orbis software
THE POWER TO MAKE IT HAPPEN

**TaskCentre® v4.5
Oracle Trigger Tool
White Paper**

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Introduction

Overview

The Oracle Trigger Tool is used to create a Task Step that utilises the Oracle Server trigger functionality to create a trigger on a table of a specified Oracle data source. When a specified data modification is attempted, such as an attempt to add or delete a table row, the trigger then causes a Task to run.

Features

- A Trigger may be activated when any row is updated, deleted or a new row inserted.

- A Trigger may be activated when specified columns are updated.

- Values of updated, deleted or new rows may be mapped to variables for use in other Steps within the Task.

Global Configuration

Before the Oracle Trigger Step the Oracle Agent must be installed and registered on the same machine as the data source.

A User with System Administrator rights must then configure the Tool to select the Oracle Agent and the synchronisation polling interval to be used when communicating with the it.ger Tool requires no global configuration.

This is achieved through the Oracle Global Configuration dialog (Ref: Figure 1) which may be opened by clicking on the Event node 🔲 in the Task Manager and then double-clicking on the Oracle Trigger icon 🔲 in the Items List.
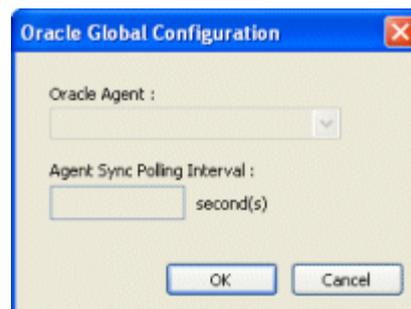

Figure 1. Oracle Global Configuration dialog.

The dialog consists of the followings:

- **'Oracle Agent'** (drop down list) - A list of all Agents that are registered with the TaskCentre server is displayed for selection.

- **'Agent Synch Polling Interval'** (field) - A number representing the polling interval ins seconds to be used to set how often the selected Agent checks for new/updated or deleted triggers.

Technical Summary

Working with other Steps

The Oracle Trigger Step is independent of any other Steps used in a Task. However, it accesses parameters that the Task exposes through the Task Browser dialog.

Dependencies

The products, technologies, protocols or systems that are required for the Oracle Trigger Step to work are listed below.

- **Oracle 8, 9 or 10 Data Source** - All versions support the use of triggers on the following platforms:

  o Linux – Linux kernels; 2.2, 2.4 and 2.6

  o Linux – Debian, Red Hat and other distributions

  o AIX

  o FreeBSD

  o HP – HP-UX (32 and 64 bit versions)

  o SGI Irix

  o DEC OSF1

  o Sun Solaris 2, 8, 9 and 10 (32 and 64 bit sparc and x86 versions)

  o Microsoft Windows NT, 2000, XP and 2003.

  o Microsoft Windows 98 and ME (console mode)

  o Apple Mac OS X

- **Oracle Trigger Agent** - The agent must be installed on the Oracle Server.

Oracle Trigger Agent

The Oracle Trigger agent is a service that sits between TaskCentre and Oracle Server and may be installed onto any Oracle Server. It is responsible for both maintaining the Triggers in Oracle Server and for handling the running of a Task once a Trigger has been fired.

When an Oracle Trigger is fired, a connection is made to the agent service which will then launch the applicable Task.
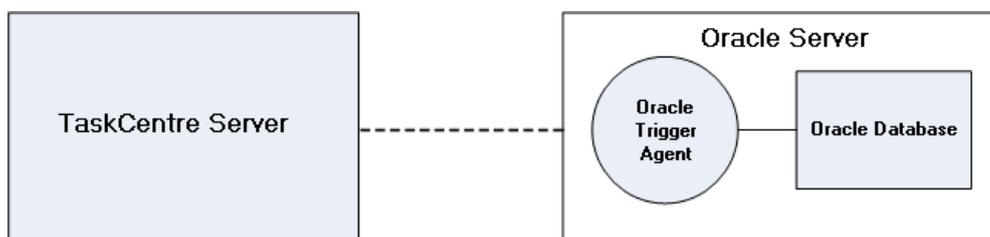
Objects Consumed

The Oracle Trigger Step consumes no objects exposed by other Steps.

Objects Exposed

The objects that the Oracle Trigger Step exposes that can be utilised by other Steps are listed below.

