

ORACLE

APEX and the REST of the world

REST Support in APEX –state of things

Carsten Czarski

Architect of Oracle APEX



About: Carsten Czarski

- Architect on the Oracle APEX Team
- Oracle since 2001
- APEX Team since 2016
- Carsten.Czarski@oracle.com



REST Support in APEX from 18.1 until today

- APEX 18.1: REST Data Sources und REST Enabled SQL
- APEX 19.1: **DML Support** (APEX_EXEC + Form Region)
- APEX 19.2: Interactive Grid und Shared LOV Support
- APEX 20.2: Web Credentials, **REST Source Plug-Ins** und Synchronization
- APEX 21.1: CSV Data over REST
- APEX 21.2: **REST Source Catalogs**, Pagination for Simple HTTP
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APEX 18.1: REST Data Sources – a quick recap

- REST Sources are meta data about external REST APIs
 - URL Endpoint, HTTP Method
 - Parameters, HTTP Headers and Cookies
 - Response format and structure information (Data Profile)
- Shared Components, part of the app
- Simple Caching supported (similar to a browser cache)
- First-Class data source for APEX components
- Combine with local data using **Post Processing SQL**

REST Data Source *Type*

REST Data Source Type	Oracle REST Data Services
* Name	A REST Service
* URL Endpoint	https://apex.oracle.com/pls/apex/r/...
HTTPS Host Name	

REST Data Source Type

Determines the REST Data Source type.

- **Simple HTTP** denotes a simple HTTP data feed. Oracle APEX assumes that all data is returned with the first request and that the server does not support server-side filtering, ordering or other advanced REST service feature. All invocation details and parameters must be configured manually.
- **Oracle REST Data Services** denotes ORDS (Oracle REST Data Services) REST Services. These REST services follow the *Oracle REST standard*, which means that GET, POST, PUT or DELETE operations are standardized. Server-side filtering and ordering are supported. Oracle APEX can leverage these features by delegating report order-bys and filters to the REST service.
- **REST Enabled SQL Query** denotes a REST Source on top of a SQL Query executed on a REST Enabled SQL Reference. Oracle APEX supports filtering and pagination, but no DML on these endpoints.
- **Oracle Cloud Applications (SaaS) REST Service** denotes RESTful web services provided by Oracle Cloud SaaS Applications. Use this web service type to integrate Oracle SaaS REST Services into your Oracle APEX application. Oracle APEX supports pagination for these Services.
- **Oracle Cloud Infrastructure (OCI) REST Service** denotes RESTful web services provided by Oracle Cloud Infrastructure. Use this web service

- Simple HTTP
- ORDS
- REST Enabled SQL Query
- Fusion SaaS REST APIs
- OCI REST APIs
- OData REST APIs
- *Plug-Ins*

REST Data Source Type

- How much does APEX know about the REST API
 - Pagination
 - Server-Side Filtering and Ordering
 - DML (Insert, Update, Delete)
- Simple HTTP assumes least knowledge – supports basic Pagination schemes
- Custom Plug-Ins allow maximum control

APEX_EXEC

```
l_context := apex_exec.open_rest_source_query(  
    p_static_id      => 'my-rest-api',  
    p_max_rows       => 100 );  
  
while apex_exec.next_row( l_context ) loop  
    http.p( apex_exec.get_varchar2(  
        p_context      => l_context,  
        p_column_name => 'COLUMN_NAME' ) );  
end loop;  
  
apex_exec.close( l_context );
```

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Synchronization

- Automatic download of REST response data to a local table
- Additional meta data within a REST Data Source
 - Table and columns to synchronize to
 - Method (append, replace, merge)
 - Schedule
- APEX components can use the local table afterwards
- Improves performance and robustness of the APEX app
- PL/SQL API for programmatic access: `APEX_REST_SOURCE_SYNC`

REST Source Plug-Ins

Product Solutions Open Source Pricing

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Files

22.2

Go to file

docs

plugins

dynamic-action/format-datepicker...

rest-source

fixed-page-size

README.md

plugin-plsql-code.sql

sample-application.sql

web_source_type_fixedpagesi...

odata-rest-apis

README.md

README.md

sample-apps

sample-code

starter-apps

.gitignore

CONTRIBUTING.md

LICENSE.txt

README.md

SECURITY.md

apex / plugins / rest-source /

cczarski-de Add files via upload 569a100 · 8 months ago History

This branch is 48 commits ahead of, 31 commits behind main .

Name	Last commit message	Last commit date
..		
fixed-page-size	sample app and sample code refresh	3 years ago
odata-rest-apis	Add files via upload	8 months ago
README.md	adding new ODATA Connector plugin to REST source plugins	2 years ago

README.md

REST Data Source Plug-In examples

This directory contains examples for REST Data Source Plug-Ins.

