ORACLE | APEX

Enhancements to the Plug-in Infrastructure: Unlimited Attributes

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What is a Plug-in in APEX?

A plug-in is a reusable component that extends APEX built-in functionality. Plug-ins come in various types such as Items, Regions, Process, Template Component and Dynamic Action allowing you to enhance and customise your application.

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Why Use Plug-ins?

- Reuse code efficiently across applications
- Extend APEX standard capabilities
- Reduce complexity by encapsulating logic

Where are Plug-ins defined in APEX?

- Plug-ins are stored in Shared Components → Other Components → Plug-ins
- They contain PL/SQL logic for processing and JavaScript/CSS for UI rendering
- Developers can configure custom attributes to modify behaviour dynamically

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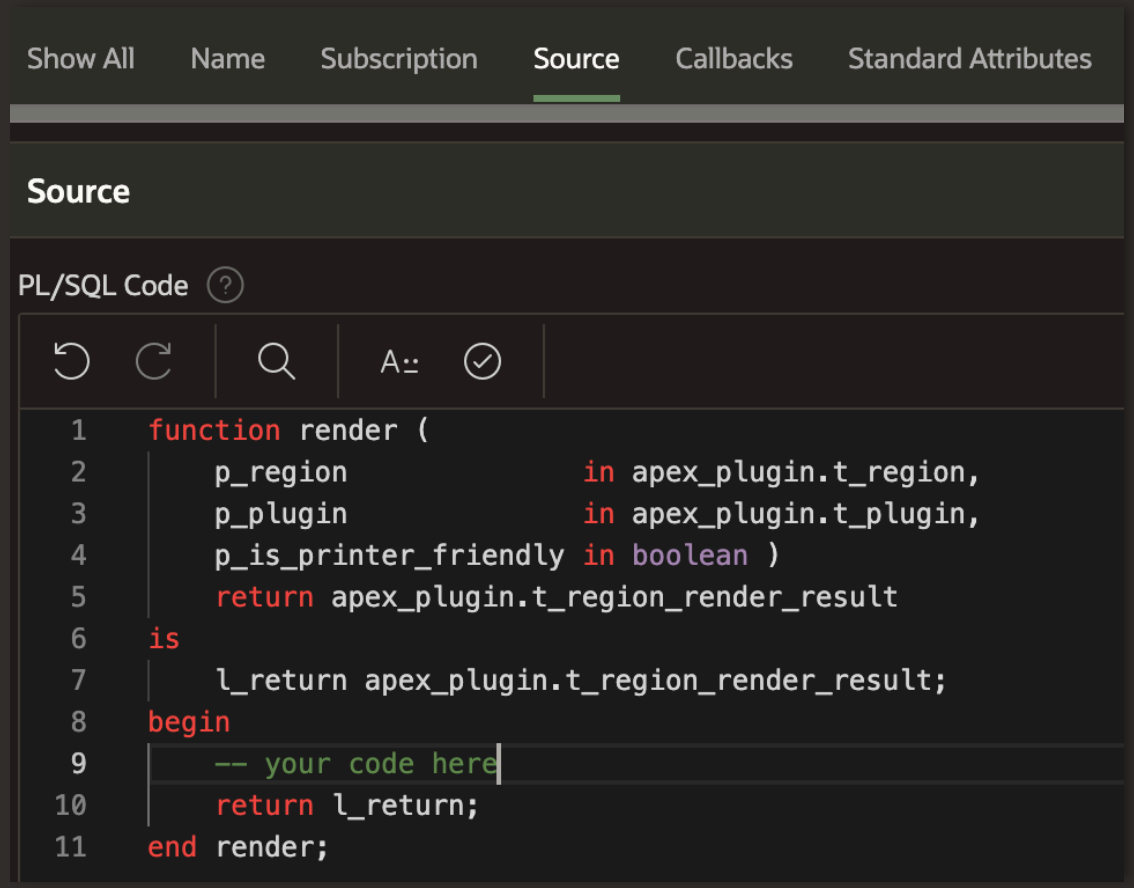
Plug-in Key Components