- **Variables (Text)** - Textual data is mapped to selected Parameter Variables for use in other Steps

Configuration

An Oracle Trigger Step is configured through the Oracle Trigger dialog which is displayed through the following methods:

To create a new Step:

- In the Task Browser dialog, select the 'Tools' tab click on the Oracle Trigger icon under the 'Event' node and then drag and drop- it onto the Task Plan. The Oracle Trigger dialog will open and once created an icon for the Step will be displayed on the Task Plan.

- In the Task Browser dialog, right-click on the Steps node and select the 'Oracle Trigger' option from the 'New' > 'Event' drop down menu. The Oracle Trigger dialog will open and once created the Step is displayed under the Steps node in the Task Browser. It may then be dragged and dropped onto the Task Plan.

- Right-click anywhere on the Task Plan in the Design tab of the Task dialog and selected the 'Oracle Trigger' option from the 'New' > 'Event' drop down menu. The Oracle Trigger dialog will open and once created an icon for the Step will be displayed on the Task Plan.

To open an existing Step:

- On the Task Plan in the Design tab of the Task dialog, double-click on the Oracle Trigger icon . The Oracle Trigger dialog will open to enable the Step details to be edited.

- In the Task Browser dialog, double-click on the Oracle Trigger node displayed under the Steps node. The Oracle Trigger dialog will open to enable the Step details to be edited.

- In the Task Browser dialog, right-click on the Oracle Trigger node displayed under the Steps node and select the 'Edit Step' option from the drop down menu. The Oracle Trigger dialog will open to enable the Step details to be edited.

The dialog has three tabbed panes described below through which an Oracle Trigger Step may be created and configured.
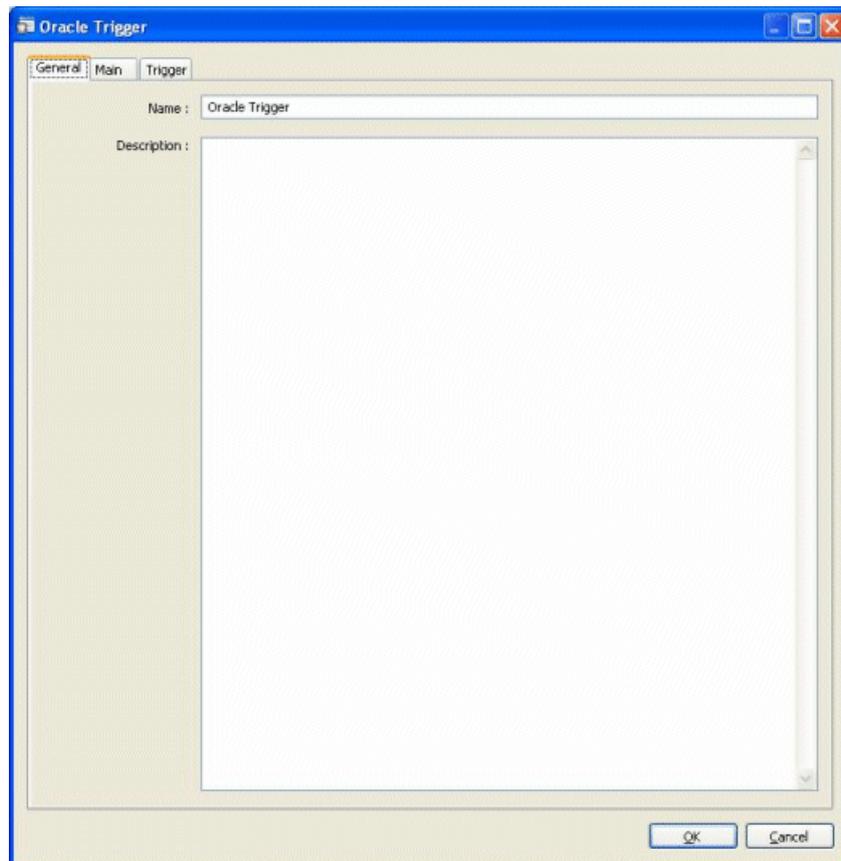
General

Figure 2. Oracle Trigger – General tab.

The contents of the **'General'** tab (Ref: Figure 2) are as follows:

- **'Name'** (field) – A unique name for the Step may be manually entered.

- **'Description'** (field) – A description for the Step may be manually entered.

Main

The Main tab (Ref: Figure 3) provides options for configuring the connection to the required database table to be used by the trigger and where more than one trigger has been created for the Task the order in which it is run.

