

Martin B. Nielsen, MBNDATA

APEX 18.1 New Features

DOUG, Ballerup, 2018



MBNDATA

Application Express Developer

Vi bygger software løsninger, yder konsulentbistand og underviser indenfor Oracle og APEX.

IT Konsulentbistand

Vores konsulenter er klar til at hjælpe vores kunder godt igennem perioder med spidsbelastninger i den interne IT afdeling. Vi arbejder både med korte og meget lange aftale perioder, hvor konsulanten typisk er placeret hos kunden. Vi hjælper gerne med udviklings & driftsopgaver indenfor: **Oracle Application Express (APEX)**, **Oracle database**, **SQL**, **PL/SQL**, **Oracle E-Business Suite**, **Java** og meget mere.

APEX Kursus

Oracle Application Express (APEX) har været vores primære værktøj i mange år. Den erfaring vil vi gerne dele med andre, igennem en række APEX kurser som vi udbyder. Kurserne kan tages både **online, eller i kursus lokalet (hos os, ellerude hos vores kunder)**. Kurserne stiller et APEX workspace til rådighed for den enkelte deltager, og indeholder min. 50% hands on Lab øvelser. Kurserne afvikles altid med den nyeste version af APEX (med mindre en anden version ønskes).

Productivity Apps

Productivity Apps er en række applikationer der leveres med som **en del af Application Express**. Oracle har bygget en række robuste database centriske web applikationer som kan benyttes enten **on-premise eller som cloud baserede løsninger**. Hos MBNDATA kan vi hjælpe med at implementere disse applikationer i virksomheden. Vi kan også yde support på applikationerne samt lave tilpasninger og integrationer til virksomhedens andre løsninger.

Built with ā'pěks

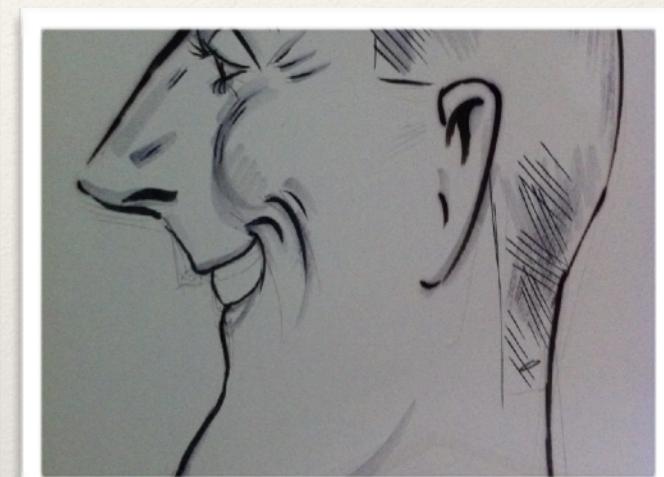
(c) MBNDATA, 2017. CVR-nr.: 19 76 85 46 | Set Screen Reader Mode On

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ORACLE Certified Expert
Oracle Database SQL

ORACLE Certified Associate
PL/SQL Developer

ORACLE Certified Expert
Oracle Application Express Developer



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ORACLE APEX SPECIALISTERNE

What can we build with APEX

The image displays three distinct Oracle APEX application interfaces:

- Oracle Store (Top Left):** A landing page for Oracle Cloud services. It features a large "Internet" button, sections for "Get Free Credits" and "Shop for the world's most complete, open, and integrated business software", and categories for Cloud, Database, Software, and Hardware.
- Sample Database Application (Bottom Left):** An application titled "Orders". The sidebar menu includes Home, Customers (7), Products (10), Orders (10), Reports, and Administration. The main content area shows an order detail for Order Number 10, placed by Eugene Bradley on 11-MAR-2018 at \$870.00. The order details table includes columns for Product, Unit price, Quantity, and Extended Price.
- MBNDATA Intranet (Bottom Right):** An application titled "Intranet". The interface includes a navigation bar with links for Home, Customers, Products, Orders, Reports, and Administration. The main content area displays a table of products with columns for Product, Unit price, Quantity, and Extended Price. A modal dialog is open over the table, showing detailed information for an order.

MBNDATA logo is located in the bottom left corner.

APEX Sweet Spot

Go from prototype to production in minutes.



Develop

Use our modern, intuitive, and powerful browser-based IDE to quickly build and run applications, enabling easy iterative development.



Customize

Powerful and intuitive design tools enable easy and extensive customization of your application's UI.



Deliver

Deployment couldn't be simpler. It is as easy as providing your users the URL to your application.

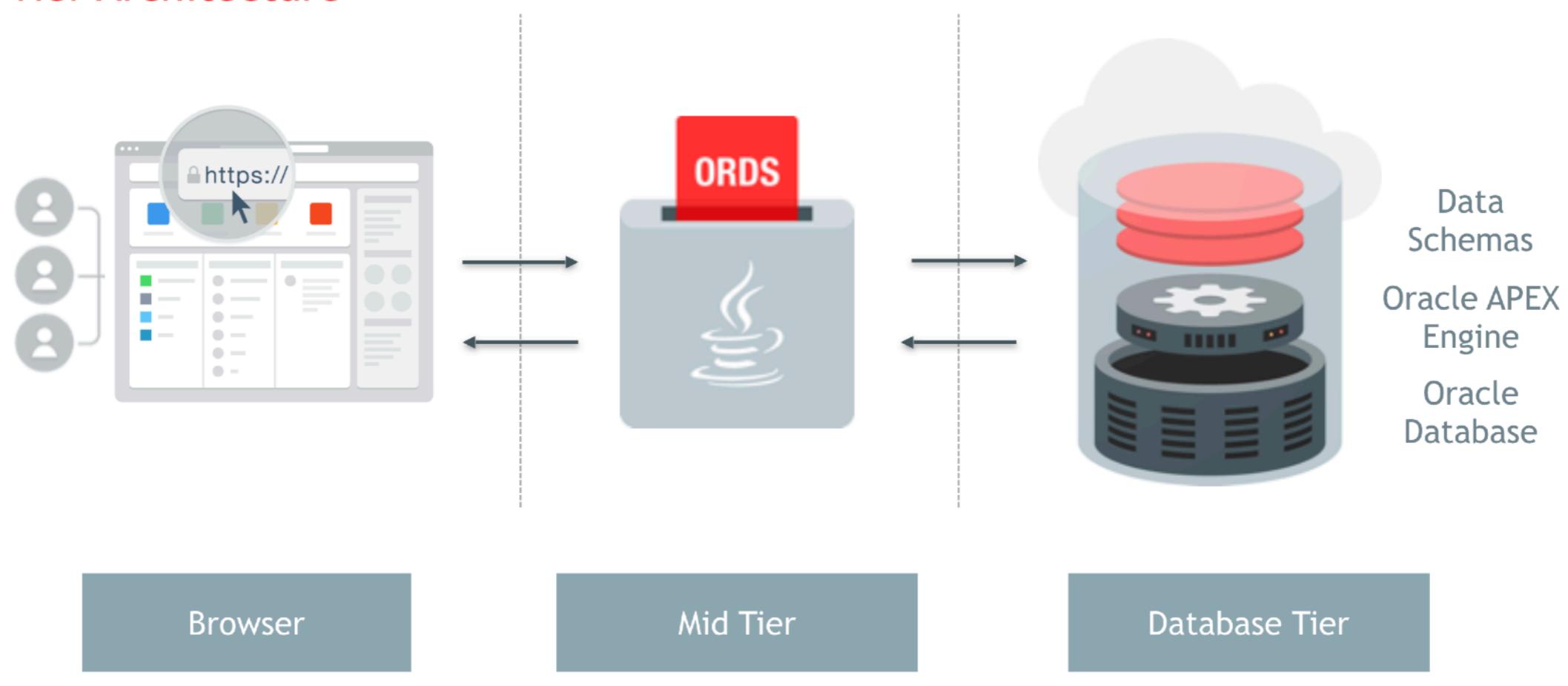


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APEX Architecture

Oracle Application Express

3 Tier Architecture



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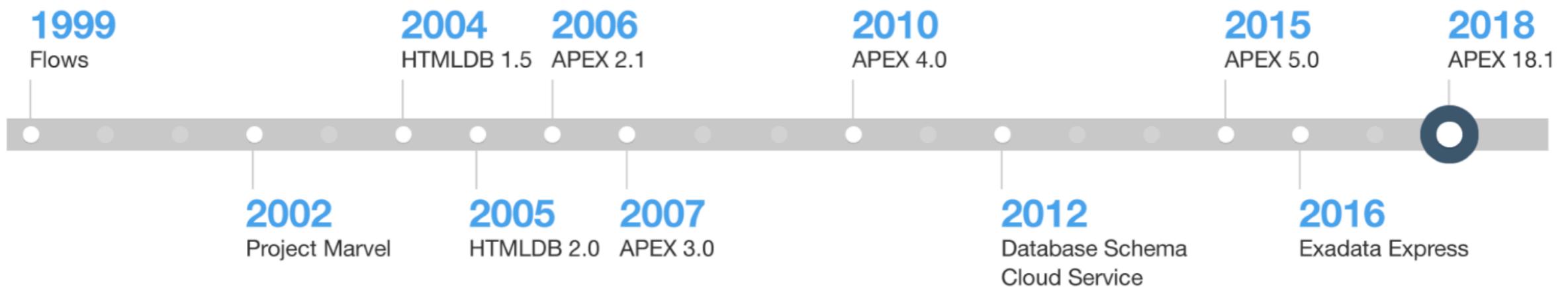
APEX History

Oracle APEX Turns 18 🎂

The upcoming release of Oracle APEX will be APEX 18.1, consistent with the release numbering for the Oracle Database as well as Oracle REST Data Services and Oracle Cloud services.

Coincidentally, it has been a little over 18 years since the first line of code was written for APEX. Throughout this time, we have always strived to empower developers with the tools they need to build modern apps fast, with less effort, and with greater consistency.

