

# ā'pěks alpe adria

## New JSON, Workflow, and Fusion Apps Features in APEX 24.2

April 11<sup>th</sup>, 2025  
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# JSON: What's New for 24.2 ?

## JSON Sources

# JSON Sources

- Use any APEX region to read and write JSON data from:
  - CLOB/BLOB columns in 19c or 23ai
  - JSON columns in 23ai
  - JSON Collection Tables in 23ai

# JSON Sources: New Shared Component

The screenshot shows the Oracle APEX App Builder interface. In the top navigation bar, 'APEX' is selected. The main area displays the 'Shared Components' page for Application 109. A modal window titled 'Data Sources' is open, listing various components: REST Data Sources, Duality Views, and JSON Sources. The 'JSON Sources' item is highlighted with a yellow border and a red notification badge showing the number '1'. The background grid shows categories like Application Logic, Security, Other Components, Navigation and Search, User Interface, and Generative AI, each with their respective sub-components.

**Data Sources**

- REST Data Sources
- Duality Views
- JSON Sources** 1

**Application Logic**

- Application Definition
- Application Items
- Application Processes
- Application Computations
- Application Settings
- Build Options 1

**Security**

- Security Attributes
- Authentication Schemes 1
- Authorization Schemes 1
- Application Access Control
- Session State Protection

**Other Components**

- Lists of Values
- Plug-ins
- Component Settings
- Shortcuts
- Component Groups
- Data Load Definitions

**Navigation and Search**

- Lists 2
- Navigation Menu
- Breadcrumbs 1
- Navigation Bar List
- Search Configurations

**User Interface**

- User Interface 6
- Progress Bars
- Themes
- Templates
- Email Templates
- Map Boxes

**Data Sources**

- REST Data Sources
- Duality Views
- JSON Sources** 1

**Workflows and Automations**

- Task Definitions
- Automations
- Workflows

**Generative AI**

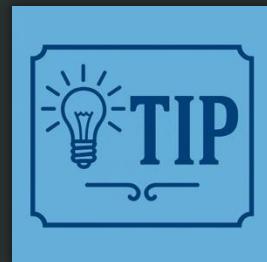
- AI Attributes
- AI Configurations
- AI Services >

**Globalization Attributes**

- Text Messages
- Application Translations

# JSON Sources vs. REST Data Sources

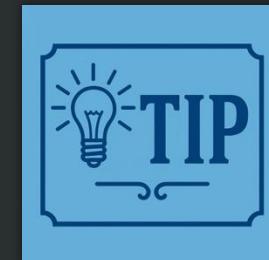
- JSON Sources work with local JSON
  - Zero-latency data access
- REST Data Sources work with remote JSON
  - Requires network roundtrip(s)



Both use a *Data Profile* to capture metadata letting the APEX engine map JSON collections and properties to columns

# JSON Source for JSON in a Column Named DATA

```
{  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```



23ai JSON Collection Table

BOOK\_COLLECTIONS

DATA

19c / 23ai Table with JSON Column

BOOK\_COLLECTIONS\_TAB

ID	DATA	COL_A	...	COL_Z
----	------	-------	-----	-------

Using regular table  
JSON column can have  
*any name*

- BLOB
- CLOB
- JSON

19c

23ai

# JSON Source Data Profile: Root JSON Column

```
{
  "collectionName": "Favorite Animation Books",
  "created": "2025-04-05T08:09:00",
  "books": [
    {
      "title": "The Illusion of Life",
      "publisher": "Disney Editions",
      "authors": [
        {
          "firstName": "Frank",
          "lastName": "Thomas"
        },
        {
          "firstName": "Ollie",
          "lastName": "Johnston"
        }
      ],
      "published": "1995-10-19",
      "ISBN": "978-0786860708",
      "price": 35
    },
    {
      "title": "The Art of Ratatouille",
      "publisher": "Chronicle Books",
      "authors": [
        {
          "firstName": "Brad",
          "lastName": "Bird"
        },
        {
          "firstName": "John",
          "lastName": "Lasseter"
        }
      ],
      "published": "2007-05-03",
      "ISBN": "978-0811858342",
      "price": 32
    }
  ]
}
```

Columns Resequence Columns Add Column >

Name		Column Type	Data Type	Selector	a Sources using REST						
DATA	Table	JSON Document	DATA								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	DATA	Table	JSON Document	DATA	No	Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	CREATED	Data	Date	created	No	Yes	Yes	DATA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	BOOKS	Data	Array	books	No	Yes	No	DATA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS

Total 15



# JSON Source Data Profile: First Level Properties

```
{
  "collectionName": "Favorite Animation Books",
  "created": "2025-04-05T08:09:00",
  "books": [
    {
      "title": "The Illusion of Life",
      "publisher": "Disney Editions",
      "authors": [
        {
          "firstName": "Frank",
          "lastName": "Thomas"
        },
        {
          "firstName": "Ollie",
          "lastName": "Johnston"
        }
      ],
      "published": "1995-10-19",
      "ISBN": "978-0786860708",
      "price": 35
    },
    {
      "title": "The Art of Ratatouille",
      "publisher": "Chronicle Books",
      "authors": [
        {
          "firstName": "Brad",
          "lastName": "Bird"
        },
        {
          "firstName": "John",
          "lastName": "Lasseter"
        }
      ],
      "published": "2007-05-03",
      "ISBN": "978-0811858342",
      "price": 32
    }
  ]
}
```

**Columns**

Resequence Columns Add Column >

JSON Array Indexes used as Primary Keys

The following primary key columns are using a **JSON Array Index** as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

AUTHORS\_POS,BOOKS\_POS

Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
0	DATA	Table	JSON Document	DATA	No	Yes	No	DATA
1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
3	CREATED	Data	Date	created	No	Yes	Yes	DATA
4	BOOKS	Data	Array	books	No	Yes	No	DATA
102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS

Total 15



# JSON Source Data Profile: Array Columns New in 24.1

```
{  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```

Columns Resequence Columns Add Column >

JSON Array Indexes used as Primary Keys  
The following primary key columns are using a **JSON Array Index** as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

AUTHORS\_POS,BOOKS\_POS

BOOKS		Data		Array		books		
Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
0	DATA	Table	JSON Document	DATA	No	Yes	No	
1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
3	CREATED	Data	Date	created	No	Yes	Yes	DATA
4	BOOKS	Data	Array	books	No	Yes	No	DATA
102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS
Total 15								



# JSON Source Data Profile: Array Columns New in 24.1

```
{  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```

Columns Resequence Columns Add Column >

JSON Array Indexes used as Primary Keys  
The following primary key columns are using a **JSON Array Index** as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

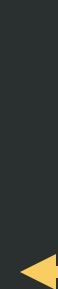
AUTHORS\_POS,BOOKS\_POS

AUTHORS		Data		Array		authors		
Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
0	DATA	Table	JSON Document	DATA	No	Yes	No	
1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
3	CREATED	Data	Date	created	No	Yes	Yes	DATA
4	BOOKS	Data	Array	books	No	Yes	No	DATA
102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS
Total 15								



# JSON Source Data Profile: Position/Line Number Columns

```
{  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "1": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "2": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```



Columns

Resequence Columns Add Column >

JSON Array Indexes used as Primary Keys

The following primary key columns are using a **JSON Array Index** as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

AUTHORS\_POS,BOOKS\_POS

Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
0	DATA	Table	JSON Document	DATA	No	Yes	No	
1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
3	CREATED	Data	Date	created	No	Yes	Yes	DATA
4	BOOKS	Data	Array	books	No	Yes	No	DATA
102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS

Total 15



# JSON Source Data Profile: Primary Key at Each Level

```
{
  "id": "67EFC25A081831C44C5486DF",
  "collectionName": "Favorite Animation Books",
  "created": "2025-04-05T08:09:00",
  "books": [
    {
      "title": "The Illusion of Life",
      "publisher": "Disney Editions",
      "authors": [
        {
          "name": "Frank",
          "lastName": "Thomas"
        },
        {
          "firstName": "Ollie",
          "lastName": "Johnston"
        }
      ],
      "published": "1995-10-19",
      "ISBN": "978-0786860708",
      "price": 35
    },
    {
      "title": "The Art of Ratatouille",
      "publisher": "Chronicle Books",
      "authors": [
        {
          "firstName": "Brad",
          "lastName": "Bird"
        },
        {
          "firstName": "John",
          "lastName": "Lasseter"
        }
      ],
      "published": "2007-05-03",
      "ISBN": "978-0811858342",
      "price": 32
    }
  ]
}
```

**Columns**

Resequence Columns Add Column >

**JSON Array Indexes used as Primary Keys**

The following primary key columns are using a **JSON Array Index** as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

AUTHORS\_POS,BOOKS\_POS

Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
0	DATA	Table	JSON Document	DATA	No	Yes	No	
1	C_ID	Data	Varchar2	_id	Yes	1	Yes	DATA
2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
3	CREATED	Data	Date	created	No	Yes	Yes	DATA
4	BOOKS	Data	Array	books	No	Yes	No	DATA
102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
107	BOOKS_POS	Data	Number		Yes	2	Yes	BOOKS
108	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	AUTHORS_POS	Data	Number		Yes	3	Yes	AUTHORS

Total 15



# JSON Source: Choosing *Nested Rows* in a Region

```
{  
  "_id": "67EFC25A081831C44C5486DF",  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```

The screenshot shows the Oracle APEX App Builder interface. The top navigation bar includes APEX, App Builder, SQL Workshop, Team Development, and Gallery. A search bar and user profile for Steve Muench (smuench) are also present. The main area displays 'Application 109 \ Page 2: Collections'. The left sidebar shows the page structure with components like Pre-Rendering, Components (Breadcrumb Bar, Body), and Post-Rendering. The Body section contains a 'Collections' region. The right sidebar contains the 'Region' tab of the properties panel, showing 'Identification' (Name: Collections, Title: Collections, Type: Interactive Report) and 'Source' (Location: JSON Source, JSON Source: Book Collections). A modal dialog titled 'Data Profile' is open at the bottom, specifically showing the 'Nested Rows' section. It displays a list of options: 'None' (selected), '1. BOOKS', and '2. ... AUTHORS'. The overall theme is dark.

# JSON Source: Choosing *Nested Rows* in Multiple Regions

```
{  
  "_id": "67EFC25A081831C44C5486DF",  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```

The screenshot shows the Oracle APEX App Builder interface for 'Application 109 \ Page 3: Book Collection'. The left sidebar displays the page structure under 'Components'.

- Region Body:** Contains fields for P3\_C\_ID, P3\_COLLECTIONNAME, P3\_CREATED, and P3\_CREATED\_DATE. The 'P3\_CREATED\_DATE' field has its 'Nested Rows' dropdown set to 'None'.
- Books Region Content:** Contains a 'Books' section with 'Nested Rows' set to '1. BOOKS'.
- Authors Region Content:** Contains an 'Authors' section with 'Nested Rows' set to '2. ... AUTHORS'.

# JSON Source: Choosing *Nested Rows* in Multiple Regions

```
{  
  "_id": "67EFC25A081831C44C5486DF",  
  "collectionName": "Favorite Animation Books",  
  "created": "2025-04-05T08:09:00",  
  "books": [  
    {  
      "title": "The Illusion of Life",  
      "publisher": "Disney Editions",  
      "authors": [  
        {  
          "firstName": "Frank",  
          "lastName": "Thomas"  
        },  
        {  
          "firstName": "Ollie",  
          "lastName": "Johnston"  
        }  
      ],  
      "published": "1995-10-19",  
      "ISBN": "978-0786860708",  
      "price": 35  
    },  
    {  
      "title": "The Art of Ratatouille",  
      "publisher": "Chronicle Books",  
      "authors": [  
        {  
          "firstName": "Brad",  
          "lastName": "Bird"  
        },  
        {  
          "firstName": "John",  
          "lastName": "Lasseter"  
        }  
      ],  
      "published": "2007-05-03",  
      "ISBN": "978-0811858342",  
      "price": 32  
    }  
  ]  
}
```

The screenshot shows a web-based application interface for managing book collections. At the top, a header bar displays the title "Books Against JSON Collection". Below it, a main section titled "Collections" lists four entries: "Favorite Animation Books", "Favorite Art Books", "Best Cookbooks", and "Finest New Books". Each entry has a small edit icon next to it.

A modal window titled "Book Collection" is open on the right side of the screen. It contains two tabs: "Edit" and "Add Book". The "Edit" tab is active, showing fields for "Collection Name" (set to "Favorite Animation Books") and "Created Date" (set to "05-APR-2025 08:09"). Below these fields, a table lists books from the first collection. The first book, "The Illusion of Life", is selected, indicated by a checked checkbox in the first column. The table columns are: ISBN, Title, Publisher, Price, and Published. The total count of selected rows is shown as "Total 2".

Below the "Edit" tab, another modal window titled "Add Author" is partially visible. It also has an "Edit" tab and a table with columns for First Name and Last Name. Two rows are listed: one for "Frank" and one for "Ollie". The total count of selected rows here is also "Total 2".

At the bottom of the application, there are buttons for "Cancel", "Delete", and "Apply Changes".

Release 1.0 Built with ❤️ using Oracle APEX



# JSON Source Data Profile



Use Sequence to order array columns into contiguous groups

Columns Resequence Columns Add Column >

**JSON Array Indexes used as Primary Keys**  
i The following primary key columns are using a *JSON Array Index* as **Selector**. This can lead to limitations for *multi-row DML* (in components like Interactive Grid), or for Data Sources using REST Enabled SQL.

AUTHORS\_POS,BOOKS\_POS

		Sequence ↑↓	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
		0	DATA	Table	JSON Document	DATA	No	Yes	No	DATA
		1	C_ID	Data	Varchar2	_id	Yes	Yes	Yes	DATA
		2	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	DATA
		3	CREATED	Data	Date	created	No	Yes	Yes	DATA
		4	BOOKS	Data	Array	books	No	Yes	No	BOOKS
		102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
		103	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
		104	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
		105	PUBLISHED	Data	Date	published	No	Yes	Yes	BOOKS
		106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
		107	BOOKS_POS	Data	Number		Yes	Yes	Yes	BOOKS
		108	AUTHORS	Data	Array	authors	No	Yes	No	AUTHORS
		201	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
		202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
		203	AUTHORS_POS	Data	Number		Yes	Yes	Yes	AUTHORS

Total 15



## JSON Duality Companion

Collection Table or Duality View Name  
BOOK\_COLLECTIONSCurrent Document RESID  
04363745464332354130383138333143343443353438364446

smuench



## Browse/Edit JSON Duality View and Collection Table Documents

&lt; Previous

&gt; Next

Extended JSON:

OFF

Save

Delete

Add New

Duplicate

Reread



```
1 {
2   "_id" : "67EFC25A081831C44C5486DF",
3   "collectionName" : "Favorite Animation Books",
4   "created" : "2025-04-05T08:09:00",
5   "books" :
6   [
7     {
8       "title" : "The Illusion of Life",
9       "publisher" : "Disney Editions",
10      "authors" :
11        [
12          {
13            "firstName" : "Frank",
14            "lastName" : "Thomas"
15          },
16          {
17            "firstName" : "Ollie",
18            "lastName" : "Johnston"
19          }
20        ],
21       "published" : "1995-10-19",
22       "ISBN" : "978-0786860708",
23       "price" : 35
24     },
25     {
26       "title" : "The Art of Ratatouille",
27       "publisher" : "Chronicle Books",
28       "authors" :
29         [
30           {
31             "firstName" : "Pete",
32             "lastName" : "Docter"
33           }
34         ]
35     }
36   ]
37 }
```

# Triggers on JSON Collection Tables

- They are tables, so triggers work

```
create or replace trigger book_collections_t
before insert on book_collections
for each row
begin
    -- Default created date
    select json_transform(:NEW.DATA,
        set '$.created' = sysdate)
        into :NEW.DATA;
end;
```