The contents of the **'Main'** tab are as follows:

- **'Server'** (area) - This area contains the following for selecting a server which is hosting the required Oracle database:

  - **'Select Server:'** (drop down list) - Displays a list of all available Oracle Servers that have the Oracle Trigger Agent installed for selection.

  - **'Oracle SID'** (field) – The Oracle server ID may be manually entered.

  - **'Advanced'** (button) – Opens the Oracle Port Number dialog (Ref: Figure 4) to enable a port number to be manually entered.
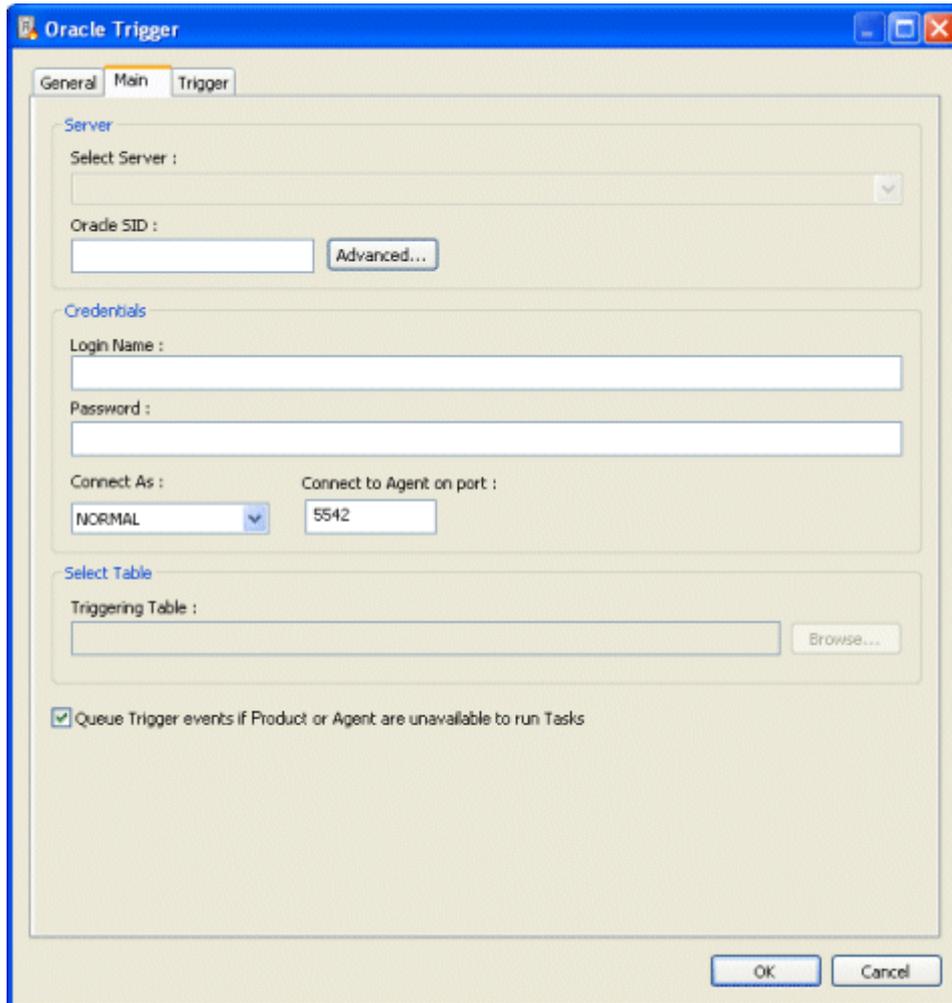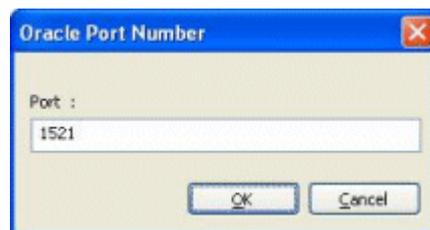
Figure 3. Oracle Trigger – Main tab.

Figure 4. Oracle Port Number dialog.

- **'Credentials'** (area) - This area contains the following for setting the selected server login credentials:

    o **'Login Name'** (field) - A valid login name for connecting to the selected server may be manually entered.

    o **'Password'** (field) - A valid password for the selected login name may be manually entered.

    o **'Connect As'** (drop down list) – Displays a list of user privileges for selection.

    o **'Connect to Agent on port'** (field) – The port number to be used to connect to the Agent may be manually entered.

