vita and Redwood Light. This is because Oracle-provided theme styles now belong to a centralized Universal Theme repository, not the current application. This change does not affect custom theme styles.

3.2 Unified Task List and Workflow Console Compatibility Mode

The **Unified Task List** and **Workflow Console** pages now use enhanced substitution strings. In order for APEX to create these pages, compatibility mode must be set to 24.2 or higher.

3.3 Improved Search Input Field on Search Pages

The default behavior for new search pages created by the Create Page Wizard is improved.

The **search field** now has:

- a larger input field (`xlarge` instead of `large`)
- item `css class` set to `mxw80 t-Form-fieldContainer--noPadding`
- text placeholder set to `Search...`

The **search region** now has:

- a default **no query entered** message (`Please enter your search term.`)
- a default **no results found** message (`No results for your search term.`)

3.4 Improved Map Labels

Right-to-left (RTL) language labels now display correctly on Map Regions.

3.5 Change to Interactive Grid Report Display During Refresh

Previously, Interactive Grid would clear the report during any kind of refresh, including when the sort or filter changed. Now, Interactive Grid displays the previous report until the new results arrive. The progress indicator behaves the same, but data loading now appears smoother.

To restore the previous behavior, add the below code to the region **Initialization JavaScript Function** attribute:

```
function( config ) {
    config.defaultModelOptions = {
        delayClearData: false
    };
    return config;
}
```

3.6 Page Import Changes

You can now import a page into a different application or workspace without needing to use the command line. This allows more efficient page-level imports through the App Builder interface, streamlining the import process.

3.7 Changes to Modal Dialog Page URLs

APEX no longer generates `javascript:` URLs for modal dialog pages. This improves the support for Content-Security-Policy settings. This change could impact your applications when you:

- manipulate the URL in the browser using JavaScript
- rely on the URL being a JavaScript function in your code

An example of custom code that no longer works is a button with an `onclick` attribute to open a modal dialog page. You should search for `onclick=` in your code:

```
<button onclick="dialog_url">Click here</button>
```

A workaround is to use the `data-action` attribute of the button:

```
<button data-action="dialog_url">Click here</button>
```

There is a new way to open modal dialog pages using JavaScript in the browser. You can use `apex.navigation.dialog`. The URL can be the return value of `APEX_PAGE.GET_URL`, even for dialog pages. For example:

```
apex.navigation.dialog(
     apex.items.P1_DIALOG_URL.value,
     {
        height:'480',
        width:'800',
     } );
```

The `p_triggering_element` parameter of the `apex_util.prepare_url` and `apex_page.get_url` APIs can no longer be a JavaScript expression. The value now must be a string selector.

For example, use `#STATIC_ID` instead of `$('#STATIC_ID')`.

```
select apex_page.get_url(
           p_application        => 100,
           p_page               => 2, -- a modal dialog page
           p_triggering_element => '#STATIC_ID' ) as url
  from dual;
```

3.8 Refresh Dynamic Action Changes

The **Refresh** dynamic action now features a **Maintain Pagination** switch. If the switch is `On`, pagination and scroll position for reports is maintained on refresh.

This switch is currently only supported for Interactive Reports.

3.9 Shared Component Navigation Changes

Some Shared Components are now located under different headings:

- **Map Backgrounds** moves from **Other Components** to **User Interface**
- **Data Load Definitions** moves from **Data Sources** to **Other Components**
- **REST Enabled SQL Databases** moves from **Data Sources** to *Workspace Objects*
- **REST Synchronizations** moves from **Data Sources** to *Tasks*

Generative AI features move to the **Generative AI** section:

- **AI Attributes**
- **AI Configurations**
- **AI Services**

3.10 Changes to Public Dictionary Views

In the following public dictionary views, the columns attribute_01...25 now return null:

- `apex_application_page_items`
- `apex_appl_page_ig_columns`
- `apex_appl_page_filters`
- `apex_appl_plugin_settings`

Use the JSON attributes column instead.

3.11 Control Break Customization (`tableModelView`)

Any custom code that used the `tableModelView` widget `controlBreakTemplate` option to implement control breaks now requires changes:

- add the new `controlBreakSelector` option
- add the `model` FieldMeta property `controlBreakIndex` to all break columns
- use the new #APEX$GROUP_IDENTIFICATION# placeholder

See the JavaScript API documentation for full details.

3.12 Changes to Faceted Search Arbitrary Filters

The **Display Toggling** property is no longer part of faceted search. Instead, use the new **Display** property, and select whether facets are displayed **Inline**, or in an **Add Filter Dialog**. If you select **Add Filter Dialog**, the facets display in a modal dialog page.

You can right-click **Facets** in Page Designer to **Synchronize Facets** and quickly add new facets to existing regions.

3.13 Show AI Assistant Dynamic Action

The "Show AI Assistant" dynamic action's JavaScript Code attribute, used for custom processing of the assistant's responses, now binds the value of the response differently. Previously, the response was available simply as "`this`". Now, the response should be accessed as "`this.data.response`".

3.14 Edit List Simplified

In **Shared Components**, **Lists**, **Edit List**, the List Entries now display as an Interactive Report. To edit a list entry, you must select the **List Entry Name** to go to the Edit List Entry page.

To use an Interactive Grid to edit list entries, select **Grid Edit** from the Tasks list when editing a list.

3.15 Text Message Substitution Strings

To reference text messages, you can now wrap the message name in curly brackets. For example, to reference text message `TEXT.MSG`, you can use `&{TEXT.MSG}`. Text message substitution also supports parameters. Before the closing bracket, add `name=value` pairs, separated by white space.

This syntax is only available if the application's Compatibility Mode is set to 24.2 or higher. For more information, see Substitutions in Text Messages (24.2 or later) in *Oracle APEX App Builder User's Guide*.

3.16 Column Toggle Report, List View, and Reflow Report now Legacy

The Column Toggle Report, List View, and Reflow Report are now marked Legacy.

3.17 App Builder UI Changes

Changes to the application builder user interface for this release include:

- The dynamic action **Open AI Assistant** is renamed to **Show AI Assistant**.
- Modal dialog pages can now be declaratively set as **Resizable**.
- Application ID, Page ID, and Page Name are now displayed in Page Designer.
- The Page Number field now supports up to eight characters.
- For Popup LOVs, the **Search as You Type** attribute is now named **Fetch on Search**. The **Minimum Characters** field is now moved to the **Search** subarea.

3.18 Compatibility Mode

The application attribute **Compatibility Mode** controls the compatibility mode of the APEX runtime engine. Certain runtime behaviors change from release to release. You can use the Compatibility Mode attribute to obtain specific application behavior. This section lists Compatibility Mode changes by release. Note that all mode changes are inclusive in that all changes in older releases are included in newer releases.

Compatibility Mode Changes in Mode 4.1

In Oracle Application Express release 4.1, Automatic DML forms raised an error when rendering the page if the column name of the source of an item was invalid. Prior to Oracle

Application Express release 4.1, an invalid column name of the source of an item would not raise an error when rendering the page but it would also not set session state of the item.

Also, in Oracle Application Express release 4.1, there are two new application Security Attributes to control Browser Security: **Cache** and **Embed in Frames**. Enabling the Cache attribute enables the browser to save the contents of your application's pages in its cache, both in memory and on disk. The Embed in Frames attribute controls if the browser displays your application's pages within a frame. Applications running in a Pre-4.1 Compatibility Mode function as if the Cache is enabled and as if Embed in Frames is set to allowed. Applications running in Compatibility Mode **4.1** or later respect the specific Browser Security attributes.

Also, in Oracle Application Express release 4.1, because of bug 12990445, the following changes were implemented for Automatic Row Processing (DML) process types. The code which performs the INSERT was changed to determine if the columns should be included in the INSERT statement. Note that these are the same checks which occur before an UPDATE. These new checks include:

- Is the source type a DB Column?
- Is the page item contained in the POST request? For example, if the page item is conditional it will not be contained in the POST request if the condition evaluates to FALSE during page rendering.
- Is the page item not of type Display Only where Save State is set to No?

To enable these behaviors, set the Compatibility Mode to **4.1** or later. For behavior that matches earlier releases, set the Compatibility Mode to **Pre-4.1**.

