Note
Before you use this information and the product it supports, read the information in “Notices” on page 411.

Product Information
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Introduction

This document is intended for use with IBM® Planning Analytics.

This document is a collection of reference material for the IBM Planning Analytics software functions, variables, and other programming elements.

Planning Analytics provides software solutions for the continuous management and monitoring of Financial And Operational Performance Management across the enterprise.

Samples disclaimer

The Sample Outdoors Company, Great Outdoors Company, GO Sales, any variation of the Sample Outdoors or Great Outdoors names, and Planning Sample depict fictitious business operations with sample data used to develop sample applications for IBM and IBM customers. These fictitious records include sample data for sales transactions, product distribution, finance, and human resources. Any resemblance to actual names, addresses, contact numbers, or transaction values is coincidental. Other sample files may contain fictional data manually or machine generated, factual data compiled from academic or public sources, or data used with permission of the copyright holder, for use as sample data to develop sample applications. Product names referenced may be the trademarks of their respective owners. Unauthorized duplication is prohibited.

Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products.

This product does not currently support accessibility features that help users with a physical disability, such as restricted mobility or limited vision, to use this product.

Forward-looking statements

This documentation describes the current functionality of the product. References to items that are not currently available may be included. No implication of any future availability should be inferred. Any such references are not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of features or functionality remain at the sole discretion of IBM.

Security considerations

For security considerations for IBM Planning Analytics, see Planning Analytics Installation and Configuration. Information on managing user and group authentication can be found in the Managing Users and Groups chapter of the TM1 Operations documentation.
Chapter 1. Windows and Dialog Boxes

This section describes all significant IBM Planning Analytics windows and dialog boxes.

**Action Button Properties Dialog Box**

Use the Action Button Properties dialog box to add TM1® Action buttons to a worksheet. You can configure the button to run a process and/or navigate to another worksheet.

For examples and steps on using Action buttons in worksheets, see *TM1 for Developers* in the IBM Knowledge Center (https://www.ibm.com/support/knowledgecenter/SSD29G_2.0.0).

**Server**

This list includes the names of all TM1 servers currently available on your network.

Select the server where the process or target worksheet is located for your Action button.

**Connect**

This button is available only when you are not connected to the server currently selected in the server list box.

Click this button to connect to the server that you selected in the server list box.

**Disconnect**

This button is available only when you are connected to the server currently selected in the server list box.

Click this button to disconnect from the server that you selected in the server list box.

**Action**

Select the action that you want the Action button to perform when it is clicked.

- **Run a TurboIntegrator Process**
  
  Select this option to configure an Action button that runs a process. When you select this option, the Process tab becomes enabled.

- **Go to another Worksheet**
  
  Select this option to configure an Action button that navigates to another worksheet. When you select this option, the Worksheet tab becomes enabled.

- **Run a Process, then go to a Worksheet**
  
  Select this option to configure an Action button that runs a process and then navigates to another worksheet. When you select this option, both the Process and Worksheet tabs become enabled.

- **Calculate/Rebuild Only**
  
  Select this option to recalculate or rebuild without running a TI process or navigating to a new worksheet. This can be useful if you want to update only the current sheet or reload the original version of an Active Form.

You can also use the **Calculate** tab to select the calculation operation that you want TM1 to perform *before* running a TI process or navigating to another worksheet.

**OK**

Closes the Action Button Properties dialog box and inserts an Action button into your worksheet.

**Cancel**

Closes the Action Button Properties dialog box without inserting an Action button.
Process Tab
Use the Process tab to configure an Action button to run a process.

Process
Use this list to select the process you want to run in one of the following ways:
- To run a process that is available on the current server, select the process name from the list.
- To retrieve both the process name and parameter values from the current worksheet, select Get Process info from Worksheet.

Options
Opens the Process Options dialog where you can control the behavior of the Action button before and after the process is run.
For details, see the section “Process Options Dialog Box” on page 39.

Process Name
This option appears only when you select the Get Process info from Worksheet in the Process list.
Enter an Excel reference that provides the name of the process to run in one of the following ways:
- To reference a single cell, use the following format: =ColumnNameRowName. For example: =A1.
- To reference a named range in Excel, use the following format: =NameOfRange
- To select the cell from the current worksheet, click the Excel Reference button next to the Process Name box.

Parameters
Enter values for the process parameters, depending on how you selected the process name from the Process list.
- If you selected a process from the Process list, the Parameters grid appears with a list of the parameters for the selected process. You can enter values for each parameter directly into the grid or use an Excel reference that dynamically retrieves a parameter value from the current worksheet.
- If you selected the Get Process info from Worksheet option in the Process list, you must use an Excel reference to retrieve the parameter values from the current worksheet. You can enter a reference to a single cell, a range of cells, or a named range. Any reference must point to the appropriate number of cells, depending on the number of parameters that the process is expecting.

Click the Excel Reference button to directly select the cell or range of cells from the worksheet.
For examples, see the TM1 for Developers documentation.

Worksheet Tab
Use the Worksheet tab to configure an Action button to navigate to another Excel worksheet.

Look In
Use one of the following methods to select a worksheet:
- TM1 Applications - Select this option if you want to choose a worksheet from the TM1 Applications tree.
- Files - Select this option if you want to choose a worksheet from your computer.

Browse
Click this button to select the worksheet to which you want to navigate.
• If you selected the TM1 Applications option, a dialog box opens where you can select a worksheet from the TM1 Applications tree.
• If you selected the Files option, the Open dialog box appears where you can browse and select a file from your computer.

**Workbook**
Contains the path and name of the Excel workbook to which you want to navigate. You can enter this value in one of the following ways:
• Click the **Browse** button next to the Look In option to select a workbook from either the TM1 Applications tree or from the files on your computer.
• Click the **Excel Reference** button to select a cell that evaluates to a workbook path and name.
• Manually enter a workbook name and path.
• Manually enter an Excel reference that evaluates to a workbook path and name.

The path for a workbook in the TM1 Applications tree uses the format:
```
<FolderName>\<FolderName>\<WorkbookName>
```
For example:
Planning Sample\Bottom Up Input\Budget Input

The path for a network file uses the format:
```
\<ComputerName>\<FolderName>\<WorkbookName>
```
For example:
```
\boston\reports\2007_summary.xls
```
For details and examples, see the IBM Cognos® TM1 for Developers documentation.

**Sheet**
Contains the name of the worksheet to which you want to navigate. You can enter this value in one of the following ways:
• Click the **Browse** button to select a workbook and then select a worksheet from the Sheet list.
• Manually enter a worksheet name.
• Manually enter an Excel reference that evaluates to a worksheet name.
• Click the **Excel Reference** button to select a cell that evaluates to a worksheet name.

For details and examples, see the IBM Cognos TM1 for Developers documentation.

**Match Title Elements**
This option automatically matches and sets the title dimensions between the source and target worksheets when a user clicks the **Action** button to navigate to the target worksheet.

For details and examples, see the IBM Cognos TM1 for Developers documentation.

**Replace Current Workbook**
This option determines how the target worksheet is opened.
• If this option is not selected (default), the target worksheet is opened in a new window in Excel or on a new tab in TM1 Web.
• If this option is selected, the target worksheet is opened in the same window or tab, replacing the source worksheet.

**CAUTION:** If you enable this option, remember to save your workbook *before* testing the new button. You could lose your changes if you click the button and cause the current workbook to close.
Advanced Options
Click this button to open the Advanced Options dialog box where you can manually map fields between the source and target worksheets for an Action button that navigates from one worksheet to another.

For details, see “Advanced Options Dialog Box” on page 4.

Appearance Tab
Use the Appearance tab to configure the visual appearance of the Action button.

Caption
Sets the caption text that displays on the Action button.

Font
Click this button to display the Font dialog box where you can set the font style and size for the button text.

Show Background Image
Allows you to select an image file (bmp, gif, or jpg format) that will be stretched to fit the Action button.

Select this option and then click Browse to locate and select the image file that you want to use.

Display as Hyperlink
Displays the Action button as a hyperlink with blue, underlined text instead of a standard button.

This option is not available when you select the Show Background Image option.

Preview
This area shows a preview of the text caption, font style, font color and background color for the button.

Colors
Allows you to set the text and background colors for the Action button.

Click the Text or Background color sample to display the Color dialog box where you can select a standard color or define a custom color.

This option is not available when you select the Display as Hyperlink option.

Advanced Options Dialog Box
Use the Advanced Options dialog box to manually map fields between the source and target worksheets when you insert an Action button that navigates from one worksheet to another. This tool helps you map dimensions, cells, and values from the source worksheet to the target worksheet.

Note: Advanced mapping is applied after any automatic mapping has been performed by the Match Title Elements option.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add</td>
<td>Adds a new row to the Advanced Mapping grid.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the selected row from the Advanced Mapping grid.</td>
</tr>
<tr>
<td>OK</td>
<td>Closes the Advanced Options dialog box and saves your settings.</td>
</tr>
</tbody>
</table>
Field | Description
--- | ---
Cancel | Closes the Advanced Options dialog box without saving your settings.

For examples on using the Advanced Options dialog box, see *TM1 for Developers* in the IBM Knowledge Center (https://www.ibm.com/support/knowledgecenter/SSD29G_2.0.0).

**Advanced Mapping Grid**

Use the Advanced Mapping grid to define the mapping of fields between the source and target worksheets. You can use the grid to specify how elements in the source and target worksheets get matched up when the target sheet opens. Each row in the grid defines one mapping configuration.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Source Type** | This field represents the type of object for the value you want to map. Select the Source Type as follows:  
  - SUBNM - Indicates that you are mapping from a cell that contains a title dimension in the source worksheet.  
  - Selected DBRW - Indicates that you are mapping from a cell that contains a DBRW formula in the source worksheet.  
  - Value - Indicates that you will enter a string or numeric value that will be sent to the target. |
| **Source Object** | This field takes a value depending on what is selected in the Source Type field. Enter the Source Object as follows:  
  - If Source Type is set to SUBNM, then you need to specify the name of the title dimension that exists in the source worksheet.  
  - If Source Type is set to Selected DBRW, then you need to specify the name of a row or column title dimension that exists in the source worksheet.  
  - If Source Type is set to Value, then you need to enter a string or numeric value that will be sent to the target worksheet.  
  You can also retrieve these values from the source worksheet by using the = symbol to create an Excel reference. |
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Target Type** | This field is the type of cell in the target worksheet where the value from the Source Object field will be inserted. Select the Target Type as follows:  
  • SUBNM - Indicates the target is a title dimension in the target worksheet.  
  • Named Range - Indicates the target is a named range in the target worksheet.  
  • Range - Indicates the target location is a cell in the target worksheet.  
  CAUTION: If you set Target Type to either a Named Range or Range, any pre-existing data or formula in the target cell will be overwritten when you navigate with the Action button. If the target cell contains a TM1DBRW function, then the function will be lost and the cell will not be able to connect to, read from, or write to the server. |
| **Target Object** | This field represents the location in the target worksheet where the value from the Source Object will be inserted. Enter the Target Object as follows, depending on your selection for Target Type:  
  • If Target Type is set to SUBNM, you need to specify the name of the title dimension in the target worksheet.  
  • If Target Type is set to Named Range, you need to specify the name of the range in the target worksheet.  
  • If Target Type is set to Range, you need to specify the cell location in the target worksheet.  
  You can also use an Excel reference to retrieve the value for the Target Object field.  
  For a detailed example, see the IBM Cognos TM1 for Developers documentation. |
| **Subset**    | Enter a value for the Subset field when the Target Type field is set to SUBNM.                                                                                                                             |
| **Alias**     | Enter a value for the Alias field when the Target Type field is set to SUBNM.                                                                                                                             |

**Attributes Editor**

Use the Attributes Editor to create and edit attributes for cubes, dimensions, elements, and replications.
Note that all elements include a Format attribute, which defines how element values display in the Cube Viewer. The default Format attribute value is Unstyled.

**File Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>Closes the Attributes Editor.</td>
</tr>
</tbody>
</table>

**Edit Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undo cell</td>
<td>Undoes the last cell action. This option applies only to individual cells. You cannot undo actions applied to a range of cells.</td>
</tr>
<tr>
<td>Cut</td>
<td>Cuts the contents of selected cells to the Clipboard.</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies the contents of selected cells to the Clipboard.</td>
</tr>
<tr>
<td>Paste</td>
<td>Pastes the contents of the Clipboard to selected cells.</td>
</tr>
<tr>
<td>Add new attribute</td>
<td>Opens the New Attribute dialog box, from which you can create a new attribute for the elements in the dimension.</td>
</tr>
<tr>
<td>Delete selected attribute</td>
<td>Deletes a selected attribute. You must delete attributes individually; you cannot delete multiple attributes simultaneously.</td>
</tr>
<tr>
<td>Clear</td>
<td>Clears the contents of selected cells.</td>
</tr>
<tr>
<td>Edit Element Format</td>
<td>Opens the Number Format dialog box, from which you can assign Format attribute values.</td>
</tr>
</tbody>
</table>

**Format Options**

The Format option is available only when you select cells at the intersection of the Format column and element rows. Click the **Format** button to display the Number Format dialog box.

Select an option from the **Category** list box to specify a display format for the selected cells.

The following number formats are available:
<table>
<thead>
<tr>
<th>Format Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>This format displays numbers without commas separating digits to the left of the decimal point. Negative values are prefixed with a minus sign (-). Use the Precision option to specify the number of digits that follow the decimal point. Note that Rules-derived values return integers only when set to General format.</td>
</tr>
<tr>
<td>Fixed</td>
<td>This format displays numbers without commas separating digits to the left of the decimal point. Negative values are prefixed with a minus sign (-); users have the option to use parentheses for negatives if preferred. Use the Precision option to specify the number of digits that follow the decimal point.</td>
</tr>
<tr>
<td>Currency</td>
<td>This format displays numbers with the currency symbol specified in your Windows RegionalSettingsProperties, and uses commas to separate every third digit to the left of the decimal point. Negative values are prefixed with a minus sign (-). Use the Precision option to specify the number of digits that follow the decimal point.</td>
</tr>
<tr>
<td>Date</td>
<td>Displays a list of predefined date formats.</td>
</tr>
<tr>
<td>Time</td>
<td>Displays a list of predefined time formats.</td>
</tr>
<tr>
<td>Percentage</td>
<td>This format multiplies numbers by 100 and displays a following percent sign (%). Digits to the left of the decimal point do not use commas, and negative values are prefixed with a minus sign (-). Use the Precision option to specify the number of digits that follow the decimal point.</td>
</tr>
<tr>
<td>Scientific</td>
<td>This format displays numbers in scientific notation. Negative values are prefixed with a minus sign (-). Use the Precision option to specify the number of digits that follow the decimal point.</td>
</tr>
<tr>
<td>Custom</td>
<td>You can define a custom format expression as needed.</td>
</tr>
<tr>
<td>Precision</td>
<td>This option determines the number of decimal places to display for a selected format. If a value has more decimal places than the specified precision, it is rounded off for display purposes only; the entire value is stored in the TM1 database.</td>
</tr>
</tbody>
</table>
Audit Log Window

Use the Audit Log window to query and view records contained in the TM1 audit log.

The Audit Log window contains two main panels; the Query panel and the Results panel. Use these panels to search the audit log and view the records retrieved by your search.

Query Panel

Use the Query panel to build queries that search the TM1 audit log.

The Query panel toolbar contains a Run Query icon to query the audit log after you set the query options.

The query options are organized into the following groups:

- Date and Time
- Event Owner
- Event Type

Date and Time Options

The Date and Time options include set the time period that you want to query.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>Contains a list of predefined time periods for the query. Select a predefined time period or select Custom Time Period to enable the Start and End time options.</td>
</tr>
<tr>
<td>Start Time</td>
<td>The start date/time for the query. This option is enabled only when you select Custom Time Period for the Time Period option. TM1 queries against all records written to the audit log on or after this date/time. Click to open the calendar tool where you can select a date and time.</td>
</tr>
<tr>
<td>End Time</td>
<td>The end date and time for the query. This option is enabled only when you select Custom Time Period for the Time Period option. TM1 queries against all audit records up to the end time you specify. Click the Calendar icon to open the calendar tool where you can select a date and time. The default end time is the current date and time.</td>
</tr>
</tbody>
</table>

Event Owner Options

The Event Owner options answer the question "Who caused this event". The owner of the event can be an actual TM1 user or a scheduled chore.
The Event Owner options include the following parameters:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Sets the query to search for audit events caused by any TM1 user or scheduled chore.</td>
</tr>
<tr>
<td>Client</td>
<td>Sets the query to search for audit events caused only by TM1 users.</td>
</tr>
<tr>
<td></td>
<td>To search for events caused by a specific TM1 user, click the Select Client button. You can select a single client or multiple clients. The default is all clients.</td>
</tr>
<tr>
<td>Scheduled Chore</td>
<td>Sets the query to search for audit events caused only by scheduled chores.</td>
</tr>
<tr>
<td></td>
<td>To search for events caused by a specific scheduled chore, click the Select Scheduled Chore button. You can select a single scheduled chore or multiple scheduled chores. The default is all scheduled chore.</td>
</tr>
</tbody>
</table>

### Event Type Options

The Event Type options let you the select the type of object or event for which you want to search. For example, you can use these search options to “find unsuccessful login attempts” or “find events where a dimension was deleted”.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Sets the query to search for both types of audit events; system-wide and object related events.</td>
</tr>
<tr>
<td>System-wide</td>
<td>Sets the query to search for only system-wide audit events.</td>
</tr>
<tr>
<td></td>
<td>To search for a specific system-wide event, select the event from the list.</td>
</tr>
<tr>
<td></td>
<td>The default setting searches for all system-wide events.</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Object | Sets the query to search for only object type audit events.  
To search for a specific object event, use the options as follows:  
- **Object Type** - Limits the query to only a specific type of TM1 object. For example, events related only to dimensions.  
- **Object Name** - Allows you to select a specific object name.  
  Click ![object name](image) to display a dialog box where you can select objects by name.  
  **Note:** When you set the Object Type option to **Element**, the Object Name Selection button becomes disabled because the element list could be too large to display. To search for events related to a specific element, you must manually enter an element name using the following format: DimensionName:ElementName. For example: region:italy  
- **Event Type** - Limits the query to only a specific type of object event. The default setting searches for all object type events. |

### Results Panel

Use the Results panel to view and navigate the records retrieved by your search.

#### Results Panel Toolbar

The Results toolbar has the following buttons:

<table>
<thead>
<tr>
<th>Action</th>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td><img src="image" alt="copy" /></td>
<td>Copies the value in the currently selected cell to the Windows clipboard.</td>
</tr>
<tr>
<td>Find</td>
<td><img src="image" alt="find" /></td>
<td>Opens the Find dialog box where you can search for text in the event records.</td>
</tr>
</tbody>
</table>
| Export | ![export](image) | Opens the Save As dialog box where you can save the event records to a file in one of the following formats:  
  - XML  
  - Comma delimited  
  - Tab delimited |
Results Grid
The Results panel includes a grid that displays the audit log records retrieved by the query. The retrieved records are organized into the following columns:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Date and time of the event.</td>
</tr>
<tr>
<td>User</td>
<td>TM1 client (user) or scheduled chore that was responsible for causing the event.</td>
</tr>
<tr>
<td>Event Type/ Description</td>
<td>Brief description of the event.</td>
</tr>
<tr>
<td>Object Type</td>
<td>Type of TM1 object associated with the event.</td>
</tr>
<tr>
<td>Object Name</td>
<td>Name of the TM1 object associated with the event.</td>
</tr>
<tr>
<td>Details</td>
<td>Displays an icon to indicate that detailed information exists for the specific event. If an event has details, you can view the details by clicking on the Details icon for that record.</td>
</tr>
</tbody>
</table>

You can sort the records in the grid in ascending or descending order for any column by clicking on the column title.

Audit Log Details Window
The Audit Log Details window displays the sub-events for an audit log event that was displayed in the query results of the main Audit Log window.

Details Toolbar
The Details toolbar has the following buttons:

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Copies the value in the currently selected cell to the Windows clipboard.</td>
</tr>
<tr>
<td>Find</td>
<td>Opens the Find dialog box where you can search for text in the event records.</td>
</tr>
<tr>
<td>Export</td>
<td>Opens the Save As dialog box where you can save the event records to a file in one of the following formats: XML, comma separated, tab separated</td>
</tr>
</tbody>
</table>

Details Grid
The Details grid displays the sub-event detail records that belong to the parent event.
The detail records are organized into the following columns:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Date and time of the event.</td>
</tr>
<tr>
<td>User</td>
<td>TM1 client (user) or scheduled chore that was responsible for causing the event.</td>
</tr>
<tr>
<td>Event Type/ Description</td>
<td>Brief description of the event.</td>
</tr>
<tr>
<td>Object Type</td>
<td>Type of TM1 object associated with the event.</td>
</tr>
<tr>
<td>Object Name</td>
<td>Name of the TM1 object associated with the event.</td>
</tr>
</tbody>
</table>

You can sort the records in the grid in ascending or descending order for any column by clicking on the column title.

**Chore Setup Wizard**

Use the Chore Setup Wizard to schedule a replication or process for synchronization or execution at a regular interval.

The Wizard consists of two screens:

- **Screen 1** - Select the replications and processes to be included in the chore.
- **Screen 2** - Specify the start time for the initial execution of the chore and the subsequent interval at which the chore should execute.

**Screen 1 (Step 1)**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available list</td>
<td>Lists all replications and processes available for scheduling as chores.</td>
</tr>
<tr>
<td>Selected list</td>
<td>Lists the replications or processes selected for inclusion in the current chore.</td>
</tr>
<tr>
<td>Add</td>
<td>Click this button to move selected replications or processes from the Available list to the Selected list</td>
</tr>
<tr>
<td>Add All</td>
<td>Click this button to move all replications or processes from the Available list to the Selected list</td>
</tr>
<tr>
<td>Remove</td>
<td>Click this button to move selected replications or processes from the Selected list to the Available list</td>
</tr>
<tr>
<td>Remove All</td>
<td>Click this button to move all replications or processes from the Selected list to the Available list</td>
</tr>
</tbody>
</table>
**Screen 2 (Step 2)**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chore Start Date and Time</td>
<td>Select a start date on the calendar and specify a start time in the Time field.</td>
</tr>
<tr>
<td>Chore Execution Frequency</td>
<td>Fill the appropriate fields to establish the interval at which the chore should be executed.</td>
</tr>
<tr>
<td>Chore Schedule is Active</td>
<td>Fill this box to activate the chore for execution at the specified start time and interval. Clear this box to activate the chore at a later time.</td>
</tr>
</tbody>
</table>

**Clients/Groups Window**

The Clients/Groups window lets you create and modify clients and user groups on a server.

**Clients/Groups grid**

The Clients/Groups grid displays client names as row headings and user groups as column headings. An 'X' at the intersection of a client name and user group indicates the group to which the user belongs. Users can belong to multiple groups.

The grid also includes several columns that display properties for clients on the server.

- The cell at the intersection of a client name and the Password column contains the password for the client.
- The cell at the intersection of a client name and the Expiration Days column contains the number of days for which the password is valid for the client. After this number of days elapses, the client can no longer log into the server with the assigned password. A client whose password is soon to expire begins receiving notification of the expiration five days before the expiration date.
- The cell at the intersection of the client name and the Status column indicates whether the client is active on the server.
- The cell at the intersection of the client name and the Max Connections column indicates the maximum number of connections that can be established to the server with the associated client name and password.

