

# Elevating Application Development with Oracle APEX

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**Marc Sewtz**

Senior Director of Software Development

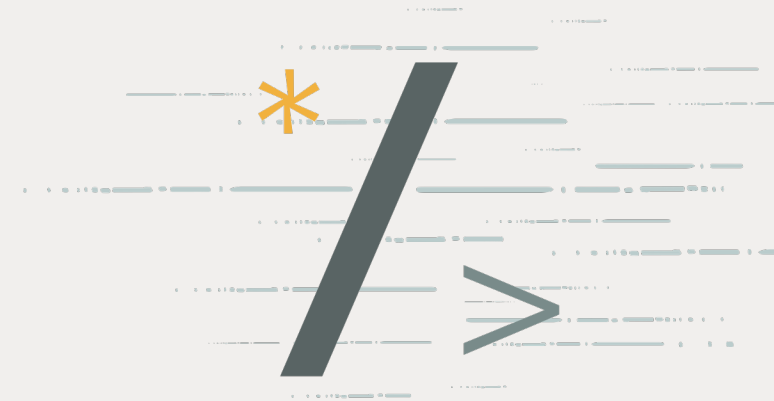
Oracle APEX

March 21, 2024



# Oracle APEX

## Positioning & Product Updates



# What is Oracle APEX?

APEX is the **world's most popular** enterprise **low-code** application platform.

It enables you to build scalable and secure enterprise apps with world-class features **20X** faster with **100X** less code.

Oracle APEX delivers the most productive way to develop and deploy **Mobile and Web** apps everywhere – cloud and on-premises.



**19 Million +**

apps created till date

**5,000 +**

APEX apps created daily

**700,000 +**

APEX developers worldwide

**60,000 +**

customers across 150 countries

**75%**

of Fortune 500 use Oracle APEX

# Oracle APEX: World's Most Popular Enterprise, Low-Code Platform





“Build applications on the cloud in a web browser with AI assistance, with zero coding and zero code generation, with everything defined in metadata, right on top of your existing data or a new data model?  
**Sounds like the future of software development.”**

- From the InfoWorld Judges  
Learn more at [infoworld.com](https://infoworld.com)

## ORACLE APEX

“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.”

*\*Oracle Q4 FY23 earnings call - June 12, 2023*



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**Larry Ellison**

Founder & CTO, Oracle

# Larry Ellison outlines Oracle's generative AI strategy

## Oracle Cloud World 2023



# Larry Ellison outlines Oracle's generative AI strategy

## Oracle Cloud World 2023



*Ellison noted that generative AI is changing how Oracle itself develops new products.*

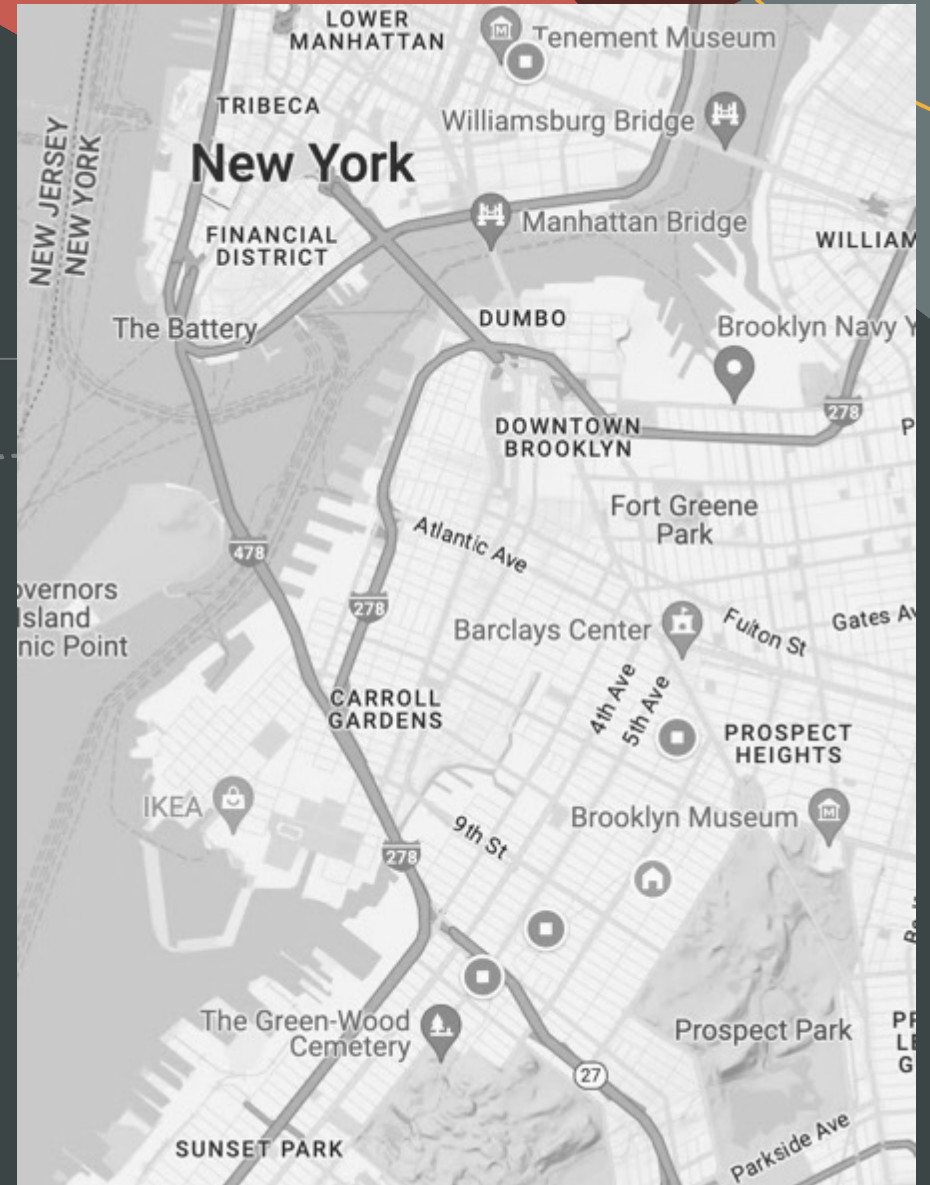
*For example, he said, Oracle will continue supporting older applications using Java if they were written in that programming language, but it **will develop new applications using code generated automatically in Oracle APEX** by GenAI tools based on developer prompts. “We’re not writing it anymore. We’re generating that code,” he said. “It **fundamentally changes how we build applications**, how we run applications. It just changes everything.”*

*Ellison also noted that the APEX application generator allows for **faster application development with smaller development teams**, and because the code was generated by GenAI, it helps **significantly reduce security flaws**.*

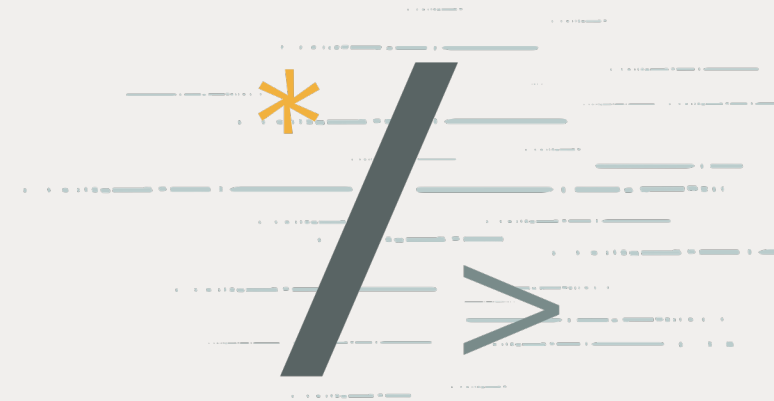
*“**This is a very big deal**” he said.*

# Demo

## Building a Real Estate App



# Oracle APEX @ Oracle



# Einstein Q&A platform

Oracle internal APEX application used by over 10K users

The screenshot shows the Oracle Einstein Q&A platform interface. At the top, there is a dark header with the 'Einstein' logo, a search bar, and navigation icons for home, heart, bell, and a user profile. Below the header, the main content area has a dark background with the text 'Home' and 'About Oracle Einstein'. The left sidebar contains a profile card for 'Oracle Einstein' (Release 23.4.2) with a cartoon illustration of Einstein, and a menu with 'Overview', 'Logos', and 'What's New'. The main content area features a section titled 'What is Oracle Einstein?' with a description of the platform as an internal application modeled after Stack Overflow. Below this, there are four statistics boxes: Questions (273,341), Replies (1,236,133), Answered (68%), and Users (76,171). At the bottom, there is a section titled 'Popular Domains' with the text 'Posts with the most views in the last 14 days.'

**Oracle Einstein**  
Release 23.4.2

**What is Oracle Einstein?**

Oracle Einstein is an internal application, modeled after Stack Overflow, which facilitates the crowd-sourcing of answers. It is actively developed and maintained by the [Oracle APEX product development team](#) and is routinely updated with new features, enhancements, and stability improvements.

This page describes some of the features and functionality in Einstein, and how you can make the most of this community resource. We welcome your feedback and bug reports, all within the app. Just click the Feedback link in the left sidebar menu.

