

ORACLE

# Oracle APEX 23.2

New Features

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**Name**

Presenter's Title

Organization, Division or Business Unit

Month 00, 2024



*“ We're now building a lot of our applications in **APEX**. And our productivity gains are, again, a factor of **10**. And we build the applications in **one tenth** the time, or **one tenth** the amount of people, or at **one tenth** the cost. But these are not typical **low-code** applications. These are applications that can scale to **millions** of users and all over the world.”*

- Larry Ellison

*Founder & CTO, Oracle*



# What's New in Oracle APEX 23.2?

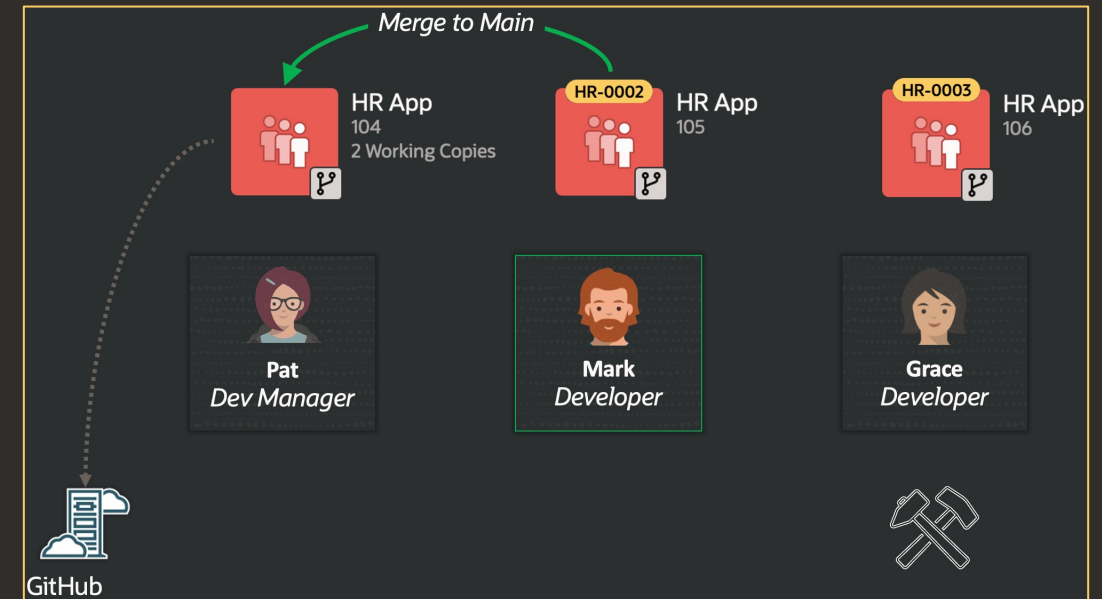
- Collaborative Development with Application Working Copy
- End-to-End Process automation with native workflow
- New and Updated Components
- Developer Experience
- General Builder Improvements
- Additional Updates and Enhancements



[apex.oracle.com](https://apex.oracle.com)

# Application Working Copy

- Enables **multiple developers** to **work on different features in isolation of each other** on the same application and then periodically merge their changes
- Beneficial for **single developers** who already have an application in production and want to **keep new changes separate from** application maintenance changes until they are ready to be moved through dev/test/production
- Allows developers to **create a working copy** of an existing application, **diff changes** between the copy and main application, and then **merge changes** back into the main application