**Security Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>Closes the Clients/Groups dialog box.</td>
</tr>
</tbody>
</table>
Clients Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add New Client</td>
<td>Opens the Creating New Client dialog box, from which you can create a new client on the server.</td>
</tr>
<tr>
<td>Delete Client</td>
<td>Deletes the currently selected client from the server.</td>
</tr>
<tr>
<td>Disconnect Client</td>
<td>Disconnects the currently selected client from the server.</td>
</tr>
<tr>
<td>Set Password</td>
<td>Sets the password for the currently selected client.</td>
</tr>
<tr>
<td>Clear Password</td>
<td>Clears the password for the currently selected client.</td>
</tr>
</tbody>
</table>

Groups Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add New Group</td>
<td>Opens the Creating New Group dialog box, from which you can create a new user group on the server.</td>
</tr>
<tr>
<td>Delete Group</td>
<td>Deletes the currently selected user group from the server.</td>
</tr>
</tbody>
</table>

Clients/Groups Grid

You can enter data for clients directly in the Clients/Groups grid. The grid includes several columns, as described in the following table.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td>Displays the usernames of all clients on the server.</td>
</tr>
<tr>
<td>Password</td>
<td>Identifies whether a password is defined for a given client. You can click in a cell at the intersection of the Password column and a client row, then type a password to assign a password to the client. After entering a password, TM1 prompts you to re-enter the password for confirmation.</td>
</tr>
</tbody>
</table>
**Expiration Days**
Indicates the number of days that a given client's password is valid.
To assign expiration for a client's password, click in the cell at the intersection of the Expiration Days column and the client row, then type an expiration value.

**Max Connections**
Identifies the maximum number of connections that can be made to the server by a given client.
To assign a maximum number of connections for a client, click in the cell at the intersection of the Max Connections column and the client row, then type the maximum number of connections for the client.

**Status**
Indicates the current connection status of a given client.

**User Groups**
There is one column for every user group on the server.
To assign a client to a user group, fill the check box at the intersection of the user group column and the client name.
Clients can belong to multiple user groups.

---

**Clients Messaging Center Dialog Box**
The Clients Messaging Center dialog box lets you manage client connections to a server. You can also use this dialog box to remotely shut down a server. You must be a member of the ADMIN group for a server to access this dialog box.

Select a server in the left pane of the Server Explorer, then choose **Server, Server Manager** to open the Clients Messaging Center dialog box.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shutdown Server</td>
<td>Select this option to shut down the server, then specify a Minutes interval.</td>
</tr>
<tr>
<td>Disconnect Clients</td>
<td>Select this option to disconnect clients from the server, then specify a Minutes interval. You must click Select Clients to create or select a subset of clients to be disconnected.</td>
</tr>
<tr>
<td>Broadcast Message to Selected Clients</td>
<td>Select this option to broadcast a text message to clients connected to the server. Enter the message in the text box then click Select Clients to create or select a subset of clients to receive the message.</td>
</tr>
</tbody>
</table>
Create a Dimension Dialog Box

Enter a name for the dimension you want to create in the field at the top of the dialog box then click OK.

To create a dimension on your local server, enter only the dimension name.

To create a dimension on a remote server, prefix the dimension name with the server name and a colon.
For example, enter Sales:Product to create the Product dimension on the Sales server.

Create Server Replication Object Dialog Box

Use the Create Server Replication Object dialog box to establish a new replication connection, or to modify an existing connection.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Server</td>
<td>Select a source server from the list. The list includes the names of all servers currently available on your network.</td>
</tr>
<tr>
<td>As User</td>
<td>Enter your user name on the selected source server.</td>
</tr>
<tr>
<td>With Password</td>
<td>Enter your password for the selected source server.</td>
</tr>
<tr>
<td>With Namespace</td>
<td>If the object uses CAM Passport security, enter the IBM Cognos Namespace ID. Do not enter the descriptive name here.</td>
</tr>
<tr>
<td>Use Integrated Login</td>
<td>Check this box to use Integrated Login authentication instead of standard TM1 security.</td>
</tr>
</tbody>
</table>

Creating Cube Dialog Box

Use the following options on the Creating Cube dialog box to create a new cube from previously-defined dimensions.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube Name</td>
<td>Type the name for the cube you are creating in this field.</td>
</tr>
<tr>
<td>Available Dimensions</td>
<td>A list of all dimensions available on the server on which you are creating the cube.</td>
</tr>
<tr>
<td>Dimensions in New Cube</td>
<td>The list of dimensions in the cube you are creating.</td>
</tr>
<tr>
<td>Add</td>
<td>Click this button to move selected dimensions from the Available Dimensions list to the Dimensions in New Cube list</td>
</tr>
</tbody>
</table>
**Cube Optimizer Dialog Box**

TM1 includes a feature that lets you optimize the order of dimensions in a cube, thereby consuming less memory and improving performance.

If you're not familiar with your data, you might specify an order of dimensions during cube creation that results in less than optimal performance. It's possible for the distribution of data in a cube to change over time, which makes the order of dimensions specified during cube creation inefficient.

When you optimize the order of dimensions in a cube, TM1 does not change the actual order of dimensions in the cube structure. TM1 does change the way dimensions are ordered internally on the server, but because the cube structure is not changed, any rules, functions, or applications referencing the cube remain valid.

As you change the order of dimensions, you can instantly view a report detailing the impact your changes have on cube memory consumption.

For the following reasons, you should optimize the order of dimensions in a cube only in a development environment while you are trying to determine optimal cube configuration:

---

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove</td>
<td>Click this button to move selected dimensions from the Dimensions in New Cube list to the Available Dimensions list.</td>
</tr>
<tr>
<td>Move up</td>
<td>Click this button to move selected dimensions up through the Dimensions in New Cube list. Each click of the button moves the selected dimensions up one position.</td>
</tr>
<tr>
<td>Move down</td>
<td>Click this button to move selected dimensions down through the Dimensions in New Cube list. Each click of the button moves the selected dimensions down one position.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Click to cancel the cube creation and exit the Creating Cube dialog box.</td>
</tr>
<tr>
<td>Reset</td>
<td>Click to reset the Available Dimensions list and clear the Dimensions in New Cube list.</td>
</tr>
<tr>
<td>Refresh</td>
<td>Click to refresh the Available Dimensions list. This option polls the server for any new dimensions, and adds any new dimensions to the Available Dimensions list.</td>
</tr>
<tr>
<td>Properties</td>
<td>Click this button to assign cube properties. You can assign properties that define a measures dimension, a time dimension, and load-on-demand status for the cube.</td>
</tr>
<tr>
<td>OK</td>
<td>Click to accept the configuration of the dialog box and create the cube.</td>
</tr>
</tbody>
</table>
• Significant memory resources are required for the server to reconfigure the order of dimensions in a cube. During the re-ordering process, the temporary RAM on the server increases by a factor of two for the cube that you are re-ordering. For example, a 50 MB cube requires 100 MB of RAM to reconfigure.

• Re-ordering puts a read lock on the server, locking all user requests while the re-order is performed.

**Note:** You must be a member of the ADMIN group to optimize the order of dimensions in cubes. The optimization option is only available for cubes on remote servers; you cannot optimize the order of dimensions in cubes on a local server. Also, when you optimize the order of dimensions in a cube, you should not move the string dimensions *from* the last position, nor move the string dimensions *to* the last position.

**Procedure**

1. In the Tree pane of the Server Explorer, select the cube you want to optimize.
2. Click **Cube, Re-order Dimensions**.
   
   The **Cube Optimizer** dialog box opens.
3. Select a dimension in the **New Order of Dimensions** list box.
4. Click the up or down arrows to change the order of the dimension in the cube.
5. Click **Test**.

   Note the value next to the Percent Change label. If this value is negative, the new order of dimensions consumes less memory and is therefore more efficient.
6. Repeat steps 3 through 5 until you achieve the most efficient ordering of dimensions.
7. Click **OK**.

**Cube Properties Dialog Box**

Use the Cube Properties dialog box to set properties for individual cubes.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures Dimension</td>
<td>Select a measures dimension from the list.</td>
</tr>
<tr>
<td>Time Dimension</td>
<td>Select a time dimension from the list.</td>
</tr>
<tr>
<td>Load on Demand</td>
<td>Fill the box to load the cube into server memory only when a client requests cube data. Clear this box to load the cube automatically when the server starts.</td>
</tr>
</tbody>
</table>

**Cube Viewer**

**Title dimensions**

Title dimensions appear directly beneath the Toolbar at the top of the Cube Viewer window. Each dimension displays in a list box.

**Row dimensions**

Row dimensions appear at the top of the row axis of the Cube Viewer. The current dimension elements appear as row headings in the Cube Viewer.
Column dimensions

Column dimensions appear at the left of the column axis of the Cube Viewer. The current dimension elements appear as column headings in the Cube Viewer.

File Menu

The following options are available on the File Menu in the Cube Viewer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Opens the TM1 Open View dialog box, from which you can open other views associated with the current cube.</td>
</tr>
<tr>
<td>Reload</td>
<td>Reloads the current view definition.</td>
</tr>
<tr>
<td>Calculate</td>
<td>Calculates the current view.</td>
</tr>
<tr>
<td>Save</td>
<td>Saves the current view configuration.</td>
</tr>
<tr>
<td>Save as</td>
<td>Saves the current view configuration under a new name.</td>
</tr>
<tr>
<td>Delete Views</td>
<td>Opens the Delete Named Views dialog box, from which you can delete saved views.</td>
</tr>
<tr>
<td>Slice</td>
<td>Exports the current view into an Excel worksheet. The Excel worksheet is populated with formulae that retrieve values from and write values to the server from which the view originates.</td>
</tr>
<tr>
<td>Active Form</td>
<td>Launches the Insert Active Form option to let you add an Active Form connection to data in the current cell of the worksheet.</td>
</tr>
<tr>
<td>Snapshot</td>
<td>Exports the current view to an Excel worksheet as simple values. The worksheet does not maintain a connection to the server from which the view originates.</td>
</tr>
<tr>
<td>Close</td>
<td>Closes the Cube Viewer window.</td>
</tr>
</tbody>
</table>

Edit Menu

The following options are available on the Edit Menu in the Cube Viewer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TransAction</td>
<td>Undoes the last cell action. Save or Close ends the collection of actions that can be undone or redone. Redo restores the last cell action.</td>
</tr>
<tr>
<td>Cut</td>
<td>Cuts the contents of selected cells to the Clipboard.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies the contents of selected cells, as currently formatted, to the Clipboard.</td>
</tr>
<tr>
<td>Copy Unformatted Value</td>
<td>Copies the unformatted contents of selected cells to the Clipboard.</td>
</tr>
<tr>
<td>Paste</td>
<td>Pastes the contents of the Clipboard to selected cells.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the selected cell values.</td>
</tr>
<tr>
<td>Edit Cube Attributes</td>
<td>Opens the Attributes Editor window, from which you can assign and edit attributes for all cubes on the current server.</td>
</tr>
</tbody>
</table>

**View Menu**

The following options are available on the View Menu in the Cube Viewer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbar</td>
<td>Hides or displays the Toolbar at the top of the Cube Viewer. A check mark indicates that the Toolbar is displayed.</td>
</tr>
<tr>
<td>Status Bar</td>
<td>Hides or displays the Status Bar at the bottom of the Cube Viewer. A check mark indicates that the Status Bar is displayed.</td>
</tr>
<tr>
<td>Right to Left</td>
<td>This toggle changes the position of column dimensions in the Cube Viewer. A right pointing arrow indicates that the columns layout right to left. A left pointing arrow means columns are laid out left to right.</td>
</tr>
</tbody>
</table>

**Options Menu**

The following options are available on the Options Menu in the Cube Viewer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppress Zeros</td>
<td>This option suppresses or displays all rows and columns containing only zero values in the cube view. A check mark indicates that rows and columns containing only zeros are suppressed in the current view.</td>
</tr>
<tr>
<td>Suppress Zeros on Rows</td>
<td>This option suppresses or displays all rows containing only zero values in the cube view. A check mark indicates that rows containing only zeros are suppressed in the current view.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Suppress Zeros on Columns</td>
<td>This option suppresses or displays all columns containing only zero values in the cube view. A check mark indicates that columns containing only zeros are suppressed in the current view.</td>
</tr>
<tr>
<td>Automatic Recalculate</td>
<td>This option enables or disables automatic recalculation upon view reconfiguration. A check mark indicates that the view is automatically recalculated whenever the view configuration changes.</td>
</tr>
<tr>
<td>Format</td>
<td>Opens the Number Format dialog box, from which you can define the number format for values in the current view. Note that the format you select applies only to those values for which there is no Format attribute specified.</td>
</tr>
<tr>
<td>Column Width</td>
<td>Opens the Column Width dialog box, which lets you set a minimum and maximum width for columns in the Cube Viewer.</td>
</tr>
<tr>
<td>Slice to New Workbook</td>
<td>This option determines how slices are created. A check mark indicates that slices are inserted in a new workbook when you choose File, Slice. If this option is not turned on, slices are inserted in a new sheet of the current workbook.</td>
</tr>
</tbody>
</table>

**Delete Named Subsets Dialog Box**

This dialog box displays the subsets associated with the current dimension. To delete a subset, select the subset and click OK.

To select multiple adjacent subsets, click and drag across the subsets. To select multiple non-adjacent subsets, CTRL-click each subset.

**Delete Named Views Dialog Box**

This dialog box displays the views associated with the current cube. To delete a view, select the view and click OK.

To select multiple adjacent views, click and drag across the views. To select multiple non-adjacent views, CTRL-click each view.

**Dimension Editor**

*Elements Pane*

Displays elements of the dimension you are currently viewing.
Properties Pane
When you select a consolidated element in the Elements pane, the Properties pane displays the properties of the immediate children of the consolidated element.

When you select a leaf element, the Properties pane displays the properties of the leaf element.

Note: When viewing an exceptionally large dimension set in the Dimension Editor with the Properties pane on, you might experience performance issues. This can happen when you select a consolidation in the Elements pane and TM1 has to display the entire list of related elements and properties in the Properties pane.

If you are working with large dimension sets, you may want to turn off the Properties pane. To turn off the Properties pane, click the Properties Window option in the View Menu to remove the check mark next to the option.

Dimension Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save</td>
<td>Saves the current dimension structure.</td>
</tr>
<tr>
<td>Save as</td>
<td>Saves the current dimension structure under a new name.</td>
</tr>
<tr>
<td>Close</td>
<td>Closes the Dimension Editor.</td>
</tr>
</tbody>
</table>

Edit Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut</td>
<td>Cuts selected elements to the Clipboard.</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies selected elements to the Clipboard.</td>
</tr>
<tr>
<td>Paste</td>
<td>Pastes the contents of the Clipboard as a new element.</td>
</tr>
<tr>
<td></td>
<td>• When no elements are selected in the Dimension Editor, this option inserts a new element above the first displayed element in the Elements pane.</td>
</tr>
<tr>
<td></td>
<td>• When an element is selected in the Elements pane, this option displays a sub-menu with the options Paste Above, Paste as Child, and Paste Below.</td>
</tr>
<tr>
<td>Paste Above</td>
<td>Pastes the contents of the Clipboard above a selected element.</td>
</tr>
<tr>
<td>Paste Below</td>
<td>Pastes the contents of the Clipboard below a selected element.</td>
</tr>
<tr>
<td>Paste as Child</td>
<td>Pastes the contents of the Clipboard as a child of a selected element.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Insert Child</td>
<td>Opens the Dimension Element Insert dialog box, from which you can insert a child or children of a selected element.</td>
</tr>
<tr>
<td>Insert Element</td>
<td>Opens the Dimension Element Insert dialog box, from which you can insert leaf (simple) elements into the dimension.</td>
</tr>
<tr>
<td>Select All</td>
<td>Selects all the elements in the Elements pane.</td>
</tr>
<tr>
<td>Filter by, Level</td>
<td>Opens the Filter by Level dialog box, from which you can select elements by hierarchy level. This option affects only the display of elements; it does not affect the dimension structure. When you use this option the Elements pane displays only the elements of the level you specify.</td>
</tr>
<tr>
<td>Filter by, Attribute</td>
<td>Opens the Filter by Attribute dialog box, from which you can select elements by attribute value. This option affects only the display of elements; it does not affect the dimension structure. When you use this option the Elements pane displays only those elements with the attribute value you specify.</td>
</tr>
<tr>
<td>Filter by, Wildcard</td>
<td>Lets you select elements that match a user-defined search expression. This option affects only the display of elements; it does not affect the dimension structure. When you use this option the Elements pane displays only those elements matching the search expression you specify.</td>
</tr>
<tr>
<td>Select Alias</td>
<td>Opens the TM1 Aliases dialog box, from which you can select an alias to use for display in the Dimension Editor.</td>
</tr>
<tr>
<td>Sort, Ascending</td>
<td>Sorts all elements in the Elements pane in alphabetically ascending order. This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Sort, Descending</td>
<td>Sorts all elements in the Elements pane in alphabetically descending order. This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sort, Hierarchy</td>
<td>Sorts all elements in the Elements pane in hierarchical order, so you can see the parent/child relationship of elements.</td>
</tr>
<tr>
<td></td>
<td>This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Sort, Index Ascending</td>
<td>Sorts all elements in the Elements pane in ascending order according to element index value.</td>
</tr>
<tr>
<td></td>
<td>This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Sort, Index Descending</td>
<td>Sorts all elements in the Elements pane in descending order according to element index value.</td>
</tr>
<tr>
<td></td>
<td>This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Keep</td>
<td>Alters the Elements pane so that only currently selected elements are displayed.</td>
</tr>
<tr>
<td></td>
<td>This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Hide</td>
<td>Alters the Elements pane so that currently selected elements are hidden.</td>
</tr>
<tr>
<td></td>
<td>This option affects only the display of elements; it does not affect the dimension structure.</td>
</tr>
<tr>
<td>Delete Element</td>
<td>Deletes all instances of a selected element from the dimension.</td>
</tr>
<tr>
<td>Delete from Consolidation</td>
<td>Deletes the instance of a selected element from the current consolidation.</td>
</tr>
<tr>
<td>Edit Element Formats</td>
<td>Opens the Edit Element Formats worksheet, from which you can define element display styles. These display styles are applied in dynamic slices and in TM1 Web websheets.</td>
</tr>
<tr>
<td>Expand Element</td>
<td>Displays all children of a selected element.</td>
</tr>
<tr>
<td>Collapse Element</td>
<td>Hides all children of a selected element.</td>
</tr>
<tr>
<td>Properties</td>
<td>Opens the Dimension Element Properties dialog box, from which you can assign element type and weight for a selected element.</td>
</tr>
</tbody>
</table>
### Menu Item

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbars</td>
<td>Hides or displays the various toolbars at the top of the Dimension Editor window. A check mark indicates that a toolbar is displayed.</td>
</tr>
<tr>
<td>Status Bar</td>
<td>Hides or displays the Status Bar at the bottom of the Dimension Editor window. A check mark indicates that the Status Bar is displayed.</td>
</tr>
<tr>
<td>Properties Window</td>
<td>Hides or displays the Properties pane. A check mark indicates that the Properties pane is displayed.</td>
</tr>
<tr>
<td>Refresh</td>
<td>Updates the display of the Elements pane.</td>
</tr>
</tbody>
</table>

### Dimension Element Insert Dialog Box

Use this dialog box to add simple, string, or consolidated elements to a dimension. The dialog contains the following options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension Name</td>
<td>The name of the dimension to which you are adding elements. This is not an editable option.</td>
</tr>
<tr>
<td>Parent Name</td>
<td>The name of the parent element to which you are adding elements. This is not an editable option. If an element was selected in the dimension editor when you opened the Dimension Element Insert dialog box, that element displays as the Parent Name. If no element was selected, the Parent Name is Root.</td>
</tr>
<tr>
<td>Insert Element Name</td>
<td>Enter a name for the new element in this box.</td>
</tr>
<tr>
<td>Element Type</td>
<td>Make a selection appropriate to the element you want to insert.</td>
</tr>
<tr>
<td>Element Weight</td>
<td>If the element type is Simple and the Parent Name is anything other than Root, enter a weight in this box. The weight is a multiplication factor applied to an element during consolidation. A weight associated with an element of a consolidation does not alter the value of the element elsewhere in the dimension.</td>
</tr>
<tr>
<td>Add</td>
<td>Click Add each time you specify a new element, type, and weight.</td>
</tr>
<tr>
<td>OK</td>
<td>Click this button when you are done adding elements to commit the new elements to the dimension.</td>
</tr>
</tbody>
</table>
Dimension Element Ordering Dialog Box

Use this dialog box to set the order of elements in a dimension.

The order of elements within a dimension determines the index value for each element in the dimension. The first element in a dimension has an index value of 1, the second element has an index value of 2, and so on. The order of elements in a dimension is important because many TM1 functions (worksheet, rules, and TurboIntegrator) reference element index values.

**Note:** If you change the order of elements in a dimension, any functions that reference element index values return new and possibly unexpected values.

Use the following steps to set the order of elements.

**Procedure**

1. Select a sort type.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic</td>
<td>Enables the Automatic Sort By options: Name, Level, and Hierarchy.</td>
</tr>
<tr>
<td>Manual</td>
<td>Orders elements as they currently exist in the dimension structure and sets</td>
</tr>
<tr>
<td></td>
<td>the dimension sorting property to Manual.</td>
</tr>
</tbody>
</table>

2. If you select the Manual sort type, skip to step 5.
3. Select an **Automatic Sort By** option.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Sorts elements alphabetically</td>
</tr>
<tr>
<td>Level</td>
<td>Sorts elements by hierarchy level.</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Sorts elements according to the dimension hierarchy.</td>
</tr>
</tbody>
</table>

4. If applicable, select a **Sort Direction**.
5. Click **OK**.

You have now set the order of the dimension elements. When you open the dimension, you will see the elements in order according to the Sort By option you specified in step 3.

**Results**

You have now set the order of the dimension elements. When you open the dimension, you will see the elements in order according to the Sort By option you specified in step 3.

Dimension Element Properties Dialog Box

Displays the name, type, and weight of the current element.
**Properties Pane**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element Type</td>
<td>To change the type of the current element, select a new type from the list. There are three possible element types: simple, consolidated, and string.</td>
</tr>
<tr>
<td>Element Weight</td>
<td>To change the weight of the current element, double-click in the Element Weight field and enter a new weight value.</td>
</tr>
</tbody>
</table>

**Drill**

The Drill menu lists the options used to create and manage a drill process and drill assignment. Drill processes and assignments are used to create links between cube cells with related detailed data.

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create/Edit/Delete Drill Assignment Rules</td>
<td>Choose these options to create, edit or delete drill assignments. The Create option opens the rules editor so you can design the rule.</td>
</tr>
<tr>
<td>Create/Edit Drill Process</td>
<td>A drill process is a TurboIntegrator process that defines the detailed data, which opens in a new window. These options edit an existing drill assignment rule or allow you to create a new one. The Create options display the parameters and values to use and the details for the data source. If you change the data source for a drill process, TurboIntegrator does not update the function with the new data source because the function is outside the <strong>Generated Statements</strong> area. You must edit the Cube View data source in the ReturnViewHandle function for the drill process.</td>
</tr>
</tbody>
</table>

**Edit Formula Dialog Box**

The Edit Formula dialog box steps you through the creation of DBR, DBRW, and DBS functions. You can also use the Edit Formula dialog box to edit any TM1 function in a worksheet.

To display the Edit Formula dialog box, click a cell in a worksheet and choose **TM1, Edit Formula**. If the cell contains a TM1 function, the function displays in the entry field of the dialog box.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Ref</td>
<td>Click this button to insert a DBR function in the current cell. TM1 steps you through several dialog boxes that help you create the function.</td>
</tr>
<tr>
<td>DBRW</td>
<td>Click this button to insert a DBRW function in the current cell. TM1 steps you through several dialog boxes that help you create the function.</td>
</tr>
</tbody>
</table>
**Field** | **Description**
---|---
DB Send | Click this button to insert a DBS function in the current cell. TM1 steps you through several dialog boxes that help you create the function.
Cell Ref | Click this button to insert a cell reference into a function. TM1 prompts you to select the cell to which you want to refer, and prompts for a reference type.
Names | Click this button to insert a cube, dimension, or element name into a function

The Formula Editor can be used to create functions that reference cubes of up to 29 dimensions.

**Edit Reference to Cube Dialog Box**

This dialog box lets you set the element references used in TM1 worksheet functions such as DBRW and DBSW.

The dialog box contains buttons and fields corresponding to each dimension in the cube that the TM1 worksheet function references. For example, the following image shows the Edit Reference to Cube dialog box for a DBRW function that references the SalesCube cube in the TM1 sample database. The dialog box includes buttons for all the dimensions in the SalesCube cube.