Questions	Replies	Answered	Users
273,341	1,236,133	68%	76,171

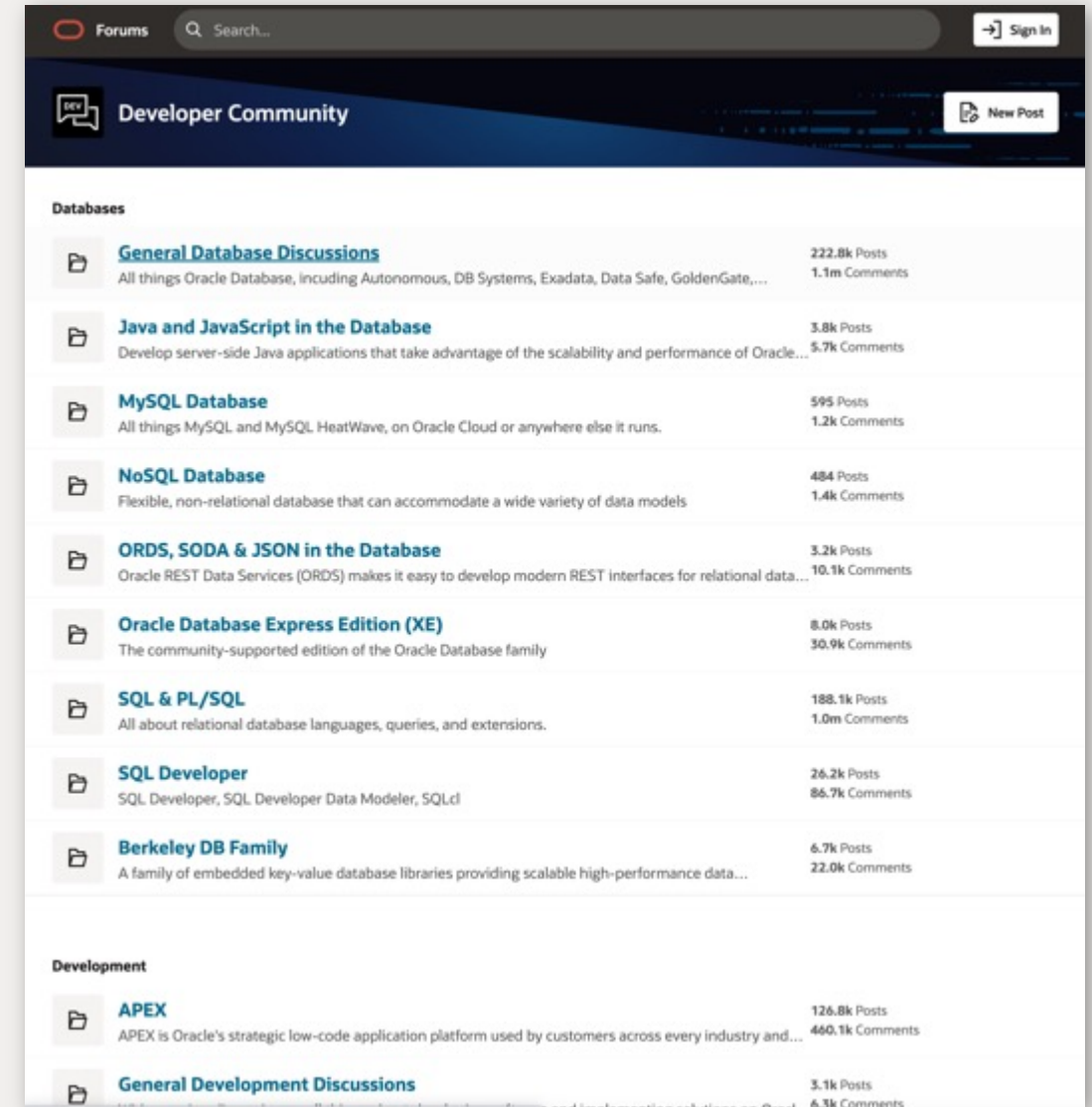
**Popular Domains**  
Posts with the most views in the last 14 days.

# Oracle Forums

New OTN Developer Community Forum platform went live in 2023

Built with APEX and based internal Oracle Einstein Forums platform.

**3.9M Users**  
**1.9M Posts**  
**7M Replies**



forums.oracle.com

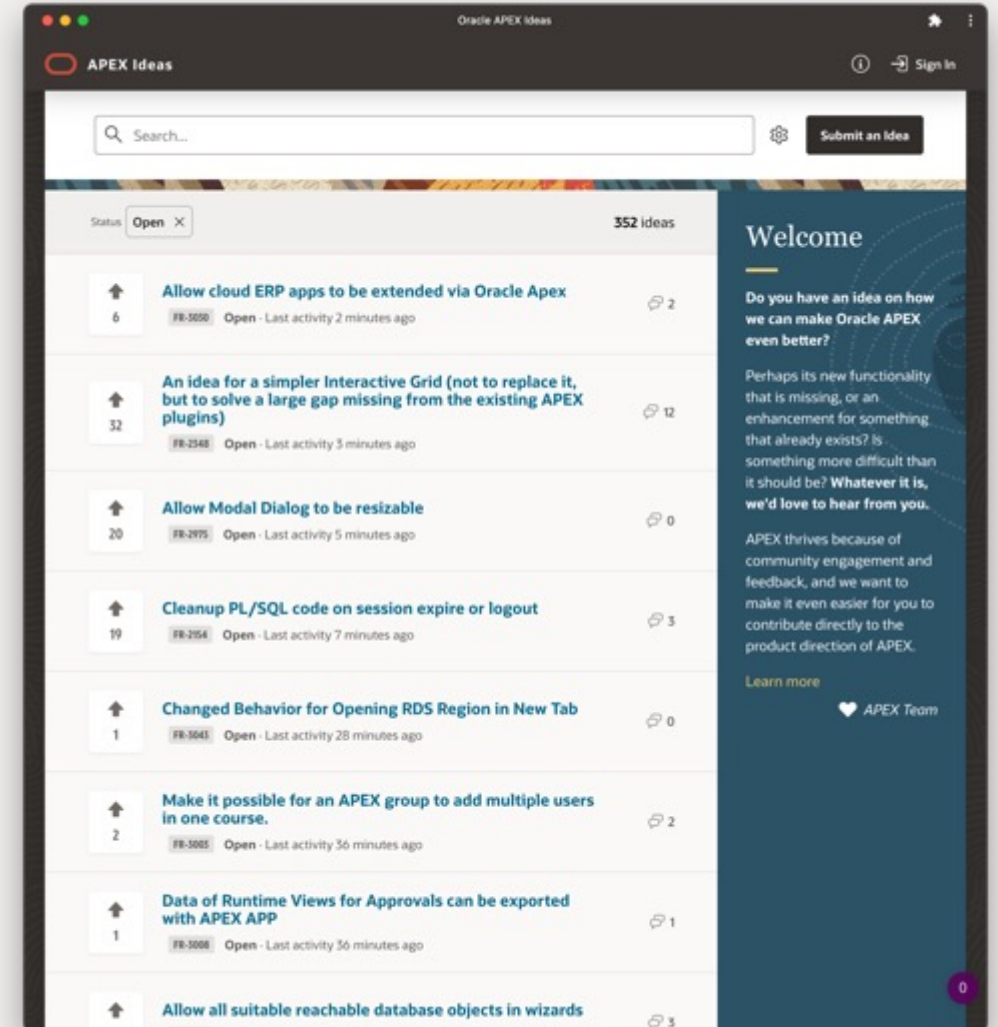
# APEX Ideas App

Do you have an idea on how we can make Oracle APEX even better?

New functionality that is missing? Enhancements for something that already exists? Is something more difficult than it should be? Whatever it is, we'd love to hear from you.

6000+ Active Users

1500+ Ideas

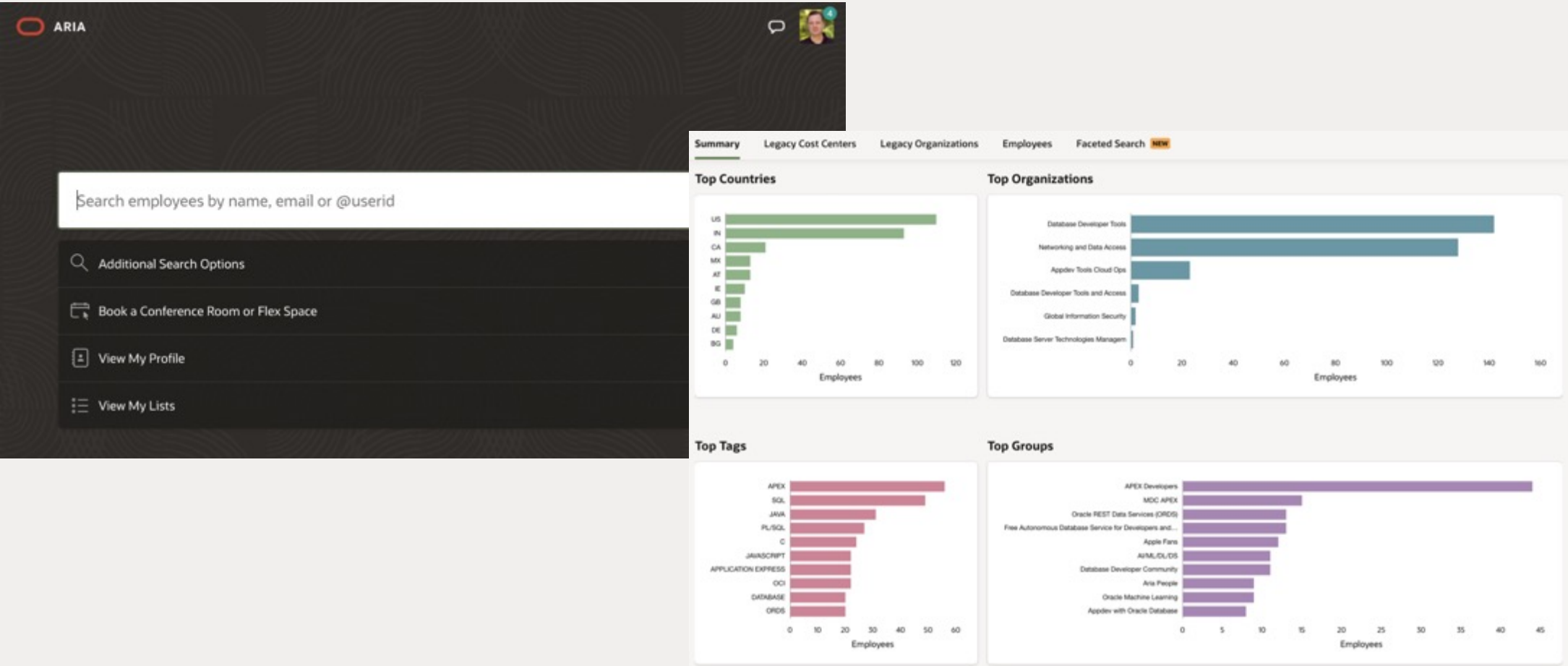


[apex.oracle.com/ideas](https://apex.oracle.com/ideas)



# Employee Directory

Oracle internal APEX application used daily by over 70K users



# Oracle APEX Surveys

Oracle APEX Surveys is a mini-SaaS service built on Oracle APEX that offers a simple and intuitive platform for designing, editing, and running surveys. Each survey is presented as a beautiful and responsive web page that is interactive, intuitive, and localized.

