

ORACLE®

Oracle APEX 18.x New Features



[Name]
[Title]
[Organization]

[Month], 2018

Step Up to Modern Cloud Development

Safe Harbor Statement

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Agenda

- ▶ New Create Application Wizard
- ▶ Improved Create Page Wizard
- ▶ REST Enabled SQL Support
- ▶ REST Service Consumption
- ▶ New REST Workshop
- ▶ Page Designer Enhancements
- ▶ Oracle JET & jQuery Upgrade
- ▶ Universal Theme Updates
- ▶ APEX Spotlight Search
- ▶ Miscellaneous

- ▶ **New Create Application Wizard**
- ▶ Improved Create Page Wizard
- ▶ REST Enabled SQL Support
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New Create Application Wizard

Low Code Development

- Oracle APEX 18.1 introduces an all new Low Code Create Application Wizard.
- New and improved user experience for creating applications.
- Simpler and modernized wizards for creating pages.
- Allows creation of more advanced pages such as Dashboards, Master-Detail, etc.

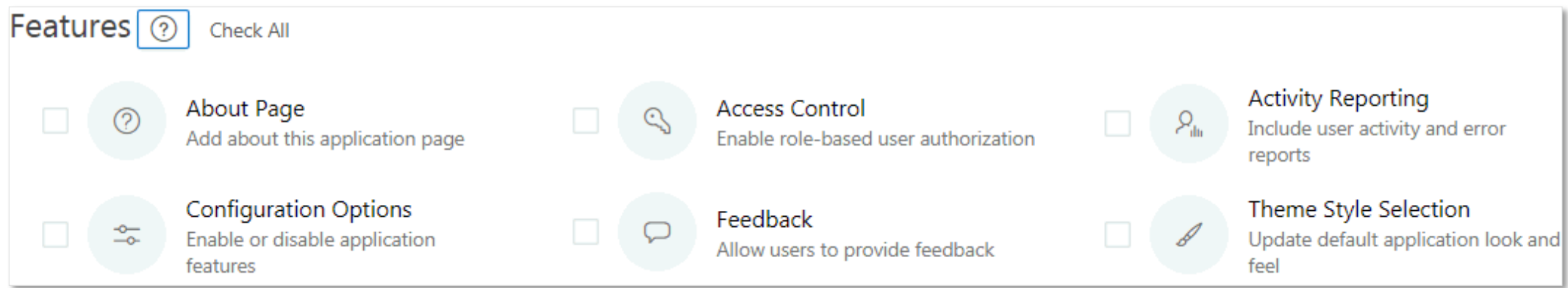
<http://apex.oracle.com/lowcode>

The screenshot shows the Oracle APEX 'Create an Application' wizard. The interface includes a top navigation bar with 'ORACLE APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Packaged Apps'. Below the navigation bar, there are links for 'View Blueprint' and 'Load Blueprint'. The main heading is 'Create an Application'. The form contains several sections: 'Name' (set to 'Demo App'), 'Appearance' (set to 'Vita, Side Menu'), 'Pages' (with an 'Add Page' button and a 'Home' page listed as 'Blank'), 'Features' (with checkboxes for 'About Page', 'Access Control', 'Activity Reporting', 'Configuration Options', 'Feedback', and 'Theme Style Selection'), and 'Settings' (with fields for 'Application ID' (606), 'Schema' (CHAITANYA), 'Authentication' (Application Express Accounts), 'Language' (English (en)), 'Advanced Settings', and 'User Interface Defaults'). At the bottom, there are 'Cancel' and 'Create Application' buttons.







New Create Application Wizard

Features

- Supports adding common frameworks or "Features" when creating an application such as access control, activity reporting, theme selection, and more
- Features provide application-level functionality and are based on best-practices used in APEX Packaged Applications.
- Customize user interface options such as Theme Style, application icon and page icons



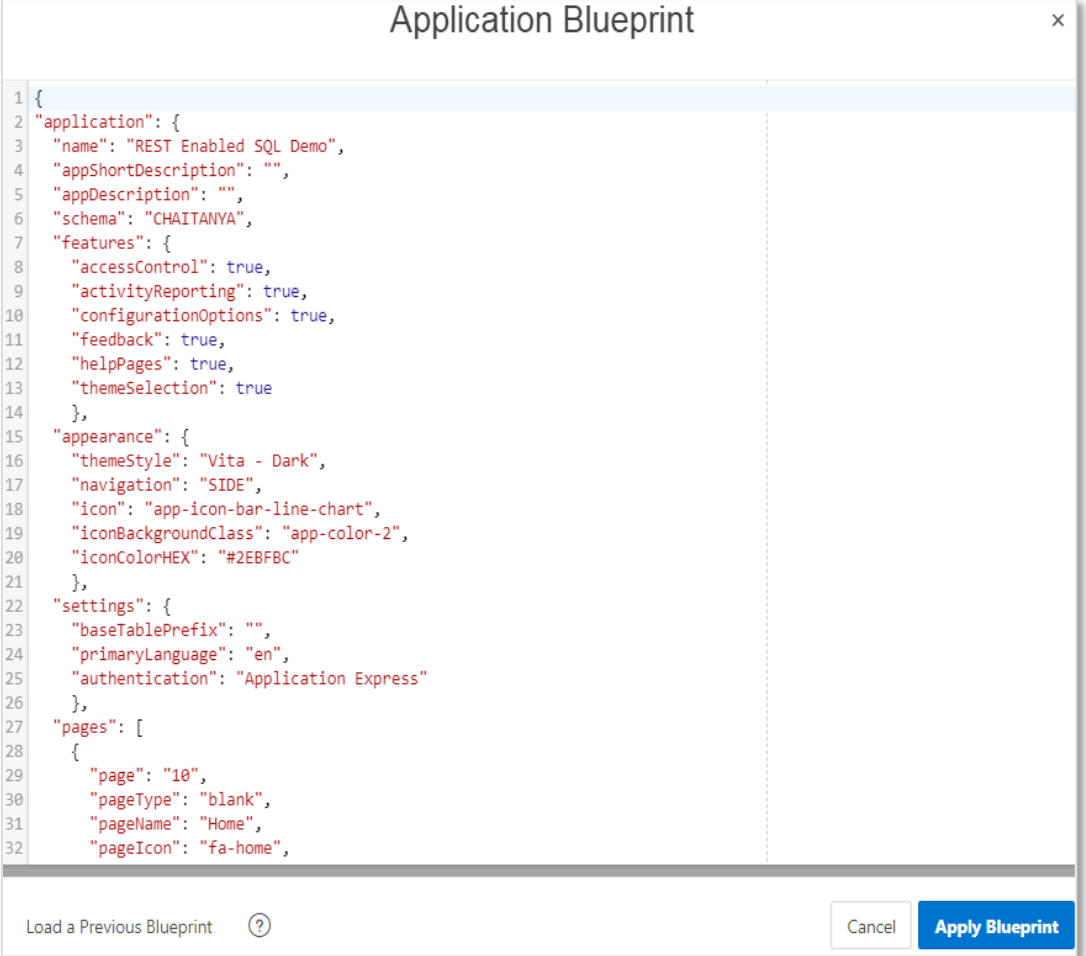
Features ? Check All

<input type="checkbox"/>	 About Page Add about this application page	<input type="checkbox"/>	 Access Control Enable role-based user authorization	<input type="checkbox"/>	 Activity Reporting Include user activity and error reports
<input type="checkbox"/>	 Configuration Options Enable or disable application features	<input type="checkbox"/>	 Feedback Allow users to provide feedback	<input type="checkbox"/>	 Theme Style Selection Update default application look and feel

New Create Application Wizard

Blueprints

- Blueprints represent an application definition in JSON format.
- The Blueprint editor allows for editing the JSON based definition and updating application properties.
- Copy & paste the JSON code of one page to quickly create a large number of similar pages.
- Blueprints of previously generated applications can be loaded again to iterate the application design.



The screenshot shows a window titled "Application Blueprint" with a close button in the top right corner. The main area contains a JSON definition for an application, with line numbers 1 through 32 on the left. The JSON is as follows:

```
1 {
2   "application": {
3     "name": "REST Enabled SQL Demo",
4     "appShortDescription": "",
5     "appDescription": "",
6     "schema": "CHAITANYA",
7     "features": {
8       "accessControl": true,
9       "activityReporting": true,
10      "configurationOptions": true,
11      "feedback": true,
12      "helpPages": true,
13      "themeSelection": true
14    },
15    "appearance": {
16      "themeStyle": "Vita - Dark",
17      "navigation": "SIDE",
18      "icon": "app-icon-bar-line-chart",
19      "iconBackgroundClass": "app-color-2",
20      "iconColorHEX": "#2EBFBC"
21    },
22    "settings": {
23      "baseTablePrefix": "",
24      "primaryLanguage": "en",
25      "authentication": "Application Express"
26    },
27    "pages": [
28      {
29        "page": "10",
30        "pageType": "blank",
31        "pageName": "Home",
32        "pageIcon": "fa-home",
```

At the bottom of the window, there is a "Load a Previous Blueprint" button with a question mark icon, a "Cancel" button, and an "Apply Blueprint" button.