Oracle APEX has an incredible legacy and an even brighter future! [#LetsWreckThisTogether](#)



APEX 18.1 Major New features

★ REST Enabled SQL support & Service consumption



★ Create App Wizard (Blueprint/LowCode)

★ Oracle JET Upgrade to latest version (4.2)

Social Login (Google, Facebook, OAuth2...)

Page Designer Improvements

Many many other improvements...



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APEX 18.1 ALL features

REST Enabled SQL Support

- Create and maintain References to REST Enabled SQL Instances (Oracle REST Data Services) in Shared Components
- Use a REST Enabled SQL Service and therefore a remote Oracle database as the Data Source for the following components: Classic Reports, Interactive Reports, CSS Calendar, JET Charts, Tree Region, Toggle Column Report, and Reflow Table Report
- Execute PL/SQL page processes on a remote Oracle database
- Use the APEX_EXEC PL/SQL package to execute SQL Queries or PL/SQL blocks on a remote database, from within your custom PL/SQL code.
- Caching for REST Enabled SQL: Session based, user based or for all users and sessions. Cache invalidation can be specified in minutes or with a DBMS_SCHEDULER calendaring syntax.

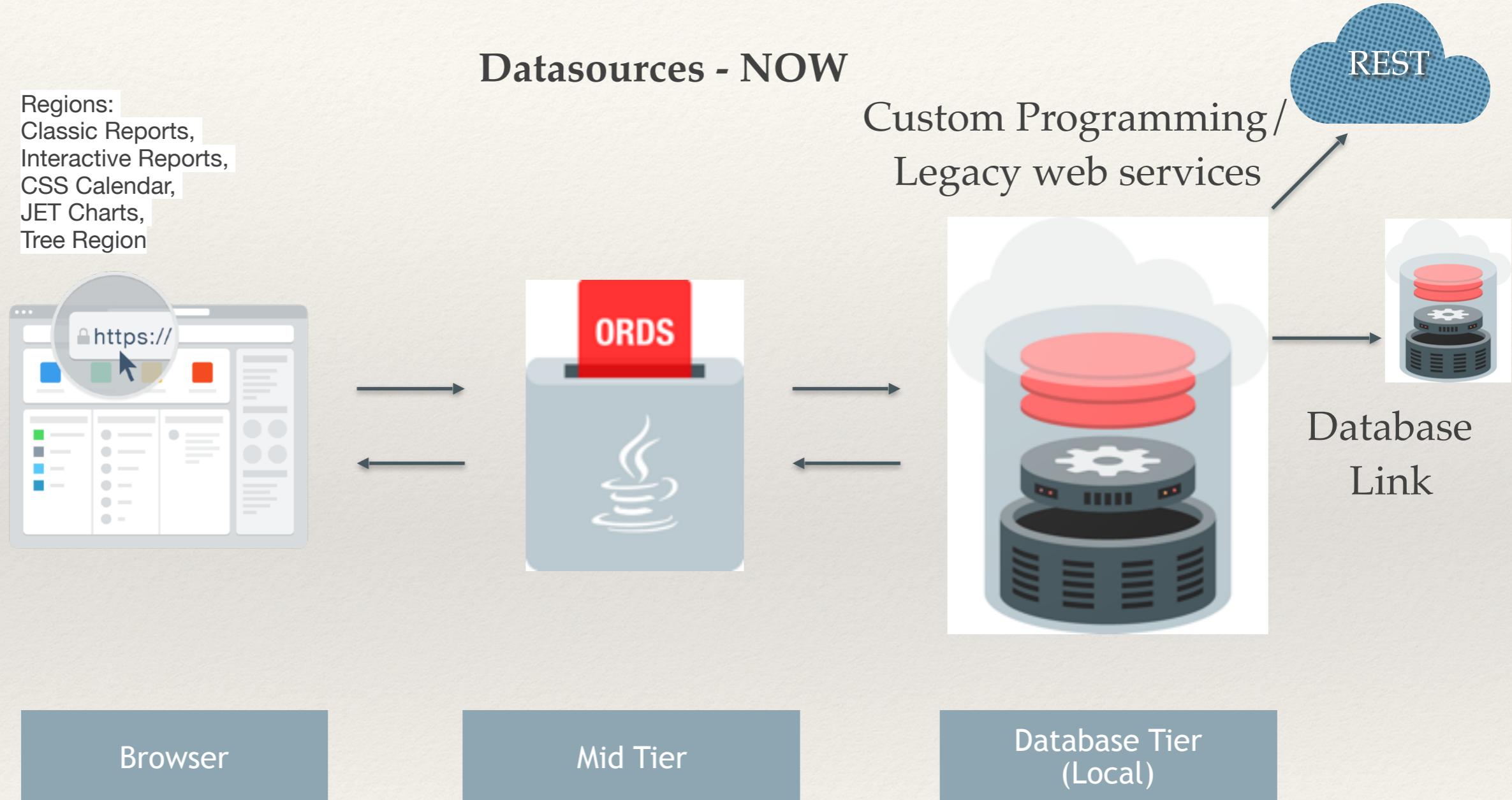


REST Service Consumption

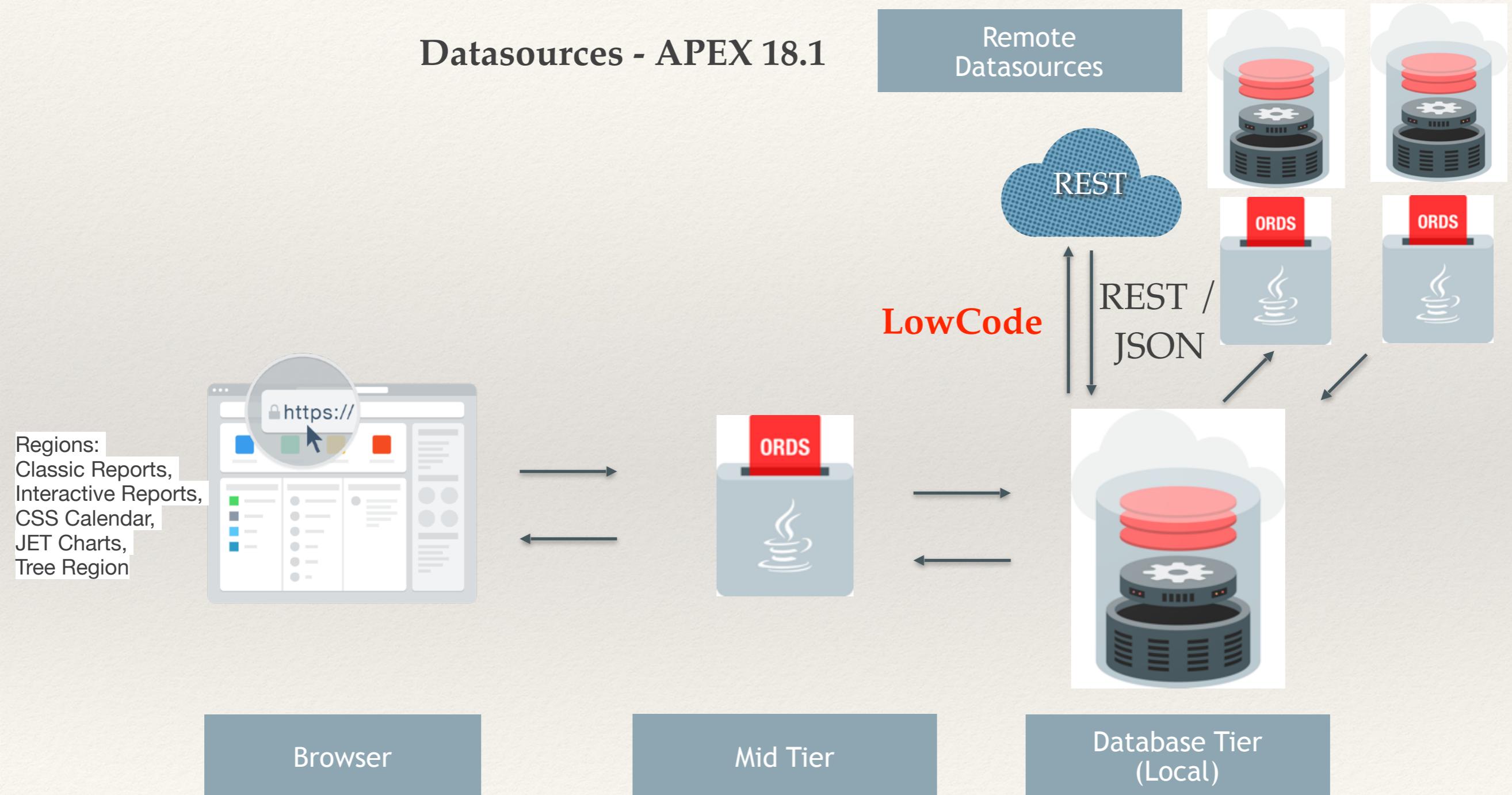
- Create and maintain references to REST services (Web Source Modules) within Shared Components
- Leverage Oracle REST Data Services features like server-side filtering or pagination to fetch only required data from the REST service
- Use Simple HTTP for generic REST services, JSON or XML data feeds
- Have Application Express automatically discover and maintain the Data Profile; no manual SQL or PL/SQL coding is required for JSON or XML parsing
- Use Web Sources as the data source for the following components: Classic Reports, Interactive Reports, CSS Calendar, JET Charts, Tree Region, Toggle Column Report, and Reflow Table Report