Two approved platforms for use at Oracle:

- Oracle Internal Surveys (Running surveys within Oracle for Oracle staff only)
- Oracle Customer Surveys (Running surveys with Oracle customers )

These services are:

- Easy-to-use
- Secure
- Approved for use at Oracle

# Fusion Apps

There are two major APEX initiatives being undertaken by Fusion Apps:

- **Customers extensions:** providing Fusion Apps customers the ability to build Fusion App extensions with APEX.
- **Factory Fusion Apps:** using APEX to build Fusion Apps.

## Support for Fusion Apps Extensions in APEX 23.2

- 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 region** 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)

# Oracle APEX - hosted instances

## apex.oracle.com

Public APEX evaluation instance. Explore the capabilities of the APEX low-code application platform and begin building your first app today. This is the fastest way to get started with APEX.

82k Workspaces

224k Apps

5.9M Pages

## apex.oraclecorp.com

Oracle provides apex.oraclecorp.com as a free service for all Oracle employees to build and host internal applications for all information classifications.

6k Workspaces

42k Apps

1.6M Pages

# Oracle Industry Solutions

The Global Business Units are vertically-oriented organizations dedicated to Oracle's industry-specific solutions. Oracle APEX empowers GBUs to build modern web applications that extend existing applications using RESTful services.



Communications



Communications Applications



Construction & Engineering



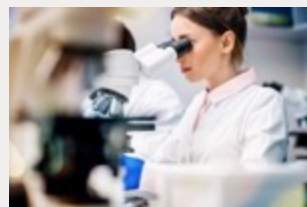
Financial Services



Food & Beverage



Healthcare



Health Sciences



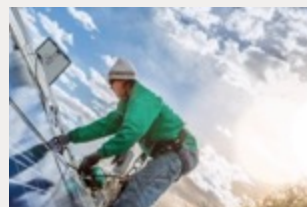
Hospitality



Retail



Local Government

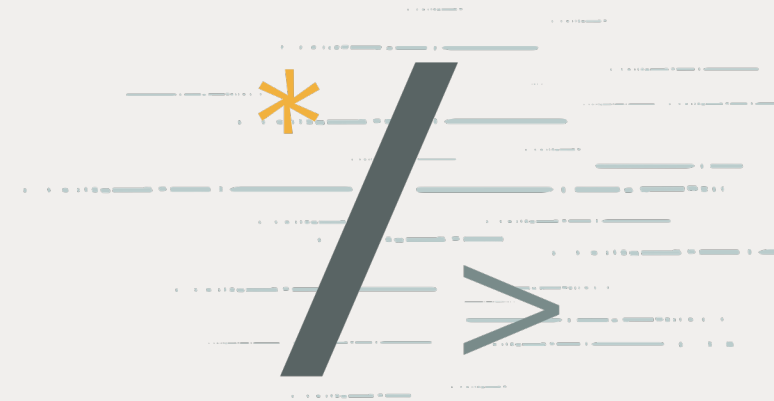


Energy & Water



Industries on Oracle.com

# Learning Oracle APEX



# Oracle APEX - Events

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



- April 3-4 Oracle DevLive Bengaluru
- April 3-4 Oracle DevLive & CloudWorld Tour Sao Paulo
- April 12 APEX Alpe Adria
- April 22-24 APEX Connect
- May 9 Oracle DevLive New York City



## London

This event has concluded. Watch keynotes on demand.



## Bengaluru

3-4 April 2024



## São Paulo

3 April 2024



## New York City

May 9, 2024

[Home](#)[About ▾](#)[Location](#)[Register](#)[APEX](#)[Agenda](#)[Partners](#)

# APEX CONFERENCE



ODTUG Kscope as you've come to love it. From the APEX Sunday Symposium through to Thursday's HOLs, your entire week could be devoted to the world's most popular low code platform. Prepare to be amazed at just what APEX can do for you!

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

# Training and Certifications

<https://apex.oracle.com/en/learn/training/>

## Learn Oracle APEX Fundamentals

**Embark on your APEX development journey by enrolling in the Oracle APEX Foundations course.**

This 3-hour learning path is ideal for beginners looking for a general overview of APEX. Explore the core functionality of APEX such as the App Builder and SQL Workshop, and build your first cloud application with APEX on OCI.

Upon completion, you will be familiar with the key capabilities and components of APEX.



## Become an Oracle APEX Professional

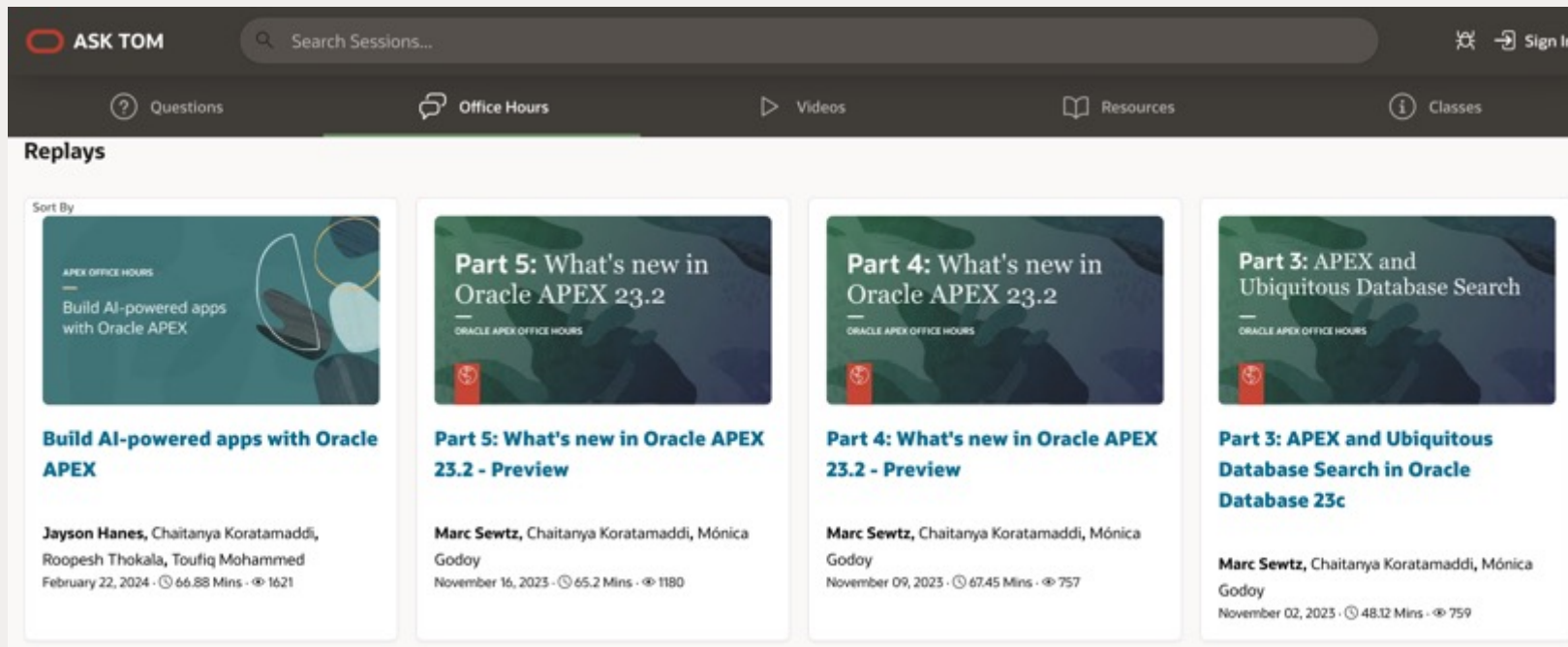
**Dive deeper into APEX capabilities by enrolling in the Oracle APEX Developer Professional Course**

This 13-hour learning path is targeted for both beginners and seasoned developers that want a deeper understanding of APEX. Dive into detail for each APEX component and try out the step-by-step guided labs for a hands-on experience.

Upon completion, you will have a practical knowledge of APEX concepts and capabilities, and a solid footing on how to build APEX apps.

# Oracle APEX Office Hours - [apex.oracle.com/officehours](https://apex.oracle.com/officehours)

Office Hours offers free, live Q&A sessions with experts in various aspects of Oracle technologies. Our experts are drawn from the ranks of product managers, developers, development managers and evangelists. We make ourselves available each month to help you be as successful as you can with Oracle products.



The screenshot shows the Oracle APEX Office Hours website interface. At the top, there is a navigation bar with the "ASK TOM" logo, a search bar labeled "Search Sessions...", and links for "Sign In", "Questions", "Office Hours", "Videos", "Resources", and "Classes". The "Office Hours" tab is currently selected. Below the navigation bar, the "Replays" section is displayed, featuring a "Sort By" dropdown and a grid of four replay cards. Each card includes a title, a subtitle, the speakers' names, and the session date, duration, and view count.

Replay Title	Speakers	Date	Duration	Views
Build AI-powered apps with Oracle APEX	Jayson Hanes, Chaitanya Koratamaddi, Roopesh Thokala, Toufiq Mohammed	February 22, 2024	66.88 Mins	1621
Part 5: What's new in Oracle APEX 23.2 - Preview	Marc Sewtz, Chaitanya Koratamaddi, Mónica Godoy	November 16, 2023	65.2 Mins	1180
Part 4: What's new in Oracle APEX 23.2 - Preview	Marc Sewtz, Chaitanya Koratamaddi, Mónica Godoy	November 09, 2023	67.45 Mins	757
Part 3: APEX and Ubiquitous Database Search in Oracle Database 23c	Marc Sewtz, Chaitanya Koratamaddi, Mónica Godoy	November 02, 2023	48.12 Mins	759



# Oracle APEX - Tutorials

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

- Build a Social Media App
- Build a Starter Online Shopping App
- Workflow Lab
- Build AI-Powered Image Search
- Build a Movies Watchlist Application

### Hands On Labs

The following labs provide step-by-step instructions to complete a given scenario, and cover everything from basics to more advanced topics.



#### Workflow Lab

**Duration:** 2-3 hours

**Intended Audience:** Intermediate

**Objectives:**

- Create a Business Process using Workflows in APEX
- Add Human Tasks to the Workflow
- Add Activities and Connections to the Workflow

Learn all about Workflows in APEX by implementing an efficient system to schedule and manage doctor consultations.