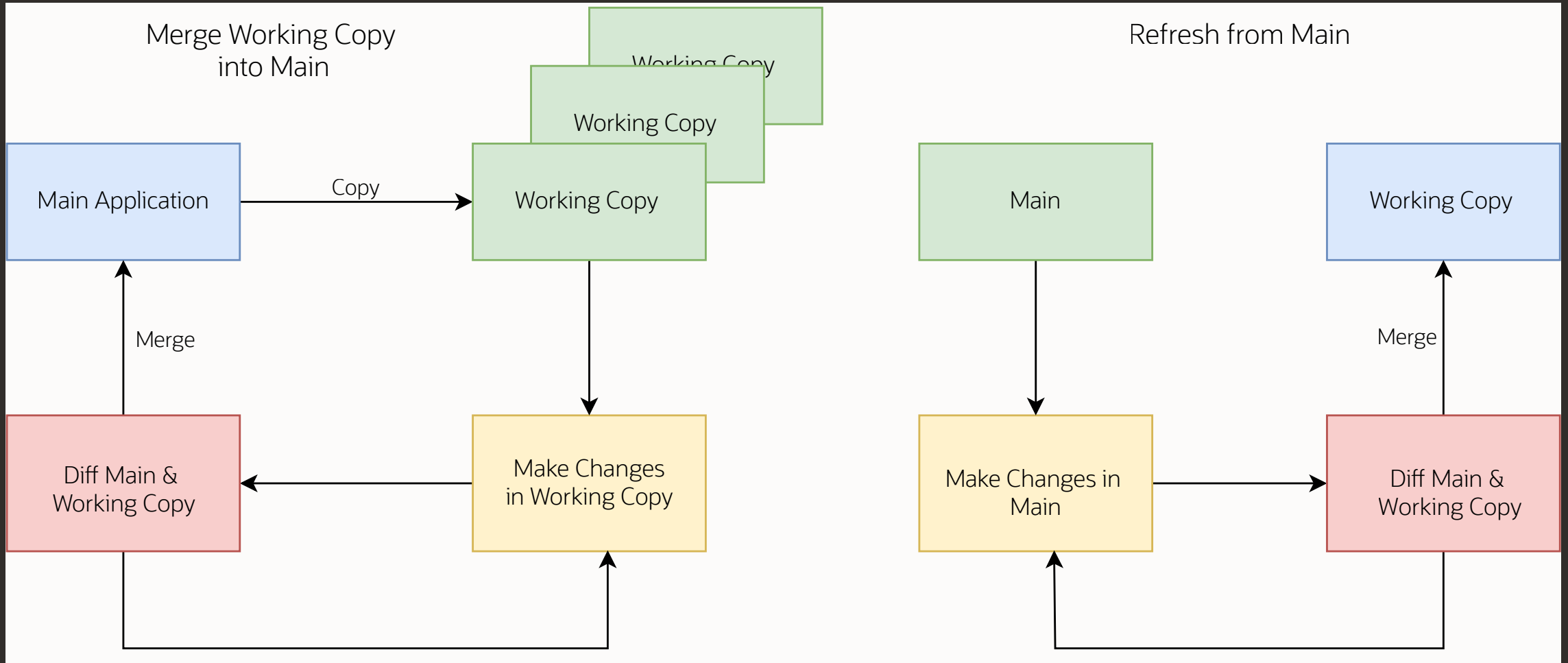


# Application Working Copy

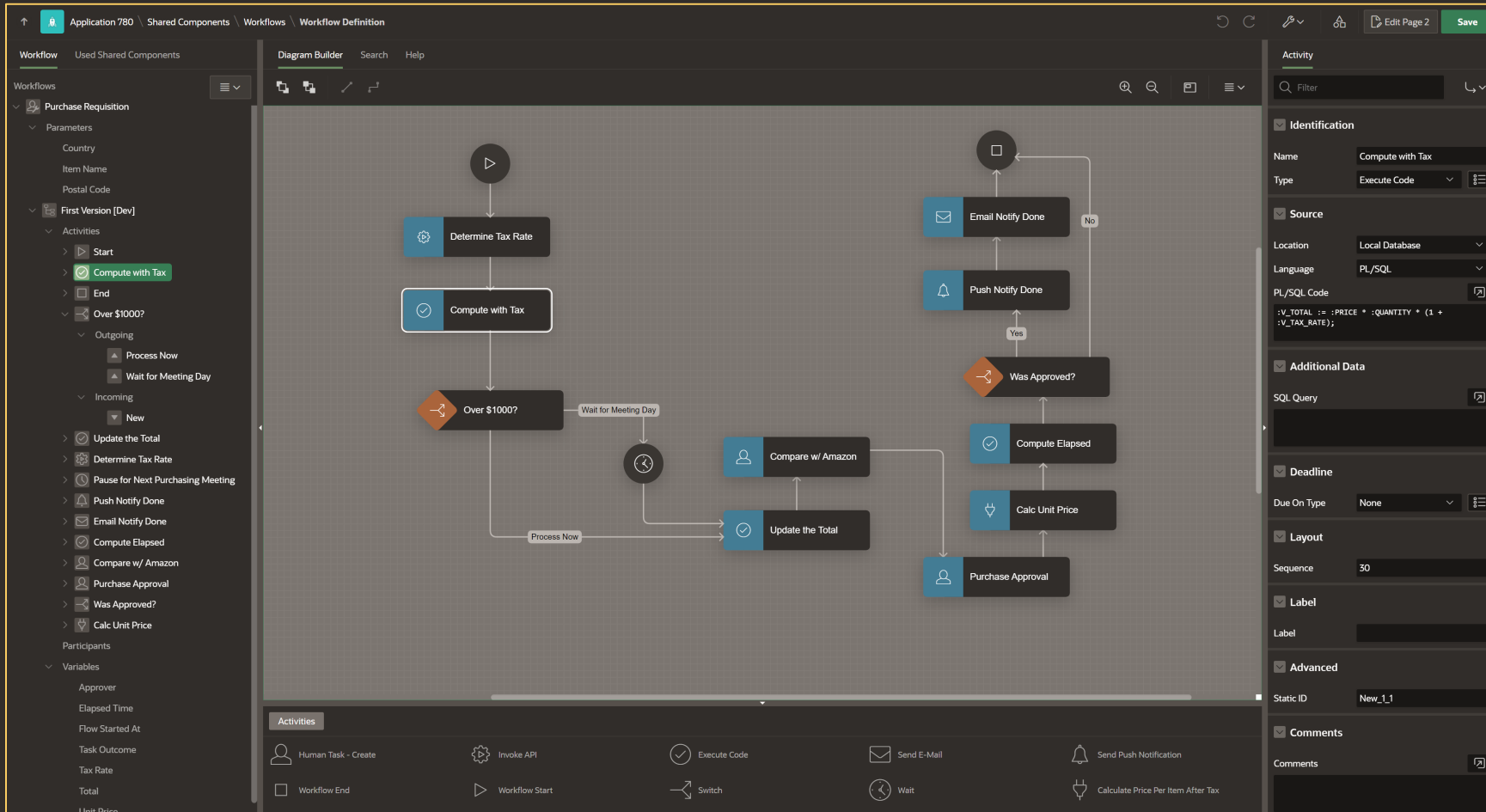
- Creating “**Working Copy**” is very similar to copying an application
- Comparison of changes is done by performing a split YAML export of both applications
- A merge conflict occurs when a page or shared component in the main application has changed and has the same component in the working copy
- Conflicts will be manually identified when viewing the file differences
- Developers have the choice of merging in full or by choosing which components they would like to merge
- Option to perform a full backup, so developer can revert to backup in case of merge issues



# Application Working Copy



# End-to-End Process automation with native workflow



# Workflow

- Workflow is the **automation of a business process**, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules (e.g. sequence flow, transition conditions etc.).
- APEX Workflow provides the following capabilities:
  - **Visual Workflow Designer** to create and author sequential workflows
  - **Workflow Console** for the monitoring and administration of Workflows
  - **Workflow Runtime** (Engine) for the execution of Workflows
- Manage workflows by creating workflow models in the Workflow Designer.
- Activate workflows and monitor them through the Workflow Admin Console.
- Use page processes to initiate workflows.