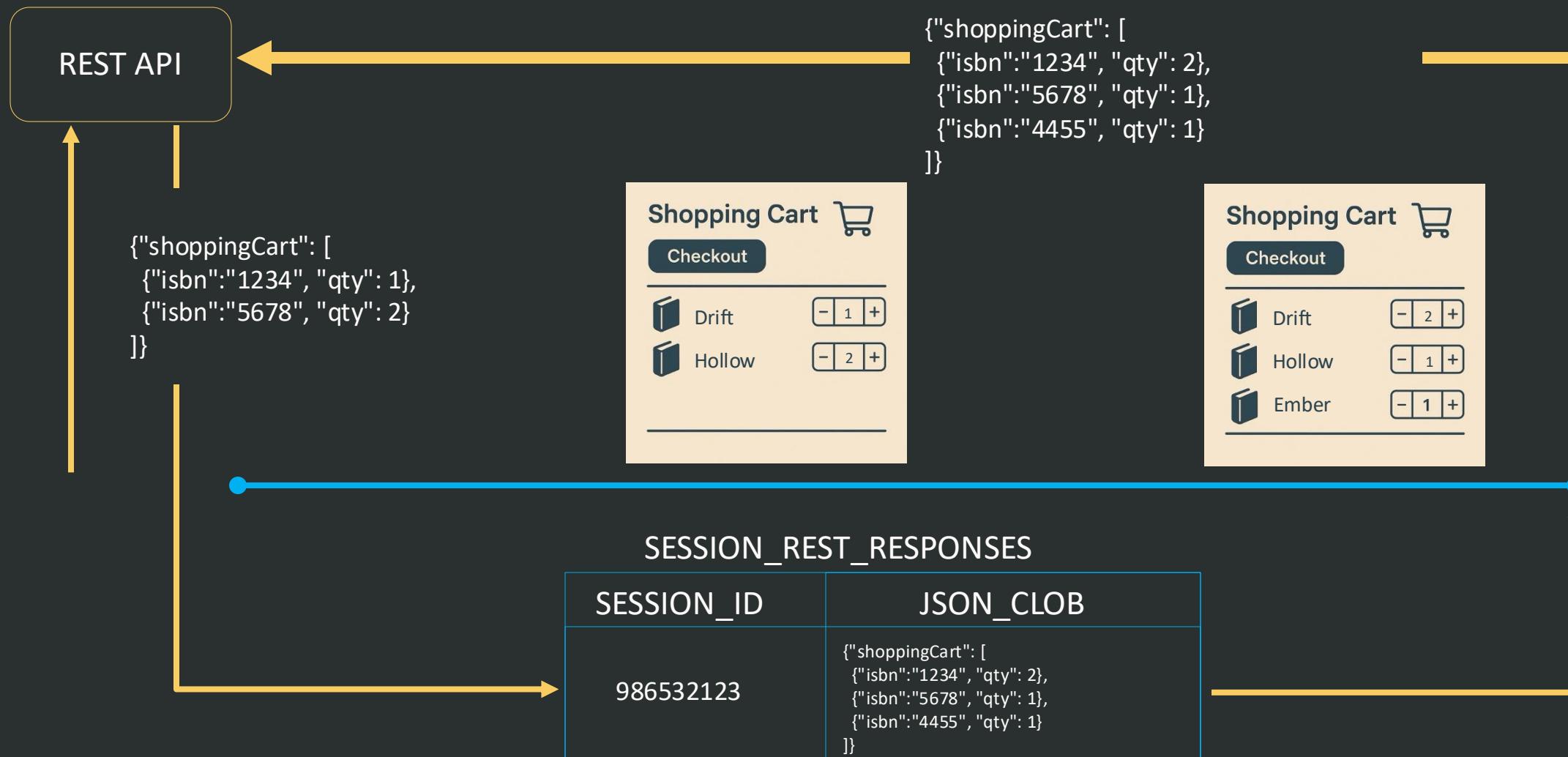
# Use Case: Editing REST Response Before Sending Back



# Use Case: Editing REST Response Before Sending Back



# Use Case: Editing REST Response Before Sending Back



# Use Case: JSON Flex Field on a Regular Table

DEPTNO	DNAME	LOC	FLEX
10	ACCOUNTING	NEW YORK	{ "budget":12345, "spendByDate": "2025-04-17", "justification":"New marketing campaign" }
20	RESEARCH	DALLAS	{ "budget":5678, "spendByDate": "2025-04-29", "justification":"Big new discoveries" }
99	COMPLIANCE AND MERRIMENT	LUMON	{ "budget":8844, "spendByDate": "2025-04-24", "justification":"New tuba and drum" }

# Use Case: JSON Flex Field on a Regular Table

Format: JSON

Data Profile Cancel Apply Changes

Row Selector

Columns Resequence Columns Add Column >

Search: All Text Columns Go Edit Add Data Column

		Sequence	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
		1	DEPTNO	Table	Number	DEPTNO	Yes	Yes	Yes	
		2	DNAME	Table	Varchar2	DNAME	No	Yes	Yes	
		3	LOC	Table	Varchar2	LOC	No	Yes	Yes	
		4	FLEX	Table	JSON Document	FLEX	No	Yes	No	<div style="border: 2px solid yellow; padding: 2px;">FLEX</div>
		5	BUDGET	Data	Number	budget	No	Yes	Yes	<div style="border: 2px solid yellow; padding: 2px;">FLEX</div>
		15	SPEND_BY_DATE	Data	Date	spendByDate	No	Yes	Yes	<div style="border: 2px solid yellow; padding: 2px;">FLEX</div>
		25	JUSTIFICATION	Data	Varchar2	justification	No	Yes	Yes	<div style="border: 2px solid yellow; padding: 2px;">FLEX</div>



# Use Case: JSON Flex Field on a Regular Table

☰ Dept with Flex

smuench

## Departments Grid

		Dname	Loc	Budget	Spend By Date	Justification	
Q	Actions	Search: All Text Columns	Go	Edit	Save	Add Row	Reset
<input type="checkbox"/>	<input type="checkbox"/>	ACCOUNTING	NEW YORK	12345	4/17/2025	New marketing campaign	<input type="button" value="Edit"/>
<input type="checkbox"/>	<input type="checkbox"/>	RESEARCH	DALLAS	5678	4/29/2025	Big new discoveries	<input type="button" value="Edit"/>
<input type="checkbox"/>	<input type="checkbox"/>	SALES	CHICAGO	10001	5/27/2025	Use it or lose it, am I right?	<input type="button" value="Edit"/>
<input type="checkbox"/>	<input type="checkbox"/>	OPERATIONS	BOSTON	5005	4/22/2025	Fix the data center roof	<input type="button" value="Edit"/>
<input type="checkbox"/>	<input type="checkbox"/>	COMPLIANCE AND MERRIMENT	LUMON	8844	4/24/2025	New tuba and drum	<input type="button" value="Edit"/>

1 rows selected Total 5

# Use Case: JSON Flex Field on a Regular Table

Dept with Flex smuench

## Departments

Actions

Create

Row text contains 'new' Spend By Date between 07-APR-2025 and 14-MAY-2025 Budget > 9999

Dname	Loc	Budget	Justification	Spend By Date
ACCOUNTING	NEW YORK	12345	New marketing campaign	17-APR-2025
RESEARCH	DALLAS	5678	Big new discoveries	29-APR-2025
COMPLIANCE AND MERRIMENT	LUMON	8844	New tuba and drum	24-APR-2025

1 - 3

# Use Case: JSON Flex Field on a Regular Table



# JSON/Relational Duality View

```
{
  "collectionName": "Favorite Animation Books",
  "created": "2025-04-05T08:09:00",
  "books": [
    {
      "title": "The Illusion of Life",
      "publisher": "Disney Editions",
      "authors": [
        {
          "firstName": "Frank",
          "lastName": "Thomas"
        },
        {
          "firstName": "Ollie",
          "lastName": "Johnston"
        }
      ],
      "published": "1995-10-19",
      "ISBN": "978-0786860708",
      "price": 35
    },
    {
      "title": "The Art of Ratatouille",
      "publisher": "Chronicle Books",
      "authors": [
        {
          "firstName": "Brad",
          "lastName": "Bird"
        },
        {
          "firstName": "John",
          "lastName": "Lasseter"
        }
      ],
      "published": "2007-05-03",
      "ISBN": "978-0811858342",
      "price": 32
    }
  ]
}
```

BOOK\_COLLECTIONS\_DV

BOOK_COLLECTIONS_DV_ROOT	
_id	varchar2_64
CREATED	timestamp
COLLECTION_NAME	varchar2_64

BOOK_COLLECTIONS_DV_BOOKS	
_id	varchar2_64
ISBN	varchar2_64
PRICE	number
TITLE	varchar2_64
PUBLISHED	timestamp
PUBLISHER	varchar2_64
_id_book_collection	varchar2_64

BOOK_COLLECTIONS_DV_AUTHORS	
_id	varchar2_64
LAST_NAME	varchar2_64
FIRST_NAME	varchar2_64
_id_book	varchar2_64



# JSON/Relational Duality View DDL Syntax

```

create json relational duality view book_collections_dv as
book_collections_dv_root @insert @update @delete
{
    "_id"
    collectionName: collection_name
    created
    books: book_collections_dv_books @insert @update @delete
    {
        "_id"
        isbn
        price
        title
        published
        publisher
        authors: book_collections_dv_authors @insert @update @delete
        {
            "_id"
            lastName: last_name
            firstName: first_name
        }
    }
}

```

BOOK\_COLLECTIONS\_DV

BOOK_COLLECTIONS_DV_ROOT	
_id	varchar2_64
CREATED	timestamp
COLLECTION_NAME	varchar2_64

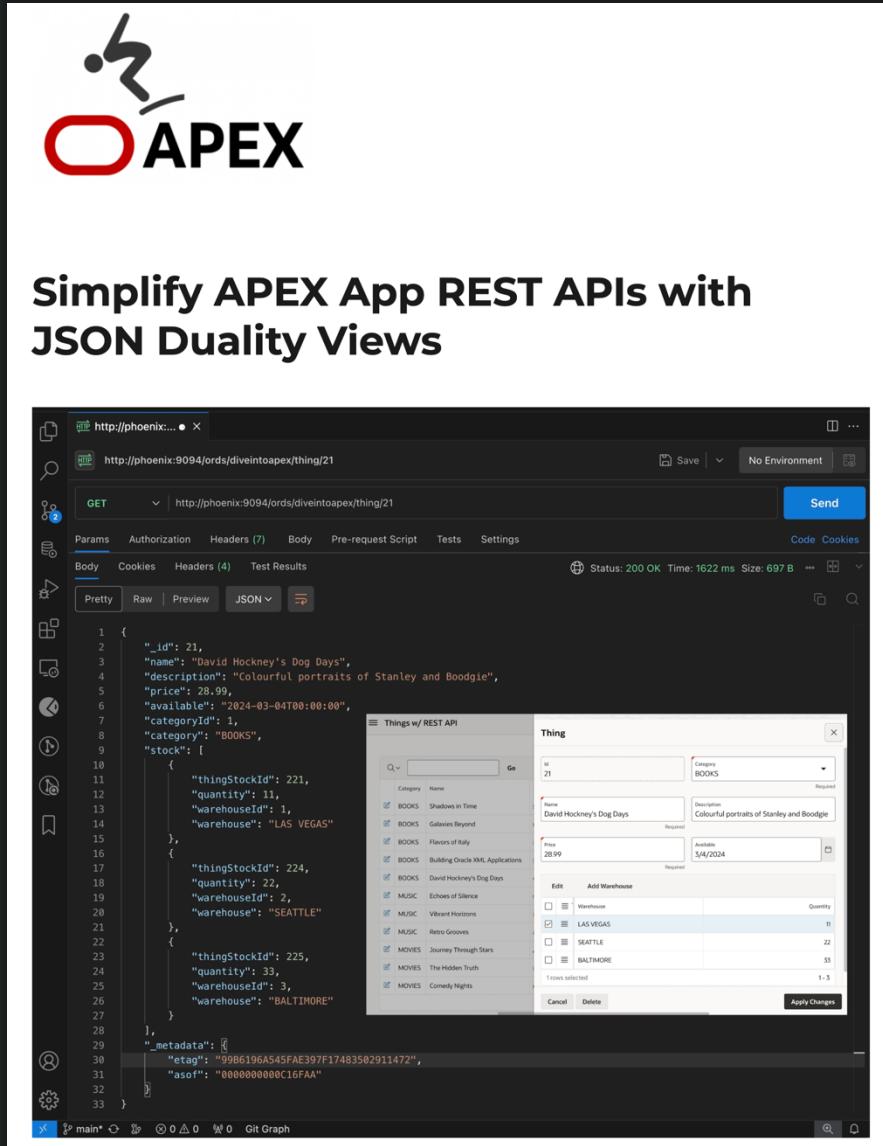
BOOK\_COLLECTIONS\_DV\_BOOKS

_id	varchar2_64
ISBN	varchar2_64
PRICE	number
TITLE	varchar2_64
PUBLISHED	timestamp
PUBLISHER	varchar2_64
_id_book_collection	varchar2_64

BOOK\_COLLECTIONS\_DV\_AUTHORS

_id	varchar2_64
LAST_NAME	varchar2_64
FIRST_NAME	varchar2_64
_id_book	varchar2_64

# Simplifies *Exposing REST APIs for APEX Developers*



The screenshot shows a browser window with a REST API response and a corresponding Oracle APEX application interface.

**REST API Response (Postman screenshot):**

```

1 {
2     "_id": 21,
3     "name": "David Hockney's Dog Days",
4     "description": "Colourful portraits of Stanley and Booglie",
5     "price": 28.99,
6     "available": "2024-03-04T00:00:00",
7     "categoryId": 1,
8     "category": "BOOKS",
9     "stock": [
10         {
11             "thingStockId": 221,
12             "quantity": 11,
13             "warehouseId": 1,
14             "warehouse": "LAS VEGAS"
15         },
16         {
17             "thingStockId": 224,
18             "quantity": 22,
19             "warehouseId": 2,
20             "warehouse": "SEATTLE"
21         },
22         {
23             "thingStockId": 225,
24             "quantity": 33,
25             "warehouseId": 3,
26             "warehouse": "BALTIMORE"
27         }
28     ],
29     "_metadata": [
30         {
31             "etag": "9986196A545FAE397F17483502911472",
32             "aso": "0000000000C16FAA"
33         }
34     ]
}

```

**Oracle APEX Application:**

The application displays a list of items under the category "BOOKS". One item is selected, showing its details: Name (David Hockney's Dog Days), Description (Colourful portraits of Stanley and Booglie), Price (28.99), and Availability (2/4/2024). The application also shows the quantity and warehouse locations for each item.



# Embracing Duality

External Client App

```
{
  "collectionName": "Favorite Animation Books",
  "created": "2025-04-05T08:09:00",
  "books": [
    {
      "title": "The Illusion of Life",
      "publisher": "Disney Editions",
      "authors": [
        {
          "firstName": "Frank",
          "lastName": "Thomas"
        },
        {
          "firstName": "Ollie",
          "lastName": "Johnston"
        }
      ],
      "published": "1995-10-19",
      "ISBN": "978-0786860708",
      "price": 35
    },
    {
      "title": "The Art of Ratatouille",
      "publisher": "Chronicle Books",
      "authors": [
        {
          "firstName": "Brad",
          "lastName": "Bird"
        },
        {
          "firstName": "John",
          "lastName": "Lasseter"
        }
      ],
      "published": "2007-05-03",
      "ISBN": "978-0811858342",
      "price": 32
    }
  ]
}
```

## BOOK\_COLLECTIONS\_DV

BOOK_COLLECTIONS_DV_ROOT	
_id	varchar2_64
CREATED	timestamp
COLLECTION_NAME	varchar2_64

## BOOK\_COLLECTIONS\_DV\_BOOKS

_id	varchar2_64
ISBN	varchar2_64
PRICE	number
TITLE	varchar2_64
PUBLISHED	timestamp
PUBLISHER	varchar2_64
_id_book_collection	varchar2_64

## BOOK\_COLLECTIONS\_DV\_AUTHORS

_id	varchar2_64
LAST_NAME	varchar2_64
FIRST_NAME	varchar2_64
_id_book	varchar2_64