APEX 18.1 REST features



APEX 18.1 REST features



APEX 18.1 REST datasources

Calendar

Chart

Classic Report

Tree

Interactive Report

Create Page

Source

Data Source
✓ REST Enabled SQL Service
Web Source

REST Enabled SQL Service MBNDATA REST_PUBLIC

* Source Type Table SQL Query

* Table / View Owner Current Schema

* Table / View Name - Select Table or View -

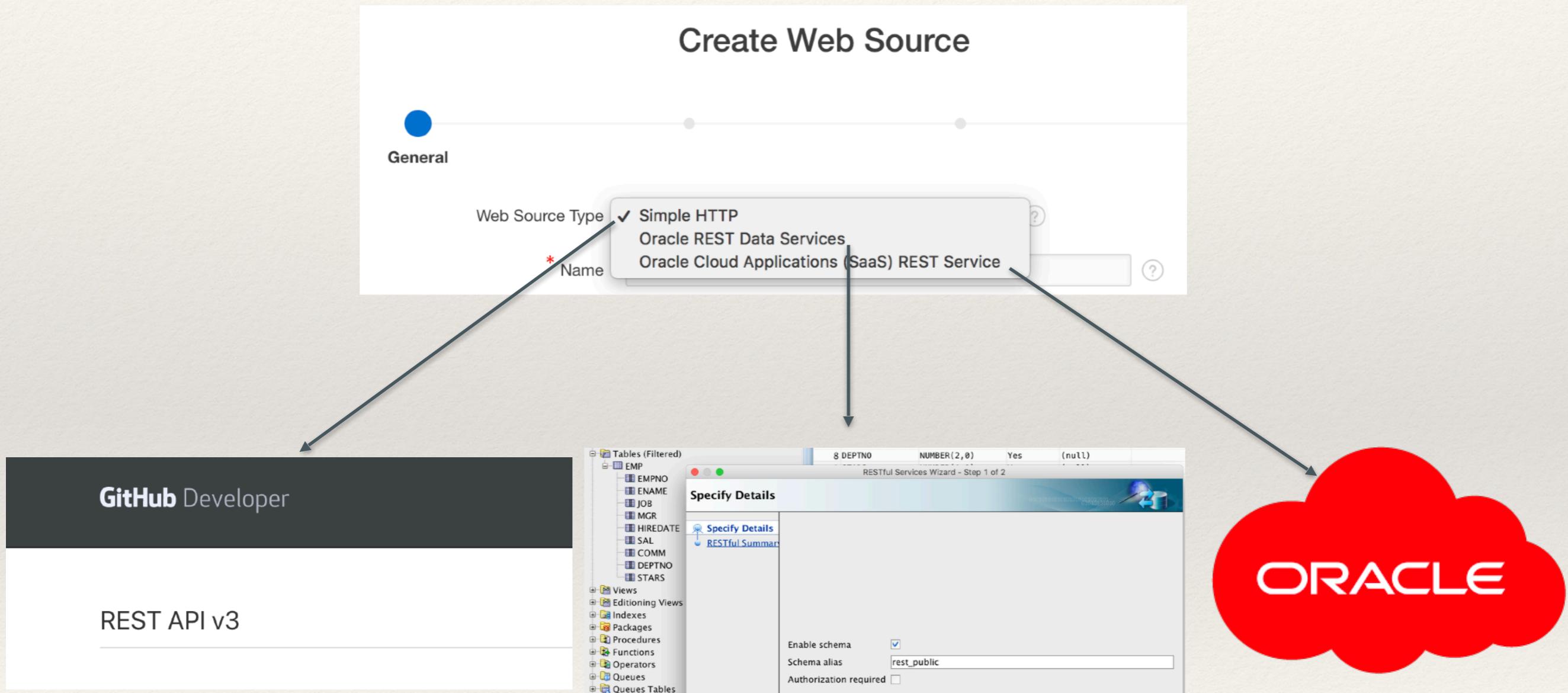
* Select Columns

Next >



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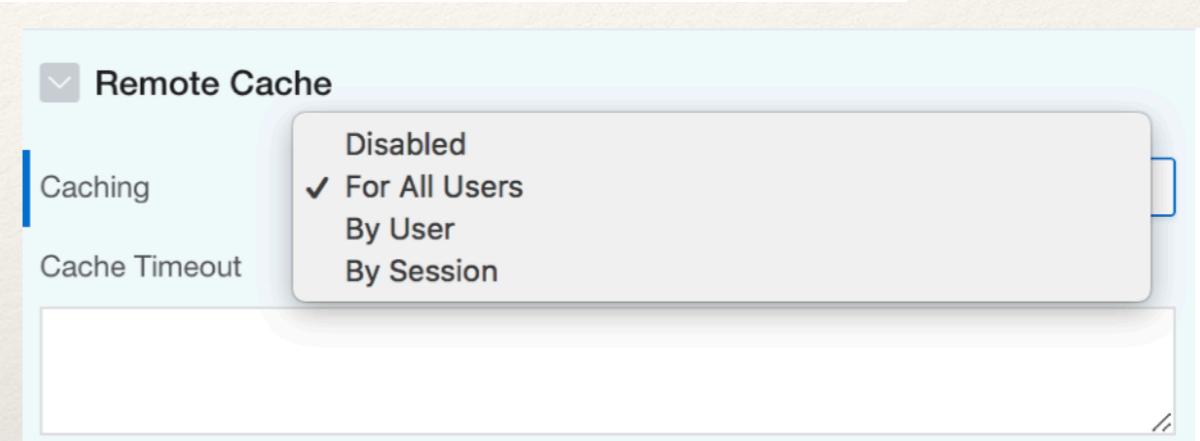
APEX 18.1 REST Web Sources



APEX 18.1 REST Caching & processing

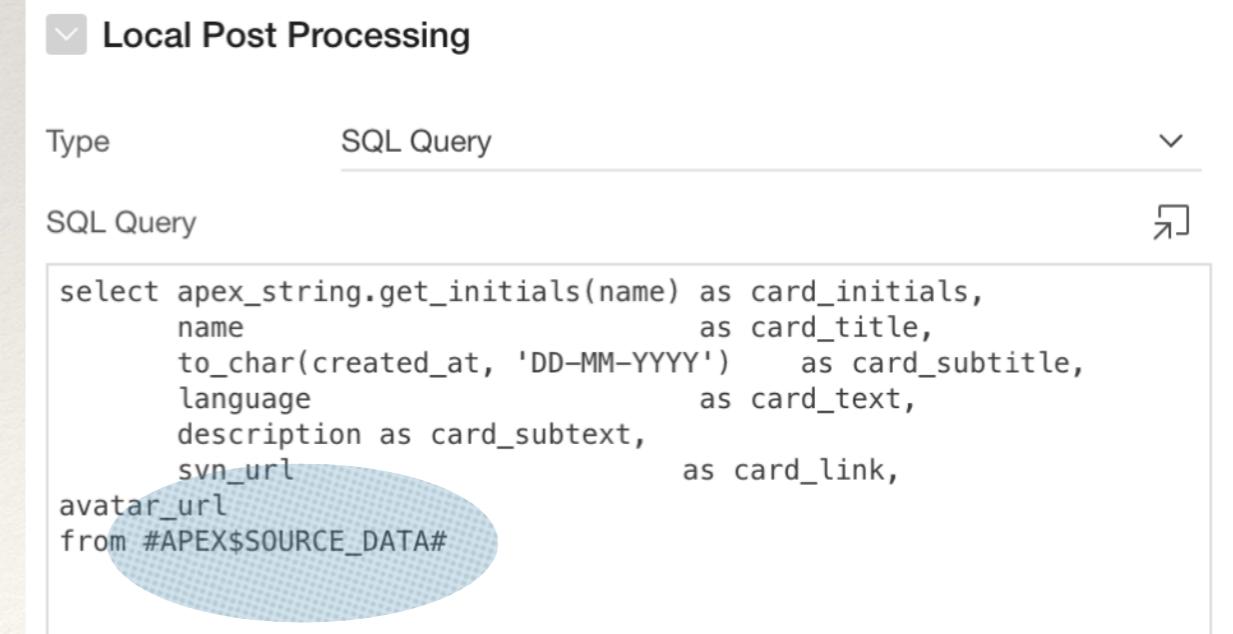
- Caching for REST Services: Session based, user based or for all users and sessions. Cache invalidation can be specified in minutes or with a DBMS_SCHEDULER calendaring syntax.

REST Enabled SQL Service



- Ability to specify a "Post Processing" SQL to post-process the REST Service response (e.g. allow joining to a local table)

