

About These Release Notes

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

- [Before You Begin](#)
- [New Features](#)
- [Changed Behavior](#)
- [Deprecated Features](#)
- [Deprecated in Previous Releases](#)
- [Desupported Features](#)
- [Fixed Bugs](#)
- [Open Bugs and Known Issues](#)
- [Documentation Accessibility](#)
- [Privacy Notice](#)

Before You Begin

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

- [Oracle Database Requirement](#)
- [Browser Requirements](#)
- [About Release Numbering Conventions](#)
- [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 21.2](#)
- [Important Information if Upgrading from Oracle Database Version 12c CDB](#)

Oracle Database Requirement

Oracle APEX release 21.2 requires an Oracle Database release 12.1.0.2 or later, including Enterprise Edition (EE) and Express Edition (Oracle Database XE).

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.

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, Oracle 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 21.2 Known Issues](#) page or the [Prior Release Archives](#) for earlier releases.

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>

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 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 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*

Important Information if Updating from a Release Prior to 21.2

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

- [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](#)
- [Oracle Application Express Release Notes release 4.2](#)
- [Oracle Application Express Release Notes release 4.1](#)
- [Oracle Application Express Release Notes release 4.0](#)

Important Information if Upgrading from Oracle Database Version 12c CDB

If you are upgrading an Oracle Database 12c Release 1 (12.1) multitenant container database (CDB), you must download the patch for Bug 20618595 from My Oracle Support and apply it to your database. To locate this patch, search for **20618595** on the Patches tab.

New Features

Oracle APEX release 21.2 includes a number of new features. These new features are not present in APEX release 21.1 and earlier releases.

- [Smart Filters](#)
- [Progressive Web Apps](#)
- [Universal Theme & UI Updates](#)
- [Faceted Search Enhancements](#)
- [Updated Alert and Confirm Dialogs](#)
- [Geocoding and Map Items](#)
- [REST Catalogs and Improvements](#)
- [Improved Report Downloads, Subscriptions, and Printing](#)
- [Improved Editors](#)
- [Environment Setup](#)
- [Email and Email Template Enhancements](#)
- [Additional Features](#)
- [JavaScript Library Upgrades](#)
- [JavaScript \(jsDoc\) Updates](#)
- [Data Package](#)
- [Font APEX Enhancements](#)
- [New Copyright Banner for Application Export](#)

Smart Filters

Smart Filters is a new search component that enables users to quickly narrow data down with filters suggestions or search terms. Developers can use this component to provide users with a simplified search experience that eliminates clutter and provides a single control to instantly find information.

Powerful Search Bar - Smart Filters features a powerful new search bar that provides built-in auto-complete for your filters, supports searching for multiple terms, and provides easy keyboard navigation.

Search Suggestions - Search suggestions are at the heart of Smart Filters. These suggestions are based on the filters you have defined and are displayed as you type or as chips below the search bar.

Suggestion Chips - Filters are evaluated against your data and displayed below the search bar as chips, suggesting the top search filters most appropriate for your data set.

Progressive Web Apps

Your apps can easily be defined as Progressive Web Apps (PWAs) to take advantage of advanced caching and improved performance. These apps can also be installed on your smartphone of choice with device-specific installation instructions.

Improved App Performance - Progressive Web Apps are faster apps. They leverage a special browser cache to store resources more efficiently, resulting in faster page load times. This works even without having to install the app.

Make your APEX application installable - Your application is worthy of being on a device home screen. Give your users the ability to install your app seamlessly.

Custom Offline Page - An APEX PWA offers a customizable offline fallback page.

Universal Theme & UI Updates

Take greater control over your application's user interface with additional component positions across page templates, modal dialog drawers, improved accessibility, smoother page loading, and much more.

The updated Reference App now provides live Template Option previews, documented CSS variables, and a new Theme Version menu in the header to quickly jump to Reference Apps for previous versions of the Universal Theme.

Greater Flexibility in Page Layouts - Enjoy greater control and flexibility over the positioning of page components than ever before. Now you can build more complex page layouts and different types of page components adjacent to each other, or position them anywhere on the page.

Modal Dialog Drawers - There is a new template to render both page and region modal dialogs that can slide in from the sides of your screen, maximizing screen real estate and providing an entirely new user experience for auxiliary actions.

Accessibility Improvements - Universal Theme improves accessibility across the board with appropriate aria-* attributes, more semantic markup, and enhancements that provide a better experience with screen readers.

Faster Page Rendering - Several improvements in page rendering speed and reduced UI flickering yield a smoother page load experience.

Faceted Search Enhancements

Faceted search now has declarative support for multi-value columns, has improved accessibility, and gives you more control over how a facet is displayed.

Multi-Value Facets - Easily create facets for multi-value columns stored as a separated string or a JSON array.

Additional UI Controls - You can now control whether a facet label is displayed for a given facet when filtered. You can also specify an icon that is displayed next to Facet label within the Faceted Search region.

Accessibility Improvements - There are numerous improvements to make faceted search more usable and accessible.

Updated Alert and Confirm Dialogs

Customizable Dialogs - The Alert and Confirm dialogs now have an updated appearance and provide customization options for easily specifying the style, title, icon, and even custom button labels.

Support for Template Directives - The dialog message supports HTML template directives, including client-side substitutions of item references for truly dynamic alerts.

Button Confirmation - You can also trigger a confirmation dialog for any Button by simply toggling the "Require Confirmation" property.

Geocoding and Map Items

Geocode your addresses and display a map as a page item without an API key.

Geocoding and Address Normalization - This new page item that provides a list of possible matches to choose from when a user starts typing an address, and returns the coordinates as well as the normalized address.

Display Mini Maps - The new Display Map item type enables you to quickly visualize a single coordinate on a map, ideal for displaying next to address information.

REST Catalogs and Improvements

Users can now search and browse through a catalog that contains metadata about REST Services and create APEX REST Data Sources based on REST Service metadata within the catalog. In addition, there is built-in pagination support for Simple HTTP REST Data Sources.

Share Catalogs Across Apps - REST Service Catalogs are part of the APEX workspace and are available for use by apps within it.

Easy Export and Import - Catalogs can easily be exported to a single file and import into other workspaces.

URL-based Updating - You can quickly refresh catalogs by pointing to a URL of a catalog export file.

Pagination Support for REST Services - Simple HTTP REST Data Sources can now support pagination schemes enabling pagination in APEX components.

Improved Report Downloads, Subscriptions, and Printing

Images in Report Downloads - Image columns are now supported for downloaded reports where they will be embedded in the PDF, XLSX, or HTML export file.

Download Dialog Improvements - The download dialog now provides an option to Strip Rich Text. In addition, the PDF accessibility property is now stored as a user preference.

Interactive Report Subscriptions - Interactive Report Subscriptions now support all download formats, no longer send email if no rows were found.

Improved Editors

Static File Editor - Enables developers to create, edit and rename static application, workspace, plug-in, and theme files without the need to re-upload the file each time. The feature also includes automatic minification of JavaScript and CSS files, and compilation of LESS files.

Improved Breadcrumb Editor - Improved editing experience in Shared Components that provides multiple conditional breadcrumb entries for a page.

Run Larger SQL in SQL Commands - SQL Commands now supports more than 32k characters. Removed previous limitation of not being able to edit columns that are longer than 32KB. Support large SQL code chunks greater than 32KB for page submit and SQL Commands.

Environment Setup

Environment Banners - Easily tell apart different APEX environments by configuring an Environment Banner at the instance or workspace level (Manage Service → Define Environment Banner).

SAML Authentication - SAML is now a supported authentication scheme that you can configure for both the APEX development environment as well as your own apps from within Administration Services. SAML support requires Oracle Database 19c (Database Release Update 19.9.0.0.0 or newer) or Oracle Database 21c.

Email and Email Template Enhancements

Email Template Support for Send Email Process - The Send Email page process now supports Email Templates with declarative substitutions.

Email Support in Automations - Send Email can now be used for Automations.

Copy Email Templates - Easily copy email templates.

Inline Email Attachments - Inline image attachments for email.

Additional Features

Data Packager - Easily migrate applications from one instance to another and include data in tables. Specify a table or a list of tables for which the data gets exported with an application.

Popup LOV Set Display Value - Set value (Dynamic Action or `apex.item.setValue`) now automatically populates the display value and (if defined) additional outputs.

New Date Picker 'Show-On' attribute - Date Picker now has a "Show On" attribute, to control when the calendar popup display.

