Oracle® OLAP

Developing Analytic Workspace Manager Plug-ins

10*g* Release 2 (10.2.0.3)

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This technical note describes how to create a Java plug-in for use with Oracle Analytic Workspace Manager, Version 10.2.0.3.0. With a plug-in, a Java developer can extend the functionality of Analytic Workspace Manager (AWM).

This technical note includes the following topics:

- Introducing Analytic Workspace Manager Plug-ins
- AWM Plug-in Interface and Example

See Also:

- *Oracle OLAP Application Developer's Guide*
- *Oracle OLAP Analytic Workspace Java API Reference*
- *Oracle OLAP Developer's Guide to the OLAP API*
- *Oracle OLAP Java API Reference*

Introducing Analytic Workspace Manager Plug-ins

An AWM plug-in enables you to run Java code in the context of AWM. With a plug-in, you can implement programs that perform actions such as the following:

- Create new type of calculations
- Create forecasts
- Implement security measures

In an AWM plug-in, you can use the following Java APIs:

- Oracle OLAP Analytic Workspace Java API
- Oracle OLAP Java API
- Oracle Business Intelligence Beans
- JDBC API
- Swing API

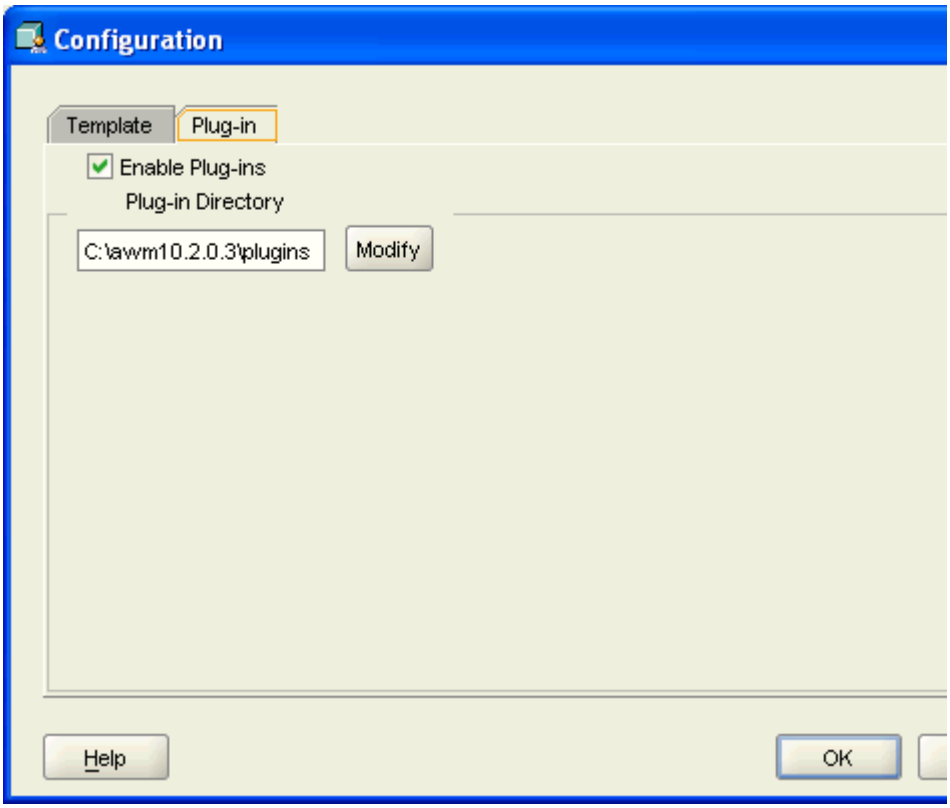
You can invoke OLAP DML or SQL procedures by using JDBC classes.

Enabling AWM Plug-ins

AWM has a configuration option that enables it to use plug-ins. To enable plug-ins, in the AWM Model View, from the **Tools** menu select **Configuration**. On the **Plug-in** tab, select **Enable Plug-ins**. On that tab, the **Plug-in Directory**

field indicates the directory in which AWM looks for plug-ins. Figure 1 shows the **Plug-in** tab of the **Configuration** dialog box with plug-ins enabled.