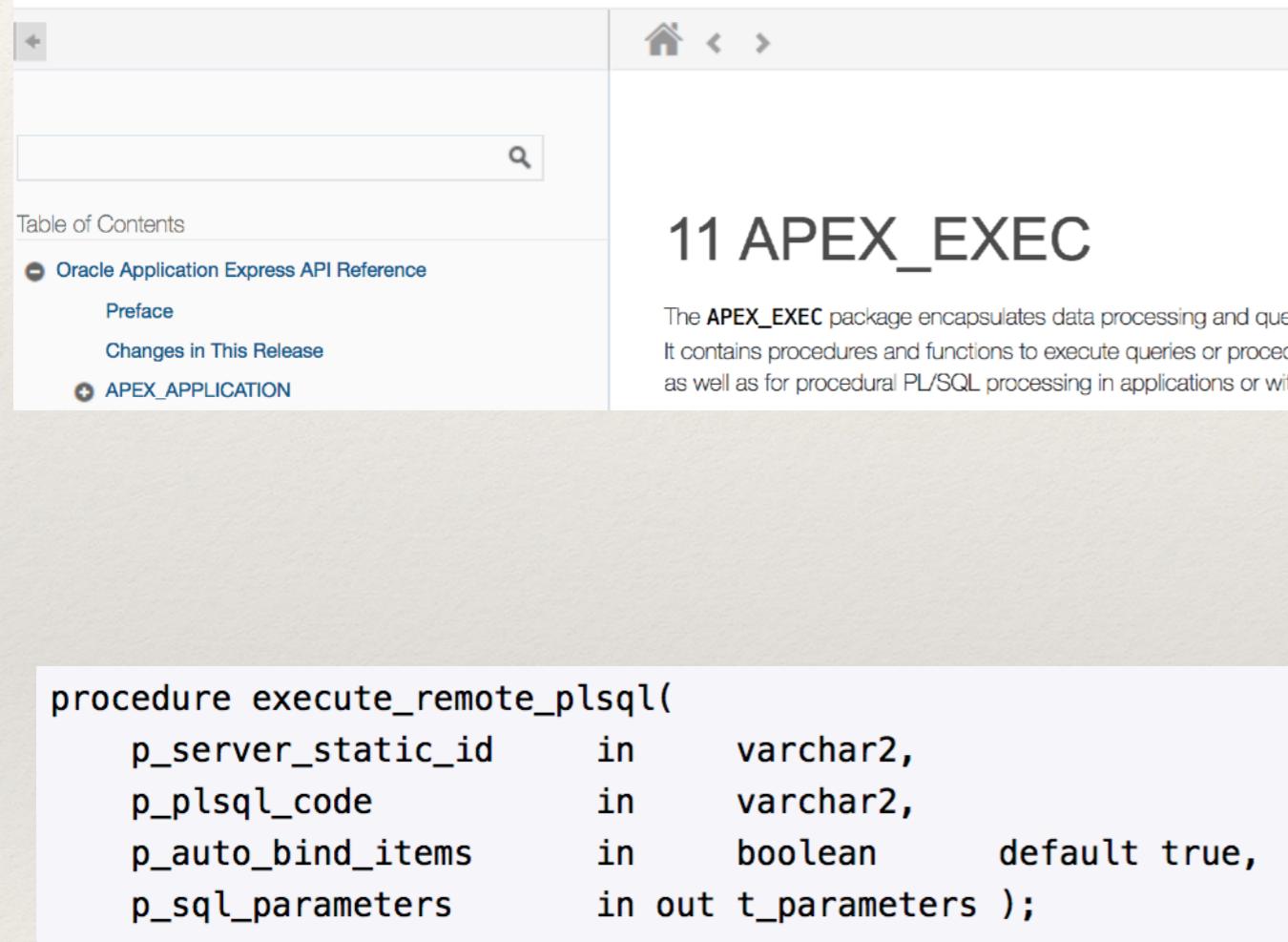
Web Source



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APEX 18.1 REST API

Application Express API Reference



The screenshot shows a web-based API reference interface. On the left, there's a sidebar with a 'Table of Contents' section containing links to 'Preface', 'Changes in This Release', and 'APEX_APPLICATION'. Below this is a code block for the `execute_remote_plsql` procedure:

```
procedure execute_remote_plsql(
    p_server_static_id      in      varchar2,
    p_plsql_code            in      varchar2,
    p_auto_bind_items       in      boolean      default true,
    p_sql_parameters        in out t_parameters );
```

11 APEX_EXEC

The `APEX_EXEC` package encapsulates data processing and querying. It contains procedures and functions to execute queries or procedures as well as for procedural PL/SQL processing in applications or with

```
declare
    l_context apex_exec.t_context;

    l_idx_empno    pls_integer;
    l_idx_ename    pls_integer;
    l_idx_job      pls_integer;
    l_idx_hiredate pls_integer;
    l_idx_mgr      pls_integer;
    l_idx_sal      pls_integer;
    l_idx_comm     pls_integer;
    l_idx_deptno   pls_integer;

begin
    l_context := apex_exec.open_remote_sql_query(
        p_server_static_id  => 'My_Remote_SQL_Instance',
        p_sql_query         => 'select * from emp' );

    l_idx_empno    := apex_exec.get_column_position( l_context, 'EMPNO');
    l_idx_ename    := apex_exec.get_column_position( l_context, 'ENAME');
    l_idx_job      := apex_exec.get_column_position( l_context, 'JOB');
    l_idx_hiredate := apex_exec.get_column_position( l_context, 'HIREDATE');
    l_idx_mgr      := apex_exec.get_column_position( l_context, 'MGR');
    l_idx_sal      := apex_exec.get_column_position( l_context, 'SAL');
    l_idx_comm     := apex_exec.get_column_position( l_context, 'COMM');
    l_idx_deptno   := apex_exec.get_column_position( l_context, 'DEPTNO');

    while apex_exec.next_row( l_context ) loop
        http.p( 'EMPNO: ' || apex_exec.get_number( l_context, l_idx_empno ) );
        http.p( 'ENAME: ' || apex_exec.get_varchar2( l_context, l_idx_ename ) );
        http.p( 'MGR: ' || apex_exec.get_number( l_context, l_idx_mgr ) );
    end loop;

    apex_exec.close( l_context );
    return;
exception
    when others then
        apex_debug.log_exception;
        apex_exec.close( l_context );
        raise;
end;
```



APEX 18.1

REST DEMO

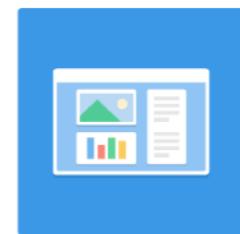
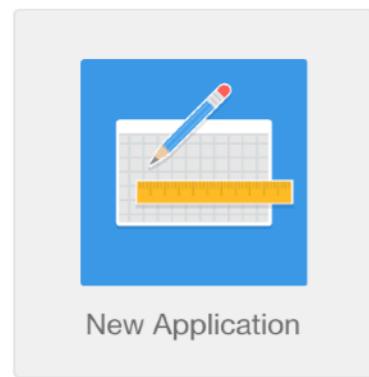


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APEX 18.1 Create App Wizard

Create an Application

What type of application would you like to create?



Websheet · Quick SQL · Copy Application



Quick SQL Integration
Application creation from Quick SQL

Utilities \ Quick SQL

Quick SQL Shorthand	Clear	Samples	Help	Generate SQL	Oracle SQL Output	Settings	Download	Save SQL Script	Review and Run
---------------------	-------	---------	------	--------------	-------------------	----------	----------	-----------------	----------------

```
1 #apex: true, auditcols: true
2 projects /insert 5
3   name /nn
4   owner
5 milestones /history /insert 10
6   name /nn
7   status /check open completed closed /values open, open, ope
8   owner
9   started date
10  closed date
11  links /insert 5
12    name /nn
13    url
14    attachments
15      contributed by
16        attachment file
17    action items /insert 12
18      action
19        desc clob
20        owner
21        status /check open completed closed
22
23 view project_ms projects milestones
24 view project_ai projects action_items
1 -- create tables
2 create table projects (
3   id
4   name
5   owner
6   created
7   created_by
8   updated
9   updated_by
10 )
11 ;
12
13 create table milestones (
14   id
15   project_id
16
17   name
18   status
19
20   owner
21   started
22   closed
23   created
24   created_by
25   updated
26   updated_by
27
28 )
```



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APEX 18.1 Blueprint

View Blueprint | Load Blueprint

Create an Application

Name

Appearance
Vita, Side Menu

Pages [?](#)

Home

Features [?](#) Check All

- Add about this application page
- Enable role-based user authorization
- Include user activity and error reports
- Enable or disable application features
- Allow users to provide feedback
- Update default application look and feel

Settings [?](#)

Application ID: 1382

Schema: MBNDATA

Authentication: Application Express Accounts

Language: English (en)

Advanced Settings

User Interface Defaults

Blueprint (JSON)

Application Blueprint

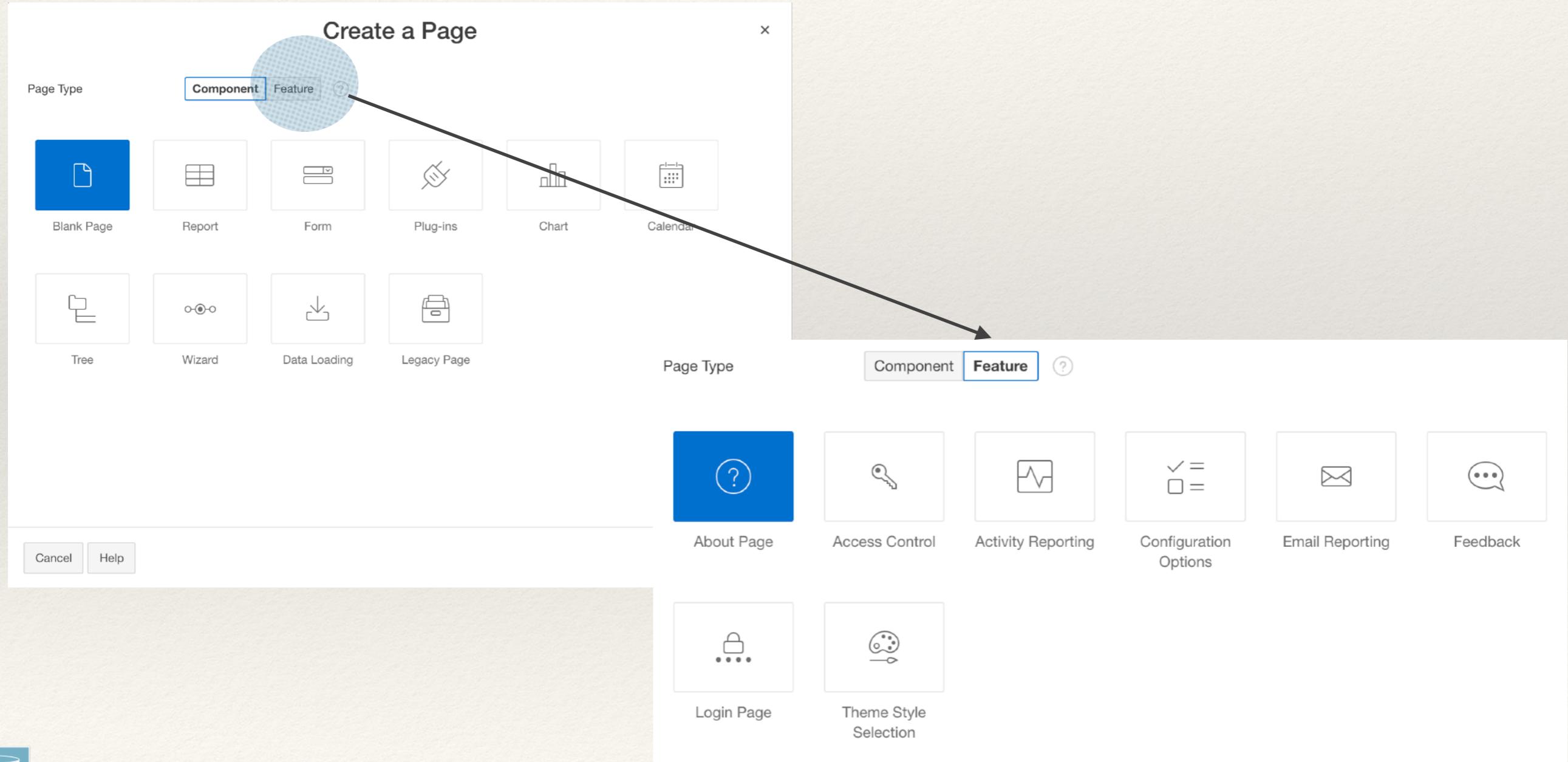
```
1 {
2   "application": {
3     "name": "",
4     "appShortDescription": "",
5     "appDescription": "",
6     "schema": "MBNDATA",
7     "features": {
8       "accessControl": false,
9       "activityReporting": false,
10      "configurationOptions": false,
11      "feedback": false,
12      "helpPages": false,
13      "themeSelection": false
14    },
15    "appearance": {
16      "themeStyle": "Vita",
17      "navigation": "SIDE",
18      "icon": "app-icon-bar-line-chart",
19      "iconBackgroundClass": "app-color-7",
20      "iconColorHEX": "#5A68AD"
21    },
22    "settings": {
23      "baseTablePrefix": "",
24      "primaryLanguage": "en",
25      "authentication": ""
26    },
27    "pages": [
28      {
29        "page": "1"
30      }
31    ]
32  }
33}
```