New Modal Dialog Event - New "Dialog Closed or Canceled" event executes if a user presses the Escape key or the X button in the dialog.

Copyright Banner in App Exports - Now you can define a copyright banner for your application exports.

New PL/SQL APIs - `apex_debug.get_page_view_id` and `apex_debug.get_last_message_id` link messages written by `LOGGER` to an APEX debug session and show `LOGGER` messages in order.

New JavaScript APIs - New APIs for `mapRegion`, `facetsRegion`, `apex.date`, `apex.items`, `apex.regions` and `apex.env`

JavaScript Library Upgrades

- jQuery 3.6.0
- MarkedJS 3.0.0
- Oracle JET 11.0.0
- PrismJS 1.24.1

JavaScript (jsDoc) Updates

New JavaScript APIs

New namespaces:

- `apex.date`
- `apex.pwa`

New interfaces:

- `colorPickerItem`
- `facetsRegion`
- `mapRegion`
- `numberFieldItem`

New widget:

- `widget.spatialMap`

Function `apex.util.applyTemplate` improvements:

- Improved syntax for the `{if/}` directive described in function `apex.util.applyTemplate`.
- Updated built-in substitutions based on `apex.env`

- Description of property reference syntax improved with clarification of case sensitivity.
- Update description and values for `defaultEscapeFilter` option property.
- Update description of `applyTemplate` ATTR escape-format.

Other Changes

- New properties `items`, `regions`, and `env` added to apex namespace.
- New function `apex.util.escapeHTMLAttr` and updated description for `apex.util.escapeHTML`.
- New function `apex.locale.getDateFormat()` was added to get the Application Date Format defined in an APEX app.
- New item interface methods `isReady` and `whenReady`. New item property `item_type`.
- The second parameter of `apex.item.create` and `apex.region.create` can be a function.
- Description of `apex.region.create` improved.
- Correction to `apex.locale.toNumber` example.
- Correction to description of `apex.locale.formatNumber` `pFormat` parameter.
- Improve `apex.navigation.redirect` example to use `apex.env`.
- Desupported APIs have been removed from the documentation.

Data Package

Supporting Objects now includes a new type of supporting object called Data Package. You can specify a list of tables to select which data to include in your application export.

If the specified tables include features such as Data Redaction, RAS, or VPD, these features also persist in the data export.

Font APEX Enhancements

Icon name changes:

Table Icon Name Changes

| Previous | Change (Current) |
|----------------------|------------------|
| file-json | file-json-o |
| file-csv | file-csv-o |
| file-sql | file-sql-o |
| location-arrow-solid | location-arrow |

Table (Cont.) Icon Name Changes

| Previous | Change (Current) |
|-----------------------|-------------------|
| location-arrow | location-arrow-o |
| location-circle-solid | location-circle |
| location-circle | location-circle-o |
| map-marker-s | map-marker |
| map-marker | map-marker-o |

Table Typo Fixes

| Previous | Change (Current) |
|------------------------------------|------------------------------------|
| emoji-stuck-out-tounge | emoji-stuck-out-tongue |
| emoji-stuck-out-tounge-closed-eyes | emoji-stuck-out-tongue-closed-eyes |
| emoji-stuck-out-tounge-wink | emoji-stuck-out-tongue-wink |

New Copyright Banner for Application Export

Applications are now exported with the new Copyright Banner.

In Application Properties, developers can use the `#APP_NAME#` substitution string to refer to the current application name and the `#YEAR#` substitution string to refer to the current year.

When Copyright Banner is added, it is included at the top of the application export file (full export).

When the application is exported as zip file, the file `copyright.txt` is created separately containing the content of Copyright Banner.

Changed Behavior

Changed behavior in this release includes:

- [Faceted Search Changes](#)
- [Interactive Grid Tabbing into Input Field Cell Selects Current Value](#)
- [Previously Desupported JavaScript APIs Moved to Legacy File](#)
- [Custom Positions for Page Components](#)
- [Faceted Search Region Supports Refresh DA Action](#)
- [JET Library Does Not Load when Faceted Search, Show Charts Set to No](#)
- [Change to Default Value of Zero Count Entries Attribute](#)
- [Accepted Code Size in SQL Commands Enlarged](#)
- [Translation of Runtime Messages into 31 Languages](#)

- [Interactive Report and Classic Report Changes](#)
- [Security Settings Enabled by Default](#)
- [New query parameter p_context added to POST and AJAX requests](#)
- [UI Changes](#)
- [Compatibility Mode](#)
- [Enabling Network Services in Oracle Database](#)

Faceted Search Changes

New and improved features of the Faceted Search region:

- Facets can now have an icon that displays next to the label. See new facet property **Appearance: Icon**.
- In the current facets area the facet label can now be shown before the values on a per facet basis. The region setting Show Facet Name has been removed and there is a new facet setting **Label: Show Label for Current Facet**.
- When there are facets with Display Toggling set to On, the resulting button has been renamed **More Filters** to be clearer for end users (previously the label was More Facets).
- Usability and accessibility improvements including search and filter inputs now use `type=search` for better soft keyboard on mobile devices and ARIA region landmarks for improved screen reader accessibility.

Interactive Grid Tabbing into Input Field Cell Selects Current Value

In Edit mode of interactive grids, users can now tab into a cell and select the current value when the column type uses an input element (such as Text Field or Number Field).

Also, for these same column types, clicking in the cell places the editing caret near to where the user clicked the mouse cursor.

Previously Desupported JavaScript APIs Moved to Legacy File

Several APIs that were desupported in release 20.2 are now moved to the `legacy_18.js` file. You must load this file in your environment to use these functions.

To load the file:

1. In App Builder, view the app, and click **Edit Application Properties**.
2. Click the **User Interface** tab.

3. Under JavaScript, locate the "Include Deprecated or Desupported Javascript Functions" options.
4. Click the **18.x checkbox** to enable.

 **Note:**

Due to some dependencies between some 18.x and pre-18.1 functions, if you previously had only Pre 18.1 checked you may need to also check 18.x now.

Custom Positions for Page Components

General UI Changes

- Renamed "Items" to "Region Body."

Page Designer Rendering Tab

- Renamed "Regions" to "Components."
- Under a region, renamed "Items" to "Region Body."
- Page Designer Layout View.

Set Compatibility Mode to 21.2 to Refresh Universal Theme

In order to refresh any theme in this release, you must set the application Compatibility Mode to 21.2.

APEX Views Changed Behavior

The behavior of the following views has changed in this release:

- View `apex_application_page_regions`:
 - column `display_position` now returns a name of the position.
 - column `display_position_code` now returns the internal code for `display_position`.
- View `apex_appl_theme_display_points` was an unused view and has now been removed.
- Every column named `component_signature` is now deprecated. Those columns will be removed in APEX release 22.1

Faceted Search Region Supports Refresh DA Action

When you refresh a faceted search region with the Refresh Dynamic Action (DA) Action, the region retrieves new counts from the database.

This change was implemented as part of documenting the `facetsRegion` API. This new refresh method is now the same as the `fetchCounts` method (the old refresh method is called `refreshView`). If you were using the previously undocumented `fetchCounts` method, it still functions, but you can now switch to refresh method or use the Refresh DA action.

JET Library Does Not Load when Faceted Search, Show Charts Set to No

When the faceted search region-level setting Show Charts is set No, the JET library is not loaded. The JET library can still be loaded by a different component on the page.

Change to Default Value of Zero Count Entries Attribute

In Page Designer, when you add a facet of type Radio Group, the default for attribute Zero Count Entries is now Disable. This change enables users to more easily change between values once a value has been selected.

Accepted Code Size in SQL Commands Enlarged

You can now run SQL and PL/SQL code that is larger than 32767 bytes in SQL Commands. This is useful for compiling large packages.

In previous releases, code was limited to 32k. Note that the code size for JavaScript (Multi-Lingual Engine) is still restricted.

Translation of Runtime Messages into 31 Languages

APEX now supports the translation of Runtime Messages into 31 languages.

The following languages are supported: Arabic, Brazilian Portuguese, Croatian, Czech, Danish, Dutch, Finnish, French, French - Canada, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Portugal) (pt), Romanian, Russian, Serbian - Cyrillic, Serbian - Latin, Simplified Chinese, Slovak, Slovenian, Spanish, Swedish, Thai, Traditional Chinese, Turkish.

Interactive Report and Classic Report Changes

This release introduces the following changes to interactive and classic reports:

- Only native PDF for interactive reports.