- **'Select a Table'** (area) - This are contains the following for selecting the required Oracle database table or view:

    o **'Trigger Table'** (field) - Displays the table name selected from the Oracle database.

    o **'Browse...'** (button) - Opens the Oracle Browser dialog (Ref: Figure 5) to enable an Oracle database table to be selected.

- **'Queue Trigger events if TaskCentre or Agent are unavailable to run Tasks'** (option check box) - If selected then the trigger events are stored until TaskCentre or the Agent are available.
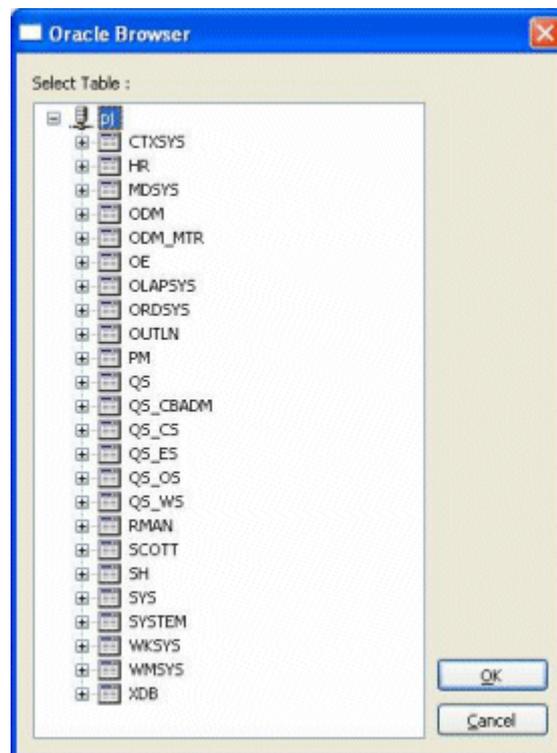
Oracle Browser

Figure 5. Oracle Browser dialog.

The Oracle Server Browser dialog is displayed when the 'Browse...' button for the 'Triggering Table' field is selected in the Main tab of the Oracle Trigger dialog and is used to select a database table to be used for the trigger

Trigger

The Trigger tab provides a comprehensive set of options for configuring the trigger. The dialog has two tabbed panes listed below through which an Oracle Trigger may be created and configured.

Configure

The Configure tab (Ref: Figure 6) provides configuration options to enable TaskCentre to automatically create the necessary Oracle Script for the trigger. The script created may be viewed by clicking on the Script tab.
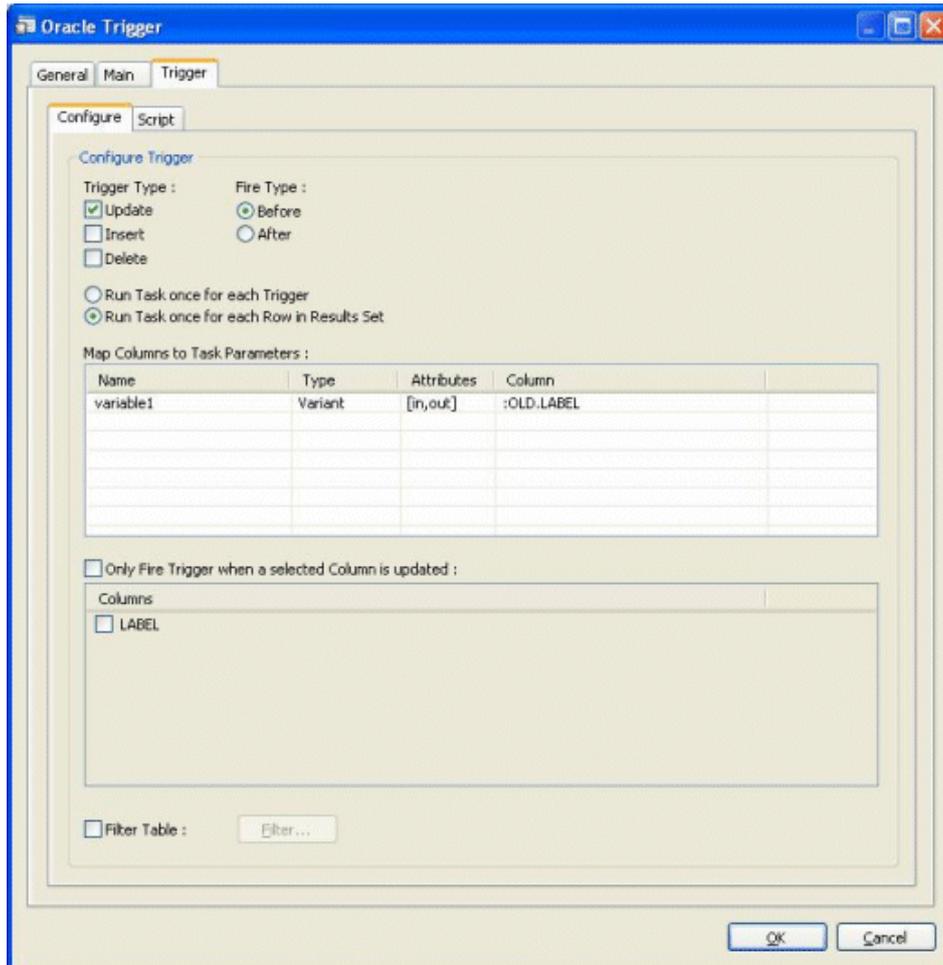
Figure 6. Oracle Trigger – Trigger tab - Configure.