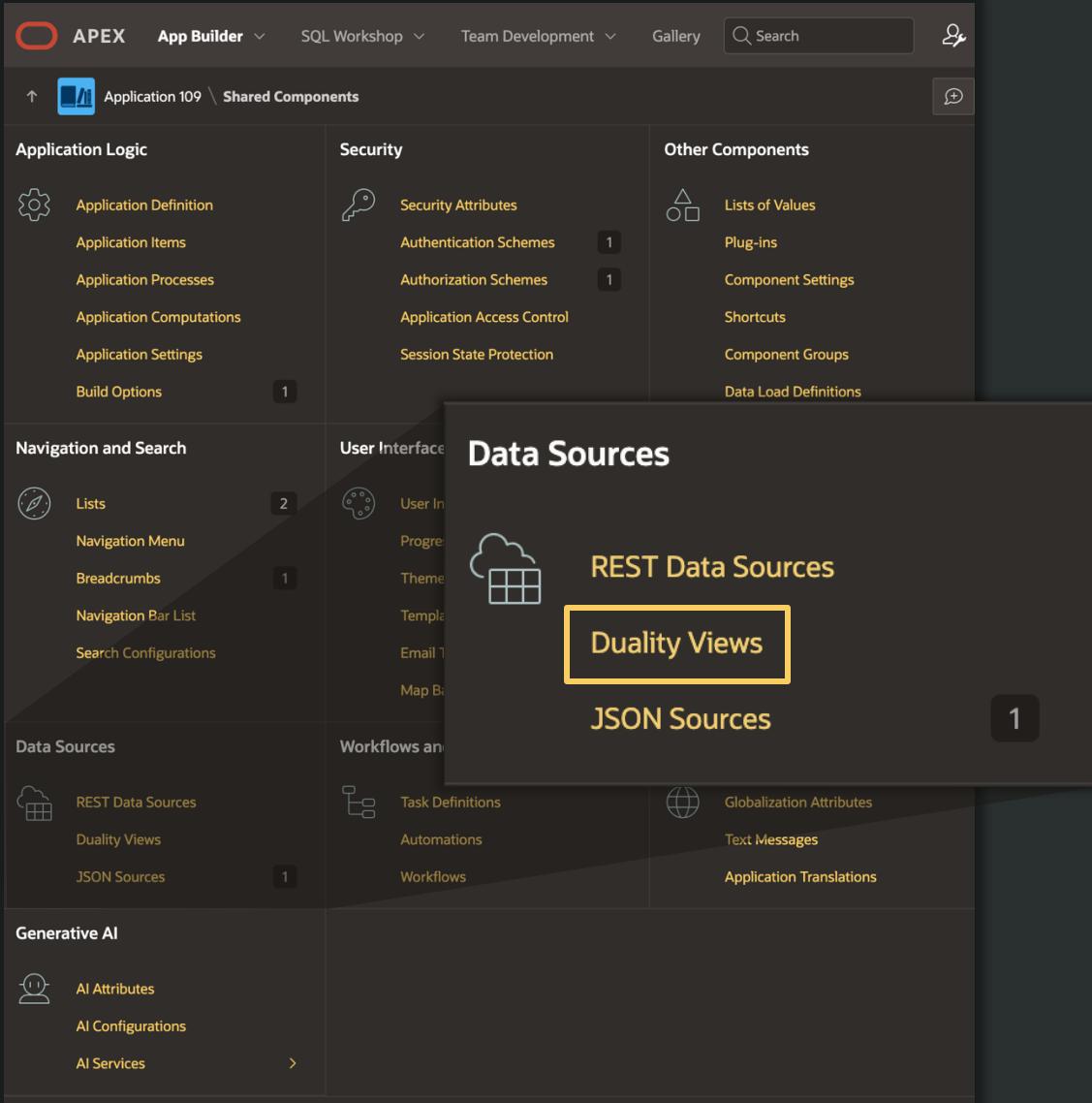
Book Collection

Collection Name	Favorite Animation Books																						
Created Formatted	05-APR-2025 08:09																						
<input type="button" value="Add Book"/> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>Title</td> <td>ISBN</td> <td>Price</td> <td>Published</td> <td>Publisher</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>The Art of Ratatouille</td> <td>978-0811858342</td> <td>32</td> <td>03-MAY-2007</td> <td>Chronicle Books</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The Illusion of Life</td> <td>978-0786860708</td> <td>35</td> <td>19-OCT-1995</td> <td>Disney Editions</td> </tr> </table>						<input type="checkbox"/>	Title	ISBN	Price	Published	Publisher	<input checked="" type="checkbox"/>	The Art of Ratatouille	978-0811858342	32	03-MAY-2007	Chronicle Books	<input type="checkbox"/>	The Illusion of Life	978-0786860708	35	19-OCT-1995	Disney Editions
<input type="checkbox"/>	Title	ISBN	Price	Published	Publisher																		
<input checked="" type="checkbox"/>	The Art of Ratatouille	978-0811858342	32	03-MAY-2007	Chronicle Books																		
<input type="checkbox"/>	The Illusion of Life	978-0786860708	35	19-OCT-1995	Disney Editions																		
1 rows selected Total 2																							
<input type="button" value="Add Author"/> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>First Name</td> <td>Last Name</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Brad</td> <td>Bird</td> </tr> <tr> <td><input type="checkbox"/></td> <td>John</td> <td>Lasseter</td> </tr> </table>						<input type="checkbox"/>	First Name	Last Name	<input checked="" type="checkbox"/>	Brad	Bird	<input type="checkbox"/>	John	Lasseter									
<input type="checkbox"/>	First Name	Last Name																					
<input checked="" type="checkbox"/>	Brad	Bird																					
<input type="checkbox"/>	John	Lasseter																					
<input type="button" value="Cancel"/> <input type="button" value="Delete"/> <input type="button" value="Apply Changes"/>																							

# JSON: What's New for 24.2 ?

Directly Use  
JSON Duality Views  
in Any Region

# JSON Duality View: New Shared Component



The screenshot shows the Oracle APEX App Builder interface with the "Shared Components" page open. A modal window titled "Data Sources" is displayed, listing various data source types:

- REST Data Sources
- Duality Views
- JSON Sources

The "Duality Views" item is highlighted with a yellow border. The modal has a dark background and a white header.

The main page has several sections:

- Application Logic**: Application Definition, Application Items, Application Processes, Application Computations, Application Settings, Build Options (1)
- Security**: Security Attributes, Authentication Schemes (1), Authorization Schemes (1), Application Access Control, Session State Protection
- Other Components**: Lists of Values, Plug-ins, Component Settings, Shortcuts, Component Groups, Data Load Definitions
- Navigation and Search**: Lists (2), Navigation Menu, Breadcrumbs (1), Navigation Bar List, Search Configurations
- User Interface**: User Interface (6), Progress Bars, Themes, Templates, Email Templates, Map Boxes
- Data Sources**: REST Data Sources, Duality Views, JSON Sources (1)
- Workflows and Automations**: Task Definitions, Automations, Workflows
- Generative AI**: AI Attributes, AI Configurations, AI Services >
- Globalization Attributes**, **Text Messages**, **Application Translations**

# JSON Duality View



Rename `_id` Columns  
in Data Profile for  
Easier Understanding  
*Before* Building Pages

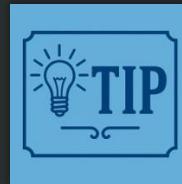
- `_id` → `ID_1` → `COLLECTION_ID`
  - `_id` → `ID_1_1` → `BOOK_ID`
  - `_id` → `ID` → `AUTHOR_ID`

BOOK_COLLECTIONS_DV_ROOT	
<code>_id</code>	<code>varchar2_64</code>
<code>CREATED</code>	<code>timestamp</code>
<code>COLLECTION_NAME</code>	<code>varchar2_64</code>

BOOK_COLLECTIONS_DV_BOOKS	
<code>_id</code>	<code>varchar2_64</code>
<code>ISBN</code>	<code>varchar2_64</code>
<code>PRICE</code>	<code>number</code>
<code>TITLE</code>	<code>varchar2_64</code>
<code>PUBLISHED</code>	<code>timestamp</code>
<code>PUBLISHER</code>	<code>varchar2_64</code>
<code>_id_book_collection</code>	<code>varchar2_64</code>

BOOK_COLLECTIONS_DV_AUTHORS	
<code>_id</code>	<code>varchar2_64</code>
<code>LAST_NAME</code>	<code>varchar2_64</code>
<code>FIRST_NAME</code>	<code>varchar2_64</code>
<code>_id_book</code>	<code>varchar2_64</code>

# JSON Duality View



Use Sequence to order array columns  
into contiguous groups

Columns

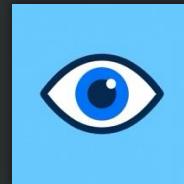
Resequence Columns Add Column >

		Sequence...	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
■	☰	1	COLLECTION_ID	Data	Varchar2	_id	Yes	Yes	Yes	
■	☰	4	APEX_METADATA_ETAG	Data	Varchar2	_metadata.etag	No	Yes	No	
■	☰	5	APEX_METADATA_ASOF	Data	Varchar2	_metadata.asof	No	Yes	No	
■	☰	6	CREATED	Data	Timestamp	created	No	Yes	Yes	
■	☰	7	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	
■	☰	8	BOOKS	Data	Array	books	No	Yes	No	
■	☰	101	BOOK_ID	Data	Varchar2	_id	Yes	Yes	Yes	BOOKS
■	☰	102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
■	☰	103	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
■	☰	104	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
■	☰	105	PUBLISHED	Data	Timestamp	published	No	Yes	Yes	BOOKS
■	☰	106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
■	☰	118	BOOKS_POS	Data	Number		No	Yes	Yes	BOOKS
■	☰	119	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
■	☰	201	AUTHOR_ID	Data	Varchar2	_id	Yes	Yes	Yes	AUTHORS
■	☰	202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
■	☰	203	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
■	☰	204	AUTHORS_POS	Data	Number		No	Yes	Yes	AUTHORS

Total 18



# JSON Duality View



Duality View always (and only) has a single column named **DATA** so no need to record the JSON column name

Columns

Search: All Text Columns    Go    Edit    Add Data Column

No "Table" Column Type

		Sequence...	Name	Column Type	Data Type	Selector	Primary Key	Visible	Common	Parent Column
1	COLLECTION_ID	1	COLLECTION_ID	Data	Varchar2	_id	Yes	Yes	Yes	
4	APEX_METADATA_ETAG	4	APEX_METADATA_ETAG	Data	Varchar2	_metadata.etag	No	Yes	No	
5	APEX_METADATA_ASOF	5	APEX_METADATA_ASOF	Data	Varchar2	_metadata.asof	No	Yes	No	
6	CREATED	6	CREATED	Data	Timestamp	created	No	Yes	Yes	
7	COLLECTIONNAME	7	COLLECTIONNAME	Data	Varchar2	collectionName	No	Yes	Yes	
8	BOOKS	8	BOOKS	Data	Array	books	No	Yes	No	
101	BOOK_ID	101	BOOK_ID	Data	Varchar2	_id	Yes	Yes	Yes	BOOKS
102	ISBN	102	ISBN	Data	Varchar2	ISBN	No	Yes	Yes	BOOKS
103	PRICE	103	PRICE	Data	Number	price	No	Yes	Yes	BOOKS
104	TITLE	104	TITLE	Data	Varchar2	title	No	Yes	Yes	BOOKS
105	PUBLISHED	105	PUBLISHED	Data	Timestamp	published	No	Yes	Yes	BOOKS
106	PUBLISHER	106	PUBLISHER	Data	Varchar2	publisher	No	Yes	Yes	BOOKS
118	BOOKS_POS	118	BOOKS_POS	Data	Number		No	Yes	Yes	BOOKS
119	AUTHORS	119	AUTHORS	Data	Array	authors	No	Yes	No	BOOKS
201	AUTHOR_ID	201	AUTHOR_ID	Data	Varchar2	_id	Yes	Yes	Yes	AUTHORS
202	FIRSTNAME	202	FIRSTNAME	Data	Varchar2	firstName	No	Yes	Yes	AUTHORS
203	LASTNAME	203	LASTNAME	Data	Varchar2	lastName	No	Yes	Yes	AUTHORS
204	AUTHORS_POS	204	AUTHORS_POS	Data	Number		No	Yes	Yes	AUTHORS

Total 18

No Parent for Top-Level Properties

# JSON Source & Duality View Editable Page Tips (1 of 2)

- Root Primary key `_id` needs to be Query Only to get database-level default
  - But in *child* regions it needs to *NOT* be Query Only to be assignable
- First level nested collection needs *Local Post-Processing* WHERE filter
  - `PARENT_ID = :P1_ID` and `ABC_POS` is not null
- For second and subsequent master/detail child grid:
  - `ABC_POS` is not null

# JSON Source & Duality View Editable Page Tips (2 of 2)

- For child collections:
  - Use position attribute as child PK (with some grid DML limitations)
  - Or, introduce unique key attribute
  - Page Process (*Editable Region* = Grid Region) to Assign Root Parent Id

*:ROOT\_PK\_COL := :P1\_ID;*

# Grid DML Limitations Using Array Position as Primary Key

- Works fine, unless end-user edits may cause position to *change*
- Only inserts and updates at a given "level" ?
- Problematic use cases:
  - More than one delete
  - One delete and some updates



**Book Collection**

**Collection** Best Books

**Created Date** 05-APR-2025 07:55

**1 error has occurred**

- Cannot execute this multi-row DML operation, as the data source uses JSON array indexes as primary keys, which will change after rows have been deleted.

**Edit** **Add Book**

	ISBN	Title	Publisher	Price	Published
<input type="checkbox"/>	23423234	Spices of India	Big Naan Press	15	16-APR-2025
<input checked="" type="checkbox"/>	93483434	Ricette Buone	Feltrinelli	20	29-APR-2025

1 rows selected Total 2

**Edit** **Add Author**

	First Name	Last Name
<input checked="" type="checkbox"/>	Angelo	Russo
<input type="checkbox"/>	Giuseppe	Giusti

1 rows selected Total 1

**Cancel** **Delete** **Apply Changes**

APEX Workflow: What's New for 24.1 ?

# Vacation Assignment Handling

# APEX Workflow: Vacation Assignment Handling

```
procedure my_vacation_rule (
    p_param in apex_approval.t_vacation_rule_input,
    p_result out apex_approval.t_vacation_rule_output );
```

Task Vacation Rule Procedure **eba\_demo\_appr.approval\_vacation\_handler**

The screenshot shows the Oracle Application Express (APEX) interface for editing an application definition. The title bar indicates the application is 'Application 120'. The top navigation bar includes tabs for 'Definition' (which is selected), 'Security', 'Globalization', 'User Interface', 'Progressive Web App', and 'AI'. Below the navigation bar, there's a toolbar with icons for help, search, and other functions. The main content area is titled 'Application 120' and contains a 'Workflow Settings' tab, which is highlighted with a green underline. Other tabs visible include 'Show All', 'Name', 'Properties', 'Availability', 'Error Handling', 'Global Notification', 'Substitutions', 'Build Options', 'Report Printing', 'Application File Storage', and 'Copyright Banner'. At the bottom of the page, there are buttons for 'Cancel', 'Delete', and a prominent green 'Apply Changes' button. The URL in the browser address bar is 'eba\_demo\_appr.approval\_vacation\_handler'. A red box highlights the procedure name in the code block above.

Set application-wide handler in App Definition



# APEX Workflow: Vacation Assignment Handling

```
procedure my_vacation_rule (
    p_param in apex_approval.t_vacation_rule_input,
    p_result out apex_approval.t_vacation_rule_output );
```

Vacation Rule Procedure eba\_demo\_appr.appraisal\_vp\_review\_handler

The screenshot shows the 'Task Definition: Appraisal - VP Review' configuration page. The 'Participants' tab is selected. A vacation rule procedure named 'eba\_demo\_appr.appraisal\_vp\_review\_handler' is assigned to the participants. The table below lists the participants and their settings.

Participant Type	Value Type	Value
Business Administrator	Static	PAT
Potential Owner	Expression	:P_VP_USERNAME

Application 120 \ Shared Components \ Task Definitions \ Appraisal - VP Review

Cancel Delete Apply Changes

Show All Name Settings Deadline Participants Parameters Actions Comments Last Updated

Participants

Vacation Rule Procedure eba\_demo\_appr.appraisal\_vp\_review\_handler

Search: All Text Columns Go Edit Add Row Reset

Total 2

Specifying handler at Task Definition level overrides app-level setting if both are configured

# APEX Workflow: Vacation Assignment Handling

Sample Workflow, Approvals, and Tasks

Install App Help jane

Home More Information Employees My Tasks My Requests Appraisal History Task Administration Pending Approvals Pending Actions Laptop Order Management Workflow Debug Messages Workflow Status Workflow Dashboard Switch User Manage Vacation Rules Setup

Manage Vacation Rules

About this page

This page lets Operations Team members edit the vacation rules that affect future task assignments, configure additional employee appraisal VP reviewers, and indicate a temporary business administrator for all approvals and action tasks.

Approval Vacation Coverage

Covering User	For Which Approvals?	For Vacationing	Start Date	End Date	Reason
FORD	Bank Account Change, Laptop Approval, Salary Change	< Any User >	4/10/2025	4/21/2025	Extra Help