Load a Previous Blueprint [?](#)



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APEX 18.1 Features



APEX 18.1 Administration Page

Administration

Configuration

- Configuration Options
Enable or disable application features
- Theme Style Selection
Set the default application look and feel

Activity Reports

- Dashboard
View application activity metrics
- Top Users
Report of page views aggregated by user
- Application Error Log
Report of errors logged by this application
- Page Performance
Report of activity and performance by application page
- Page Views
Report of each page view by user including date of access and elapsed time

Email Reporting

- Email Reporting
Report of all email queued to be sent and those already sent

Access Control

All authenticated users can access this application

Role	Count
Administrator	1
Reader	1
Contributor	0

- Users
Change access control settings and disable access control
- Access Control
Set level of access for authenticated users of this application

Feedback

No Action	0
Acknowledged	0
Open	0
Closed	0

- User Feedback
Report of all feedback submitted by application users



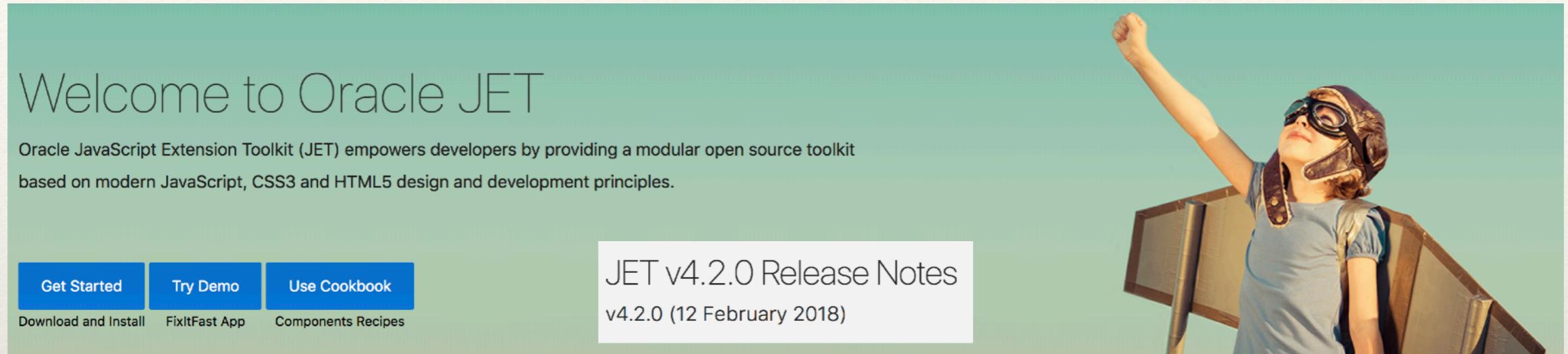
APEX 18.1

Create Application DEMO



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APEX 18.1 JET 4.2 Integration



Welcome to Oracle JET

Oracle JavaScript Extension Toolkit (JET) empowers developers by providing a modular open source toolkit based on modern JavaScript, CSS3 and HTML5 design and development principles.

Get Started Try Demo Use Cookbook

Download and Install FixitFast App Components Recipes

JET v4.2.0 Release Notes
v4.2.0 (12 February 2018)

A young boy wearing a cardboard airplane wingsuit and goggles, standing with one arm raised in triumph against a clear blue sky.



jQuery
write less, do more.

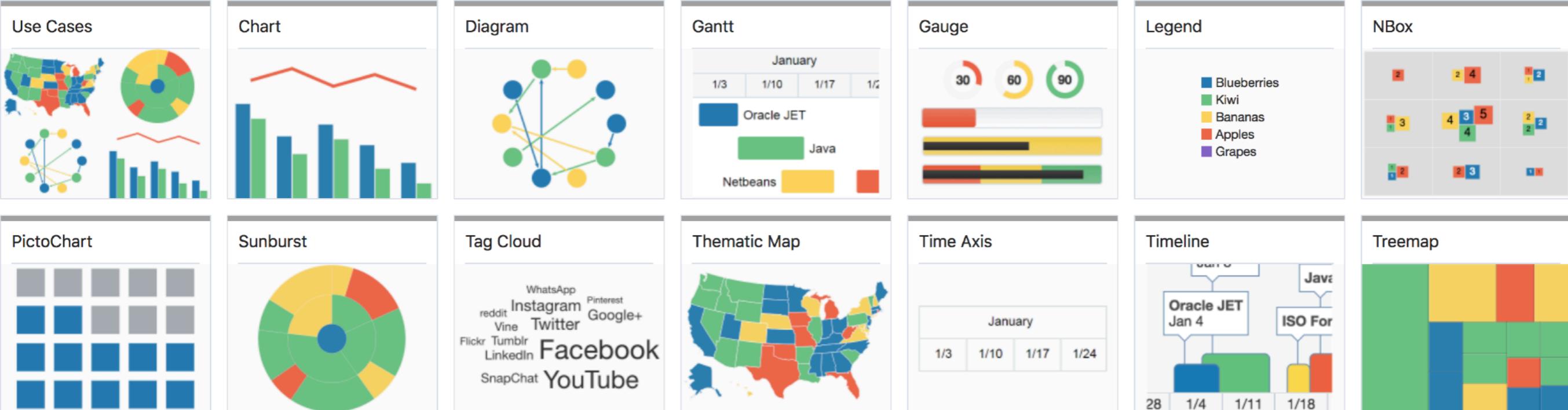
jQuery
user interface

Knockout.



APACHE
CORDOVA™

Visualizations

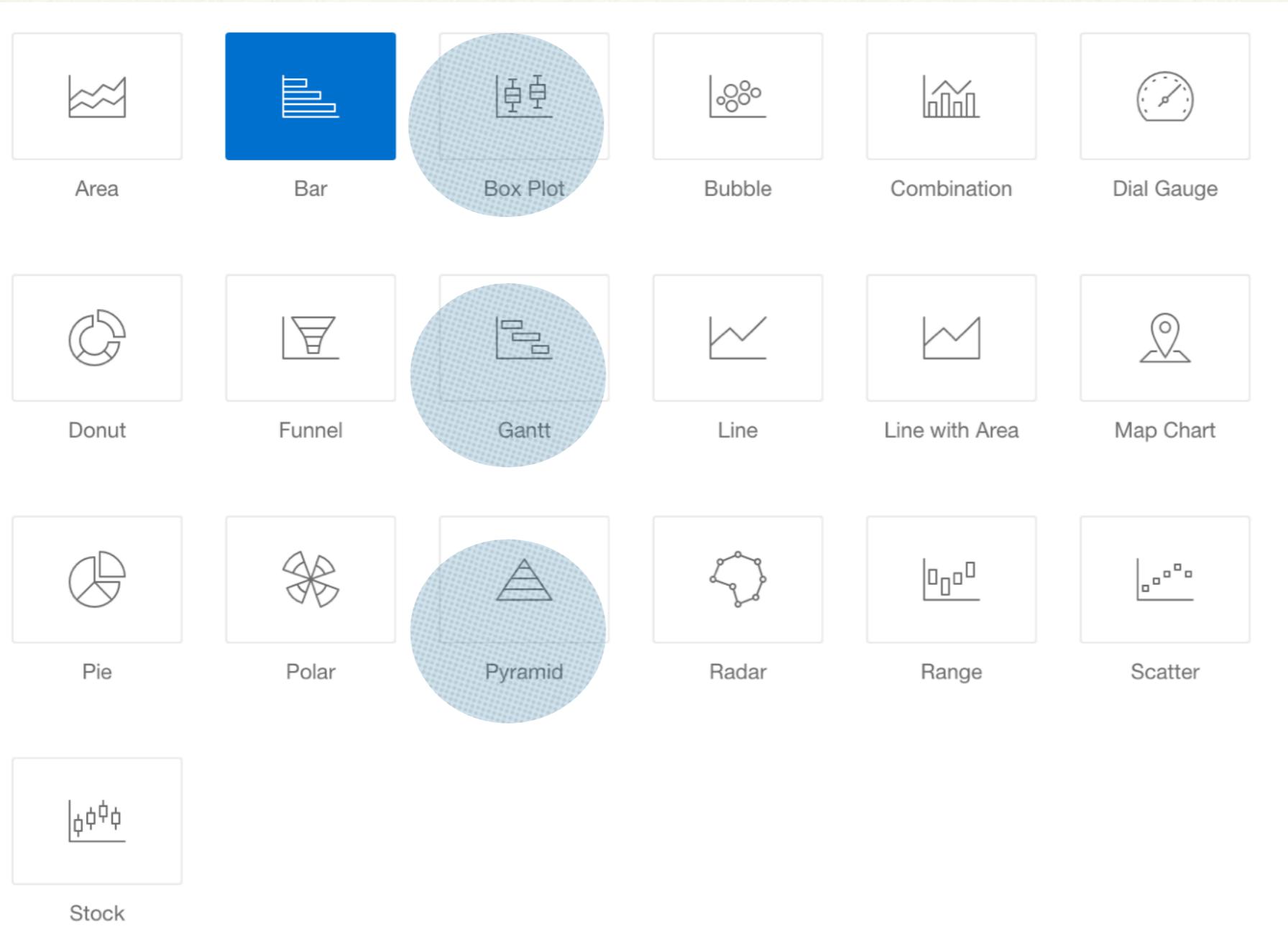


Use Cases Chart Diagram Gantt Gauge Legend NBox

PictoChart Sunburst Tag Cloud Thematic Map Time Axis Timeline Treemap

Detailed description: A grid of 14 visualization components. The first row contains 'Use Cases' (map and network graphs), 'Chart' (line and bar charts), 'Diagram' (network graph), 'Gantt' (calendar with tasks), 'Gauge' (progress bars), 'Legend' (color-coded list), and 'NBox' (matrix grid). The second row contains 'PictoChart' (grid of colored squares), 'Sunburst' (radial sunburst chart), 'Tag Cloud' (list of social media platforms), 'Thematic Map' (map of US states with color-coded data), 'Time Axis' (calendar with tasks), 'Timeline' (tree diagram of tasks over time), and 'Treemap' (hierarchical tree map).