#### Build AI-Powered Image Search

**Duration:** 1 hour

**Intended Audience:** Intermediate

**Objectives:**

- Create REST Data Source based on the OCI Vision API
- Invoke the OCI Vision REST Data Source
- Display OCI Vision results and search images
- Enable PWA and other mobile-friendly features

Learn how OCI Vision is used to tap into the power of visual intelligence and enhance the Oracle APEX Social Media app for the classification of images.



#### Build a Social Media App

**Duration:** 1 hour

**Intended Audience:** Everyone

**Objectives:**

- Learn how to use Quick SQL
- Learn how to use a Form and a Cards Region including Dialogs
- Learn to work with BLOBs, Dynamic Actions and Custom Events

This workshop will give everyone a great exposure to what a developer can do with APEX using Low-Code and relatively simple approaches!

# Understanding the Oracle APEX Application Development Lifecycle



## Oracle APEX Technical Paper

- Best-practice tips and working sample scripts to help navigate the key phases of development, testing, and deployment from the command line as well as from popular automation platforms
- Learn about available options to track issues, manage source control changes, perform unit testing, and automate steps of the software delivery process

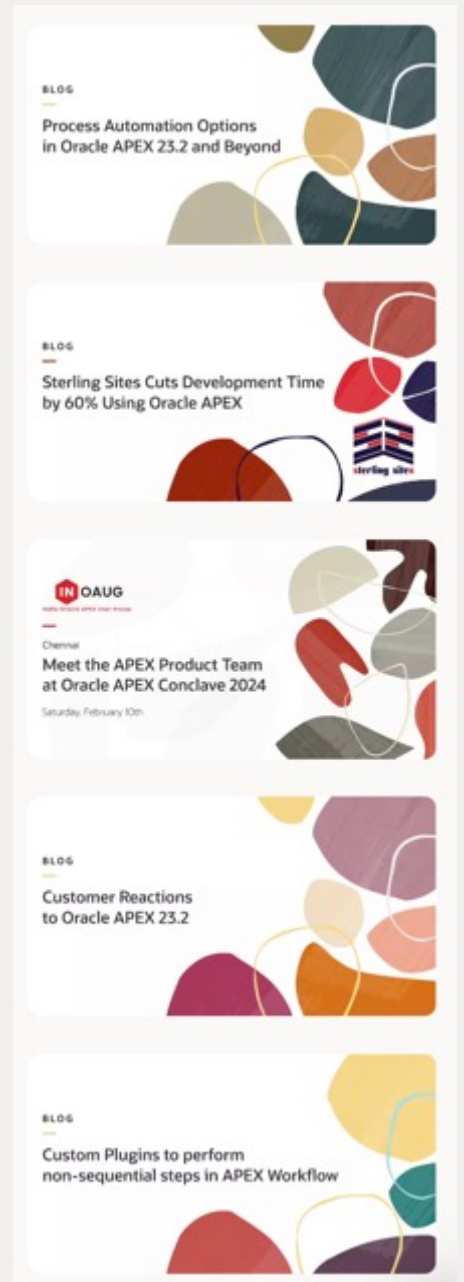


<https://blogs.oracle.com/apex/post/application-development-lifecycle-technical-paper>

## New Blog Posts

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

- Announcing the Oracle APEX Sample Document Generator App!
- General Guide: Modernizing Oracle Forms using Oracle APEX
- Oracle APEX lowers the barriers to entry for low-code app development with ECPUs and per-Gigabyte Storage Pricing
- Process Automation Options in Oracle APEX 23.2 and Beyond

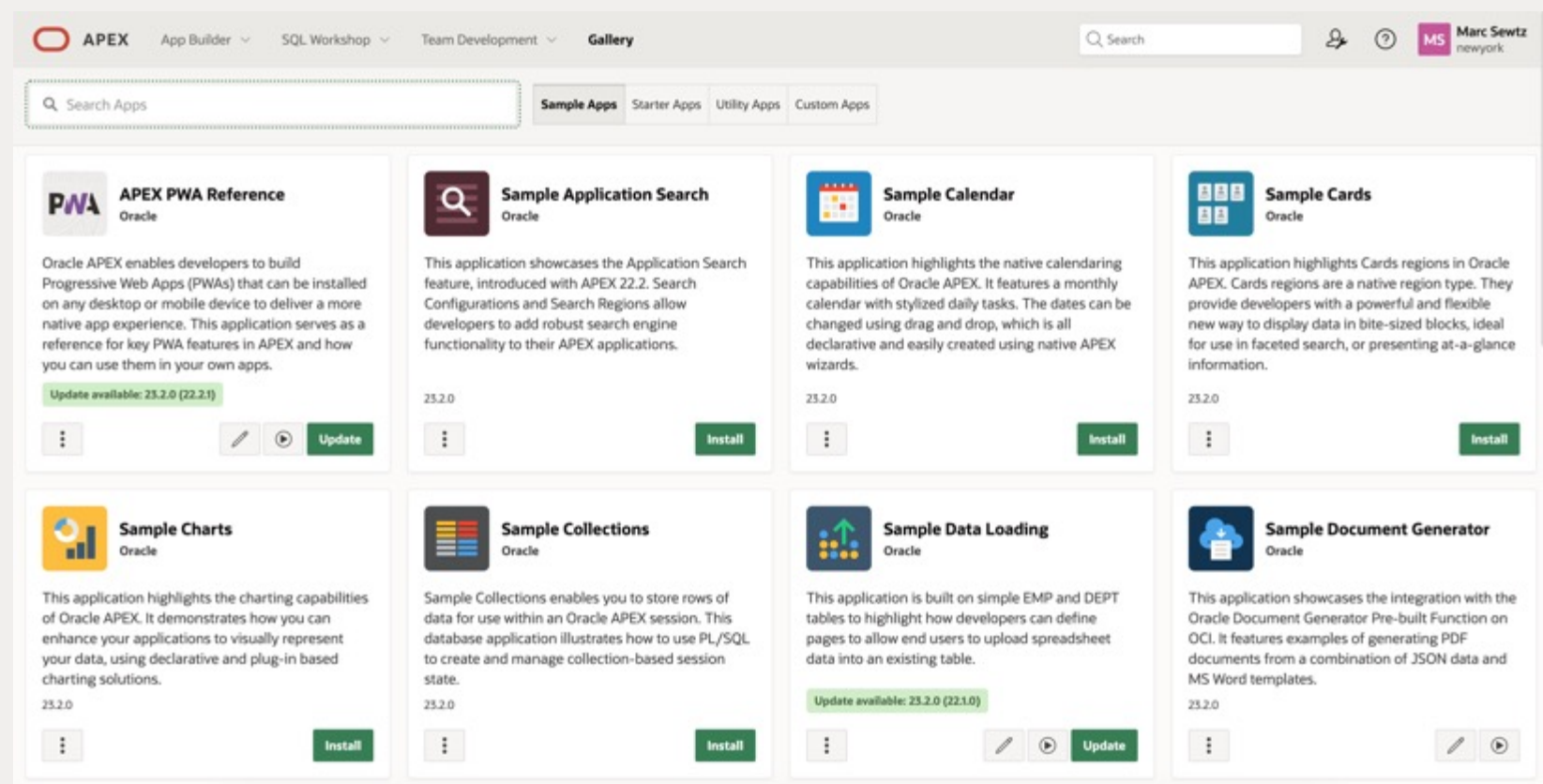


# Oracle APEX Apps & Plug-Ins on GitHub

The APEX GitHub repository contains starter apps, sample apps, sample code, and plug-ins that you can try, learn from, use, and experiment within Oracle APEX!



[oracle.github.io/apex](https://oracle.github.io/apex)



The screenshot shows the Oracle APEX Gallery interface. At the top, there's a navigation bar with links to APEX, App Builder, SQL Workshop, Team Development, and Gallery. A search bar is also present. Below the navigation bar, there are tabs for Sample Apps, Starter Apps, Utility Apps, and Custom Apps. The main area displays a grid of app cards. Each card includes an icon, a title, a description, a version number (23.2.0), and an 'Install' button. The apps shown are:

- APEX PWA Reference**: Oracle APEX enables developers to build Progressive Web Apps (PWAs) that can be installed on any desktop or mobile device to deliver a more native app experience.
- Sample Application Search**: This application showcases the Application Search feature, introduced with APEX 22.2. Search Configurations and Search Regions allow developers to add robust search engine functionality to their APEX applications.
- Sample Calendar**: This application highlights the native calendaring capabilities of Oracle APEX. It features a monthly calendar with stylized daily tasks. The dates can be changed using drag and drop, which is all declarative and easily created using native APEX wizards.
- Sample Cards**: This application highlights Cards regions in Oracle APEX. Cards regions are a native region type. They provide developers with a powerful and flexible new way to display data in bite-sized blocks, ideal for use in faceted search, or presenting at-a-glance information.
- Sample Charts**: This application highlights the charting capabilities of Oracle APEX. It demonstrates how you can enhance your applications to visually represent your data, using declarative and plug-in based charting solutions.
- Sample Collections**: Sample Collections enables you to store rows of data for use within an Oracle APEX session. This database application illustrates how to use PL/SQL to create and manage collection-based session state.
- Sample Data Loading**: This application is built on simple EMP and DEPT tables to highlight how developers can define pages to allow end users to upload spreadsheet data into an existing table.
- Sample Document Generator**: This application showcases the integration with the Oracle Document Generator Pre-built Function on OCI. It features examples of generating PDF documents from a combination of JSON data and MS Word templates.

This branch is 44 commits ahead, 12 commits behind main.