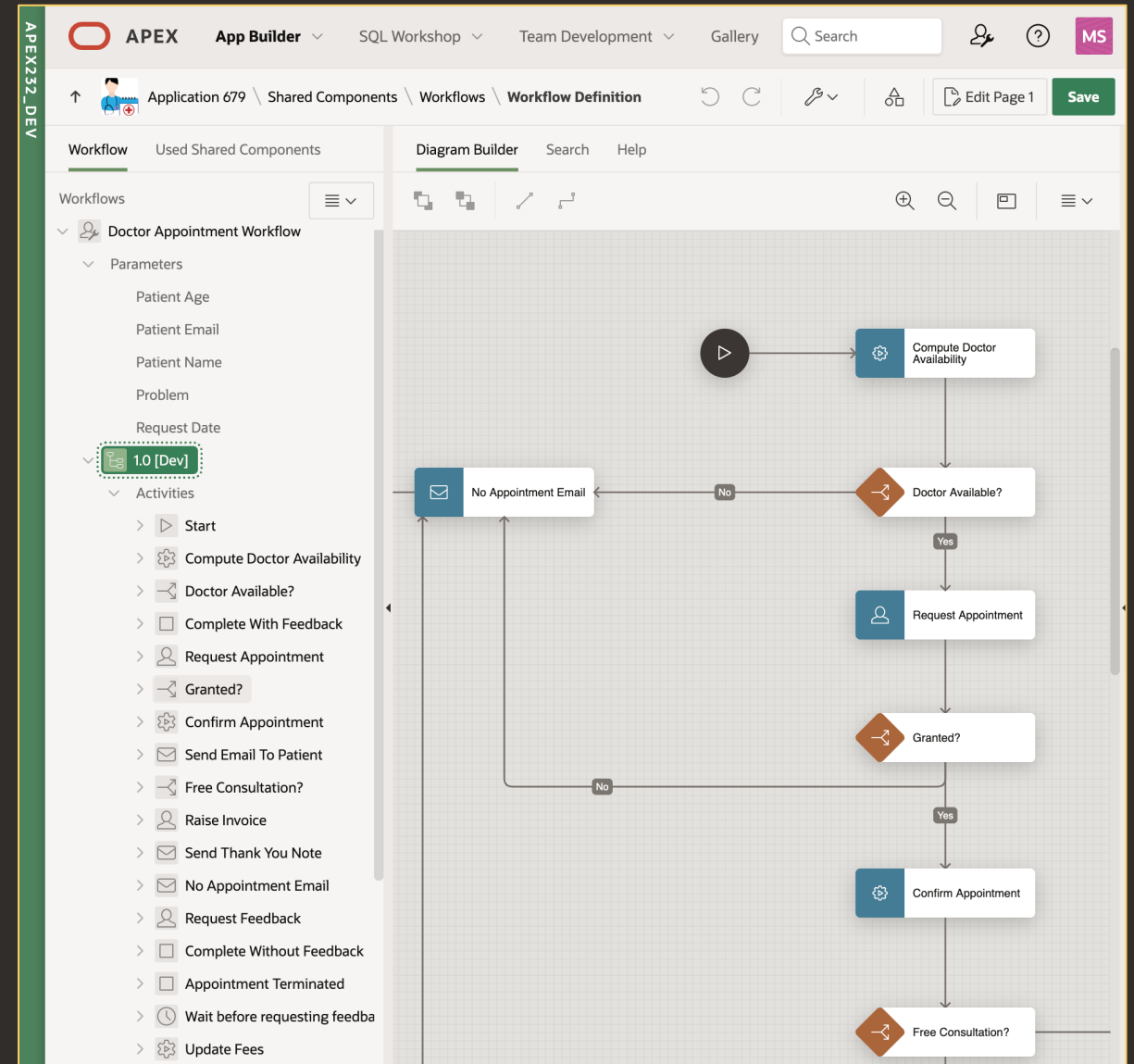


# APEX Workflow – Design Principles

- **Simple**  
APEX Workflow is simple to use with a flat learning curve. No prior Process knowledge is required to use APEX Workflow
- **Extensible**  
APEX Workflow is extensible. Activities are implemented as Process Type plugins. Customers can create their own plugins and natively use them in APEX Workflow as Activities
- **Integrated**  
APEX Workflow is fully integrated in the current APEX development experience and shares code with APEX Page Designer. This makes it intuitive to use for APEX developers
- **Intelligent**  
APEX Workflow is designed to use Oracle Machine Learning

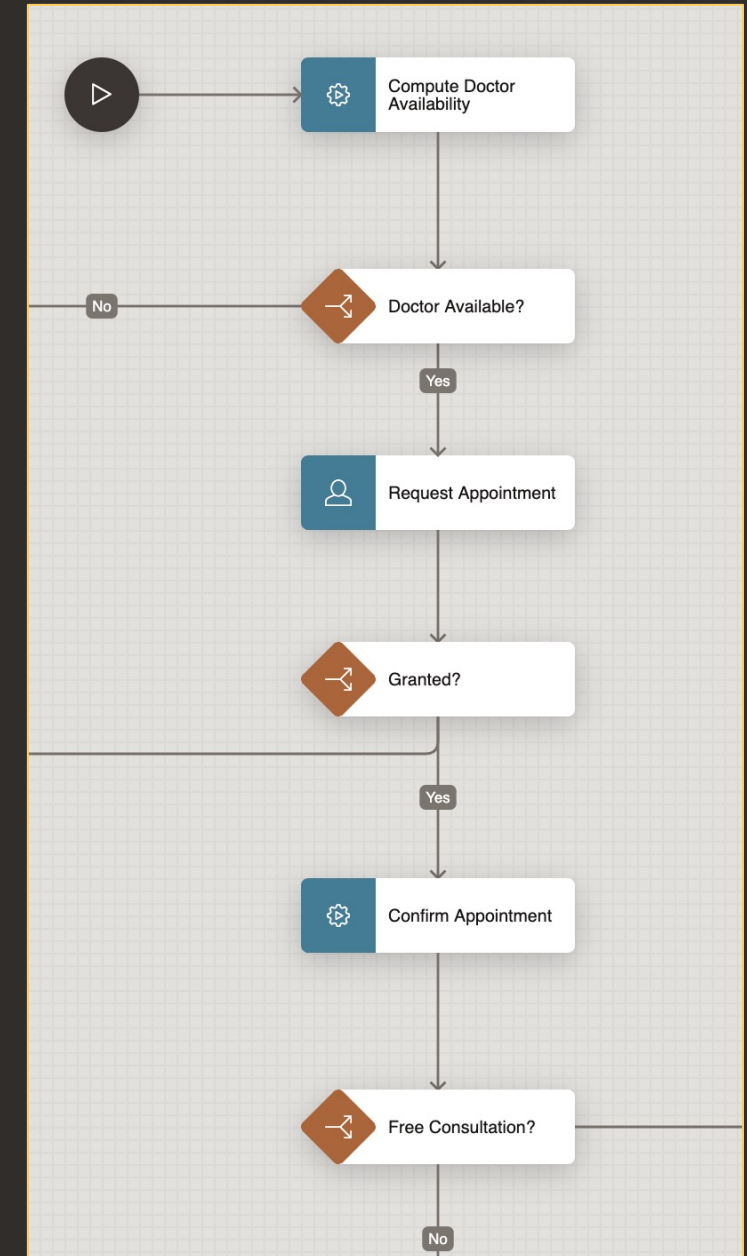
# Designing Workflows

- The Workflow Designer is a graphical user interface for modeling of Oracle APEX Workflows.
- The Workflow Designer shows all Workflow Definitions within the APEX Application in a tree.
- Workflow Definitions can be expanded to show additional information like the Workflow Input Parameters, **Workflow Activities**, **Transitions**, and **Variables**.
- The Central Pane of the Workflow Designer also has a **Diagram Builder** for modeling workflows.



# Workflow Activities

- Workflow Activities are the “boxes” within a Workflow Definition.
- They specify which kind of work is performed in “Workflow Execution” when the Activity is activated.
- In the APEX Ecosystem, each workflow activity corresponds to a process type plugin. All workflows have:
  - Exactly one Start Activity in the beginning
  - At least one End Activity in the end
  - Existing Native Process Type Plugins like Execute Code, Send E-Mail, Human Task – Create (Approval), Send Push Notifications, are available as Workflow Activities.
  - Workflow Specific Process Type Plugins are Workflow Start, Workflow End, Wait and Workflow Switch.



# Workflow Reports

- Workflow Report page shows the summary of all Workflows in the Application.
- Clicking on the Workflow Name, opens the Workflow Designer with the specific workflow highlighted.
- The Workflow Utilization Report shows all pages and page components where Workflows are used in a specific application.
- The Workflow History Report shows recent modifications made to Workflows.