When you insert a TM1 function into a worksheet, TM1 attempts to determine if any relevant element references exist in the worksheet. If so, those references are automatically inserted into the appropriate fields on the Edit Reference to Cube dialog box. If relevant element references cannot be determined, TM1 inserts "Undef" in the fields.

You can set references in this dialog box by either:

• clicking a dimension button and selecting an element. In this case, the reference is inserted as a string into the appropriate field.

• entering a cell reference directly in a field. You can use row-relative, column-relative, or absolute cell references.

If the cube for which you are creating a reference contains more than 16 dimensions, click Previous to page backward to the previous 16 dimensions, or click Next to page forward to the next 16 dimensions.

**Filter Elements by Attribute Dialog Box**

Use this dialog box to select only those subset elements that have a specified attribute value.

Select the desired attribute from the Select an Attribute list.

Select a corresponding value from the Select a Value list.

**Filter Elements by Level Dialog Box**

The list box displays the hierarchy levels available in the current subset. To view only elements of a given level, select the level and click OK.

To select multiple adjacent levels, click and drag across the levels. To select multiple non-adjacent levels, CTRL-click each level.
### Filter Subset Dialog Box

The Filter Subset dialog box lets you create a dynamic subset based on values in a specified cube. For example, you can create a subset of the Region dimension that returns the 10 elements with the largest values for actual yearly sales of the 1.8L Sedan in the Sales cube.

The dialog box contains the following options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube for which you want to filter values.</td>
</tr>
<tr>
<td>Filter</td>
<td>The type of filter you want to apply to the current view.</td>
</tr>
<tr>
<td></td>
<td><strong>TopCount</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the largest n elements, where n is a number specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>BottomCount</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the smallest n elements, where n is a number specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>TopSum</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the largest elements whose sum is greater than or equal to n, where n is a number specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>BottomSum</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the smallest elements whose sum is greater than or equal to n, where n is a number specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>TopPercent</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the largest elements whose sum is greater than or equal to n, where n is a percentage of the dimension total specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>BottomPercent</strong></td>
</tr>
<tr>
<td></td>
<td>Filters the subset to return only the smallest elements whose sum is greater than or equal to n, where n is a percentage of the dimension total specified in the Value option.</td>
</tr>
<tr>
<td></td>
<td><strong>None</strong></td>
</tr>
<tr>
<td></td>
<td>Not applicable to filtering subsets.</td>
</tr>
<tr>
<td>Value</td>
<td>A value for the Filter type.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Select Column Member</td>
<td>The column element(s) against which the filter or sort is applied. Click the dimension buttons to select a single element for each column dimension.</td>
</tr>
<tr>
<td>Sort</td>
<td>The sort order you want to apply to the selected column element(s).</td>
</tr>
<tr>
<td></td>
<td><strong>Ascending</strong></td>
</tr>
<tr>
<td></td>
<td>Sorts values for the specified column element(s) from lowest to highest.</td>
</tr>
<tr>
<td></td>
<td><strong>Descending</strong></td>
</tr>
<tr>
<td></td>
<td>Sorts values for the specified column element(s) from highest to lowest.</td>
</tr>
<tr>
<td></td>
<td><strong>None</strong></td>
</tr>
<tr>
<td></td>
<td>No sort order.</td>
</tr>
<tr>
<td>Select Column Members</td>
<td>You must select a single element from each remaining cube dimension. For example, if you are filtering the Region dimension in the sample database against values in the Sales cube, you must specify a single element each of the Model, Month, ActVsBud, and Account1 dimensions. For each dimension, click the appropriate button and select a single element. If the cube contains more than 16 dimensions, click to page backward to the previous 16 dimensions, or click to page forward to the next 16 dimensions.</td>
</tr>
</tbody>
</table>

**Filter View Dialog Box**

The Filter View dialog box lets you filter and sort columns in the Cube Viewer or In-Spreadsheet Browser. The dialog contains the following options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Filter/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube for which you want to filter or sort values. This option is always set to the cube associated with the current view. It cannot be edited.</td>
</tr>
<tr>
<td>Filter</td>
<td>The type of filter you want to apply to the current view.</td>
</tr>
<tr>
<td>TopCount</td>
<td>Filters the view to display only the largest n elements, where n is a number specified in the Value option.</td>
</tr>
<tr>
<td>Option</td>
<td>Filter/Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BottomCount</td>
<td>Filters the view to display only the smallest ( n ) elements, where ( n ) is a number specified in the Value option.</td>
</tr>
<tr>
<td>TopSum</td>
<td>Filters the view to display only the largest elements whose sum is greater than or equal to ( n ), where ( n ) is a number specified in the Value option.</td>
</tr>
<tr>
<td>BottomSum</td>
<td>Filters the view to display only the smallest elements whose sum is greater than or equal to ( n ), where ( n ) is a number specified in the Value option.</td>
</tr>
<tr>
<td>TopPercent</td>
<td>Filters the view to display only the largest elements whose sum is greater than or equal to ( n ), where ( n ) is a percentage of the dimension total specified in the Value option.</td>
</tr>
<tr>
<td>BottomPercent</td>
<td>Filters the view to display only the smallest elements whose sum is greater than or equal to ( n ), where ( n ) is a percentage of the dimension total specified in the Value option.</td>
</tr>
<tr>
<td>None</td>
<td>No filter. Select this option if you want to sort values without filtering.</td>
</tr>
<tr>
<td>Value</td>
<td>A value for the Filter type.</td>
</tr>
<tr>
<td>Select Column Member</td>
<td>The column element(s) against which the filter or sort is applied. Click the dimension buttons to select a single element for each column dimension.</td>
</tr>
<tr>
<td>Sort</td>
<td>The sort order you want to apply to the selected column element(s).</td>
</tr>
<tr>
<td>Ascending</td>
<td>Sorts values for the specified column element(s) from lowest to highest.</td>
</tr>
<tr>
<td>Descending</td>
<td>Sorts values for the specified column element(s) from highest to lowest.</td>
</tr>
<tr>
<td>Option</td>
<td>Filter/Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>No sort order.</td>
</tr>
</tbody>
</table>

**Get View Dialog Box (In-Spreadsheet Browser)**

The Get View dialog box lets you open a view on your local server or on any servers available on your network.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>The Server list displays all servers available on your network. Select the server on which the view you want to open resides. If you are not logged on to the server containing the view you want to open, click Connect to open the Connect Server dialog box and log on to the server. Click Start Local Server to start your local server.</td>
</tr>
<tr>
<td>Cube</td>
<td>The Cube list displays all cubes available on the selected server. Select the cube associated with the view you want to open.</td>
</tr>
<tr>
<td>View</td>
<td>The View list displays all views available on the selected cube. Select the view you want to open.</td>
</tr>
</tbody>
</table>

**In-Spreadsheet Browser Menu**

The In-Spreadsheet Browser Menu is available from a right-click on the TM1 View Control. The menu lets you open, update, format, slice and save a view. It also includes several options that control the behavior of the In-Spreadsheet Browser.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update View</td>
<td>Updates the current view by sending any edited values to the TM1 database and retrieving current values from the database.</td>
</tr>
<tr>
<td>Get View</td>
<td>Opens the Get View dialog box, from which you can open a view on any available server.</td>
</tr>
<tr>
<td>Styles</td>
<td>Opens the View Styles dialog box, which lets you format a view.</td>
</tr>
<tr>
<td>Save</td>
<td>Opens the Save View dialog box, which lets you save a TM1 view.</td>
</tr>
<tr>
<td>Clear Display</td>
<td>Clears all data associated with a view, including title, row, and column labels.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the TM1 View Control. Note that all data associated with the view, including values and labels, remain in the spreadsheet.</td>
</tr>
<tr>
<td>Cut</td>
<td>Cuts the TM1 View Control to the Clipboard.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies the TM1 View Control to the Clipboard.</td>
</tr>
<tr>
<td>Slice</td>
<td>Slices the current view into a new Excel spreadsheet.</td>
</tr>
<tr>
<td>Suppress Zeroes</td>
<td>This toggle suppresses or displays zero values in the cube view. A check mark indicates that zeros are suppressed in the current view.</td>
</tr>
<tr>
<td>Show Automatically</td>
<td>This toggle enables or disables automatic view update upon view reconfiguration. A check mark indicates that the view is automatically updated whenever the view configuration changes.</td>
</tr>
<tr>
<td>Update View on Recalc</td>
<td>This toggle enables or disables automatic view update upon spreadsheet recalculation (F9). A check mark indicates that the view is updated whenever the spreadsheet is recalculated.</td>
</tr>
<tr>
<td>Help</td>
<td>Open the In-Spreadsheet Browser help topic.</td>
</tr>
</tbody>
</table>

### Message Log Window

The TM1 Message Log window displays status messages on the activity of the server. These messages are saved to the server message log and contain details on activity such as executed processes, chores, loaded cubes and dimensions, and synchronized replication.

For detailed information about the server message log, see TM1 Operations.

#### Message Log pane

This pane displays status messages contained in the server message log.

Each row in the pane represents one unique message. If a message in the log shows an error condition for an executed process or replication, you can double-click the message to view the details of why the activity generated the error.

For details about the fields in the Message Log pane, see TM1 Operations.

### File Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exit</td>
<td>Closes the Message Log window.</td>
</tr>
</tbody>
</table>

### Edit Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Copies the selected text from the Message Log pane to the Clipboard.</td>
</tr>
<tr>
<td>Find</td>
<td>Opens the Find dialog box where you can search for text in the Message Log pane.</td>
</tr>
</tbody>
</table>
Help Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Log Help</td>
<td>Opens the Message Log help topic.</td>
</tr>
<tr>
<td>Contents and Index</td>
<td>Opens the full TM1 Documentation Library.</td>
</tr>
</tbody>
</table>

New Attribute Dialog Box

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Attribute Name</td>
<td>Enter a name for the new attribute in this field.</td>
</tr>
<tr>
<td>Numeric</td>
<td>Select this option if the attribute values are numbers.</td>
</tr>
<tr>
<td>String</td>
<td>Select this option if the attribute values are character strings.</td>
</tr>
<tr>
<td>Alias</td>
<td>Select this option if the attribute values are alternative names for current element, dimension, cube, or server names.</td>
</tr>
</tbody>
</table>

Open Subset Dialog Box

Use the Open Subset Dialog Box to open an existing dimension subset.
To open the public default subset, select the Default box and click **Open**.

Open View Dialog Box

Use the Open View Dialog Box to open an existing cube view.
To open the public default view, select the Default box and click **Open**.

Print Report Wizard

Use the Print Report Wizard to generate "briefing book"-style reports from TM1 slices.
The Wizard consists of three screens.
• Screen 1 - Select the sheets to include in the report
• Screen 2 - Select the title dimensions to use in the report, set the order in which they appear in the report, and set workbook print options
• Screen 3 - Select a print destination for the report (printer, Excel file, or PDF file)
The Print Report Wizard also allows you to save your report settings.

All Screens
<table>
<thead>
<tr>
<th><strong>Button</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Load</td>
<td>Click this button to load an existing TM1 Print Job.</td>
</tr>
<tr>
<td>Save</td>
<td>Click this button to save the current report settings as a TM1 Print Job.</td>
</tr>
<tr>
<td>Save As</td>
<td>Click this button to save the current report settings as a TM1 Print Job under a new name.</td>
</tr>
<tr>
<td>Next</td>
<td>Click this button to advance to the next Wizard screen.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Click this button to close the Wizard window without generating a report.</td>
</tr>
</tbody>
</table>

**Screen 1 of 3**

<table>
<thead>
<tr>
<th><strong>Item</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Include these sheets in the report list</td>
<td>Lists the available worksheets in the current Excel workbook that you can include in the report. To include a worksheet in the report, select the check box next to the sheet name.</td>
</tr>
<tr>
<td>Select All</td>
<td>Click this button to include all sheets in the report.</td>
</tr>
<tr>
<td>Clear All</td>
<td>Click this button to exclude all sheets from the report.</td>
</tr>
</tbody>
</table>

**Screen 2 of 3**

<table>
<thead>
<tr>
<th><strong>Item</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Title Dimensions list</td>
<td>Lists the available title dimensions that you can use in the report. For each dimension, this list displays the subset name (if applicable), number of elements in the dimension or subset, and cell address of the title dimension in the worksheet.</td>
</tr>
<tr>
<td>Selected Title Dimensions list</td>
<td>Lists the title dimensions to include in the report. The order of this list is used when TM1 generates the report.</td>
</tr>
<tr>
<td>Add</td>
<td>Click this button to move selected dimensions from the Available Title Dimensions list to the Selected Title Dimensions list.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Add All</td>
<td>Click this button to move all dimensions from the Available Title Dimensions list to the Selected Title Dimensions list.</td>
</tr>
<tr>
<td>Remove</td>
<td>Click this button to move selected dimensions from the Selected Title Dimensions list to the Available Title Dimensions list.</td>
</tr>
<tr>
<td>Remove All</td>
<td>Click this button to move all dimensions from the Selected Title Dimensions list to the Available Title Dimensions list.</td>
</tr>
<tr>
<td>Move Up</td>
<td>Click this button to move the selected dimension up in the Selected Title Dimensions list. The order in this list is used when TM1 generates the report.</td>
</tr>
<tr>
<td>Move Down</td>
<td>Click this button to move the selected dimension down in the Selected Title Dimensions list. The order in this list is used when TM1 generates the report.</td>
</tr>
<tr>
<td>Subset Editor</td>
<td>Click this button to open the Subset Editor if you want to select a subset of elements from the currently selected dimension in the Selected Title Dimensions list.</td>
</tr>
<tr>
<td>Print Single Workbook</td>
<td>Select this option to create a report arranged into one complete group of worksheets. Each sheet in the report is printed only once, including sheets that do not contain TM1 slice data.</td>
</tr>
<tr>
<td>Print Multiple Workbooks</td>
<td>Select this option to create a report arranged into multiple groups based on dimension elements. This option creates a report with a larger number of sheets because a copy of each sheet is printed for each title element.</td>
</tr>
<tr>
<td>Total Excel Workbooks that will be generated</td>
<td>Displays the total number of Excel sheets that TM1 will generate for the current report.</td>
</tr>
</tbody>
</table>

Screen 3 of 3

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print to Printer</td>
<td>Select this option if you want to print the report to a printer.</td>
</tr>
<tr>
<td>Save As Excel Files</td>
<td>Select this option if you want to generate the report as an Excel file.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Save As PDF Files</td>
<td>Select this option if you want to generate the report as a PDF file.</td>
</tr>
<tr>
<td>Preview</td>
<td>This button becomes available when you select the Print to Printer option. Click this button to preview the report before printing.</td>
</tr>
<tr>
<td>Printer Name</td>
<td>This option becomes available when you select the Print to Printer option. Use this option to specify the printer to which TM1 prints the report.</td>
</tr>
<tr>
<td>Number of Copies</td>
<td>This option becomes available when you select the Print to Printer option. Use this option to specify the number of copies of the report to print.</td>
</tr>
<tr>
<td>Print To File</td>
<td>This option becomes available when you select the Print to Printer option. Select this option to save the report as a printer-ready file.</td>
</tr>
<tr>
<td>File Name</td>
<td>This option becomes available when you select both the Print to Printer and Print to File options. Enter a full path and file name to which you want to save the report. You must also specify a file type. For example, if you print to a file using a PostScript printer, you should append the .ps file type to the file name.</td>
</tr>
<tr>
<td>Browse</td>
<td>This button becomes available when you select the option to print or save the report to a file. Click this button to choose the directory in which you want to save the report.</td>
</tr>
<tr>
<td>Collate</td>
<td>This option becomes available when you select the Print to Printer option. Select this option to group pages together when printing multiple copies of the report.</td>
</tr>
<tr>
<td>Generate New Workbook for Each Title</td>
<td>This option becomes available when you choose to save the report as an Excel or PDF file. Select this option if you want to create a separate file for each title dimension in the report.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Directory Name</td>
<td>This option is available when saving a report as an Excel or PDF file and you select the Generate New Workbook for Each Title option. Enter a directory in which to save the report files. To choose a directory location, click the Browse button.</td>
</tr>
<tr>
<td>Create Snapshot</td>
<td>This option becomes available when you select the Save As Excel Files option. Select this option when you want to save the report as an Excel file that contains actual values and not TM1 functions that retrieve values.</td>
</tr>
<tr>
<td>Back</td>
<td>Click this button to step back to the previous Wizard screen.</td>
</tr>
<tr>
<td>Finish</td>
<td>Click this button to generate the report based on the options you have selected.</td>
</tr>
</tbody>
</table>

**Process Options Dialog Box**

Use the Process Options dialog box to control the behavior of the Action button before and after the process is run.

You can use one of the following methods to set the text for confirmation and status messages that display when the Action button is clicked:

- Enter text for a message directly into the text box.
- Use an Excel reference to dynamically retrieve the text for a message from the worksheet.

For example, to retrieve the text for a message from the contents of cell A1, enter =A1 into the text box for that message. To reference a named range, use the format: =Named Range.

For more information about using the Process Options dialog, see IBM Cognos TM1 for Developers.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatically Recalculate Book</td>
<td>Select this option to have TM1 automatically recalculate the full workbook after the process has run.</td>
</tr>
<tr>
<td>Show Success Message</td>
<td>Select this option to display a message after the process has run successfully. Enter your message text into the box as described above.</td>
</tr>
<tr>
<td>Show Failure Message</td>
<td>Select this option to display a message if the process does not run successfully. Enter your message text into the box as described above.</td>
</tr>
</tbody>
</table>
**Replicate Cube Dialog Box**

Use the Replicate Cube dialog box to replicate a cube from a source server to a target server.

### Cube Information

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The name of the mirror cube on the target server. By default, TM1 names the mirror cube by concatenating the source server name with the source cube name. Do not change the default name if you are replicating rules in that cube.</td>
</tr>
<tr>
<td>Copy Data and Set to Synchronize</td>
<td>Select this option to copy data when the replication is established and to synchronize data when synchronization occurs between the source and target servers.</td>
</tr>
<tr>
<td>Copy Data but Do Not Set to Synchronize</td>
<td>Select this option to copy data when the replication is established but to disable later synchronization of data.</td>
</tr>
<tr>
<td>Replicate Views</td>
<td>Select this option to replicate all views associated with the source cube.</td>
</tr>
</tbody>
</table>

### Rule Information

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy Rule</td>
<td>Select this option to copy any rules from the source cube to the mirror cube.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Set Rule to Synchronize</td>
<td>Fill this box to synchronize rules when synchronization occurs between the source and target servers. Clear this box to disable synchronization of the rule.</td>
</tr>
<tr>
<td>Do Not Copy Rule</td>
<td>If you select this option, TM1 does not copy the rule from the source cube to the mirror cube.</td>
</tr>
</tbody>
</table>

**Dimension Information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension Information box</td>
<td>This box displays information about the dimensions in the mirror cube. If the source cube does not contain rules, TM1 renames the mirror dimensions by concatenating the source server names with the source dimension names. If the source cube contains rules, TM1 does not change the dimension names in the mirror cube. The Dimension Information box also displays the name of the source dimension, source server, and replication status for each dimension in the cube.</td>
</tr>
<tr>
<td>Select Local Dimension</td>
<td>To use a local dimension in the place of a source dimension, click the source dimension in the Dimension Information box and click Select local dimension. Select the local dimension you want to use and click OK.</td>
</tr>
<tr>
<td>Reset Current Selection to Default</td>
<td>If you change any Dimension Information options for a dimension in a replicated cube, you can restore all options to default values by selecting the dimension in the Dimension Information box and clicking this button.</td>
</tr>
<tr>
<td>Overwrite Dimension</td>
<td>This option becomes available when you select a local dimension. Select this option to overwrite the local dimension with the definition of the source dimension.</td>
</tr>
<tr>
<td>Set Dimension to Synchronize</td>
<td>Fill this box to synchronize changes to between the source and mirror dimension when synchronization occurs between the source and target servers. Clear this box to disable synchronization of the dimension.</td>
</tr>
</tbody>
</table>
**Rules Editor**

The Rules Editor has a full set of menus for creating, editing, and managing TM1 rules. Keyboard shortcuts are provided for the more commonly used menu options.

**File Menu**

The following table describes the options in the File Menu.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>Opens a file browse dialog so you can select a text file to import. Imported text will overwrite the current rule if one exists.</td>
</tr>
<tr>
<td>Save</td>
<td>Saves the current rule to the server.</td>
</tr>
<tr>
<td>Save As</td>
<td>Saves the current rule to an external TM1 rule.rux file.</td>
</tr>
<tr>
<td>Check Syntax</td>
<td>Checks the current rule for syntax errors.</td>
</tr>
<tr>
<td>Print</td>
<td>Opens the Print dialog box so you can print the current rule.</td>
</tr>
<tr>
<td>Print Preview</td>
<td>Opens the Print Preview window where you can view a sample printed version of the rule before sending it to a printer.</td>
</tr>
<tr>
<td>Exit</td>
<td>Closes the Rules Editor.</td>
</tr>
</tbody>
</table>

**Edit Menu**

The following table describes the options in the Edit Menu.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undo</td>
<td>Undoes the last edit. Multiple levels of undo are supported.</td>
</tr>
<tr>
<td>Redo</td>
<td>Reverses the last undo command.</td>
</tr>
<tr>
<td>Cut</td>
<td>Removes the selected text and places it in the clipboard.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies the selected text to the clipboard.</td>
</tr>
<tr>
<td>Paste</td>
<td>Pastes the contents of the clipboard into the Rules Editor.</td>
</tr>
<tr>
<td>Select All</td>
<td>Selects the entire contents of the Rules Editor.</td>
</tr>
<tr>
<td>Find</td>
<td>Opens the Find dialog box so you can search for text in the rule.</td>
</tr>
<tr>
<td>Find / Replace...</td>
<td>Opens the Find/Replace dialog box to search for and replace text.</td>
</tr>
<tr>
<td>Find Next</td>
<td>Locates the next occurrence of the text for which you are searching.</td>
</tr>
<tr>
<td>Toggle Bookmark</td>
<td>Turns a bookmark on or off for the current line of code.</td>
</tr>
<tr>
<td>Next Bookmark</td>
<td>Moves the cursor to the next available bookmark.</td>
</tr>
<tr>
<td>Previous Bookmark</td>
<td>Moves the cursor to the previous available bookmark.</td>
</tr>
<tr>
<td>Clear All Bookmarks</td>
<td>Removes all bookmarks.</td>
</tr>
<tr>
<td>Comment Selection</td>
<td>Adds a comment symbol # in front of all lines in the currently selected text to exclude the lines from the compiled rule. <strong>Note:</strong> Comment length is limited to 255 bytes. For Western character sets, such as English, a single character is represented by a single byte, allowing you to enter comments with 255 characters. However, large character sets, such as Chinese, Japanese, and Korean, use multiple bytes to represent one character. In this case, the 255 byte limit may be exceeded sooner and not actually allow the entry of 255 characters.</td>
</tr>
<tr>
<td>Uncomment Selection</td>
<td>Removes the comment symbol # from in front of all lines in the currently selected text to include the lines in the rule.</td>
</tr>
<tr>
<td>Indent</td>
<td>Indents the currently selected lines.</td>
</tr>
<tr>
<td>Unindent</td>
<td>Removes the indent from the currently selected lines.</td>
</tr>
<tr>
<td>Goto Line...</td>
<td>Displays the Go To Line dialog box so you can enter and jump to a specific line number in the Rules Editor.</td>
</tr>
</tbody>
</table>
### View Menu

The following table describes the options in the View Menu.