- Always display **View File As** print attribute for interactive and classic reports. This behavior no longer depends on Response Header attribute.
- Print Server Overwrite print attribute removed from interactive and classic reports. Developers can configure a different print server in the application-level print settings.
- Response Header print attribute removed from interactive and classic reports (originally used for FOP based printing).

Security Settings Enabled by Default

Prior to this release, when a new page is created (either during or after app creation), Page Access Protection was set to "Unrestricted" by default.

Now all new pages have Page Access Protection value set to "Arguments Must Have Checksum" by default.

New query parameter `p_context` added to POST and AJAX requests

New query parameter `p_context` is added to POST and AJAX requests. This change helps to pinpoint each URL entry from the the Web Server Access Logs and Error Logs to a specific application, page, and session.

For **page GET** requests, application, page and session details are part of the APEX URL.

For **POST** requests (such as when the page is submitted) and for **AJAX** requests, application, page and session information can be found in the `p_context` query parameter in the URL.

Whether the Friendly URLs attribute is enabled determines what the `p_context` query parameter contains.

If the Friendly URLs is **enabled**, `p_context` contains:

```
app-alias/page-alias/session-id
```

If the Friendly URLs is **disabled** (that is, you are using legacy `f?p` URL Syntax), `p_context` contains:

```
app_id:page_number:session_id
```

Note:

The location of the Web Server Access Logs and Error Logs depends on which Web Server you are using (for example, Apache, Tomcat, Jetty and so on). For more information, see the appropriate web server documentation.

UI Changes

The following changes to the APEX user interface were introduced in this release:

- The homepage layout has been re-arranged. The third column now contains additional information:
 - New Summary Region (previously Dashboard) which now only displays the number of applications, tables, and developers. It no longer shows the number of issues.
 - Workspace Message region always displays with a button to edit the workspace message if the user is a workspace administrator.
 - System Message
 - Resources (previously "Site-Specific Tasks")
 - Available Updates
- Site-Specific Tasks has been renamed to Site-Specific Resources in the Instance Administration. Changes include:
 - Header Menu Bar: Manage Site Tasks is now Manage Site-Specific Resources
 - Page 4050:9: Link in Messages Region
 - Page 4050:17 and 4050:18 (Form and Report for Site-Specific Resources)
 - Update to Workspace Sign-in page to rename Site-Specific Tasks to Resources

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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX 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 APEX raises an error instead of redirecting to the application's home page. If the session setup for an Ajax requests fails, Oracle APEX 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 APEX 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 APEX 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 APEX 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

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

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

Enabling Network Services in Oracle Database

You must enable network services in Oracle Database to send outbound mail, use Web services, or use PDF report printing in Oracle APEX.

When and Why Network Services Must be Enabled

Enabling network services enables support for sending outbound mail in Oracle APEXAPEX, use of Web services in APEX, and PDF report printing with BI Publisher.

By default, the ability to interact with network services is disabled in Oracle Database 11g Release 2 or later. Therefore, if you are running Oracle APEX with Oracle

Database 11g Release 2 or later, you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_210200` database user. 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 web services from APEX.
- Making outbound LDAP calls from APEX.
- PDF report printing with BI Publisher.

 **Note:**

When upgrading APEX on a database 12c or newer, based on the configuration of the old APEX version the upgrade automatically configures Network Services.

 **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 an 11g or 12c database will already have the parameter set properly, but a database upgraded to 11g or 12c from a prior version may not. 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*.

Granting Connect Privileges in Oracle Database 12c or Later

Procedures `CREATE_ACL`, `ASSIGN_ACL`, `ADD_PRIVILEGE` and `CHECK_PRIVILEGE` in `DBMS_NETWORK_ACL_ADMIN` are deprecated in Oracle Database 12c. Oracle recommends to use `APPEND_HOST_ACE`.

The following example demonstrates how to grant connect privileges to any host for the `APEX_210200` database user. 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_210200',
                          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 to servers on the local host only, such as email and report servers.

```

BEGIN
  DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE(
    host => 'localhost',
    ace => xs$ace_type(privilege_list => xs$name_list('connect'),
                      principal_name => 'APEX_210200',
                      principal_type => xs_acl.ptype_db));
END;
/

```

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_210200 user.

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 Page Positions](#)
- [Deprecated Region Positions](#)
- [Custom Page Region Templates with Duplicated Positions Deprecated](#)
- [Legacy Substitution Strings Deprecated](#)

 **See Also:**

Running Advisor to Check Application Integrity in the *Oracle APEX App Builder User's Guide*

Deprecated Page Positions

The following page positions are marked as deprecated and display as "Legacy" in Page Designer:

- Body 1
- Body 2
- Body 3
- After Header
- Before Footer

Deprecated Region Positions

The following region positions used for button positioning are marked as deprecated and display as "Legacy" in Page Designer:

- Top of Region
- Bottom of Region
- Above Region
- Below Region

Custom Page Region Templates with Duplicated Positions Deprecated

Custom page template and custom region templates with duplicated positions are considered deprecated. For example, a region template referencing position #CHANGE# twice is not recommended because that duplicate position causes duplicate DOM IDs.

Legacy Substitution Strings Deprecated

As of this release, the following apex.env substitution strings are deprecated and considered legacy:

- APP_IMAGES
- IMAGE_PREFIX
- THEME_DB_IMAGES

- `THEME_IMAGES`
- `WORKSPACE_IMAGES`

While the legacy substitutions still function, Oracle recommends developers update their environments to use updated substitutions (listed below).

Table Updated apex.env Substitutions

| Legacy | New |
|-------------------------------|------------------------------|
| <code>IMAGE_PREFIX</code> | <code>APEX_FILES</code> |
| <code>WORKSPACE_IMAGES</code> | <code>WORKSPACE_FILES</code> |
| <code>APP_IMAGES</code> | <code>APP_FILES</code> |
| <code>THEME_IMAGES</code> | <code>THEME_FILES</code> |
| <code>THEME_DB_IMAGES</code> | <code>THEME_DB_FILES</code> |

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 JavaScript Functions](#)
- [jQuery UI Deprecated](#)
- [Post Calculation for Page Items Deprecated](#)
- [Show / Hide All Page Items On Same Line attributes Deprecated](#)
- [apex.server Plug-in and Process Function Async Option Deprecated](#)
- [apex.widget.initPageItem Function Deprecated](#)
- [Popup LOV Template Deprecated](#)
- [Based On - Output of PL/SQL Code attribute Deprecated](#)
- [Date Picker \(jQuery\) Deprecated](#)
- [Syntax {COLUMN_NAME}_LABEL in Interactive Grid Icon and Detail Views Deprecated](#)

Deprecated JavaScript Functions

The following functions are deprecated as of this release:

Universal Theme JavaScript API function:

- `apex.theme42.util.mq` (use `apex.theme.mq` instead)

jQuery UI Deprecated

As of this release, 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.

Post Calculation for Page Items Deprecated

The "Post Calculation" functionality of page items is deprecated.

This functionality remains for existing page items where it has been used, but you can no longer set it for new page items nor add it to existing page items where it has not been used in the past.

Show / Hide All Page Items On Same Line attributes Deprecated

In Dynamic Actions, the Show and Hide actions have attributes "Show all page items on same line" and "Hide all page items on same line," respectively. These attributes were designed for forms with a table-based layout. Because Universal Theme no longer uses table-based layout, these attributes are deprecated.

This functionality remains for existing Dynamic Actions where it was set to `Yes`, but developers cannot select it for new Dynamic Actions.

apex.server Plug-in and Process Function Async Option Deprecated

In a future release the `async` option will be ignored and all Ajax requests will be asynchronous.

apex.widget.initPageItem Function Deprecated

The function `apex.widget.initPageItem` is deprecated. Item plug-in creators should use `apex.item.create` instead.

Popup LOV Template Deprecated

The Popup LOV template type is deprecated. A future release of APEX will not use this template to render Popup LOV dialogs.

Based On - Output of PL/SQL Code attribute Deprecated

The selection **Output of PL/SQL Code** of the attribute **Based On** is now deprecated.

Date Picker (jQuery) Deprecated

This release introduces a new Date Picker item type. The old Date Picker item type "Date Picker (jQuery)" is deprecated and should no longer be used. It will be removed in a future release.

Existing apps will not automatically switch to using the new date picker to preserve possible customizations that would no longer work. You can switch all the date pickers in your app to use the new date pickers by using Upgrade Application in the Utilities section of your application in App Builder.

See *Upgrading an Application to Include New Components in the Oracle APEX App Builder User's Guide*.