Compatibility Mode Changes in Mode 4.2

In Oracle Application Express release 4.2 due to changes for the new grid layout, when a page is rendered, all regions in a certain display point are evaluated before rendering that display point, to find out if they should be displayed or not (so that the grid layout knows how many columns to render). The regions where the evaluation returned true will be executed and displayed. However, this will not work if a PL/SQL based region sets session state which is then used in a subsequent region condition to determine if the region should be displayed. In that scenario, the condition has already been checked before the display point is rendered. Use computations or PL/SQL processes to set session state before any region is displayed. In previous versions, the condition was evaluated right before each region was displayed.

In Oracle Application Express release 4.2, computations and processes with a processing point Before Region(s) do now fire before any region gets rendered. Computations and processes with a processing point After Region(s) fire after all regions have been rendered. In previous versions, the computations and processes fired just before and after the region display point Page Template Body (1-3).

Oracle Application Express Patch Set 4.2.2 added two new Compatibility Mode changes for Compatibility Mode **4.2**:

- Text areas were changed to always use the Maximum Width attribute to restrict text input.
- Enhanced security for report column links, where the link contains both JavaScript and references to other report column substitutions, for example:

  ```
  javascript:alert( 'Delete #NAME#' );
  ```

  In the previous example, *NAME* is a column name in the report.

Prior to Oracle Application Express release 4.2.1, to protect against possible cross-site scripting vulnerabilities, you would have had to explicitly escape any column values in the

report source, so that they could safely be used in JavaScript links. When running in Compatibility Mode **4.2**, Oracle Application Express automatically JavaScript escapes column name substitutions referenced in JavaScript links if the column is defined to escape special characters.

To fix this, Oracle recommends that you remove the manual JavaScript escaping from your report source and use of the native escaping.

Compatibility Mode Changes in Mode 5.0

In Oracle Application Express release 5.0, referencing a Static Application File with `#WORKSPACE_IMAGES#` no longer returns the application file. Instead, use `#APP_IMAGES#`.

The API calls to `wwv_flow_custom_auth_std.logout`, `wwv_flow_custom_auth_std.logout_then_go_to_page`, `wwv_flow_custom_auth_std.logout_then_go_to_url`, and `apex_custom_auth.logout` are desupported and will raise a runtime error instead of logging out from the Oracle Application Express session. Instead, use the `apex_authentication.logout` entry point.
Prior to release 5.0, developers using data upload did not have the option to choose a date format. Instead, a parser checked for the best format to match the user's entry or an end user could enter their own format. Oracle Application Express release 5.0 includes a new item that enables the user to choose an application date format or user entered format. Because applications created before release 5.0 do not have an item, a Compatibility Mode of **5.0** checks if the user has entered some data. If no data has been entered, it picks the application date format.

When a session timeout occurs and no timeout URL is specified, Oracle Application Express raises an error instead of redirecting to the application's home page. If the session setup for an Ajax requests fails, Oracle Application Express also raises an error. For Ajax requests that expect JSON, the response is a JSON string with members that describe the error. For other requests, the error appears on an error page.

Page items based on a database column where the attribute Source Used is set to **Only when current value in session state is null** will raise an error when the page item gets rendered. Using this setting for a database column is very dangerous and can result in accidentally overwriting data when viewing and saving multiple records. Always set the Source Used attribute to **Always, replacing any existing value in session state**.

Compatibility Mode Changes in Mode 5.1 / 18.1 / 18.2

In Oracle Application Express 18.1, buttons where the Execute Validations attribute is set to **Yes** also perform some client-side validations (such as item required checks) and will not submit the page until all issues are fixed. In previous versions this flag was just used to determine if server-side validations should be executed.

> **Tip:**
>
> Please pay attention when changing the Compatibility Mode to 5.1/18.1/18.2. Buttons, such as Cancel or Previous, where the Execute Validation flag has incorrectly been set to **Yes** and which use an After Submit branch, never execute validations when the user clicks the button. You can address this issue by using the new client-side validations, or by setting Execute Validations to **No**.

In release 5.1, any Ajax-based Dynamic Actions where the "Wait for Result" attribute is set to `Yes` perform an asynchronous Ajax call. Prior to 5.1, such calls would be made synchronously.

Compatibility Mode Changes in Mode 19.1

In Oracle Application Express 19.1, the Rich Text editor now enforces validation of the `Max Length` item attribute. When the length of the HTML markup exceeds the `Max Length` value, the system produces an error message.

Compatibility Mode Changes in Mode 19.2 / 20.1 / 20.2 / 21.1

In Oracle Application Express 19.2, Classic Reports render empty column values as an empty cell instead of using a "non-breaking white-space" (` `).

Compatibility Mode Changes in Mode 21.2 to 24.1

Prior to Oracle Application Express 21.2, all processes of the current processing point have been executed regardless of the added errors.

In Oracle Application Express 21.2, calling `APEX_ERROR.ADD_ERROR` in a process stops further processes from executing and immediately displays the inline errors.

Compatibility Mode Changes in Mode 24.2

Starting with release 24.2, APEX supports an extended substitution syntax for text messages: `&{TEXT.MESSAGE}`.

3.19 Enabling Network Services in Oracle Database

Database administrators must enable network services in Oracle Database to send outbound mail, invoke web services, or use template-based PDF report printing with external print servers in Oracle APEX.

To learn more, see Enabling Network Services in Oracle Database in *Oracle APEX Installation Guide*.

> **Note:**
>
> Enabling network services does not apply to APEX instances running on Oracle Autonomous Database. APEX can communicate with external endpoints over the internet without additional configuration.

- When and Why Network Services Must be Enabled
  Enabling network services enables support for sending outbound mail in Oracle APEX, using REST Services, REST Enabled SQL, or other web services, and using a remote server for report printing.
- Granting Connect Privileges
- Troubleshooting an Invalid ACL Error
  Learn how to identify any invalid ACL error by running the query.

3.19.1 When and Why Network Services Must be Enabled

Enabling network services enables support for sending outbound mail in Oracle APEX, using REST Services, REST Enabled SQL, or other web services, and using a remote server for report printing.

By default, the ability to interact with network services is disabled in Oracle Database. Therefore, you must use the `DBMS_NETWORK_ACL_ADMIN` package to grant network connect privileges to the database user that owns the APEX schema (`APEX_240200`). Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle APEX.

  Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Consuming REST services and other web services from APEX.
- Making outbound LDAP calls from APEX.
- Using a remote print server for report printing.

The granted network connect privileges apply to the entire APEX instance and enable all applications in all workspaces to perform outbound network calls. You do *not* need to grant network connect privileges to individual workspace schemas unless applications also use native database PL/SQL API such as `UTL_HTTP` and `UTL_SMTP`.

> **Note:**
>
> When upgrading APEX, the upgrade automatically configures Network Services based on the configuration of the previous APEX version.

> **Tip:**
>
> To run the examples described in this section, the compatible initialization parameter of the database must be set to at least `11.1.0.0.0`. By default, the parameter is set properly, but a database upgraded from a version prior to 11*g* may require an update. For information about changing database initialization parameters, see Specifying the Database Compatibility Level in *Oracle Multitenant Administrator's Guide*.

> **See Also:**
>
> About Report Printing in *Oracle APEX App Builder User's Guide*.

3.19.2 Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the the database user that owns the APEX schema (`APEX_240200`). This example assumes you connected to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role.

```
BEGIN
    DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE(
        host => '*',
        ace => xs$ace_type(privilege_list => xs$name_list('connect'),
                           principal_name =>
APEX_APPLICATION.g_flow_schema_owner,
```

```
                          principal_type => xs_acl.ptype_db));
END;
/
```

The following example demonstrates how to provide less privileged access to local network resources. This example enables access only to servers running on the same database host (`localhost`), such as email and report printing servers.

```
BEGIN
    DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE(
        host => 'localhost',
        ace => xs$ace_type(privilege_list => xs$name_list('connect'),
                           principal_name =>
APEX_APPLICATION.g_flow_schema_owner,
                           principal_type => xs_acl.ptype_db));
END;
/
```

3.19.3 Troubleshooting an Invalid ACL Error

Learn how to identify any invalid ACL error by running the query.