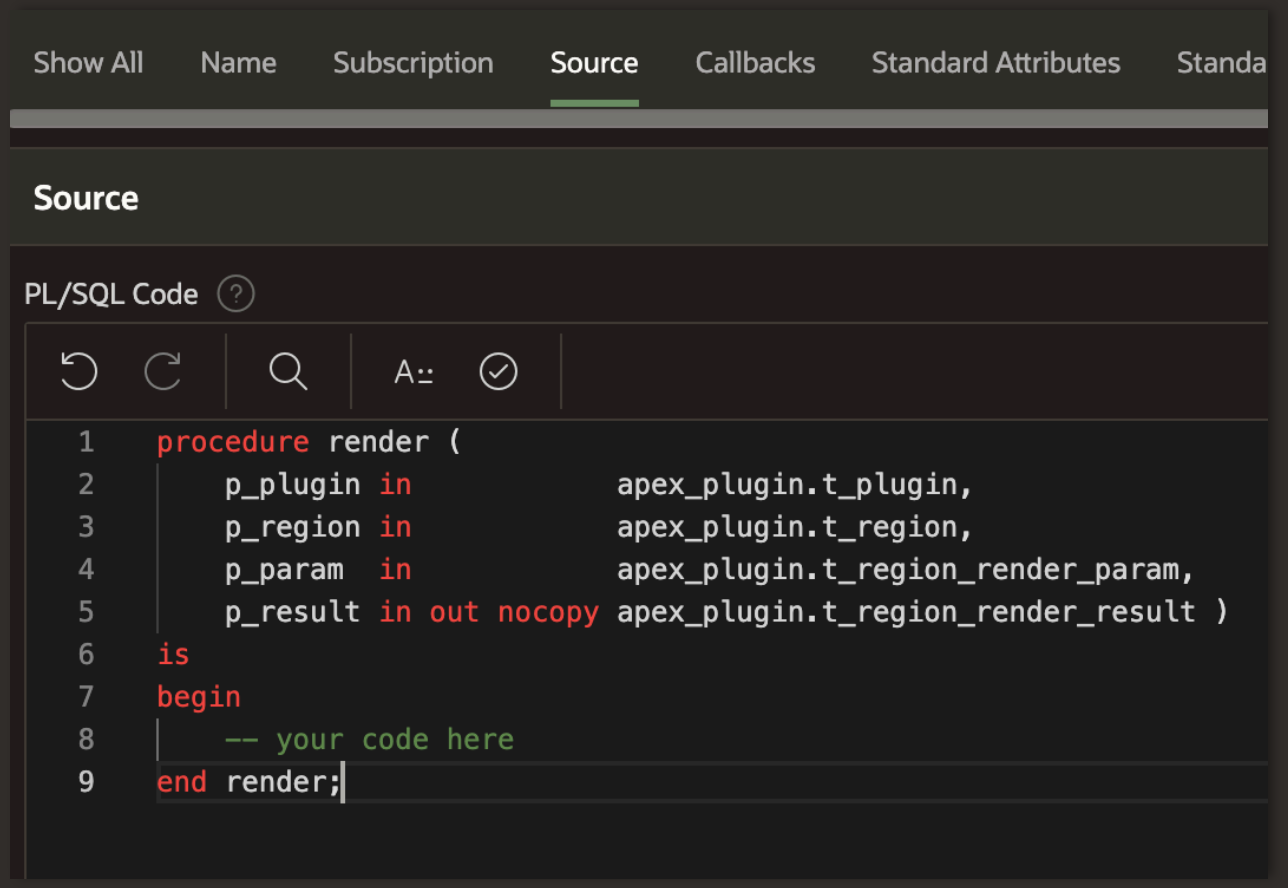
- Plug-in Definition
- PL/SQL Rendering Logic
- Custom Attributes
- Static Files