**Note:** Any changes you make to the settings on the View Menu are saved when you exit the Rules Editor and are automatically re-applied the next time you open the Rules Editor.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Wrap</td>
<td>Turns on/off the word wrap feature so lines of text either extend to the right or wrap to display within the Edit pane.</td>
</tr>
<tr>
<td>Line Numbers</td>
<td>Turns on/off line numbers.</td>
</tr>
<tr>
<td>Function Tooltips</td>
<td>Turns on/off the display of function tooltips.</td>
</tr>
<tr>
<td>Auto-Complete</td>
<td>Turns on/off the auto-complete feature when typing in the Edit pane.</td>
</tr>
<tr>
<td>Toolbar</td>
<td>Turns on/off the display of the main toolbar.</td>
</tr>
<tr>
<td>Status Bar</td>
<td>Turns on/off the display of the status bar at the bottom of the Rules Editor.</td>
</tr>
<tr>
<td>Control Objects</td>
<td>Turns on/off the display of TM1 control objects when selecting cubes.</td>
</tr>
<tr>
<td>Expand All Regions</td>
<td>Expands all of the user-defined regions in the current rule to show all lines.</td>
</tr>
<tr>
<td>Collapse All Regions</td>
<td>Collapses all of the user-defined regions in the current rule to hide all lines that are included in a region.</td>
</tr>
</tbody>
</table>

### Insert Menu

The following table describes the options in the Insert Menu.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Displays the Insert a Function dialog box to enter a new function into the current rule.</td>
</tr>
<tr>
<td>Cube Reference</td>
<td>Displays the Insert Cube Reference dialog so you can insert a DB function.</td>
</tr>
</tbody>
</table>

### Tools Menu

The following table describes the options in the Tools Menu.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferences...</td>
<td>Displays the Preferences dialog where you can set the font attributes such as font type, size, and color to be used in the Edit pane.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Options...</td>
<td>Displays the Control Options dialog where you can adjust the global settings for the Rules Editor.</td>
</tr>
</tbody>
</table>

### Save Subset Dialog Box

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select or Enter Subset Name</td>
<td>Enter a name for the saved subset, or select a name from the list.</td>
</tr>
<tr>
<td>Private</td>
<td>Toggle this option on to save the subset as a private object. Toggle this option off to save the subset as a public object.</td>
</tr>
<tr>
<td>Default</td>
<td>Toggle this option on to save the subset as a default subset.</td>
</tr>
<tr>
<td>Save Expression</td>
<td>If the subset is dynamic, toggle this option on to save the MDX expression with the subset. If the subset is dynamic and you do not toggle this option on, the MDX expression is not saved and the resulting subset is static, containing the elements present when saved.</td>
</tr>
</tbody>
</table>

### Save View Dialog Box

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select or Enter Named View</td>
<td>Enter a name for the saved view, or select a name from the list.</td>
</tr>
<tr>
<td>Private</td>
<td>Toggle this option on to save the view as a private object. Toggle this option off to save the view as a public object.</td>
</tr>
<tr>
<td>Default</td>
<td>Toggle this option on to save the view as a default view.</td>
</tr>
</tbody>
</table>

### Save View Dialog Box (In-Spreadsheet Browser)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Name</td>
<td>Enter a name for the view in this field.</td>
</tr>
</tbody>
</table>
### Security Assignments Dialog Box

The Security Assignments dialog box lets you assign access privileges for cubes, dimensions, individual elements, processes, and chores. Access privileges are assigned by user group.

### Assignments Grid

The Assignments grid displays object names as row headings and user groups as column headings. Access privileges appear as cell values at the intersection of a given object and user group.

When you access the Security Assignment dialog box from a Cubes group, the grid includes a Logging column. This column includes a check box for each cube. To enable logging for a cube, turn on the check box at the intersection of the cube name and the Logging column. To disable logging, turn off the check box. The default is on.

### Access Privileges

Click one of the following options to assign an access privileges to a selected cell in the Assignments grid:

**None Privilege**

The following table describes the ability of TM1 user groups to access various TM1 objects when assigned the None privilege for an object.

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Members of the group cannot see the cube in the Server Explorer, and thus cannot browse the cube.</td>
</tr>
<tr>
<td>Element</td>
<td>Members of the group cannot see the element in the Subset Editor or Dimension Editor, and cannot view cells identified by the element when browsing a cube.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Members of the group cannot see the dimension in the Server Explorer, and cannot browse any cubes that contain the dimension.</td>
</tr>
<tr>
<td>Process</td>
<td>Members of the group cannot see the process in the Server Explorer. <strong>Note:</strong> Privileges assigned to processes are ignored when a process is executed from within a chore.</td>
</tr>
<tr>
<td>Chore</td>
<td>Members of the group cannot see the chore in the Server Explorer.</td>
</tr>
<tr>
<td>Application</td>
<td>Members of the group cannot see the application or its contents in the Server Explorer.</td>
</tr>
</tbody>
</table>
### Reference

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>Members of the group cannot see the reference in the Server Explorer.</td>
</tr>
</tbody>
</table>

### Read Privilege

The following table describes the ability of TM1 user groups to access various TM1 objects when assigned Read privilege for an object:

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Members of the group can view data in the cube, but cannot edit the data.</td>
</tr>
<tr>
<td>Element</td>
<td>Members of the group can view data identified by the element, but cannot edit the data.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Members of the group can view the elements in a dimension, but cannot edit the dimension structure.</td>
</tr>
</tbody>
</table>
| Process| Members of the group can see the process in the Server Explorer and can execute the process, but cannot edit the process.  
*Note:* Privileges assigned to processes are ignored when a process is executed from within a chore. |
| Chore  | Members of the group can see the chore in the Server Explorer and can manually execute the chore, but cannot edit the chore or change the activation status. |
| Application| Members of the group can see the application and use any references within the application to which you have at least Read privilege. You can create private references in the application, as well as private sub-applications |
| Reference| Members of the group can open and use the reference, but cannot update the reference in the parent application. You can, however, perform a "save-as" operation to save a new private version of the reference in any application to which you have at least Read privilege. |

### Write Privilege

The following table describes the ability of TM1 user groups to access various TM1 objects when assigned Write privilege for an object.
Object | Description
---|---
Cube | Members of the group can view and edit cube data, and can create private views of the cube. Write access does not allow you to edit data identified by consolidated elements or derived from rules. By definition, values derived by consolidation or by rules cannot be edited.

Element | Members of the group can view and edit data identified by the element.

Dimension | Members of the group can edit element attributes, edit element formats, and create private subsets for the dimension. Members of the group can also edit attributes for the dimension itself.

**Reserve Privilege**
The following table describes the ability of TM1 user groups to access various TM1 objects when assigned Reserve privilege for an object.

Note that when you reserve an object, that reservation expires when the server containing the object shuts down.

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Members of the group can view and edit data in the cube, and can reserve the cube to prevent other clients from editing cube data. You can release a cube you have reserved.</td>
</tr>
<tr>
<td>Element</td>
<td>Members of the group can view and edit data identified by the element, and can reserve the element to prevent other users from editing data. You can release an element you have reserved.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Members of the group can add, remove, and reorder elements in the dimension, and can reserve the dimension to prevent other users from editing the dimension structure. You can release a dimension you have reserved.</td>
</tr>
</tbody>
</table>

**Lock Privilege**
The following table describes the ability of TM1 user groups to access various TM1 objects when assigned Lock privilege for an object.

Note that there is no Unlock privilege, and that only users with Admin privilege for an object can unlock that object.

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Members of the group can view and edit data in the cube, and can lock the cube. When a cube is locked, nobody can update its data.</td>
</tr>
</tbody>
</table>
Members of the group can view and edit data identified by the element, and can lock the element.

When an element is locked, nobody can update data identified by the element.

Members of the group can add, remove, and reorder elements in the dimension, and can lock the dimension to prevent other users from editing the dimension structure.

When a dimension is locked, nobody can edit the dimension structure.

The following table describes the ability of TM1 user groups to access various TM1 objects when assigned Admin privilege for an object.

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Members of the group can read, write, reserve, release, lock, unlock, and delete the cube.</td>
</tr>
<tr>
<td>Element</td>
<td>Members of the group can view, update, and delete cells identified by the element. They can reserve, release, lock, and unlock the element. They can also grant access privileges for this element to other users.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Members of the group can add, remove, and reorder elements in the dimension. They can reserve, release, lock, and unlock the dimension. They can also create public subsets for the dimension and grant access privileges for the dimension to other users.</td>
</tr>
</tbody>
</table>
| Application | Members of the group can see the application, use references within the application, and create both public and private references in the application. They can also create both public and private sub-applications. 

When a group has Admin privilege to an application, members of the group can set security privileges for all references and sub-applications within the application for other groups but not their own group. |
| Reference | Members of the group can use the reference, as well as update or delete the reference. They can publish private references, and privatize public references. |
Select Dimension
When you access the Security Assignment dialog box from an individual dimension, the Select Dimension option is available. This option lets you assign access privileges for elements in multiple dimensions.

After you assign access privileges for one dimension, click Save then select a new dimension from the Select Dimension list. When you complete assigning privileges for all desired dimensions, click OK to dismiss the dialog box.

Select Cube Dialog Box
Select the cube name you want to insert into your worksheet or formula and click OK.

Select Cube for Rules Dialog Box
Select the cube for which you want to create a new rule and click OK.

Select Dimension Dialog Box
Select the dimension name you want to insert into your worksheet or formula and click OK.

Select Element Dialog Box
Select the element name you want to insert into your worksheet or formula and click OK.

Server Explorer (Main Window)

Left pane (Tree pane)
Displays a hierarchical representation of all objects on servers to which you are currently connected.

Right pane (Properties pane)
Displays the properties of the object selected in the left pane of the Server Explorer. Properties vary according to the object selected.

File Menu
The following options are available on the File Menu in the Server Explorer.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>Opens the TM1 Options dialog box.</td>
</tr>
<tr>
<td>Shutdown local server</td>
<td>Shuts down the local server and prompts you to save changes to data. This option is available only when the local server is running.</td>
</tr>
<tr>
<td>Start local server</td>
<td>Starts the local server. This option is available only when the local server is not running.</td>
</tr>
</tbody>
</table>
### Dynamic Menu

The options available from the second menu in the Server Explorer vary according to the type of object currently selected.

#### Servers Group

The following options are available from the TM1 menu when you select the servers Group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Data All</td>
<td>Saves data on all servers to which you are currently connected.</td>
</tr>
</tbody>
</table>

#### Server

The following options are available from the Server Menu when you select an individual server in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Data</td>
<td>Saves all edits to data on the selected server.</td>
</tr>
<tr>
<td>Recycle (Clear memory for Local Server)</td>
<td>Shuts down and restarts the local server. When choosing this option you have the choice of recycling and saving data on the local server, or recycling and abandoning changes on the local server.</td>
</tr>
<tr>
<td>Shutdown</td>
<td>Shuts down the local server. This option is available only when the local server is selected.</td>
</tr>
<tr>
<td>Security, Clients/Groups</td>
<td>Opens the Clients/Groups Editor for the selected server. You must have Admin privileges for the server to access the Clients/Groups Editor.</td>
</tr>
<tr>
<td>Security, Change Password</td>
<td>Opens the Password Change dialog box, from which you can change your password on the selected server.</td>
</tr>
<tr>
<td>Security, Refresh Security</td>
<td>Update all security structures/assignments on the selected server.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Capability Assignments</td>
<td>Allows the administrator to set permissions for specific features by usergroup. At the intersection of the usergroup and the capability, administrators can set Grant or Deny (same as blank) to enable or disable that capability. Some capability settings may be ignored depending on the configuration settings made on the server. The following capabilities can be set per usergroup:</td>
</tr>
</tbody>
</table>
|                               | • **Block Access to Server Explorer**  
|                                | To prevent the Server Explorer from launching, click the intersection of this capability and the usergroup and select **Grant**. Blank or Deny means the Server Explorer is used by this usergroup.                                                                                                                   |
|                               | • **Personal Workspace Writeback Mode**  
|                                | To enable a usergroup to use Personal Workspaces, click the intersection of the usergroup and this capability and select **Grant**. Blank or Deny means this usergroup does not use Personal Workspaces.                                                                                     |
|                               | If DisableSandboxing is set to T, this capability assignment is ignored.                                                                                                                                                                                                                                                                       |
|                               | • **Sandbox**  
|                                | To enable a usergroup to use Sandboxes to create multiple what-if scenarios, click the intersection of the usergroup and this capability and select **Grant**. Blank or Deny means this usergroup cannot use multiple Sandboxes.                                                                                          |
|                               | If DisableSandboxing is set to T, this capability assignment is ignored.                                                                                                                                                                                                                                                                       |
|                               | See the *TM1 Operations* and *TM1 Architect, Perspectives, and TM1 Web* documentation for more information.                                                                                                                                                                                                                                   |
| View Transaction Log          | Opens the Transaction Log Query dialog box, from which you can view a log of transactions on the selected server.                                                                                                                                                                                                                                                                                  |
| View Message Log              | Opens the Message Log dialog box, which displays messages recorded on the selected server.                                                                                                                                                                                                                                                                                                             |
| Start Performance Monitor     | Initiates performance monitoring. When the Performance Monitor is running TM1 populates several control cubes that let you track statistics for cubes, clients, and server.                                                                                                                                                                                                                       |
| Stop Performance Monitor      | Stops performance monitoring.                                                                                                                                                                                                                                                                                                                                                                        |
### Deferred Updates
- **Start Batch Updates**
  - Starts batching updates to be sent to the selected server.

- **End Batch Updates**
  - Ends batching updates and sends all edits to the selected server.

### Server Manager
- Opens the Clients Messaging Center dialog box, from which you can shutdown the selected server, disconnect clients, and broadcast messages.

### Applications
The following options are available from the Applications Menu when you select either the Applications group or an individual application in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Expands the selected application or Applications group to reveal references and sub-applications.</td>
</tr>
<tr>
<td>Close</td>
<td>Collapses the selected application or Applications group to hide references and sub-applications.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the selected application. When you delete an application, all sub-applications and references within the application are automatically deleted. This option is not available when the Applications group is selected.</td>
</tr>
<tr>
<td>Rename</td>
<td>Sets the selected application name in edit mode, so you can type a new name for the application. This option is not available when the Applications group is selected.</td>
</tr>
<tr>
<td>Security, Security Assignments</td>
<td>Opens the TM1 Security Assignments window, from which you can assign security privileges for the references and immediate sub-applications contained within the selected application or Applications group.</td>
</tr>
<tr>
<td>Security, Make Public</td>
<td>Choose this option to publish a private application. When you publish an application, all sub-applications and private references to public objects within the application are automatically published as well. This option is not available when the Applications group is selected.</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security, Make Private</td>
<td>Choose this option to privatize a public application. When you privatize an application, all sub-applications and public references within the application are automatically privatized as well. This option is not available when the Applications group is selected.</td>
</tr>
</tbody>
</table>

#### Cubes

The following options are available from the Cubes Menu when you select a cubes group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create New Cube</td>
<td>Opens the Creating Cube dialog box.</td>
</tr>
<tr>
<td>Edit Attributes</td>
<td>Opens the Attributes Editor for the selected cube.</td>
</tr>
<tr>
<td>Security Assignments</td>
<td>Opens the TM1 Security Assignments dialog box for the cubes in the selected cube group. You must be a member of the Admin group on the server containing the cube group to access this dialog box.</td>
</tr>
</tbody>
</table>

#### Cube

The following options are available from the Cube Menu when you select a cube in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browse</td>
<td>Opens the cube for browsing in the Cube Viewer window.</td>
</tr>
<tr>
<td>Browse in Excel</td>
<td>Opens the cube for browsing in the In-Spreadsheet Browser.</td>
</tr>
<tr>
<td>Pick</td>
<td>Copies the cube name to the Clipboard.</td>
</tr>
<tr>
<td>Create New Cube</td>
<td>Opens the Creating Cube dialog box.</td>
</tr>
<tr>
<td>Unload Cube</td>
<td>Unload the selected cube from the server's memory.</td>
</tr>
<tr>
<td>Delete Cube</td>
<td>Deletes the selected cube and all associated data. You must have Admin privileges to delete a cube</td>
</tr>
<tr>
<td>Re-order Dimensions</td>
<td>Opens the Cube Optimizer window, from which you can optimize the order of dimensions in the selected cube.</td>
</tr>
<tr>
<td>Create Rule</td>
<td>Opens the Rules Editor, from which you can create a rule for the selected cube.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Delete Rule</td>
<td>Deletes the rule associated with the selected cube. You must have Admin privileges for a cube to delete the associated rule.</td>
</tr>
<tr>
<td>Export as ASCII Data</td>
<td>Exports the data contained in the selected cube to a comma-delimited (.cma) ASCII file.</td>
</tr>
<tr>
<td>Synchronize Data</td>
<td>Synchronizes the data in the selected cube with data from the associated replication server.</td>
</tr>
<tr>
<td>Security, Reserve</td>
<td>Temporarily reserves the selected cube so that other clients cannot edit data in the cube. You must have Reserve privileges to reserve a cube.</td>
</tr>
<tr>
<td>Security, Release</td>
<td>Releases a cube you have reserved so that other clients can edit data in the cube. You must have Reserve privileges to release a cube.</td>
</tr>
<tr>
<td>Security, Lock</td>
<td>Permanently locks the selected cube so that other clients cannot edit data in the cube. The client you are logged in with also becomes locked out of these elements. You must have Lock privileges to lock a cube.</td>
</tr>
<tr>
<td>Security, Unlock</td>
<td>Unlocks the selected cube so that other clients can edit data. You must have Admin privileges to unlock a cube.</td>
</tr>
<tr>
<td>Properties</td>
<td>Opens the Cube Properties dialog box, from which you can set measure and time dimensions.</td>
</tr>
</tbody>
</table>

**Dimensions**
The following options are available from the Dimensions Menu when you select a dimensions group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create New Dimension</td>
<td>Opens the Dimension Editor window, from which you can create a new dimension.</td>
</tr>
<tr>
<td>Edit Attributes</td>
<td>Opens the Attributes Editor window, from which you can assign and edit attributes for all dimensions in the selected group.</td>
</tr>
<tr>
<td>Security Assignments</td>
<td>Opens the TM1 Security Assignments dialog box, from which you can assign security privileges for each dimension in the group. You must be a member of the Admin group to use this option.</td>
</tr>
</tbody>
</table>

**Dimension**
The following options are available from the Dimension Menu when you select a dimension in the Server Explorer.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert New Subset</td>
<td>Opens the Subset Editor window for the dimension.</td>
</tr>
<tr>
<td>Pick</td>
<td>Copies the dimension name to the Clipboard.</td>
</tr>
<tr>
<td>Edit Dimension Structure</td>
<td>Opens the selected dimension for editing in the Dimension Editor window. You must have Write privileges for the selected dimension to use this option.</td>
</tr>
<tr>
<td>Create New Dimension</td>
<td>Opens an empty Dimension Editor window, from which you can create a new dimension. You must be a member of the Admin group to create a new dimension.</td>
</tr>
<tr>
<td>Export Dimension</td>
<td>Exports the selected dimensions as a comma-delimited (.cma) file.</td>
</tr>
<tr>
<td>Delete Dimension</td>
<td>Deletes the selected dimension. You must be a member of the Admin group to delete a dimension.</td>
</tr>
<tr>
<td>Set Elements Order</td>
<td>Opens the Dimension Element Ordering dialog box, from which you can set the order of elements in the selected dimension.</td>
</tr>
<tr>
<td>Edit Element Attributes</td>
<td>Opens the Attributes Editor window, from which you can assign and edit attributes for all elements in the selected dimension.</td>
</tr>
<tr>
<td>Synchronize Data</td>
<td>Synchronizes the data in the selected dimension with associated data from any replicated servers.</td>
</tr>
<tr>
<td>Security, Reserve</td>
<td>Temporarily reserves the selected dimension so that other clients cannot edit the dimension structure. You must have Reserve privileges to reserve a dimension. Note that this option reserves only the dimension structure. It does not reserve any data identified by elements in the selected dimension.</td>
</tr>
<tr>
<td>Security, Release</td>
<td>Releases a reserved dimension so that other clients can edit the dimension structure. You must have Reserve privileges to release a dimension. Note that this option releases only the dimension structure. It does not release any data identified by elements in the selected dimension.</td>
</tr>
<tr>
<td>Security, Lock</td>
<td>Permanently locks the selected dimension so that other clients cannot edit the dimension structure. You must have Lock privileges to lock a dimension. Note that this option locks only the dimension structure. It does not lock any data identified by elements in the selected dimension.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Security, Unlock</td>
<td>Unlocks the selected dimension so that other clients can edit the dimension structure. You must have Admin privileges to unlock a dimension. Note that this option unlocks only the dimension structure. It does not unlock any data identified by elements in the selected dimension.</td>
</tr>
<tr>
<td>Security, Elements Security Assignments</td>
<td>Opens the TM1 Security Assignments dialog box, from which you can assign security privileges for each element in the dimension. You must have Write privileges for the selected dimension to use this option.</td>
</tr>
</tbody>
</table>

**CubeViews**

The following options are available from the CubeViews Menu when you select a views group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create New View</td>
<td>Opens the Cube Viewer window, from which you can configure a new view.</td>
</tr>
</tbody>
</table>

**CubeView**

The following options are available from the CubeView Menu when you select a view in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browse</td>
<td>Opens the view in the Cube Viewer window.</td>
</tr>
<tr>
<td>Browse in Excel</td>
<td>Opens the view in the In-Spreadsheet Browser.</td>
</tr>
<tr>
<td>Export as Text Data</td>
<td>Opens the View Extract window, from which you can export the view as a comma-delimited (.cma) file.</td>
</tr>
<tr>
<td>Publish</td>
<td>This option is available when you select a private view. Choose this option to convert a view from private to public. Public views are available to all clients with Read privileges for the cube containing the view.</td>
</tr>
<tr>
<td>Delete View</td>
<td>Deletes the selected view. Note that this option only deletes the view configuration, and not the data contained in the view.</td>
</tr>
</tbody>
</table>

**Subsets**

The following options are available from the Subsets Menu when you select a subsets group in the Server Explorer.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert New Subset</td>
<td>Opens the Subset Editor window, from which you can define a new subset.</td>
</tr>
</tbody>
</table>

**Subset**
The following options are available from the Subset Menu when you select a subset in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Opens the selected subset in the Subset Editor window.</td>
</tr>
<tr>
<td>Create New Subset</td>
<td>Opens the Subset Editor window for the dimension to which the selected subset belongs. You can define a new subset in this window.</td>
</tr>
<tr>
<td>Publish</td>
<td>This option is available when you select a private subset. Choose this option to convert a subset from private to public. Public subsets are available to all clients with Read privileges for the dimension containing the subset.</td>
</tr>
<tr>
<td>Delete Subset</td>
<td>Deletes the selected subset. Note that this option only deletes the subset configuration, and does not delete the elements contained in the subset from the parent dimension.</td>
</tr>
</tbody>
</table>

**Replications**
The following options are available from the Replications Menu when you select a replications group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert New Replication</td>
<td>Opens the Create Server Replication Object dialog box, from which you can establish a new replication connection.</td>
</tr>
</tbody>
</table>

**Replication**
The following options are available from the Replication Menu when you select a replication in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronize Data</td>
<td>Synchronizes data between the target and source servers.</td>
</tr>
<tr>
<td>Modify Replication Parameters</td>
<td>Opens the Create Server Replication Object dialog box, from which you can modify the parameters for the selected replication connection.</td>
</tr>
<tr>
<td>Delete Replication</td>
<td>Deletes the selected replication connection.</td>
</tr>
</tbody>
</table>
### Display Chores Involved
Opens the Select Chores to Modify dialog box. You can use this dialog box to remove the selected replication from any associated chores.