Syntax {COLUMN_NAME}_LABEL in Interactive Grid Icon and Detail Views Deprecated

The `&{COLUMN_NAME}_LABEL.` syntax which is used to reference the column label in Interactive Grid Detail and Icon views is deprecated.

Instead use `&{COLUMN_NAME}%LABEL.`

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.

- [Component View Tab Desupported](#)

Component View Tab Desupported

The Component View tab in Page Designer is desupported and removed from APEX as of this release.

Fixed Bugs

The following section lists bugs fixed in this release.

Table Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|---|
| 18111142 | ADD 'COMMENTED OUT' BUILD OPTION FOR NEW APPLICATIONS |
| 20693220 | PROPERTY EDITOR > DISPLAY GROUPS HEADINGS ACCESSIBILITY ISSUES |
| 21231428 | INTERACTIVE REPORTS - PAGINATION ROWS PER PAGE INCONSISTENCIES |
| 22713070 | INTERACTIVE REPORT PIVOT COLUMN DOES NOT RESPECT FORMAT MASK |
| 23082839 | PAGE DESIGNER: FAILS WITH ERROR IF PLUG-IN ATTRIBUTE DOESN'T HAVE LOV ENTRIES |
| 23105909 | PAGE DESIGNER: ERROR "FAILED TO EXECUTE DELETE" WHEN DELETING PAGE ITEM |
| 24325678 | CALLING APEX_ERROR.ADD_ERROR DOESN'T STOP EXECUTION OF PROCESSES |
| 25027799 | NO HORIZONTAL SCROLL BAR ON THE MAXIMIZE INTERACTIVE REPORT |
| 25269104 | PAGE DESIGNER DUPLICATE BUTTON OR REGION SHOULD NOT DUPLICATE STATIC ID |
| 25641646 | PAGE DESIGNER: GO TO GROUP MENU SOMETIMES MISSING DISPLAYED GROUPS IN PROPERTY EDITOR |
| 25681898 | INTERACTIVE GRID KEYBOARD REORDER DOESN'T WORK MOVING 2ND TO 1ST COLUMN |
| 26365136 | REPORT IN SUBSCRIPTION OF A TRANSLATED APP HAS COLUMN HEADINGS IN PRIMARY LANGUAGE |
| 27030158 | ERROR IN COPY PROCESS TO NEW PAGE FOR INTERACTIVE GRID - AUTOMATIC ROW PROCESS |
| 27637105 | REMOVE UNUSED 'INITIALIZATION JAVASCRIPT CODE' ATTRIBUTE FROM DYNAMIC ACTIONS 'ACTION' PLUG-INS |
| 27782465 | PAGE DESIGNER: 'BODY' BUTTONS LOSE THEIR POSITION AFTER REGION DUPLICATION |
| 27801912 | INTERACTIVE REPORT HIDDEN COLUMN CANNOT BE ESCAPED WHEN USED IN HTML EXPRESSION |
| 27978977 | SHOW VALUE FOR PERCENT GRAPH IN INTERACTIVE GRID NOT WORKING |
| 28076198 | INTERACTIVE GRID DOUBLE ESCAPE SELECT LIST DISPLAY VALUE ON EDIT |
| 28407772 | ACL FEATURE: SHOULD NOT ALLOW LAST ADMIN TO BE EDITED OR REMOVED |
| 28781408 | PAGE DESIGNER: DUPLICATE INTERACTIVE REPORT OR INTERACTIVE GRID REGION WITH COLUMN GROUP DOES NOT USE NEW COPIED GROUP_ID |
| 29285388 | PAGE DESIGNER DOES NOT RENDER LINK ITEM VALUE CORRECTLY IF ESCAPE CHARACTER USED |
| 29347790 | REPLACE USE OF WITH WHERE USED FOR SEMANTIC IMPORTANCE |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 29838510 | DEV TOOLBAR ERROR BUTTON ADDED MULTIPLE TIMES |
| 30055422 | PAGE DESIGNER: INTERACTIVE GRID ROWID COLUMN REMOVED AFTER ADDING A NEW COLUMN |
| 30180461 | INTERACTIVE GRID IN COLLAPSIBLE REGION SCROLLS PAGE TO TOP WHEN EXPAND |
| 30203115 | ON/OFF LABEL TEXT IS NOT DISPLAYED FOR THE TOGGLE SWITCH |
| 30273768 | ADDING NON-NUMERIC CHARACTER IN INTERACTIVE GRID FILTER RESULTS IN ORA-06502 |
| 30457120 | DEVELOPERS SHOULD NOT BE ABLE TO DELETE SHARED LIST OF VALUES WHICH ARE IN USE |
| 30473121 | INTERACTIVE GRID: ALPHANUMERIC VALUE IS DISPLAYED FOR DATE VALUE IN ACTIONS > FILTER IN REPORT |
| 30500820 | PLUG-IN DYNAMIC ATTRIBUTE ISCHANGED() ALWAYS TRUE |
| 30704900 | APEX_MAIL.SEND THROWS AN ORA-00942: TABLE OR VIEW DOES NOT EXIST - 19CDB |
| 30793064 | UNABLE TO ZOOM IN AND OUT IN MOBILE APPLICATION |
| 30825849 | 'USED IN JAVASCRIPT' FLAG SHOULD AUTOMATICALLY BE SET FOR APEX.POPUP_LOV.* |
| 30889483 | INTERACTIVE GRID HIGHLIGHT NOT REMOVED WHEN CONDITION IS NOT SATISFIED ANY MORE AFTER SAVE |
| 31049514 | AJAX CALLS WRITE NULL USERNAME TO ACTIVITY LOG IF SESSION EXPIRED |
| 31195428 | EMAIL HTML BODY CONTAINS LINES ENDING IN LF AND NOT CRLF |
| 31230889 | LOCALLY DEFINED' LIST OF VALUES PAGE (4000:419) MISSING INTERACTIVE GRID COLUMN LIST OF VALUES |
| 31427803 | PAGE DESIGNER > BUBBLE CHART SERIES LINK > LINK TYPE CAN BE DEFINED TWICE |
| 31472739 | INTERACTIVE REPORT SHOULD RESET PAGINATION WHEN CREATING/SWITCHING TO DIFFERENT VIEW |
| 31493147 | INTERACTIVE GRID ADD ROW IN DETAIL GRID RESULTS IN WRONG ROW SELECTED |
| 31502703 | UPGRADE FROM VERY OLD APEX VERSIONS (2.1) RAISES ORA-932 DURING COPY OF WWV_FLOW_BANNER |
| 31510219 | PAGE DESIGNER: FORM REGION PAGE ITEMS HAVE TO BE UNIQUE |
| 31647113 | INTERACTIVE GRID "FILESIZE" FORMAT MASK RAISES ORA-01481: INVALID NUMBER FORMAT MODEL |
| 31711428 | SOME INTERNAL ERRORS ARE NOT DISPLAYED IN APEX ACTIVITY / ERROR LOGS |
| 31770084 | SAML AUTHENTICATION: ERROR WHEN ATTRIBUTE CONTAINS MULTIPLE ATTRIBUTEVALUE ENTRIES |
| 31778775 | LIFT THE LIMITATION(32K) OF WEB SOURCE MODULES |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 31791922 | INTERACTIVE GRID: DETAIL VIEW AND SINGLE ROW VIEW SHOW NO DATA OR WRONG RECORD |
| 31867300 | APEX QUERY BUILDER DATA COLUMNS CAN BE MOVED ABOVE THE COLUMN HEADING |
| 31908618 | PIVOT FORMAT MASK DROP-DOWN LIST DOES NOT DISPLAY |
| 31937725 | PAGE DESIGNER: LINK BUILDER HIDES INTERACTIVE REPORT SUBSTITUTION WHEN USING ESCAPE MODIFIER FOR VALUE |
| 31964057 | FACETED SEARCH: FACET COUNT DIFFICULT TO UNDERSTAND WITH SCREEN READER |
| 31964540 | SHARED COMPONENTS PAGE: JAWS ISSUE WITH LINKS TO WORKSPACE-SCOPED COMPONENTS |
| 31972352 | BUTTONS CONTAINER > REGION TEMPLATE STRUCTURE ISSUES |
| 32019920 | "NO AUTHENTICATION" AUTH SCHEME SHOULD NOT EXPOSE DB SESSION USER |
| 32028315 | IMPROVE INTERACTIVE GRID CLOB HANDLING |
| 32051430 | DYNAMIC ACTION ON BUTTON POSITIONED TOP AND BOTTOM - ONLY WORKS FOR TOP |
| 32112565 | PAGE DESIGNER: CAN'T CREATE A SUB REGION WITH DRAG AND DROP ANYMORE |
| 32118618 | WIZARD TEMPLATES ARE MISSING ARIA-CURRENT ATTRIBUTE FOR THE CURRENT PAGE IN THE LIST OF STEPS |
| 32123748 | INTERACTIVE REPORTS: VIEW MODE BUTTONS ARE MISSING ARIA-PRESSED ATTRIBUTE |
| 32127807 | EMBEDDED CODE: DOES NOT SHOW PAGE LEVEL ATTRIBUTES |
| 32139056 | BREADCRUMB TEMPLATES NEED ACCESSIBILITY IMPROVEMENTS |
| 32140767 | PERFORMANCE: CHECK WORKSPACE LIMIT TAKES REALLY LONG |
| 32179948 | INTERACTIVE GRID: DOWNLOADS NOT WORKING IN SAFARI BROWSER |
| 32214026 | USE OF HOME_LINK. SUBSTITUTION DOES NOT REPLACE &APP_ID. AND GIVES INVALID URL |