If you receive an `ORA-44416: Invalid ACL` error after running the previous script, use the following query to identify the invalid ACL:

```
REM Show the dangling references to dropped users in the ACL that is assigned
REM to '*'.

SELECT ACL, PRINCIPAL
  FROM DBA_NETWORK_ACLS NACL, XDS_ACE ACE
 WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL AND
       NACL.ACLID = ACE.ACLID AND
       NOT EXISTS (SELECT NULL FROM ALL_USERS WHERE USERNAME = PRINCIPAL);
```

Next, run the following code to fix the ACL:

```
DECLARE
  ACL_ID   RAW(16);
  CNT      NUMBER;
BEGIN
  -- Look for the object ID of the ACL currently assigned to '*'
  SELECT ACLID INTO ACL_ID FROM DBA_NETWORK_ACLS
   WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- If just some users referenced in the ACL are invalid, remove just those
  -- users in the ACL. Otherwise, drop the ACL completely.
  SELECT COUNT(PRINCIPAL) INTO CNT FROM XDS_ACE
   WHERE ACLID = ACL_ID AND
         EXISTS (SELECT NULL FROM ALL_USERS WHERE USERNAME = PRINCIPAL);

  IF (CNT > 0) THEN

    FOR R IN (SELECT PRINCIPAL FROM XDS_ACE
              WHERE ACLID = ACL_ID AND
```

```
                    NOT EXISTS (SELECT NULL FROM ALL_USERS
                                  WHERE USERNAME = PRINCIPAL)) LOOP
      UPDATE XDB.XDB$ACL
         SET OBJECT_VALUE =
               DELETEXML(OBJECT_VALUE,
                         '/ACL/ACE[PRINCIPAL="'||R.PRINCIPAL||'"]')
       WHERE OBJECT_ID = ACL_ID;
    END LOOP;

  ELSE
    DELETE FROM XDB.XDB$ACL WHERE OBJECT_ID = ACL_ID;
  END IF;

END;
/

REM commit the changes.

COMMIT;
```

Once the ACL has been fixed, you must run the first script in this section to apply the ACL to the `APEX_240200` user.

4
Ideas App Implementations

APEX thrives because of community engagement and feedback. The APEX Ideas app makes it easier for you to contribute directly to the product direction of APEX.

Feature Request Number	Subject	Solution
FR-1613 / FR-1909	Add Back Database Object Dependencies Report	Delivered. See Database Object Dependencies.
FR-1736	Better Translation of Applications Handling	Delivered. See Export App Enhancements.
FR-1843	Refresh Region: Keep Pagination and Scroll Position	Delivered. See Refresh Dynamic Action Changes.
FR-2371 / FR-2647	Rename Page Designer to the Page's Name	Delivered. See App Builder UI Changes.
FR-2425	Generate "nonce" for inline scripts	Delivered. See Universal Theme Enhancements.
FR-2799	Provide API to Change/Create Remote Server Entries	Delivered. See PL/SQL API Updates.
FR-2972	Add Flag to the apex_page.GET_URL Function	Delivered. See PL/SQL API Updates.
FR-2975	Allow Modal Dialog to be Resizable	Delivered. See App Builder UI Changes.
FR-3042	Add function to get Region ID by Static ID and Name	Delivered. See PL/SQL API Updates.
FR-3127	Using JSON Collections as Persistence for new APEX Applications	Delivered. See JSON Duality Views and JSON Sources.
FR-3565	Add the "eyeball" to the login area so users can view their password	Delivered. See Universal Theme Enhancements.
FR-3573	Substitution String for MAIN_APPLICATION_ID	Delivered. See New Substitution String.
FR-3727	CSS Minifier Should Support CSS Nesting	Delivered.
FR-3738	Allow APEX to run when CSP `default-src` is enabled without having to use `unsafe-inline`	Partially delivered. See Improved Content-Security-Policy Support.
FR-3742	Additional Text Style CSS Utility Classes	Delivered. See Universal Theme Enhancements.
FR-3750	Expanded Page Number Field	Delivered. See App Builder UI Changes.
FR-3751	Set Remote Server URL while Running APEX Application	Delivered. See REST Source Enhancements.
FR-3768	Add Common Text Messages to Shared Components, Globalization	Delivered. See Text Messages Enhancements.
FR-3781	Update List Entry for Static Menus	Delivered. See Edit List Simplified.

Feature Request Number	Subject	Solution
FR-3800	Popup LOV Filter Option Value% vs %Value%	Delivered. See Improved Popup LOV Functionality.
FR-3857	Integration with Oracle Vector features for enabling RAG	Delivered. See AI Configurations and RAG Sources.
FR-3890	Alternative for opening Modal Dialog pages	Delivered. See Changes to Modal Dialog Page URLs.
FR-3913	Provide a way to define token-based, cursor-based, or custom pagination in REST Data Sources	Delivered. See REST Source Enhancements.
FR-3917	PWA iOS - Increase padding for bottom nav tab menu	Delivered. See Universal Theme Enhancements.
FR-3918	Workflow Admin Tool to interact with a running process	Delivered. See Workflow Enhancements.
FR-3951	Support for Subflow (Subprocess) and Calling Another Workflow in APEX Workflow	Delivered. See Workflow Enhancements.
FR-4033	Excel or PDF template for Document Generator	Delivered. See Document Generator Enhancements.
FR-4035	Allow CLOB input for the PL/SQL APIs APEX_AI.GENERATE and APEX_AI.CHAT	Delivered. See AI Configurations and RAG Sources.
FR-4048	Automatically set Primary Key for Form page item(s) based on a REST Data Source	Delivered.

5
Deprecated Features

Deprecated features are features which Oracle plans to desupport or remove in a future release of Oracle APEX. If a feature is related to application metadata or an API, existing applications can still use the feature, but Oracle strongly recommends that developers start to modify their applications as described in this section. Use APEX Advisor to scan existing applications for deprecated attributes.

- Deprecated APIs

5.1 Deprecated APIs

APEX_LANG

`APEX_LANG.MESSAGE` is deprecated. Instead, use `APEX_LANG.GET_MESSAGE` to support named substitution parameters.

APEX_PLUGIN_UTIL

`APEX_PLUGIN_UTIL.EXECUTE_PLSQL_CODE` is now deprecated. Instead, use `APEX_EXEC.EXECUTE_PLSQL` Signature 1 or Signature 2.

APEX_UTIL

In `APEX_UTIL`, the following APIs are deprecated:

- `custom_calendar`
- `increment_calendar`

6
Deprecated in Previous Releases

The following section lists features which were deprecated in a previous release but have not been fully removed or desupported from Oracle APEX.

Oracle strongly recommends that developers start to modify their applications as described in this section. Use APEX Advisor to scan existing applications for deprecated attributes.

- Deprecated APIs
- Deprecated Dynamic Action Event
- Deprecated Plug-In Attribute
- Number Field Substitutions
- Quick SQL Deprecated Functionality
- Deprecated Object Browser Features
- Preventing Double Escaping of LOV Display Values
- Display Only Item with Format HTML (Unsafe) Deprecated
- Deprecated Functions and Procedures
- Deprecated APEX Item Markup
- Deprecated jQuery Date Picker
- Previously Deprecated APIs
- Deprecated Legacy Web Service References
- jQuery UI Deprecated

6.1 Deprecated APIs

As of APEX 24.1, the following APIs are deprecated:

- The `APEX_APPROVAL` package is deprecated. Use `APEX_HUMAN_TASK` instead.
- The `URL_ENCODE` function in `APEX_UTIL` is now deprecated. Instead, use the built-in database function `UTL_URL.ESCAPE`.
- The `apex_plugin_util.print_display_only` API is deprecated. Instead, use `apex_plugin_util.print_read_only`.
- The `ABORT` function in `APEX_AUTOMATION` is now deprecated. Instead, use `TERMINATE` to terminate a currently executing automation.

6.2 Deprecated Dynamic Action Event

As of APEX 24.1, the APEX Dynamic Action event "Page Unload" is deprecated because the underlying browser event `unload` is deprecated. For more information, see Window: unload event.

6.3 Deprecated Plug-In Attribute

As of APEX 24.1, when editing a region plug-in, the **Substitute Attribute Values** switch is now deprecated. When you move to the Procedure interface, this switch disappears. To perform substitutions on the attribute value, use `apex_plugin_util.replace_substitutions`.