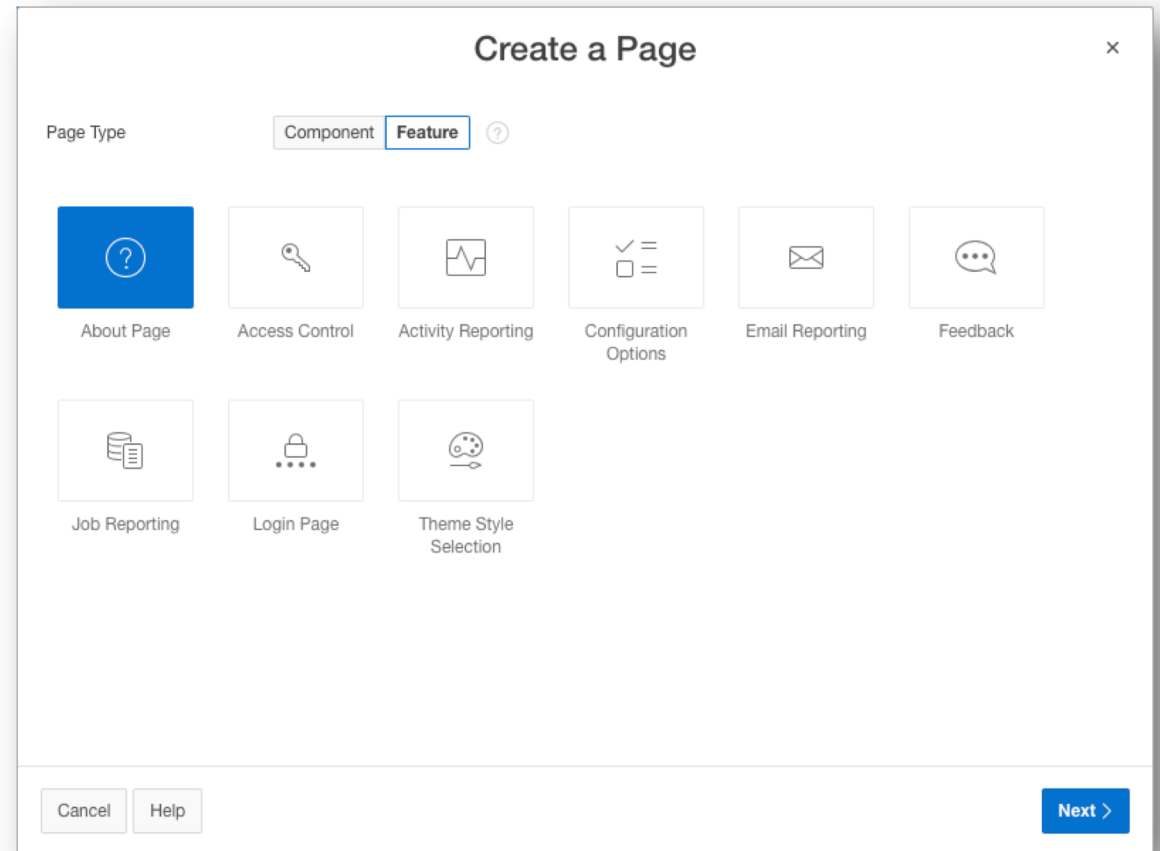
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- ▶ **Improved Create Page Wizard**
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- ▶ Miscellaneous
- ▶

Improved Create Page Wizard

Features

- Add the same features as available in Create App Wizard into an existing app
- Additional Features -
 - Email Reporting
 - Job Reporting *

* Only shown if jobs defined in schema
- Add to existing Administration page or create a new Admin page
- Only available for Universal Theme



Improved Create Page Wizard

New Page Type - Side by Side Master Detail

- Define up to 4 Detail tables
- Left Panel
 - Master record selector (with search)
- Right Panel
 - Master Value Pair Report (with Create / Edit)
 - Detail Classic Reports (with Region Display Selector if multiple)

Side by Side Master Detail Reset + Create

Search...

Configure Web Development Tool Environment
Lucille Beatie

Develop Bug Tracking Application
Lucille Beatie

Develop Customer Tracker Application
Lucille Beatie

Develop IT Management Apps
Bernard Jackman

Develop New Reporting Apps
Lucille Beatie

Develop Partner Portal POC
Bernard Jackman

Develop Production Partner Portal
Lucille Beatie

Sample\$Projects Edit

Status Id	3
Name	Develop Bug Tracking Application
Description	Develop an application to track bugs and their resolution.
Project Lead	Lucille Beatie
Budget	18000
Completed Date	09/OCT/18
Created	16/OCT/18 06:09:27.146866 PM
Created By	DPEAKE
Updated	16/OCT/18 06:09:27.146915 PM
Updated By	DPEAKE

[Show All](#) [Sample\\$Project Milestones](#) [Sample\\$Project Tasks](#)

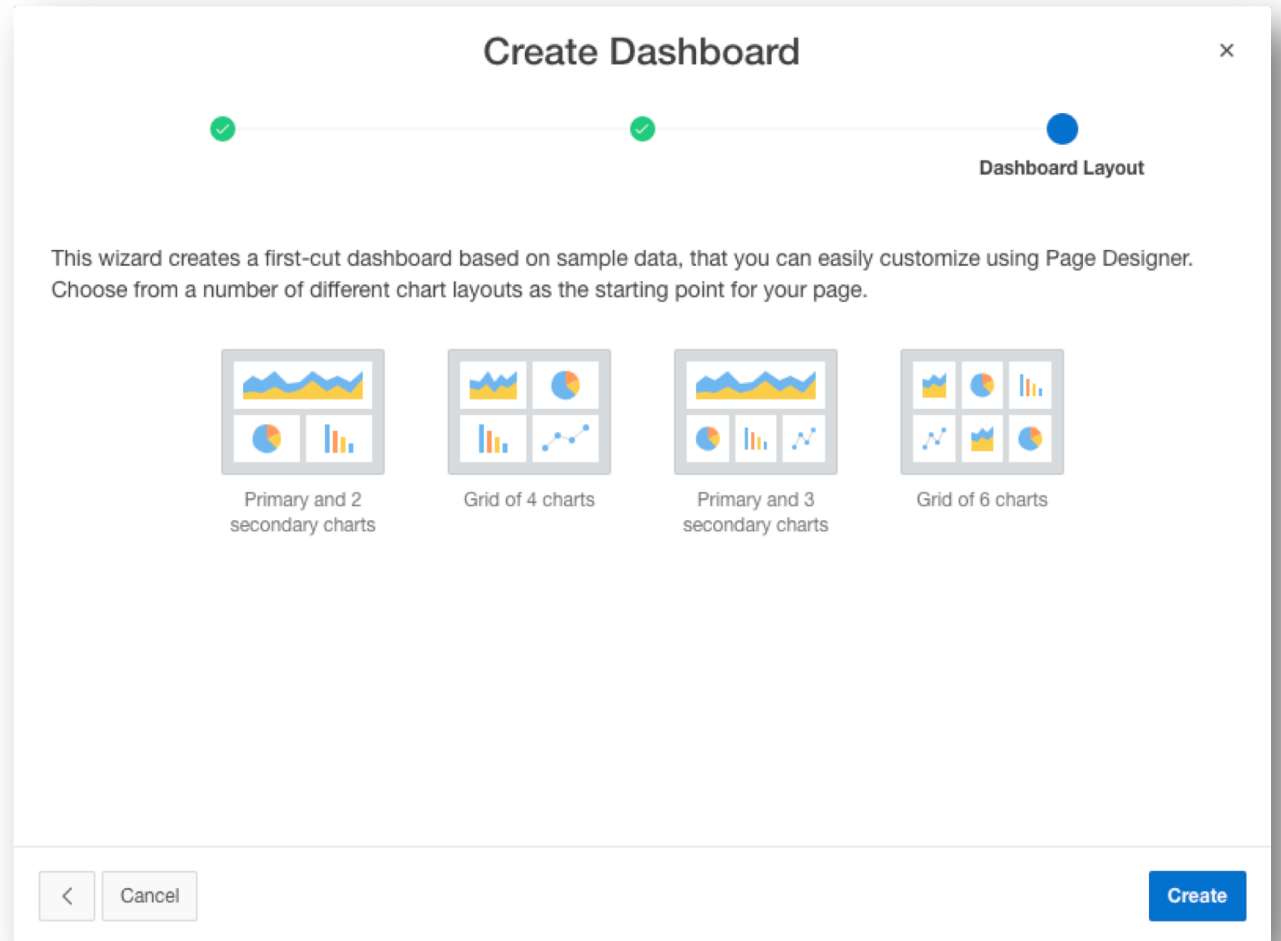
Sample\$Project Milestones +

	Name	Description	Due Date	Created	Created By	Updated	Updated By
	Review Bug Tracker Packaged App	Work with key stakeholders to prioritize improvements to the default Packaged App.	25/SEP/18	16/OCT/18 06:09:27.147938 PM	DPEAKE	16/OCT/18 06:09:27.147979 PM	DPEAKE

Improved Create Page Wizard

New Page Type - Dashboard

- Different chart layouts -
 - Primary and 2 secondary charts
 - Grid of 4 charts
 - Primary and 3 secondary charts
 - Grid of 6 charts
- Based on sample data
- Update using Page Designer post-generation



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REST Enabled SQL

The Basics...