| 32221558 | APEX INTERACTIVE GRID DOWNLOAD FUNCTION ISSUES |
| 32263821 | SESSION TIMEOUT ALERTS DO NOT USE TIMEOUT URL OVERRIDES IF DEFINED |
| 32305386 | INTERACTIVE REPORT: COLUMN SPAN ON THE CONTROL BREAK ROW IS WRONG IF REPORT HAS A LINK COLUMN |
| 32317483 | ARIA-MODAL IS MISSING IN WIZARDS OF APP BUILDER |
| 32393433 | SELECT LIST DISPLAYS WRONG VALUES WHEN ITEM IS READ ONLY |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 32393990 | USER APPS LACK ALT TEXT FOR LOGOS OF TYPE IMAGE OR IMAGE AND TEXT |
| 32402136 | FORM REGION: CHECKSUM ERROR RAISED WHEN "ROW VERSION COLUMN" WITH QUERY ONLY = YES IS USED |
| 32440879 | BUILD OPTION IGNORED FOR AJAX CALLBACKS |
| 32463547 | MAP REGION: "RECTANGLE ZOOM" FEATURE NEEDS KEYBOARD ACCESSIBILITY |
| 32465921 | LANGUAGE SELECTOR NOT DISPLAYED WHEN NLS_CHARACTERSET IS NOT AL32UTF8 |
| 32471840 | IF COLUMN NAME HAS POSTFIX YN WITH CHECK CONSTRAINT VALUES, QUICK SQL GENERATES COLUMN WITH LENGTH OF 1 ALWAYS |
| 32496208 | WORKSPACE ADMIN DEBUG MESSAGES SHOULD SHOW PERFORMANCE BAR CHART |
| 32500177 | APEX CAN NOT DISPLAY ADDITIONAL LANGUAGE WHEN USING UTF8 FOR THE DATABASE CHARACTER SET |
| 32517202 | CREATE PAGE WIZARD: DISPLAY OF TABLES TAKES SOME TIME IN TABLE SELECT LIST |
| 32567443 | NEW DATA LOADING: CLICKING 'APPLY CHANGES' IN EDIT DATA PROFILE DISCARDS THE UNSAVED CHANGES IN DATA DEFINITION PAGE |
| 32577838 | ALLOW EMAIL ATTACHMENTS INLINE FOR EMBEDDED IMAGES |
| 32588577 | EDIT REST SYNCHRONIZATION TABLE OWNER IS NULL IF OWNER NOT VALID WORKSPACE SCHEMA |
| 32598374 | PDF EXPORT: INFINITE LOOP WHEN PAGE HEADER TEXT LONGER THAN 1 PAGE |
| 32609135 | RATING FOR FEEDBACK PAGE DOESN'T RENDER CORRECTLY |
| 32612937 | EDITING A LIST ENTRY - 'LIST ENTRY CURRENT FOR PAGES TYPE' BEHAVIOURS IS NOT CORRECT. |
| 32613703 | REST DATA SOURCE DISCOVERY DOES NOT WORK WITH "POST" ENDPOINTS |
| 32617125 | REST SOURCE PLUG-IN DEVELOPERS NEED "REMOTE DATA TYPE" DATA PROFILE ATTRIBUTE |
| 32623459 | DISPLAY ISSUES WHEN A REGION TITLE CONTAINS HTML, WHERE REGION TEMPLATES HAVE ARIA-LABEL="#TITLE#" |
| 32625558 | LOGO EDITOR NOT USING FULL HEIGHT OF DIALOG |
| 32645363 | APEX INTERACTIVE GRID - COLUMN GROUPS ARE DISPLAYED INCORRECT |
| 32650030 | FORTIFY SCAN: CODE IN THEME ROLLER REQUIRES VALIDATION WHEN USING LAMBDA FUNCTION |
| 32654932 | DATA EXPORT: WRONG COLUMN HIGHLIGHTS APPLIED |
| 32661392 | PL/SQL PROCESS AND VALIDATION RAISES ORA-06502 IF A FORM REGION IS ASSIGNED AS EDITABLE REGION |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 32675040 | SOCIAL SIGN-IN: MISLEADING ERROR WHEN THERE IS A PROBLEM WITH DISCOVERY URL |
| 32675487 | INTERACTIVE GRID TEMPLATE DIRECTIVE LOOP IS BROKEN |
| 32680930 | PJSON EXPORT: COLUMN WIDTHS ARE MISSING IN METADATA |
| 32716823 | AZURE SOCIAL SIGN-IN: ORA-06533: SUBSCRIPT BEYOND COUNT WHEN USERNAME ATTRIBUTE IS INCORRECT |
| 32732351 | ORA-12012: ERROR ON AUTO EXECUTE OF JOB "APEX_180200"."ORACLE_APEX_DAILY_MAINTENANCE" |
| 32736736 | CARDS: TOTAL ROW COUNT IS NOT DISPLAYED IF CARDS PER PAGE >= TOTAL NO OF ROWS |
| 32755401 | CARD TITLE OF SINGLE LETTER 'N' OR 'F' IS COMPLETELY IGNORED |
| 32758715 | ACCESS TO V\$ VIEWS WITH COL=SYS_CONTEXT(...) CAN BE INEFFICIENT |
| 32774466 | UNIVERSAL THEME: TREE-BASED LEFT NAVIGATION: TREE WIDGET MALFORMED |
| 32783537 | FORM REGION: CUSTOM "LOCK ROWS" PL/SQL CODE IS NOT EXECUTED |
| 32792411 | NOT POSSIBLE TO INSERT LINKS IN CK EDITOR 5 IN INLINE DIALOG |
| 32793005 | CARD REGION: IMAGE FROM BLOB COLUMN DOES NOT WORK WITH SQL QUERY AND ROWID AS PRIMARY KEY |
| 32794279 | APEX UPGRADE RUNS INTO DBA_REGISTRY FK ERROR (SYS.DEPENDENCIES_FK) |
| 32794478 | INTERACTIVE GRID MULTIPLE LEVEL STACKED MASTER DETAIL UNWANTED SCROLL TO TOP |
| 32796567 | QUERY FOR REPORT OF UNINDEXED FOREIGN KEYS ON 4500:704 IS NOT ACCURATE |
| 32799581 | INTERACTIVE GRID MASTER DETAIL ADD ROW IN DETAIL WHEN MASTER ROW DELETED GIVES ERROR |
| 32803343 | REST ENABLED SQL PROCESSING FAILS WHEN "SESSION INIT CODE" IS USED AND USED MORE THAN ONCE ON A PAGE |
| 32803727 | INTERACTIVE GRID: PRINT ATTRIBUTES NOT EXPOSED IN VIEWS |
| 32805143 | OBJECT BROWSER: COMPOUND TRIGGERS ARE DISPLAYED MULTIPLE TIMES |
| 32806288 | THEME ROLLER: SAVE/SAVE AS BUTTONS SHOW WEIRD BEHAVIOR |
| 32806311 | THEME ROLLER: EMPTY CSS FILES ARE GENERATED ON THEME SAVE WITH NO CSS STYLES |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 32814751 | MAP REGION RETURNS MISLEADING MESSAGE "JSON.WRITER.CLOSE_OBJECT" WHEN GEOJSON CONTENT IS INVALID |
| 32815068 | PAGE DESIGNER MAP REGION COLUMN MAPPING IS CLEARED WHEN THE SQL QUERY CHANGES |
| 32815260 | HELP TEXT FOR THEME STYLE CSS CLASSES IS INCORRECT |
| 32815932 | IMPORT APP: WIZARD ASKS FOR CREDENTIALS WHEN EXPORT DOES NOT CONTAIN CREDENTIALS |
| 32816757 | MAP REGION: POP UPS BEING CUT-OFF WHEN A POINT IS TOO CLOSE TO THE MAP'S EDGE. |
| 32816875 | MAP REGION: POP UPS ARE NOT HIDDEN AFTER TOGGLE LAYER LEGEND CHECKBOX TO OFF |
| 32825018 | DATE PICKER: SETTING SHOW TIME=ON SOMETIMES INCORRECTLY ADDS HH24:MI |
| 32825390 | MAP REGION: PAGE DESIGNER AND WIZARDS DO NOT DETECT SDO_GEOMETRY WHEN OTHER OBJECT TYPE COLUMNS ARE SELECTED |
| 32825619 | DATE PICKER IN INTERACTIVE GRID: SETTING TIME=ON DOES NOT AUTOMATICALLY ADD HH24:MI LIKE PAGE ITEMS |
| 32825697 | CODE EDITOR DOES NOT MARK NONEXISTENT PAGE ITEMS IF IN LOWERCASE |
| 32828261 | DESUPPORTED TEXTFIELD WITH CALCULATOR NOT MIGRATED TO TEXTFIELD |
| 32828722 | THEME ROLLER: THEME STYLE SELECTION IS NOT PRESERVED ON PAGE NAVIGATION |
| 32830469 | MAP REGION: NULL COORDINATE DATA IS TREATED DIFFERENTLY FOR SDO_GEOMETRY VS. TWO NUMBER COLUMNS |
| 32831880 | DATA PROFILE: CANNOT CREATE A SQL EXPRESSION COLUMN WHEN ANOTHER "JSON DOCUMENT" COLUMN IS PRESENT |
| 32833517 | APEX_DATA_PARSER.PARSE FAILS WITH ORA-12728 IN THE CA-FR LOCALE |
| 32850331 | SOCIAL SIGN-IN: UPDATE FACEBOOK API VERSION |
| 32860369 | XLSX EXPORT: ERROR OPENING FILE IF COLUMN HEADING STARTS / ENDS WITH A SPACE |
| 32861547 | APEX_DATA_PARSER ERRORS OUT WITH ORA-06502 IF FIRST ROWS CONTAIN UNICODE CONTENT LONGER THAN 128 BYTE |
| 32871688 | DICTIONARY VIEW APEX_APPLICATION_TRANS_DYNAMIC DOES NOT RETURN ANY ROWS |