6.4 Number Field Substitutions

As of APEX 24.1, dynamic substitutions for Min/Max Value attributes for the Number field page item, including `&P1_MIN.`, are deprecated. This will be fixed in a future release by allowing developers to declaratively pick an item to use for Min/Max Value attributes.

6.5 Quick SQL Deprecated Functionality

Deprecated Settings

As of APEX 23.2, the following Quick SQL settings are deprecated:

- Data Language (`#language:"DE"`): No longer generates sample data into different languages (German, Korean, Japanese, Spanish).
- Tags Framework (`#tags:true`): No longer generates tag framework objects (table, trigger, sync procedure).
- On Delete (`#ondelete:"cascade"`): No longer supports system-wide `ondelete` settings. Handle these settings through the new `/cascade` column directive.
- Longer Varchar2 (`#longVC:true`): No longer supports artificially shortening or increasing `VARCHAR2` size.
- Tenant ID (`#tenantID:true`): No longer supported.

Deprecated Directives

As of APEX 23.2, the following Quick SQL directives are deprecated:

- `/select`: No longer generates a SQL `SELECT` statement after generating data for each table.

6.6 Deprecated Object Browser Features

As of APEX 23.1, some functionality in Object Browser is deprecated:

- The Model tab for tables is removed.
- The Create Materialized View Wizard is removed. Create materialized views by using a `CREATE MATERIALIZED VIEW` statement in SQL Commands or SQL Scripts. You can still view materialized views in Object Browser.

6.7 Preventing Double Escaping of LOV Display Values

As of APEX 23.1, APEX prevents double escaping of LOV display values.

By default, APEX automatically HTML-escapes Lists of Values (LOV) display values as necessary. To ensure backward compatibility with legacy apps, APEX checks whether the LOV

query already includes a utility function to escape the display value. If it does, APEX avoids double-escaping the value when displaying it in a Select List, Popup LOV, Shuttle, Display Only item, or similar components.

Oracle recommends removing redundant inline escaping calls from your LOVs. In a future version of APEX, this prevention mechanism may be removed, which could cause some display values to appear double-escaped.

To identify whether any of your LOVs are impacted, run the following queries:

```
select *
  from apex_application_lovs
 where lov_type = 'Dynamic'
   and (   upper(list_of_values_query) like '%HTF.ESCAPE_SC%'
        or upper(list_of_values_query) like '%APEX_ESCAPE.HTML%'
        or upper(list_of_values_query) like '%WWV_FLOW_ESCAPE.HTML%' );


select *
  from apex_application_page_items
 where lov_named_lov is null
   and (   upper(lov_definition) like '%HTF.ESCAPE_SC%'
       or upper(lov_definition) like '%APEX_ESCAPE.HTML%'
       or upper(lov_definition) like '%WWV_FLOW_ESCAPE.HTML%' );
```

If the queries returns no rows, then no action is required. Otherwise, check the LOV definition and/or page items, remove any manual escaping, and test your applications to ensure that the values still appear as intended.

6.8 Display Only Item with Format HTML (Unsafe) Deprecated

As of APEX 23.1, Format HTML sanitizes the HTML content on the client before displaying it. This simplifies the display of user-provided HTML, including the content of HTML-based rich text editors.

To maintain backward compatibility with existing applications, all current Display Only page items using the Format HTML option will be migrated to HTML (Unsafe) to preserve their current behavior. However, going forward, this option is deprecated, and displaying "unsafe" HTML, such as script tags or `javascript:` expressions, `onclick` attributes, and others, is no longer possible, as this content is stripped away.

Although it is not recommended to display unsafe HTML content, you can still choose to display it.

6.9 Deprecated Functions and Procedures

As part of moving existing APIs from `APEX_UTIL` to `APEX_APPLICATION_ADMIN`, some comments changed. As of APEX 23.1, the following functions and procedures are deprecated:

- `set_build_option_status`
- `get_build_option_status` (two times, overloaded)
- `set_application_status`
- `get_application_status`

- `set_global_notification`
- `get_global_notification`
- `set_app_build_status`

6.10 Deprecated APEX Item Markup

Future releases of APEX may include fixes and improvements to the accessibility, usability, and functionality of various items that require changing the markup or using custom elements (web components). These changes may create more dynamic behaviors for items, and will be done in a way that minimizes impact to items and forms in existing apps.

As of APEX 22.2, the `apex.item` namespace and item interface are the only supported APIs for customizing and programmatically working with items. APEX discourages customizations that rely on undocumented item markup or CSS classes, as these may not work as expected in future releases.

Assumptions about the HTML markup used by each of the native APEX items may not hold in the future. Item customization through Advanced attributes (CSS Classes), Custom Attributes, JavaScript code, and CSS rules that assumes particular markup could break.

For example, you could make the text area item character counter bold by adding class `important-text` to the **Advanced: CSS Classes** attribute of a text area and then add a custom CSS rule like:

```
.important-text.apex-item-textarea + .apex-item-textarea-counter {
    font-weight: bold;
}
```

This currently works, but may not in the future because it relies on undocumented class names and the counter element directly following the `textarea` element. It is also not a best practice to add event handlers in Custom Attributes.

Future releases may document new custom element markup, classes, and CSS variables to allow more supportable customization.

6.11 Deprecated jQuery Date Picker

As of APEX 22.2, jQuery Date Picker is now deprecated and cannot be used for new pages or applications. The old jQuery Date Picker JavaScript APIs are not supported.

Oracle recommends replacing all old Date Pickers with the new Date Picker.

6.12 Previously Deprecated APIs

As of APEX 22.1, the `APEX_IR.GET_REPORT` API is deprecated. Instead, use `APEX_REGION.OPEN_QUERY_CONTEXT` to get interactive report data.

6.13 Deprecated Legacy Web Service References

As of APEX 22.1, SOAP style Web Service references and legacy support for REST style Web Services references are deprecated.

6.14 jQuery UI Deprecated

As of APEX 20.1, jQuery UI is deprecated. Oracle recommends that customers update third-party APEX plug-ins and custom JavaScript code to remove any jQuery UI references. Native APEX components that use jQuery UI will continue to function, but support will be removed in a future release.

Oracle ships a custom bundle of JQuery UI 1.13.2 that includes only the modules that APEX needs. Oracle no longer ships individual widgets or any jQuery UI CSS files.

7

Desupported Features

Desupported features are no longer available. If a desupported feature has to do with application metadata or APIs, then existing applications may not work as they did previously. Oracle recommends modifying the application to replace the feature.

- Desupported APIs
- Public Dictionary View Changes
- TinyMCE-based Rich Text Editor Desupported
- CSSO Desupported

7.1 Desupported APIs

As of APEX 24.2, the following APIs are desupported:

- `apex_javascript.add_3rd_party_library_file`
- `apex_css.add_3rd_party_library_file`

7.2 Public Dictionary View Changes

As of APEX 24.2, columns `attribute_01` through `attribute_25` now return null in the following views:

- `apex_application_page_items`
- `apex_appl_page_ig_columns`
- `apex_appl_plugin_settings`
- `apex_appl_page_filters`

You can query this attributes by reading the attribute's JSON column. See Unlimited Attributes for Item Plug-ins.

7.3 TinyMCE-based Rich Text Editor Desupported

In APEX 24.1, the Rich Text Editor page item based on the TinyMCE library was deprecated.

As of APEX 24.2, TinyMCE is desupported and the Rich Text Editor page item no longer supports the TinyMCE library. The underlying library is now Oracle Rich Text Library (ORTL). Any Rich Text Editor page items still using TinyMCE are auto-migrated to ORTL. Any custom Initialization JavaScript Function code is commented out.

7.4 CSSO Desupported

The CSSO 3rd party JavaScript library is removed from APEX, and replaced with a basic minification logic. This may impact existing CSS static files.

8

Desupported in Previous Releases

The following section lists features that were desupported in a previous release.

If a desupported feature has to do with application metadata or APIs, then existing applications may not work as they did previously. Oracle recommends modifying the application to replace the feature.

- Removed JSON Application Export
- CKEditor Desupported
- Desupported Utilities
- Querying Template Component Metadata

8.1 Removed JSON Application Export

As of APEX 24.1, the JSON application export option is removed. The **Export Readable Format** option is now a switch. If off, the application exports in SQL form. If on, the export file contains a human-readable YAML version of the application metadata.