Execute any SQL through a REST Endpoint

- e.g. "curl" utility

```
curl -H "Content-Type: application/json"
-u "SCOTT:*****"
-d '{"statementText": "select systimestamp as dt from dual"}'
http://{ords-hostname}:{ords-port}/ords/{db-schema}/_/_sql
```

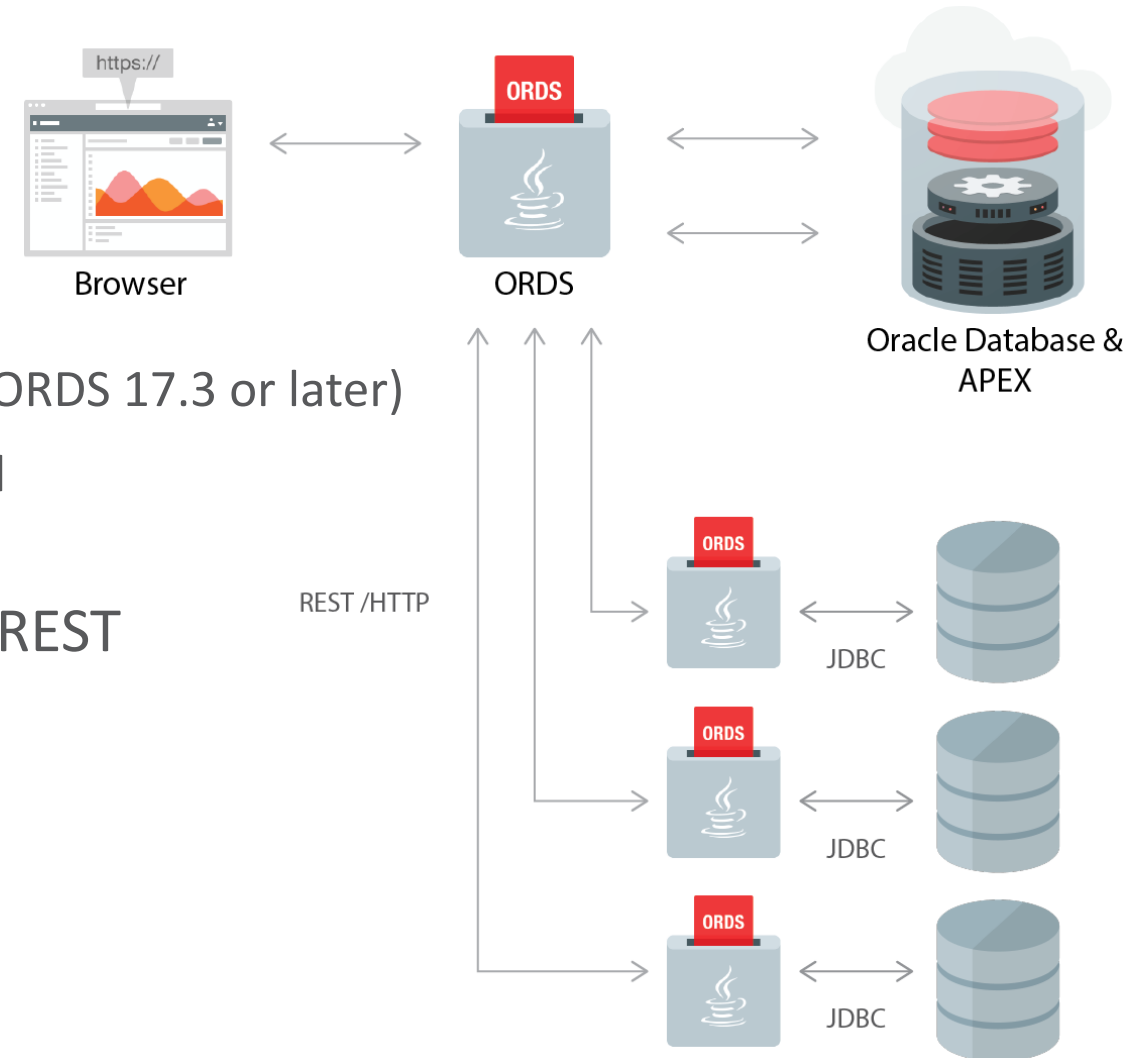


```
{
:
"items":[
{
:
"resultSet":{
"metadata":[
{
"columnName":"DT",
"jsonColumnName":"dt",
"columnName":"TIMESTAMP WITH TIME ZONE",
:
"items":[
{
"dt":"2018-03-09T14:44:18.401Z"}],
"hasMore":false,
:
}
```

REST Enabled SQL Support

Remote Database Connections

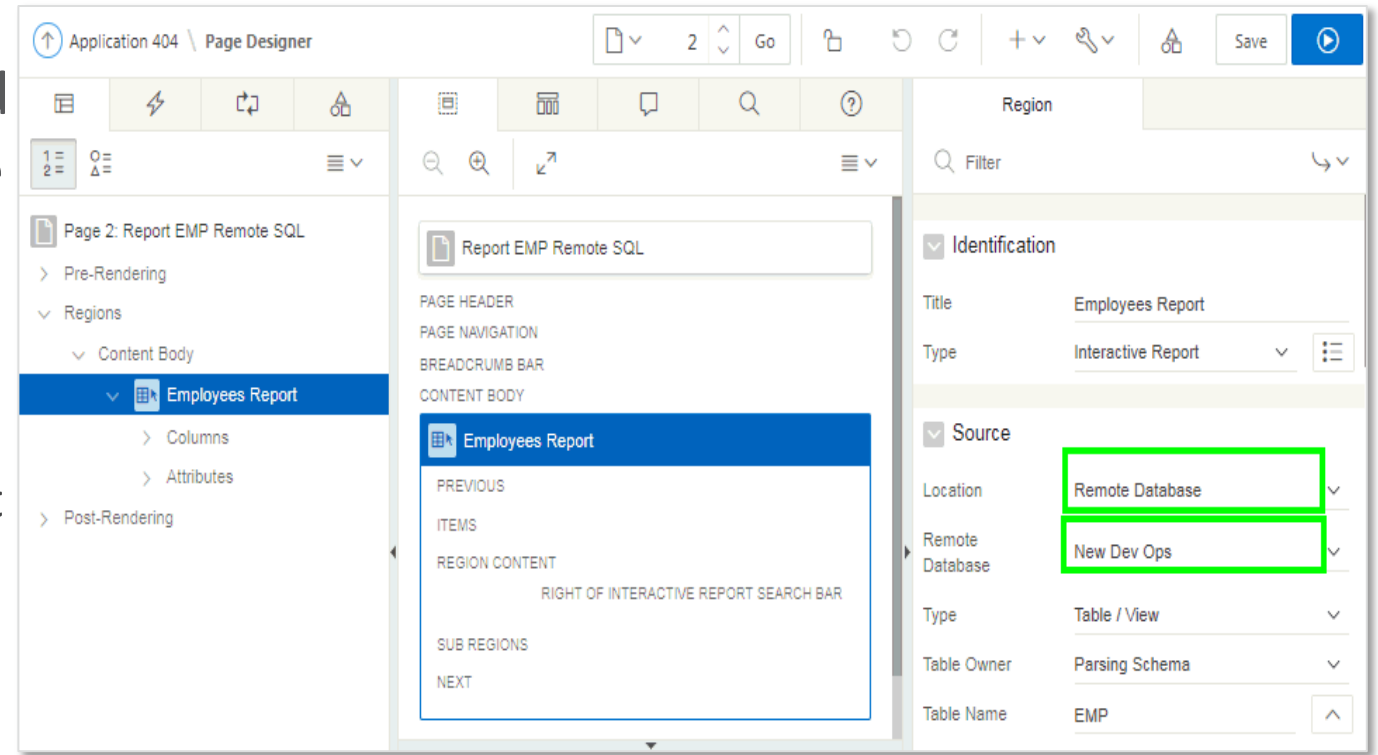
- Executing dynamic SQL or PL/SQL on remote databases using ORDS and REST
 - Relies on the ORDS "REST Enabled SQL" feature (ORDS 17.3 or later)
 - Requires ORDS instance having a connection pool configured for target database.
- Oracle APEX passes SQL query to ORDS over REST
- Self-describing JSON response
- Response contains a JSON object with:
 - Result set meta data (column names, data types)
 - The result data
 - Information about pagination