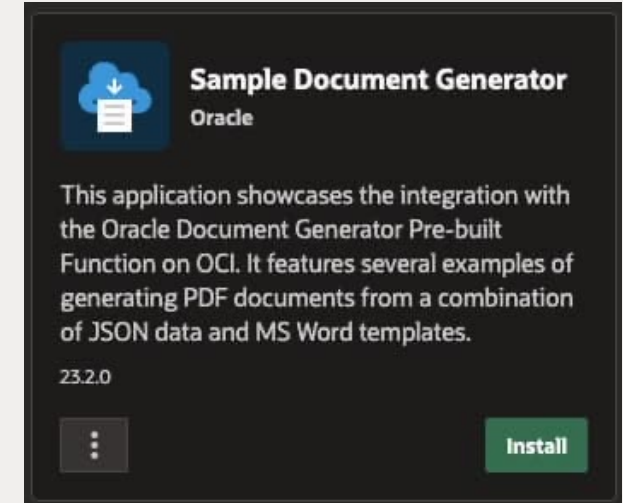
vincentmorneau Starter App Team Calendar 22.2.1	
docs	Starter App Team Calendar 22.2.1
plugins	updated sample calendar app & datepicker
sample-apps	updated sample calendar app & datepicker
sample-code	Universal Theme refresh
starter-apps	Starter App Team Calendar 22.2.1
.gitignore	Initial release to GitHub
CONTRIBUTING.md	Initial release to GitHub
LICENSE.txt	Initial release to GitHub
README.md	changing current year in readme
SECURITY.md	Initial release to GitHub
THIRD_PARTY_LICENSES.txt	Initial release to GitHub



# Oracle APEX Sample Document Generator App

## [apex.oracle.com/go/sample-doc-gen-app](https://apex.oracle.com/go/sample-doc-gen-app)

- Oracle Cloud Infrastructure (OCI) provides a powerful serverless computing platform called “Functions”, which allows you to run code without provisioning or managing servers.
- OCI Document Generator Function allows PDF generation with pre-built Function, based on JSON data and MS Word DOCX template
- OCI has a full offering of SDKs and a command line support, making it easy to integrate this prebuilt function into any application.
- Blog post: Announcing the Oracle APEX Sample Document Generator App  
<https://blogs.oracle.com/apex/post/announcing-the-oracle-apex-sample-document-generator-app>





# Demo

**DocGen Sample App**



# Oracle APEX & AI

 **APEX** Platform Solutions Learn Community 

[Start for Free Today](#) [Sign In](#)

## AI Powered Apps

Give your users greater insights by leveraging native platform capabilities including vector-based similarity search, content summary, and predictions. You can also incorporate powerful AI features to deliver personalized experiences and recommendations, process natural language prompts and more by integrating directly with the suite of OCI AI services.

For example, you can leverage OCI Vision to interpret visual and text inputs, including image recognition and classification, or use OCI Speech to transcribe and understand spoken language, making both images and audio content accessible and actionable.

### Empowering Search with OCI Vision in APEX

Learn how OCI Vision can be integrated with Oracle APEX to tap into the power of visual intelligence and transform data...

### Integrating AI Powered Image Search in APEX

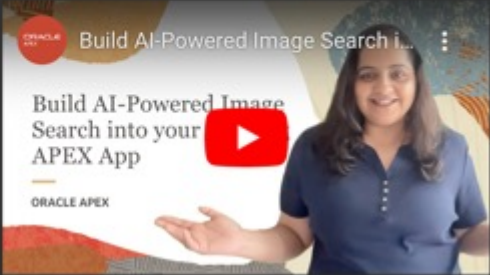
In this detailed video, walk through the step-by-step procedure to integrate OCI Vision with an existing Social...

### Oracle APEX Meets OCI Generative AI

With the introduction of native Generative AI Service on Oracle Cloud Infrastructure (OCI), enabling your application...

### Using Select AI within APEX

Select AI, a new feature of Autonomous Database, harnesses the power of generative AI and Large Language Models...



Build AI-Powered Image Search into your APEX App

ORACLE APEX

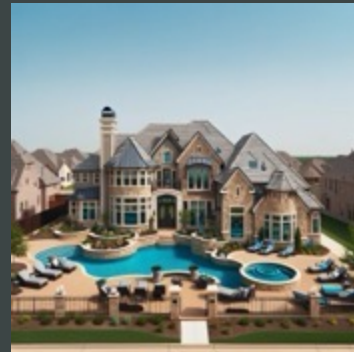


[apex.oracle.com/en/platform/ai](https://apex.oracle.com/en/platform/ai)

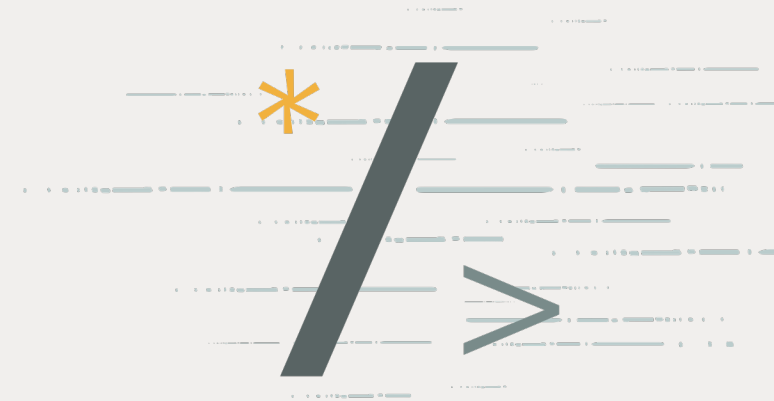


# Demo

## Vision AI



# Pricing & Support



# Oracle APEX - Pricing

## **APEX on Premises**

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

APEX is available as a free, no-cost feature of the Oracle Database. Take advantage of the full functionality of Oracle APEX and install it anywhere, from your notebook to Exadata in your data center. The entire stack, including Oracle APEX, Oracle REST Data Services (ORDS), and Oracle Database are fully supported with your Oracle Database license.

### **Free with Oracle Database**

Oracle APEX is a no-cost feature of the Oracle Database.

### **Support Included**

Receive enterprise-grade support from Oracle's product experts.

### **No limits on apps, users, or developers**

Enjoy unrestricted creation, collaboration, and deployment capabilities.



# Oracle APEX - Pricing

## APEX on Oracle Cloud

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

Oracle APEX offers simple, **consumption-based pricing** for developing and running your low-code apps on Oracle Cloud Infrastructure (OCI). You simply pay for the amount of compute and storage consumed by your APEX apps. You are not charged by the number of app users, developers, apps, or workloads.

There are two main ways to deploy Oracle APEX applications with **ECPU pricing**:

- **Oracle APEX Application Development Service:** This fully managed service offers a pay-as-you-go model based on ECPU hours. The basic tier starts at \$122 per month for 2 ECPUs and 20 GB of storage. As your application grows, you can easily scale up by adding more ECPUs and gigabytes of storage.
- **Oracle APEX on Autonomous Database Service:** Enables you to build and run scalable cloud and mobile apps with full database connectivity. Pricing starts at \$502 per month for 2 ECPUs and 20 GB of storage. In addition, Oracle Database customers with unused licenses can obtain Autonomous Database Serverless at significantly reduced prices with Bring-Your-Own-License (BYOL) discounts.

You can also get started with Oracle APEX for FREE by signing up for Oracle Cloud Free Tier.



# Oracle APEX - Pricing

## APEX on Oracle Cloud

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

### Database Access

	Always Free	APEX Application Development Service	APEX with Autonomous Database
Database Edition	Oracle Database Enterprise Edition		
Database Connectivity	<ul style="list-style-type: none"><li>• Browser-based tools</li><li>• REST access to data</li><li>• Direct database connectivity</li></ul>	<ul style="list-style-type: none"><li>• Browser-based tools</li><li>• REST access to data</li></ul>	<ul style="list-style-type: none"><li>• Browser-based tools</li><li>• REST access to data</li><li>• Direct database connectivity</li></ul>



# Oracle APEX - Pricing

## APEX on Oracle Cloud

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

### Licensing

	Always Free	APEX Application Development Service	APEX with Autonomous Database
BYOL Discounts	-No	-No	Yes
Compute Pricing	FREE	<b>\$120.08 per 2 ECPU per month</b> (billed hourly while running)	<b>\$499.97 per 2 ECPU per month</b> (billed hourly while running)
Data Storage Pricing	FREE	<b>\$2.31 per 20 GB per month</b> (billed monthly)	<b>\$2.31 per 20 GB per month</b> (billed monthly)



# Oracle APEX – Support

[www.oracle.com/application-development/apex/faq/](https://www.oracle.com/application-development/apex/faq/)

## On Premises

- Oracle APEX is supported for **18 months**.
- Oracle APEX ships with several open source libraries, including Oracle JavaScript Extension Toolkit (JET). These libraries are frequently updated, and bug fixes are only available with the most recent releases of these libraries.
- Oracle's support policy for APEX was changed to 18 months to align with Oracle and industry standards.

## Oracle Cloud

- Oracle APEX is available on Oracle Cloud Infrastructure (OCI), as part of the APEX Service and Autonomous Database.
- Both services are fully managed by Oracle and new versions of APEX are available on-premises and on OCI at the same time.
- Customers can choose to upgrade APEX at any time within the first 90 days after the release. After this time, Oracle APEX gets upgraded automatically.



# Oracle APEX – Support

[www.oracle.com/database/technologies/appdev/apex/collateral](http://www.oracle.com/database/technologies/appdev/apex/collateral)

## On Premises

Release	General Availability Date	Support Ends
23.2	Nov 2023	May 2025
23.1	May 2023	Dec 2024
22.2	Nov 2022	Dec 2024
22.1	May 2022	Dec 2024
21.2	Nov 2021	Nov 2024
21.1	May 2021	May 2024
20.2	Oct 2020	Dec 2024
20.1	Apr 2020	Dec 2024
19.2	Nov 2019	Nov 2024
19.1	Mar 2019	Mar 2024



# Oracle APEX – Support

## APEX on ADB

### Patches and upgrades

- Oracle is responsible for APEX patches and upgrades
- Monthly Patch Set Bundles
- New APEX releases at the same time as on premises (as of November 2022)
- Opt-in
  - 45-day or 90-day upgrade window
  - Apply the upgrade at the time of your choosing
  - Initiate the upgrade from APEX UI or using PL/SQL API
- Upgrade experience keeps improving with each upgrade cycle

# Git for internal APEX Development

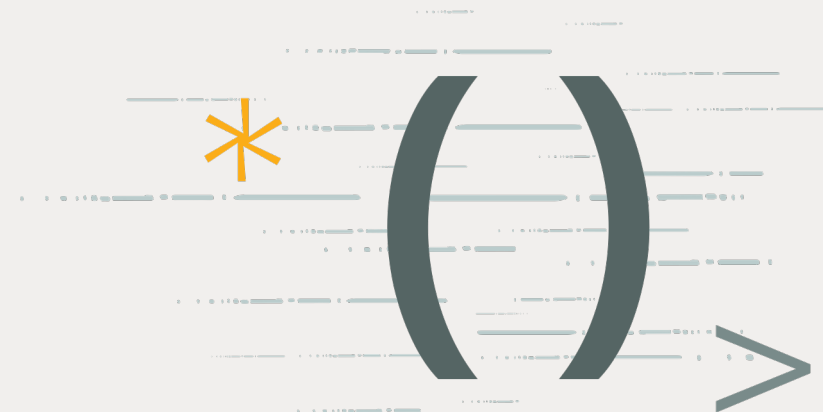


APEX product development has completed the migration from SVN to Git in October 2023

- **Modern Web UI:** OraHub presents a user friendly interface for people to visualize source code, create and merge branches
- **Enhanced Code Reviews:** Platforms like OraHub streamlines the code review process, ensures higher code quality and facilitates collaboration
- **Branching and merging:** Git branching and merging are superior, enabling efficient parallel development, even offline.
- **Cleanup opportunity:** Moving to Git was an opportunity for APEX to migrate only the relevant pieces and cleanup older unused directories in the source code.
- **Ecosystem and Integrations:** OraHub allows direct integrations with BugDB and Jira, reducing the manual labor of adding commit comments to Jira tickets or bug comments.