8.2 CKEditor Desupported

As of APEX 23.2.9, CKEditor 4 and CKEditor5 are desupported. Any custom code using CKEditor5 APIs must be re-worked. Any code referencing CKEditor4 and the `CKEDITOR` global object no longer works. Any existing CKEditor regions default to using Oracle Rich Text Library.

8.3 Desupported Utilities

As of APEX 23.2, the `APEXExport` utility is desupported and is no longer included with Oracle APEX. Oracle recommends using SQLcl to perform export operations.

8.4 Querying Template Component Metadata

As of APEX 23.2, for template components only, the `ATTRIBUTE_01...ATTRIBUTE_25` columns of `APEX_APPLICATION_PAGE_REGIONS` and `APEX_APPLICATION_PAGE_IR_COL` public views now return null.

Instead, use the new `ATTRIBUTES` column that stores a JSON object of all attribute values. Use the attribute's Static ID as the object key. Note that a table alias is always needed when using the JSON dot notation. For example:

```
select r.attributes.COLOR
  from apex_application_page_regions r
 where r.application_id = 100
   and r.page_id        = 1
   and r.static_id      = 'user_badge';
```

9
Fixed Bugs

The following section lists bugs fixed in this release.

Bug Number	Description
31176472	HELP TEXT IMPROVEMENT FOR CLASSIC REPORT - BREAK FORMATTING
33462185	JS API APEX.LOCALE RETURNS INCORRECT VALUES IF CUSTOM NLS_NUMERIC_CHARACTERS ARE SET
33763656	RENDERING TREE IN PAGE DESIGNER EXPANDS ALL COMPONENTS ON SIMPLE INTERACTIONS
33925337	REPORTS IN THE INTERNAL DEV ENVIRONMENT MISSING ROW HEADERS
34078016	UNABLE TO SEARCH IN THE NAMES POPUP LOV IN CREATE AUTHORIZATION SCHEME DIALOG
34918506	INTERACTIVE GRID - CONFUSING ACCESSIBLE CONTEXT MESSAGES FOR THE ROW AND COLUMN NUMBERS
34980410	INTERACTIVE GRID, BUTTONS IN THE SINGLE ROW VIEW TOOLBAR NEED BETTER ACCESSIBLE NAMES
35166387	INTERACTIVE GRID, LOAD MORE BUTTON IS DIFFICULT TO FIND FOR SCREEN READER USERS
35172263	TEAM DEVELOPER EDIT ISSUE TEXT DIALOG/CODE EDITOR OPENS SHOWING ONLY ONE LINE
35222957	RECORDVIEW: ERROR MESSAGE NOT CONVEYED TO JAWS
35406974	INTERACTIVE GRID, ICON VIEW WITH LINKS IS NOT ACCESSIBLE USING JAWS
35493760	APPROVALS COMPONENT > TASK DETAILS PAGE > EDIT BUTTONS > INLINE DIALOGS DO NOT TRAP KEYBOARD FOCUS
35533463	CHANGES IN INTERACTIVE GRID WHEN FILTER IS USED WILL NOT BE SAVED FOR THE FIRST ROW IN THE TABLE
35613230	DATA GENERATOR: ERRORS ARE MASKED WHEN GENERATING DATA
35653855	COMBOBOX SELECT INTERFACE ANNOUNCES "1 MATCHES FOUND" (PLURAL)
35734489	WHEN OPENING A POPUP LOV THE SCROLLBAR DISAPPEARS AND THE LAYOUT IS SHIFTED TO THE RIGHT
35846358	REGRESSION: FILE UPLOAD ITEM: CLIENT SIDE VALIDATION DOES NOT CHECK IF ITEM IS REQUIRED
36064312	REMOVE BUTTON IN 23.2 FILE UPLOAD ITEM DOES NOT TRIGGER A CHANGE EVENT
36077709	ERR-7620 WHEN CLICKING ON EXPLAIN PLAN TAB WITHOUT A SQL STATEMENT ON SQL COMMANDS
36151716	HTML TAG MISSING LANG ATTRIBUTE IN IRR'S ACTIONS > HELP DOM
36173294	REGRESSION: CALLING CLICK() ON FILE BROWSE ITEM DOES NOT WORK ANY MORE
36182515	SEQUENCE OF DISPLAYED MAP LAYERS NOT CORRECT WHEN LAYERS ARE SWITCHED ON AND OFF DYNAMICALLY

Bug Number	Description
36205509	THE FILE UPLOAD ITEM CONTAINS A REMOVE BUTTON THAT IS NOT INTUITIVE
36210761	DEV TOOLBAR > SESSION AND DEBUG BUTTON MARKUP SHOULD BE IMPROVED
36293226	APPLICATION IMPORT NOT WORKING IF THERE IS COPYRIGHT BANNER ADDED TO APPLICATION
36304620	SESSION TIMEOUT MESSAGE HAS UNLABELED ELEMENT WITHOUT A "IMAGE" SEMANTIC ROLE
36318386	SELECTING A MASTER COMPONENT BASED ON REST DATA SOURCE WONT COPY REST DATA SOURCE INFORMATION FOR LOVS AND SEARCH CONFIGURATIONS
36329224	COMBOBOX: COMBOBOX IS NOT ABLE TO HANDLE MULTI CHARACTER MULTI VALUE SEPARATORS
36386151	OBJECT BROWSER AND SUPPORTING OBJECTS: EMPTY SCHEMA IN MLE ENV DDL
36393898	DISPLAY GLITCHES ON EDIT PLUGIN PAGES FOR REST SOURCE PLUG-IN
36445520	MAP REGION: IF ONLY A POINT IS DISPLAYED; INITIAL ZOOMING ZOOMS IN WAY TO MUCH
36454664	INCLUDE WORKFLOW IN SHARED COMPONENT UTILIZATION REPORTS
36550051	PAGE SUBMIT RAISES ERR-1002 AFTER INTERACTIVE REPORT SUBSCRIPTION DIALOG WAS CANCELLED
36574850	INTERACTIVE GRID: USING CLOB COLUMNS IN LINK PROPERTIES THROWS CLOB ERROR EVEN FOR SMALL STRINGS
36605260	WORKFLOW COMPONENT: APEX_WORKFLOW_ACT_VARS VIEW DOES NOT RETURN ANY ACTIVITY VARIABLE DATA
36605381	WORKFLOW: IMPROVE UNAUTHORIZED ERROR MESSAGE FOR APEX_WORKFLOW.UPDATE_VARIABLES API
36605935	HUMAN TASKS STARTED FROM A WORKFLOW LOSE WORKFLOW DETAILS WHEN RENEWED
36611175	PAGE SHOWS NO CONTENT WHEN IN PRINTER-FRIENDLY MODE AND "MINIMAL (NO NAVIGATION)" IS USED AS PRINTER FRIENDLY TEMPLATE
36618965	REGRESSION: INTERACTIVE GRID FILTERING IS BROKEN IF APEX$ROW_SELECTOR CONTROL IS HIDDEN
36623420	INTERACTIVE GRID DOES NOT PRESERVE LAST VIEWED PRIVATE REPORT SELECTION UPON APPLICATION IMPORT
36631223	ORDS BASED INTERACTIVE REPORTS AND INTERACTIVE GRIDS SHOULD SUPPORT ORDER BY NULLS CLAUSES
36633270	IMPROVE ITEM-LEVEL HELP FOR CHART FORMAT OPTIONS
36704861	PAGE DESIGNER: CHANGING VALUE TYPE OF IN/OUT PROCESS PARAMETER THROWS AN ERROR
36715586	ADVISOR THROWS ORA-20555 ERROR WHEN RUNNING ON SAMPLE INTERACTIVE GRID APP
36723611	HUMAN TASKS - DEADLINES - THROWS ORA-06502: PL/SQL: NUMERIC OR VALUE ERROR EXCEPTION WHEN DUE ON INTERVAL LENGTH > 500 CHARACTERS
36725511	APEX NOT SETTING CLIENT_ID FOR BACKGROUND EXECUTION CHAINS
36730241	TEMPLATE DIRECTIVES - THE OTHERWISE CLAUSE OF A CASE DIRECTIVE DOES NOT WORK FOR NULL VALUES