REST Enabled SQL Support

Using Remote Database Connections in Oracle APEX

- Create and maintain References to REST Enabled SQL Instances (Oracle REST Data Services) in Shared Components: A name, Endpoint URL, and Authentication information
- Use a REST Enabled SQL Service and therefore a remote Oracle database as the Data Source for Oracle APEX components like:
 - Classic Reports, Interactive Reports
 - Reflow Report, Toggle Columns Report
 - Tree Region, JET Charts, CSS Calendar
 - PL/SQL Process



REST Enabled SQL Support

Using Custom PL/SQL Code

- Access REST enabled SQL sources within custom PL/SQL Code:
 - Execute query and provide a "cursor" object `APEX_EXEC.OPEN_REMOTESQL_QUERY`
 - Execute a PL/SQL block anonymously `APEX_EXEC.EXECUTE_REMOTE_SQL`
- Use REST Enabled SQL as a Plug-In developer:
 - "Region Source supports different Data Sources" Plugin Attribute
 - Use `APEX_EXEC PL/SQL` package in Plug-In code

REST Enabled SQL Support

REST Enabled SQL vs. Database Links

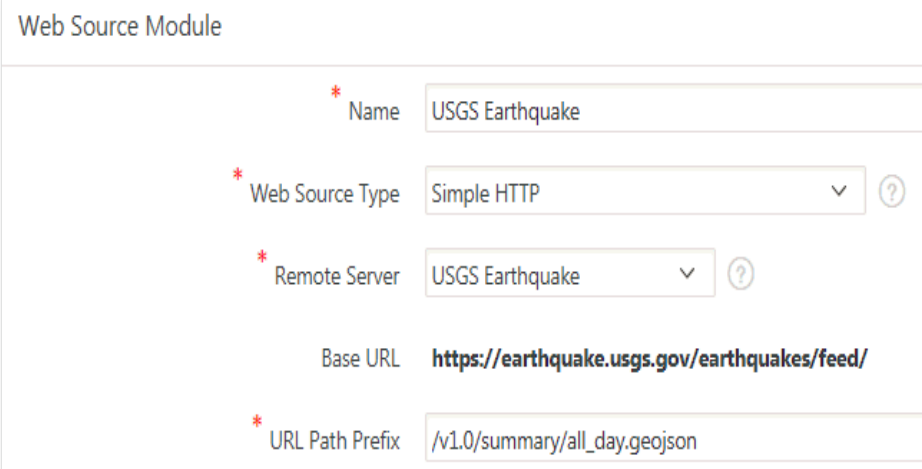
- Database Links:
 - Integration at the SQL- level
 - Works over SQL*Net or over the internet in the Cloud which can be problematic
 - Opens a session within the remote database
- REST Enabled SQL:
 - Integration at the workspace - level
 - Works with JSON over HTTP(s) which makes it easy-to-use it in Cloud environments or over the internet
 - Better scalability by using Connection Pool at the remote database

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REST Service Consumption

Web Source Modules

- Oracle APEX 18.1 introduces a new data source type called "Web Source Modules", a declarative method to define references to external REST APIs and generic JSON data feeds.
- Web Source Modules store additional metadata about how to parse response data and map it as a virtual table with rows and columns.
- A module can contain one or many Web Source Operations which are the references to a concrete external web service.
- Create and maintain Web Source Modules in Shared Components.



The screenshot shows the configuration for a Web Source Module. The fields are as follows:

Field	Value
Name	USGS Earthquake
Web Source Type	Simple HTTP
Remote Server	USGS Earthquake
Base URL	https://earthquake.usgs.gov/earthquakes/feed/
URL Path Prefix	/v1.0/summary/all_day.geojson

REST Service Consumption

Web Source Modules

- Use as data sources for Oracle APEX components such as:
 - Interactive Report, Classic Report
 - JET Chart, CSS Calendar
 - Tree Region, Reflow Report, Toggle Column Report
- Post Processing SQL modifies data before being processed by an Oracle APEX component:
 - Apply SQL functions, aggregations, join to local tables etc.
 - Avoid unnecessary HTTP requests by using **Caching**

REST Service Consumption

Web Source Modules: Drive Oracle APEX Components...

Sample REST Services \

Github Repositories

This example makes use of the [Github API](#). In Shared Components, the Web Source **Sample Application - Github Repositories** references all repositories of **oracle** Github user. Further Web Source Modules are available for *Commits*, *Issues* and *Pull Requests*.

This page renders some important repository attributes as an Interactive Report. The report behaves like a report on a local table; a repository name opens a modal dialog showing repository details as Report, Calendar or Cards view.

To avoid too many HTTP requests, *Caching* is enabled for this Web Source Module (Shared Components > Web Source M

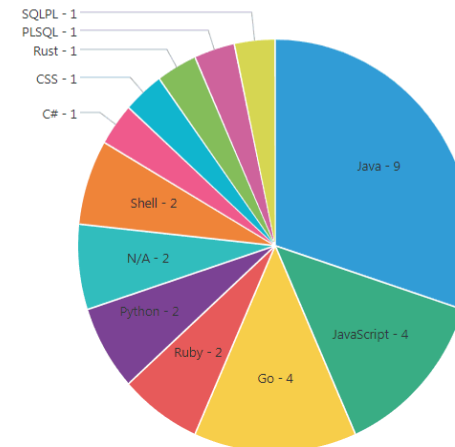
Name	Language	Description
accelerators	C#	Open Source Accelerator samples and tools for the Oracle Service Cloud (OSvC) developme
accs-caching-java-sdk	Java	Java Client Caching SDK for Oracle Application Container Cloud Service
adf-samples	Java	Various code samples published by Oracle relating to the Oracle Application Development
analytical-sql-examples	PLSQL	NO LONGER MAINTAINED. Code samples for Oracle's analytical SQL features
apps-cloud-ui-kit	CSS	Oracle Applications User Experience Rapid Development Kit (R10) for Oracle Applications C
apps-mobile-ui-kit	Java	Oracle Applications User Experience Rapid Development Kit for Mobile Apps
atg-build-tools	Java	Oracle ATG Commerce build tools and examples
atg-commerce-iaas	Python	The Oracle ATG Commerce provisioning tool set allows for the rapid deployment of the AT

Github Repositories

This page renders some important repository attributes as an Interactive Report. The report behaves like a report on a local table; all interactive report features like searching, sorting or computations are available. Clicking on the repository name opens a modal dialog showing repository details as Report, Calendar or Cards view.