1 rows selected Total 1

Additional Appraisal VP Reviewers

PAT BO JANE	STEVE
-------------------	-------

Temporary Business Admin

Temporary Business Admin BO
--------------------------------

Apply Changes

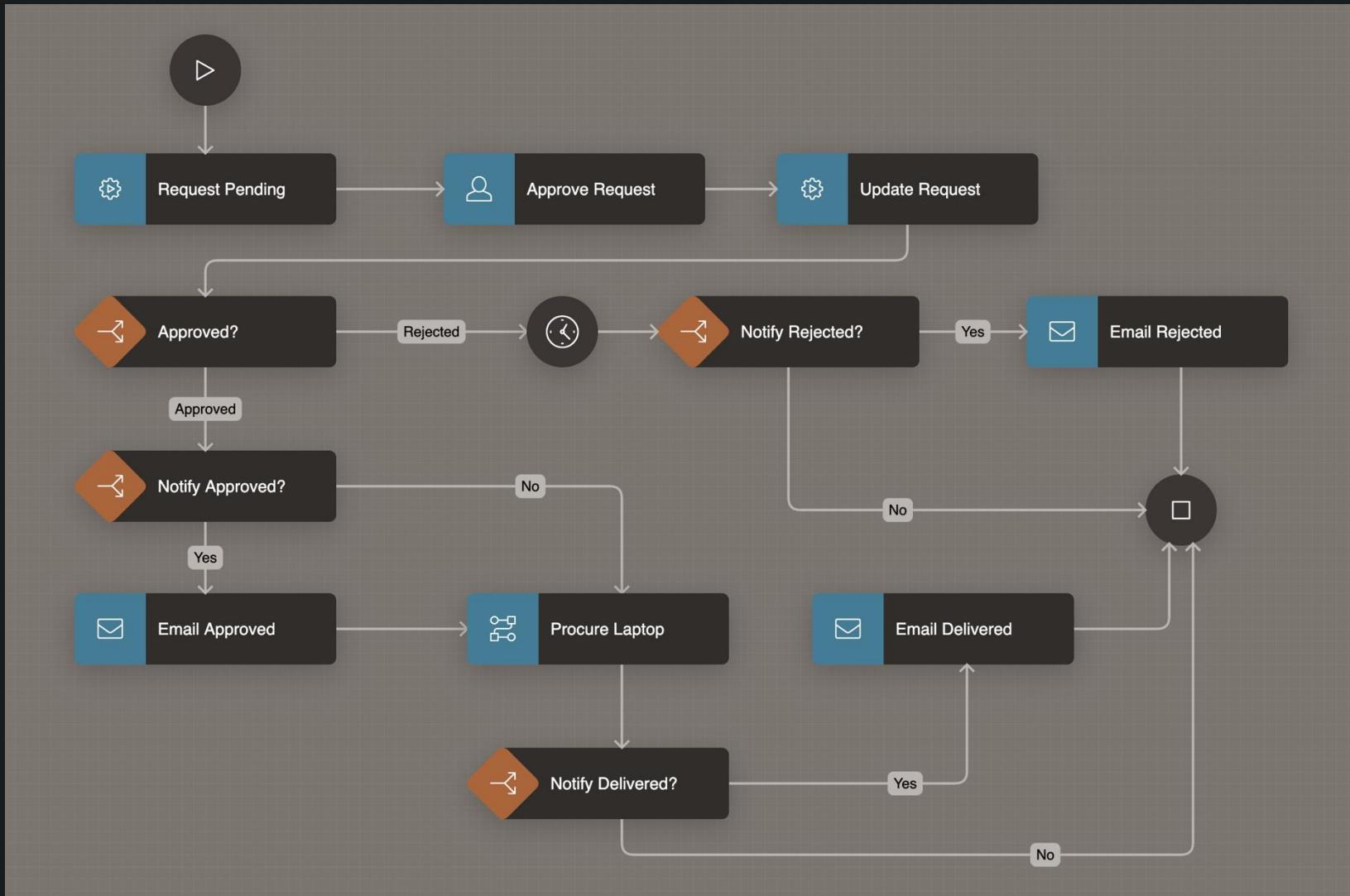
24.2.2 Built with ❤ using Oracle APEX



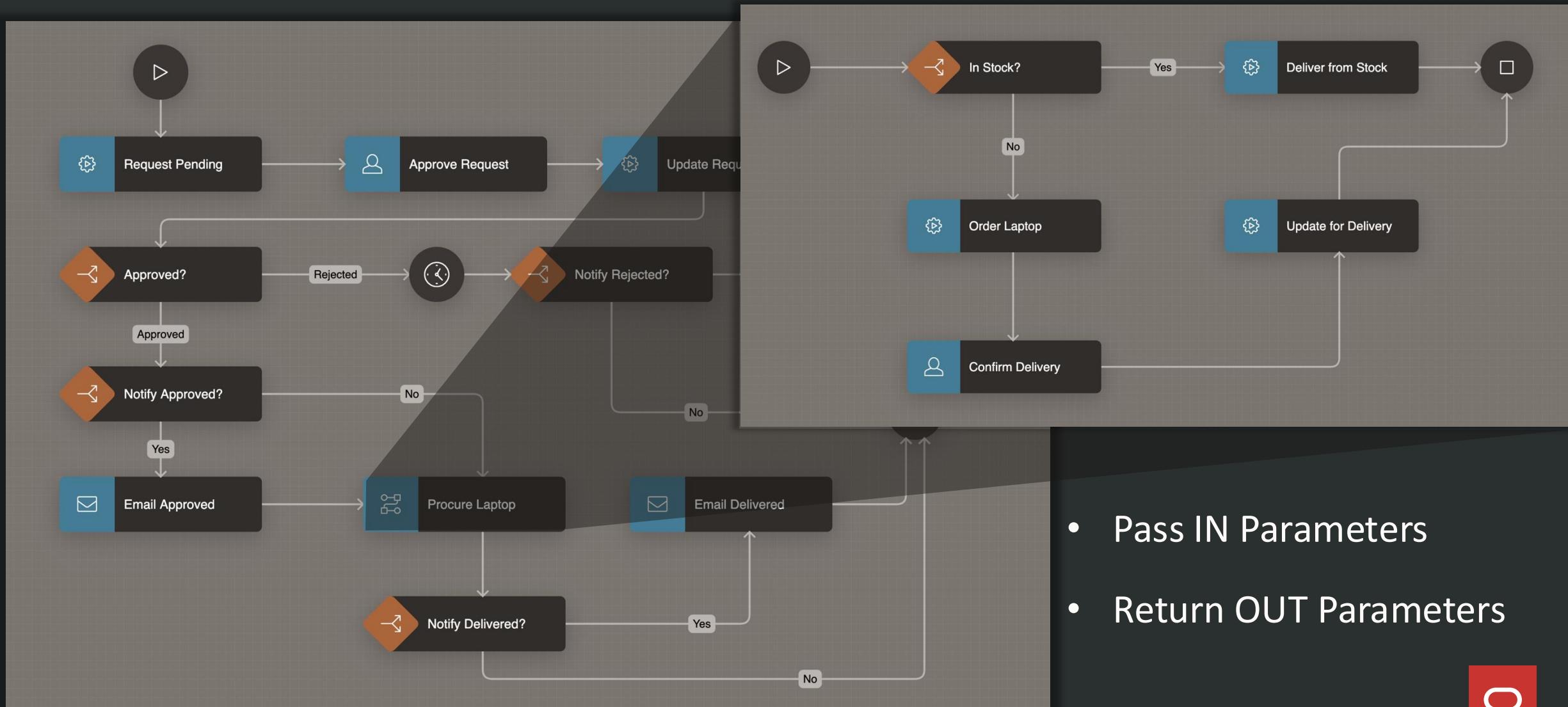
# APEX Workflow: What's New for 24.2 ?

Invoke Workflows  
Like "Subroutines"

# APEX Workflow: Invoke Another Workflow



# APEX Workflow: Invoke Another Workflow



# APEX Workflow: Passing in Details Primary Key

AAAPEKS 2025

APEX App Builder SQL Workshop Team Development Gallery

Search Edit Page 1 Save

Application 110 \ Shared Components \ Workflows \ Workflow Definition

Workflow Used Shared Components

Approved? Email Approved Email Rejected Email Delivered End New Notify Approved? Notify Delivered? Notify Rejected? Procure Laptop Parameters Delivered from Stock Outgoing Incoming Participants Workflow Administrator Workflow Owner Variables Approval Task ID Delivered from Stock Email to Notify Laptop Approval Outcome Laptop Approver

Diagram Builder Search Help

Activity Identification

Name: Procure Laptop  
Type: Invoke Workflow

Settings

Definition: Laptop Procurement  
Initiator Item: **P\_LAPTOP\_REQUEST\_ID** (highlighted)

Additional Data

SQL Query:

Deadline

Due On Type: None

```
graph TD; Start(( )) --> RequestPending[Request Pending]; RequestPending --> ApproveRequest[Approve Request]; ApproveRequest --> UpdateRequest[Update Request]; UpdateRequest --> Approved{Approved?}; Approved -- Approved --> NotifyApproved[Notify Approved?]; NotifyApproved -- Yes --> EmailApproved[Email Approved]; EmailApproved --> ProcureLaptop[Procure Laptop]; ProcureLaptop --> EmailDelivered[Email Delivered]; EmailDelivered --> NotifyDelivered{Notify Delivered?}; NotifyDelivered -- Yes --> End(( )); NotifyDelivered -- No --> ProcureLaptop;
```

Approved? Rejected --> NotifyRejected{Notify Rejected?}; NotifyRejected -- Yes --> EmailRejected[Email Rejected]; EmailRejected --> End;

# APEX Workflow: Configuring IN/OUT Parameters

Screenshot of the Oracle APEX App Builder interface showing the configuration of workflow parameters.

The left sidebar shows the navigation path: Application 110 \ Shared Components \ Workflows \ Workflow Definition.

The central area displays a workflow diagram titled "Request Pending". The process starts with an initial state (grey circle), followed by a "Request Pending" step (blue rounded rectangle). This leads to an "Approve Request" step (blue rounded rectangle with a person icon) and then an "Update Request" step (blue rounded rectangle with a gear icon).

The workflow then branches into two paths based on the approval decision:

- If "Approved?", the process continues to "Notify Approved?" (orange diamond). If "Yes", it leads to "Email Approved" (blue rounded rectangle with an envelope icon). If "No", it leads to "Procure Laptop" (blue rounded rectangle with a laptop icon).
- If "Rejected", it leads to a "Notify Rejected?" (orange diamond). If "Yes", it leads to "Email Rejected" (blue rounded rectangle with an envelope icon).

The "Update Request" step has a feedback loop returning to the "Request Pending" step.

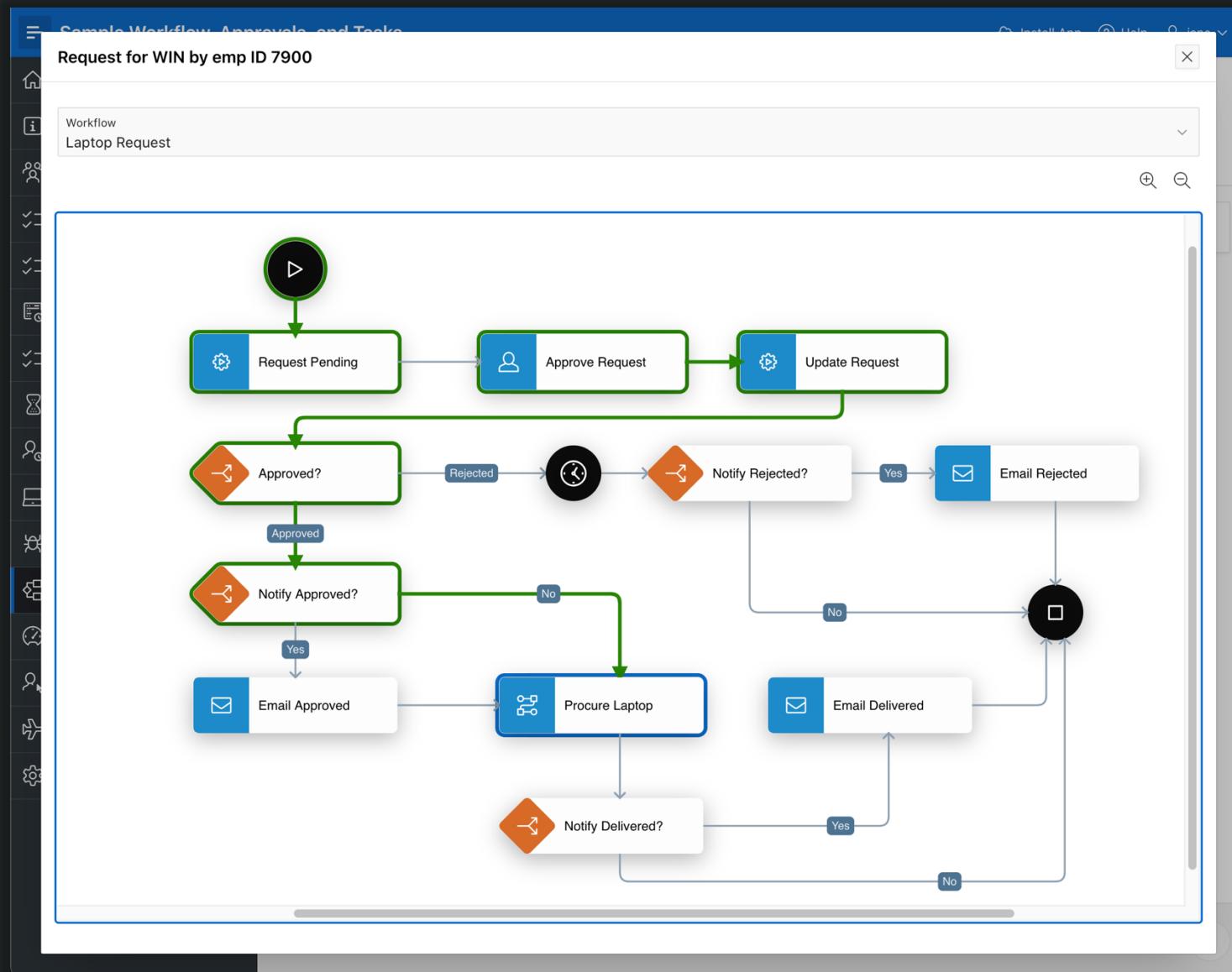
The right sidebar shows the configuration for the parameter "Delivered from Stock".

- Identification:** Name: Delivered from Stock
- Parameter:** Direction: Out (highlighted)
- Value:** Item: V\_DELIVERED\_FROM\_STOC (highlighted)
- Audit Information:** Changed By, Changed On

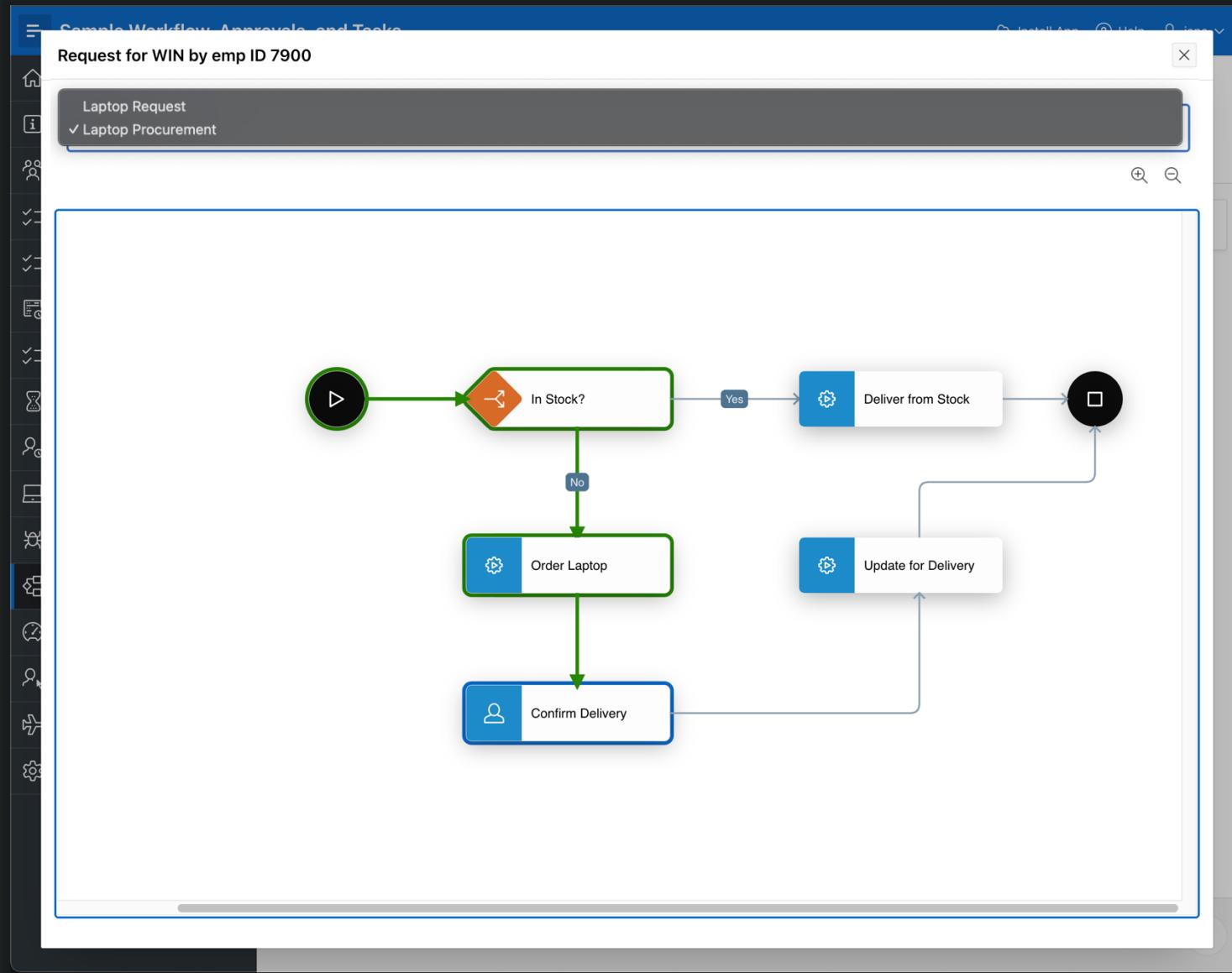
The bottom left sidebar lists variables used in the workflow:

- Approval Task ID
- Delivered from Stock (highlighted)
- Email to Notify
- Laptop Approval Outcome
- Laptop Approver

# APEX Workflow: Invoked Workflow in the Diagram Region



# APEX Workflow: Invoked Workflow in the Diagram Region



# APEX Workflow: What's New for 24.2 ?

Developer  
Quality of Life  
Improvements

# APEX Workflow: Copy Workflow

Copy Workflow From Other Application X

Copy from Application: 120. Sample Workflow, Approvals, and Tasks ?

Copy Workflow: Employee Appraisal ?

\* Name: Peer Review ?

\* Static ID: PEER REVIEW ?