### Replicated Cube
The following options are available from the Cube Menu when you select a replicated cube in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replicate</td>
<td>Opens the Replicate Cube dialog box for the selected cube, from which you can define replication parameters and replicate the cube.</td>
</tr>
<tr>
<td>Synchronize Data</td>
<td>Synchronizes data between the replicated cube and the source server.</td>
</tr>
</tbody>
</table>

### Processes
The following options are available from the Processes Menu when you select a processes group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create New Process</td>
<td>Opens TurboIntegrator, from which you can create a new process.</td>
</tr>
<tr>
<td>Security Assignments</td>
<td>Opens the TM1 Security Assignments dialog box, from which you can set security privileges for processes on the current server.</td>
</tr>
</tbody>
</table>

### Process
The following options are available from the Process Menu when you select a process in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Chores Involved</td>
<td>Opens the Select Chores to Modify dialog box. You can use this dialog box to remove the selected process from any associated chores.</td>
</tr>
<tr>
<td>Edit Process</td>
<td>Opens the selected process in a TurboIntegrator window.</td>
</tr>
<tr>
<td>Run Process</td>
<td>Runs the selected process.</td>
</tr>
<tr>
<td>View</td>
<td>Views a process in read-only mode. Allows members of the DataAdmin and SecurityAdmin groups to view a process in read-only mode when the Security Access option is enabled for the process.</td>
</tr>
</tbody>
</table>
### Security Access
Controls whether a process is allowed to modify security data in the script of the process. Only members of the ADMIN and SecurityAdmin groups are allowed to set this option. You set this option on a process-by-process basis.

### Delete Process
Deletes the selected process.

### Use Active Sandbox
Configures the process to use the data in the current active sandbox instead of base data when you run the process. The active sandbox is determined by which sandbox is currently selected in the Cube Viewer.

---

#### Chores
The following options are available from the Chores Menu when you select a chores group in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create New Chore</td>
<td>Opens the Chore Setup Wizard, from which you can schedule a new chore.</td>
</tr>
<tr>
<td>Security Assignments</td>
<td>Opens the TM1 Security Assignments dialog box, from which you can set security privileges for chores on the current server.</td>
</tr>
</tbody>
</table>

#### Chore
The following options are available from the Chore Menu when you select an individual chore in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activate Schedule</td>
<td>This option toggles the chores execution status. Select this option to activate the selected chore for execution. A check mark displays next to this option when a chore is activated. Select this option again to deactivate the selected chore.</td>
</tr>
<tr>
<td>Edit</td>
<td>Opens the chore for editing in the Chore SetUp Wizard. You must deactivate a chore before editing.</td>
</tr>
<tr>
<td>Run</td>
<td>Runs the selected chore.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the selected chore. You must deactivate a chore before deleting.</td>
</tr>
</tbody>
</table>

---

#### Edit Menu
The following options are available on the Edit Menu in the Server Explorer.
## View Menu

The following options are available on the View Menu in the Server Explorer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Bar</td>
<td>Hides or displays the status bar at the bottom of the Server Explorer window. A check mark indicates that the status bar is displayed.</td>
</tr>
<tr>
<td>Toolbar</td>
<td>Hides or displays the toolbar at the top of the Server Explorer window. A check mark indicates that the toolbar is displayed.</td>
</tr>
<tr>
<td>Properties Window</td>
<td>Hides or displays the Properties pane of the Server Explorer. A check mark indicates that the Properties pane is displayed.</td>
</tr>
<tr>
<td>Objects:</td>
<td></td>
</tr>
<tr>
<td>Applications</td>
<td>Hides or displays any of the objects in the Server Explorer's left pane (Tree pane). A check mark indicates that the selected object is displayed.</td>
</tr>
<tr>
<td>Cubes</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Replications</td>
<td></td>
</tr>
<tr>
<td>Processes</td>
<td></td>
</tr>
<tr>
<td>Chores</td>
<td></td>
</tr>
<tr>
<td>Collapse All Children</td>
<td>Contracts the tree in the left pane of the Server Explorer to hide all children of a selected object.</td>
</tr>
<tr>
<td>Expand All Children</td>
<td>Expands the tree in the left pane of the Server Explorer to show all children of a selected object.</td>
</tr>
<tr>
<td>Display Control Objects</td>
<td>Hides or displays the control cubes and dimensions in the left pane of the Server Explorer window. A check mark indicates that the control objects are displayed.</td>
</tr>
<tr>
<td>Refresh</td>
<td>Updates the current hierarchical display of objects in the left pane of the Server Explorer.</td>
</tr>
</tbody>
</table>
**Elements pane**
Displays a hierarchical representation of all elements in the subset you are currently viewing.

**Properties pane**
Displays the properties of the elements selected in the Elements pane of the Subset Editor. When you select a consolidated element, this pane displays the names, types, and weights of all children of the consolidated element.

**Note:** When viewing an exceptionally large dimension set in the Subset Editor with the Properties pane on, you might experience performance issues. This can happen when you select a consolidation in the Elements pane and TM1 has to display the entire list of related elements and properties in the Properties pane.

If you are working with large dimension sets, you may want to turn off the Properties pane. To turn off the Properties pane, click the Properties Window option in the View Menu to remove the check mark next to the option.

**Subset Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Opens the TM1 Save Subset dialog box. Select a subset from the list and click OK to open the subset.</td>
</tr>
<tr>
<td>Reload</td>
<td>Reloads the current subset definition.</td>
</tr>
<tr>
<td>Save</td>
<td>Saves the current subset definition.</td>
</tr>
<tr>
<td>Save as</td>
<td>Saves the current subset definition under a new name.</td>
</tr>
<tr>
<td>Close</td>
<td>Closes the Subset Editor.</td>
</tr>
</tbody>
</table>

**Edit Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undo</td>
<td>Undoes last action.</td>
</tr>
<tr>
<td>Redo</td>
<td>Restores the last &quot;undo&quot; action.</td>
</tr>
<tr>
<td>Cut</td>
<td>Cuts selected elements to the Clipboard.</td>
</tr>
<tr>
<td>Copy</td>
<td>Copies selected elements to the Clipboard.</td>
</tr>
<tr>
<td>Copy Unique Name</td>
<td>Copies the element name, as an MDX expression, to the Clipboard. The copied element name can then be pasted into the Expression Window of the Subset Editor.</td>
</tr>
<tr>
<td>Paste</td>
<td>Pastes the contents of the Clipboard at the current insertion point.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Paste Above</td>
<td>Paste the contents of the Clipboard above the currently selected element.</td>
</tr>
<tr>
<td>Paste Below</td>
<td>Paste the contents of the Clipboard below the currently selected element.</td>
</tr>
<tr>
<td>Insert Subset</td>
<td>Opens a new instance of the Subset Editor so you can add a user-defined consolidation to the current subset.</td>
</tr>
<tr>
<td>Keep</td>
<td>Keeps only the currently selected elements in the Elements pane of the Subset Editor, and removes all other elements.</td>
</tr>
<tr>
<td>Delete</td>
<td>Removes selected elements from the current subset definition.</td>
</tr>
<tr>
<td>Pick Elements, Horizontal</td>
<td>Copies selected elements to the Clipboard in a horizontal orientation, so they can be pasted into a worksheet row.</td>
</tr>
<tr>
<td>Pick Elements, Vertical</td>
<td>Copies selected elements to the Clipboard in a vertical orientation, so they can be pasted into a worksheet column.</td>
</tr>
<tr>
<td>Sort, Descending</td>
<td>Sorts all elements in the Elements pane in alphabetically descending order.</td>
</tr>
<tr>
<td>Sort, Ascending</td>
<td>Sorts all elements in the Elements pane in alphabetically ascending order.</td>
</tr>
<tr>
<td>Sort, Hierarchy</td>
<td>Sorts all elements in the Elements pane in hierarchical order, so you can see the parent/child relationship of elements.</td>
</tr>
<tr>
<td>Sort, Index Ascending</td>
<td>Sorts all elements in the Elements pane in ascending order according to element index value.</td>
</tr>
<tr>
<td>Sort, Index Descending</td>
<td>Sorts all elements in the Elements pane in descending order according to element index value.</td>
</tr>
<tr>
<td>Drill Down</td>
<td>Displays the immediate children of selected elements.</td>
</tr>
<tr>
<td>Roll Up</td>
<td>Displays the immediate parents of selected elements.</td>
</tr>
<tr>
<td>Expand Element</td>
<td>Displays all children of selected elements.</td>
</tr>
<tr>
<td>Collapse Element</td>
<td>Collapses selected consolidations so that children are not displayed.</td>
</tr>
</tbody>
</table>
### Menu Item | Description
--- | ---
Filter by, Levels | Opens the Filter by Level dialog box, from which you can select elements by hierarchy level.
Filter by, Attribute | Opens the Filter by Attribute dialog box, from which you can select elements by attribute value.
Filter by, View Extract | Lets you select only those elements that satisfy a user-defined query. This option is available only when you open the Subset Editor by clicking on a dimension label in the Cube Viewer window.
Filter by, Wildcard | Lets you select elements that match a user-defined search string.
Select Alias | Opens the TM1 Aliases dialog box, from which you can select a previously defined alias by which to display element names.
Security, Reserve | Temporarily reserves the selected element so that other clients cannot edit data identified by the element. You must have Reserve privileges to reserve an element.
Security, Release | Releases a reserved element so that other clients can edit data identified by the element. You must have Reserve privileges to release an element.
Security, Lock | Permanently locks the selected element so that other clients cannot edit data identified by the element. You must have Lock privileges to lock an element.
Security, Unlock | Unlocks the selected element so that other clients can edit data identified by the element. You must have Admin privileges to unlock a dimension.
Edit Element Formats | Opens the Edit Element Formats worksheet, where you can define display styles for dynamic slices and TM1 Websheets.

### View Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbars</td>
<td>Opens a submenu that lets you enable or disable the display of all Subset Editor toolbars. A check mark indicates that a toolbar is displayed.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Status Bar</td>
<td>Hides or displays the Status Bar at the bottom of the Subset Editor window.</td>
</tr>
<tr>
<td></td>
<td>A check mark indicates that the Status Bar is displayed.</td>
</tr>
<tr>
<td>Properties Window</td>
<td>Hides or displays the Properties pane.</td>
</tr>
<tr>
<td></td>
<td>A check mark indicates that the Properties pane is displayed.</td>
</tr>
<tr>
<td>Expression Window</td>
<td>Hides or displays the Expression Window at the bottom of the Subset Editor.</td>
</tr>
<tr>
<td></td>
<td>A check mark indicates that the Expression Window is displayed.</td>
</tr>
<tr>
<td>Expand Above</td>
<td>This option determines how consolidations expand and contract when you drill down.</td>
</tr>
<tr>
<td></td>
<td>When this option is turned on, children of a consolidation expand above the consolidation when you drill down.</td>
</tr>
<tr>
<td></td>
<td>When this option is turned off, children of a consolidation expand below the consolidation when you drill down.</td>
</tr>
<tr>
<td></td>
<td>When the Expand Above option is enabled in a subset, drilling down on a consolidation in either the Cube Viewer, In-Spreadsheet Browser, or slice results in the following behavior:</td>
</tr>
<tr>
<td></td>
<td>If the option is enabled in a row subset, drilling down on a consolidation displays the children above the consolidation.</td>
</tr>
<tr>
<td></td>
<td>If the option is enabled in a column subset, drilling down on a consolidation displays the children to the left of the consolidation.</td>
</tr>
<tr>
<td>Refresh</td>
<td>Updates the display of the Elements pane.</td>
</tr>
</tbody>
</table>

**Tools Menu**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record Expression</td>
<td>Starts recording your actions in the Subset Editor.</td>
</tr>
<tr>
<td>Stop Recording</td>
<td>Stops recording your actions in the Subset Editor.</td>
</tr>
<tr>
<td></td>
<td>When you stop recording, TM1 generates an MDX expression that can be saved to create a dynamic subset.</td>
</tr>
<tr>
<td>Clear Expression</td>
<td>Clears the contents of the Expression Window.</td>
</tr>
</tbody>
</table>
### Menu Item

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>Opens the Filter Subset dialog box, which lets you create a dynamic subset based on cube values.</td>
</tr>
</tbody>
</table>

### Aliases Dialog Box

To view current subset elements by assigned aliases, select an alias name from the list and click **OK**.

### TM1 Options Dialog Box

The following options can be set in the TM1 Options dialog box.

#### Login Parameters

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Host</td>
<td>Enter the computer name of your Admin Host. The Admin Host is the computer on which your Admin Server runs.</td>
</tr>
<tr>
<td>Integrated Login</td>
<td>Toggle this option on to use Integrated Login. Toggle this option off to use standard TM1 login security. The default is off.</td>
</tr>
</tbody>
</table>

#### Local Server

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Server Data Directory</td>
<td>Enter the full path to your Local Server Data Directory, or click the accompanying Browse button to browse to the directory. You can also click the down arrow to select from a list of recently accessed directories.</td>
</tr>
<tr>
<td>Connect to Local Server on Startup</td>
<td>Toggle this option off to start TM1 Perspectives/TM1 Architect without launching the local server. The default is on.</td>
</tr>
</tbody>
</table>

**Note:** The local server is supported only on 32-bit versions of TM1. The default data directory for the local server is Pdata. If you are running a 64-bit version of TM1, the Sdata sample server, which is installed by default with the TM1 server, contains the same objects and data as are found in Pdata.

### Admin Server Transport Layer Security
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate Authority</td>
<td>The full path of the certificate authority file that issued the Admin Server’s certificate.</td>
</tr>
<tr>
<td>Certificate Revocation List</td>
<td>The full path of the certificate revocation file issued by the certificate authority that originally issued the Admin Server’s certificate. A certificate revocation file will only exist in the event a certificate had been revoked.</td>
</tr>
<tr>
<td>Certificated ID</td>
<td>The name of the principal to whom the Admin Server’s certificate is issued.</td>
</tr>
<tr>
<td>Use Certificate Store</td>
<td>Select this option if you want the certificate authority certificate which originally issued the Admin Server’s certificate to be exported from the Windows certificate store at runtime. When this option is selected, you must also set a value for Export Certificate ID in the TM1 Options dialog box.</td>
</tr>
<tr>
<td>Export Certificate ID</td>
<td>The identity key used to export the certificate authority certificate, which originally issued the Admin Server’s certificate, from the certificate store. This parameter is required only if you enable the Use Certificate Store option.</td>
</tr>
</tbody>
</table>

**Transaction Log Query Dialog Box**

The Transaction Log Query dialog box lets you query and view records in the TM1 transaction log (Tm1s.log). The dialog box contains fields for four parameters that you must specify to execute a query.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time</td>
<td>The start date/time for the query. TM1 queries against all records written to the transaction log on or after this date/time. You must use the format MM/DD/YYYY HH:MM:SS to specify a start time. The default start date/time is 00:01:00 GMT on the date the query is launched.</td>
</tr>
<tr>
<td>End Time</td>
<td>The end date/time for the query. The default is <strong>/</strong>/____ <strong>:</strong>:__, which is an open-end date/time. If you accept the default, TM1 queries against all records up to the time the query is launched.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Client(s)</td>
<td>The client(s) against which the query is applied. You can query against either a single client or all clients. The default is all clients (*).</td>
</tr>
<tr>
<td>Cubes(s)</td>
<td>The cube(s) against which the query is applied. You can query against either a single cube or all cubes. The default is all cubes (*).</td>
</tr>
</tbody>
</table>

To set any of the above parameters, click the arrow next to the appropriate field.

**Transaction Log Query Results Dialog Box**

The Transaction Log Query Results dialog box presents the result of a transaction log query in table format. The table contains the following columns for each record returned by the query:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOGTIME</td>
<td>The time at which a value was edited.</td>
</tr>
<tr>
<td>REPLICATIONTIME</td>
<td>The time at which a value was replicated.</td>
</tr>
<tr>
<td>CLIENT</td>
<td>The name of the client who wrote the value.</td>
</tr>
<tr>
<td>OLDVALUE</td>
<td>Data value before editing.</td>
</tr>
<tr>
<td>NEWVALUE</td>
<td>Data value after editing.</td>
</tr>
<tr>
<td>CUBENAME</td>
<td>The cube to which the value was written.</td>
</tr>
<tr>
<td>KEY N</td>
<td>There are multiple Key N columns in the table, each column representing the elements that identify the value.</td>
</tr>
</tbody>
</table>

The Transaction Log Query Results dialog box includes three menus.

The **File** Menu contains a single item: Exit.

The **Help** Menu contains a single item to open help for the dialog box.

The **Edit** Menu contains the following items:

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Copies a single selected cell to the clipboard.</td>
</tr>
<tr>
<td>Hide</td>
<td>Suppresses the display of selected record(s) in the table.</td>
</tr>
<tr>
<td></td>
<td>You can click Refresh to restore the display of hidden records.</td>
</tr>
<tr>
<td>Sort</td>
<td>Opens a sub-menu from which you can choose columns to sort or a sort order to apply.</td>
</tr>
</tbody>
</table>
### Menu Item | Description
---|---
Find | Opens the Find/Replace dialog box, which allows you to search the current table.
Select | Selects highlighted record(s)
Unselect | Unselects highlighted record(s).
Select All | Selects all records in the table.
Unselect All | Unselects all records in the table.
Back Out | Backs out selected record(s). When a record is backed out, the OLDVALUE for the record replaces the NEWVALUE for the record. When multiple records for a single cube location are selected, records are backed out to OLDVALUE of the earliest LOGTIME.

### TurboIntegrator Editor

The TurboIntegrator Editor lets you define processes for importing data or metadata from several possible sources. The editor is comprised of five tabs, several of which are dynamic or contain sub-tabs. You define a process by completing each tab in sequential order.

### File Menu

| Menu Item | Description |
---|---|
Save | Saves the current process definition. |
Save As | Saves the current process definition with a new name. |
Run | Runs the current process. |
Exit | Closes the TurboIntegrator Editor. |

### Edit Menu

| Menu Item | Description |
---|---|
Undo | Undoes the last typing action that was performed on the Prolog, Metadata, Data, or Epilog procedure sub-tab. |
Cut | Cuts the selected text to the Clipboard. |
Copy | Copies the selected text to the Clipboard. |
Menu Item | Description
---|---
Paste | Pastes the contents of the Clipboard to the current field or cell.

Data Source Tab
Use the Data Source tab to identify and access the source from which you want to import data.

**Note:** When defining a process from the TM1 client, the path to an ASCII or ODBC data source may differ from the path used by the server. If this happens, the process will fail. To ensure that your processes work correctly:

- Define processes involving ODBC data sources on the actual server where the process is to reside. Do not use a remote client to define such a process.
- Use the Windows Network Neighborhood to define the path to ASCII data sources. This ensures that the path is unambiguous to both clients and servers.

The fields and options available on the Data Source tab vary according to the Datasource Type you select. The following tables describes the required fields and options for each source.

**ODBC**
Define an ODBC datasource:

<table>
<thead>
<tr>
<th>Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Source Name</td>
<td>The full path to the ODBC data source.</td>
</tr>
<tr>
<td>UserName</td>
<td>Your user name on the source.</td>
</tr>
<tr>
<td>Password</td>
<td>Your password.</td>
</tr>
<tr>
<td>Query</td>
<td>An SQL query to extract data from the source.</td>
</tr>
<tr>
<td>Use Unicode</td>
<td>Check here to use Unicode for this source.</td>
</tr>
<tr>
<td>Preview</td>
<td>Displays the first 10 records.</td>
</tr>
</tbody>
</table>

**Text**
Define an ASCII or Text datasource:

<table>
<thead>
<tr>
<th>Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Source Name On Server</td>
<td>When you create a new process, TurboIntegrator assumes that the data source name on the server is identical to the data source name used to create the process. If the data source name on the server is different from the local data source used to create the process, enter the full path to the data source file on the server.</td>
</tr>
<tr>
<td>Data Source Name On Server</td>
<td>The full path to the source text file. To ensure that this path is recognizable to both client and server, click the Browse button and use the Network Neighborhood to define the path.</td>
</tr>
<tr>
<td><strong>Fields</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Delimiter Type</td>
<td>If the source uses a character to define the columns, select <strong>Delimited</strong>, then choose the character in the <strong>Delimiter</strong> box.</td>
</tr>
<tr>
<td>Fixed Width</td>
<td>If the source uses a fixed width, select <strong>Fixed Width</strong>, then use the <strong>Set Field Widths</strong> button to open the Preview dialog box to set column widths.</td>
</tr>
<tr>
<td>Quote Char</td>
<td>Specify the quote character used in your source data.</td>
</tr>
<tr>
<td>Number of title records</td>
<td>If the title records span more than one row, enter the number of rows here. Otherwise, leave this field blank.</td>
</tr>
<tr>
<td>Number Delimiters</td>
<td>Enter the character to use for the Decimal <strong>Separator</strong> and <strong>Thousand</strong> Separator in the source.</td>
</tr>
</tbody>
</table>

**ODBO**
Define an ODBC data source established for a relational database that can be built using the Microsoft Windows Data Sources control panel:

**Cube or Dimension**
Select the type of import to do:

<table>
<thead>
<tr>
<th><strong>Fields</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ODBO Provider</td>
<td>To import a ODBO cube, use the pull-down to select the OLE DB for OLAP data source, including Microsoft Analysis Services to use.</td>
</tr>
<tr>
<td>ODBO Location</td>
<td>Enter the file location for this provider. When you import a dimension, leave this field blank.</td>
</tr>
<tr>
<td>ODBO Datasource</td>
<td>Enter the name your administrator assigns to a set of catalogs at a particular location. In Microsoft Analysis Services, this is the name of a registered server.</td>
</tr>
<tr>
<td>ODBO Catalog</td>
<td>The name assigned by your administrator to a particular collection of databases (Cubes, Dimensions and other objects). For MAS, this is the name of the database.</td>
</tr>
<tr>
<td>ODBO UserID</td>
<td>A valid username for the database.</td>
</tr>
<tr>
<td>ODBO Password</td>
<td>A valid password in this datasource.</td>
</tr>
<tr>
<td>Additional Connection Parameters</td>
<td>Enter any additional parameters required by the ODBO source here. Delimit the parameters with semi-colons. When you import a dimension, leave this blank.</td>
</tr>
</tbody>
</table>
**MDX Query**
Define an MDX-based query:

<table>
<thead>
<tr>
<th>Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection tab</td>
<td>Enter the required connection information. Connection parameters are vendor-specific. Click Connect. If you connect successfully, the MDX Query tab becomes available.</td>
</tr>
<tr>
<td>MDX Query tab</td>
<td>Enter the MDX query into this tab or paste a working MDX query from another application.</td>
</tr>
</tbody>
</table>

**SAP**
Defines the SAP RFC datasource:

<table>
<thead>
<tr>
<th>Tab</th>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>System</td>
<td>The name of the SAP system you want to connect to. If the system name includes spaces, enclose the name in double quotes.</td>
</tr>
<tr>
<td></td>
<td>Client</td>
<td>A number that corresponds to the UI version on the SAP server. For example, 498.</td>
</tr>
<tr>
<td></td>
<td>User</td>
<td>Your username on the SAP system.</td>
</tr>
<tr>
<td></td>
<td>Password</td>
<td>Your password on the SAP system.</td>
</tr>
<tr>
<td></td>
<td>Language</td>
<td>The language you want to use to logon to the SAP system. All textual descriptions are returned in the language specified, if available. The language parameter is a two-letter abbreviation, for example, EN=English.</td>
</tr>
<tr>
<td></td>
<td>Additional Connection Parameters</td>
<td>Enter any other parameters and values you use to connect to your SAP BW system.</td>
</tr>
</tbody>
</table>
### Packet Size
A value that limits the number of rows in each packet sent from SAP to TM1. A smaller packet size will result in increased network traffic with small packets, while a larger packet size results in decreased network traffic but larger packets per transmission.

The default packet size, which is also the minimum packet size, is 50,000.