| 32872548 | FORM REGION: NO LOST UPDATE DETECTION FOR DELETE OPERATION WITH ROW VERSION COLUMN |
| 32872623 | POPUP LOV: DISPLAY ISSUE WITH NULL DISPLAY VALUE AND FLOATING LABEL. |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|--|
| 32886864 | DATA LOADING PAGE PROCESS RAISES ERROR IF SOURCE DATA TYPE SET TO SQL QUERY |
| 32888337 | APEX_ESCAPE.HTML_ATTRIBUTE DOES NOT HANDLE UNICODE CHARACTERS THAT TAKE 2 UTF-16 CODE POINTS |
| 32892661 | JET RANGE CHART: SUPPORT ORIENTATION, LINE TYPE, AND MARKER |
| 32898202 | BROKEN EDIT LINK IN 'GRID EDIT OF ALL ITEM LABELS' |
| 32900598 | CREATE APP WIZARD: CREATE MAP PAGE ON A VIEW THROWS ORA-01403 ERROR FOR AJAX REQUEST |
| 32900887 | INTERACTIVE GRID: DOWNLOAD HAS WRONG COLUMN ORDER |
| 32902486 | CARDS REGION USING TITLE OR SUB_TITLE COLUMN ALIAS FAILS RENDERING |
| 32920967 | SUPPORTING OBJECT BASED ON TABLE DATABASE OBJECTS DO NOT RESPECT DEFAULT ON NULL IN GENERATED SCRIPT |
| 32929433 | JSON ERROR IN PAGE DESIGNER |
| 32933786 | APEX_DATA_PARSER.GET_COLUMNS ALWAYS CONTAINS DEFAULT NLS DECIMAL CHAR FOR NUMBER COLUMNS |
| 32935317 | POPUP LOV HAS UNNECESSARY EXTRA ACCESSIBILITY ROLE=GROUP |
| 32945308 | APXREMOV.SQL: ORA-65040 WHEN DROPPING PUBLIC SYNONYMS |
| 32955782 | SQL WORKSHOP DATA UNLOAD TO TEXT FAILS WHEN A COLUMN NAME HAS MORE THAN 30 BYTES |
| 32960270 | XLSX EXPORT: ERROR ON OPENING WHEN TEXT CONTAINS A CONTROL CHARACTER |
| 32970879 | NUMBER FIELD AUTO CHANGE DIGITS TO ZEROS LOSS OF PRECISION ON LARGE NUMBERS |
| 32972874 | APEX_DATA_PARSER DOES NOT DETECT SEPARATOR AND ENCLOSED CHARS FOR FILES ENCODED AS AL16UTF16LE |
| 32973256 | DATA LOADING LOG ERROR TO COLLECTION GENERATES PAGE WITH ERRORS REPORT REGION QUERYING EMPTY COLLECTION NAME |
| 32976595 | FACETED SEARCH: CASCADING LOV FACETS DON'T WORK IF COMPUTE COUNTS IS OFF FOR ALL FACETS |
| 32981207 | TEXT MESSAGE GRID EDIT DOESN'T UPDATE WHEN A TEXT MESSAGE IS ADDED |
| 32987135 | CANNOT EXPORT SHARED COMPONENT EMAIL TEMPLATES |
| 32988581 | REQUIRED - FLOATING ITEM TEMPLATE HAS ACCESSIBLE BUT UNLABELED ELEMENT |
| 32990340 | APEX_DATA_PARSER DOES NOT DETECT "2018-09-25T09:10:34.000+00:00 " AS TIME STAMP WITH TIME ZONE |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|---|
| 32992358 | SQL WORKSHOP LOAD INTO NEW TABLE CUTS OFF CLOB COLUMNS AT 1000 CHARS FOR GEOJSON FILES |
| 32992423 | APPLICATION DATA LOADING THROWS ORA-06592 IF DATA PROFILE COLUMN CONTAINS SDO_GEOMETRY COLUMN |
| 32999325 | MAP REGION: "CIRCLE TOOL" FEATURE NEEDS KEYBOARD ACCESSIBILITY |
| 32999363 | JET CHART: GANTT CHART COLORS NOT CUSTOMISABLE WITH UNIVERSAL THEME 21.1 |
| 33005088 | INTERACTIVE GRID SHOWS ELLIPSIS AFTER CHECKBOX IN SOME CASES ON CHROME BROWSER |
| 33005100 | CREATE REST DATA SOURCE CAN THROW ORA-01422 IF MULTIPLE "AUTHENTICATION" REMOTE SERVERS EXIST |
| 33012448 | SESSION STATE IN AUTOMATION ACTION NOT AVAILABLE WHEN CALLED BY APEX_AUTOMATION.EXECUTE FOR QUERY CONTEXT |
| 33012554 | ORA-06592 ERROR ON COPY PAGE COMPUTATIONS |
| 33014279 | LOGO EDITOR IS MISSING WHEN THEME SELECTED HAS NO THEME STYLES |
| 33014762 | APEX_DATA_PARSER SOMETIMES RETURNS EXCEL NUMBERS WITH MANY FRACTIONAL DIGITS |
| 33025319 | INCORRECT DATE CONVERSION WHEN LOADING FROM XML |
| 33031528 | SQL COMMANDS DESC PICKS WRONG OBJECT IF THERE IS NAMESPACE COLLISION |
| 33063434 | APPLICATION IMPORT FAILS WITH "GET_BLOCK" ERROR IF APPLICATION COMMENT CONTAINS MANY UNICODE CHARACTERS |
| 33090860 | USE DEFAULT EMAIL FROM IN TEAM DEVELOPMENT NOTIFICATIONS |
| 33096769 | SELECTING "JSON" DATA TYPE RAISES VALUE_ERROR WHEN DOCUMENTS LARGER THAN 4K ARE CONTAINED |
| 33103243 | APEX_DATA_PARSER RETURNS TOO STRICT FORMAT MASKS FOR TIMESTAMP WITH TIME ZONE COLUMNS |
| 33104296 | RANGE FACET WITHOUT LOV DOES NOT APPEAR UNDER CURRENT FACETS |
| 33105381 | OBJECT BROWSER SHOWS INCORRECT OBJECT OWNER FOR SYNONYMS |
| 33105596 | ORA-01467: SORT KEY TOO LONG WHILE TRYING TO UPGRADE APEX FROM THE VERSION 20.2 TO 21.1 |
| 33109708 | DATE PICKER: FLOATING LABEL ISSUES |
| 33110475 | DATE PICKER: FORMAT MASK CONTAINING 'MON' CAUSES ISSUE WITH JET LENIANCY PARSING |
| 33110591 | ISEMPTY() SHOULD BE IMPLEMENTED IN WIDGET.POPUPLOV.JS |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|-------------------|---|
| 33114296 | CREATE DATA LOADING WIZARD DOES NOT SET "HAS_TIME_ZONE" DATA PROFILE FLAG |
| 33114751 | THEME ROLLER: STRING SUBSTITUTION NOT PERFORMED ON MIXED ENTRIES |
| 33119940 | INTERACTICE REPORT ON "ORDS" REST SOURCE THROWS HTTP ERROR FOR "IN" FILTER BASED ON LOV COLUMN |
| 33126186 | SPOTLIGHT SEARCH SHOWS THE OPTION TO EDIT A PAGE THAT DOESN'T EXIST |
| 33131188 | SQL WORKSHOP LOAD INTO EXISTING TABLE: CANNOT LOAD INTO TIMESTAMP WITH LOCAL TIME ZONE COLUMNS |
| 33132344 | FACETED SEARCH NEEDS ACCESSIBILITY IMPROVEMENTS WITH LANDMARKS |
| 33136033 | CREATE FORM ON PROCEDURE WIZARD CONFUSES STANDALONE AND PACKAGED PROCEDURES WITH SAME NAME |
| 33141090 | COPY PAGE DOES NOT ADJUST PAGE ITEM NAMES USED AS REGION SOURCE WHERE CLAUSE |
| 33142547 | INITIALIZE WORKSPACE IN APEX_WEB_SERVICE IF NOT DONE BY THE CALLER |
| 33143830 | REQUEST VALUES FOR FORM REGION DML ACTIONS ("CREATE","SAVE", ...) ARE NOT EXPLAINED IN PAGE DESIGNER HELP |
| 33146606 | CREATE APP > FEATURE > ACTIVITY REPORT > TOP USERS REPORT DISPLAYS OUT OF STYLE IN VITA DARK |
| 33150006 | MAP REGION THROWS ORA-1403 IF DATA SOURCE IS AT REGION LEVEL AND MORE THAN ONE LAYERS REFERENCE IT |
| 33171015 | EDIT EMAIL TEMPLATE PAGE (4000:4861) DOES NOT PROPERLY HANDLE "INVALID PLACEHOLDERS" |
| 33176816 | "MEDIA LIST" LIST TEMPLATE NEEDS ACCESSIBILITY IMPROVEMENTS |
| 33181189 | DIALOG RAISES ERROR WHEN OPENED AND CLOSED IMMEDIATELY |
| 33183675 | SYS_CONTEXT('APEX\$SESSION','APP_SESSION') RETURNS NULL FOR FILE UPLOAD |
| 33185537 | BUTTON TEMPLATE - TEXT WITH ICON WITH TEMPLATE OPTION 'HIDE LABEL ON MOBILE' IS INACCESSIBLE |
| 33210261 | APEX SPOTLIGHT SEARCH LOST FOCUS ON REOPEN |
| 33235891 | AFTER UPGRADE TO APEX 20.2 FUNCTION STOPPED WORKING IN SHORTCUTS |
| 33240068 | CREATE APP WIZARD DOESN'T AUTOMATICALLY SET APP DOCUMENT DIRECTION TO RIGHT-TO-LEFT IF LANGUAGE SELECTED IS RIGHT-TO-LEFT |
| 33254100 | APEX_LANG.PUBLISH_APPLICATION FAILS ON RUNTIME ONLY BECAUSE OF DEPENDENCY TO WWV_FLOW_PLUGIN_DEV |