The Configure tab contains the following:

- **'Trigger Type:'** (option check boxes) - The following options are provided for selection:

  - **UPDATE** - When this trigger type is selected, the trigger is fired when a column in the selected table is updated.

  - **INSERT** - When this trigger type is selected, the trigger is fired when a new row is added to the table.

  - **DELETE** - When this trigger type is selected, the trigger is fired when an existing row is deleted from the table.

- **'Fire Trigger:'** (option radio buttons) - The following options are provided for selection:

  - **BEFORE** - When this trigger option is selected, the trigger fires before the table has been updated.

  - **AFTER** - This is the default trigger option which fires the trigger after the table has been updated.

- **'Run Task once for each Trigger'** (option radio button) - If this option is selected then the Task is run once for each trigger created for the Task. Numerous updates may therefore be made to the table but the trigger will only fire once. No mapping of results set columns

to Task Parameters is available, but any changes to the database that caused the trigger to fire may be accessed through TaskCentre's memory feature.

- **'Run Task once for each Row in Results Set'** (option radio button) - If this option is selected then the Task is run once for each row in the results set.

- **'Map Columns to Task Parameters:'** (table) - Displays a list of variables created for the Task. The 'Columns' column contains a drop down list of columns for selection, from the 'Inserted' and 'Deleted' tables created by the Oracle Trigger, to be mapped against the variable. The variable may then be used to expose the selected column value to subsequent Steps.

- **'Only Fire Trigger when a selected Column is updated:'** (option check box) - Selecting this option activates the 'Columns' table displayed below it.

- **'Columns'** (table) - Displays a list of columns available in the selected database table. A check box is provided to the left of each column name for selecting / de-selecting the column. The trigger is then fired when any of the selected columns is updated.

- **'Filter Table'** (option check box) - Selecting this option activates the **'Filter'** button so that it may be selected.

- **'Filter'** (button) - Clicking on the Filter button opens the Selecting the **'Filter Table Expression'** dialog (Ref: Figure 7) to enable a new expression to be entered.

Filter Table Expression dialog

The **'Filter Table Expression'** dialog (Ref: Figure 7) is displayed when the **'Filter'** button is selected in the **'Trigger'** tab of the **'Oracle Trigger'** dialog.
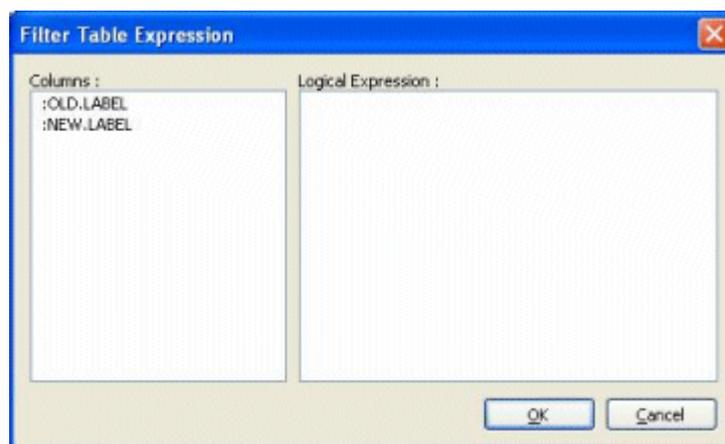
Figure 7. Filter Table Expression dialog.