The screenshot displays the APEX App Builder interface for the 'Workflows' section. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The breadcrumb trail shows 'Application 679 \ Shared Components \ Workflows'. The main content area features a table with workflow details and a sidebar with additional information.

Name	Title	Parameters	Active Versions	In Development Versions	Inactive Versions	Last Updated By	Last Updated On	Workflow Comment
Doctor Appointment Workflow	Doctor Appointment Workflow For &PATIENT_NAME.	5	0	1	0	ANACHATT	09/14/2023	

1 - 1

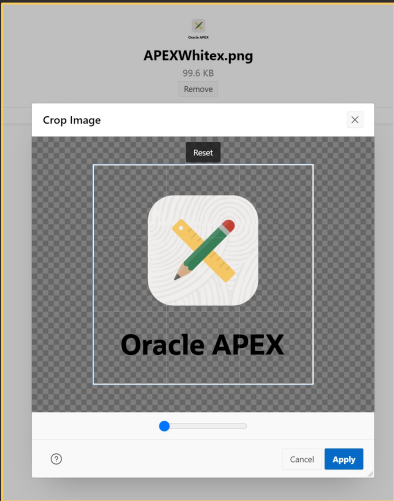
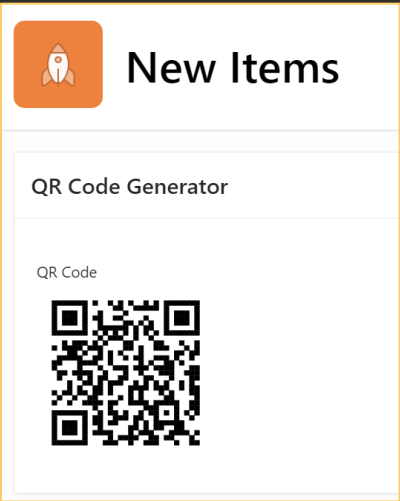
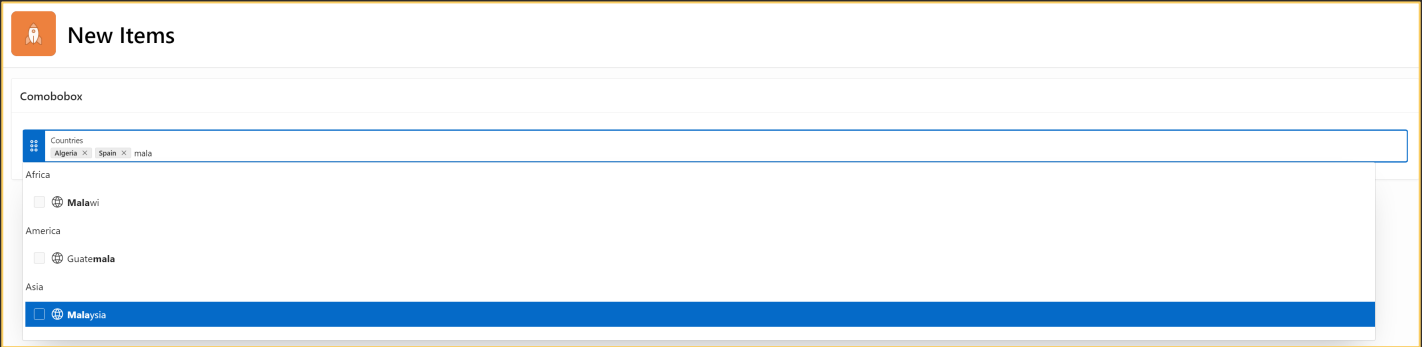
**Workflows**  
A workflow represents the automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules, for example, sequence flows or transition conditions.  
[Learn More ...](#)

**Recently Edited**  
Doctor Appointment Workflow

# Monitoring Workflows

- The Workflow Console allows workspace users to view and manage their workflow instances
- When configuring the Workflow Console, you have different Report Contexts to choose from:
  - **My Workflows**, for users who are specified as Workflow Owner for the workflow.
    - Shows all workflow instances with the user as a workflow owner.
    - Sorts by descending creation date, with newly created workflows at the top of the list.
  - **Admin Workflows**, for users who are workflow administrators of the workflow(s).
    - Shows all workflows that have the user specified as a workflow administrator
  - **Initiated by Me**, for users who have initiated workflows.
    - Shows all workflows that the user has initiated.

# New and Updated Components



# New and Updated Components – New Page Items

## Combobox

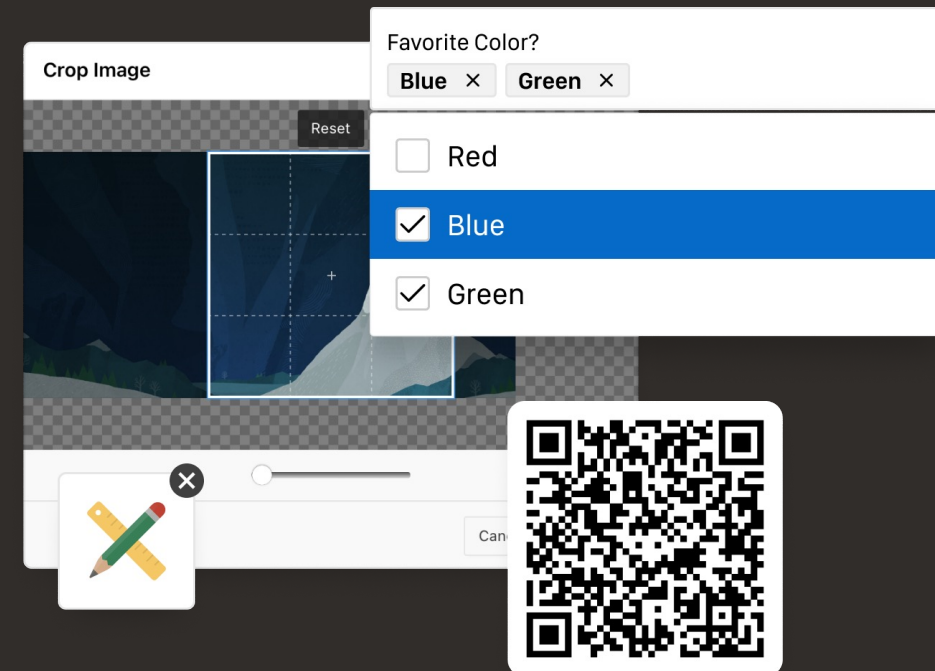
- A new Combo Box item type, which has a One and Many configuration
- Supports custom HTML for the choices with Template Directives
- Multi-select, The user can select more than one option and the dropdown is kept opened

## QR Code Generator

- The new QR Code item type lets you easily embed scannable QR codes that contain text, URL, phone, email, SMS, or location data.
- You can also use the associated QR Code API for embedding QR codes within reports, emails, or other parts of your application.

## Image Upload

- File Browse renamed to **Image Upload**
- Ability to crop and/or resize images client-side
- You can also configure whether to use the main or selfie camera for mobile devices.