APEX 18.1 JET 4.2 Integration



- ❖ Fill Gaps in Chart Data
- ❖ Sort order (4 options)
- ❖ New series level attributetes
- ❖ ...

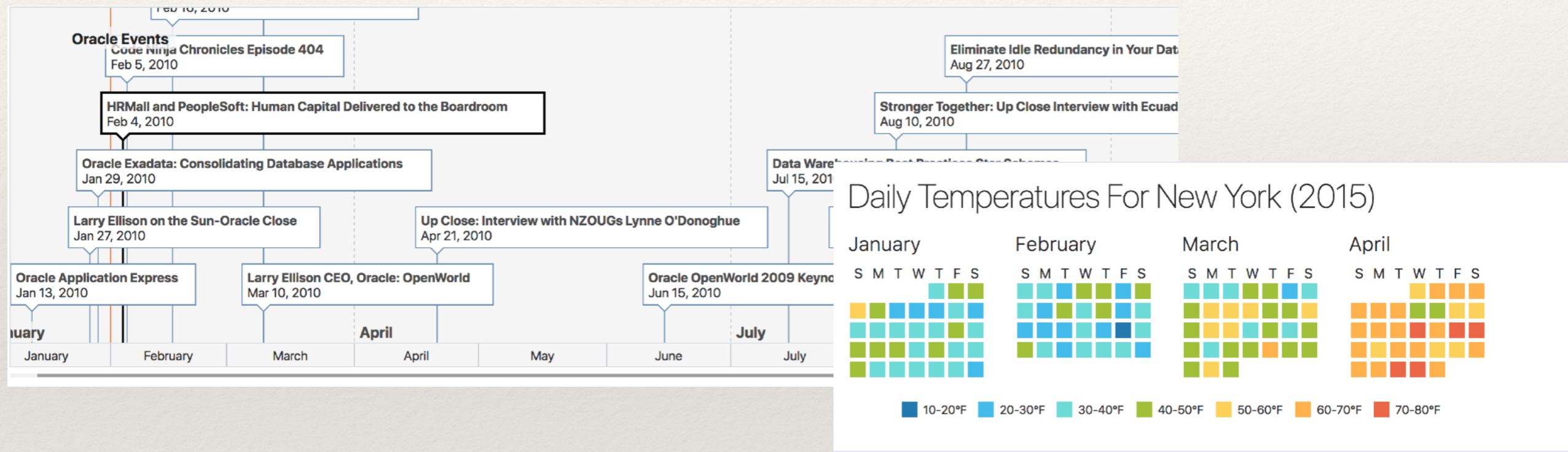
JS Stack Upgrade

- JET 4.2.0
- jQuery 3.1.1
- jQuery UI 1.12.0



APEX 18.1 JET 4.2 Integration

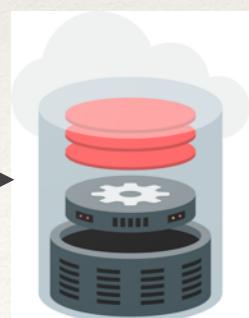
Integration of other JET visualisations - using code or plugins



Use Cookbook

* Oracle JET Cookbook

REST/
JSON



MBNDA

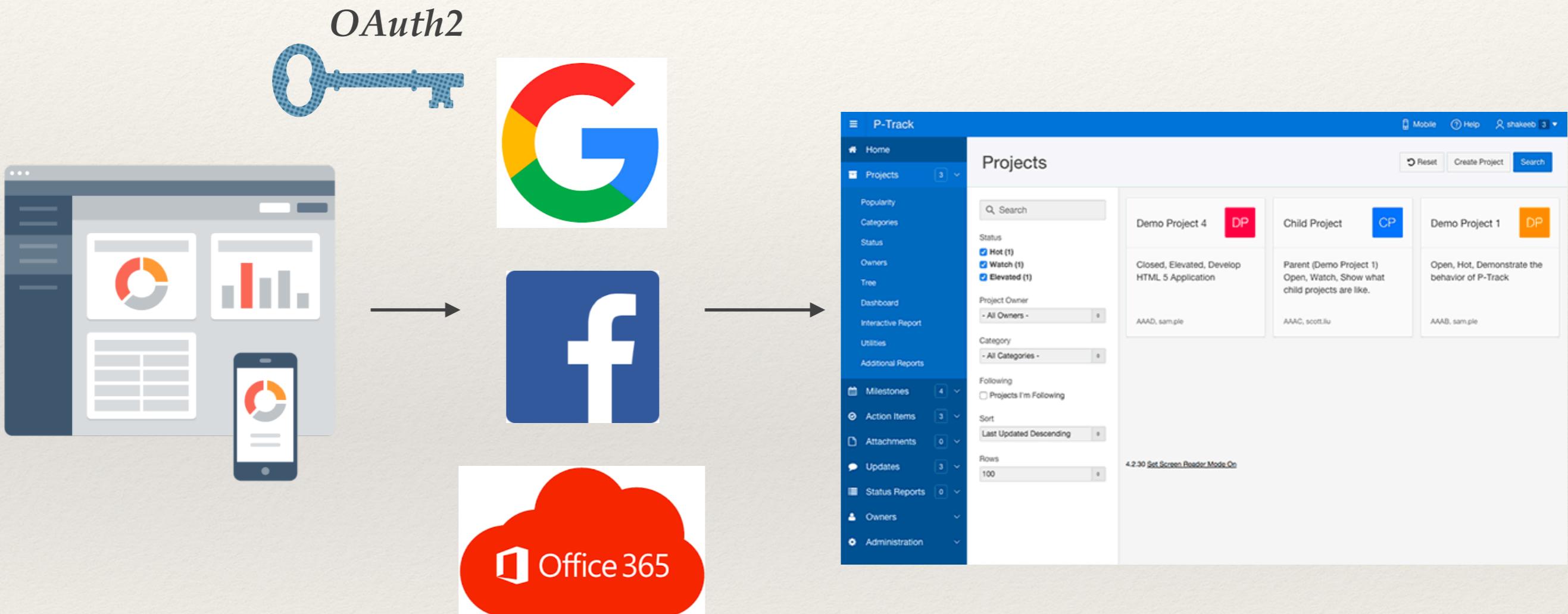
APEX 18.1

JET Charts DEMO



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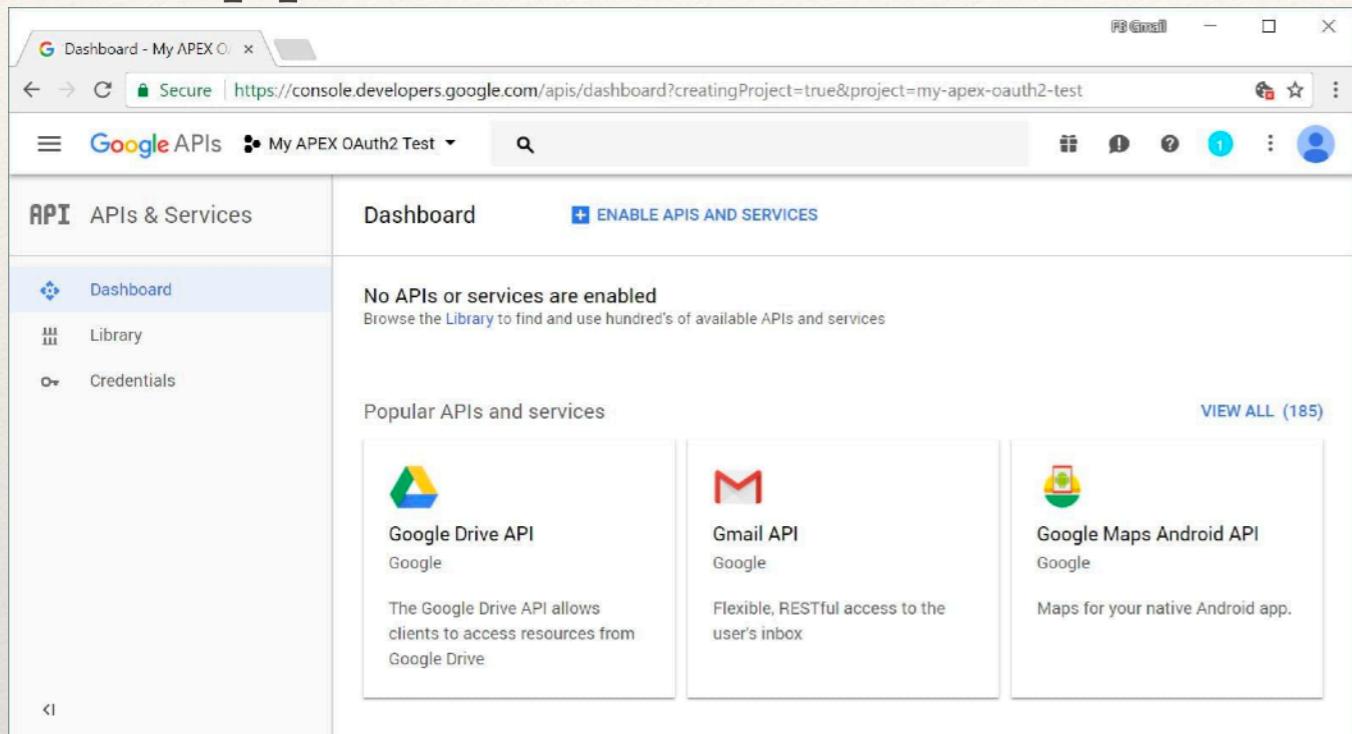
APEX 18.1 Social Login