# APEX 23.2

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# Oracle APEX 23.2

Released on Nov 14, 2023 (OCI and On-Premises)

## New Features

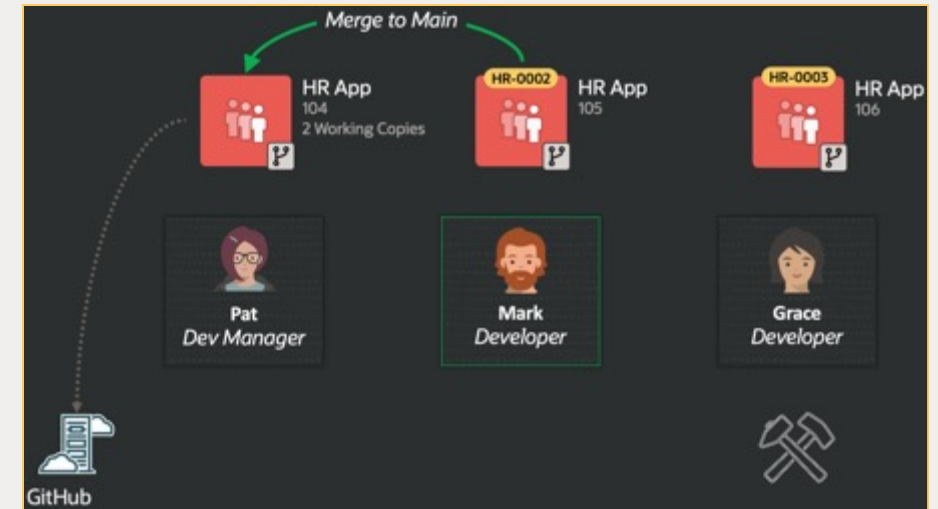
- Collaborative Development with Application Working Copy
- End-to-End Process automation with native Workflow
- New and Updated Components
- Developer Experience
- General Builder Improvements
- Additional Updates and Enhancements