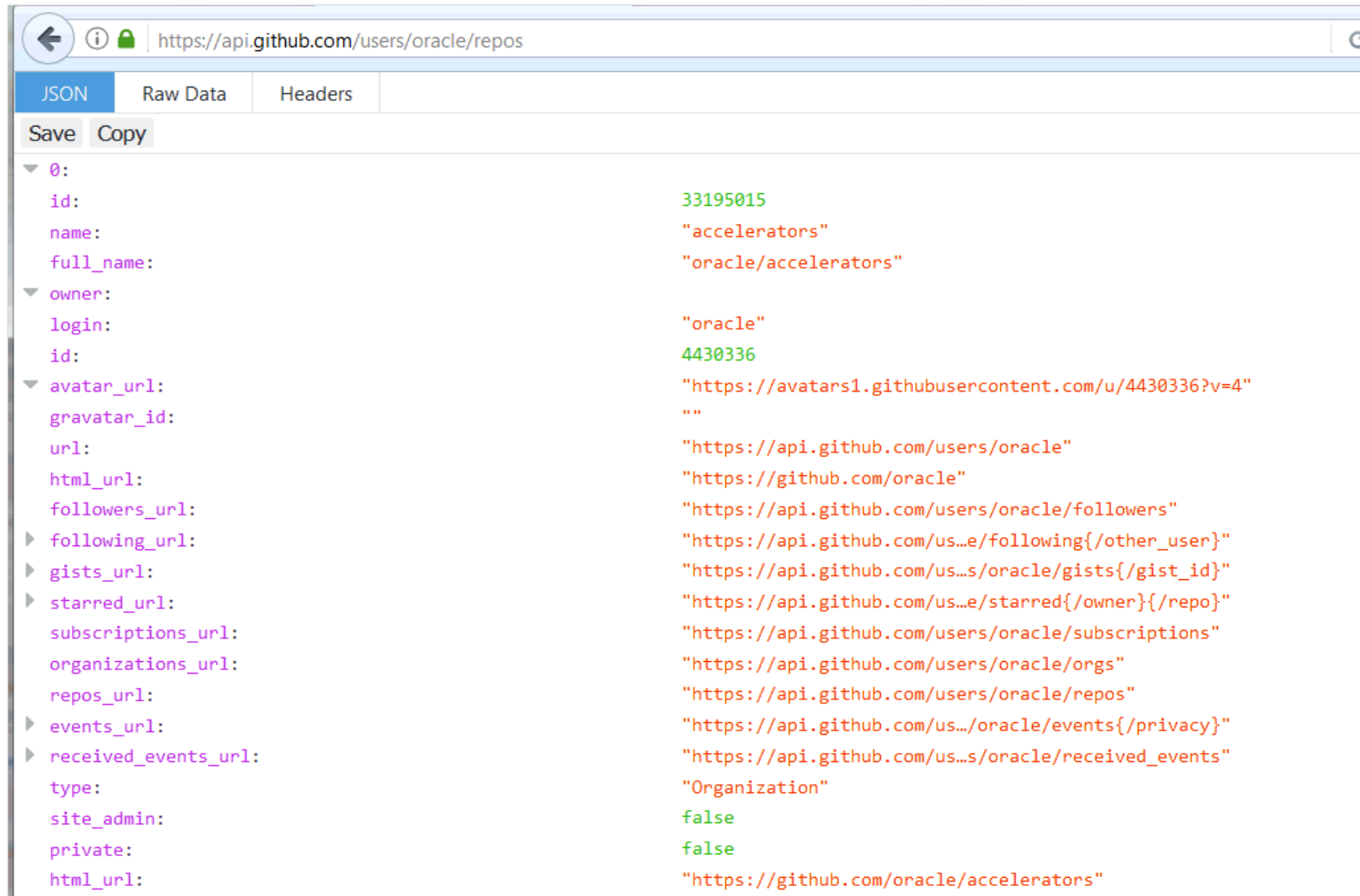
To avoid too many HTTP requests, *Caching* is enabled for this Web Source Module (Shared Components > Web Source Modules > Github > Operations > Caching).

Search: Go Actions



REST Service Consumption

...with data from a REST Endpoint



```
https://api.github.com/users/oracle/repos

JSON Raw Data Headers

Save Copy

{
  "id": 33195015,
  "name": "accelerators",
  "full_name": "oracle/accelerators",
  "owner": {
    "login": "oracle",
    "id": 4430336,
    "avatar_url": "https://avatars1.githubusercontent.com/u/4430336?v=4",
    "gravatar_id": "",
    "url": "https://api.github.com/users/oracle",
    "html_url": "https://github.com/oracle",
    "followers_url": "https://api.github.com/users/oracle/followers",
    "following_url": "https://api.github.com/us...e/following{/other_user}",
    "gists_url": "https://api.github.com/us...s/oracle/gists{/gist_id}",
    "starred_url": "https://api.github.com/us...e/starred{/owner}/{repo}",
    "subscriptions_url": "https://api.github.com/users/oracle/subscriptions",
    "organizations_url": "https://api.github.com/users/oracle/orgs",
    "repos_url": "https://api.github.com/users/oracle/repos",
    "events_url": "https://api.github.com/us.../oracle/events{/privacy}",
    "received_events_url": "https://api.github.com/us...s/oracle/received_events",
    "type": "Organization",
    "site_admin": false,
    "private": false,
    "html_url": "https://github.com/oracle/accelerators"
  }
}
```

REST Service Consumption

Post Processing SQL Query: Join Local Data to the Web Source Result Data

Sample REST Services \ Join Local Data

Post Processing SQL Query

In the *Post Processing SQL Query*, the Web Source response data is referenced with the **#APEX\$SOURCE_DATA#** placeholder, and can be used like a table. The report on this page uses the following query.

```
select remote.ID,  
       remote.NAME,  
       remote.HOMEPAGE,  
       remote.SIZE_  
       remote.LANGUAGE,  
       local.CREATED_BY  
from #APEX$SOURCE_DATA# remote,  
     EBA_RESTDEMO_SAMPLE_LANG local  
where remote.LANGUAGE = local.NAME
```

Search:

Local Data

Repository	Size	Language	Language Created By
accs-caching-java-sdk	359	Java	James Gosling
adf-samples	51KB	Java	James Gosling
apps-mobile-ui-kit	23KB	Java	James Gosling
atg-build-tools	479	Java	James Gosling
bdglue	2KB	Java	James Gosling
big-data-lite	87KB	Java	James Gosling

REST Service Consumption

Web Source Modules: Custom PL/SQL Code

- Access Web Source Modules within custom PL/SQL Code:
 - Execute "GET" request and provide a "cursor" object
`APEX_EXEC.OPEN_WEB_SOURCE_QUERY`
 - Execute POST, PUT, or DELETE requests `APEX_EXEC.EXECUTE_WEB_SOURCE`
- Use Web Source Modules as a Plug-In developer:
 - "Region Source supports different Data Sources" Plugin Attribute
 - Use `APEX_EXEC PL/SQL` package in Plug-In code

REST Service Consumption

Use Cases

- Access data from other Oracle Databases using REST
 - Similar use case to REST Enabled SQL, however REST Enabled SQL requires privileges to directly access tables on target database via SQL.
 - Many databases do not allow this type of access but do provide standardized REST services.
- Access internal systems (non Oracle Databases) within an Oracle APEX application
 - Writing extensions to third-party in-house systems that provide REST APIs.
- Access Oracle SaaS functionality from within Oracle APEX applications.
- Access external APIs (non Oracle Databases) or fetch external data feeds within Oracle APEX applications

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New REST Workshop

ORDS Repository

- Declarative REST service support for ORDS-enabled REST services.
- New REST workshop supports REST web services developed using the ORDS repository.
- Oracle APEX 18.1 requires ORDS 17.4.1 and above to provide full integration with the ORDS repository
- You can migrate any existing APEX-based REST services

The screenshot displays the Oracle APEX REST Workshop interface. The top navigation bar includes 'ORACLE APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Packaged Apps'. The breadcrumb trail shows the path: 'RESTful Services \ ORDS RESTful Services \ Modules \ Module Definition \ Resource Template \ Resource Handler'. The schema is set to 'CHAITANYA'.

The left sidebar shows a tree view of RESTful Data Services under 'oracle.example.hr'. The 'empsec/empname' module is selected, and the 'GET' method is highlighted.

The main area displays the 'ORDS Handler Definition' for the selected service:

- RESTful Service Module: **oracle.example.hr**
- Module Base Path: **/hr/**
- URI Template: **empsec:empname**
- Full URL: **http://[redacted].com:7779/apex181/chaitanya/hr/empsec:empname**
- Method: **GET**
- Source Type: **Query**
- Format: **JSON**
- Pagination Size: **25**
- Comments: (empty text area)


The 'Source' section shows the SQL query used for the service:




```
1 select empno, ename, deptno, job from emp
2   where ((select job from emp where ename = :empname) IN ('PRESIDENT', 'MANAGER'))
3   OR
4   (deptno = (select deptno from emp where ename = :empname))
5 order by deptno, ename
```









New REST Workshop



Using the ORDS Repository

- Create and manage REST Services in any schema assigned to a Workspace
- Generate Swagger documentation

Name	URI Prefix	Items Per Page	Published Status	Comments	Origins Allowed	Created On	Updated On	Protected by Privilege
oracle.example.hr	/hr/	25	PUBLISHED	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	

Legend:  Module fully protected by a privilege  Module partially protected by a privilege  Module not protected by any privilege

URI Template	Priority	Etag Type	Etag Query	Comments	Created On	Updated On	Protected by Privilege
empsec:/empname	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
empsecformat:/empname	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
employees/	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
version/	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
employees/id	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
empinfo/	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
employeesfeed/	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	
employeesfeed:/id	0	HASH	-	-	23-FEB-2018 10:46:55	23-FEB-2018 10:46:55	

Legend:  Template fully protected by a privilege  Template not protected by any privilege