MBN DATA

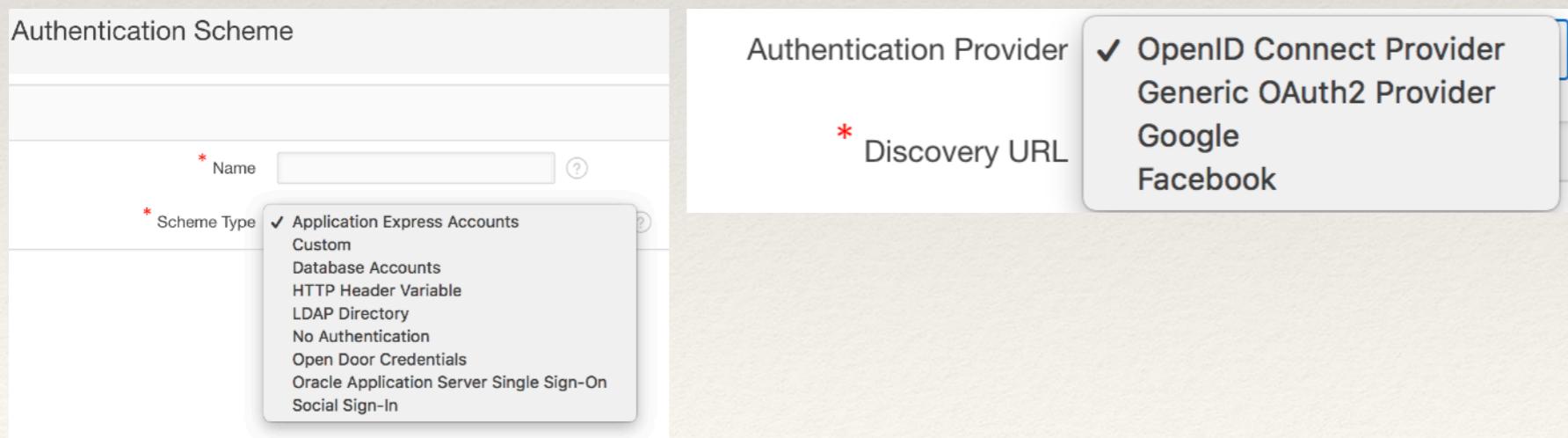
APEX 18.1 Social Login

1. Setup provider credentials (client id and key)



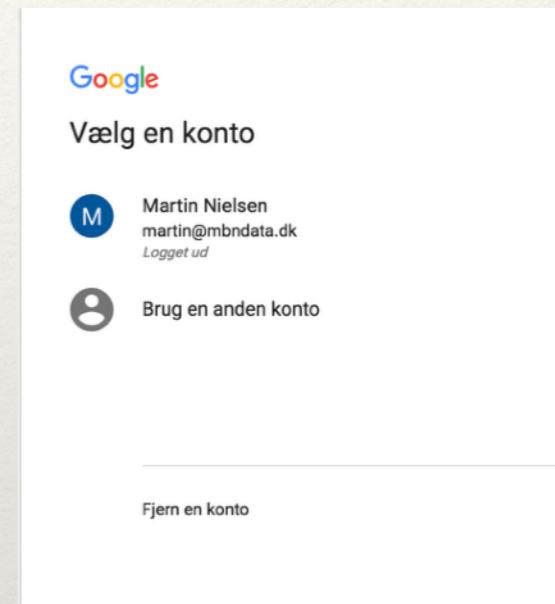
The screenshot shows the Google Cloud Platform API Console Dashboard. The left sidebar is titled 'API APIs & Services' and has three items: 'Dashboard' (selected), 'Library', and 'Credentials'. The main area is titled 'Dashboard' and shows 'No APIs or services are enabled'. Below this, there's a section for 'Popular APIs and services' with cards for 'Google Drive API', 'Gmail API', and 'Google Maps Android API'. A blue button at the top right says '+ ENABLE APIs AND SERVICES'.

2. Create credentials in APEX



The screenshot shows the 'Authentication Scheme' configuration screen in Oracle APEX. It includes fields for 'Name' and 'Scheme Type'. A dropdown menu under 'Scheme Type' lists several options: Application Express Accounts, Custom, Database Accounts, HTTP Header Variable, LDAP Directory, No Authentication, Open Door Credentials, Oracle Application Server Single Sign-On, and Social Sign-In. The 'Social Sign-In' option is highlighted with a red asterisk. On the right, the 'Authentication Provider' section is expanded, showing a list of providers: OpenID Connect Provider (checked), Generic OAuth2 Provider, Google, and Facebook. A red asterisk is next to the 'Discovery URL' field.

3. Log in



The screenshot shows a Google login page. At the top, it says 'Google' and 'Vælg en konto'. It displays a profile for 'Martin Nielsen' with the email 'martin@mbndata.dk' and a 'Logget ud' link. Below that is a link 'Brug en anden konto'. At the bottom, there's a link 'Fjern en konto'.

APEX 18.1

Social Login DEMO



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APEX 18.1 Other features

Oracle APEX 18.1 Early Adopter 2



A preview of modern database web application development. Take it for a spin today!



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APEX 18.1 JavaScript Documentation

Index

Widgets

grid
menu
menuButton
treeView

Namespaces

apex
apex.actions
apex.debug
apex.item
apex.lang
apex.model
apex.page
apex.region
apex.server
apex.util
apex.util.delayLinger
apex.widget

Interfaces

actions
htmlBuilder
item
model
region
treeNodeAdapter

Non-namespace APIs

Pre-General Availability: 2018-3-2

Introduction



Oracle Application Express JavaScript API Reference

This section describes the JavaScript APIs available to Oracle Application Express applications. You can use these functions to provide client-side functionality, such as showing and hiding page elements, or making Ajax (Asynchronous JavaScript and XML) requests.

Most of the Application Express JavaScript APIs are organized into namespaces. A namespace is simply a global singleton object that contains a number of functions. There is one top level Application Express namespace called `apex`. This has a number of sub namespaces such as `apex.server` and `apex.util`. Namespaces help to organize code and reduce the chance of name conflicts with other JavaScript libraries.

There are some older global functions that are not in a namespace. Most of these start with a \$ character. These are known as [Non-namespace APIs](#).

Some functions return an interface, which is an object that contains functions known as methods and variables known as properties, that allows access to a specific instance of a page component or other entity.

Application Express also includes a number of UI widgets based on the jQuery UI widget factory. Widgets are high level user interface components such as menus, trees, or grids. Application Express makes it easy to declaratively add components such as items and regions to a page. Internally some components are implemented using these widgets. Default component behavior does not require any JavaScript programming. To implement advanced use cases you can leverage the documented widget methods, options and events.

TODO describe how to know which APIs are available when i.e. desktop vs mobile, core/default vs need to load a specific file.

Adding JavaScript to an Application Express application

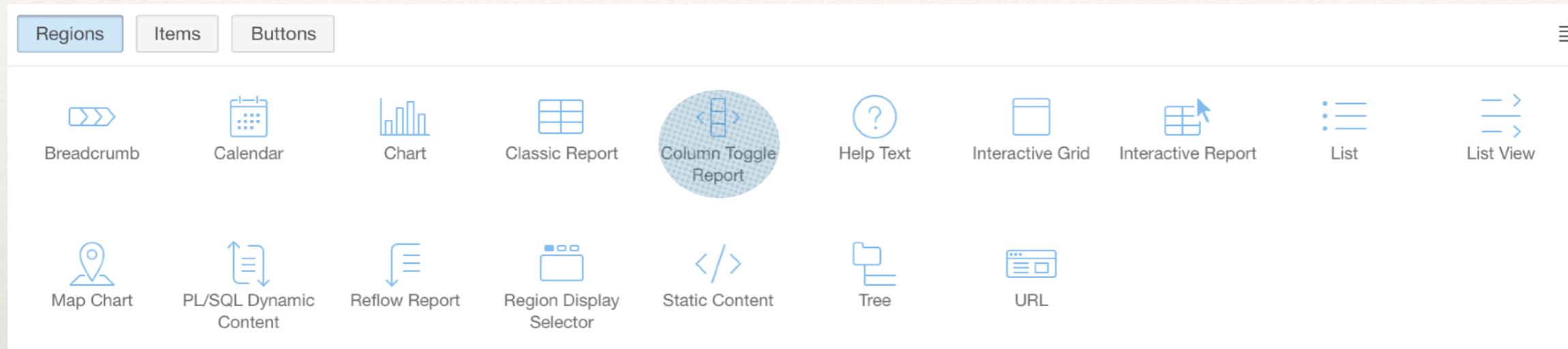
TODO describe how to include/call JavaScript code in an APEX page

Legacy JavaScript APIs

Work has commenced to reduce the overall size of JavaScript that is loaded by Oracle Application Express when rendering a page. JavaScript functions that are no longer served on every page are gradually being moved to a legacy JavaScript file, which can be found in `/i/libraries/apex/legacy.js`.



APEX 18.1 New regions



Smart Column Setup for
hide first,
Hide last...

Smart Column Setup for
hide first,
Hide last...