Figure 1 Plug-in Tab in Configuration Dialog Box



How AWM Calls a Plug-in

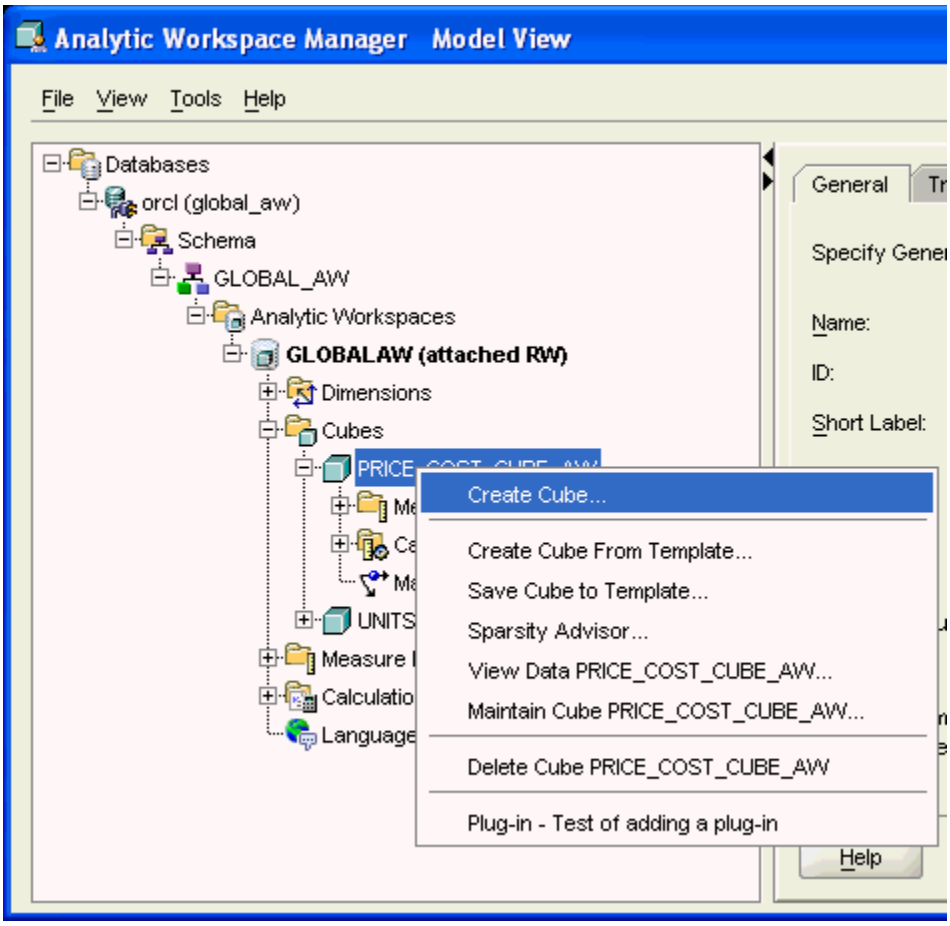
If AWM has plug-ins enabled, then on startup AWM dynamically loads Java code from JAR files located in the plug-ins directory. After loading the contents of the JAR files, AWM looks for classes that implement the `AWMPlugin` interface.

> **Note:** You can include multiple plug-ins in a single JAR file.

When a user right-clicks an item in the AWM Model view navigation tree, a menu appears that presents the actions available for the item. The menu also displays the plug-ins that apply to the item. The plug-in uses the `isSupported` method to indicate whether it applies an item in the tree.

The menu displays the text `Plug-in -` followed by the string returned by the `getMenu` method of the plug-in. Figure 2 shows the menu that AWM displays for a right-click on a Cube in the tree. The menu includes the `PluginTest` example plug-in. For the code of the plug-in example, see Example 2.

Figure 2 Right-click Menu of the AWM Model View Navigation Tree



If the user selects the plug-in, then AWM calls the `handle` method of the plug-in. The `handle` method specifies the actions that the plug-in performs. The `refreshTree` method of the plug-in indicates whether AWM refreshes the navigation tree to include any new items created by the plug-in.

AWM passes the following objects as input parameters to the plug-in methods:

- A `java.sql.Connection` object that represents the current connection to the Oracle Database instance.
- A `java.lang.String` object that indicates the type of the selected AWM navigation tree item. Currently for tree items immediately under the **Schema** item, AWM passes a String that contains SCHEMA. For all other items, AWM passes null.
- A `java.lang.Object` that AWM associates with the item selected in the AWM navigation tree. The `Object` can be a `String`, an object from the `oracle.AWXML` package of the Oracle OLAP Analytic Workspace Java API, or `null`. The `oracle.AWXML` object can be one of the following:

  ```
  Attribute
  Cube
  DerivedMeasure
  Dimension
  Hierarchy
  ```

```
Level
Measure
OlapMeasure
SolveGroup
```

- An `oracle.AWXML.AW` object that represents the current analytic workspace.
- A `java.util.Map` object that is for use by AWM.

For the `handle` method, AWM also passes a `java.awt.Frame` object that the plug-in can use as the parent frame for user interface components.

AWM does not pass any user identification or password to the plug-in. It only passes the connection object. An AWM plug-in does not allow you to do anything that you cannot do by writing a standalone Java Program.