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

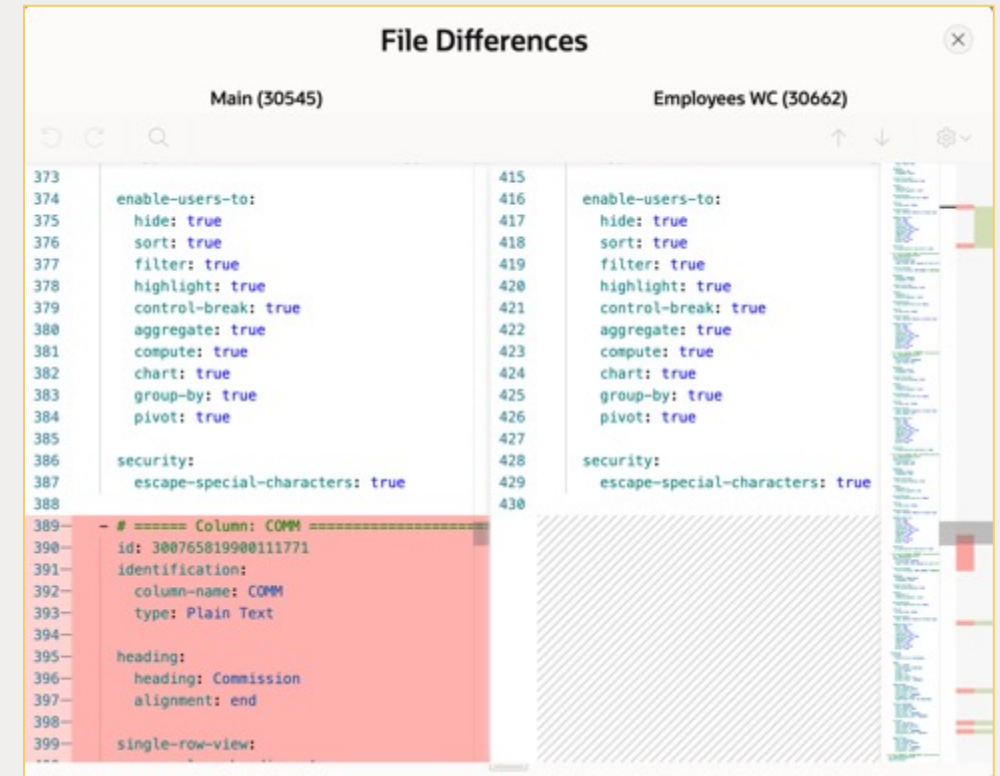
# Application Working Copy

- 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

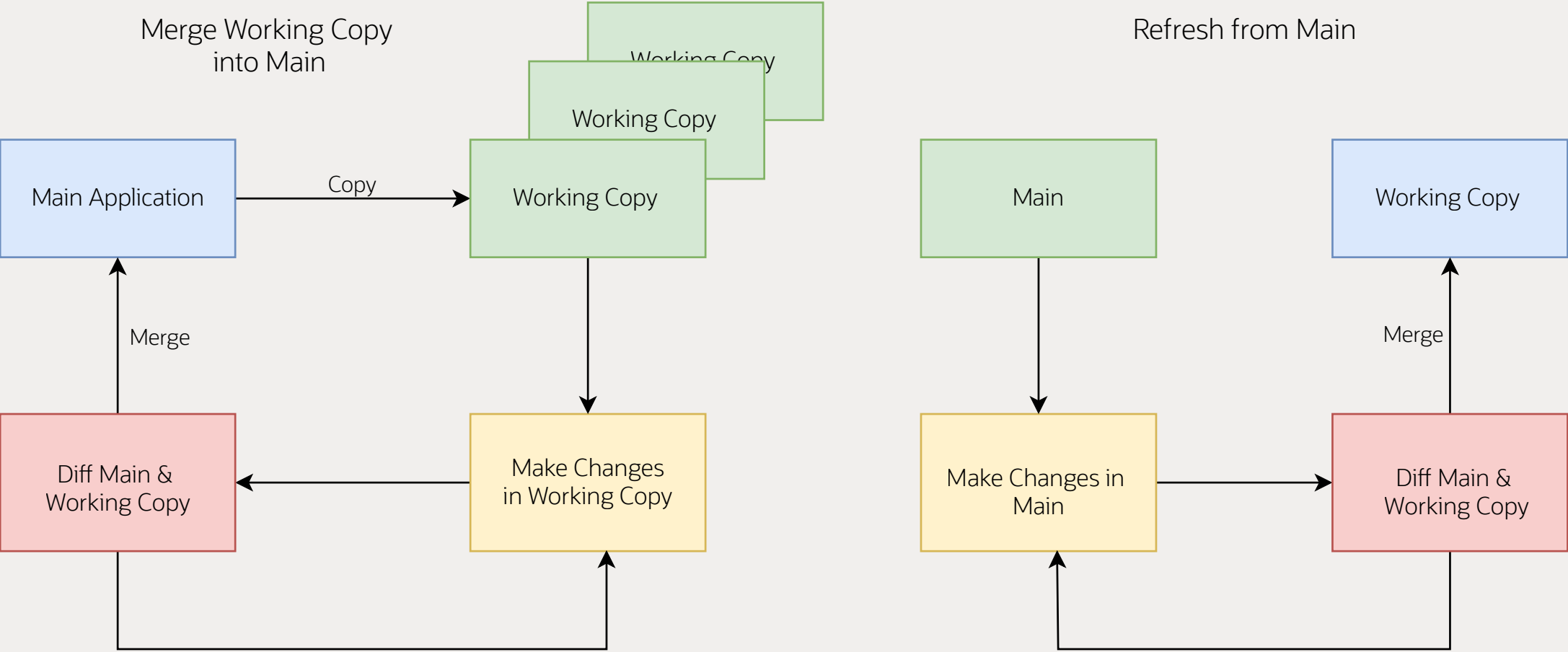


# Application Working Copy

- 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

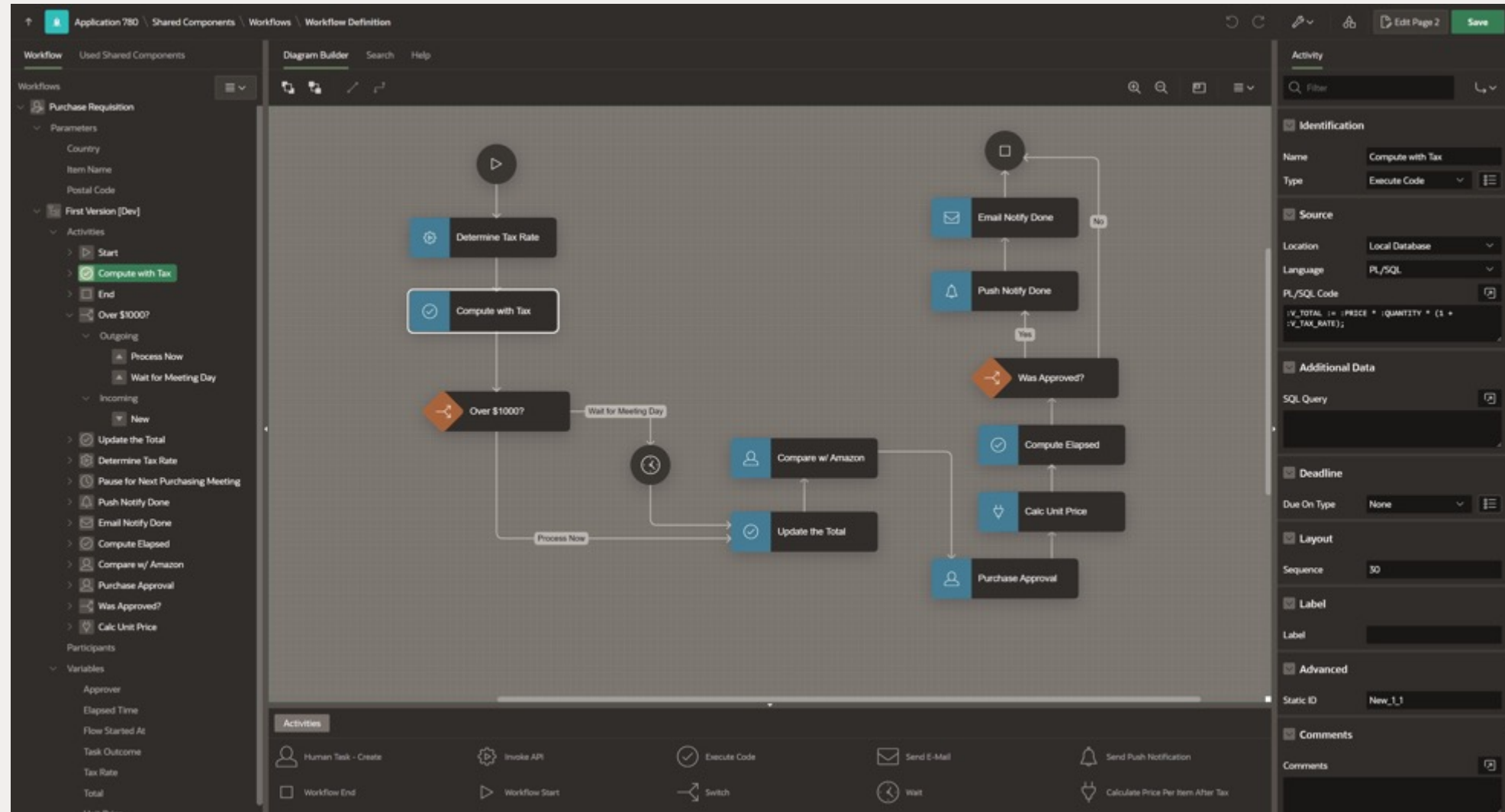


# Demo

**Working Copy**



# End-to-End Process automation with native workflow



# Workflow

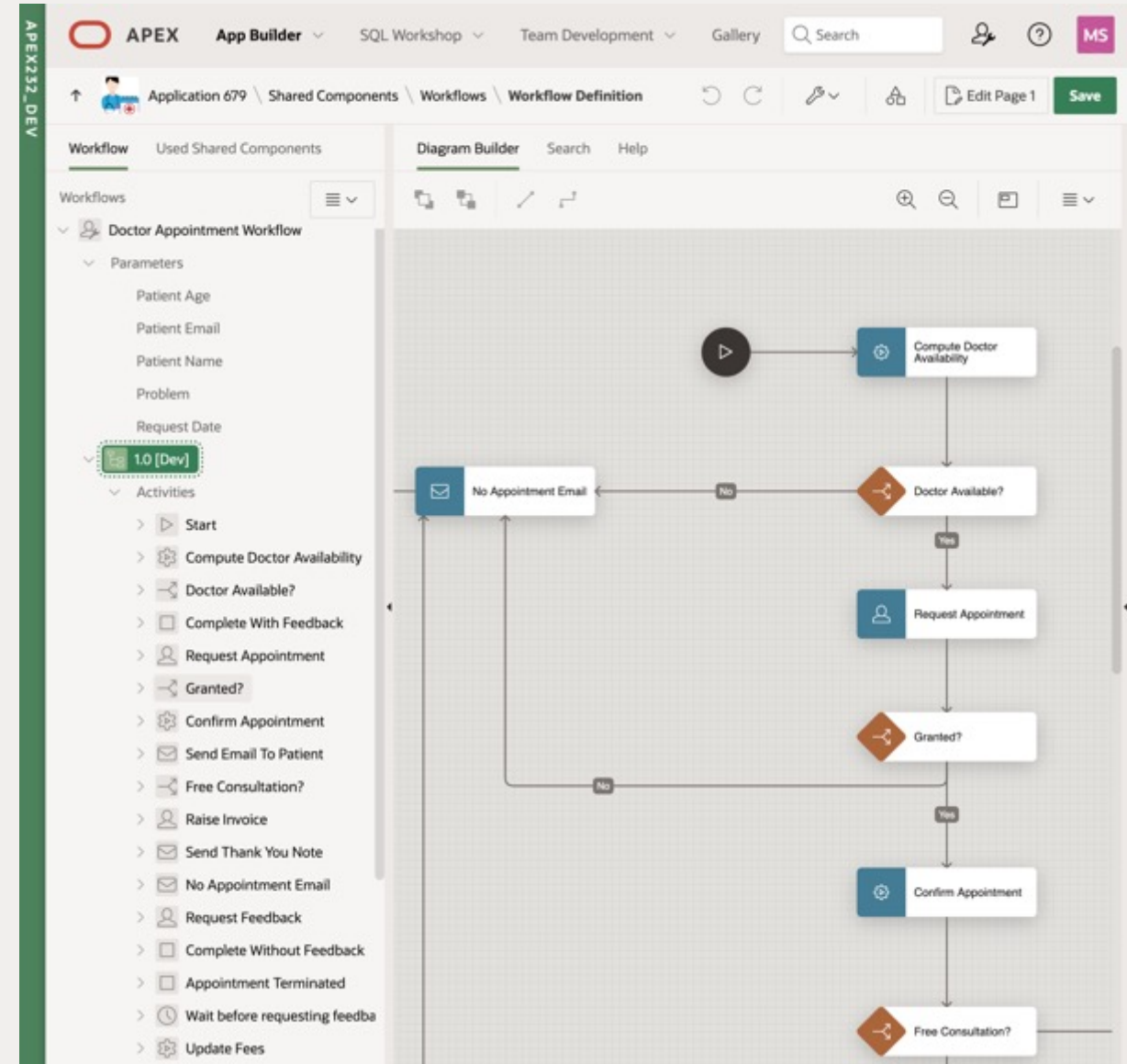
- Workflow is the **automation of a business process**, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules (e.g. sequence flow, transition conditions etc.).
- APEX Workflow provides the following 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

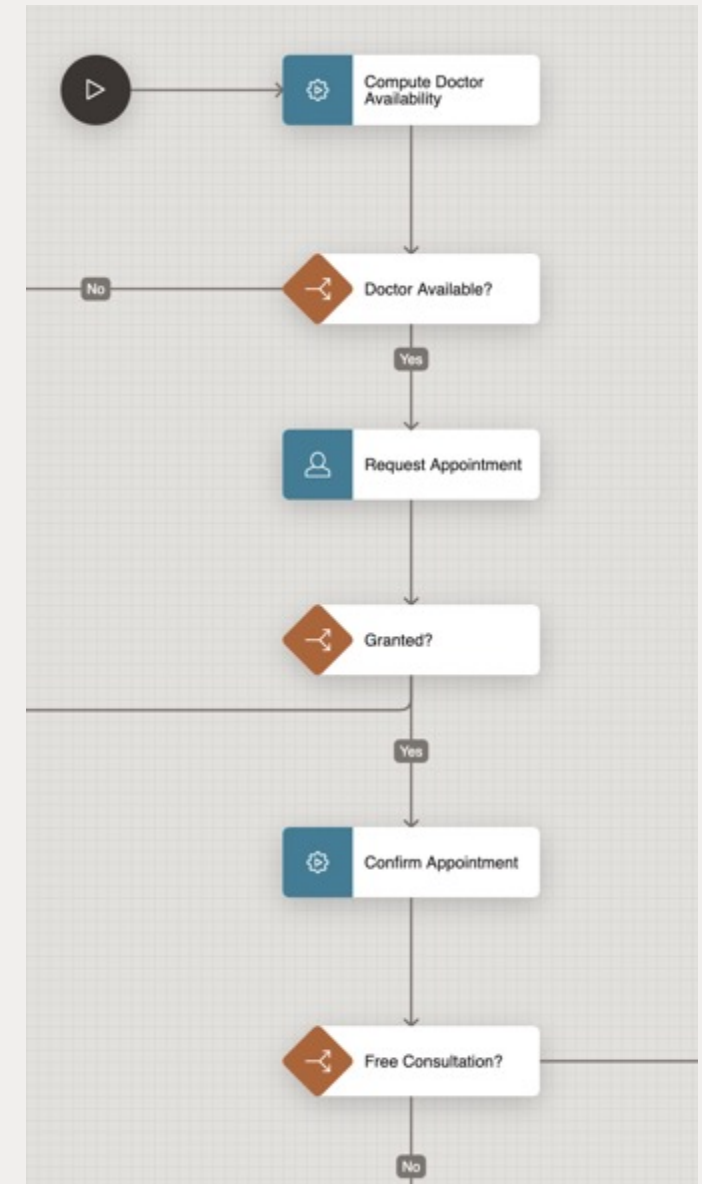
# Designing Workflows

- 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.