# New and Updated Components

## Custom Map Backgrounds

- Maps now support custom background tiles enabling you to visualize your spatial data in more ways than ever before.
- Map backgrounds are **defined in Shared Components** and can be used across all map components. You can subscribe, refresh, and publish your Map Backgrounds just like any other Shared Component.
- Map backgrounds can be defined as **Raster**, **Vector**, and **OGC WMS** tile layers, and can be further customized with additional parameters

## Faceted Search Enhancements

- **Arbitrary Facets Support**: Flexible filtering of report columns on input-based facets, with support for comparison operators extended to include not equals, does not contain, and does not start with.
- **Sort by Descending**: Developers can control the sort direction for distinct LOV based facets.

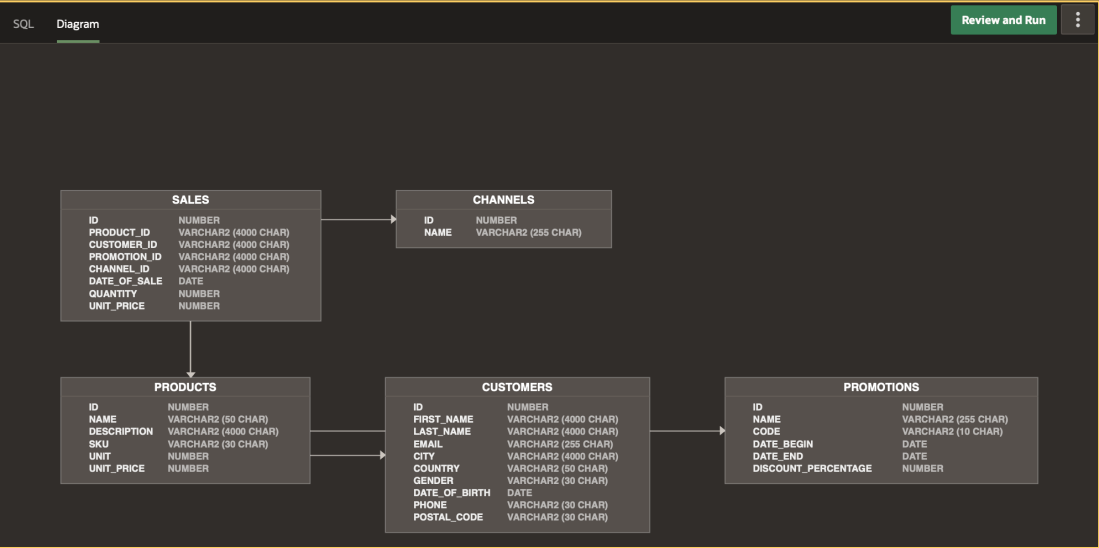


# New and Updated Components

## Template Component Updates

- Template Components render faster and support any number of attributes, enabling developers to build even more sophisticated UI components.
- Developers can now create Template Component plug-ins without the constraint of only 25 attributes.
- With improvements to compilation time, Template Components now render even faster, creating the optimal user experience.
- Several updates to the Template Components shipped with Universal Theme provide developers with more versatility in how to use Template Component across their applications.

# Developer Experience



### Create REST Data Source

General

REST Data Source Type

- ✓ OData REST Service
- Oracle Cloud Applications (SaaS) REST Service
- Oracle Cloud Infrastructure (OCI)
- Oracle REST Data Services
- REST Enabled SQL Query
- Simple HTTP

Name

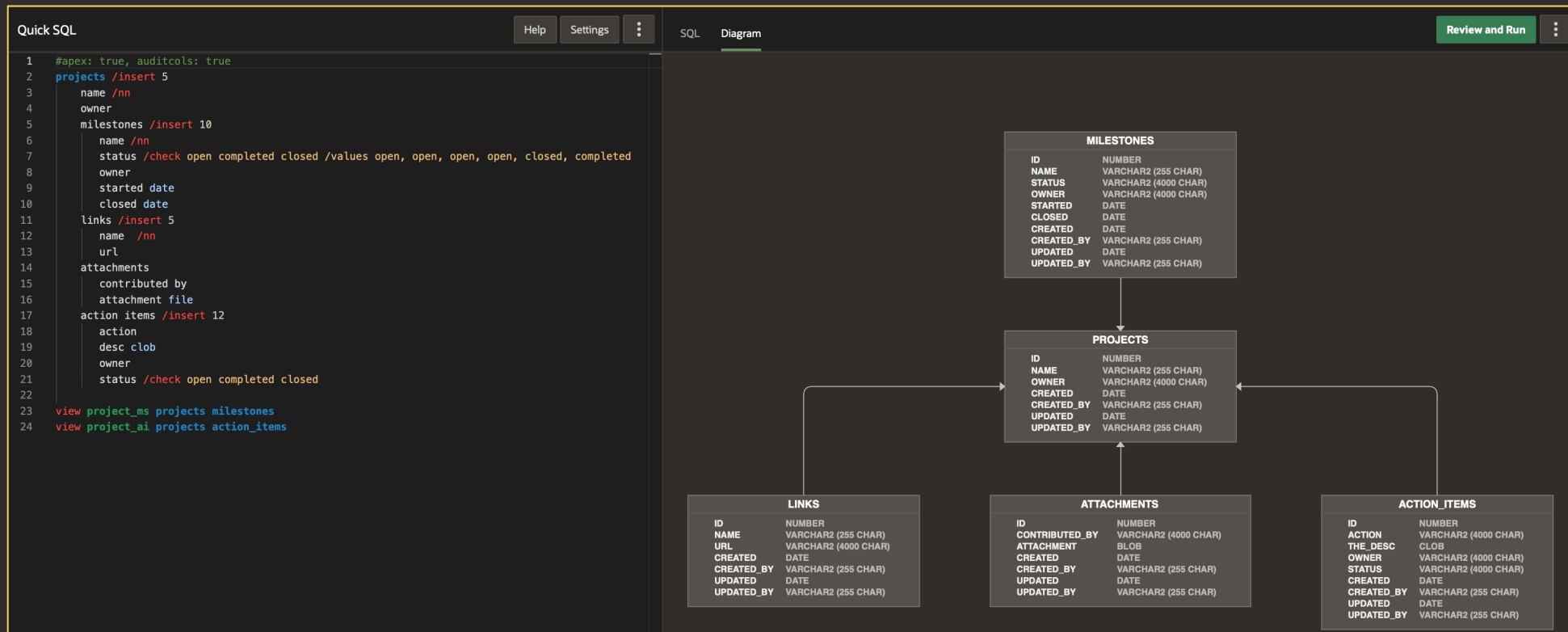
URL Endpoint



# Developer Experience

## Quick SQL Updates

- Visualize your data model's tables, columns, datatypes, and relationships in an intuitive entity relationship diagram accessible via the new Diagram tab.
- The generated SQL script and ER diagram refresh instantly whenever you pause your typing.
- Save time and cognitive cycles with the revamped review and run, simpler saving, and streamlined help.