Unlimited Attributes: Key Enhancements

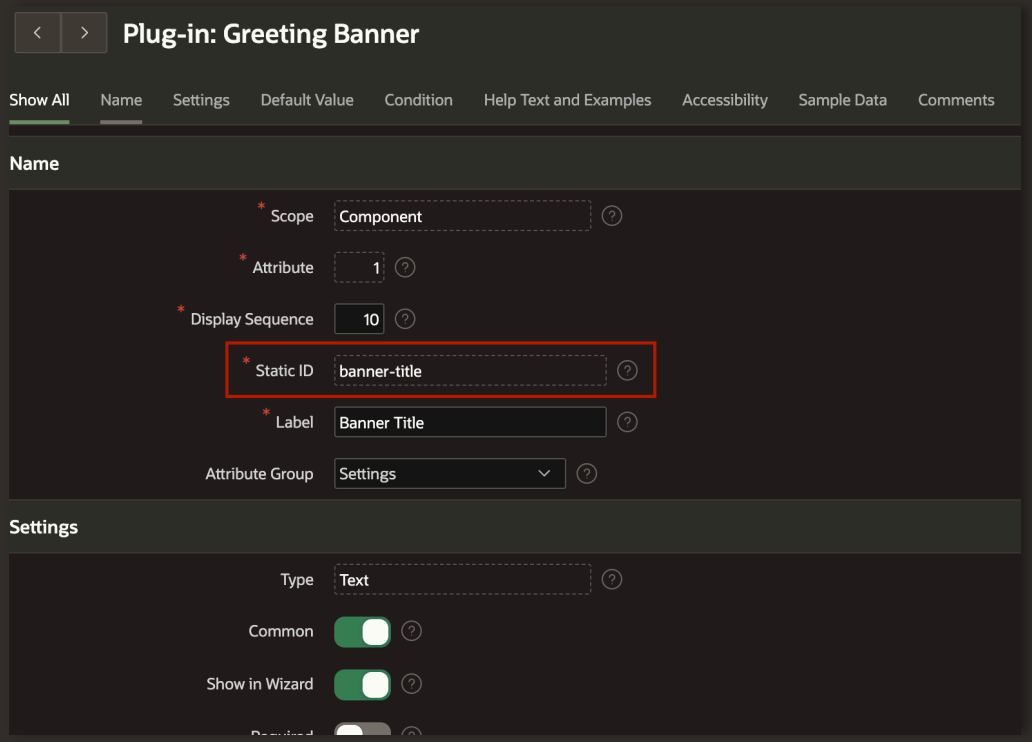
- **Template Component, Region** and **Item** type Plug-ins now fully leverage the new infrastructure
- A new **Attributes** column that stores data as a JSON Object (key/value pairs) has been introduced
- Legacy columns **attribute_01 .. attribute_25** are now deprecated
- A modern and future-proof "**Procedure**" callback interface replaces the old mechanism
- Plug-in **Attributes** now require a user friendly **static id**, e.g: css_class, region_height, etc.
- Plug-in Attributes are accessible via new APIs : **get_varchar2, get_number** and **get_boolean**
- **Substitution** now occurs at the attribute level, instead of Plug-in level.
- **Roadmap Preview** - Upcoming support for Dynamic Actions and Process Plug-in types

Function Interface VS Procedure Interface





Attribute Static ID



Custom Attributes — Add Attribute

Label	Static ID	Scope	Attribute Group	Sequence	Type	Required	Default Value	Depending on
Banner Logo	banner-logo	Application		10	Text	No		
Banner Title	banner-title	Component		10	Text	No		
Description	banner-description	Component		20	Textarea	No		
Button Title	banner-button-title	Component		30	Text	No		
Button Link	banner-button-link	Component		40	Text	No		
Banner Background	banner-bg	Component		50	Text	No		