Cancel Copy Workflow

# APEX Workflow: Utilization Report Enhancements

- Email Templates
- Task Definitions
- REST Data Sources

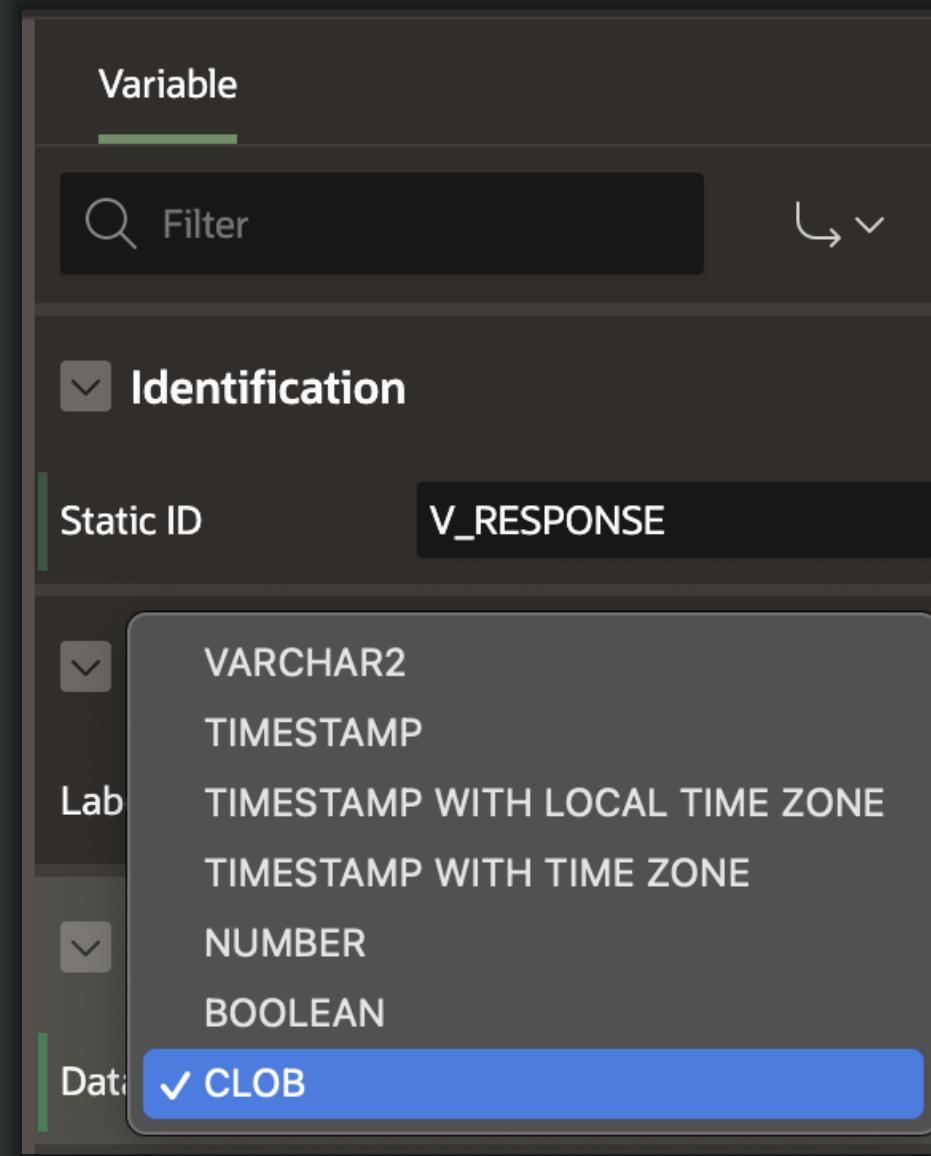
The screenshot shows the 'Email Templates' section of the Oracle APEX application. The interface includes a breadcrumb path 'Application 120 \ Shared Components \ Email Templates', a navigation bar with tabs 'Email Templates' (selected), 'Utilization', and 'History', and a search bar with a 'Go' button. A green dashed box highlights the 'Actions' dropdown menu. A 'Create Email Template' button is located in the top right. The main table lists two email templates:

Name	Subject	Supports Template Directives	Static Identifier	Copy
Job Change Notification	Job Change for #P_ENAME# Completed	Yes	JOB_CHANGE_NOTIFICATION	
Laptop Delivered Notification	#P_LAPTOP_TYPE# Laptop for #P_ENAME# Completed	Yes	LAPTOP_DELIVERED_NOTIFICATION	

The screenshot shows the 'Task Definitions' section of the Oracle APEX application, specifically the 'Utilization' tab. The interface includes a breadcrumb path 'Application 120 \ Shared Components \ Task Definitions \ Utilization', a navigation bar with tabs 'Task Definitions' (selected), 'Utilization' (selected), and 'History', and a search bar with a 'Go' button. A green dashed box highlights the 'Actions' dropdown menu. The main table lists task definitions:

Task Definition Name	Component Type	Component Name	References
Salary Change	Page Process	Submit Task	Page 4 - Request Salary Change
Job Change	Page Process	Submit Task	Page 7 - Request Job Change
Bank Account Change	Page Process	Submit Task	Page 28 - Request Bank Account Change
Laptop Delivered	Workflow Activity	Laptop Procurement - Confirm Delivery	Workflow - Laptop Procurement
Laptop Approval	Workflow Activity	Laptop Request - Approve Request	Workflow - Laptop Request
Appraisal - Employee Input	Workflow Activity	Employee Appraisal - Self-Evaluation	Workflow - Employee Appraisal
Appraisal - Manager Input	Workflow Activity	Employee Appraisal - Manager Appraisal	Workflow - Employee Appraisal
Appraisal - VP Review	Workflow Activity	Employee Appraisal - VP Review	Workflow - Employee Appraisal

# APEX Workflow: CLOB Parameter & Version Variables



# APEX & Fusion Apps: What's New for 23.2 & 24.1?

First Class Support  
for Fusion Apps Extensions

# Simplify Extending Fusion Applications

- Discover all operations for any Fusion Apps Business Object REST API
- Use with all APEX regions
- Work against a FA sandbox to iterate APEX UI for pending BO extensions
- Delegate filtering, sorting, and bulk ops to FA REST endpoint
- Select only required data & get total row count
- See validation errors from FA business objects like regular APEX errors
- Build parent/child lists and QBE screens w/ filter params

# Building Fusion Apps Extensions: CRM Leads Data Source

The screenshot shows the Oracle Fusion Apps App Builder interface for configuring a REST Data Source named "Leads". A yellow arrow points to the "Name" field, which contains "Leads".

**REST Data Source**

**REST Data Source**

- \* Name: Leads
- \* REST Data Source Type: Oracle Cloud Applications (SaaS) REST Service
- \* Remote Server: FA\_REST
- Base URL: <https://fa-enyd-pintlabfadef.fa.ocs.oc-test.com/>
- \* URL Path Prefix: crmRestApi/resources/latest/leads

**Settings**

- Use Batch DML?: Yes
- Root Resource Name: leads
- Use Total Results?: No
- Use Pagination?: Yes

**Authentication**

- Credentials: Credentials for Leads
- Authentication Server: - Select -

**REST Data Sources**

REST Data Sources act as a reference to one or multiple external web services. A REST Data Source can contain one or many Operations which are the references to a concrete external web service. Configurations at the top level are shared across all operations.

Stay on page

[Learn More ...](#)

[Manage Synchronization](#)

[REST Source Catalogs](#)

# Building Fusion Apps Extensions: All CRUD Operations

**REST Data Source**

Delete **Apply Changes**

Show All REST Data Source Settings Authentication Data Profile Operations Parameters Subscription Advanced

Use Total Results? No

Use Pagination? Yes

**Authentication**

Credentials Credentials for Leads

Authentication Server - Select -

**Data Profile**

Edit Data Profile

Response Format	Returns	Columns	Visible	Derived
JSON	Table	166	150	0

**Operations**

Add Operation

Edit	Name	Operation	URL Pattern	Database Action	Array Column	Parameter Count	Test Operation	Last Updated
<input type="button" value="Edit"/>	-	GET	.	Fetch rows	-	-	<input type="button" value="Run"/>	3 days ago
<input type="button" value="Edit"/>	-	POST	.	Insert row	-	-		3 days ago
<input type="button" value="Edit"/>	-	GET	/:APEX\$ResourceKey	Fetch single row	-	-		3 days ago
<input type="button" value="Edit"/>	-	PATCH	/:APEX\$ResourceKey	Update row	-	-		3 days ago
<input type="button" value="Edit"/>	-	DELETE	/:APEX\$ResourceKey	Delete row	-	-		3 days ago

1 - 5



# Building Fusion Apps Extensions: Easy as Using Tables

APEX App Builder SQL Workshop Team Development Gallery Search Steve Muench fusion

Application 103 Woods Clinic Run Application

Create a Page

Component Feature Legacy Pages

Blank Page Calendar Cards Chart Classic Report

Comments Content Row Dashboard Data Loading Faceted Search

Form Interactive Grid Interactive Report Map Master Detail

Cancel Help Create Page as Copy Next >

Application Definition About

Use the Application home page to run, edit, import, export, copy, or delete an application. Select a page to edit the page properties, or click **Create Page** to add a page to the application.

Learn More ...

Import

Create Page

Tasks

- Delete Application
- Copy Application
- Add Feature Page
- Browse by Facets
- Workflow Designer

Working Copy Tasks

- Create Working Copy

Recently Edited Pages

- 0. Global Page
- 9999. Login Page
- 1. Home

Backups

Last Backup: 3 days ago

Manage backups

O

The screenshot displays the Oracle Fusion Applications App Builder interface. At the top, there's a navigation bar with links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user profile information. Below the navigation is a sidebar with sections for Application Definition, About (instructions for creating pages), Tasks (with options like Delete Application, Copy Application, etc.), Working Copy Tasks, Recently Edited Pages, and Backups. The main area features a modal dialog titled 'Create a Page' with tabs for Component, Feature, and Legacy Pages. Under the Component tab, various page types are listed with their corresponding icons: Blank Page, Calendar, Cards, Chart, Classic Report, Comments, Content Row, Dashboard, Data Loading, Faceted Search, Form, Interactive Grid, Interactive Report (which is highlighted with a green border and a cursor icon), Map, and Master Detail. At the bottom of the dialog are buttons for Cancel, Help, Create Page as Copy, and Next >. To the left of the dialog, there's a sidebar for 'Woods Clinic' with a 'Run Application' button and a search bar. At the bottom right of the screen is a large red button with a white 'O' icon.

# Building Fusion Apps Extensions: Easy as Using Tables

The screenshot shows the Oracle Fusion Applications App Builder interface. A modal dialog titled "Create Interactive Report" is open in the center. The dialog is divided into sections: "Page Definition" and "Data Source".

**Page Definition:**

- \* Page Number: 2
- \* Name: Leads
- Page Mode: Normal
- Include Form Page: On
- \* Form Page Number: 3
- \* Form Page Name: Lead
- Form Page Mode: Drawer

**Data Source:**

- Data Source: REST Data Source
- \* REST Data Source: Leads

A yellow box highlights the "REST Data Source" dropdown in the Data Source section.

On the right side of the screen, there is a sidebar with various application-related tasks and navigation links. Some items in the sidebar are highlighted in red.

- Application Definition
- About
- Tasks
  - Delete Application
  - Copy Application
  - Add Feature Page
  - Browse by Facets
  - Workflow Designer
- Working Copy Tasks
  - Create Working Copy
- Recently Edited Pages
  - 0. Global Page
  - 9999. Login Page
  - 1. Home
- Backups
  - Last Backup: 3 days ago
  - Manage backups

# Building Fusion Apps Extensions: Integrates with FA SSO

The screenshot shows the sign-in interface for Oracle Applications Cloud. At the top, the text "Sign In" and "Oracle Applications Cloud" is displayed. Below this, there are two input fields: "User ID" containing "mhoope|" and "Password" containing a series of dots. A "Forgot Password" link is located just below the password field. A large "Sign In" button is centered below the fields. At the bottom, there is a "Select Language" dropdown menu set to "English". The Oracle logo is visible in the bottom right corner.

Sign In  
Oracle Applications Cloud

User ID  
mhoope|

Password .....  
Forgot Password

Sign In

Select Language  
English

ORACLE

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# Building Fusion Apps Extensions: Works Just Like a Table

The screenshot shows a screenshot of Oracle Fusion Applications interface. The top navigation bar has a user icon and the text "mhoope (direct)". The main title is "Leads". Below the title is a search bar with a magnifying glass icon, a text input field, and a "Go" button. To the right of the search bar is a "Create" button. The main content area displays a table with the following columns: Name, Recordset, Leadnumber, Ownerpartyname, Statuscode, Rank, Sourcecode, Customerpartyname, Productgroupname, and Inventoryitem. The table contains 12 rows of lead data. The last row, "a1", has specific details: Leadnumber 300100005481493, Ownerpartyname Gabrielle Lee, Statuscode QUALIFIED, Customerpartyname Norway (MOLDE, NO), and Inventoryitem DG150-50 Server.

	Name	Recordset	Leadnumber	Ownerpartyname	Statuscode	Rank	Sourcecode	Customerpartyname	Productgroupname	Inventoryitem
<a href="#">Edit</a>	Sept29Lead46		CDRM_206		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead47		CDRM_207		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead48		CDRM_208		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead49		CDRM_209		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead50		CDRM_210		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead1		CDRM_2042		QUALIFIED					
<a href="#">Edit</a>	QTPLeadAuto346201204947476812		CDRM_14	Baker,Chris	QUALIFIED			A. C. Networks (Olympia, US)	Vision Catalog	
<a href="#">Edit</a>	Sept29Lead2		CDRM_2043		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead3		CDRM_2044		UNQUALIFIED					
<a href="#">Edit</a>	Sept29Lead4		CDRM_2045		UNQUALIFIED					
<a href="#">Edit</a>	a1		300100005481493	Gabrielle Lee	QUALIFIED			Norway (MOLDE, NO)	DG150-50 Server	



# Building Fusion Apps Extensions: Works Just Like a Table

≡ Woods Clinic      mhoope (direct) ▾

## Leads

Q  Go Actions ▾ Create

▼  Row text contains 'vision' X

Name	Recordset	Leadnumber	Ownerpartyname	Statuscode	Rank	Sourcecode	Customerpartyname	Productgroupname	Inventoryitemdescription	Creationdate	Regi
ELQENGSales_491136861	CDRM	CDRM_95948	Matt Hooper	UNQUALIFIED			ELQENGACC_491136861_1 (New York, US)	Vision Catalog		4/20/2023	
ELQENGSales_2015197825	CDRM	CDRM_96906	Matt Hooper	UNQUALIFIED			ELQENGACC_2015197825_1 (New York, US)	Vision Catalog		4/23/2023	

1 - 2

Release 1.0



# Building Fusion Apps Extensions: Works Just Like a Table

☰ Woods Clinic

## Leads

Q ▾ Go Actions ▾

▼  Row text contains 'vision' X

	Name	Recordset	Leadnumber	Ownerpartyname	Statuscode	Rank
<input checked="" type="checkbox"/>	ELQENGSALES_491136861		CDRM_95948	Matt Hooper	UNQUALIFIED	
<input checked="" type="checkbox"/>	ELQENGSALES_2015197825		CDRM_96906	Matt Hooper	UNQUALIFIED	

Lead

X

Name  
ELQENGSALES\_491136861

Recordset

Leadnumber  
CDRM\_95948

Ownerpartyname  
Matt Hooper

Statuscode  
UNQUALIFIED

Rank

Sourcecode

Cancel Delete Apply Changes

Notes Comments

Slide 290 of 368 English (United States)

O

# Building Fusion Apps Extensions: Works Just Like a Table

☰ Woods Clinic

## Leads

Q ▾ Go Actions ▾

▼  Row text contains 'vision' X

	Name	Recordset	Leadnumber	Ownerpartyname	Statuscode	Rank
<a href="#">Edit</a>	ELQENGSALES_491136861		CDRM_95948	Matt Hooper	UNQUALIFIED	
<a href="#">Edit</a>	ELQENGSALES_2015197825		CDRM_96906	Matt Hooper	UNQUALIFIED	

Lead

Name  
ELQENGSALES\_491136861

Recordset

Leadnumber  
CDRM\_95948

Ownerpartyname  
Matt Hooper

Statuscode  
QUALIFIED

Rank

Sourcecode

Cancel Delete Apply Changes



# Building Fusion Apps Extensions: Works Just Like a Table

≡ Woods Clinic mhoope (direct) ▾

## Leads

Q ▾  Go Actions ▾ Create

▼  Row text contains 'vision' X

	Name	Recordset	Leadnumber	Ownerpartyname	Statuscode	Rank	Sourcecode	Customerpartyname	Productgroupname	Inventoryitemdescription	Creationdate	Regi
<input checked="" type="checkbox"/>	ELQENGSALES_491136861		CDRM_95948	Matt Hooper	QUALIFIED			ELQENGACC_491136861_1 (New York, US)	Vision Catalog		4/20/2023	
<input checked="" type="checkbox"/>	ELQENGSALES_2015197825		CDRM_96906	Matt Hooper	UNQUALIFIED			ELQENGACC_2015197825_1 (New York, US)	Vision Catalog		4/23/2023	

1 - 2

Release 1.0 ^



# Building Fusion Apps Extensions: Errors Surface Naturally

The screenshot illustrates a user interface for managing books. At the top left, there's a navigation bar with a menu icon and the text "VB Books". Below it, a main title "Book" is displayed above a decorative horizontal bar. The central area contains a form with fields for "Title" (containing "Oracle PL/SQL Programming: 6th EditionXXX"), "Publisheddate" (containing "1/23/2014"), "isbn" (containing "XXX978-1449324452"), and "Publisher" (containing "O'Reilly"). A "Cancel" button is located at the bottom left of the form. In the foreground, a modal dialog box is overlaid, showing a warning icon and the message "1 error has occurred". It lists two validation errors: "ISBN cannot start with XXX" and "Title cannot end with XXX". The bottom right corner of the dialog has a close button (an 'X'). The footer of the application shows the text "Release 1.0".

VB Books

Book

Book

Title  
Oracle PL/SQL Programming: 6th EditionXXX

Publisheddate  
1/23/2014

isbn  
XXX978-1449324452

Publisher  
O'Reilly

Cancel

Release 1.0

⚠ 1 error has occurred

- ISBN cannot start with XXX
- Title cannot end with XXX

# Building Fusion Apps Extensions: Errors Surface Naturally

The screenshot illustrates the integration of error handling into a Fusion Application extension. A modal dialog box in the foreground displays a warning message: "1 error has occurred" with the details: "ISBN cannot start with XXX" and "Title cannot end with XXX". In the background, a table view shows five rows of book data. The fourth row, "Practical PythonXXX", is highlighted with a light blue background, indicating it is the current selection. The table includes columns for Title, ISBN, Publication Date, and Publisher.