# Developer Experience

## REST Data Source Enhancements

- Data-type aware REST Source Parameters
- Regular expression validation for REST Source Parameters and Data Profile columns
- You can now create a REST Data Source Catalog which contains all of the endpoints based on an OpenAPI definition.
- REST Source Plug-in enhancements
- **Native OData REST Source Type:** The OData Connector has now been integrated as a native component within APEX, allowing developers to incorporate data from REST services that adhere to the OData protocol without the need to install any plug-ins.

REST Data Source Discovery

Preview

Data

Data Profile

Response Body

Response Type

Row Selector

Returns

JSON

features

Table

Sequence	Name	Primary Key	Data type	Max Length	Format Mask	Has Time Zone	Selector	Remove
1	ID	No	VARCHAR2	4000	-	No	id	×
2	TYPE	No	VARCHAR2	4000	-	No	type	×
3	GEOMETRY	No	DOCUMENT_FRAGMENT	-	-	No	geometry	×

<


More Detail

Create REST Data Source



# Developer Experience

## Support for Fusion Apps Extensions

 Fusion Apps

Changes saved

### Accounts IG

<input type="checkbox"/>		Organization Profile ID	Organization Name	Unique Name Suffix	Type
<input type="checkbox"/>		100000013637002	Iren's Fusion Account	(New York, US)	ZCA_CUSTOMER
<input checked="" type="checkbox"/>		100000013637022	Outlook Fusion Account	(Redwood Shores, US)	ZCA_CUSTOMER
<input type="checkbox"/>		100000014983002	OBIA Technologies	(Hannover, DE)	ZCA_CUSTOMER
<input type="checkbox"/>		100000014983050	OBIA Security	(_OLD_, CA)	ZCA_CUSTOMER
<input type="checkbox"/>		100000014983070	OBIA Healthcare	(Mod	

### Settings

Use Batch DML?

Yes

Root Resource Name

accounts

Use Total Results?

Yes

Use Pagination?

Yes

# Developer Experience

## Support for Fusion Apps Extensions

- You can now create REST data sources to query, insert, update, and delete data from Fusion Apps REST APIs.
- Once your REST Data Sources are defined, you can use any APEX regions connected to the Fusion Apps REST APIs and build custom experiences using the power of SQL.
- Intuitively present FA REST API validation errors like native APEX ones
- Quickly build Query-by-Example pages and Cascading LOVs using filter parameters
- Intelligently avoid common errors using auto-discovered additional info hints on data profile columns
- Directly pass filtering/ordering to the backend, request only necessary data, and use bulk operations
- Efficiently paginate search results with total results when needed (X - Y of Z)
- Iteratively develop against in-progress FA Business Object customizations in a sandbox
- Consistently use APEX\$RESOURCEKEY with any approach FA REST allows to uniquely identify rows

# Developer Experience

## Improved Share Components Subscriptions

- Extend subscription functionality to all shared components
- Subscribed components are now read-only
- Automatic dependency resolution
- New **Subscription Status** column available across Shared Components reports
- Bulk refresh and deletion – Easily view subscribed shared components that are out of sync and refresh them

## Workflow and Approvals Enhancements

- **Action Tasks**: Define human tasks that require a participant's input or acknowledgement without an explicit approval outcome.
- Optionally allow parameters to change value during a human task and react to the event using the Update Parameter action and new APIs.
- Business administrators can now remove task participants in addition to adding new ones.

# Developer Experience

## Translating Default Reports

- You can now translate Default reports ( Primary Default or Alternative Report ) for interactive report and interactive grid regions.
- Saved default reports can be translated via **application translation** process. The translatable XLIFF file includes translating default report settings.

≡ 보고서 앱

언어 Korean chaityanyak

인터랙티브 그리드

Q 모든 텍스트 열

실행 기본 보고서

작업

재설정

이름	직책	매니저	고용날짜	월	봉급	커미션	부서
CLARK	MANAGER	KING	1981/06/09	필터	2,450		ACCOUNTING
JONES	MANAGER	KING	1981/04/02	데이터			RESEARCH
BLAKE	MANAGER	KING	1981/05/01	형식			SALES
ALLEN	SALESMAN	BLAKE	1981/02/20	선택 사항		300	SALES
WARD	SALESMAN	BLAKE	1981/02/22	차트		500	SALES
MARTIN	SALESMAN	BLAKE	1981/09/28	보고서	1,250	1400	SALES
TURNER	SALESMAN	BLAKE	1981/09/08	다운로드	1,500	0	SALES
JAMES	CLERK	BLAKE	1981/12/03	도움말	950		SALES
MILLER	CLERK	CLARK	1982/01/23		1,300		ACCOUNTING
SCOTT	ANALYST	JONES	1982/12/09		3,000		RESEARCH

≡ 보고서 앱

언어 Korean chaityanyak

새로운 대화형 보고서

Q

실행 1. 기본 보고서

작업

재설정

이름	직책	매니저	월	봉급	커미션	부서
CLARK	MANAGER	KING	필터	2,450		ACCOUNTING
MILLER	CLERK	CLARK	데이터	1,300		ACCOUNTING
KING	PRESIDENT		형식	5,000		ACCOUNTING
JONES	MANAGER	KING	차트	2,975		RESEARCH
SCOTT	ANALYST	JONES	그룹 기준	3,000		RESEARCH
FORD	ANALYST	JONES	피벗	3,000		RESEARCH
ADAMS	CLERK	SCOTT	보고서	100		RESEARCH
SMITH	CLERK	FORD	다운로드	300		RESEARCH
BLAKE	MANAGER	KING	적용	350		SALES
ALLEN	SALESMAN	BLAKE	도움말	1,600	300	SALES
WARD	SALESMAN	BLAKE		1,250	500	SALES





# General Builder Improvements

Create an Application


Name

My First Cloud App

ID


17854

Create Application




Use Create App Wizard

Create a new application using the full Create Application wizard with advanced options.




Create App From a File

Upload a CSV, XLSX, XML or JSON file, or copy and paste data, then create your application.




Create App From Quick SQL

Build your own data model or use an existing one and create a new application from it.



Browse Apps in Gallery

Install one of many Sample and Starter Apps from the Gallery.



Copy Existing App

Create a new application as a copy of an existing application in your workspace.

Application 155666

Install Application

Application Installed

Your application contains supporting objects. You may [preview the installation details](#), or select **Install Supporting Objects** to continue.