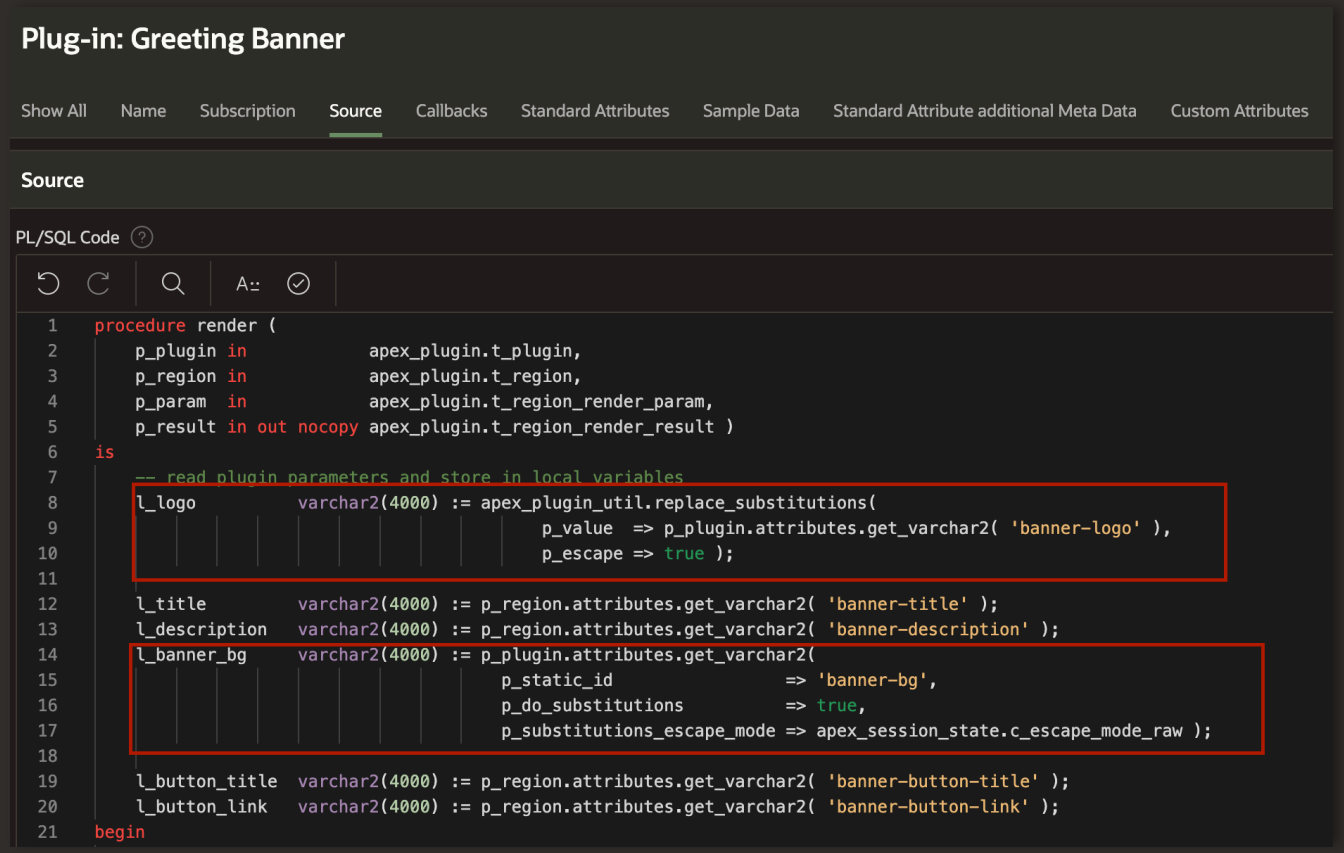
In the the Edit page of an attribute, you will now find a new **Static ID** filed, which can be utilised for future reference to access the attribute value.

The Static ID of an attribute has some caracter restrictions, it should be concise and directly relevant to the associated label.

Custom attributes benefitting the new infrastructure will be **automatically** assigned a new static ID during migration. For example, an attribute with sequence 1 will receive the static ID “attribute_01"

To enhance visibility, the Custom Attribute report now includes a new column, **Static ID**

Accessing Attribute values and performing Substitution



Attribute values can be accessed based on a **Static ID** using the new APIs tailored to specific **data type.** The following functions are available:

- get_varchar2(‘string-value’)
- get_number(‘number-value’)
- get_boolean(‘boolean-value’)

As previously mentioned **Substitution** is now performed at the attribute level and can be achieved in two ways:

- using apex_plugin_util.replace_substitution up to version 24.1
- using the parameters found under get_varchar2 API since version 24.2

New Type, APIs and Constants

44.3.24 t_plugin_attributes

```
type t_plugin_attributes is object (
    function get_varchar2 (
        p_static_id     IN VARCHAR2
        --
        p_default_value               IN VARCHAR2    DEFAULT NULL,
        p_do_substitutions            IN BOOLEAN     DEFAULT FALSE,
        p_do_serveronly_substitutions IN BOOLEAN     DEFAULT FALSE,
        p_substitutions_escape_mode   IN apex_session_state.t_escape_mode
                                   DEFAULT apex_session_state.c_escape_mode_html )
        RETURN VARCHAR2
        --
    function get_number (
        p_static_id     IN VARCHAR2,
        --
        p_default_value IN NUMBER DEFAULT NULL )
        RETURN NUMBER

        --Y returns TRUE / N returns FALSE
    function get_boolean (
        p_static_id     IN VARCHAR2,
        --
        p_default_value IN BOOLEAN DEFAULT NULL )
        RETURN BOOLEAN

);
```

p_do_substitutions and and **p_do_serveronly_substitutions** are mutually exclusive. Only one should be used, depending on the required type of substitution.

To enhance **flexibility**, new constants have been introduced, select the appropriate mode based on your specific needs.