Bug Number	Description
36735168	APEX_APPLICATION_ADMIN.SET_APPLICATION_STATUS IGNORES P_MESSAGE FOR SOME STATES
36748376	APEX_REGION.OPEN_QUERY_CONTEXT W/ P_OUTER_SQL AND TOTAL_ROW_COUNT CAN THROW ORA-1007
36750696	SUBSCRIBED TEMPLATE COMPONENTS HAVE WRONG FILES VERSION NO, LEADING TO OUT OF SYNC AT THEME VERIFY
36755135	SELECT ONE AND MANY DOESN'T OPEN DROPDOWN WITH KEYBOARD KEY DOWN AFTER EMPTY
36770653	APPROVALS COMPONENT: ORA-12012: ERROR ON AUTO EXECUTE OF TASK EXPIRE JOB
36779216	PAGE LOCKS PAGE IS SHOWING THE SUCCESS MESSAGE "PAGE(S) UNLOCKED" EVEN WITH THE FAILED ATTEMPT
36788807	SQL COMMANDS BIND VARIABLE VALUE DOUBLE ESCAPES
36804488	WORKFLOW COMPONENT : TIMED OUT HUMAN TASK ACTIVITIES REMAIN IN WAITING STATE AND CONTINUE TRIGGERING TIMEOUT FLOWS
36805637	ADMIN SERVICES LOGIN PAGE (4550:10): USERNAME AND PASSWORD FIELDS MISSING AUTOCOMPLETE
36805833	SPOTLIGHT WILL FAIL WITH JAVASCRIPT ERROR IF UNSUPPORTED BUILDER LANGUAGE IS SET
36814132	AUTHORIZATION SCHEMES, ITEM SELECTION NOT WORKING
36834206	METHODS ON TABLES DOES NOT RESPECT DEFAULT SQL WORKSHOP SCHEMA; ALWAYS USES FIRST SCHEMA
36836191	WORKFLOW DESIGNER: NODES CAN BECOME OBSCURED WHEN KEYBOARD NAVIGATING
36838627	TEMPLATE COMPONENTS DO NOT SUPPORT QUICK EDIT
36846713	UNABLE TO CREATE WORKFLOW CONSOLE PAGES WHEN THEME ID != 42
36848454	DYNAMIC ACTION IS NOT TRIGGERED WHEN SPECIFIC FILES ARE UPLOADED TO FILE UPLOAD ITEM
36851237	NO SHOW MORE... LINK FOR MULTIBYTE TEAM DEV ISSUE TEXT > 4000 BYTES & < 4000 CHARS
36856070	OBJECT BROWSER: DDL DOWNLOAD OF MLE ENVIRONMENT ERRORS OUT
36858317	RTL LABELS ARE NOT DISPLAYING CORRECTLY IN BUIT-IN OPENSTREETMAP MAP BACKGROUND
36872523	STAY ON PAGE CHECKBOX RESETS ON LIST OF VALUES EDIT PAGE
36878923	APPLICATION CONTAINER INSTALL RESULTS IN ORA-01031: INSUFFICIENT PRIVILEGES
36883052	REST SOURCE TYPE "OCI" DOES NOT DETECT OBJECT STORE URLS CORRECTLY AND USES WRONG PAGINATION
36895705	UPGRADE EMAIL TEMPLATE BUTTON IS BROKEN IN BUILDER
36896413	SHARED LOV "COMMENTS" ARE NOT CONTAINED IN APP EXPORT
36897058	OBJECT BROWSER TABLE DATA TAB CHANGED TO [SDO_GEOMETRY] INSTEAD OF [POINT(X,Y)]
36911655	VALIDATE_APEX.SQL SHOULD NOT EMIT MESSAGES FOR "UNSUCCESSFUL" GRANTS
36922907	RUN SCRIPT BUTTON SHOWS NO PROGRESS AND USERS CAN CLICK SEVERAL TIMES

Bug Number	Description
36925920	INTERACTIVE REPORT > COMPUTE DIALOG: KEYPAD CONTROLS INSUFFICIENT WIDTH
36925972	INTERACTIVE GRID > PAGE PAGINATION: PAGE NUMBER BUTTONS INSUFFICIENT WIDTH
36926469	CALLING WWV_FLOW_DATA_PARSER.GET_FILE_TYPE WITH LONG FILE NAME CAUSES ORA-06502: CHARACTER STRING BUFFER TOO SMALL
36929684	SOCIAL SIGN-IN: IDENTITY PROVIDER RETURNS ERROR "INVALID_CLIENT" AFTER UPGRADE TO 24.1
36935004	AUTOMATION WITH ERRORS IN THE MIDDLE OF PROCESS ARE NOT MARKED AS A FAILURE
36951093	EXPORTING A PAGE "AS OF X MINUTES AGO" EXPORTS THE ACTUAL PAGE
36964386	COMBOBOX ONE MANUAL VALUE CONSOLIDATION NOT WORKING CORRECTLY
36967765	SUBMIT ON NON MODAL PAGE RESIZES SQUEEZES THE POP UP PAGE WITH EACH REFRESH
36968451	APEX_APPL_WORKFLOW_PARTICIPANT MISSING DESCRIPTIVE PARTICIPANT DESIGN-TIME NAME
36974113	REGRESSION: CUSTOM BRANCH_TO_PAGE_ACCEPT URL LOGIN FAILS IN 24.1 W/ CHECKSUM ERR
36997994	TASK DEFINITIONS: ACTION SOURCE TABLES NOT LOADING FOR SOME APEX INSTANCES
37013515	WORKING COPY SHOWING DIFFERENCES FOR CHECKBOX GROUP WITHIN A SMART FILTER WHEN NO CHANGES HAVE BEEN MADE
37021766	ISSUE WITH BORDER RADIUS ON DATE PICKER AND POPUP LOV ITEMS
37021932	PRESET TEMPLATE OPTIONS: DEFAULT STYLE DISAPPEARS AFTER MODIFICATION
37023292	REMOVED COMMENT IN ZIP FILES GENERATED BY APEX_ZIP
37033662	AI MODEL SHOULD NOT BE REQUIRED TO CREATE AN AI SERVICE
37044268	THE EXTENSION MENU ICON STAYING IN THE MENU BAR, EVEN WHEN THERE ARE NO MENU ENTRIES TO DISPLAY
37052457	REGRESSION: BRANCH WITH REQUEST AND RESET PAGINATION STOPPED WORKING IN 22.2
37055276	LAYOUT ISSUES IN RUNTIME APPS ON MOBILE SCREEN SIZES WHEN SIDE NAVIGATION IS OPEN
37071332	SPOTLIGHT SEARCH SHOWS ERRORS WHEN OPENING LINKS TO DIALOGS
37074931	APEX_WORKFLOW_PARAMETERS VIEW DOES NOT FILTER BY WORKFLOW_ID
37083935	DATE PICKER: INVALID USE OF ARIA-EXPANDED ON INPUT FIELD
37090630	SQL SCRIPTS PARSER FAILS ON VIEW WITH PROCEDURE IN WITH CLAUSE
37090910	BADGE STYLE AND SHAPE ATTRIBUTES NOT PASSED INTO TIMELINE TEMPLATE COMPONENT
37109732	THEME ROLLER CODE EDITOR BROKEN FOR RTL APPS
37125595	APPROVAL COMPONENT: P_DUE_ON_DATE PARAMETER IN CREATE_TASK API NOT RECOGNIZED

Bug Number	Description
37142150	PAGE DESIGNER: CLASSIC REPORT "USE GENERIC COLUMNS" SWITCH DOES NOT WORK WITH REST ENABLED SQL SOURCES
37185164	COPY PAGE FROM OTHER APP CAN THROW "ORA-43912 - INVALID COLLATION" ON ADB AND 23AI DATABASES
37191542	SETTING WORKSPACE PARAMETER ENV_BANNER_YN - INVALID PARAMETER NAME
37211771	SQL WORKSHOP: CREATE SPATIAL INDEX, REGISTER COLUMN FAILS WITH ORA-06550 ERROR
37218806	NO_SEARCH_COLUMNS_PROVIDED ERR W/ SMART FILTER ON CLASSIC REPORT W/ ARRAY COLUMN
37235652	APEX INTERACTIVE REPORT SUBSCRIPTION TIME ZONE GOES BACK TO DB TIME ZONE
37291512	ERROR USING NEXT_ARRAY_ROW OR HAS_MORE_ARRAY_ROWS IF ARRAY COLUMN IS EMPTY
37294979	TRANSLATABLE PLUG-IN ATTRIBUTES ARE NOT ALWAYS GETTING TRANSLATED
37324843	APEX_INSTANCE_ADMIN.TRUNCATE_LOG DOES NOT ALLOW TO PURGE AUTOMATION AND REST SYNC LOGS

10

Open Bugs and Known Issues

This section describes bugs and known issues for Oracle APEX release 24.2.