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Page Designer Enhancements

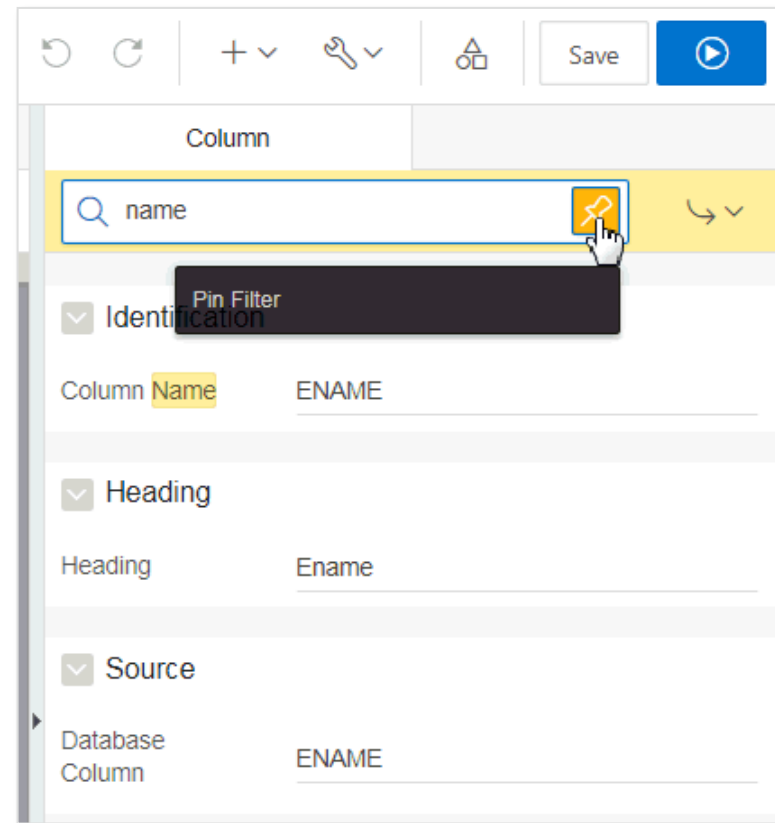
Property Editor Enhancements

- Updated UI to improve usability
- When an attribute has focus, the group becomes highlighted
- Improved "Go to group" functionality
- Alignment property (for example, column heading alignment in an interactive report) now use a pile button

Page Designer Enhancements

Sticky Filters

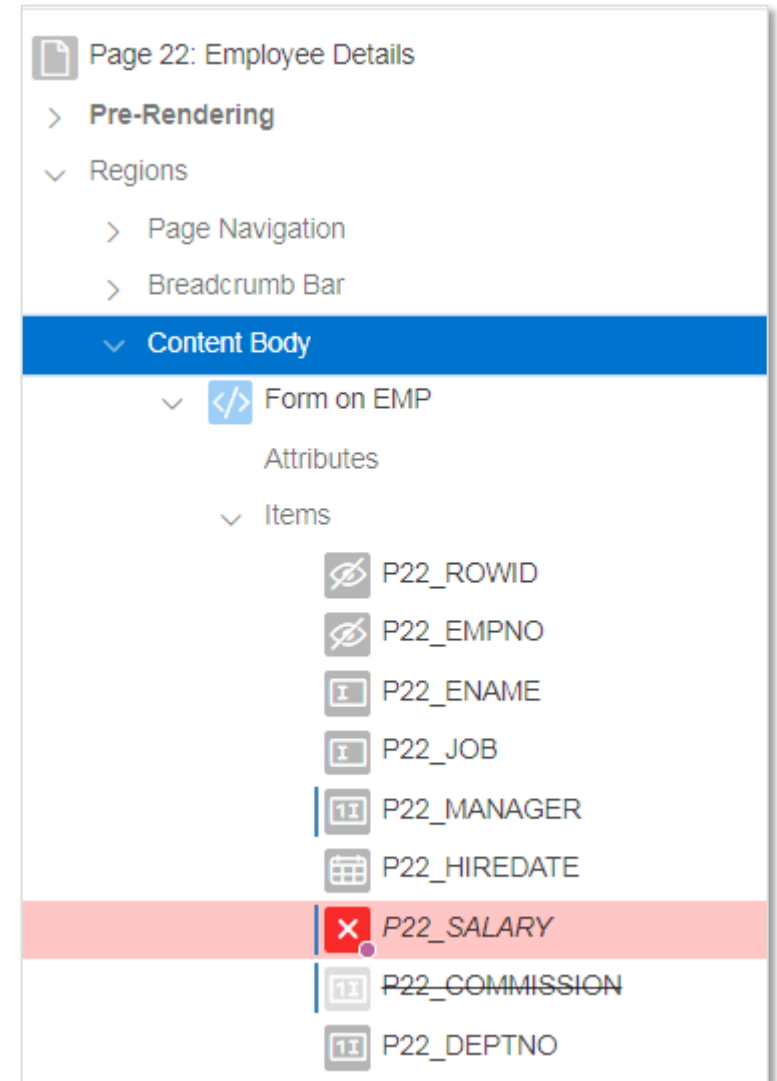
You can now pin keywords to have them persist as you click around Page Designer



Page Designer Enhancements

Miscellaneous

- New indicator (red dot) if a page component has a condition
- Component name strikethrough if it has a 'Never' condition
- Page Designer Toolbar > Utilities includes option to enable and disable tooltips within the UI



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Oracle JET & jQuery Upgrade

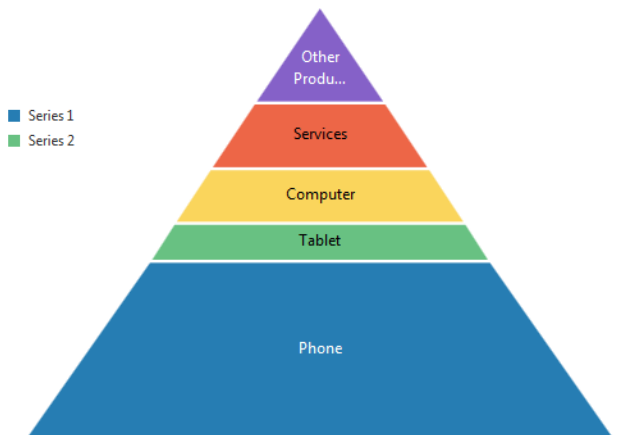
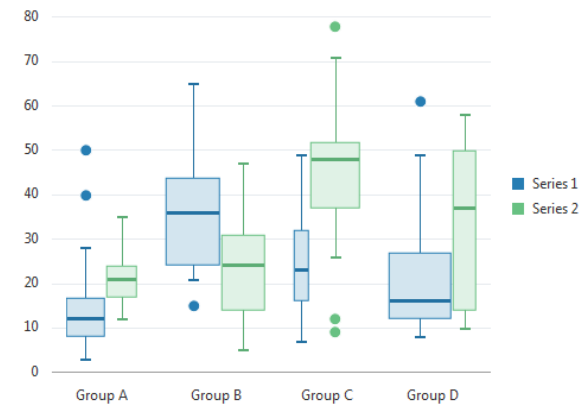
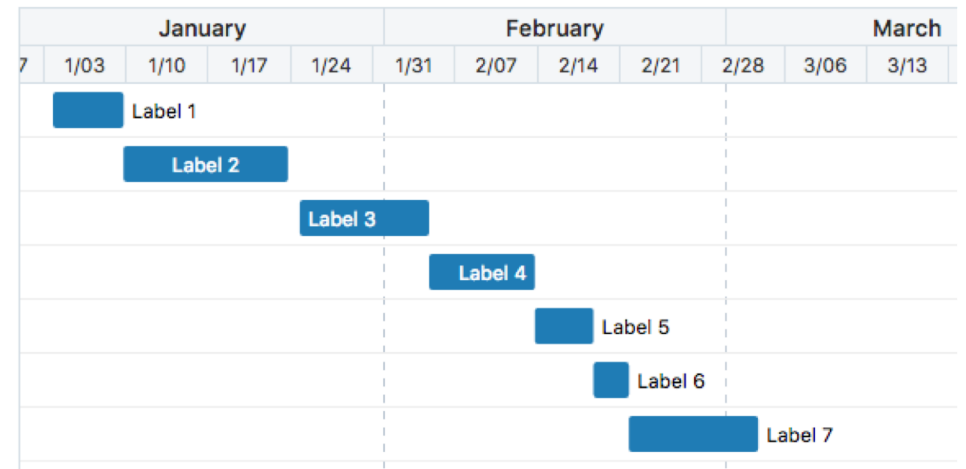
New 3rd Party Libraries

- Upgraded jQuery & jQuery UI Libraries
 - jQuery 3.1.1 and jQuery UI 1.12.0
 - [Review jQuery Upgrade Guide](#)
- New Oracle JET libraries
 - JET 4.2.0
 - Impact on custom JavaScript

Oracle JET & jQuery Upgrade

New Chart Types and Attributes

- New Gantt Charts
 - Based on JET ojGantt component
 - Responsive, theme-able, WAI-ARIA compliant
- New Chart Types – Pyramid, Box Plot
- New Chart-Level Attributes:
 - Fill Gaps in Chart Data – Yes / No
 - Sort Order
- New Series-Level Attributes:
 - Display As
 - Value Aggregation
- Enhanced Sample Charts application



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Universal Theme Updates

Improvements for Mobile UI

- JQuery Mobile Apps can now be transitioned to Universal Theme
- New Region Types for Mobile UI patterns:
 - Reflow Report
 - List view
 - Column Toggle Report
- Support for touch gestures (Swipe, Tap, etc.)
- New Mobile Navigation template
- Performance Improvements

Universal Theme Updates

Floating Labels

- Optimized for Mobile UI
- Form Item Labels can now be placed to the side or top of the input fields.
- New Form Item Label template – "Floating"
- Positions the label inside of the input field.
- Label automatically shrinks upon entering a value in the input field

The screenshot shows a user profile form with various input fields. Labels are positioned inside the input fields and shrink as the user enters text. For example, 'First Name' is inside the 'Scott' field, and 'Last Name' is inside the 'Tiger' field. Other fields include 'Phone' (+1 707 555 1234), 'Email' (scott.tiger@oracle.com), 'Desired Salary' (100000 USD), 'Website' (Oracle.com), 'Profile' (Hello everybody!), 'Top Skill' (APEX), 'Receive Emails' (Yes/No), 'Skills' (APEX, HTML, JavaScript, CSS, Java, Scala, Ruby on Rails), 'Availability' (Immediate, Next Month, Not Available), and 'Start Date' (13-Jun-17). A 'Referral' field is also present at the bottom left.