Modes for escaping substitution variables.

```
subtype t_escape_mode is pls_integer range 1..6;

c_escape_mode_raw              constant t_escape_mode := 1;
c_escape_mode_html             constant t_escape_mode := 2;
c_escape_mode_html_attribute   constant t_escape_mode := 3;
c_escape_mode_javascript       constant t_escape_mode := 4;
c_escape_mode_striphtml        constant t_escape_mode := 5;
c_escape_mode_json             constant t_escape_mode := 6;
```

Dictionary view changes and Debugging

Language SQL Rows 10 Clear Command Find Tables

```
1  select pr.region_name,
2         pr.attributes.attribute_01                 as "Using dot notation",
3         json_value( pr.attributes, '$.attribute_01') as "Using json_value",
4         pr.attributes,
5         pr.attribute_01,
6         pr.attribute_25
7    from apex_application_page_regions pr;
```

Results | Explain | Describe | Saved SQL | History

REGION_NAME	Using dot notation	Using json_value	ATTRIBUTES
Greetings	Hello, APEX enthusiast!	Hello, APEX enthusiast!	{"attribute_01":"Hello, APEX enthusiast!","attribute_02":"Lorem ipsum dolor sit amet, c ligula eget dolor.","attribute_03":"Discover APEX!","attribute_04":"https://apex.oracle.com/en/","attribute_05":"#APP_FILES#de

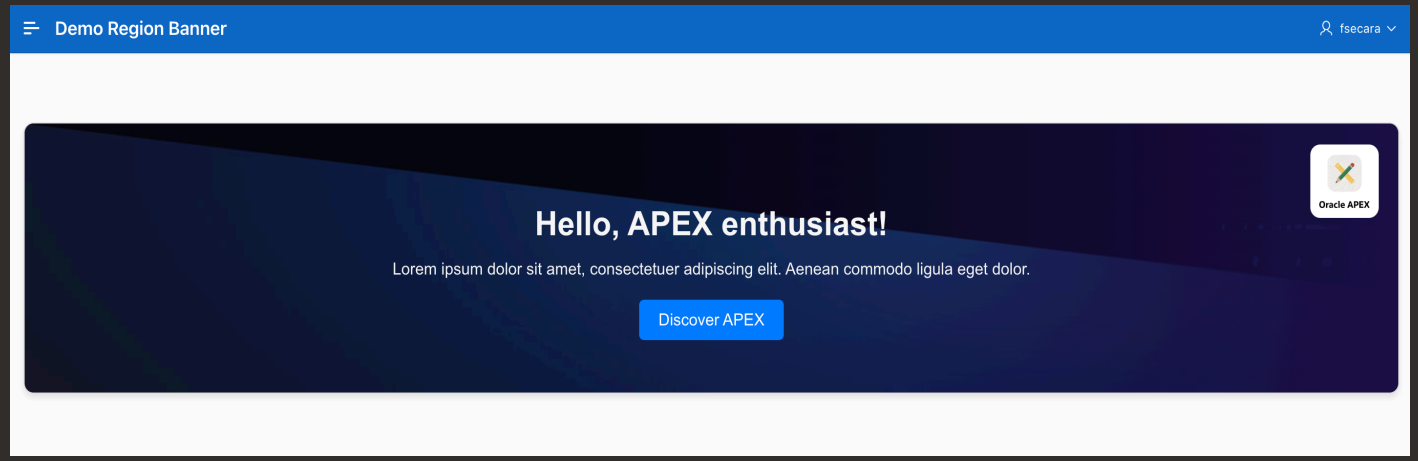
0.05427	0.00001	filter_region_dom_id:
0.05428	0.00008	Attributes:
0.05435	0.00002	banner-bg: #APP_FILES#devrel-header-bg.jpg
0.05437	0.00002	banner-button-link: https://apex.oracle.com/en/
0.05439	0.00002	banner-button-title: Discover APEX
0.05441	0.00002	banner-description: Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Aenean commodo ligula eget dolor.
0.05443	0.00002	banner-title: Hello, APEX enthusiast!
0.05445	0.00053	init_javascript_code:
0.05498	0.00004	Evaluate which components should be rendered for region slot NEXT
0.05502	0.00007	< APEX_APPLICATION_PAGE_REGIONS Banner
0.05509	0.00002	Evaluate which components should be rendered for page slot BODY_1

A single plug-in attribute can be accessed in SQL using either dot notation or the json_value function to extract values from **attributes**.

The columns attribute_01 … attribute_25 will return null, use **attributes** instead.

When Debug is enabled, **static ids** can be easily identified by their specific naming convention.

Demo - Migrate “Greeting Banner” plug-in to the new infrastructure



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