> **Tip:**
>
> This section is current as of the writing of this document. To view the most current listing of changed behavior, go to the **Known Issues** page:
>
> https://www.oracle.com/tools/downloads/apex-downloads/apex-242-known-issues/
>
> Alternatively, you can view the Accessibility Conformance Report (ACR). The ACR includes details of all known issues with APEX. A single release of APEX uses multiple component ACRs for specific areas of the product (for example, "Development Environment", "Components", "Documentation", etc.) Please go to Accessibility ACRs | Oracle's Accessibility Program to find the ACRs for Oracle APEX.

- Known Issue with Document Generator
- Known Issue with Theme Decoupling
- Known Issues with Using BOSS REST Services
- Known Issue with ORDS 24.1 and APEX SQL Developer Web
- Known Issue for Sublists
- Known Issues for Working Copy Feature
- Known Issues for Workflow Component
- Known Issue with Confirm or Alert Dynamic Action Messages When Upgrading
- Known Issue using 'Source Display' region type plug-in in previously installed Sample Apps
- Known Issues for jQuery Upgrade
- Interactive Grid support for REST Enabled SQL
- Group By Component Type mode prevents Default View
- Known Issues for Data Generator

10.1 Known Issue with Document Generator

When you create a `DBMS_CLOUD` OCI API Key Credential in APEX 24.1 and use it as a credential for Document Generator, the credential is missing after upgrading to APEX 24.2.

The fix for this issue is added in APEX 24.2.4. Any credential created in APEX 24.2.4 or later will not be missing after an upgrade.

10.2 Known Issue with Theme Decoupling

There is a known issue with theme decoupling in the following scenario:

1. A Master theme app and a child theme app are defined in the same workspace.
2. The Master theme app is subscribed to the UT in the central application, and the child theme app is subscribed to the Master theme app.
3. The Master theme app hosts some locally-defined templates that don't exist in the central application.

In this scenario, if you refresh the child app theme, it does not copy the Master theme's locally-defined templates over to the child app. As a workaround, you can copy the locally-defined templates manually.

10.3 Known Issues with Using BOSS REST Services

Total Results Only Works with Search Views

BOSS support for total results currently only works on search views.

Error Defining REST Data Source Against OAuth-Protected BOSS Endpoint in RDBMS 19c

If your APEX is running in an Oracle 19c database, then when initially defining a REST Data Source against an OAuth-secured BOSS endpoint, you may encounter an `HTTP 401 Not Authorized` error when discovering the service. The error text returned could indicate `Anonymous Access is not allowed for OpenApi Service`.

The solution is to use the fully-qualified BOSS endpoint URL including both the optional language path segment (for example, `$en`) and an explicit deployment id after the version path segment. For example, instead of referencing `.../v1/exampleobject` you would use `.../v1:99/$en/exampleobject` during discovery. Once the REST Data Source is created, you can edit its service URL to remove the language path segment and the explicit deployment id.

10.4 Known Issue with ORDS 24.1 and APEX SQL Developer Web

When on an upgraded APEX 24.1 instance using ORDS version 24.1.0, if you click the link from APEX App Builder to SQL Developer Web, an error message ("Method Not Allowed") appears.

This bug is fixed in ORDS version 24.1.2.

10.5 Known Issue for Sublists

Currently, sublist entries are not included in list search results when the list search configuration is defined on the list referencing the sublist. This will be fixed in a future release.

10.6 Known Issues for Working Copy Feature

The known issues for the working copy feature are:

- **Server Error** message - If you are running APEX on Oracle Database release 19c and using the new working copy feature, when you choose the actions **Merge into Main** or **Refresh from Main** or **Compare Changes**, you may get a "Server Error" message that is caused by an underlying ORA-00600 error message. For example:

  ```
  ORA-00600: internal error code, arguments: [qjsnplsDecDomRefCnt:noValP],
  [], [], [], [], [], [], [], [], [], [], []
  ```

  The fix for this error is to upgrade to 19.16 or higher.
- **ORA-00001** error during merge - The Working Copy feature raises an ORA-00001 unique constraint error when attempting to merge changes for component names that are not unique. It is important to coordinate the naming of shared components across working copies and the main application to avoid this error occurring.

10.7 Known Issues for Workflow Component

The known issues for the Workflow Component are:

- The workflow title can only use workflow parameters as substitution strings, but not any additional data source columns
- When using Workflow Designer in a Safari browser, arrows become straight lines in the Workflow Diagram Builder and the type text disappears under the Additional Data Property for workflow version.
- Terminating a Workflow does not auto-cancel the human task(s) created while executing the workflow.
- When deleting a workflow using the `Delete` key on the keyboard, there is no warning message. Deleting a workflow by right-clicking the workflow and selecting **Delete** provides a warning message and a prompt for user confirmation.

10.8 Known Issue with Confirm or Alert Dynamic Action Messages When Upgrading

Issue

When upgrading from APEX 21.2 or earlier, the text in existing Confirm or Alert dynamic action messages may be truncated if it is too long, leading to data loss. This is due to APEX HTML-escaping messages, which may increase their size past the 4000-byte limit.

Resolution

Prior to upgrading, run a query to check whether any messages are affected:

```
select *
    from apex_application_page_da_acts
where action_name in ('Alert', 'Confirm')
    and ( lengthb( attribute_01 )
        + ( 4 * nvl( regexp_count( attribute_01, '&|"|<|>' ), 0 ) )
        ) > 4000;
```

If the query does not return any rows, proceed with the upgrade.

If the query does return rows, convert the affected rows into application text messages and reference them with substitution syntax before proceeding with the upgrade.

10.9 Known Issue using 'Source Display' region type plug-in in previously installed Sample Apps

Issue

The Source Display region type plug-in that is used in a Sample App installed in a previous release of APEX no longer works. This issue is due to the removal of views associated with AnyChart charts and AnyMap map charts.

Resolution

1. Open the application to edit it.
2. Navigate to **Shared Components**, under Other Components select **Plug-ins**, and **Source Display**.
3. Update the PL/SQL Code to **remove** the following lines of code (lines 35 - 48):

```
union all
select reg.source_type, fs.series_seq, fs.series_name, fs.series_query
source
from apex_application_page_regions reg,
    apex_application_page_flash5_s fs
where reg.application_id = :APP_ID
    and reg.page_id = :APP_PAGE_ID
    and reg.static_id = d_region_static_id
    and fs.application_id = reg.application_id
    and fs.page_id = reg.page_id
    and fs.region_id = reg.region_id
    and reg.source_type in (
        'Flash Chart',
        'Map'
    )
```

4. Click **Apply Changes**.

10.10 Known Issues for jQuery Upgrade

jQuery 3.x breaks compatibility with earlier 2.x versions. For applications that still rely on removed 2.x functionality, you can use the jQuery Migrate plug-in (to include this plug-in, set the Desktop User Interface Details attribute **Include jQuery Migrate** to **Yes**).

If your application relies on removed 1.x jQuery APIs, that functionality no longer works as of Application Express release 18.1. You must update the JavaScript to only use jQuery 3.5 or later APIs. See the jQuery migration guides to learn more:

- To migrate from 1.x to 2.x see http://jquery.com/upgrade-guide/1.9/
- To migrate from 2.x to 3.5.x see https://jquery.com/upgrade-guide/3.5/

10.11 Interactive Grid support for REST Enabled SQL

Issue

Oracle REST Data Services (ORDS) REST Enabled SQL has a limit of 1000 bind variables in a REST Enabled SQL request. As a result, when Interactive Grid DML sends more than 1000 column values, the following error displays: "Internal ORDS OUT Bind limits exceeded."