In the **'Main'** tab of the Tool, an Oracle database and table are selected. You can configure the trigger to fire when a specific column is updated but through the Filter Table Expression dialog you may also create a filter expression on column values.

For example, a table is used to store the value of orders received in a column called 'Value'. The Task runs a report to list all orders received with a value in excess of £10,000 and then sends it to the Sales Manager.

The report could be scheduled to run on a regular basis but the manager requires the report to be run each time a new large value order is received.

The following expression is therefore created for the trigger 'Inserted.Value > = 10000' to cover occurrences where the value is equal to or exceeds £10,000.

The dialog contains the following for creating a filter:

- **'Columns'** (table) - Displays a list of columns available for the selected table.

- **'Logical Expression'** (text box) - The expression is manually entered into this area. Any columns listed in the 'Columns' table may be dragged and dropped into the text box for inclusion in the filter expression.
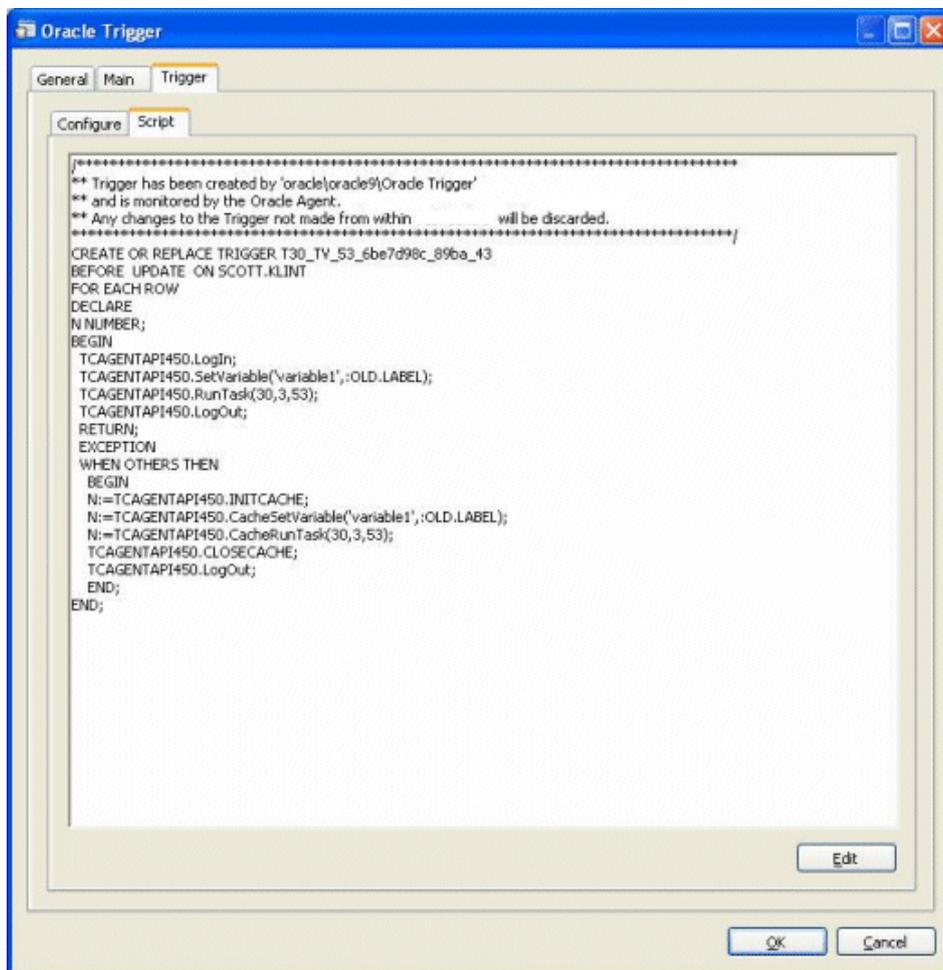
Script

Figure 8. Oracle Trigger – Trigger tab - Script.

The Script tab (Ref: Figure 8) is provided to enable the Oracle Script for a trigger to be manually created. When the tab is first selected it will display the Oracle Script automatically created for the trigger through the Configure tab using the default options selected in the tab.

Selecting the '**Edit**' button switches the tab to script mode so that the Oracle Script may be manually edited. Once the script mode has been selected it cannot be reversed and the trigger may only be edited by updating the Oracle Script