Table (Cont.) Fixed Bugs in Oracle Application Express 21.2

| Bug Number | Description |
|------------|---|
| 33255068 | CANNOT IMPORT AN APP IF EXPORT FILE INCLUDES PUBLIC INTERACTIVE GRID REPORTS (BUG 28012212 REGRESSION) |
| 33262463 | CLICKING "SAVE" OR "SAVE AND RUN" ON REST SRC SYNC PAGE CLEARS "USE SYNC TABLE" ATTRIBUTE FOR REGIONS |
| 33262470 | APEX_REST_SOURCE_SYNC: SYNCHRONIZE_DATA, DYNAMIC_SYNCHRONIZE_DATA AND GET_LAST_SYNC_TIMESTAMP PROCEDURES SHOULD HAVE P_APPLICATION_ID PARAMETER |
| 33265624 | REST DATA SOURCE: DATA PROFILE COLUMN SHOULD SUPPORT "CLOB" DATA TYPE ON 18C DATABASES |
| 33269858 | AJAX CALLBACK WITH LOCATION = REST ENABLED SQL FAILS WITH ORA-06592 |
| 33270049 | CREATE REPORT WITH FORM PAGE WIZARD DOES NOT PRE-POPULATE COLUMNS FOR THE LOCAL TABLE IF TABLE NAME ENTERED MANUALLY |
| 33271250 | SPOTLIGHT SEARCH RESULTS HAVE WRONG ORDER |
| 33275993 | DISABLE TOOLTIPS IN PAGE DESIGNER BY DEFAULT |
| 33285690 | EXTEND BLOCKED EMAIL DOMAINS ATTRIBUTE TO SUPPORT SETTING PERMITTED EMAIL DOMAIN |
| 33287299 | WORKSPACE STORAGE REQUESTS SHOULD ALLOW FOR A LIMIT SPECIFIED AT THE INSTANCE LEVEL |
| 33307521 | CREATE APP WIZARD - ADD TIMELINE, WIZARD PAGE TYPES RAISE NOT A VALID TYPE ERROR |
| 33309808 | SQL WORKSHOP CREATE TABLE HIDES PRECISION, SCALE, NOT NULL, IDENTITY COLUMNS IF PAGE VALIDATION RAISES |
| 33313833 | CREATE FEATURE PAGES CREATES PAGE WITH UNNECESSARY WARN ON SAVE ENABLED |
| 33332500 | SUBSTITUTION #PRISMJS_DIRECTORY# IS MISSING |
| 33336777 | CARD REGION SPAMMING POST WWV_FLOW.AJAX AFTER SESSION INVALIDATES |
| 33359331 | SPOTLIGHT SEARCH DOES NOT SHOW "GO TO PAGE" OPTION WHEN USING DASH IN SEARCH TERM |
| 33369321 | MAP REGION - CIRCLE TOOL DOESN'T RETURN COORDINATES OF DRAWN CIRCLE |
| 33374210 | APP EXPORT IS MISSING PAGE TEMPLATE PRESETS |
| 33384701 | WHEN SCROLL DOWN IN A BIG GRID, CONTROL BREAK NAMES ARE NOT DISPLAYED |
| 33401852 | EXPORT WITH ORIGINAL IDS CAN CORRUPT EXPORT FILE IF APPLICATION HAS A REMOTE PRINT SERVER DEFINED |

Open Bugs and Known Issues

This section describes bugs and known issues for Oracle APEX release 21.2.

 **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-212-known-issues.html>

- [Known Issue using 'Source Display' region type plug-in in previously installed Sample Apps](#)
- [Known Issue for Item and Region Plug-in Visibility During Initialization](#)
- [Known Issue with New Version Date Picker in Universal Theme 1.5 and Earlier](#)
- [Known Issue using Code Editor in Safari 13](#)
- [Known Issues for jQuery UI and jQuery Upgrade](#)
- [Interactive Grid support for REST Enabled SQL](#)
- [Group By Component Type mode prevents Default View](#)
- [Known Issues for RESTful Services and Oracle REST Data Services \(ORDS\)](#)

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**.

Known Issue for Item and Region Plug-in Visibility During Initialization

Developers should avoid reliance upon the current behavior of the Region Display Selector and Tabs Container template (tabs), where all the tab contents are visible briefly during page load.

This behavior will change in a future release.