Steps in Creating a Plug-in

The prerequisites for creating an AWM plug-in are the following:

- Include the `AWMPlugin` interface class in your development environment. You can download a JAR file that contains the `AWMPlugin.class` file from the OLAP OTN Web page http://www.oracle.com/technology/bi/olap/olap.html. You could also compile your own `AWMPlugin.class` file by creating the directory structure `oracle/olap/awm/plugin` in your development environment and creating the `AWMPlugin.java` interface in that directory.
- Compile the code with JDK 1.4.

> **Note:** Only plug-ins compiled with JDK 1.4 are compatible with Analytic Workspace Manager in 10*g* Release 2 (10.2.0.3). A plug-in compiled with JDK 1.5 is not compatible with AWM in this release.

To create an AWM plug-in, do the following:

1. Create a class that implements the `AWMPlugin` interface. In the `handle` method, include the code for the operations that the plug-in performs.
2. Using JDK 1.4, compile the plug-in and any other classes that it uses.
3. Deploy the plug-in and other classes to a JAR file. You can include more than one plug-in an the same JAR file.
4. Put the JAR file in the plug-ins directory.
5. Start AWM.

> **Note:** Each time you put a new or updated version of a JAR file in the plug-ins directory, you must restart AWM. AWM only loads the contents of the JAR files upon startup.

AWM Plug-in Interface and Example

This section contains the specification for the `AWMPlugin` interface and an example that implements the interface.

Plug-in Interface Specification

Example 1 has the code for the interface.

Example 1 The AWMPlugin Interface

```
package oracle.olap.awm.plugin;

import oracle.AWXML.AW;
import java.awt.Frame;
import java.sql.Connection;
import java.util.Map;

/**
 * On startup, AWM looks for classes that implement the AWMPlugin interface.
 * When calling the methods specified by the interface, AWM passes in the
 * following objects:
 *
 * <UL>
 *   <LI>A Connection object for the current connection to the Oracle
 *       Database instance.
 *   <LI>A String object that relates to the type of the selected item in
 *       the AWM Model View navigation tree or null.
 *       Currently for tree items immediately under the Schema item, AWM
 *       passes a String that contains SCHEMA. For all other items, AWM
 *       passes null.
 *   <LI>An Object that is associated with the selected item in the tree
 *       or null. The Object is a String or an oracle.AWXML object.
 *  <LI>The oracle.AWXML.AW object for the current analytic workspace.
 *  <LI>A Map object that is for future use by AWM.
 * </UL>
 *
 * The isSupported method indicates whether the plug-in applies to an
 * item in the AWM navigation tree.
 * When a user right-clicks a tree object that the plug-in supports, AWM
 * adds the string returned by the getMenu method to the menu it displays.
 * If the user selects the plug-in from the menu, then AWM calls the handle
 * method.
 * When calling the handle method, AWM passes a Frame object that the plug-in
 * can use as the parent Frame for user interface elements it displays.
 */
public interface AWMPlugin
{
  /**
   * Indicates whether the plug-in applies to the selected item in the
   * AWM Model View navigation tree.
   *
   * @param conn The Connection object for the current connection to the
   *             Oracle Database instance.
   * @param type A String that is associated with the selected tree item
   *             or null.
   * @param obj An Object that is associated with the selected tree item
   *             or null. The Object is a String or an oracle.AWXML object.
   * @param aw The AW object for the current analytic workspace.
```

```
     * @param params A Map for future use by AWM.
     *
     * @return A boolean that indicates whether AWM should display the
     *          plug-in for the selected item in the tree.
     */
    boolean isSupported(Connection conn, String type, Object obj, AW aw,
                        Map param);

    /**
     * Gets the String to display on the right-click menu for the plug-in.
     *
     * @param conn The Connection object for the current connection to the
     *             Oracle Database instance.
     * @param type A String that is associated with the selected tree item
     *             or null.
     * @param obj An Object that is associated with the selected tree item
     *             or null. The Object is a String or an oracle.AWXML object.
     * @param aw The AW object for the current analytic workspace.
     * @param params A Map for future use by AWM.
     *
     * @return A String the contains the text that AWM displays on the
     *         right-click menu.
     */
    String getMenu(Connection conn, String type, Object obj, AW aw, Map param);

    /**
     * Specifies the actions to take when the user selects the plug-in from
     * the navigation tree right-click menu.
     *
     * @param parent A Frame to use as the parent for user interface objects.
     * @param conn The Connection object for the current connection to the
     *             Oracle Database instance.
     * @param type A String that is associated with the selected tree item
     *             or null.
     * @param obj An Object that is associated with the selected tree item
     *             or null. The Object is a String or an oracle.AWXML object.
     * @param aw The AW object for the current analytic workspace.
     * @param params A Map for future use by AWM.
     */
    void handle(Frame parent, Connection conn, String type, Object obj,
                AW aw, Map param);

    /**
     * Indicates whether AWM should refresh the navigation tree.
     * If the plug-in creates new oracle.AWXML objects, then this method
     * should return true.
     *
     * @param conn The Connection object for the current connection to the
     *             Oracle Database instance.
     * @param type A String that is associated with the selected tree item
     *             or null.
     * @param obj An Object that is associated with the selected tree item
     *             or null. The Object is a String or an oracle.AWXML object.
     * @param aw The AW object for the current analytic workspace.
     * @param params A Map for future use by AWM.
     */
    boolean refreshTree(Connection conn, String type, Object obj, AW aw,
                        Map param);
}
```