### Info Cube

<table>
<thead>
<tr>
<th>Area</th>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info Cube</td>
<td>Show SAP Technical Names</td>
<td>To use technical names, select this checkbox. Leave this box unchecked to display by descriptive name.</td>
</tr>
<tr>
<td></td>
<td>Select InfoCube to Load from</td>
<td>Use the option to indicate the InfoCube from which you want to import data.</td>
</tr>
<tr>
<td></td>
<td>Select TM1 Cube to Load to</td>
<td>To import the SAP InfoCube to an existing TM1 cube, click this option and select the cube to receive the SAP InfoCube data.</td>
</tr>
<tr>
<td></td>
<td>Select TM1 Cube to Load to</td>
<td>To create a new TM1 cube when you import the InfoCube, enter a name for the new TM1 cube in this to field.</td>
</tr>
<tr>
<td>TM1 Cube Action</td>
<td>Create</td>
<td>Imports data and metadata from the SAP InfoCube and creates a new cube in TM1. Use this option only when none of the cubes and dimensions you are importing exist on the server.</td>
</tr>
<tr>
<td></td>
<td>Recreate</td>
<td>Destroys an existing TM1 cube and rebuilds it using data and metadata from the SAP InfoCube. Use this option only when the TM1 cube and dimensions exist, and you want to replace them with new structures and data from the SAP InfoCube.</td>
</tr>
<tr>
<td>Area</td>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Update</td>
<td>Imports data from an existing SAP InfoCube cube and inserts it into an existing TM1 cube. This option does not change the structure of cubes and dimensions on the server.</td>
</tr>
<tr>
<td></td>
<td>Processes that specify No Action do not affect the data or metadata of TM1 cubes. Use this option to test and debug processes or to define your own custom operations.</td>
<td></td>
</tr>
<tr>
<td>Data Action</td>
<td>Store Values</td>
<td>This option writes cell values from the SAP InfoCube to the TM1 cube. If you choose this option when the Update Cube option is selected, existing TM1 cube values are overwritten by values imported from the InfoCube.</td>
</tr>
<tr>
<td></td>
<td>Accumulate Values</td>
<td>The Accumulate Values option allows you to aggregate existing TM1 Cube values with values imported from the SAP InfoCube.</td>
</tr>
<tr>
<td></td>
<td>Zero Out Portion of Target Cube</td>
<td>This option becomes available when you select the Update Cube action. Select this option if you want to set all data points in a specified cube view to zero. To define the cube view to be zeroed, you can: • Click the View list to select an existing view to be zeroed. • Click the More button next to the View option list to define a new view to be zeroed.</td>
</tr>
<tr>
<td>Area</td>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Enable Cube Logging</td>
<td></td>
<td>To log changes to cube data while importing from an SAP InfoCube, select this option. To disable logging while importing, clear this option.</td>
</tr>
<tr>
<td></td>
<td>Note: Disabling logging</td>
<td>accelerates data loading and updating, but makes it impossible to recover any updates in the event of a system failure.</td>
</tr>
</tbody>
</table>

**Characteristics tab**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Hierarchies</td>
<td>Identify the hierarchies in the datasource.</td>
</tr>
<tr>
<td>Evaluation Date</td>
<td>Date when all time-dependent SAP attributes are imported into TM1 as they existed on the specified date. Attributes that are not time-dependent are imported as they exist at the time of process execution. If this date is cleared, all SAP attributes are imported as they exist on the date the TM1 process runs. Do not import a hierarchy with intervals.</td>
</tr>
<tr>
<td>TM1 Dimension</td>
<td>Select the existing TM1 dimension that maps to this characteristic. Leave this field empty if you do not want to import the characteristic in to your TM1 cube.</td>
</tr>
<tr>
<td>TM1 Dimension Action</td>
<td>Create a new TM1 dimension from the SAP characteristic.</td>
</tr>
<tr>
<td></td>
<td>Entirely recreate an existing TM1 dimension with elements imported from the SAP characteristic.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Update</td>
<td>Update an existing dimension structure by adding new elements imported from the SAP characteristic.</td>
</tr>
<tr>
<td>AsIs</td>
<td>Process the characteristic through TurboIntegrator, but do not use the characteristic to create or modify any TM1 dimensions. Use this option to test and debug processes or to manipulate the characteristic in the Advanced tab of TurboIntegrator.</td>
</tr>
<tr>
<td>Don't Load</td>
<td>Do not import the SAP characteristic into TM1. The characteristic is entirely excluded when the SAP InfoCube is processed through TurboIntegrator.</td>
</tr>
<tr>
<td>Select Attributes</td>
<td>Characteristic Attributes</td>
</tr>
<tr>
<td>Text</td>
<td>Defines the attributes for this data source.</td>
</tr>
<tr>
<td>Numeric</td>
<td>Identifies attributes with a numeric value.</td>
</tr>
<tr>
<td>Alias</td>
<td>Identifies attributes that are alternative names for the dimensions with which they are associated. A dimension alias must be unique from all other dimension aliases or actual dimension names.</td>
</tr>
<tr>
<td>Select Key Figure</td>
<td>Select each key figure you want to import into TM1.</td>
</tr>
<tr>
<td></td>
<td>If the key figures map to an existing TM1 dimension, click the <strong>TM1</strong> Dimension column and select the dimension that corresponds to the key figures.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>Add Restrictions</td>
</tr>
<tr>
<td></td>
<td>Create a new restriction for this characteristic.</td>
</tr>
<tr>
<td>SAP Characteristic</td>
<td>Select the characteristic to set a restriction on.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Sign</td>
<td>Indicates if the restriction is inclusive or exclusive. Choose Include if you want the TurboIntegrator process to import only those values that fall within the restriction definition. Choose Exclude if you want the TurboIntegrator process import only those values that fall outside of the restriction definition.</td>
</tr>
<tr>
<td>Option</td>
<td>The Operator used for the restriction. There are eight operators to choose from, as described in the following table.</td>
</tr>
</tbody>
</table>

### Option Restriction Operators

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>The restriction identifies only characteristics equal to the specified Low Value.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>The restriction identifies only characteristics less than or greater than the specified Low Value.</td>
</tr>
<tr>
<td>&lt;</td>
<td>The restriction identifies only characteristics less than the specified Low Value.</td>
</tr>
<tr>
<td>&gt;</td>
<td>The restriction identifies only characteristics greater than the specified Low Value.</td>
</tr>
<tr>
<td>&lt;=</td>
<td>The restriction identifies only characteristics less than or equal to the specified Low Value.</td>
</tr>
<tr>
<td>&gt;=</td>
<td>The restriction identifies only characteristics greater than or equal to the specified Low Value.</td>
</tr>
<tr>
<td>[]</td>
<td>The restriction identifies only characteristics that fall between the specified Low Value and High Value, inclusive.</td>
</tr>
<tr>
<td>][</td>
<td>The restriction identifies only characteristics that fall outside of the specified Low Value and High Value, inclusive.</td>
</tr>
</tbody>
</table>

There are eight operators to choose from, as described in the following table.
Enter a low value for the restriction in the Low Value column.
Enter a high value for the restriction, if required, in the High Value column.
Note: Restrictions are not validated through TurboIntegrator. You must ensure that the restrictions you enter are accurate and valid for your SAP data.

**Security**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import Security</td>
<td>Indicates that the security assignments for this characteristic should be imported.</td>
</tr>
<tr>
<td>Top Consolidation</td>
<td>Creates a top-level consolidation for the TM1 dimension created using the name entered here.</td>
</tr>
<tr>
<td>Make Texts Unique</td>
<td>To generate unique aliases for all elements created from the SAP characteristic, select this option. When you import an SAP characteristic into TM1, characteristic values become TM1 dimension elements while SAP value descriptions become TM1 element aliases. In TM1, all element aliases within a dimension must be unique. If a TurboIntegrator process attempts to assign the same alias to multiple elements, the process will generate errors and alias creation will fail. When Make Texts Unique option is selected, TM1 examines the SAP descriptions that are imported and converted into TM1 aliases. If TM1 detects that multiple values use identical descriptions, TM1 appends the value name to the description to generate unique aliases. <strong>If Make Texts Unique</strong> is not checked, no SAP Text data is fetched. When Make Texts Unique is not checked, you can add DataSourceSAPUsingTexts=1; in the prolog to import the alias attribute values. See the AttrPutS function to get the same behavior using a TI script.</td>
</tr>
<tr>
<td>Evaluation Date</td>
<td>All characteristic values that existed between the selected date and the date of process execution will be imported into TM1. When there is no evaluation date specified, the default is the date on which the TurboIntegrator process is executed.</td>
</tr>
</tbody>
</table>

**SAP Table**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Table</td>
<td>Indicates that the data source is an SAP table query.</td>
</tr>
<tr>
<td>Table Name</td>
<td>Name of the SAP table to use.</td>
</tr>
</tbody>
</table>
### Filter string

An SQL filter string to be used in the WHERE clause when the SQL SELECT statement that is generated by TurboIntegrator is executed against the SAP table.

### ODS Table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODS Table</td>
<td>Used to export TM1 data to an ODS table which can then be used to import data through a SAP Infocube.</td>
</tr>
<tr>
<td>ODS Setup</td>
<td>Define the details of the ODS table.</td>
</tr>
<tr>
<td>Browse</td>
<td>Select the TM1 View to use as the data source.</td>
</tr>
<tr>
<td>Show Technical Names</td>
<td>To use technical names, select this checkbox. Leave this box unchecked to display by descriptive name.</td>
</tr>
<tr>
<td>Select ODS Table</td>
<td>Select the ODS table to export to.</td>
</tr>
</tbody>
</table>
| Columns           | Columns may be either SAP characteristics or key figures. You must be familiar with the structure of the ODS table to know which columns are characteristics and which are key figures; TurboIntegrator does not differentiate the ODS table column types. You should be aware of the following details when mapping dimensions to characteristics:  

  - You do not have to map a dimension to every characteristic column in the ODS table. Some columns may not have a corresponding TM1 dimension when the mapping is complete. In this case, any characteristic column that is not mapped will be empty when the export is completed.  
  - You should not map a single TM1 dimension to multiple ODS characteristic table columns. The TurboIntegrator user interface does not prevent you from doing so, but such mapping will result in redundant column values in the ODS table.  
  - When you map a TM1 view title dimension to a characteristic, and the title dimension does not use a named subset, only the last element in the current unnamed title subset is exported to the ODS table. If the title dimension does use a named subset, all subset elements are exported to the ODS table. |
### Field

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Measure</td>
<td>The last dimension in the source cube view is assumed to be the measures dimension. When you map a measures dimension to an ODS table column, the Select Measure button becomes available. Select the single element that maps directly to the key figure column in the ODS table. If your ODS table includes a single key figure column, you can also use the alternate key figure.</td>
</tr>
<tr>
<td>TM1 Dimension</td>
<td>If your ODS table includes a single key figure column, you can use the <em>TM1CellValue</em> option to map TM1 cube values to the ODS table. You cannot use the <em>TM1CellValue</em> option if your ODS table contains multiple key figure columns. To use this option, do not map the TM1 measures dimension to the key figure column. Instead, click the TM1 Dimension column and select <em>TM1CellValue</em>. When you use this alternate method to map TM1 cube values, the TM1 measures dimension should not be mapped to any ODS column.</td>
</tr>
</tbody>
</table>

### Currency

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Currency</td>
<td>Used to import currency data to a new or existing three-dimensional cube on your server.</td>
</tr>
<tr>
<td>Show SAP Technical Names</td>
<td>To use technical names, select this checkbox. Leave this box unchecked to display by descriptive name.</td>
</tr>
<tr>
<td>Enter Cube Name</td>
<td>Enter an existing three-dimensional cube or enter a new cube name.</td>
</tr>
<tr>
<td>From Currency</td>
<td>Select the initial currency to import from SAP. The list of available currencies reflects the currencies defined in your SAP system.</td>
</tr>
<tr>
<td>Target Dimension</td>
<td>Specify the TM1 dimension to receive the SAP currency strings.</td>
</tr>
<tr>
<td>To Currency</td>
<td>Select the second currency to import from SAP.</td>
</tr>
<tr>
<td>Conversion Type</td>
<td>Select the conversion method to use when converting the initial currency to the second currency.</td>
</tr>
</tbody>
</table>
TM1
Uses a TM1 cube or dimension as the datasource.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube View</td>
<td>Use the Browse button to select an available TM1 view or Dimension to use as the data source. Click the Preview button. Then complete the fields on the other tabs.</td>
</tr>
<tr>
<td>Dimension Subset</td>
<td></td>
</tr>
</tbody>
</table>

IBM Cognos Package Connector
Removed in v2.0.8 Indicates that the datasource is a published IBM Cognos Package created from an SAP query.

Package

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Define the connection to this data source. Define the connection to this data source.</td>
</tr>
<tr>
<td>Authentication Namespace</td>
<td>Displays all created IBM Cognos Namespaces currently available.</td>
</tr>
<tr>
<td>UserID</td>
<td>Password</td>
</tr>
<tr>
<td>Package</td>
<td>Select Package</td>
</tr>
<tr>
<td>Select TM1 cube to load to</td>
<td>If you are importing the data directly into an existing TM1 cube, enter the cube name here or use the pull-down.</td>
</tr>
<tr>
<td>Data Action, Cube Action, Enable Cube Logging</td>
<td>See the descriptions of these fields in the SAP Info Cube above.</td>
</tr>
</tbody>
</table>

Dimension

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>Package Identify the Package to use for this dimension.</td>
</tr>
<tr>
<td>Dimension to load from</td>
<td>Identify the dimension to use.</td>
</tr>
<tr>
<td>Dimension to load into</td>
<td>Identify the dimension to import into.</td>
</tr>
<tr>
<td>TM1 Dimension Action</td>
<td>See the description for the Characteristics tab for details.</td>
</tr>
<tr>
<td>Retrieve Security Settings</td>
<td>Use the security on the dimension.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Top Consolidation</td>
<td>The name of a top-level consolidation for the TM1 dimension with all imported elements as children of the consolidation.</td>
</tr>
<tr>
<td>Select Hierarchies</td>
<td>Select and map the hierarchies to use in this import and define how they are mapped into the new TM1 dimension. See the IBM Cognos TM1 TurboIntegrator documentation for details.</td>
</tr>
<tr>
<td>Select Attributes</td>
<td>Select the Attributes to use and define the mapping. See the IBM Cognos TM1 TurboIntegrator documentation for details.</td>
</tr>
</tbody>
</table>

**None**

Used to add a user-defined prolog to a process.

If the data source for the process is None, TurboIntegrator immediately executes the Epilog procedure after the Prolog finishes processing.

**Note:** When the data source for a process is None, the Metadata and Data procedures are ignored. In this case, all scripts for the process must be created in either the Prolog or Epilog procedures.

**Preview Grid**

The preview grid displays the first ten records in your data source. Use this grid to confirm that the source is correct and to help determine the structure of records.

If you change your data source, click Preview again to refresh the display of the grid.

**Variables Tab**

The Variables tab includes a grid and two buttons.

**Grid**

Use the Variables grid to assign variables and identify the contents of each column in your data source. The Variables grid includes the following columns.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column ID</td>
<td>Lists each unique field or column identified in your data source. Cells in this column cannot be edited.</td>
</tr>
<tr>
<td>Variable Name</td>
<td>Contains an automatically generated variable for each column in your data source. All generated variables are named Vn, where n is 0 for the first column and is incremented by 1 for each subsequent column in the source. To assign a different variable, click the appropriate cell and enter the new variable.</td>
</tr>
<tr>
<td>Column</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Variable Type</td>
<td>Contains a list for each column in your data source. Use the list to specify whether a variable is string or numeric.</td>
</tr>
<tr>
<td>Sample Value</td>
<td>Contains sample values from the first record of your source. These sample values help you identify the contents of each column of your source. Cells in the Sample Value column cannot be edited.</td>
</tr>
<tr>
<td>Contents</td>
<td>Contains a list for each column in your data source. Use the list to specify the type of value contained in each column of your source.</td>
</tr>
<tr>
<td>Formula</td>
<td>This column is grayed-out for all fields in your source, and becomes available only when you create a new variable. When you create a new variable, double-click the associated Formula cell to open the Process Variable Formula dialog box, from which you can define a formula for the variable.</td>
</tr>
</tbody>
</table>

**Buttons**

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New variable</td>
<td>Click to create a new variable.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete a user-created variable.</td>
</tr>
</tbody>
</table>

**Process Variable Formula**

The Process Variable Formula dialog box displays and allows editing of formulas used in a TurboIntegrator process. When a formula exists, and you click Formula on the Variables tab, the currently set formula displays in the Formula window. Click New Variable to define a new formula.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula</td>
<td>The currently entered formula displays in this window. As you enter formula text this window updates.</td>
</tr>
<tr>
<td>Destination</td>
<td>Choose the location for this formula depending on your programming needs for this process. Select Data to put this formula into the Data section of the TurboIntegrator process. Select Metadata to position the formula in the MetaData section. Both puts the formula in both locations.</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Click here to validate the formula.</td>
</tr>
<tr>
<td>Sample value</td>
<td>When the formula is evaluated, information about the formula displays here. For example, <em>Line 1: Syntax error on or before: \n (end of line) missing semicolon.</em></td>
</tr>
</tbody>
</table>
Maps Tab

Use the Maps tab to specify how source data maps to cubes, dimensions, data, consolidations, and attributes in the TM1 database.

The Maps tab consists of a series of sub-tabs, each containing options that let you map variables for your source data to existing TM1 metadata structures. The sub-tabs that are available vary according to the type of values contained in your source data, as specified in the Contents column of the Variables tab.

The Maps tab contains the following sub-tabs.

Cube

Use the Cube sub-tab to specify how TurboIntegrator maps imported data to TM1 cubes. The Cube sub-tab includes the following options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube Action</td>
<td>Select an option to create, update, recreate, or apply no action to a cube.</td>
</tr>
<tr>
<td>Cube Name</td>
<td>Specify the cube to which the action applies. If creating a new cube, type the cube name in the entry field. Otherwise, select an existing cube from the list.</td>
</tr>
<tr>
<td>Zero Out Portion</td>
<td>This option becomes available when you select the Update Cube action. Select this box if you want to set all data points in a cube view to zero.</td>
</tr>
<tr>
<td>View Name</td>
<td>This option becomes available when you select the Update Cube and Zero Out Portion options. Select or define the view that encompasses the data points you want to zero out.</td>
</tr>
<tr>
<td>Data Action</td>
<td>Select an option that determines how processed data is stored in the cube. Store Values overwrites existing cube values with values imported by the process. Accumulate Values adds values imported by the process to existing cube values.</td>
</tr>
<tr>
<td>Enable Cube Logging</td>
<td>Fill this check box to write cube changes to the Tm1s.log file. Clear this box to process cubes without recording changes in Tm1s.log.</td>
</tr>
</tbody>
</table>

Dimensions

Use the Dimensions sub-tab to map element variables to dimension elements.
The sub-tab includes a grid you use to map individual variables to dimensions in the TM1 database. The grid includes the following columns.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element Variable</td>
<td>Contains the name of each variable for which you specified a Contents value of Element. The Contents value is specified in the Variables tab. This column also contains the label (Data Variables) for any variables with a Contents value of Data.</td>
</tr>
<tr>
<td>Sample Value</td>
<td>A sample value from the first record of your data source. Use this value to help identify the dimension to which the element variable maps.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Lists all dimensions available on the server. Select the dimension to which the element variable maps. To map the element variable to a new dimension, type the new dimension name in the entry field.</td>
</tr>
<tr>
<td>Order in Cube</td>
<td>This option becomes available when the Cube Action is Create. Specify the order of each dimension in the cube you are creating.</td>
</tr>
<tr>
<td>Action</td>
<td>Lists available dimension actions. Select an action. To create a new dimension, you must specify an action of Create.</td>
</tr>
<tr>
<td>Element Type</td>
<td>Select an element type for the variable, either Numeric or String.</td>
</tr>
<tr>
<td>Element Order</td>
<td>Select an option for ordering elements in any dimensions you are creating or updating. There are four sort orders: Input - Sorts elements in the order they are created in the dimension. Name - Sorts elements in alphabetical order, either ascending or descending. Level - Sorts elements by hierarchy level, either ascending or descending. Hierarchy - Sorts elements as they exist in the dimension hierarchy.</td>
</tr>
</tbody>
</table>

**Data**

Use the Data sub-tab to map data variables to specific elements.

The sub-tab includes a grid you use to map individual variables to elements in the TM1 database. The grid includes the following columns.
### Data Variable
Contains the name of each variable for which you specified a Contents value of Data. The Contents value is specified in the Variables tab.

### Element
Click the right arrow button to open the Subset Editor, where you can choose the element to which the variable maps.
To map the variable to a new element, type the element name in the entry field.

### Element Type
Select an element type here.

### Sample Value
A sample value from the first record of your data source. Use this value to help identify the element to which the data variable maps.

### Consolidations
Use the Consolidations sub-tab to map children to consolidated elements.
The sub-tab includes a grid you use to map individual variables to dimensions in the TM1 database. The grid includes the following columns.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cons. Variable</td>
<td>Contains the name of each variable for which you specified a Contents value of Consolidation. The Contents value is specified in the Variables tab.</td>
</tr>
<tr>
<td>Dimension</td>
<td>List of dimensions to which the consolidation can map.</td>
</tr>
<tr>
<td>Child Variable</td>
<td>Lists the variables from which you select the immediate child of the consolidation.</td>
</tr>
<tr>
<td>Weight</td>
<td>Assigns a weight to the specified child variable.</td>
</tr>
<tr>
<td>Sample Value</td>
<td>A sample value from the first record of your data source. Use this value to help identify the element to which the consolidation maps.</td>
</tr>
</tbody>
</table>
### Element Order
Select an option for ordering elements in any consolidations you are creating or updating. There are four sort orders:
- **Input**: Sorts elements in the order they are created in the dimension.
- **Name**: Sorts elements in alphabetical order, either ascending or descending.
- **Level**: Sorts elements by hierarchy level, either ascending or descending.
- **Hierarchy**: Sorts elements as they exist in the dimension hierarchy.

### Attributes
Use the Attributes sub-tab to map attribute variables to specific attributes.

The sub-tab includes a grid you use to map individual variables to dimensions in the TM1 database. The grid includes the following columns.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute Variable</td>
<td>Contains the name of each variable for which you specified a Contents value of Attribute. The Contents value is specified in the Variables tab.</td>
</tr>
<tr>
<td>Sample Value</td>
<td>Displays a sample value from the data source. Use this sample to help map the attribute.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Lists all dimensions available on the server. Select the dimension to which the attribute applies.</td>
</tr>
<tr>
<td>Element Variable</td>
<td>Lists the element variables. Select the variable for the element to which the attribute variable applies.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Lists the attributes to which the variable can map. Select the appropriate attribute from this list.</td>
</tr>
<tr>
<td>Action</td>
<td>Choose to either Create a new attribute or Update an existing one.</td>
</tr>
<tr>
<td>Attribute Type</td>
<td>Identifies the type of attribute selected in the Attribute column.</td>
</tr>
</tbody>
</table>

### Advanced Tab
The Advanced tab contains several sub-tabs that display statements generated by TM1 based on the options you select elsewhere in the TurboIntegrator Editor. The Advanced tab also includes a sub-tab where you can define parameters for the process.
<table>
<thead>
<tr>
<th>Parameters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>Insert</td>
<td>Click to insert a new parameter.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete a selected parameter.</td>
</tr>
<tr>
<td>Parameters</td>
<td>Type a name for each new parameter.</td>
</tr>
<tr>
<td>Type</td>
<td>For each parameter, select a type here.</td>
</tr>
<tr>
<td>Default Value</td>
<td>Enter a value to use as the default value for this parameter when the TurboIntegrator process runs.</td>
</tr>
<tr>
<td>Prompt Question</td>
<td>Enter a prompt to use for this parameter when the TurboIntegrator process runs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prolog</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
</tbody>
</table>
| Statement text box | Displays generated statements that define a series of actions to be executed before the data source is processed.  
You can enhance a process by creating additional statements with rules or TurboIntegrator functions. |
| Goto Line button | Click this button, enter the line you want to go to, then click OK to go directly to a line of code in the statement text box. |

<table>
<thead>
<tr>
<th>Metadata</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
</tbody>
</table>
| Statement text box | Displays generated statements that define a series of actions to be executed on TM1 metadata before the data source is processed.  
You can enhance a process by creating additional statements with rules or TurboIntegrator functions. |
| Goto Line button | Click this button, enter the line you want to go to, then click OK to go directly to a line of code in the statement text box. |
### Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement text box</td>
<td>Displays generated statements that define a series of actions to be executed when the data source is processed. You can enhance a process by creating additional statements with rules or TurboIntegrator functions.</td>
</tr>
<tr>
<td>Goto Line button</td>
<td>Click this button, enter the line you want to go to, then click OK to go directly to a line of code in the statement text box.</td>
</tr>
</tbody>
</table>

### Epilog

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement text box</td>
<td>Displays generated statements that define a series of actions to be executed after the data source is processed. You can enhance a process by creating additional statements with rules or TurboIntegrator functions.</td>
</tr>
<tr>
<td>Goto Line button</td>
<td>Click this button, enter the line you want to go to, then click OK to go directly to a line of code in the statement text box.</td>
</tr>
</tbody>
</table>

### Schedule Tab

Use this tab to schedule a process to execute at regular intervals.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule this Process as a Chore Named</td>
<td>Check here to execute this process as a chore at regular intervals. By default, the chore bears the same name as the process. If you want to assign the chore a different name, type it in the entry field.</td>
</tr>
<tr>
<td>Chore Start Date and Time</td>
<td>Select a start date on the calendar and specify a start time in the Time field.</td>
</tr>
<tr>
<td>Chore Execution Frequency</td>
<td>Fill the appropriate fields to establish the interval at which the chore should be executed.</td>
</tr>
</tbody>
</table>

### View Extract Window

Use the View Extract window to create a view that includes only those values satisfying user-defined criteria, or to define a view for export.
Skip parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skip Consolidated Values</td>
<td>Turn this option on to ignore values derived through consolidation when extracting the view. Turn this option off to include values derived through consolidation when extracting the view. The default is off.</td>
</tr>
<tr>
<td>Skip Rule Calculated Values</td>
<td>Turn this option on to ignore values derived through rules when extracting the view. Turn this option off to include values derived through rules when extracting the view. The default is off.</td>
</tr>
<tr>
<td>Skip Zero/Blank Values</td>
<td>Turn this option on to ignore zeros or blank values when extracting the view. Turn this option off to include zeros or blank values when extracting the view. The default is on.</td>
</tr>
</tbody>
</table>

Range parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator</td>
<td>Select an operator that defines the values you want to extract.</td>
</tr>
<tr>
<td>Numeric Limits</td>
<td>Enter a numeric value for the variable(s) in the Operator.</td>
</tr>
<tr>
<td>Text Limits</td>
<td>Enter a string value for the variable(s) in the Operator.</td>
</tr>
</tbody>
</table>

Dimension Elements selection

For each dimension, click the Subset button and select the elements or subset that defines the parameters for the view extract.