Known Issue with New Version Date Picker in Universal Theme 1.5 and Earlier

Issue

There are display issues with the new date picker when used in combination with Universal Theme version 1.5 (shipped with APEX 20.1) and older.

Resolution

If your app is using Universal Theme 1.5 or earlier, first refresh your Universal Theme to the latest version before using or migrating to the new date pickers.

Known Issue using Code Editor in Safari 13

Issue

There is a known issue with using the Code Editor in the APEX development environment in Safari 13 where the editor is unusable. This affects all places where you can enter code, including SQL Commands.

Resolution

Upgrade to Safari 14 or use a different supported browser.

Known Issues for jQuery UI and 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 Oracle APEX release 18.1. You must update the JavaScript to only use jQuery 3.5+ 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/>

jQuery UI 1.12.x has changed the folder structure and files that make up the library compared to version 1.10.4. If you have direct references to any of the old file filenames, you must update them to the new name. For example, if you previously referenced the tabs widget with `#JQUERYUI_DIRECTORY#ui/#MIN_DIRECTORY#jquery.ui.tabs#MIN#.js`, you must change it to `#JQUERYUI_DIRECTORY#ui/widgets/#MIN_DIRECTORY#tabs#MIN#.js`.

The Oracle APEX specific bundle `jquery-ui-apex[.min].js` that loads by default for APEX desktop UI pages (either as `jquery-ui-apex.js` or as part of `desktop[_all].min.js`) includes all the core files, the drop effect, and the following widgets:

- button
- checkboxradio
- controlgroup
- datepicker
- dialog
- draggable
- droppable
- resizable
- selectable
- sortable
- tooltip

This is essentially the same set as in 1.10.4 with the addition of sortable. If you have a separate reference to sortable, you can remove it.



See Also:

[JET v4.2.0 Release Notes](#)

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.

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.

Known Issues for RESTful Services and Oracle REST Data Services (ORDS)

Customers using Oracle APEX 18.1 and Oracle REST Data Services 18.1 may encounter the following issues when developing and deploying RESTful Services.

- [Issue when Migrating Application Express RESTful Services with a Null URI to ORDS](#)
- [Issue when Workspace Name Differs From First Provisioned Schema Name](#)
- [Issue when Using SQL Developer or SQL Scripts to Enable ORDS on an Application Express 18.1 or later Schema](#)

Issue when Workspace Name Differs From First Provisioned Schema Name

Issue

This issue affects all releases of Oracle REST Data Services **except** 17.4.1 and 18.2 or later and all releases of APEX (ORDS services can be created by SQL Developer or an API). This issue exists for services created in the First Apportioned Schema of a workspace when the workspace name and schema name are different.

Due to an error in the way older releases of Oracle REST Data Services retrieve information about the APEX environment, Oracle REST Data Services cannot serve ORDS Based RESTful Services if a given workspace name does not match the first provisioned schema name. This error was corrected in Oracle REST Data Services 17.4.1 but regressed in Oracle REST Data Services 18.1.

The following examples describe the issue:

- A user has existing APEX Based RESTful Services and migrates them to Oracle REST Data Services, then modifies the ORDS Based RESTful Services definition. If the user calls the services and expects the new logic to perform, instead the older APEX Based RESTful Services are still called. If the user then goes to the APEX Based RESTful Services page, deletes the original service, and runs the service expecting to call the ORDS service, the user instead gets a 404 error.
- If a user creates new ORDS Based RESTful Services in the first provisioned schema but does not have corresponding APEX Based RESTful Services, a 404 error results when the user calls the services.

There is no supported resolution at this time.

Issue when Migrating Application Express RESTful Services with a Null URI to ORDS

Issue

Prior to 5.1, the APEX RESTful Services interface enabled users to create RESTful service modules with a null URI Prefix (users could also create multiple modules with null URI Prefixes). The URI templates in all modules had to be unique in order to share the null URI Prefix across the services.

Example Module Definitions with Null URI Prefixes

Consider the following definitions:

Module 1

Name: MyMod1
URI Prefix: NULL


```
URI Templates: /Template1
               /Template2
```

Module 2

```
Name:          MyMod2
URI Prefix:    NULL
```

```
URI Templates: /Template3
               /Template4
```

In effect, these definitions create a single virtual service with four templates with *null* for the URI Prefix. These can be called in the following ways:

```
http://server.com/ords/mySchema/Template1
http://server.com/ords/mySchema/Template2
http://server.com/ords/mySchema/Template3
http://server.com/ords/mySchema/Template4
```

Where:

- `http://server.com` - the **server URL**.
- `ords` - the **ORDS alias**.
- `mySchema` - the **Path Prefix**.
- `null` - the **null Module URI Prefix**. Does not appear in the call, but is processed by the services.
- `Template1` - the **URI Template**.

While the ability to create null URI Prefixes was disabled in APEX 5.1, legacy services that were defined in prior releases were migrated and functioned as long as they were not deleted. However, when migrating these services to Oracle REST Data Services, the ORDS-based data model does not accept multiple modules with duplicate URI Prefixes (including null prefixes).

The logic to migrate APEX-based RESTful Services to Oracle REST Data Services in APEX 18.1 is a simple pass-through to an Oracle REST Data Services procedure (introduced in Oracle REST Data Services 17.4.1). However, the logic of that procedure fails to process multiple modules with a null base path. Users in this situation who try to migrate to Oracle REST Data Services encounter a "Duplicate Value" and throw an `ORA-0001` error (Oracle bug 27916570).

Resolution

Logic added to the migration procedure merges all modules that have null URI Prefixes. The rules are as follows:

Oracle REST Data Services 18.2

All affected modules collapse into a single ORDS-based module named `merged.apex.rest.services`

If **any** of the APEX-based modules being merged are published, the new merged module publishes.

If **none** of the APEX-based modules being merged are published, the new merged module does not publish.

All **roles** associated with APEX-based modules being merged are assigned to the new merged module.

The **pagination size** of the merged module is set to the largest pagination size in the modules being merged.

For APEX-based modules with null URI Prefixes that also have duplicate URI templates, the following occurs:

- The **most recently updated** template maintains the duplicate URI.
- All other templates are given the prefix `dup001_*`
- The comment for the template contains: 1) the original module name that it migrated from, and 2) the original Template URI.

Oracle APEX 18.1

If you have **one module or none** with a null URI Prefix, the services migrate successfully regardless of your release of Oracle REST Data Services (the migration is only available in Oracle REST Data Services 17.4.1 or later).

If you have **two or more modules** with a null URI Prefix, one of the following occurs:

- If you have Oracle REST Data Services 18.2 or later, the modules migrate using the rules above.
- If your Oracle REST Data Services release is older than 18.2, a warning message displays and you cannot migrate your services to Oracle REST Data Services until you upgrade to 18.2 or later.

Issue when Using SQL Developer or SQL Scripts to Enable ORDS on an Application Express 18.1 or later Schema

Issue

This issue affects systems running ORDS 17.4 or prior and Oracle APEX 18.1 or later.

This issue only affects schemas that are assigned to an APEX workspace.

The issue occurs when you use SQL Developer or SQL Scripts (however, not RESTful Services in SQL Workshop) to enable ORDS for a schema, when that schema is also assigned to an Application Express Workspace.

RESTful Services ensures that the `ORDS_SCHEMA_ALIAS` and the `APEX_PATH_PREFIX` synchronize. However, when ORDS enables a schema using another method, the `APEX_PATH_PREFIX` does not sync. When these two items are out of sync, ORDS returns a 404 error when attempting to access ORDS services defined within the schema.

Resolution

To sync the `APEX_PATH_PREFIX` with the `ORDS_URI_PREFIX`:

1. In APEX, click **SQL Workshop** then **RESTful Services**.
2. Click the **Configure** button to launch the ORDS Schema Attributes modal dialog.
3. For Schema Alias, select the alias.
4. Click the **Save Schema Attributes** button.

This sets the same value for both the `ORDS_SCHEMA_ALIAS` and the `APEX_PATH_PREFIX`.

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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

- `ORA_WWV_apex.builder.devToolbar.grid` - This stores the current setting of the Development Toolbar's Show Layout Columns option.
- `ORA_WWV_apex.builder.themeRoller.application id.*` - This stores settings of the Development Toolbar's Theme Roller popup.
- `.4000.4500.*` - This stores the current tab in each of the tab sets of Page Designer.
- `APEX.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.
- `.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.
- `.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.

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.useComponentView` - This stores the users preference for the Page Designer's Component View tab.
- `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 the *Oracle APEX API Reference*.

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