Application

155666 - Sample Workflow, Approvals, and Tasks

Parsing Schema

CHAITANYAK

Free Space Required in KB

100

Cancel

Edit Application

Install Supporting Objects



# General Builder Improvements

## Simplified Create App Wizard

- Enter an app name and use the Create Application button on the first page of the Create App process without having to go through the whole wizard
- The list of additional create options now have a new look, and there are options to use the full Create App wizard or Quick SQL in addition to the existing entries

## Improved UX of App Export and Import

- The import and export wizards have been simplified to create a more intuitive, enhanced user experience.
- Export apps, pages, or components using the new, standardized navigation system for different types of exports, then import them into your workspaces and applications in just a few steps.

## Builder Extension Links

- Add additional menu entries to the Builder UI for your workspace
- All entries/URLs will be opened in a new browser tab

# General Builder Improvements

## Comment and Uncomment from Context Menu in Page Designer

- New Comment and Uncomment options in the Rendering Tree Context Menu in Page Designer allows toggling any component's Build Option attribute directly from the Context Menu in Page Designer, saving many clicks during the development process.

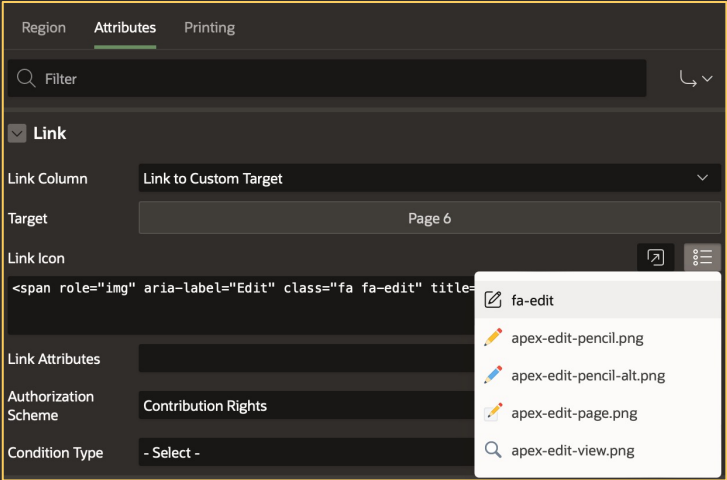
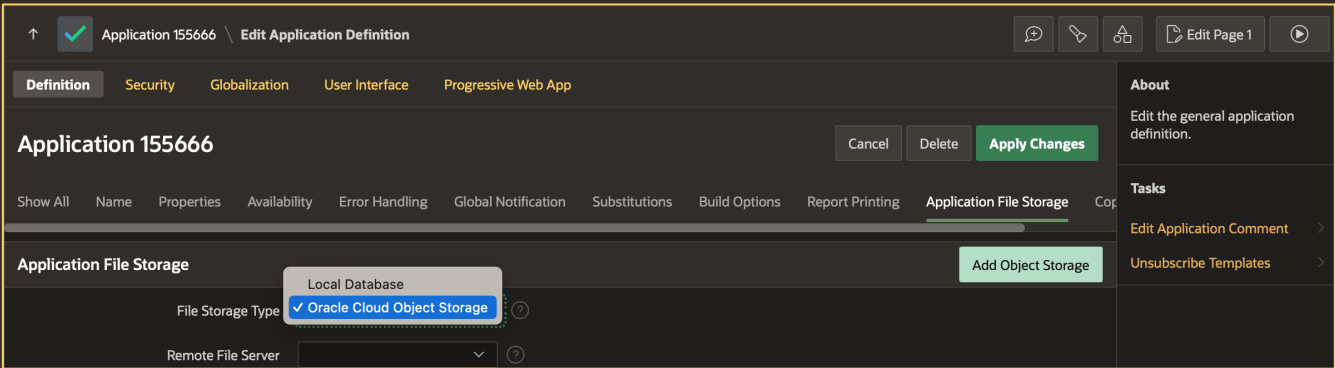
## Application Gallery Improvements

- Install an app without using the Install dialog, and configure background app installations for an instance so you can do other tasks while an app installs or so you can install multiple apps in sequence.
- A new update option allows you to get the most recent version of a previously installed app already without needing to remove it.

## Accessibility Improvements across the Builder

- General accessibility enhancements to the development environment and numerous accessibility-focused bug fixes have been made to create a better user experience for all users.

# Additional Updates and Enhancements



# Additional Updates and Enhancements

## Show Success Messages After Close Dialog

The Close Dialog process has a new attribute called **Show Success Messages**. When switched on, success messages are shown in the top level frame of the page.

## Store Static Resources in Object Storage

A new Application File Storage option in Application Definition makes Object Storage available as the location for storing application static resources such as images, CSS, and JavaScript.

## Default Interactive Report Link Edit Icon

When choosing a custom target for an interactive report attributes, the link icon will default to **fa-edit** if the application contains Font APEX. **fa-edit** is also added to the quick pick list.

## Ubiquitous Database Search for Oracle Database 23c

A new search type in the APEX Search Configuration wizard provides support for the new Oracle Database 23c feature, Ubiquitous Database Search.

# Additional Updates and Enhancements

## Background Execution Chain Context

Associate a context value with a background execution chain and optionally serialize execution based on it.

## Disable and Restrict Apps with new Instance Parameters

New parameters in the APEX\_INSTANCE\_ADMIN API makes it possible to disable and restrict apps in your APEX workspace. Disable some or all apps with the **DISABLE\_APPS\_LOGIN** parameter, or restrict access to back-office apps with the **RESTRICT\_APPS\_HEADER** parameter, which identifies the HTTP request header and determines which apps are permitted for public use.

## New Dataset for Arabic and Italian Languages

The EMP and DEPT dataset has been added for both the Arabic and Italian languages, accompanied by a blueprint for easily building sample applications on the underlying dataset.

# Additional Updates and Enhancements

## Populate List Item Sub Entries with List Reference

Child Items of a Static List Item can now be populated by a reference a List, with the ability to nest lists up to 10 levels. The referenced List can be static or Dynamic, and identifying List and Sublist relations can easily be done in the List Utilization report.

## Enhancements to Template Directives

Template Directives are now available for use inside the Text, Textarea, and HTML Template Component attributes in Page Designer, as well as in assignments of a {with/} and {apply/} block.

## Improvements to Background Processing

Background page processing just got better with improved serialization, better integration with APEX error handling, and allowing transactional and non-transactional submissions.

## Refreshed Redwood Light

Tweaks to colors, backgrounds, textures, padding, and additional styling give the Redwood Light theme a refreshed look and feel.

# JavaScript Library Upgrades

- Oracle JET 15.0.7
- jQuery 3.6.4
- jQuery Migrate 3.4.1
- FullCalendar 6.1.8
- MarkedJS 5.1.2
- DOMPurify 3.0.5
- Terser 5.19.2
- MapLibre 2.4.0
- TinyMCE 6.7.1
- PrismJS 1.29.0
- csso 5.0.5
- cropperjs 1.5.13
- CKEditor5 36.0.0
- jQuery UI 1.13.2



## Learn More...

- What's New in Oracle APEX 23.2  
[apex.oracle.com/go/whats-new-232](https://apex.oracle.com/go/whats-new-232)
- Oracle APEX 23.2 New Features videos playlist  
[apex.oracle.com/go/232-playlist](https://apex.oracle.com/go/232-playlist)
- Updated and New Hands-on Labs  
[apex.oracle.com/hols](https://apex.oracle.com/hols)

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# Oracle APEX Training & Certification

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Explore the various training, certifications, and other resources below to level up your APEX expertise. Whether you are new to APEX, or looking to sharpen your skills, there is something for everyone.