Universal Theme Updates

Template Options and Font APEX 2

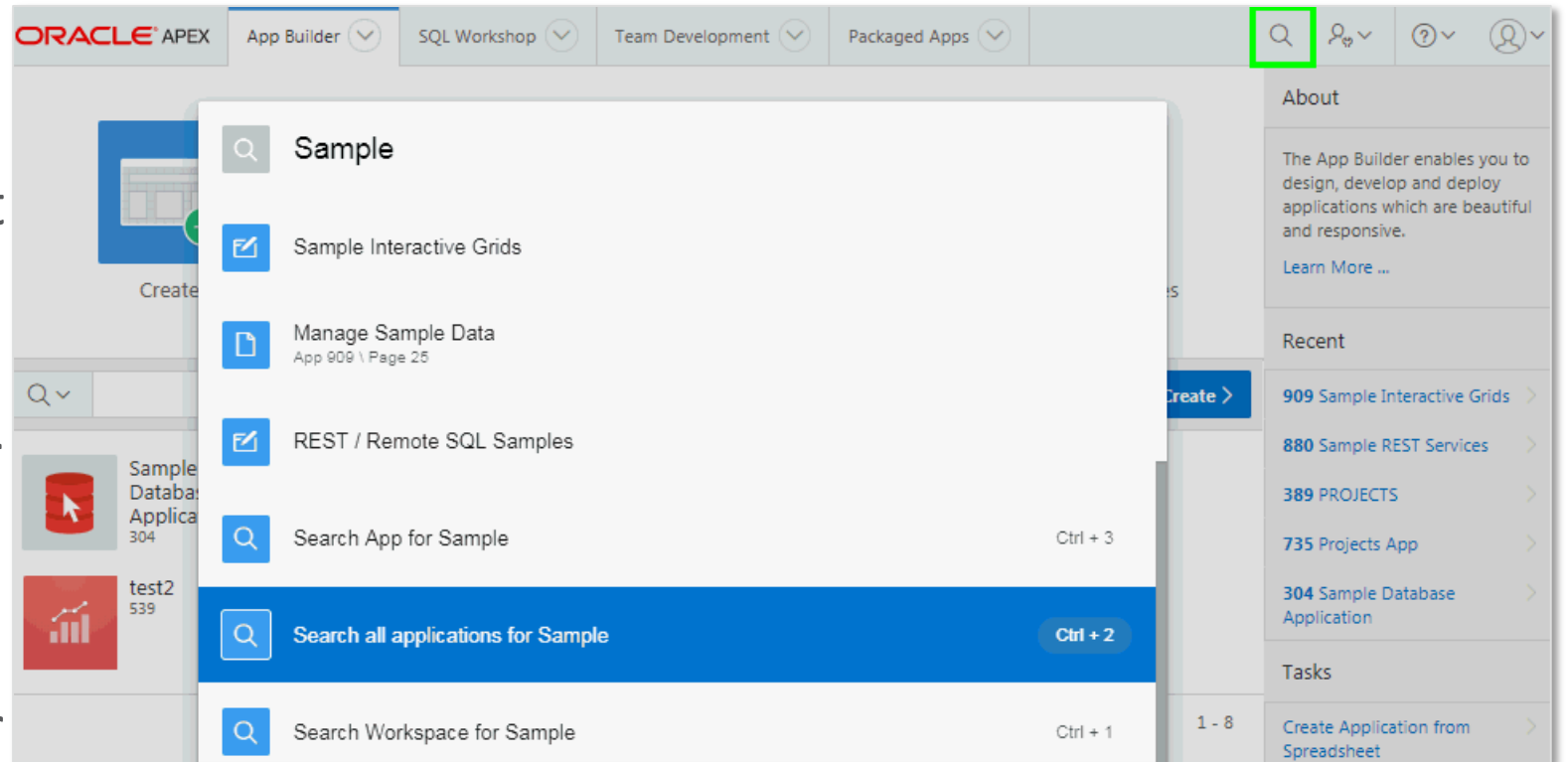
- Updated Font APEX with new set of high-resolution icons.
- Additional new template options for many templates
 - Breadcrumbs can now be rendered compact
 - Region templates can now display icon in the region header
 - Left-side navigation menu can now be collapsed by default

- New Create Application Wizard
- Improved Create Page Wizard
- REST Enabled SQL Support
- REST Service Consumption
- New REST Workshop
- Page Designer Enhancements
- Oracle JET & jQuery Upgrade
- Universal Theme Updates
- **APEX Spotlight Search**
- Miscellaneous

APEX Spotlight Search

Developer Experience

- Provides quick navigation and unified search experience across APEX
- Activate by clicking search button from header, or using the keyboard shortcut **Ctrl + '**
- You can navigate to most screens within APEX builder
- Quickly jump across apps and pages
- Also works in Page Designer – can focus on page components



- New Create Application Wizard
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- **Miscellaneous**

Item Type Improvements

New Item Type

- New "Text Field with Autocomplete" item type
 - Based on Oracle JET Input Search component.
 - Better Dynamic Action support, better Usability and Accessibility.
 - Automatic migration for existing items during upgrade.

Authentication Scheme Enhancements

New Authentication Scheme

- New authentication scheme – **Social Sign-In**
- Supports Oracle Identity Cloud Service, Google, Facebook, OpenID Connect, OAuth2
- New authentication scheme attribute "Switch in Session" for schemes that can be set in the current session.

Application 347 \ Shared Components \ Authentication Schemes \ Create / Edit

Authentication Scheme

Cancel Create Authentication Scheme

Name

* Name APEX 18.1 OAuth2

* Scheme Type Social Sign-In

Settings

Credential Store Credentials for APEX 5.2 Dev Box Stats

Authentication Provider Google

* Scope profile,email

Authentication URI Parameters

* Username Attribute email

Google

Sign in
to continue to [oracle.com](#)

Email or phone

Forgot email?

Create account

NEXT

Advisor Improvements

New Advisor Checks

- Accessibility checks to check your apps for common accessibility issues
- Performance check for inclusion of compatibility JavaScript

▼ Check Page(s) Perform Check

The Advisor performs various checks on your application, including programming errors, security issues, quality assurance, and other best practices. For the list of checks, see *Checks to Perform*. Once executed, your previous settings will be recalled for the next use.

Specify a comma separated list of pages to check, or leave blank to check all pages.

Page(s)

▶ Pages last edited within the last 7 days

▼ Checks to Perform

Select All Deselect All

Errors: ?

- References with Substitution Syntax
- References with Column Syntax
- References with Bind Variable Syntax

Declarative References of Application Items, Page Items, Columns or Interactive Report Filters

- Referenced Page Number Exists
- Is Valid SQL or PL/SQL Code
- Fetch, DML, MR* Processes are Valid
- Unconditional Branch before other Branches
- Referenced Button in When Button Pressed exists
- Button is not compatible with Dynamic Actions

Security: ?

- Inappropriate use of Substitution Syntax
- Application attributes that can be locked down
- Authorization
- Session State Protection
- Browser Security Settings

Warnings: ?

- Referenced Item is on Current Page
- Referenced Item is Page Item of Target Page
- References of Page Item in a String
- Clear Cache Page Number equals Target or Current Page
- Length of Item or Tabular Form Column Name
- Inconsistent references between Dynamic Actions and Buttons
- Protected items in Ajax calls

Performance: ?

- V Function used in SQL Statements
- User Interface includes compatibility JavaScript

Usability: ?

- Target Page Authorization is also set for Current Component
- Associated Item or Column of Validations

Quality Assurance: ?