If the view from which you are creating the extract contains more than 16 dimensions, click to page backward to the previous 16 dimensions, or click to page forward to the next 16 dimensions.

View Styles Dialog Box

The View Styles dialog box lets you apply Excel styles to the TM1 cube view in the In-Spreadsheet Browser. The dialog box contains several lists that let you apply an existing Excel style to a range of cells, as well as buttons that let you edit or create styles.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>Select a style from this list to apply to the background of the In-Spreadsheet Browser.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Data Cells</td>
<td>Select a style from this list to apply to data cells.</td>
</tr>
<tr>
<td></td>
<td>The Data Cells style takes precedence over the Background style.</td>
</tr>
<tr>
<td>Row Header Cells</td>
<td>Select a style from this list to apply to row header cells.</td>
</tr>
<tr>
<td></td>
<td>The Row Header Cells style takes precedence over the Background style.</td>
</tr>
<tr>
<td>Column Header Cells</td>
<td>Select a style from this list to apply to column header cells.</td>
</tr>
<tr>
<td></td>
<td>The Column Header Cells style takes precedence over the Background style.</td>
</tr>
<tr>
<td>Edit Style buttons</td>
<td>Click the appropriate Edit Style button to edit or create styles for the</td>
</tr>
<tr>
<td></td>
<td>associated range of the In-Spreadsheet Browser.</td>
</tr>
<tr>
<td>Freeze Panes</td>
<td>Toggle this option to freeze and unfreeze panes in the In-Spreadsheet</td>
</tr>
<tr>
<td></td>
<td>Browser.</td>
</tr>
<tr>
<td></td>
<td>When this option is toggled on, row element names remain visible when you</td>
</tr>
<tr>
<td></td>
<td>scroll horizontally through a view, and column element names remain visible</td>
</tr>
<tr>
<td></td>
<td>when you scroll vertically.</td>
</tr>
<tr>
<td></td>
<td>When this option is toggled off, row and column element names move along</td>
</tr>
<tr>
<td></td>
<td>with cube values as you scroll through a view.</td>
</tr>
</tbody>
</table>
Chapter 2. Rules Functions

This section contains a complete list of all IBM TM1 rules functions. You can use any of these functions when writing TM1 rules.

Arithmetic Operators in TM1 Rules

The following mathematical operators can be used when constructing TM1 rules.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ (plus sign)</td>
<td>Addition</td>
</tr>
<tr>
<td>- (minus sign)</td>
<td>Subtraction</td>
</tr>
<tr>
<td>* (asterisk)</td>
<td>Multiplication</td>
</tr>
<tr>
<td>/ (forward slash)</td>
<td>Division by zero using this operator returns an undefined value.</td>
</tr>
<tr>
<td>\ (back slash)</td>
<td>Division by zero using this operator returns zero.</td>
</tr>
<tr>
<td>^ (caret/circumflex)</td>
<td>Exponentiation</td>
</tr>
</tbody>
</table>

Comparison Operators in TM1 Rules

The comparison operators compare values in the formula portion of a rule calculation statement. To compare two string values, insert the @ symbol before the comparison operator. For example, IF ('A' @= 'B', 0, 1) yields the number 1.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;</td>
<td>Greater than</td>
</tr>
<tr>
<td>&lt;</td>
<td>Less than</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater than or equal to</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less than or equal to</td>
</tr>
<tr>
<td>=</td>
<td>Equal to</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Not equal to</td>
</tr>
</tbody>
</table>

Logical Operators in TM1 Rules

You can combine expressions in a rules calculation statement using logical operators.
### Attribute Rules Functions

Rules functions that work on attributes.

**ATTRN**

ATTRN returns a numeric attribute for a specified element of a dimension. This function is valid in both TM1 rules and TurboIntegrator processes.

#### Syntax

\[
\text{ATTRN}(\text{dimension, element, attribute})
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>attribute</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
</tbody>
</table>

**Note:** When this function is used in a conditional statement (IF), the statement is the portion containing the condition, not the entire conditional block. After a minor error, execution continues with the next statement. TI processing has no knowledge that it was in a conditional once the minor error is processed, so the next statement is the next line, not the line after the endif.

To avoid this situation, use variables for any operation that could encounter a minor error and then use the variables in the conditional statement. For example:

```plaintext
V1 = CELLGETN('PNLCube', 'fred', 'argentina', 'Sales', 'Jan');
IF(V1 = 454);ASCIIOUTPUT ('bug.txt', 'if logic not working properly');
ENDIF;
```
Example
In this example, the function returns the numeric value of the Engine Size attribute of the L Series 1.8L Sedan element in the Model dimension.

\[
\text{ATTRN('Model', 'L Series 1.8L Sedan', 'Engine Size')}
\]

**ATTRS**

ATTRS returns a string attribute for a specified element of a dimension.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
\text{ATTRS(dimension, element, attribute)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>attribute</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
</tbody>
</table>

Example
In this example, the function returns the string value of the Currency attribute of the 10100 element in the plan_business_unit dimension.

\[
\text{ATTRS('plan_business_unit', '10100', 'Currency')}
\]

**CubeATTRN**

CubeATTRN returns a numeric attribute for a specified cube.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
\text{CubeATTRN(CubeName, AttrName)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the cube.</td>
</tr>
</tbody>
</table>

Example
In this example, the function returns the numeric value of the Accounting_Code attribute of the Product cube.

\[
\text{CubeATTRN('Product', 'Accounting_Code')}
\]
**CubeATTRS**

CubeATTRS returns a string attribute for a specified cube.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
CubeATTRS(CubeName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the cube.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Owner attribute of the Product cube.

```plaintext
CubeATTRS('Product', 'Owner');
```

**DimensionATTRN**

DimensionATTRN returns a numeric attribute for a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
DimensionATTRN(DimName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Plan_Business_Unit dimension.

```plaintext
DimensionATTRN('Plan_Business_Unit', 'Accounting_Code');
```

**DimensionATTRS**

DimensionATTRS returns a string attribute for a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
DimensionATTRS(DimName, AttrName);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Plan_Business_Unit dimension.

```
DimensionATTRS('Plan_Business_Unit', 'Manager');
```

**ElementAttrN**

ElementAttrN returns a numeric attribute for a specified element of a dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementAttrN(dimension, hierarchy, element, attribute)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>attribute</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
</tbody>
</table>

**Note:** When this function is used in a conditional statement (IF), the statement is the portion containing the condition, not the entire conditional block. After a minor error, execution continues with the next statement. TI processing has no knowledge that it was in a conditional once the minor error is processed, so the next statement is the next line, not the line after the endif.

To avoid this situation, use variables for any operation that could encounter a minor error and then use the variables in the conditional statement. For example:

```
V1 = CELLGETN('PNLCube', 'fred', 'argentina', 'Sales', 'Jan');
IF(V1 = 454);ASCIIOUTPUT ('bug.txt', 'if logic not working properly');
ENDIF;
```
Example
In this example, the function returns the numeric value of the Engine Size attribute of the L Series 1.8L Sedan element in the Automobile hierarchy of the Model dimension.

ElementAttrN('Model', 'Automobile', 'L Series 1.8L Sedan', 'Engine Size')

ElementAttrS
ElementAttrS returns a string attribute for a specified element of a dimension. This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
ElementAttrS(dimension, hierarchy, element, attribute)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>attribute</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
</tbody>
</table>

Example
In this example, the function returns the string value of the Currency attribute of the 10100 element in the expense hierarchy of the plan_business_unit dimension.

ElementAttrS('plan_business_unit', 'expense', '10100', 'Currency')

Consolidation Calculation Rules Functions
The ConsolidatedMax; ConsolidatedMin; ConsolidatedAvg; ConsolidatedCount; and ConsolidatedCountUnique perform mathematical calculations on consolidations.

ConsolidatedAvg
ConsolidatedAvg calculates the average value in a consolidation and returns a single value. This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
ConsolidatedAvg(flag-value, cube-name, element_1, element_2,...)

Arguments
flag-value
The flag value is the sum of the following values:
• 1 - Use consolidation weighting when computing the value (include zeros in calculation). If this value is not turned on, the raw value of the consolidated element is used. The following conditions might affect whether zeros are included in the calculation:
  – If zero is specified as the weighting of some consolidated elements, then the configuration parameter: ZeroWeightOptimization=F must be set for these elements to be factored into the computation of these functions. Without this configuration parameter, the elements for which the weighting is zero are eliminated from the consolidation list, and are therefore not processed when discovering things like the minimum or maximum value.
  – If you want zero cells to participate in the average, UNDEFVALS must be set for the cube such that when a zero is assigned to a cell of the cube, a value will be stored in the cell just like any other non-zero value, and then it will participate in the average.
  – If a cube rule includes a SKIPCHECK, zeros are ignored even when the flag-value is set to 1. Remove SKIPCHECK from the rule to include zeros in the consolidated average.
• 2 - Ignore zero values. If this value is set, zero values will not be included in the calculation.

**cube-name**

Name of the cube where the values reside.

If the function is running as part of a cube rule, and NOT as part of a TurboIntegrator process, the cube-name argument can be specified as an empty string to mean the current cube. This means you can write a rule such as ['Apr']:=ConsolidatedAvg( 0, '', !actvsbud, '1 Quarter' );

**element_1, element_2, ...**

Dimension element names that define the intersection of the cube that contains the value to be retrieved.

Arguments element_1 through element_n are sequence-sensitive. element_1 must be an element from the first dimension of the cube, element_2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.

**Example**

In a cube that is called Income Statement with three dimensions that are named Regions, Time, and Income Statement, the Income Statement dimension contains an element that is called Gross Sales for the overall sales number.

To calculate the average sales across all regions in the year 2010, write:

```
ConsolidatedAvg( 1, 'Income Statement', 'All Regions', '2010', 'Gross Sales' );
```

**ConsolidateChildren**

ConsolidateChildren forces consolidated values to be calculated by summing immediate children along a specified dimension. ConsolidateChildren is useful when intermediate consolidations are calculated by rules and you want a parent consolidation to be calculated by summing the intermediate consolidations rather than by summing the underlying leaf values.

This function is valid in TM1 rules only.

**Syntax**

```
ConsolidateChildren(DimName1, DimName2, ...)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName1, DimName2, ...</td>
<td>Names of the dimensions along which consolidations will be performed. The function requires at least one DimName argument, and can accept as many DimName arguments as there are dimensions in the cube for which the rule is written.</td>
</tr>
</tbody>
</table>

**Example**

Consider a cube named Sales composed of the dimensions ActVsBud, Region, Model, Account1, and Month.

In this example, the Month dimension is defined as follows:

```
Σ Year
  Σ 1 Quarter
    n Jan
    n Feb
    n Mar
  Σ 2 Quarter
    n Apr
    n May
    n Jun
  Σ 3 Quarter
    n Jul
    n Aug
    n Sep
  Σ 4 Quarter
    n Oct
    n Nov
    n Dec
```

If no rule is in place for this cube, the value of the Year consolidation is calculated by summing all the underlying leaf values, in this case Jan through Dec. The following image illustrates this consolidation.

```
<table>
<thead>
<tr>
<th>Actual</th>
<th>Denmark</th>
<th>$ Series 1.8 L Sedan</th>
<th>Units</th>
</tr>
</thead>
</table>
```

```
<table>
<thead>
<tr>
<th>month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>1 Quarter</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>3156</td>
</tr>
<tr>
<td>770</td>
</tr>
<tr>
<td>223</td>
</tr>
<tr>
<td>331</td>
</tr>
<tr>
<td>216</td>
</tr>
<tr>
<td>906</td>
</tr>
<tr>
<td>311</td>
</tr>
<tr>
<td>250</td>
</tr>
<tr>
<td>345</td>
</tr>
<tr>
<td>757</td>
</tr>
<tr>
<td>222</td>
</tr>
<tr>
<td>197</td>
</tr>
<tr>
<td>338</td>
</tr>
<tr>
<td>723</td>
</tr>
<tr>
<td>199</td>
</tr>
<tr>
<td>212</td>
</tr>
<tr>
<td>312</td>
</tr>
</tbody>
</table>
```

Now, suppose you create the following rule for this cube, which indicates that all quarterly values should be 1:

```
[{'1 Quarter', '2 Quarter', '3 Quarter', '4 Quarter'}]=1;
```

The result is as follows:

```
<table>
<thead>
<tr>
<th>Actual</th>
<th>Denmark</th>
<th>$ Series 1.8 L Sedan</th>
<th>Units</th>
</tr>
</thead>
</table>
```

```
<table>
<thead>
<tr>
<th>month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>1 Quarter</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>3156</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>223</td>
</tr>
<tr>
<td>331</td>
</tr>
<tr>
<td>216</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>311</td>
</tr>
<tr>
<td>250</td>
</tr>
<tr>
<td>345</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>222</td>
</tr>
<tr>
<td>197</td>
</tr>
<tr>
<td>338</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>199</td>
</tr>
<tr>
<td>212</td>
</tr>
<tr>
<td>312</td>
</tr>
</tbody>
</table>
```
In the following image, you can see that quarterly values are indeed calculated by the rule, but the Year consolidation is still calculated by summing all underlying leaf values. If this is not your desired calculation path, you can use the ConsolidateChildren function to force TM1 to calculate the Year consolidation by summing its immediate children, specifically 1 Quarter, 2 Quarter, 3 Quarter, and 4 Quarter.

\[
[\text{\textquote{Year}}] = \text{ConsolidateChildren('Month')};
[[\text{1 Quarter}, \text{2 Quarter}, \text{3 Quarter}, \text{4 Quarter}]] = 1;
\]

In the rule, the statement \[\text{\textquote{Year}} = \text{ConsolidateChildren('Month')}\] says that the Year consolidation should be calculated by summing the immediate children of Year in the Month dimension. The following image shows the result of the \[\text{\textquote{Year}} = \text{ConsolidateChildren('Month')}\] statement:

![Image showing the result of consolidating by quarters.](image)

Note that the Year consolidation is now calculated by summing its immediate children.

It's important to remember that for a given consolidation, the ConsolidateChildren function applies only to the immediate children of the consolidation.

The ConsolidateChildren function can also be used to specify how consolidations are calculated in multiple dimensions, as in the following example:

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[\text{'World','Year'} = \text{ConsolidateChildren('Region','Month')}]</td>
<td>This statement applies the ConsolidateChildren function to both the World and Year consolidations. In this case, World is calculated by summing all its immediate children in the Region dimension, while Year is calculated by summing its immediate children in the Month dimension.</td>
</tr>
</tbody>
</table>

**ConsolidatedCount**

ConsolidatedCount counts the value in a consolidation and returns a single value.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
\text{ConsolidatedCount(flag-value, cube-name, element_1, element_2,...)};
\]

**Arguments**

flag-value

The flag value is the sum of the following values:

1 - use consolidation weighting when computing the value. If this is not turned on the raw value of the consolidated element will be used.

2 - ignore zero values. If this is set, zero values will not be used by these functions.

**Note:** If zero is specified as the weighting of some consolidated elements, then the configuration parameter: ZeroWeightOptimization=F must be set for these elements to be factored into the computation of these functions. Without this configuration parameter, the elements for which the weighting is zero are eliminated from the consolidation list, and are therefore not processed when discovering things like the minimum or maximum value.
cube-name

Name of the cube where the values reside.

If the function is running as part of a cube rule, and NOT as part of a TurboIntegrator process, the cube-name argument can be specified as an empty string to mean the current cube. This means you may write a rule such as:['Apr']=ConsolidatedCount( 1, ' ', !actvsbud, '1 Quarter' );

element_1, element_2, ...

Dimension element names that define the intersection of the cube containing the value to be retrieved.

Arguments element_1 through element_n are sequence-sensitive. element_1 must be an element from the first dimension of the cube, element_2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.

ConsolidatedCountUnique

ConsolidatedCountUnique counts the number of unique elements for which data points actually exist for the specified consolidation. The unique elements are counted along one dimension of the consolidated cell.

This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

ConsolidatedCountUnique( 0, unique-along-dimension-name, cube-name, elem_1, elem_2, ... );

Arguments

flag word

Specify 0 (zero).

Note: If zero is specified as the weighting of some consolidated elements, then the configuration parameter: ZeroWeightOptimization=F must be set for these elements to be factored into the computation of these functions. Without this configuration parameter, the elements for which the weighting is zero are eliminated from the consolidation list, and are therefore not processed when discovering things like the minimum or maximum value.

unique-along-dimension-name

The dimension along which unique element entries for which there is real data are to be counted.

cube-name

Name of the cube where the values reside.

If the function is running as part of a cube rule, and NOT as part of a TurboIntegrator process, the cube-name argument can be specified as an empty string to mean the current cube.

element_1, element_2, ...

Dimension element names that define the intersection of the cube which is the consolidated value to be processed.

Arguments element_1 through element_n are sequence-sensitive. element_1 must be an element from the first dimension of the cube, element_2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.
**Example**

In a cube called Income Statement with three dimensions: Regions, Time, and Income Statement, the Income Statement dimension contains an element called Gross Sales for the overall sales number. To count how many regions had some gross sales in the year 2010 write:

\[
\text{ConsolidatedCountUnique( 0, 'Regions', 'Income Statement', 'All Regions', '2010', 'Gross Sales' )};
\]

**ConsolidatedMax**

ConsolidatedMax calculates the maximum value in a consolidation and returns a single value. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
\text{ConsolidatedMax(flag-value, cube-name, element_1, element_2,... )};
\]

**Arguments**

**flag-value**

The flag value is the sum of the following values:

1 - use consolidation weighting when computing the value. If this is not turned on the raw value of the consolidated element will be used.

2 - ignore zero values. If this is set, zero values will not be used by these functions.

**Note:** If zero is specified as the weighting of some consolidated elements, then the configuration parameter: ZeroWeightOptimization=F must be set for these elements to be factored into the computation of these functions. Without this configuration parameter, the elements for which the weighting is zero are eliminated from the consolidation list, and are therefore not processed when discovering things line the minimum or maximum value.

**cube-name**

Name of the cube where the values reside.

If the function is running as part of a cube rule, and NOT as part of a TurboIntegrator process, the cube-name argument can be specified as an empty string to mean the current cube. This means you may write a rule such as:

\[
[\text{'Apr'}]=\text{ConsolidatedMax( 1, '', !actvsbud, '1 Quarter' )};
\]

**element_1, element_2, ...**

Dimension element names that define the intersection of the cube containing the value to be retrieved.

Arguments element_1 through element_n are sequence-sensitive. element_1 must be an element from the first dimension of the cube, element_2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.

**Example**

Consider a cube called Income Statement with three dimensions, "Area", "Time", and "Income Statement". The Income Statement dimension contains an element "Gross Sales" for the overall sales number.

To calculate the maximum sales across all regions in the year 2010 use:

\[
\text{ConsolidatedMax( 1, 'Income Statement', 'All Regions', '2010', 'Gross Sales' )};
\]
**ConsolidatedMin**

ConsolidatedMin calculates the minimum value in a consolidation and returns a single value. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ConsolidatedMin(flag-value, cube-name, element_1, element_2,...);
```

**Arguments**

**flag-value**

The flag value is the sum of the following values:

1 - use consolidation weighting when computing the value. If this is not turned on the raw value of the consolidated element will be used.

2 - ignore zero values. If this is set, zero values will not be used by these functions.

**Note:** If zero is specified as the weighting of some consolidated elements, then the configuration parameter: ZeroWeightOptimization=F must be set for these elements to be factored into the computation of these functions. Without this configuration parameter, the elements for which the weighting is zero are eliminated from the consolidation list, and are therefore not processed when discovering things like the minimum or maximum value.

**cube-name**

Name of the cube where the values reside.

If the function is running as part of a cube rule, and NOT as part of a TurboIntegrator process, the cube-name argument can be specified as an empty string to mean the current cube. This means you may write a rule such as:

```
['Apr']=ConsolidatedMin( 1, '', !actvsbud, '1 Quarter' );
```

**element_1, element_2, ...**

Dimension element names that define the intersection of the cube containing the value to be retrieved.

Arguments element_1 through element_n are sequence-sensitive. element_1 must be an element from the first dimension of the cube, element_2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.

---

**Cube Data Rules Functions**

Rules functions that work on cube data.

**CellValueN**

CellValueN returns the numeric value of the specified element(s) in a cube. This is a TM1 rules function, valid in TM1 rules only. Use of this function in a TurboIntegrator process will result in an error.

For dimensions not among the element parameters, coordinates are retrieved from the rule target (the cell being retrieved and triggering rule evaluation). The function behavior is analogous to the intra-cube reference expression (e.g. [ 'Measures':'Count' ]), as used on the rule’s right-side.

The element parameters may be specified in any order, and for CellValueN, multiple elements from the same dimension (but different hierarchies of the dimension) may be specified. Since the elements list is not required to be in cube dimension order, it is necessary to dimension-qualify all element parameters. Element parameters from multi-hierarchy dimensions must also be hierarchy-qualified.
**Syntax**

```
CellValueN(cube, element1,..., elementN);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>elementN</td>
<td>Element name that defines the cell. A minimum of one element must be specified.</td>
</tr>
</tbody>
</table>

**Example**

```
CellValueS('ForecastCube', 'Products':'ProductsByChannel':'Channel2', 'Measures':'Location');
```

This example returns the string value of the specified cell. The Products dimension has multiple hierarchies while the Measures dimension has one hierarchy.

The intra-cube reference is restricted to literal parameters, while CellValueN is not. This behavior is analogous to the DB() rules function. The element parameters may be specified using string-valued expressions. For example, the above Products element parameter could be specified as:

```
'Products' : 'ProductsByChannel' : AttrS(...)
```

Unlike DB() and the intra-cube reference expression, CellValueN element parameters must be either dimension-qualified, or dimension and hierarchy qualified.

**CellValueS**

CellValueS returns the string value of the specified element(s) in a cube. This is a TM1 rules function, valid in TM1 rules only. Use of this function in a TurboIntegrator process will result in an error.

For dimensions not among the element parameters, coordinates are retrieved from the rule target (the cell being retrieved and triggering rule evaluation). The function behavior is analogous to the intra-cube reference expression (e.g. ['Measures': 'Count']), as used on the rule's right-side.

The element parameters may be specified in any order, and for CellValueS, multiple elements from the same dimension (but different hierarchies of the dimension) may be specified. Since the elements list is not required to be in cube dimension order, it is necessary to dimension-qualify all element parameters. Element parameters from multi-hierarchy dimensions must also be hierarchy-qualified.

**Syntax**

```
CellValueS(cube, element1,..., elementN);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>elementN</td>
<td>Element name that defines the cell. A minimum of one element must be specified.</td>
</tr>
</tbody>
</table>

**Example**

```
CellValueS('ForecastCube', 'Products':'ProductsByChannel':'Channel2', 'Measures':'Location');
```

This example returns the string value of the specified cell. The Products dimension has multiple hierarchies while the Measures dimension has one hierarchy.
The intra-cube reference is restricted to literal parameters, while CellValueS is not. This behavior is analogous to the DB() rules function. The element parameters may be specified using string-valued expressions. For example, the above Products element parameter could be specified as:

```
'Products' : 'ProductsByChannel' : AttrS( _ )
```

Unlike DB() and the intra-cube reference expression, CellValueS element parameters must be either dimension-qualified, or dimension and hierarchy qualified.