		Publisher		
<input type="checkbox"/>	Extending Oracle Application Express wit...	978-1484281697	9/2/2022	APress
<input type="checkbox"/>	Deep South: Four Seasons on Back Roads	978-0544323520	8/17/2023	Houghton Mifflin
<input type="checkbox"/>	On The Plain Of Snakes: A Mexican Journey	978-0544866478	10/8/2019	Houghton Mifflin
<input checked="" type="checkbox"/>	Practical PythonXXX	XXX888-3456789	7/12/2023	O'Reilly
<input type="checkbox"/>	My Secret History	456456456	7/12/2023	Houghton Mifflin

1 rows selected      1 - 7

Save Using Submit

Release 1.0

# Fusion Apps Extensions: What's New for 24.2 ?

Dramatically  
Simpler  
Setup

# Fusion Apps Extensions: Define Connection to APEX DB

≡ Cloud Search resources, services, documentation, and Marketplace US East (Ashburn) ⓘ ⓘ ⓘ ⓘ

Fusion Applications

- Overview
- Environment families
- Environments

Page Scope

Compartment COMP\_FA orclapexdev (root)/COMP\_FA

## Fusion Applications

Oracle Fusion Applications are modular, flexible, service-enabled enterprise applications for building, managing, and tracking solutions for your finance, human resources, supply chain, manufacturing, customer service, and marketing needs.



### Subscription

New subscriptions available for Fusion Application environments

You can [associate subscriptions](#) with an existing environment family, or a new environment family.

### Environments in COMP\_FA compartment

Families	Production environments	Non-production environments
----------	-------------------------	-----------------------------

### Documentation

- Resources
  - What's New - Fusion Technologies and User Experience
  - Creating an environment family
  - Creating an environment
  - Applying subscription updates
  - Understanding environment status
  - Learn about Fusion Applications environment management
  - [View all documentation](#)

Terms of Use and Privacy | [Cookie Preferences](#) Copyright © 2025, Oracle and/or its affiliates. All rights reserved. Why don't I see Redwood? | Redwood preview



# Fusion Apps Extensions: Define Connection to APEX DB

The screenshot shows the 'Create connection' dialog in the Oracle Fusion Cloud Service. The top navigation bar includes 'Cloud', a search bar, and location information 'US East (Ashburn)'. The main title is 'Create connection'. The 'Name' field contains 'FA-APEX-CONN' with a 'Required' label. The 'Compartment' dropdown is set to 'COMP\_FA' with a 'Required' label. Under 'Database details', there are two options: 'Select database' (selected, with a note: 'The connection details will be retrieved from the selected database.') and 'Enter database information' (disabled, with a note: 'The connection details must be entered manually.'). The 'Database cloud service' dropdown is set to 'Oracle Base Database' with a 'Required' label. Below it, 'Compartment' is set to 'DEMO' and 'Database system' is set to 'APFX PM'. At the bottom right are 'Close' and 'Create' buttons, with 'Create' being highlighted. The footer includes links for 'Terms of Use and Privacy' and 'Cookie Preferences', copyright notice 'Copyright © 2025, Oracle and/or its affiliates. All rights reserved.', and a 'Give us feedback | Redwood preview' button.

Name  
FA-APEX-CONN

Required

Compartment  
COMP\_FA

Required

Database details

Select database

The connection details will be retrieved from the selected database.

Enter database information

The connection details must be entered manually.

Database cloud service  
Oracle Base Database

Required

Compartment  
DEMO

Database system  
APFX PM

Close Create

Terms of Use and Privacy Cookie Preferences Copyright © 2025, Oracle and/or its affiliates. All rights reserved. Give us feedback | Redwood preview



# Fusion Apps Extensions: Integrate with Fusion Apps

The screenshot shows the Oracle Cloud Infrastructure Connections page. At the top, there's a navigation bar with 'Cloud' and a search bar. Below it, a sidebar shows a cloud icon and a back arrow labeled 'Connections'. The main area displays a connection named 'FA-APEX-CONN' (status: Active). A context menu is open over this connection, with the cursor hovering over the option 'Integrate APEX with Fusion Applications'. The menu also includes options like 'Launch SQLcl', 'Edit', 'Validate', 'Move resource', 'Add tags', and 'Delete'. The page has tabs for 'Connection information', 'Connection properties', 'Work requests', and 'Tags'. Under 'General information', details like OCID, Compartment, Created, Updated, and Private endpoint are listed. Under 'Connection details', a database is listed as 'DB0118\_ndb1'. At the bottom, there are links for 'Terms of Use and Privacy' and 'Cookie Preferences', along with copyright and feedback information.

Cloud

Search resources, services, documentation, and Marketplace

US East (Ashburn)

Actions

SQL worksheet

FA-APEX-CONN Active

Connection Details

Connection information Connection properties Work requests Tags

General information

OCID ocid1.databasetoolsconnection.oc1.iad. [REDACTED]

Compartment orclapexdev (root)/COMP\_FA

Created Wed, Jan 29, 2025, 17:18:40 UTC

Updated Mon, Feb 3, 2025, 11:35:57 UTC

Private endpoint APEX-DBCS-Private-rothokal

Connection details

Database DB0118\_ndb1

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# Fusion Apps Extensions: One Click Integration

The screenshot shows the Oracle Cloud interface with the following details:

**Cloud Navigation Bar:** Includes Cloud icon, Search bar ("Search resources, services, documentation, and Marketplace"), and US West (Phoenix) location.

**Left Sidebar:** Database Tools > Connections > Connection Details. Shows a large green circular icon with "DBC" and "ACTIVE".

**Central Content:**

- APEX Fusion Connection Details:** Shows OCID: ...dxe4q, Compartment: secondfaaspr, Created: Mon, Jan 6, 2025, Updated: Mon, Jan 6, 2025, Private endpoint: None.
- Integrate APEX with Fusion Applications:** A modal dialog with the following sections:
  - Fusion Applications environment details:** System name: IANYQY-DEV1, Public URL: [REDACTED], Integrated domain URL: [REDACTED]
  - Integrated application name:** APEX\_FA\_INTEGRATION\_APPLICATION
  - APEX instance URL:** [REDACTED]/ords/apex
  - Integration details:** Database credential name: APEX\$FA\_IANYQY-DEV1\_CRED, APEX authentication substitution keys:
    - FA\_IANYQY-DEV1\_DISCOVERY\_URL: [REDACTED].identity.oraclecloud.com:443/.well-known/openid-configuration
    - FA\_IANYQY-DEV1\_OAUTH\_SCOPE: [REDACTED]

**Bottom Buttons:** Integrate (red button), Cancel.



# Building Fusion Apps Extensions: One Click Integration

The screenshot shows the Oracle Cloud Infrastructure (OCI) console interface. The top navigation bar includes 'Cloud' (with a cloud icon), a search bar ('Search resources, services, documentation, and Marketplace'), and account information ('US West (Phoenix)', a bell icon, a question mark icon, and a user profile icon).

The main content area displays a modal window titled 'Integrate APEX with Fusion Applications'. This modal lists several steps with status indicators:

- ▼ Add Integrated application (1 resolved)  
Creating Integrated application APEX\_FA\_INTEGRATION\_APPLICATION  
Status: Done ✓
- ▼ Add database credential (1 resolved)  
Creating database credential APEX\$FA\_IANYQY-DEV1\_CRED  
Status: Done ✓
- ▼ Configure database credential (2 resolved)  
Creating database public synonym APEX\$FA\_IANYQY-DEV1\_CRED  
Creating database execute grantee APEX\_240200  
Status: Done ✓
- ▼ Configure APEX (1 resolved)  
Updating APEX authentication substitutions  
Status: Done ✓

A green rectangular box highlights the 'Done ✓' status for all completed steps.

On the left side of the modal, there's a sidebar for 'APEX Fusion Connection' with details like 'ACTIVE', 'OCID', 'Compartment', 'Created', 'Updated', and 'Private endpoint'. Below this is a 'Connection properties' section with a table for adding connection properties.

The bottom of the modal has 'Close' and 'Cancel' buttons.



# What Does OCI Console Wizard Do for FA Instance ABC?

- Creates a *Confidential App* in your Fusion IDCS
- Creates database credential APEX\$FA\_ABC\_CRED in the APEX database
- Grants privileges on DB credential to APEX engine schema (e.g. APEX\_240200)
- Configures substitution strings used by *Social Sign-In* Authentication
  - FA\_ABC\_DISCOVERY\_URL
  - FA\_ABC\_OAUTH\_SCOPE

# Fusion Integration Wizard

## Create an Application

Name

ID  
103

**Create Application**



### Use Create App Wizard

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



### Create App From a File

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



### Create App From Quick SQL

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



### Create Fusion Integration

Create a starter application with pre-configured integrations to an Oracle Fusion Applications instance.



### Browse Apps in Gallery

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



### Copy Existing App

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



# Fusion Integration Wizard

## Create Fusion Integration

This utility will create a starter application pre-configured to integrate with an Oracle Fusion Applications instance according to the setup performed by the Database Tools Fusion Integration Wizard. [Learn more ...](#)

### Configuration Options

\* Fusion Instance Name  ⓘ

\* Base URL for REST APIs  ⓘ

API Status **200 - OK** ⓘ

### Advanced Settings

\* Application Name  ⓘ

\* Application Alias  ⓘ

\* Application ID  ⓘ

**Create Application**



# What Does the Fusion Integration Wizard Create?

- New APEX app
- Web Credential delegating to the FA DB credential created by OCI wizard
- Properly Configured Social Sign-in Authentication Scheme
- Remote Server APEX\_FA\_ABC\_REST\_APIS
- *HCM Self Details* "Who Am I" REST Data Source
- Home page with Classic Report Using *HCM Self Details* REST Data Source

# Fusion Integration: Initial "Who Am I" REST Data Source

**REST Data Source**

Show All REST Data Source Settings Authentication Data Profile Operations Parameters Subscription Advanced

**REST Data Source**

\* Name HCM Self Details

\* REST Data Source Type Oracle Cloud Applications (SaaS) REST Service

\* Remote Server APEX\_FA\_CPDBDYHJB-TEST\_REST\_APIS

Base URL https://cpdbdyhjb-test.fusionappspreprod.ocs.oc-test.com/

\* URL Path Prefix hcmRestApi/resources/latest/selfDetails

**Settings**

Use Batch DML Yes

Root Resource Name selfDetails

Use Total Results No

Use Pagination Yes

**Authentication**

Credentials APEX\_FA\_CPDBDYHJB-TEST\_DBMS\_CRED

Remote Server Created by Fusion Integration

Web Credential Created by Fusion Integration



# Fusion Integration: Authentication Scheme

**Authentication Scheme**

Show All Name Subscription Settings Source Session Not Valid Login Processing Post-Logout URL Session Sharing

**Name**

\* Name APEX\_FA\_CPDBDYHJB-TEST\_OAUTH ⓘ

\* Scheme Type Social Sign-In ⓘ

**Subscription**

Subscribed from ⓘ

This is the "master" copy of this authentication scheme.

There are no subscribers to this authentication scheme.

**Settings**

Credential Store APEX\_FA\_CPDBDYHJB-TEST\_DBMS\_CRED ⓘ

Authentication Provider OpenID Connect Provider ⓘ

\* Discovery URL #FA\_CPDBDYHJB-TEST\_DISCOVERY\_URL# ⓘ

\* Scope profile,email,offline\_access,#FA\_CPDBDYHJB-TEST\_OAUTH\_SCOPE# ⓘ

Authentication URI Parameters ⓘ

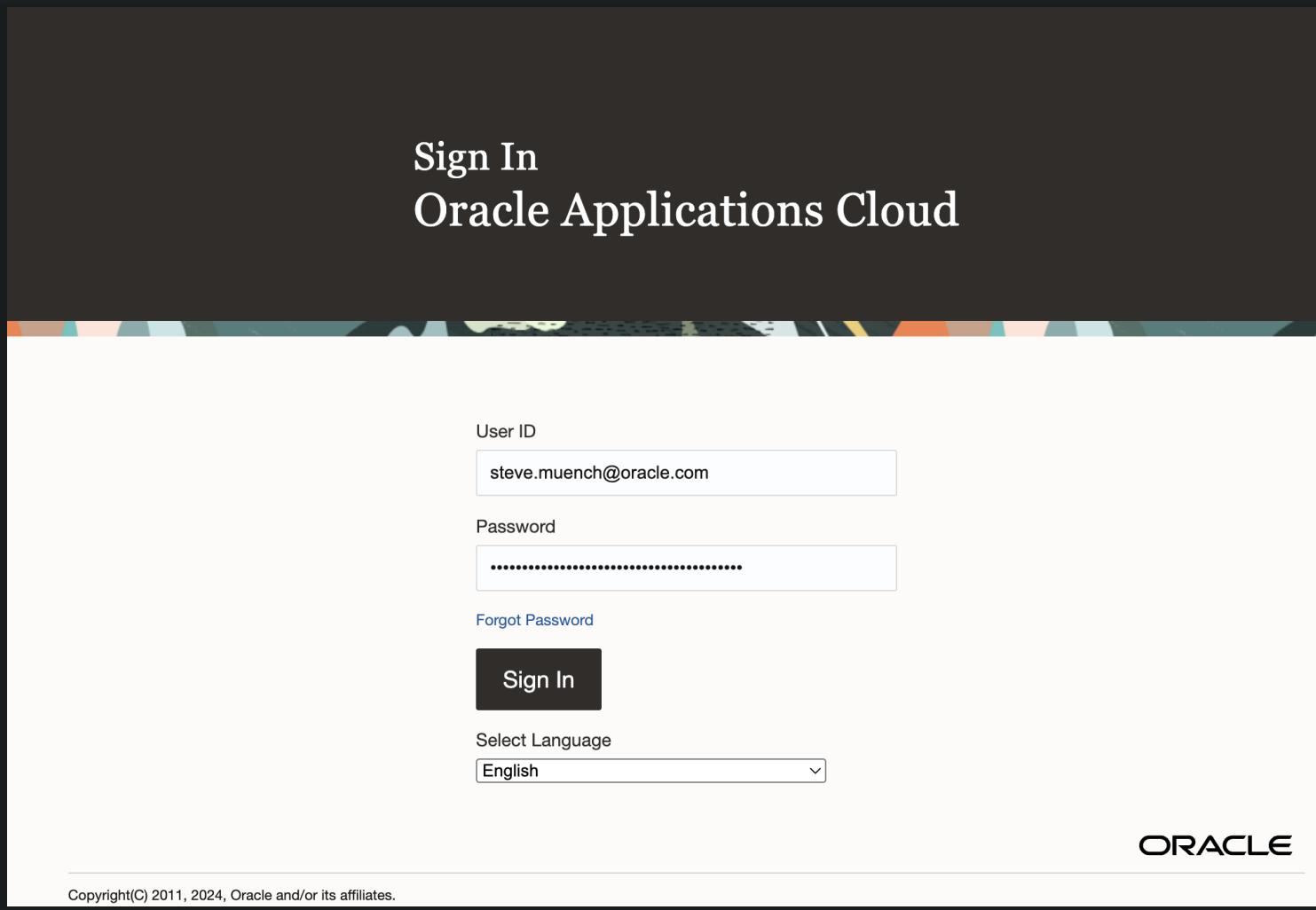
\* Username #sub# ⓘ

Web Credential Created by Fusion Integration

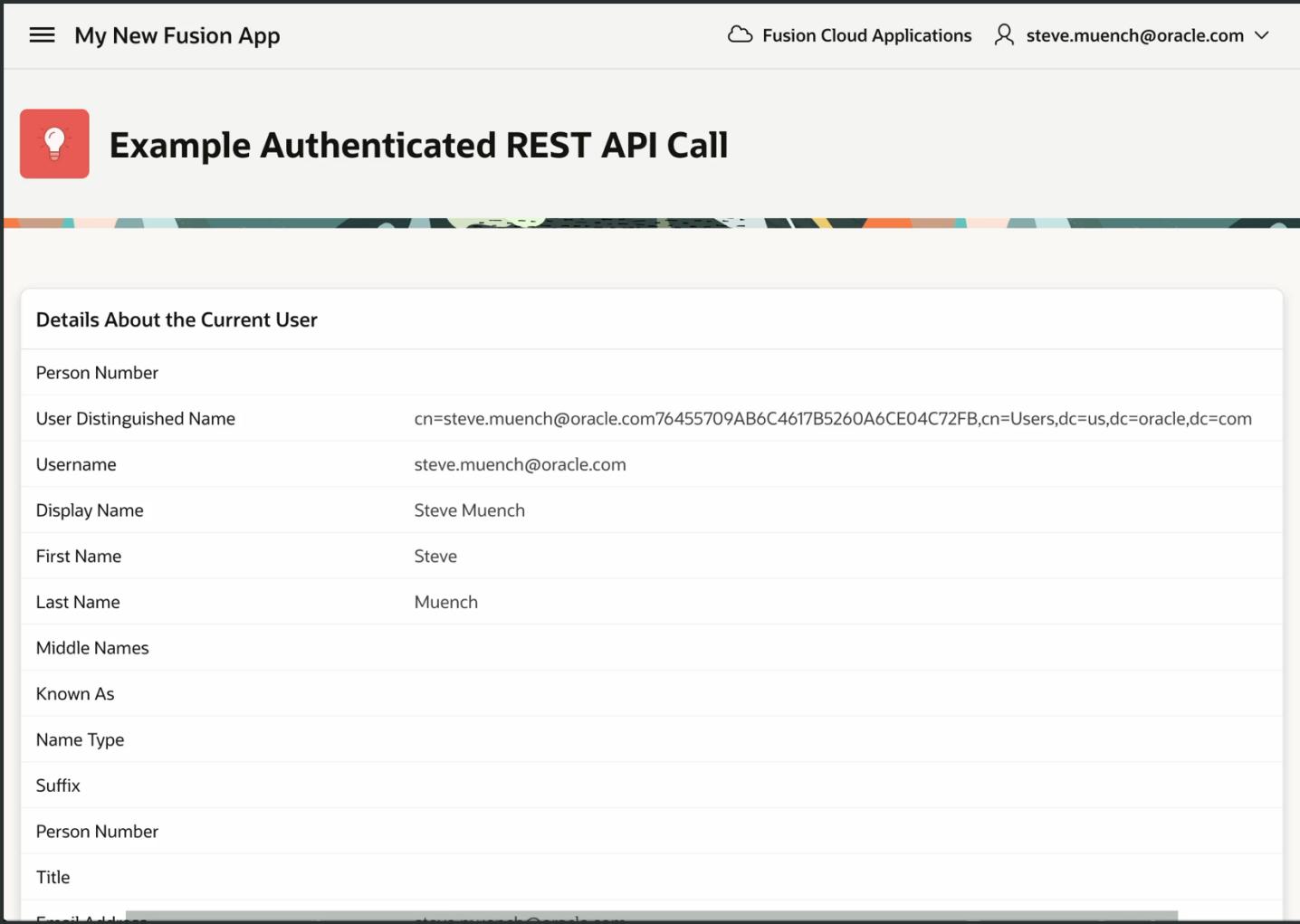
Substitution Strings Added by Fusion Integration Wizard in OCI Console