Solution

Reduce the amount of DML rows.

10.12 Group By Component Type mode prevents Default View

Issue

Due to the removal of "Sort by Processing Order" and "Group by Component Type" from Page Designer, developers may be stuck in "Group by Component Type" mode without a way to switch back to the default view ("Sort by Processing Order").

Resolution

1. In Page Designer, open Developer Console in the browser, and run the following command:

   ```
   pageDesigner.saveBoolPref( "GROUP_BY_COMPONENT_TYPE", true );
   ```

2. Refresh the page.

10.13 Known Issues for Data Generator

There are known issues with the API for the data generator:

- API does not accept Percent Blank value of 100.
- Some built-ins that return a number data type ignore values set for minimum value, maximum value, and value precision.
- Preview ignores columns when all their values are null.
- When generating data and using row scaling other than 1x, sometimes an extra row is added.

These issues will be fixed in a future release.

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Documentation Accessibility

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

Access to Oracle Support

Oracle customer access to and use of Oracle support services will be pursuant to the terms and conditions specified in their Oracle order for the applicable services.

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Privacy Notice

This privacy notice describes what to expect when Oracle APEX directly collects information about users of applications that you create or install. Note that all APEX internal applications (such as Application Builder) are written in APEX, so the same facts apply to developers and administrators who are using these applications. Oracle is not responsible for information collection of applications that were developed by customers.

Event Logging

APEX provides extensive logging of user triggered events. For example, developers and administrators can use this data to find security and performance issues. The log data includes the user's IP address and application username plus event specific information. Below is a brief list of event log types.

- **Activity Log** - Page views and Ajax requests. Can be disabled by developers and instance administrators.
- **Login Access Log** - Successful and failed login attempts.
- **Debug Log** - Application-specific instrumentation, such as internal variable values. Disabled by default, the debug log can be enabled by end users and developers.
- **Click Count Log** - Clicks on external links within applications.
- **Web Service Activity Log** - Requests to external web services from inside the database.
- **Developer Activity Log** - Changes to application components.
- **SQL Workshop Log** - History of SQL statements in the development environment's SQL Workshop.

Cookies and Related Technologies

APEX does not use any third-party cookies, but it does use functional cookies (no tracking) and the browser's SessionStorage and LocalStorage for maintaining the login session and for personalization. This is essential for application security, performance, and ease of use. Below are details about the cookie and storage names that APEX uses and their intended use.

Session Cookies

- `ORA_WWV_USER_`*`instance id`* - Security cookie for internal applications, like Application Builder.
- `ORA_WWV_APP_`*`application id`*`, ORA_WWV_APP_`*`workspace cookie id`*`, `*`custom name`* - Security cookie for applications. Developers can choose custom cookie names in an application's authentication scheme.
- `ORA_WWV_RAC_INSTANCE` - Session cookie for the Real Application Cluster (RAC) node instance number, for node pinning on the web server. Only sent when multiple RAC nodes are detected.

Persistent Cookies

- `ORA_WWV_REMEMBER_LANG` - The user's selected application language.

- `ORA_WWV_REMEMBER_UN` - (Optional) Workspace and username of the previous login to the development environment login page. See check box **Remember workspace and username** on the development environment login page for details.
- `LOGIN_USERNAME_COOKIE` - (Optional) Username of the previous login to developed applications. See check box **Remember username** on login pages of new applications for details. To make this cookie optional on login pages of existing applications, add a **Remember username** checkbox to the page. The API documentation for `APEX_AUTHENTICATION.GET_LOGIN_USERNAME_COOKIE` and `APEX_AUTHENTICATION.SEND_LOGIN_USERNAME_COOKIE` has examples for the PL/SQL process code to set the check box value and to only send the cookie when the check box is checked.

Session Storage

- Object Browser - Session storage keys used for the Object Browser:
  - `ORA_WWV_apex.objectBrowser.openTabs` - Stores a JSON structure with information about the currently open object.
  - `ORA_WWV_apex.objectBrowser.viewState` - Stores view state for the current view of the current open object.
  - `ORA_WWV_apex.objectBrowser.lastSchema` - Stores an opaque number related to the last used schema.
  - `ORA_WWV_apex.objectBrowser.treeExpansionState` - Stores a list of expanded tree nodes.
  - `ORA_WWV_apex.objectBrowser.treeSelection` - Stores the selected tree node.
  - `ORA_WWV_apex.objectBrowser.objectFilter` - Stores the current filter.
- Spatial Map Region - Session storage keys used on the map component:
  - `ORA_WWV_apex.spatialMap.`*`application id.page.region id`*`.zoomState` - Stores the current zoom level on the map
  - `ORA_WWV_apex.spatialMap.`*`application id.page.region id`*`.lngState` - Stores the current longitude on map
  - `ORA_WWV_apex.spatialMap.`*`application id.page.region id`*`.latState` - Stores the current latitude on map
  - `ORA_WWV_apex.spatialMap.`*`application id.page.region id`*`.bearingState` - Stores the current tilt in degrees on the map
  - `ORA_WWV_apex.spatialMap.`*`application id.page.region id`*`.pitchState` - Stores current direction user is facing measured clockwise as an angle on the map
- `ORA_WWV_apex.facets.`*`application id.page.region id`*`.clientSideFiltering` - Stores the facets where the user has enabled or disabled on client-side filtering.
- `ORA_WWV_apex.facets.`*`application id.page.region id`*`.hiddenFacets` - Stores the facets where the user has set Visibility to `Off`.
- `ORA_WWV_apex.facets.`*`application id.page.region id`*`.chartConfig` - Stores the configuration for the facet charts.
- `ORA_WWV_apex.facets.`*`application id.page.region id`*`.openCharts` - Stores the facet charts that have been opened.

- ORA_WWV_apex.facets.*application id*.*page*.*region id*.facetCollapsedState - Stores the facet-collapsible state.
- ORA_WWV_apex.PopupLov_*.*application id*.*page*.state - This stores the popup dialog size, column widths, sort column, and direction of popup LOV items.
- ORA_WWV_apex.builder.devToolbar.grid - This stores the current setting of the Development Toolbar's Show Layout Columns option.
- ORA_WWV_apex.builder.utr.*application id*.* - This stores settings of the Development Toolbar's Theme Roller popup.
- ORA_WWV_apex.builder.pageDesigner.*application id*.(*current tab id*) - This stores the current tab in each of the tab sets of Page Designer.
- ORA_WWV_apex.core.userHasTouched - This is used to remember if the user has interacted with the application using touch (a touchstart event has been seen). It is used by some components to customize the user experience when using touch devices.
- ORA_WWV_apex.apexTabs.*application id*.*page*.*.activeTab - This remembers the last tab selected for Region Display Selector regions or regions using the Tabs Container template that have enabled the option to save the current tab
- ORA_WWV_apex.Calendar.*application id*.*page*.*region id*.lastview - This remembers the last viewed calendar period.
- ORA_WWV_apex.toggleCore.*.*application id*.*page*.*.preferenceForExpanded - This remembers the expanded state for collapsible regions.
- ORA_WWV_apex.MED_*.splitterPosition - This stores the splitter bar position for various Interactive Grid settings dialogs.
- ORA_WWV_apex.builder.dependencyTree.treeExpansionState - This stores the expanded state for the Database Object Dependencies tree and the selected node.

Local Storage

- ORA_WWV_apex.builder.devToolbar.options - This stores the Developer Toolbar user preference settings: Auto Hide, Show Icons Only, and Display Position.
- ORA_WWV_apex.builder.pageDesigner.model.componentIds - This stores a pool of not yet used IDs for new components in Page Designer.

Check for Updates

When developers log in to the APEX development environment, they get a notification when a new version is available. To get this version information, APEX sends a request to an oracle.com server on a bi-weekly basis. It passes anonymized, statistical information about the development server (such as database version and APEX component usage) that the APEX product development team uses to make decisions about the products' future. This check is enabled by default, but can be disabled by instance administrators. To learn more, review the CHECK_FOR_UPDATES parameter in APEX_INSTANCE_ADMIN in *Oracle APEX API Reference*.

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