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APEX Foundations

[apex.oracle.com/go/foundations](https://apex.oracle.com/go/foundations)

APEX Developer Professional

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**Available on LinkedIn Learning**

**[www.linkedin.com/learning/oracle-apex-foundations](https://www.linkedin.com/learning/oracle-apex-foundations)**



Don't forget to share your badge on social media and tag us using #orclAPEX




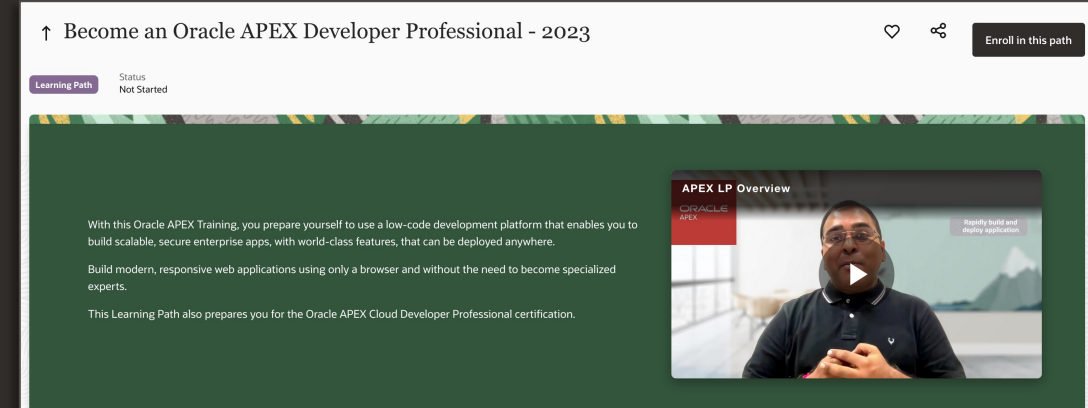
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## Oracle APEX Developer Professional Course

 **Soup-to-nuts** covering complete low-code app dev with Oracle APEX

 **13** hours of expert training delivered by the APEX Product Team

 **Hands-on-Labs** to practice along with the training videos



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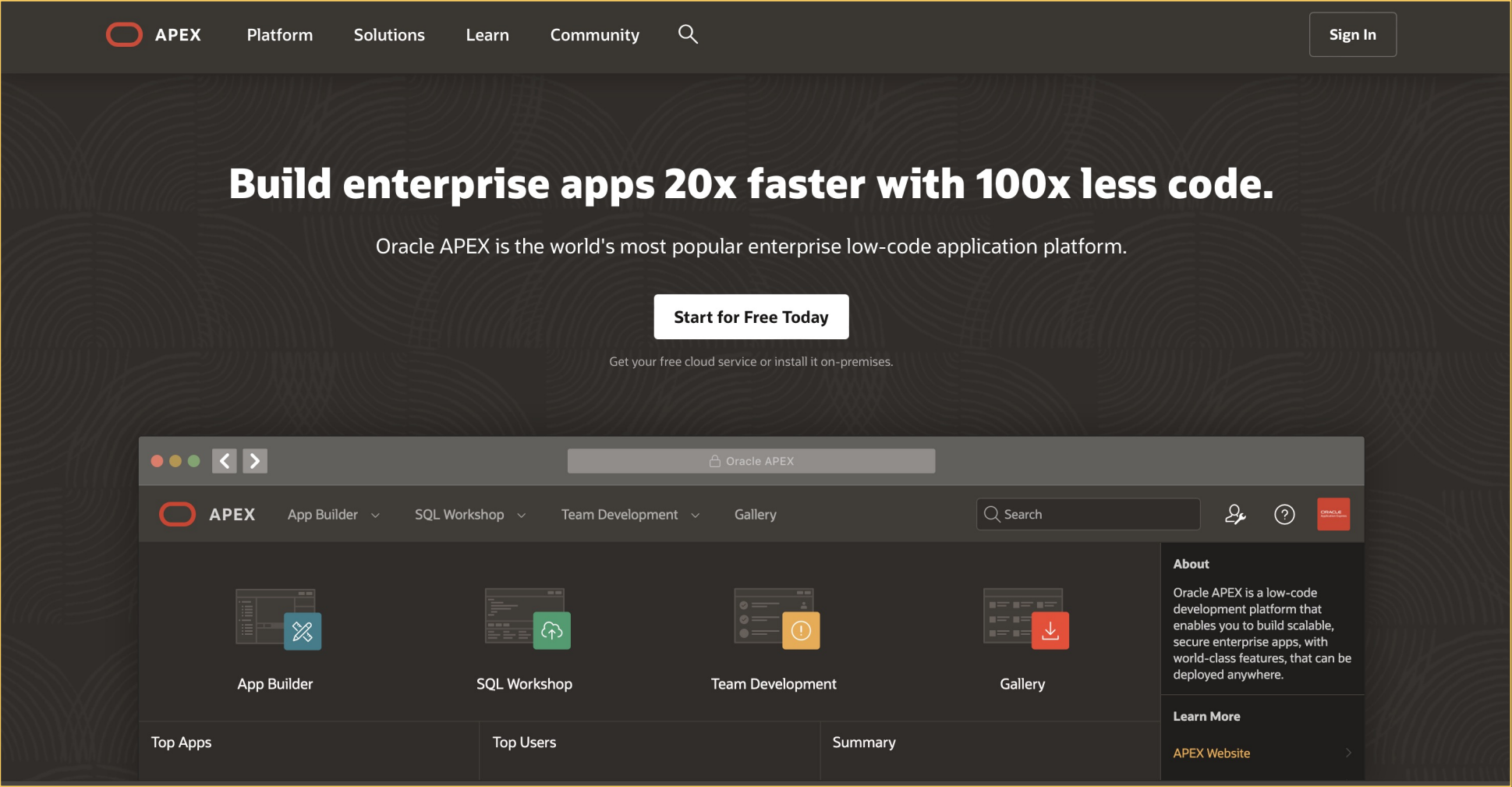
## Become an **Oracle APEX Cloud Developer Certified Professional**:

1. Complete Oracle APEX Developer Professional course
2. Perform Oracle APEX Developer Professional Hands-on-Labs
3. Prepare for Oracle APEX Cloud Developer Professional Exam
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# Thank you

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data in new ways, discover insights,  
unlock endless possibilities.