# Fusion Integration: Running the App, Fusion SSO Appears



# Fusion Integration: First REST Data Source Working



The screenshot shows a Fusion Cloud Application interface titled "My New Fusion App". At the top right, it displays "Fusion Cloud Applications" and the user "steve.muench@oracle.com". A red icon with a lightbulb is followed by the text "Example Authenticated REST API Call". Below this, a table titled "Details About the Current User" lists the following information:

Details About the Current User	
Person Number	
User Distinguished Name	cn=steve.muench@oracle.com76455709AB6C4617B5260A6CE04C72FB,cn=Users,dc=us,dc=oracle,dc=com
Username	steve.muench@oracle.com
Display Name	Steve Muench
First Name	Steve
Last Name	Muench
Middle Names	
Known As	
Name Type	
Suffix	
Person Number	
Title	

Authenticated User  
Securely Propagated to  
Every REST API Call

Important for  
Fusion Data Security

# Creating New Fusion REST Data Sources in the Builder

- APEX Builder uses *runtime-acquired* authentication token
  1. *First* run app to acquire token
  2. *Then* create REST Data Sources in APEX Builder
  3. After an hour, token may expire. Return to step 1.
- Check Fusion Apps REST API documentation for required roles

# Oracle Cloud Apps Data Source Explorer

The screenshot shows the Oracle Cloud Apps Data Source Explorer application running in a web browser. The interface has a dark-themed header bar with the following elements:

- APEX logo and "APEX" text.
- Navigation links: App Builder, SQL Workshop, Team Development, and Gallery (which is currently selected).
- Search bar with placeholder "Search" and a magnifying glass icon.
- User profile icon and "smuench" text.

Below the header is a search bar with the placeholder "Search Apps" and a dropdown menu with tabs: Sample Apps, Starter Apps, Utility Apps (which is selected and highlighted in blue), and Custom Apps.

The main content area displays a card for the "Oracle Cloud Apps REST Data Source Explorer" application. The card includes:

- An icon of a magnifying glass inside a green rounded square.
- The application name: "Oracle Cloud Apps REST Data Source Explorer" followed by "Oracle".
- A detailed description of the application's functionality, mentioning its purpose of showing REST Data Sources, retrieving reference info, and helping with discovery and clipboard integration.
- The version number: "24.2.1".
- Action buttons: three small gray boxes containing a vertical ellipsis, a pencil, and a circular arrow.



# Oracle Cloud Apps Data Source Explorer

Oracle Cloud Apps Data Source Explorer - Service Details: Leads

Show Only Visible Attributes ▾ ⓘ ⚡ Install App 🔎 smuench ▾

Attributes Child Objects

Attribute Name	Type	Label	Description	LOV Endpoint	Preferred UI	Queryable?	Required?	Defaulted?	Editable?	Remote PK?	Custom?	Only Operators?
Name	string(250)	Lead Name	Lead Name used for identifying the lead.			Y	Y	N	Y	N	N	
RecordSet	string	Record Set		⌚	Select List	Y	N	N	N	N	N	
LeadNumber	string(30)	Lead Number	User friendly unique identifier for a lead.			Y	N	Y	On Create	N	N	
OwnerPartyName	string(360)	Owner	Name associated with the owner of this sales lead.	⌚	Popup LOV	Y	N	N	Y	N	N	
StatusCode	string(30)	Status	Pre-defined code used to indicate the status of a lead.	⌚	Select List	Y	N	N	Y	N	N	
Rank	string(30)	Rank	Rank associated with this sales lead.	⌚	Select List	Y	N	N	Y	N	N	
SourceCode	string(30)	Source Code	Marketing source code associated with this sales lead.	⌚	Popup LOV	Y	N	N	Y	N	N	
CustomerPartyName	string(360)	Account Name	Name of the customer.			Y	N	N	Y	N	N	
ProductGroupName	string(250)	Product Group	Name of the product group associated with a lead.	⌚	Popup LOV	Y	N	N	Y	N	N	
InventoryItemDescription	string(240)	Product Item	The description of the product added to a lead.	⌚	Popup LOV	N	N	N	Y	N	N	
CreationDate	datetime	Creation Date	Indicates the date and time when this record is created.		Date Picker	Y	Y	N	N	N	N	
RegistrationNumber	string(120)	Registration Number	Registration number of the sales lead. This unique identifier is generated when the sales lead is approved. This is a deal specific attribute.			Y	N	N	Y	N	N	



# Oracle Cloud Apps Data Source Explorer

Oracle Cloud Apps Data Source Explorer - REST Data Sources

Endpoints In Use   All Endpoints   Background Progress

Search: Row text contains 'forecast'   Actions: Refresh List, Refresh Catalog In Background

Base Url: <https://fa-exgs-saasfademo1.ds-fa.oracledemos.com:443/crmRestApi/resources/11.13.18.05>

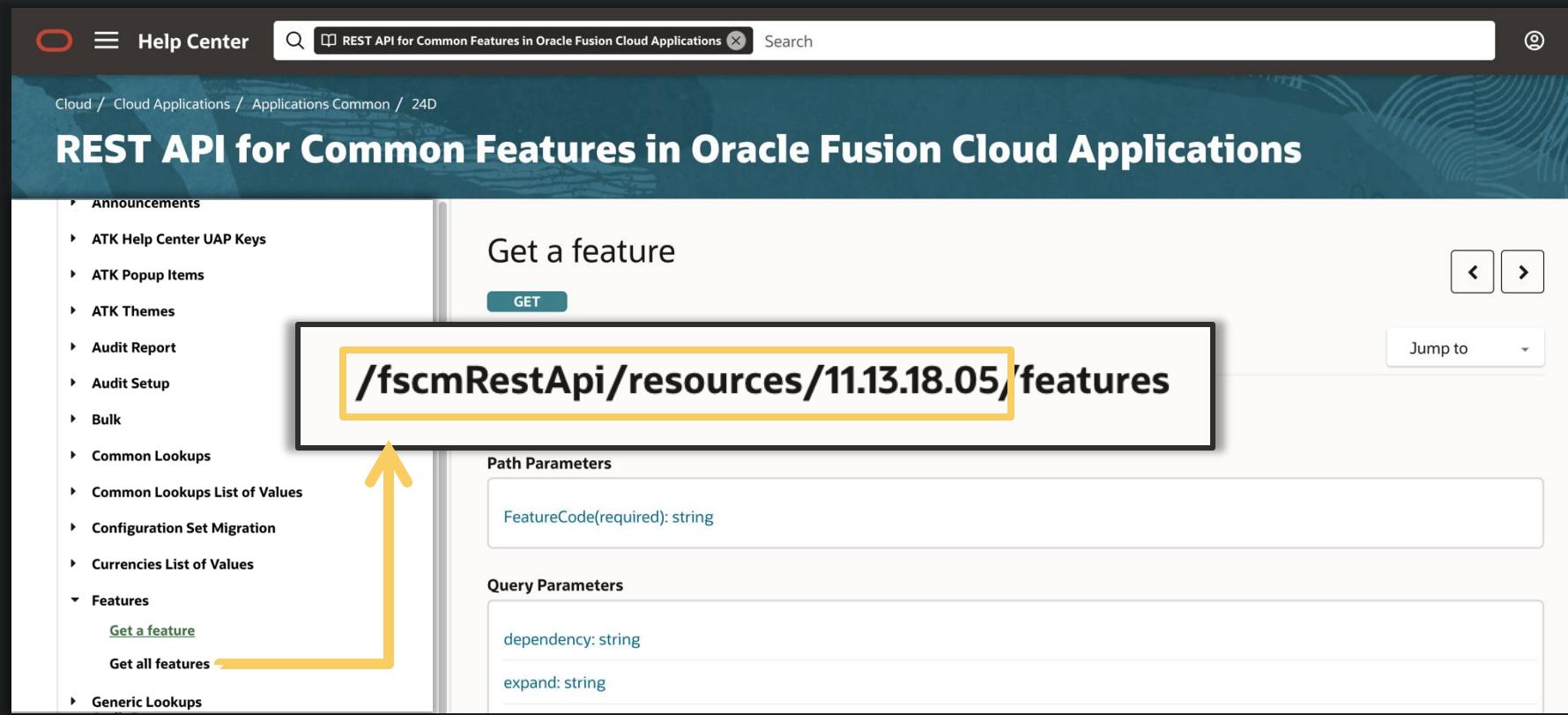
Endpoint URL	Resource Name ↑	Title
<a href="#"></a>	salesForecastAdjustments	Sales Forecast Adjustments
<a href="#"></a>	salesForecastDimensions	Sales Forecast Dimensions
<a href="#"></a>	salesForecastMetricSourceItems	Sales Forecast Metric Source Items
<a href="#"></a>	salesForecastMetricSources	Sales Forecast Metric Sources
<a href="#"></a>	salesForecastMetrics	Sales Forecasts Metrics
<a href="#"></a>	salesForecastParams	Sales Forecast Parameters
<a href="#"></a>	salesForecastParticipants	Sales Forecast Participants
<a href="#"></a>	salesForecastPeriods	Sales Forecast Periods
<a href="#"></a>	salesForecastQuotas	Sales Forecast Quotas
<a href="#"></a>	territoryForecasts	Forecast Territory Hierarchy

1 - 10



# Most Fusion REST APIs Use *Oracle ADF*

- Workhorse FA business component framework used since 1998
- Recognize from URL **/xxxRestApi/resources/11.13.18.05**



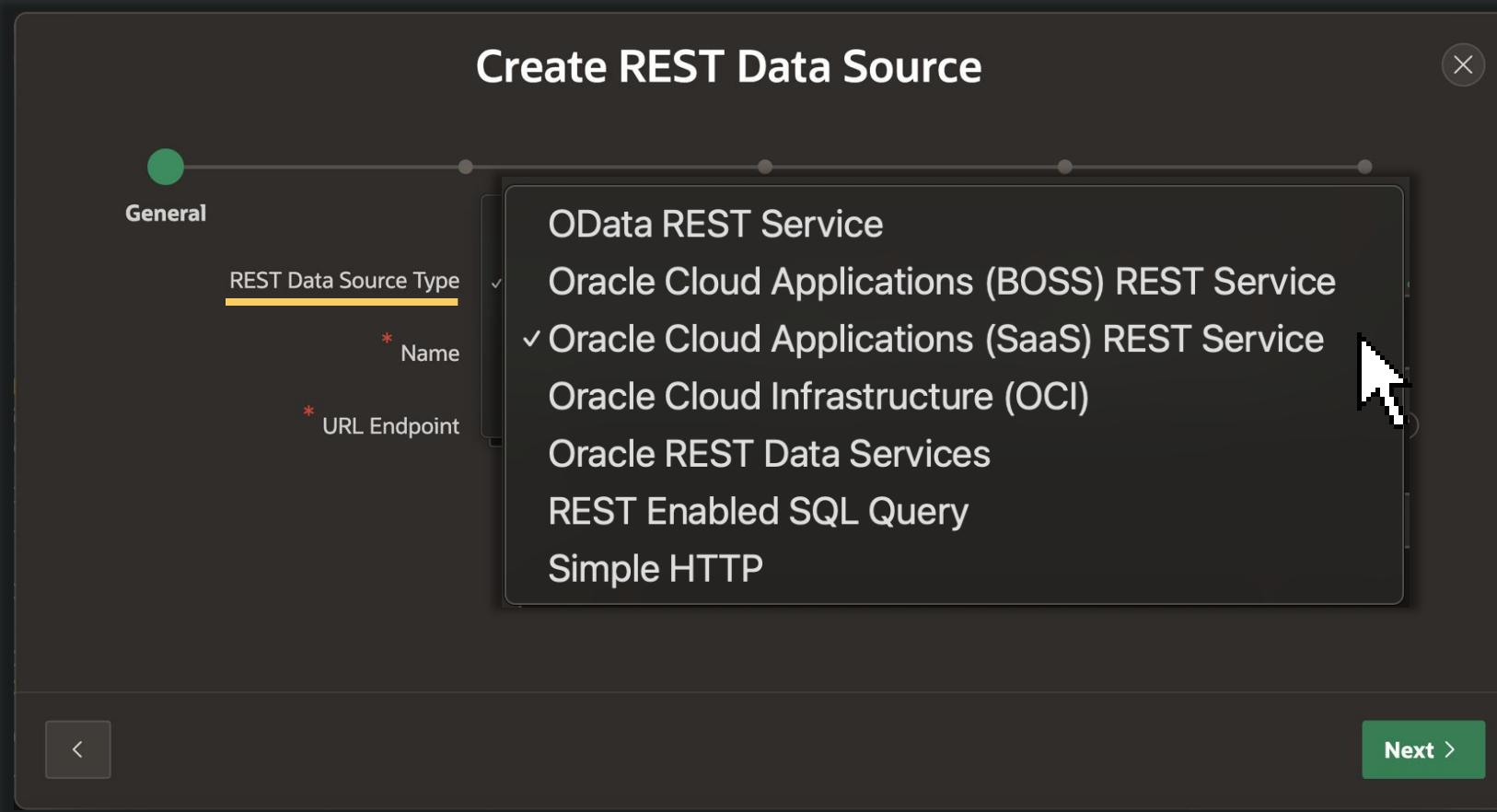
# Newest Fusion REST APIs Use *Business Object Service*

- Alternative implementation approach for newest endpoints
- Recognize from URL **/api/boss**

The screenshot shows a web browser displaying the "REST API for Common Features in Oracle Fusion Cloud Applications". The URL in the address bar is <servername>/api/boss/data/objects/ora/commonAppsInfra/objects/v1/territories. A yellow arrow points from the "Get a territory" link in the sidebar to this URL. The page content includes a sidebar with links like "Setup Task CSV Exports", "Setup Task CSV Imports", and "Setup Task CSV Template Exports". The main content area shows a "Get a territory" operation with a "GET" button. Below it, there are sections for "Path Parameters" (territories\_id(required): string) and "Query Parameters" (\$fields: string). A note at the bottom states "There's no request body for this operation."

# APEX 24.2 Lets You Work Easily with Either

- *Oracle Cloud Apps (SaaS)* for `/xxxRestApi/resources/11.13.18.05/*`
- *Oracle Cloud Apps (BOSS)* for `/api/boss/*`



# Fusion Roles Authorization: Use Custom Code for Groups

The screenshot shows the 'Edit Security Attributes' page for 'Application 106'. The 'Security' tab is active. The 'Authorization' section is selected under the sub-tabs. A tooltip for 'Source for Role or Group Schemes' indicates options like 'Custom Code'.

Application 106 \ Edit Security Attributes

Definition Security Globalization User Interface Progressive Web App AI

Application 106 Cancel Apply Changes

Show All Authentication Authorization Session Management Session State Protection Browser Security Database Session Advanced

Authorization Define Authorization Schemes >

Application authorization schemes control access to all pages within an application. Unauthorized access to the application, regardless of which page is requested, will cause an error page to be displayed.

Authorization Scheme - No application authorization required - ?

Run on Public Pages ?

Run on Background Job

Access Control User Role Assignments

Authentication Scheme

Source for Role or Group Schemes ✓ Custom Code ?

# Fusion Roles Authorization: SCIM Users REST Data Source

The screenshot shows the Oracle Fusion REST Data Source configuration page for the 'User Roles' component. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user icons. The breadcrumb path indicates the current location: Application 106 \ Shared Components \ REST Data Sources \ User Roles. Below the header, there are tabs for Show All, REST Data Source (which is selected), Settings, Authentication, Data Profile, Operations, Parameters, Subscription, Open API, and Advanced. On the right side of the main content area, there are 'Delete' and 'Apply Changes' buttons. The 'REST Data Source' configuration section contains fields for Name (User Roles), REST Data Source Type (Simple HTTP, highlighted with a yellow box), Remote Server (APEX\_FA\_CPDBDYHJB-TEST\_REST\_APIS), Base URL (https://cpdbdyhjb-test.fusionappspreprod.ocs.oc-test.com/), and URL Path Prefix (hcmRestApi/scim/Users?filter=userName+eq+"{USER\_NAME}"). A callout bubble points to the REST Data Source Type field with the text: "Uses different REST API approach than the rest of Fusion REST APIs to comply with industry standard". At the bottom left, a large text box displays the URL path: hcmRestApi/scim/Users?filter=userName+eq+"{USER\_NAME}".