# Process Automation Options in Oracle APEX 23.2 and Beyond

- Two Process Automation solutions available for Oracle APEX:
  - **Oracle APEX Workflow** (introduced in 23.2) - APEX Workflow is a net new component in APEX 23.2 (and as such part of every APEX 23.2 installation)
  - **Flows for APEX** (since 2020) - Flows for APEX is an open-source implementation of the ISO standard BPMN 2.0. Initially started as a project at MT-IT Solutions, the implementation was made publicly available on GitHub and developers from other companies, including Oracle, started contributing.
- <https://blogs.oracle.com/apex/post/apex-workflow-positioning>

# New and Updated Components – New Page Items

## Combobox

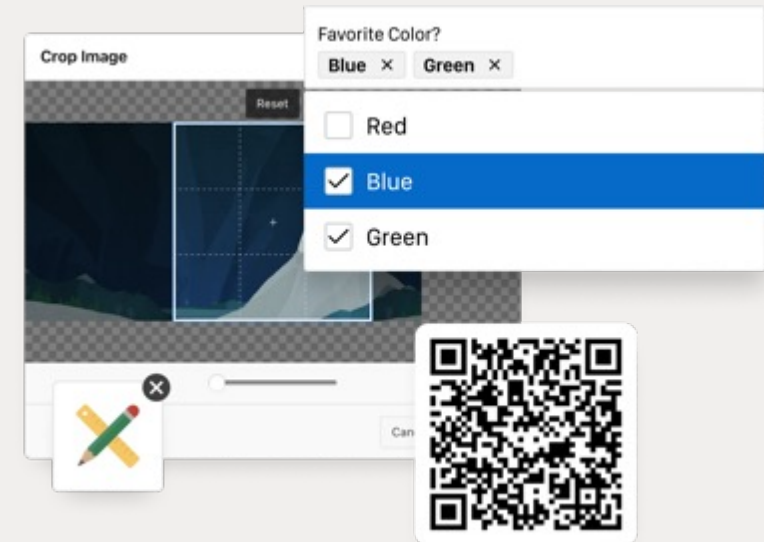
- A new Combo Box item type, which has a One and Many configuration
- Supports custom HTML for the choices with Template Directives
- Multi-select, The user can select more than one option and the dropdown is kept opened

## 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 File 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

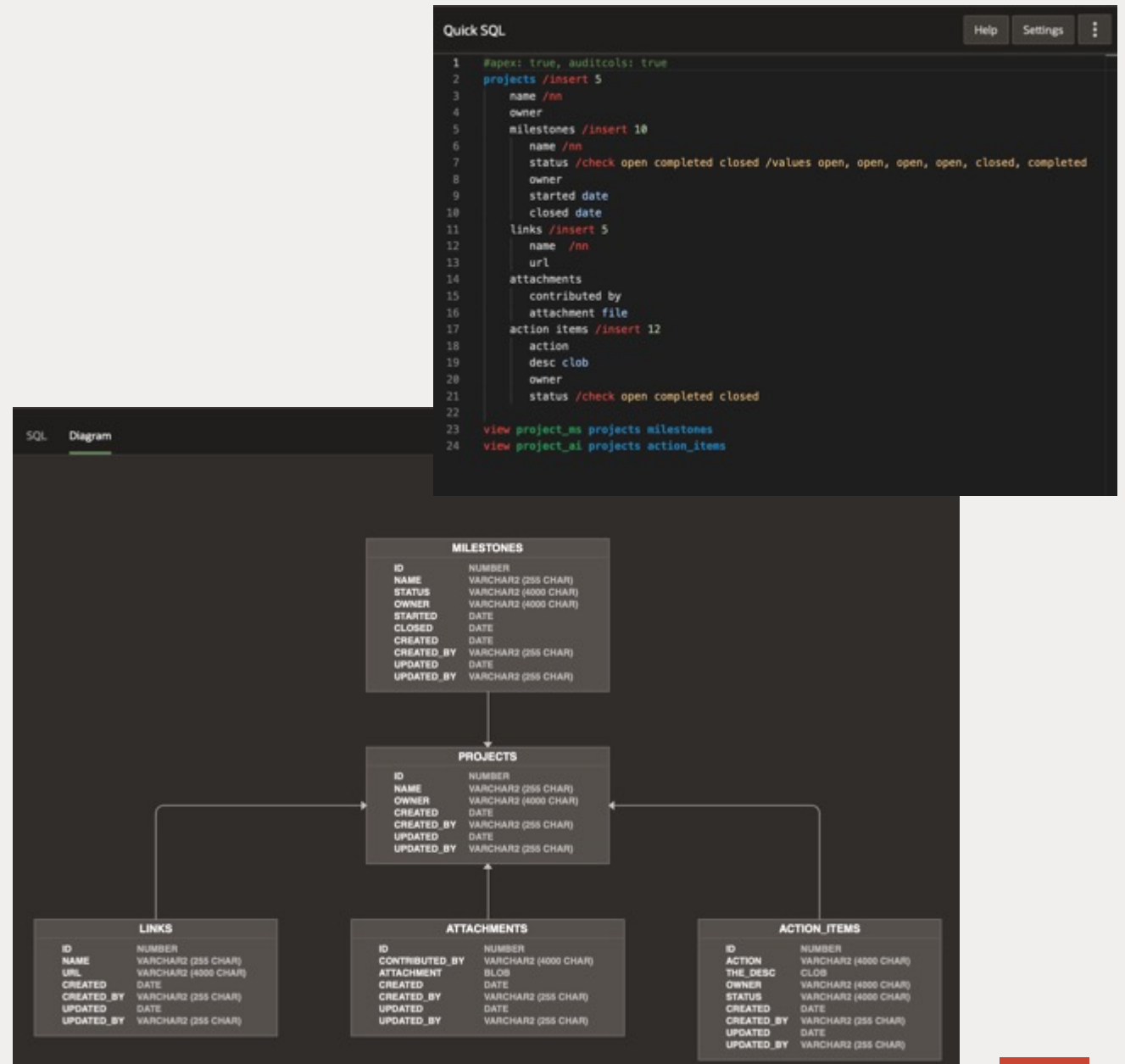
## Faceted Search Enhancements

- 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.

# 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	×

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More Detail

Create REST Data Source



# 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.

# 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.

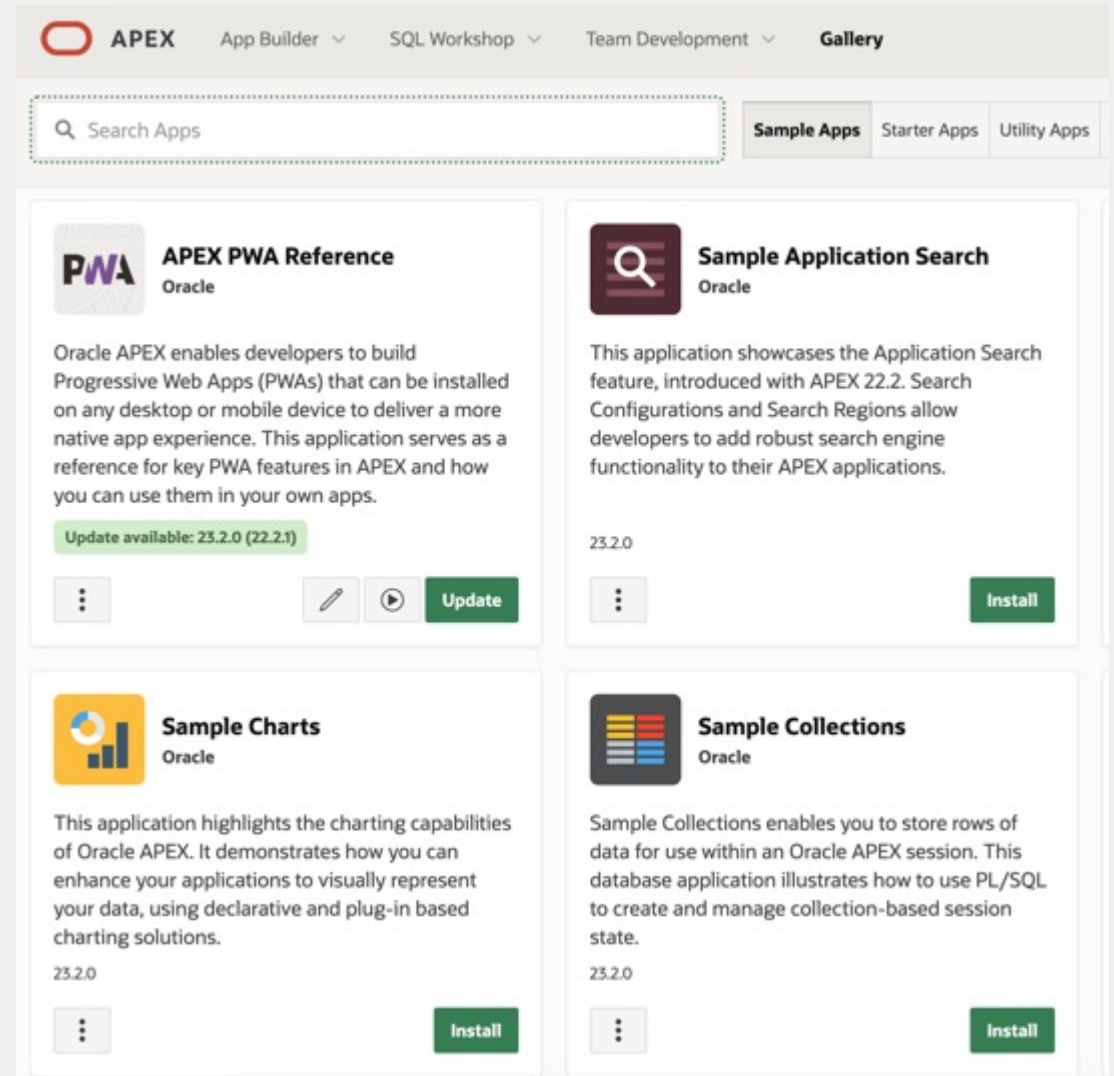
## **Builder Extension Links**

- 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

## 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.



# 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.

## **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

## **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**

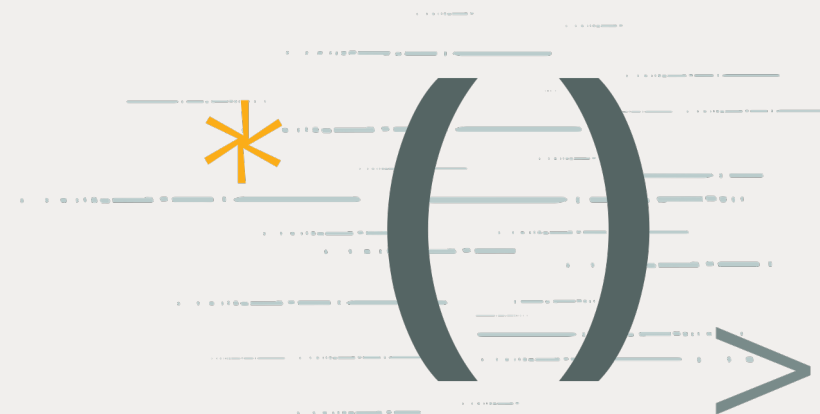
Tweaks to colors, backgrounds, textures, padding, and additional styling give the Redwood Light theme a refreshed look and feel.

## **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.

# JavaScript Library Upgrades

- Oracle JET 15.0.0
- 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 6.6.1
- PrismJS 1.29.0
- csso 5.0.5
- cropperjs 1.5.13
- CKEditor5 36.0.0
- jQuery UI 1.13.2



# Thank you

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