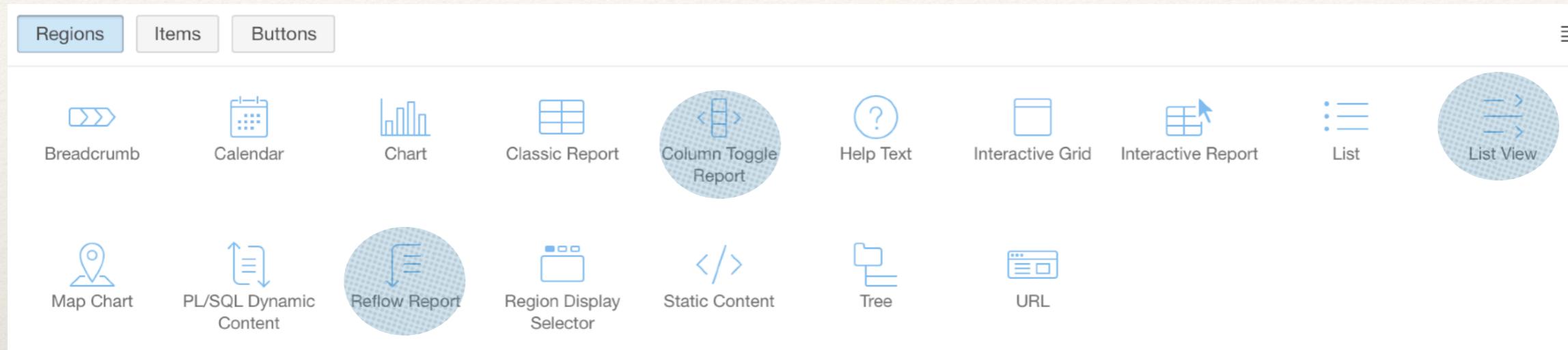
Table Columns

Table Name	Column Name	Data Type	Data Type Mod	Data Type Owner	Data Length	Data Precision	Data Scale	Nullable	Column Id	Default Length	Data Default	Num Distinct
ACTION_ITEMS	ID	NUMBER			22			N	1			0
ACTION_ITEMS	PROJECT_ID	NUMBER			22			Y	2			0
ACTION_ITEMS	ACTION	VARCHAR2			4000			Y	3			0
ACTION_ITEMS	THE_DESC	CLOB			4000			Y	4			0
ACTION_ITEMS	OWNER	VARCHAR2			4000			Y	5			0
ACTION_ITEMS	STATUS	VARCHAR2			60			Y	6			0
ACTION_ITEMS	CREATED	DATE			7			N	7			0
ACTION_ITEMS	CREATED_BY	VARCHAR2			255			N	8			0
ACTION_ITEMS	UPDATED	DATE			7			N	9			0
ACTION_ITEMS	UPDATED_BY	VARCHAR2			255			N	10			0
APEX\$TEAM_DEV_FILES	ID	NUMBER			22			N	1			0
APEX\$TEAM_DEV_FILES	ROW_VERSION_NUMBER	NUMBER			22			Y	2			0
APEX\$TEAM_DEV_FILES	COMPONENT_ID	NUMBER			22			N	3			0

Columns... Table Name Column Name Data Type Data Type Mod Data Type Owner Data Length Data Precision Data Scale Nullable Column Id Default Length Data Default Num Distinct Low Value High Value Density Num Nulls Num Buckets Last Analyzed Sample Size Character Set Name Char Col Decl Length

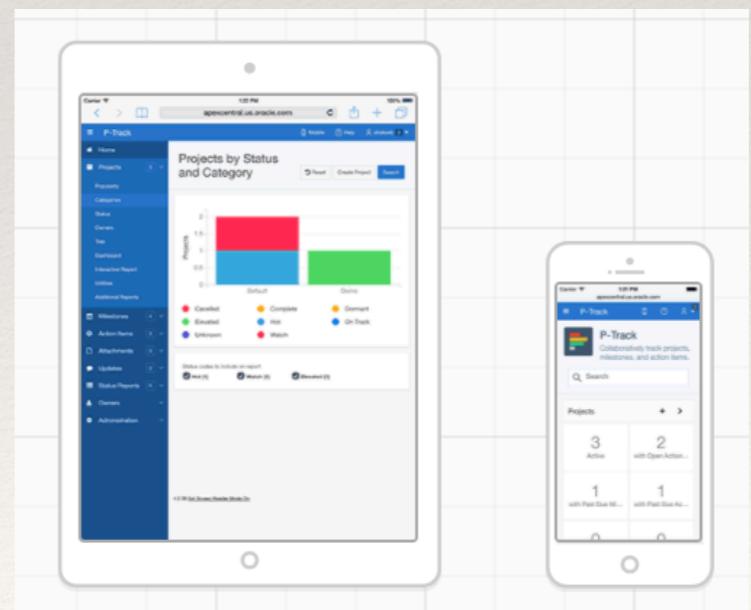


APEX 18.1 New regions



Regions are gradually copied from the mobile theme to the desktop theme.

APEX is moving away from jQuery mobile
And integrating into the universal theme.

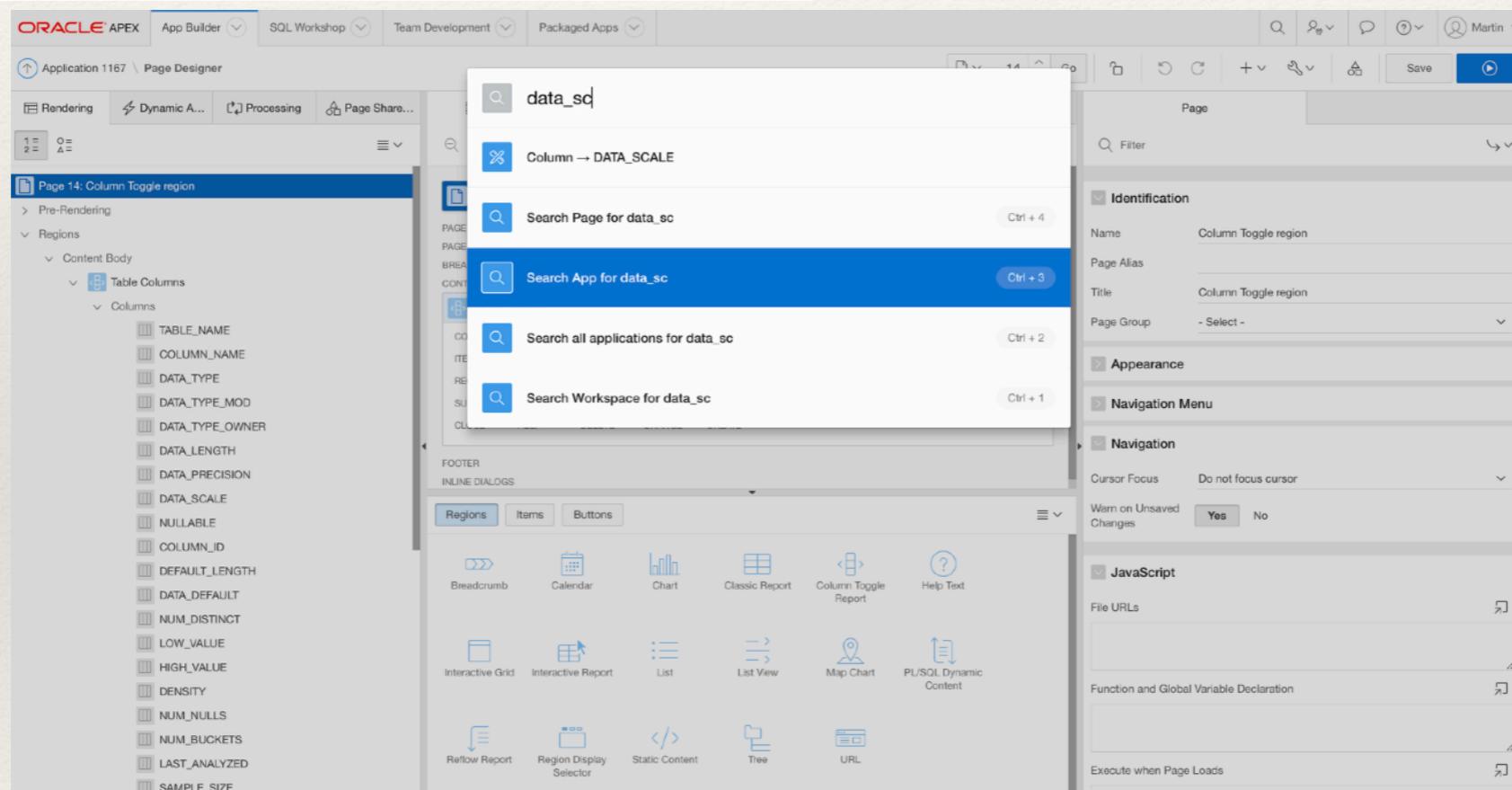


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APEX 18.1 Page Designer

- Sticky Filters
 - Filters can now be pinned so you can filter on something and click across to other components maintaining the filter

APEX Spotlight Search



• Property Editor

- Updated UI to improve usability
- Removed show common / show all, and collapse all / expand all functionality
- When a property has focus, the group becomes highlighted
- Improved 'Go to group' functionality
- Addition of 'Anchor' attribute for link property types



APEX 18.1 Grid Improvements

The screenshot shows a grid interface with the following features:

- Search bar: Search: All Text Columns, Go, Primary Report dropdown.
- Actions bar: Actions dropdown, Edit, Save (highlighted in blue), Add Row.
- Grid data:

	Name	Job	Manager	Salary
<input type="checkbox"/>	MILLER	Clerk	CLARK	1300
<input checked="" type="checkbox"/>	JAMES	Clerk	BLAKE	950
<input checked="" type="checkbox"/>	ADAMS	Clerk	SCOTT	1100
<input type="checkbox"/>	SMITH	Clerk	FORD	800
<input type="checkbox"/>	TURNER	Salesman	BLAKE	1500
- Context menu (opened over selected rows):
 - Columns
 - Filter
 - Data
 - Format
 - Selection (highlighted in blue)
 - Chart
 - Report
 - Download
 - Help
 - Cell Selection F8
 - Copy to Clipboard Ctrl+C
 - Duplicate Rows
 - Delete Rows
 - Refresh Rows
 - Revert Changes
 - Copy Down
 - Fill
 - Clear
- Message: 2 rows selected

* More spreadsheet like features
* More dynamic action events



Questions

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Github example application and presentations here...



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