REST Data Source

REST Data Source

Name: User Roles

REST Data Source Type: Simple HTTP

Remote Server: APEX\_FA\_CPDBDYHJB-TEST\_REST\_APIS

Base URL: <https://cpdbdyhjb-test.fusionappspreprod.ocs.oc-test.com/>

URL Path Prefix: hcmRestApi/scim/Users?filter=userName+eq+"{USER\_NAME}"

Uses different REST API approach than the rest of Fusion REST APIs to comply with industry standard

hcmRestApi/scim/Users?filter=userName+eq+"{USER\_NAME}"

# Fusion Roles Authorization: Single GET Operation

The screenshot shows the Oracle APEX App Builder interface for managing REST Data Sources. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user icons.

The current page path is Application 106 \ Shared Components \ REST Data Sources \ User Roles. The main title is "REST Data Source". On the right, there are "Delete" and "Apply Changes" buttons.

The tab navigation bar includes Show All, REST Data Source, Settings, Authentication, Data Profile, Operations (which is selected), Parameters, Subscription, Open API, and Advanced.

The "Operations" section header has an "Add Operation" button. The table below lists one operation:

Edit	Name	Operation	URL Pattern	Database Action	For Nested Rows	Parameter Count	Test Operation	Last Updated
	-	GET	.	Fetch rows	-	-		68 minutes ago

Pagination at the bottom indicates 1 - 1.

# Fusion Roles Authorization: USER\_NAME URL Pattern Param

The screenshot shows the Oracle APEX App Builder interface for configuring a REST Data Source. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user icons.

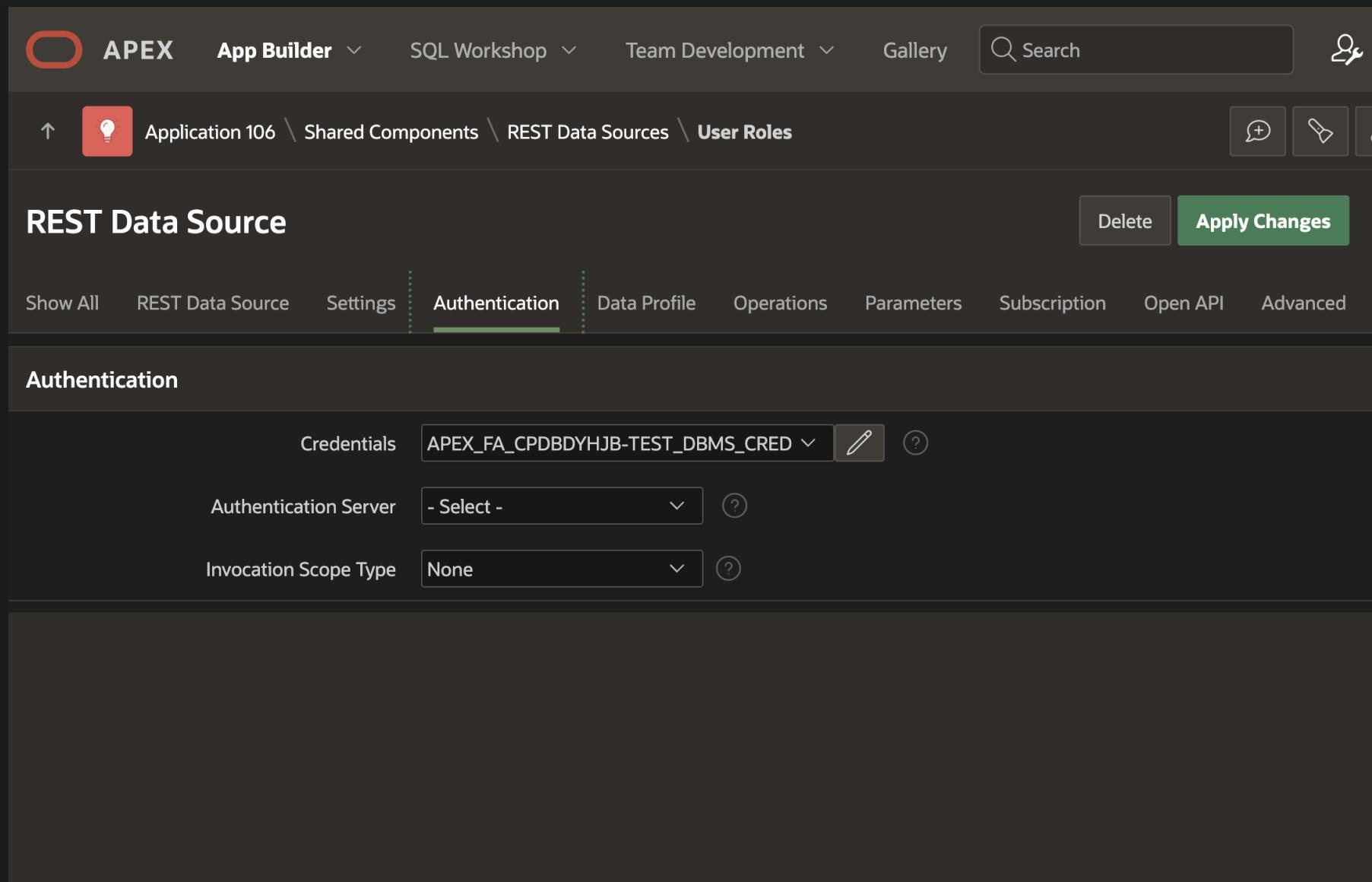
The current page path is Application 106 \ Shared Components \ REST Data Sources \ User Roles.

The main title is "REST Data Source" with "Parameters" selected in the tab bar. The "Parameters" section contains a table with one row:

Edit	Name	Type	Direction	Default Value	Required	Use for Row Search
	USER_NAME	URL Pattern	In	-	Yes	No

Below the table, the text "1 - 1" is displayed. The bottom right corner of the page has a red square with a white 'O' icon.

# Fusion Roles Authorization: Same Credential



The screenshot shows the Oracle Fusion REST Data Source configuration page. The navigation bar at the top includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user icons. The current path in the breadcrumb menu is Application 106 \ Shared Components \ REST Data Sources \ User Roles. On the right side of the header are three small icons: a plus sign, a magnifying glass, and a refresh symbol.

The main title is "REST Data Source". Below it, a navigation bar contains links for Show All, REST Data Source, Settings, **Authentication**, Data Profile, Operations, Parameters, Subscription, Open API, and Advanced. The "Authentication" tab is currently selected, indicated by a green underline.

The "Authentication" section contains three configuration fields:

- Credentials: A dropdown menu set to "APEX\_FA\_CPDBDYHJB-TEST\_DBMS\_CRED" with a pencil icon for editing and a question mark icon for help.
- Authentication Server: A dropdown menu set to "- Select -" with a question mark icon for help.
- Invocation Scope Type: A dropdown menu set to "None" with a question mark icon for help.

A large, dark gray rectangular area below the authentication section is partially visible, likely representing a modal or a collapsed section of the interface.

# Fusion Roles Authorization: Resources.roles Selector

**Data Profile**

Show All Settings Columns Rediscovery Advanced

**Settings**

\* Name: User Roles

\* Format: JSON

Row Selector: Resources.roles

Contains Single Row:

**Columns**

Resequence Columns Add Column >

			Sequence...	Name	Column Ty	Data Type.	Selector	Primary Key	Visible	Common...	Parent Co
			1	ID	Data	Varchar2	id	No	Yes	Yes	
			2	VALUE	Data	Varchar2	value	No	Yes	Yes	
			3	DESCRIPTION	Data	Varchar2	descript...	No	Yes	Yes	
			4	DISPLAYNAME	Data	Varchar2	display...	No	Yes	Yes	

VALUE column holds role name using value selector



# Fusion Roles Authorization: Get Roles in Post-Auth Proc

The screenshot shows the Oracle APEX App Builder interface for creating or editing an authentication scheme. The navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user profile icon. The current page path is Application 106 \ Shared Components \ Authentication Schemes \ Create / Edit. The main content area is titled "Authentication Scheme" and displays several tabs: Show All, Name, Subscription, Settings, Source, Session Not Valid, Login Processing (which is selected), Post-Logout URL, Session Sharing, Advanced, and Comments. The "Login Processing" section contains the following fields:

- Pre-Authentication Procedure Name: (empty input field)
- Post-Authentication Procedure Name: `fa_get_user_roles` (this field is highlighted with a yellow box)
- Switch in Session: `Disabled` (dropdown menu)
- Help Text: (empty text area)

To the right of the "Post-Authentication Procedure Name" field, there is explanatory text in yellow:

Use APEX\_EXEC to retrieve distinct role names from user\_roles REST Data Source, passing in USER\_NAME parameter value of APP\_USER

# Fusion Roles Authorization: Get Roles in Post-Auth Proc

```
procedure fa_get_user_roles is
  l_params apex_exec.t_parameters;
  l_context apex_exec.t_context;
  l_groups apex_t_varchar2 := apex_t_varchar2();
  l_group varchar2(4000);
begin
  -- Set USER_NAME param to current user name
  apex_exec.add_parameter( l_params, 'USER_NAME', v('APP_USER') );
  l_context := apex_exec.open_rest_source_query(
    p_static_id => 'user_roles',
    p_max_rows => 1000, -- May need to increase!
    p_parameters => l_params);
  -- Collect distinct role names
  while apex_exec.next_row( l_context ) loop
    l_group := apex_exec.get_varchar2( l_context, 'VALUE' );
    if l_group not member of l_groups then
      apex_string.push(l_groups, l_group);
    end if;
  end loop;
  -- Set the dynamic groups
  apex_authorization.enable_dynamic_groups(l_groups);
  apex_exec.close( l_context );
exception
  when others then
    apex_exec.close( l_context );
    raise;
end fa_get_user_roles;
```

Use APEX\_EXEC to retrieve distinct role names from user\_roles REST Data Source, passing in USER\_NAME parameter value of APP\_USER

Enable dynamically retrieved roles as dynamic groups

# Fusion Roles Authorization: Get Roles in Post-Auth Proc

The screenshot shows the Oracle Fusion Middleware Application Builder interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery, along with a search bar and user icons.

The current page is 'Application 106 \ Shared Components \ Authorization Schemes \ Edit'. The main title is 'Authorization Scheme'. There are tabs for Show All, Name, Subscription, Authorization Scheme, Evaluation Point, Advanced, and Comments, with 'Authorization Scheme' currently selected.

The 'Name' section shows the application is '106 My New Fusion App'. The 'Name' field contains 'HR Specialist', which is highlighted with a yellow box.

The 'Subscription' section indicates the scheme is the "master" copy and no other schemes subscribe to it.

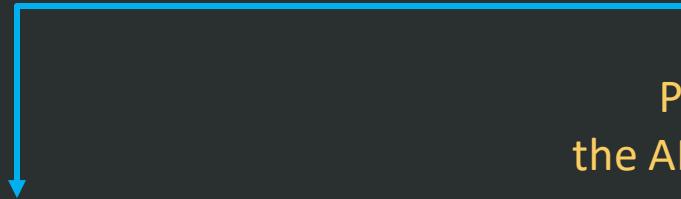
The 'Authorization Scheme' section shows the 'Scheme Type' is 'Is In Role or Group' and the 'Type' is 'Custom'. The 'Name(s)' field contains 'ORA\_HUMAN\_RESOURCE\_SPECIALIST\_JOB', also highlighted with a yellow box.

On the right side of the screen, there is a callout text:  
Define custom-type /s  
In Role or Group  
Authorization Schemes  
as needed

# Useful Post-Auth Procedure Debugging Tip

```
procedure your_post_auth_procedure is
    -- Your existing declarations

    procedure debug_dump_json
        is
            l_json_clob clob;
            pragma autonomous_transaction;
        begin
            apex_json.initialize_clob_output;
            apex_json.write( p_values => apex_json.g_values );
            l_json_clob := apex_json.get_clob_output;
            insert into post_auth_debug(json_clob) values (l_json_clob);
            apex_json.free_output;
            commit;
        end debug_dump_json;
    begin
        debug_dump_json;
        -- Your existing logic
    end fa_get_user_roles;
```



Parsed JSON structure  
the APEX engine received from  
authentication provider

Write out JSON CLOB to:  
- a table, or  
- CLOB-typed hidden page zero item  
That you create for debugging purposes

# Extending Oracle Fusion Cloud Apps Suite w/ Oracle APEX

[apex.oracle.com/go/fusion-app](https://apex.oracle.com/go/fusion-app)

The screenshot shows a web page with a dark blue header containing the Oracle APEX logo and navigation icons. The main content area has a light blue background with a wavy pattern. At the top, it says "Oracle APEX" and "Follow: RSS". Below that is a large image of a person's face. Underneath the image, the title "Enhancing Oracle Fusion Applications with Oracle APEX: Getting Started" is displayed in bold black font. Below the title, the date "January 13, 2025 | 10 minute read" is shown. A photo of a man, identified as Roopesh Thokala, Senior Product Manager, Oracle APEX, is next to his name. Below the author information are social sharing icons for Facebook, Twitter, LinkedIn, and Email. A detailed paragraph about the Oracle Fusion Applications suite follows, mentioning AI integration and personalization. A brief description of Oracle APEX is provided, highlighting its low-code nature and scalability. Finally, a note about extending Oracle Fusion Applications with Oracle APEX is included.

[apex.oracle.com/go/fusion-technical-paper](https://apex.oracle.com/go/fusion-technical-paper)

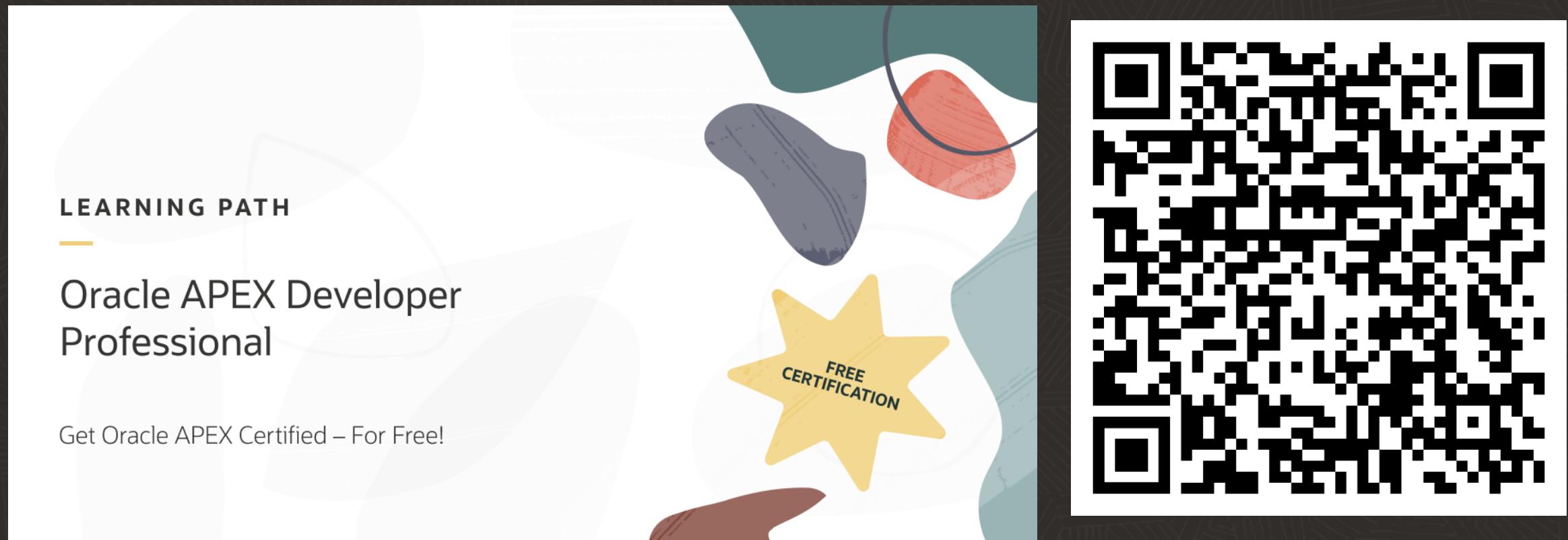
The screenshot shows a white page with a green vertical bar on the left. At the top right is the Oracle logo. The main title "Extending Oracle Fusion Cloud Applications Suite using Oracle APEX" is centered in large black font. Below the title, it says "Oracle APEX Technical Paper". At the bottom, there is copyright information: "February, 2025, Version [1.0] Copyright © 2025, Oracle and/or its affiliates Public".



# Become an Oracle APEX Pro: The Latest Learning Path You Need to Follow

[blogs.oracle.com/apex/post/become-an-oracle-apex-pro](https://blogs.oracle.com/apex/post/become-an-oracle-apex-pro)

Claim your Free Certification until May 15, 2025



[apex.oracle.com/go/professional-ai-ip](https://apex.oracle.com/go/professional-ai-ip)



# ā'pěks alpe adria

Thank You!    Questions?



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