- Hardcoded Application ID
- Report has Default Order
- Page Item has Help Text
- Deprecated attribute values

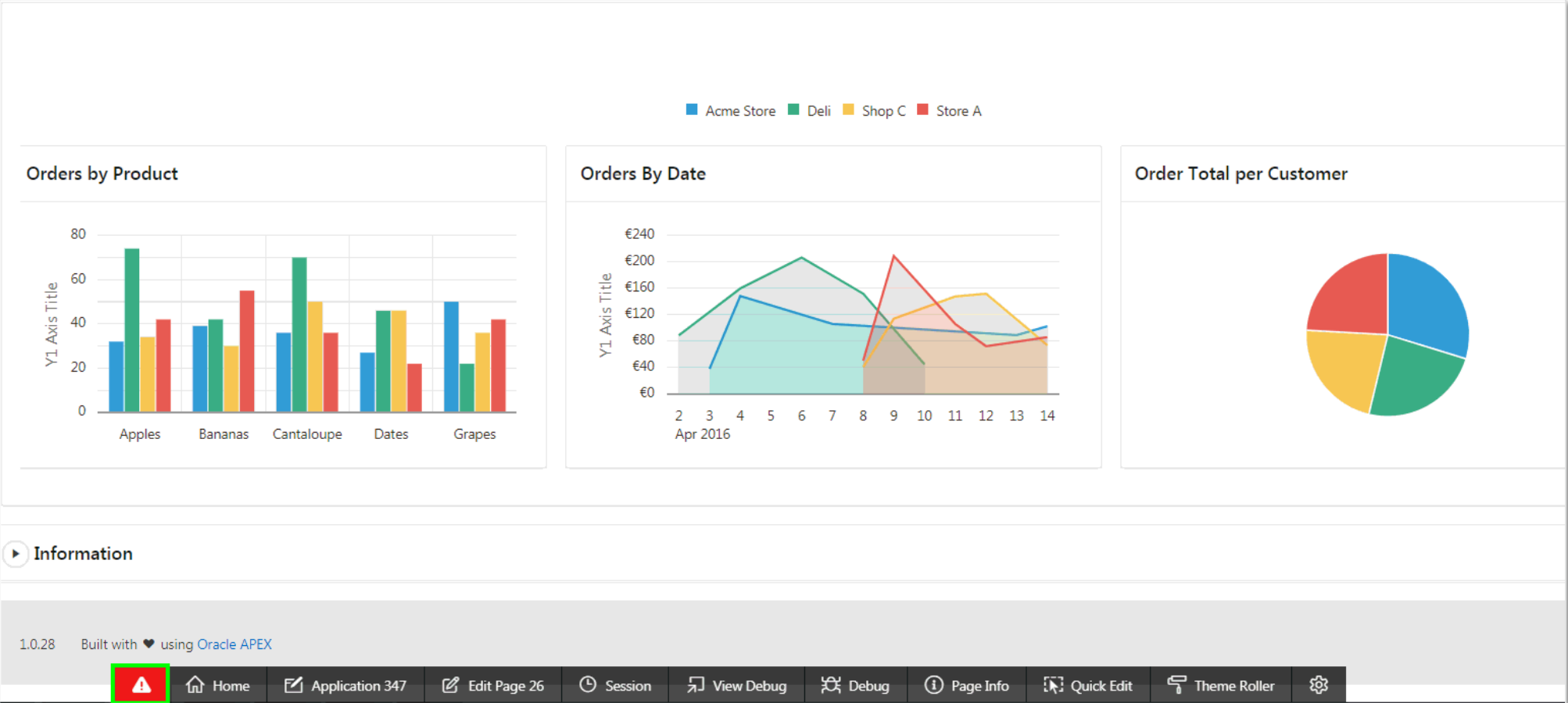
Accessibility: ?

- Theme Style tested for accessibility
- Page has page title
- Region has Row Header
- Chart type supports accessibility
- Page item has label
- Page item does not cause an unexpected context change
- Display Image item has image ALT text defined

Developer Toolbar Improvements

Developer Productivity

Developer Toolbar shows a red indicator if there is any JavaScript error on the page



Developer Toolbar Improvements

Developer Productivity

Page Info > Show Page Timing displays the page performance timing

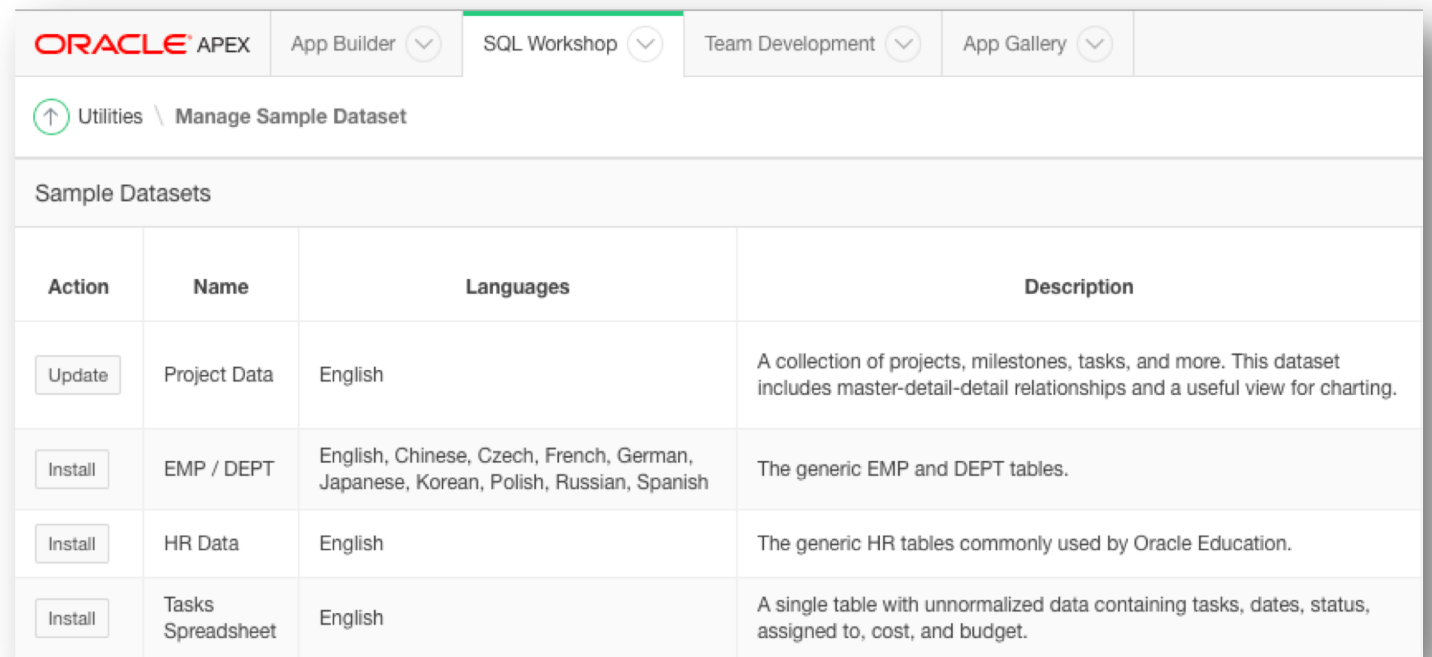
The screenshot shows the Oracle APEX Developer toolbar with the 'Page Info' button highlighted in green. A 'Show Page Timing' button is also highlighted in green. A 'Page Performance Timing: JET Plug-in' window is open, displaying a waterfall chart and a list of resources with their load times.

Resource	Load Time
Page Navigate	1,403ms
Redirect	820ms
Request	435ms
Response	275ms
DOM Loading	409ms
oj-alta-notag-min.css	23.1ms
Theme-Standard.min.css	20.2ms
Core.min.css	19.3ms
font-apex.min.css	39.1ms
jquery-ui-apex.min.css	20.6ms
Core.min.css	37ms
Vita.min.css	37ms
5.0.min.css	37ms
apex-5-icon-font.woff2	
Font-APEX-Large.woff2	
Font-APEX-Small.woff2	
desktop_all.min.js	

Sample Datasets

Zero to Full App in 5 clicks

- Tables (and Views) with usable sample data
- Emp / Dept available in multiple languages
- Dates updated based on sysdate
- Update / Remove / Change Schema
- Generate Full App
 - Customized Blueprint
 - Useful Dashboard
 - Appropriate pages
- Designed for facilitating demos



Action	Name	Languages	Description
<input type="button" value="Update"/>	Project Data	English	A collection of projects, milestones, tasks, and more. This dataset includes master-detail-detail relationships and a useful view for charting.
<input type="button" value="Install"/>	EMP / DEPT	English, Chinese, Czech, French, German, Japanese, Korean, Polish, Russian, Spanish	The generic EMP and DEPT tables.
<input type="button" value="Install"/>	HR Data	English	The generic HR tables commonly used by Oracle Education.
<input type="button" value="Install"/>	Tasks Spreadsheet	English	A single table with unnormalized data containing tasks, dates, status, assigned to, cost, and budget.



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