Repo/Folder name	Description
fixed-page-size	Example plug-in which shows how to implement pagination for a REST API using a fixed page size and a page number parameter
odata-rest-apis	Plug-In to support OData APIs in REST Data Sources, including filtering, ordering and discovery

https://github.com/oracle/apex/tree/22.2/plugins/rest-source

REST Source Plug-Ins

- *Callback* procedures for integration points between APEX and the REST API

Callback	Purpose	APEX_EXEC
Fetch	APEX component fetches rows	OPEN_REST_SOURCE_QUERY
DML	Form, Interactive Grid or Plug-In performs DML	EXECUTE_DML
Execute	Invoke API process invokes REST API	EXECUTE_REST_SOURCE
Discover	New REST Source is created through the wizard	
Capabilites	Returns basic capabilities of the REST Source	

REST Source Plug-Ins

Source

PL/SQL Code ?

```
156 -- Fetcher, APEX computes the first row and the amount of rows required. This
157 -- and all dynamic filter and order by information is passed to the
158 -- procedure as the "p_params" parameter.
159 -----
160 procedure fetch_themoviedb (
161     p_plugin      in      apex_plugin.t_plugin,
162     p_web_source  in      apex_plugin.t_web_source,
163     p_params      in      apex_plugin.t_web_source_fetch_params,
164     p_result      in out nocopy apex_plugin.t_web_source_fetch_result )
165 is
166     l_web_source_operation apex_plugin.t_web_source_operation;
167
168     l_time_budget      number;
169     l_summary          t_summary;
170     l_page_id          pls_integer;
171     l_start_page_id    pls_integer;
172     l_continue_fetching boolean := true;
173     l_page_to_fetch    pls_integer := 0;
174
175     c_page_size        pls_integer := coalesce( p_params.fixed_page_size, 20 );
176
177     l_query_string      varchar2(32767);
178 begin
179     --
180     -- This gets all meta data on the REST Operation as an instance of APEX_PLUGIN.T_WEB_SOURCE_OPERATION.
181     -- The P_PERFORM_INIT parameter determines whether APEX should compute the URL and initialize all
```

☐ Do not validate code (parse code at runtime only).

Callbacks

REST Source Capabilities Procedure	capabilities_themoviedb	
REST Source Fetch Procedure	fetch_themoviedb	
REST Source DML Procedure		
REST Source Execute Procedure		
REST Source Discover Procedure	discover_themoviedb	



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Declarative REST process invocation

Rendering

Dynamic Actions

Processing

Process

After Submit

Validating

Processing

- Processes
 - Invoke

Parameters
 - query1
 - query2
 - request-body
 - response-body
 - status-code
 - x-hdr-inout-1
 - x-hdr-inout-2
 - x-query-out-1
 - x-query-out-2

Filter

Identification

Name

Invoke

Type

Invoke API

Execution Chain

None

Editable Region

- Select -

Settings

Type

REST Source

REST Source

Echo Params Simple

Operation

POST

Execution

Success Message

Error



Declarative REST process invocation

Rendering

Dynamic Actions

Processing

Process

After Submit

Validating

Processing

Processes

Invoke

Parameters

query1

query2

request-body

response-body

status-code

x-hdr-inout-1

x-hdr-inout-2

x-query-out-1

x-query-out-2

Rendering

Dynamic Actions

Processing

Parameter

After Submit

Validating

Processing

Processes

Invoke

Parameters

query1

query2

request-body

response-body

status-code

x-hdr-inout-1

x-hdr-inout-2

Filter

Identification

Name

response-body

Parameter

Direction

Out

Ignore Output

Value

Item

P4_RESPONSE

Audit Information



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REST Catalog from OpenAPI: Example “Spotify”

↑ Workspace Utilities \ REST Source Catalogs \ Spotify Web API

Catalog Services

Search: All Text Columns

Go

Reset

Name	Description	Operations
get-current-users-profile	Get detailed profile information about the curr...	GET
get-multiple-shows	Get Spotify catalog information for several sh...	GET
get-multiple-albums	Get Spotify catalog information for multiple al...	GET
get-several-tracks	Get Spotify catalog information for multiple tr...	GET
search	Get Spotify catalog information about albums,...	GET
get-multiple-artists	Get Spotify catalog information for several arti...	GET
get-available-markets	Get the list of markets where Spotify is available.	GET
get-multiple-episodes	Get Spotify catalog information for several epi...	GET
get-several-chapters	Get Spotify catalog information for several ch...	GET
get-users-saved-shows	Get a list of shows saved in the current Spotify...	GET PUT DELETE
get-users-saved-albums	Get a list of the albums saved in the current S...	GET PUT DELETE

About

Review the services provided by the catalog.

Tasks

Export Catalog >



Q & A

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