Example of an AWM Plug-in

Example 2 contains the code for the `PluginTest` class, which implements the `AWMPlugin` interface. The plug-in supports `oracle.AWXML.Cube` and `oracle.AWXML.DerivedMeasure` objects, which correspond to the items under the **Cubes** and **Calculated Measures** items, respectively, of the navigation tree. The plug-in displays a string representation and the class of the `oracle.AWXML` object. It also calls the `getAutoSolve` method of the `Cube` or `DerivedMeasure` object and displays a message determined by the return value of that method. The message appears in a dialog box displayed by `JOptionPane` class. For an example of the message that `PluginTest` displays, see Figure 3.

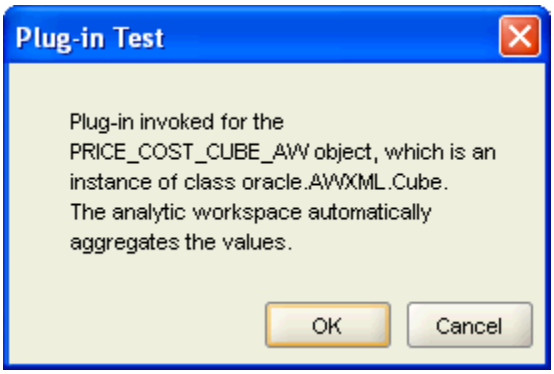
Example 2 The PluginTest Example

```
import oracle.AWXML.AW;
import oracle.AWXML.Cube;
import oracle.AWXML.DerivedMeasure;
import oracle.olap.awm.plugin.AWMPlugin;

import java.awt.Frame;
import java.sql.Connection;
import java.util.Map;
import javax.swing.JOptionPane;

public class PluginTest implements AWMPlugin
{
  public boolean isSupported(Connection conn, String type, Object obj,
                             AW aw, Map params)
  {
    // Support Cube and DerivedMeasure objects.
    if (obj instanceof Cube || obj instanceof DerivedMeasure)
    {
      return true;
    }
    return false;
  }

  public String getMenu(Connection conn, String type, Object obj, AW aw,
                        Map params)
  {
    // Text to display on the right-click menu.
    String menu = "Test of adding a plug-in";
    return menu;
  }

  public void handle(Frame parent, Connection conn, String type, Object obj,
                     AW aw, Map params)
  {
    String msg = "Plug-in invoked for ";
    String response = "";
    if (obj != null)
    {
       msg += "the " + obj.toString() + " object, ";
       msg += "which is an instance of " + obj.getClass().toString() + ".";
    }
```

```
    if (type != null)
      msg += "\nThe type is " + type + ".";

    if (obj instanceof Cube)
    {
      Cube cube = (Cube) obj;
      response = cube.getAutoSolve();
      response = evaluateResponse(response);
      msg += "\n" + response;
    }
    else if (obj instanceof DerivedMeasure)
    {
      DerivedMeasure dmeas = (DerivedMeasure) obj;
      response = dmeas.getAutoSolve();
      response = evaluateResponse(response);
      msg += "\n" + response;
    }

    JOptionPane.showConfirmDialog(null,
                                  msg,
                                  "Plug-in Test",
                                  JOptionPane.CANCEL_OPTION,
                                  JOptionPane.PLAIN_MESSAGE);
  }

  public boolean refreshTree(Connection conn, String type, Object obj,
                             AW aw, Map params)
  {
    return true;
  }

  public String evaluateResponse(String response)
  {
    String isYes = "YES";
    String isNo = "NO";
    String isDefault = "DEFAULT";

    if(isYes.equalsIgnoreCase(response))
    {
      response = "The analytic workspace automatically aggregates "
                  + "the values.";
    }
    else if(isNo.equalsIgnoreCase(response))
    {
      response = "The analytic workspace does not automatically aggregate "
                 + "the values.";
    }
    else if(isDefault.equalsIgnoreCase(response))
    {
      response = "Whether the analytic workspace automatically aggregates "
                 + "the values of the DerivedMeasure depends on the "
                 + "default specified by the parent Cube.";
    }

    return response;
  }
}
```

Figure 3 illustrates the type of dialog box that the `PluginTest` example displays.

Figure 3 Dialog Box Displayed by the PluginTest Example



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