**DB**

DB returns a value from a cube in a TM1 database. DB returns a numeric value if used in a numeric expression and a string value if used in a string expression.

DB is a TM1 rules function, valid in TM1 rules only. Use of this function in a TurboIntegrator process causes an error.

**Syntax**

```
DB(cube, e1, e2, [...e256])
```

**Parameters**

- **cube**
  The name of the cube from which to retrieve the value.

- **e1,...en**
  Dimension element names that define the intersection containing the value to be retrieved.

  Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on.

**Example**

In this example, Budget is the cube name, and the function returns the value at the intersection of California, 15" Flat Panel Monitors, Net Sales, and January.

```
DB('Budget', 'California', '15" Flat Panel Monitors', 'Net Sales', 'January')
```

When used to reference multi-hierarchy dimensions, you must specify the particular hierarchy. In this example, the Category2 element exists in the ByCategory hierarchy of the ProductsCube dimension.

```
DB('ProductsCube', 'ByCategory','Category2',...)
```

**ISLEAF**

ISLEAF returns 1 if a specified cell is a leaf cell (identified solely by leaf/simple elements). If the specified cell is identified by any consolidated elements, the function returns 0.

This function is valid in TM1 rules only.

The ISLEAF function cannot be used in TurboIntegrator processes. The presence of this function in a process will prevent the process from compiling.

**Syntax**

```
ISLEAF
```

**Arguments**

None.
Example
You can use ISLEAF in an IF statement to test if a current cell is a leaf cell. For example:

```excel
[]=IF((ISLEAF=1),TrueStatement, FalseStatement);
```

Executes the TrueStatement if the current cell is a leaf cell, otherwise it executes the FalseStatement.

**ISUNDEFINEDCELLVALUE**
ISUNDEFINEDCELLVALUE compares the passed value to the default numeric cube value, which is influenced by the presence of the UNDEFVALS declaration in that cube's rule. The function returns 1 if the passed value equals the cube's default value, otherwise the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

`ISUNDEFINEDCELLVALUE(TestValue, <Cube>)`

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TestValue</td>
<td>The numerical value to compare against the cube's default value.</td>
</tr>
</tbody>
</table>
| Cube     | An optional String argument that specifies the cube whose default value should be compared.  
When ISUNDEFINEDCELLVALUE is used in a rule, the cube is assumed to be the subject cube unless otherwise specified.  
When used in a TI, a cube should be specified.  
If the cube is omitted in a TI, or is not valid when specified, 0 will be used for comparison. |

**Example**

`ISUNDEFINEDCELLVALUE(TestValue)` returns 1 when TestValue is the special undefined value and is used in the rule of a cube with UNDEFVALS declared.

**UNDEF**
UNDEF returns the undefined value. This function can be used to prevent data from being stored in a cube based on a logical test.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

`UNDEF`

**Arguments**

None.

**Example**

UNDEF returns the undefined value.
UNDEFINEDCELLVALUE

UNDEFINEDCELLVALUE returns the default numeric cube value, which is influenced by the presence of the UNDEFVALS declaration in that cube's rule.

This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

UNDEFINEDCELLVALUE(<Cube>)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>An optional String argument that specifies the cube whose default value should be returned. When UNDEFINEDCELLVALUE is used in a rule, the cube is assumed to be the subject cube unless otherwise specified. When used in a TI process, a cube should be specified. If the cube is omitted in a TI process, or is not valid when specified, 0 will be returned.</td>
</tr>
</tbody>
</table>

Example

UNDEFINEDCELLVALUE returns 0 when used in the rule of a cube without UNDEFVALS declared, or when used in a TI process.

UNDEFINEDCELLVALUE returns the special undefined value when used in the rule of a cube with UNDEFVALS declared.

UNDEFINEDCELLVALUE('ExampleCube') returns the default value of 'ExampleCube', or 0 if 'ExampleCube' does not exist.

UNDEFVALS

Putting UNDEFVALS in the rules for a cube changes the default value for the cube from zero to a special undefined value. Like other rules functions, UNDEFVALS applies only to the cube associated with the rule in which the function appears.

This is a TM1 rules function, valid only in TM1 rules.

Use of UNDEFVALS has ramifications regarding how data is stored in the cube and retrieved.

• Data Storage

For a cube without UNDEFVALS in the rules, the default value is zero. If an attempt is made to store a zero in a cell of the cube, that storage request is ignored, as this is a redundant attempt to store the default value, and it would needlessly consume memory space. Similarly, if a cell already contains a value and the value is deleted, nothing is stored in the cell.

If however the cube has UNDEFVALS defined in the rules, this makes the default value a special undefined value. Now when a zero is stored in a cell of a cube, it is actually stored, just like any other non-zero value.

The special undefined value is only a run-time value, returned from requests for cell values. It is never stored in an actual cell in memory, and is never written to disk. Including UNDEFVALS in the rule for a cube has no effect on memory usage or disk storage, except for cells that actually contain zero as a value. When UNDEFVALS is included in the rule for a cube, zero values in that cube will consume memory space and will be written to disk, just like any other data value. If UNDEFVALS is not specified, zero value cells are not stored in memory nor are they written to disk.
• Data Retrieval

For a cube without UNDEFVALS in the rules, the default value is zero. When a cell is retrieved, and there is no value currently stored for that value in the cube, a value of zero (as the default value) is returned. This means that an application cannot tell whether a cell actually exists and contains zero as the cell value, or whether the cell does not exist (as can be the case with sparse data).

If however the cube has UNDEFVALS defined in the rules, this makes the default value a special undefined value. In this case, when a non-existent cell is retrieved, the value retrieved will be this special undefined value. This can be used to distinguish a cell that does not exist (special undefined returned) from a cell that exists, but whose value is zero (zero returned). Any client written to run against TM1, which can encounter a cube with UNDEFVALS set, must be prepared to handle a cell value of this special undefined rather than a zero. A client can detect whether a value returned from TM1 is this special undefined value with the TM1ValIsUndefined API function. For details on the TM1ValIsUndefined API function, see the TM1 API documentation.

Note: This special undefined value is not the value returned by the UNDEF() TurboIntegrator function. The value returned by UNDEF() is an undefined value used for such things as an attempt to divide by zero, or take the logarithm of an illegal number, etc.

In TurboIntegrator, for normal arithmetic operations (+, -, *, /, \, ^) and normal arithmetic comparisons (<, >, >=, <=, =, <>), the special undefined value is treated as a zero. Because of this, the following code does not work:

NoCellVal = UndefinedCellValue( 'cube-name' );
If ( vv = NoCellVal );

In this comparison, NoCellVal, which is the special undefined value for an UNDEFVALS cube, is treated as a zero. This means the comparison is really If ( vv = 0 ).

In TurboIntegrator you must use the IsUndefinedCellValue to test if a cell value is the special undefined value. For example:

vv = CellGetN( 'cube-name', elements-list);
if ( IsUndefinedCellValue( vv, 'cube-name' ) = 1 );
#the cells does not exist
cell_does_not_exist = 1;
else;
#cell exists
cell_does_not_exist = 0;
Endif;

Syntax

UNDEFVALS

Arguments

None.

Date and Time Rules Functions

Rules functions that work with dates and time.

DATE

DATE returns the date string in yy-mm-dd or yyyy-mm-dd format for a given serial number.

This function is valid in both TM1 rules and TurboIntegrator processes.
### Syntax

**DATE(SerialNumber, ReturnFourDigitYear)**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SerialNumber</td>
<td>A date expressed in serial format.</td>
</tr>
<tr>
<td>ReturnFourDigitYear</td>
<td>An optional Boolean argument that determines whether the DATE function returns a string using two- or four-digit notation for the year.</td>
</tr>
</tbody>
</table>

If ReturnFourDigitYear is true, the function returns date falling within the range of Jan. 1, 1960 and Dec. 31, 9999, using four-digit notation for the year. Serial date 0 corresponds to Jan. 1, 1960 and serial date 2936549 corresponds to Dec. 31, 9999.

If ReturnFourDigitYear is false, or if this optional argument is omitted from the DATE function, the function returns a date falling within the range Jan. 1, 1960 and Dec. 31, 2059, using two-digit notation for the year. Serial date 0 corresponds to Jan 1, 1960 and serial date 36524 corresponds to Dec. 31, 2059.

If ReturnFourDigitYear is false or is omitted and you specify a serial date greater than 36524, the serial date used by the function is determined by the formula n - 36525. For example, if you specify a serial date of 36530, then 36530 - 36525 = 5. In this case, DATE uses 5 as the serial date and returns the date Jan. 6, 1960.

#### Example

DATE(13947) returns 98-03-09.

DATE(13947, 1) returns 1998-03-09.

**DATES**

DATES returns a date string, in the form 'yy-mm-dd' or 'yyyy-mm-dd', corresponding to a given year, month, and day.

This function is valid in both TM1 rules and TurboIntegrator processes.

#### Syntax

**DATES(year, month, day)**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>year</td>
<td>A year, expressed in either yy or yyyy format.</td>
</tr>
<tr>
<td>month</td>
<td>A month, expressed in mm format.</td>
</tr>
<tr>
<td>day</td>
<td>A day, expressed in dd format.</td>
</tr>
</tbody>
</table>

#### Example

DATES(98, 2, 10) returns '98-02-10'.

DATES(1998, 2, 10) returns '1998-02-10'.
DAY
DAY returns a numeric value for the day in a given date string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
DAY(DateString)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DateString</td>
<td>A date string in either YY-MM-DD or YYYY-MM-DD format.</td>
</tr>
</tbody>
</table>

Example
DAY('02-05-25') returns 25.

DAYNO
DAYNO returns the serial date number corresponding to a given date string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Note: DAYNO can return serial dates for date strings starting at January 1, 1960 (dates string 1960-01-01 or 60-01-01). For dates after December 31, 2059, you use a four digit year in the date string. For example, the date string for January 5, 2061 would be 2061-01-05.

Syntax
DAYNO('DateString')

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DateString</td>
<td>A date string in either YY-MM-DD or YYYY-MM-DD format.</td>
</tr>
</tbody>
</table>

Example
DAYNO('98-03-09') returns 13947.

MONTH
MONTH returns a numeric value for the month in a given date string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
MONTH(date)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>A date string in either YY-MM-DD or YYYY-MM-DD format.</td>
</tr>
</tbody>
</table>
**Example**

MONTH('02-05-25') returns 5.

**NOW**

NOW returns the current date/time value in serial number format. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
NOW
```

**Arguments**

None.

**Example**

NOW returns the current date/time value in serial number format.

**TIME**

TIME returns a string, in HH:MM format, representing the system time on the TM1 server. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
TIME
```

**Arguments**

None.

**Example**

Given a system time of 9:33 AM, TIME returns the string ‘09:33’.

Given a system time of 9:33 PM, TIME returns the string ‘21:33’.

**TIMST**

TIMST returns a formatted date/time string. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
TIMST(datetime, format, ExtendedYears)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Modifier/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datetime</td>
<td>A date/time serial number. The integer part of the number specifies the date, and the decimal part specifies the time within the day. Day number 0 corresponds to '60-01-01'. Negative numbers correspond to prior years. Years in the 21st Century, up to 2059, are represented by years 00 through 59. An hour is 1/24th of a day, a minute 1/60th of an hour, and a second 1/60th of a minute.</td>
</tr>
<tr>
<td>format</td>
<td>A string that formats the result of the function. All the characters in the format argument appear in the result, except for the following characters, which return date/time component values:</td>
</tr>
<tr>
<td></td>
<td>\y the last two digits of the year (97, 98, etc.)</td>
</tr>
<tr>
<td></td>
<td>\Y the four digits of the year (1997, 1998, etc.)</td>
</tr>
<tr>
<td></td>
<td>\m the two digits of the month (01 through 12)</td>
</tr>
<tr>
<td></td>
<td>\M the abbreviation of the month (JAN, FEB, etc.)</td>
</tr>
<tr>
<td></td>
<td>\d the two digits of the day (01 through 31)</td>
</tr>
<tr>
<td></td>
<td>\D the digit of the day (1 through 31)</td>
</tr>
<tr>
<td></td>
<td>\h the hour in military time (00 through 23)</td>
</tr>
<tr>
<td></td>
<td>\H the standard hour (1 through 12)</td>
</tr>
<tr>
<td></td>
<td>\i the minute (00 through 59)</td>
</tr>
<tr>
<td></td>
<td>\s the second (00 through 59)</td>
</tr>
<tr>
<td>Argument</td>
<td>Modifier/ Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>\p</td>
<td>a.m. or p.m.</td>
</tr>
<tr>
<td>ExtendedYears</td>
<td>This optional Boolean parameter specifies whether the function returns a date falling within the range 1960 - 2059 or 1960 - 9999. If ExtendedYears is true, the function returns a date falling within the range of Jan. 1, 1960 and Dec. 31, 9999. Serial date 0 corresponds to Jan. 1, 1960 and serial date 2936549 corresponds to Dec. 31, 9999. If ExtendedYears is false, or if this optional argument is omitted from the TIMST function, the function returns a date falling within the range Jan. 1, 1960 and Dec. 31, 2059. Serial date 0 corresponds to Jan 1, 1960 and serial date 36524 corresponds to Dec. 31, 2059. If ExtendedYears is false or is omitted and you specify a serial date greater than 36524, the serial date used by the function is determined by the formula n - 36525. For example, if you specify a serial date of 36530, then 36530 - 36525 = 5. In this case, TIMST uses 5 as the serial date and returns the date Jan. 6, 1960.</td>
</tr>
</tbody>
</table>

**Example**

TIMST(366.0000, \"M \D, \Y\") returns 'JAN 1, 1961'.
TIMST(366.5000, \"H\p \imin\sssec\") returns '12p.m. 00min00sec'.
TIMST(366.1000, 'On \M \D, \Y at \H\p \imin\sssec\') returns 'On JAN 1, 1961 at 2a.m. 24min00sec'.
TIMST(11111.1100, 'On \M \D, \Y at \H\p \imin\sssec\') returns 'On JUN 3,1990 at 2a.m. 38min24sec'.

**TIMVL**

TIMVL returns the numeric value of a component (year, month, etc.) of a date/time value. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
TIMVL(datetime, type, ExtendedYears)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Modifier and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datetime</td>
<td>A date and time serial number. The integer part of the number specifies the date, and the decimal part specifies the time within the day. Day number 0 corresponds to '60-01-01.' Negative numbers correspond to prior years. Years in the 21st Century, up to 2059, are represented by years 00 through 59. An hour is 1/24th of a day, a minute 1/60th of an hour, and a second 1/60th of a minute.</td>
</tr>
<tr>
<td>type</td>
<td>A character that specifies the type of component to be extracted. The following are valid type arguments:</td>
</tr>
<tr>
<td>Y</td>
<td>year value (1997, 1998, etc.)</td>
</tr>
<tr>
<td>M</td>
<td>month value (1 through 12)</td>
</tr>
<tr>
<td>D</td>
<td>day value (1 through 31)</td>
</tr>
<tr>
<td>H</td>
<td>hour value (0 through 23)</td>
</tr>
<tr>
<td>I</td>
<td>minute value (00 through 59)</td>
</tr>
<tr>
<td>S</td>
<td>second value (00 through 59)</td>
</tr>
<tr>
<td>Argument</td>
<td>Modifier and Description</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>ExtendedYears</td>
<td>This optional Boolean parameter specifies whether the function returns a date falling within the range 1960 - 2059 or 1960 - 9999. If ExtendedYears is true, the function returns a date falling within the range of Jan. 1, 1960 and Dec. 31, 9999. Serial date 0 corresponds to Jan. 1, 1960 and serial date 2936549 corresponds to Dec. 31, 9999. If ExtendedYears is false, or if this optional argument is omitted from the TIMVL function, the function returns a date falling within the range Jan. 1, 1960 and Dec. 31, 2059. Serial date 0 corresponds to Jan 1, 1960 and serial date 36524 corresponds to Dec. 31, 2059. If ExtendedYears is false or is omitted and you specify a serial date greater than 36524, the serial date used by the function is determined by the formula n - 36525. For example, if you specify a serial date of 36530, then 36530 - 36525 = 5. In this case, TIMVL uses 5 as the serial date and returns the date Jan. 6, 1960.</td>
</tr>
</tbody>
</table>

**Example**

TIMVL(11111.1100, 'Y') returns 1990.
TIMVL(11111.1100, 'H') returns 2.

**TODAY**

TODAY returns the current date in yy-mm-dd format.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
TODAY(<ReturnFourDigitYear>)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReturnFourDigitYear</td>
<td>An optional Boolean argument that determines whether the TODAY function returns a string using two- or four-digit notation for the year.</td>
</tr>
<tr>
<td></td>
<td>If ReturnFourDigitYear is true, the function returns a date falling within the range of Jan. 1, 1960 and Dec. 31, 9999, using four-digit notation for the year. Serial date 0 corresponds to Jan. 1, 1960 and serial date 2936549 corresponds to Dec. 31, 999.</td>
</tr>
<tr>
<td></td>
<td>If ReturnFourDigitYear is false, or if this optional argument is omitted from the TODAY function, the function returns a date falling within the range Jan. 1, 1960 and Dec. 31, 2059, using two-digit notation for the year. Serial date 0 corresponds to Jan 1, 1960 and serial date 36524 corresponds to Dec. 31, 2059.</td>
</tr>
<tr>
<td></td>
<td>If ReturnFourDigitYear is false or is omitted and you specify a serial date greater than 36524, the serial date used by the function is determined by the formula n - 36525. For example, if you specify a serial date of 36530, then 36530 - 36525 = 5. In this case, TODAY uses 5 as the serial date and returns the date Jan. 6, 1960.</td>
</tr>
</tbody>
</table>

**Example**

P1=TODAY(1) returns a data string in YYYY-MM-DD format such as 2009-06-05.

P1=TODAY(0) returns a date string in YY-MM-DD format such as 09-06-05

**YEAR**

YEAR returns a numeric value for the year in a given date string.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

YEAR(date)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>A date string in YY-MM-DD format.</td>
</tr>
</tbody>
</table>

**Example**

YEAR('02-05-25') returns 2.

### Dimension Information Rules Functions

Rules functions that manage dimension information.
**DIMIX**

DIMIX returns the index number of an element within a dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
DIMIX(server_name:dimension, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name qualified by the server name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. If the element is not a member of the dimension specified, the function returns 0.</td>
</tr>
</tbody>
</table>

**Example**

Brazil has an index value of three in the Region dimension. The example returns 3.

```
DIMIX('planning_sample:Region','Brazil')
```

**DIMNM**

DIMNM returns the element of a dimension that corresponds to the index argument.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
DIMNM(server_name:dimension, index)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name qualified by the server name.</td>
</tr>
<tr>
<td>index</td>
<td>A value less than or equal to the number of elements in the dimension. If this argument is less than 1, or greater than the number of elements in the dimension, the function returns 0.</td>
</tr>
</tbody>
</table>

**Example**

This example returns 'Belgium', which is the element within the Region dimension with an index value of 2.

```
DIMNM(planning_sample:'Region',2)
```

**DIMSIZ**

DIMSIZ returns the number of elements within a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.
Syntax
DIMSIZ(dimension)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name. Some installations may need to qualify the dimension name with the server name, as in server_name:dimension.</td>
</tr>
</tbody>
</table>

Example
If the dimension Accounts contains 19 elements, the example returns the value 19.

DIMSIZ('Accounts')

DNEXT
DNEXT returns the element name that follows the element specified as an argument to the function.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
DNEXT(dimension, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name. Some installations may need to qualify the dimension name with the server name, as in server_name:dimension.</td>
</tr>
</tbody>
</table>

| element   | The name of an element within the dimension. This argument can also be the name of an alias for a dimension element. |

Example
If the Location dimension contains the ordered elements California, Oregon, and Washington, the example returns Washington.

DNEXT("Location","Oregon")

DNLEV
DNLEV returns the number levels in a dimension.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
DNLEV(dimension)
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name. Some installations may need to qualify the dimension name with the server name, as in server_name:dimension.</td>
</tr>
</tbody>
</table>

**Example**

DNLEV('Region')

In the Region dimension, the various nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3).

![Region Dimension Diagram](image)

There are four levels in the Region dimension, so the example returns the value 4.

**DTYPE**

DTYPE returns information about the element type of a specified element. DTYPE returns N if the element is a numeric element, S if the element is a string element, and C if the element is a consolidated element.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

DTYPE(dimension, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

The element Europe is a consolidated element of the Region dimension, so the example returns C.

DTYPE('Region', 'Europe')

**TABDIM**

TABDIM returns the dimension name that corresponds to the index argument.

This function is valid in both TM1 rules and TurboIntegrator processes.
Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of dimensions in the cube.</td>
</tr>
</tbody>
</table>

Example

The cube SalesCube contains five dimensions: account1, actvsbud, model, month, and region. The example returns model, the third dimension of SalesCube.

TABDIM('SalesCube',3)

Element Information Rules Functions

Rules functions that manage element information.

ELCOMP

ELCOMP returns the name of a child of a consolidated element in a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
<tr>
<td>position</td>
<td>A positive value less than or equal to the total number of children in the specified element.</td>
</tr>
</tbody>
</table>

Example

In the dimension Region, the consolidated element Central Europe is a consolidation of the children France and Germany. Germany is in the second position in this consolidation. Accordingly, the example returns Germany.

ELCOMP('Region','Central Europe',2)

ELCOMPN

ELCOMPN returns the number of components in a specified element. If the element argument is not a consolidated element, the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.
Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In the Region dimension, the element Scandinavia is a consolidation of three elements. The example returns 3.

ELCOMPN('Region', 'Scandinavia')

**ElementComponent**

ElementComponent returns the name of a child of a consolidated element in a specified dimension. If the element argument is not a consolidated element, the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
<tr>
<td>position</td>
<td>A positive value less than or equal to the total number of children in the specified element.</td>
</tr>
</tbody>
</table>

**Example**

In the dimension Region, the consolidated element Central Europe is a consolidation of the children France and Germany. Germany is in the second position in this consolidation. Accordingly, the example returns Germany.

ElementComponent('Region', 'Europe', 'Central Europe', 2)

**ElementComponentCount**

ElementComponentCount returns the number of components in a specified element. If the element argument is not a consolidated element, the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.
Syntax

ElementComponentCount(dimension, hierarchy, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
</tbody>
</table>

Example

In the Region dimension, the element Scandinavia is a consolidation of three elements. The example returns 3.

ElementComponentCount('Region', '', 'Scandinavia')

ElementCount

ElementCount returns the number of elements within a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

ElementCount(dimension, hierarchy)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>

Example

If the Receivables hierarchy in the Accounts dimension contains 19 elements, the example returns the value 19.

ElementCount('Accounts', 'Receivables')

ElementFirst

ElementFirst returns the first element of a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

ElementFirst(server_name:dimension, hierarchy)
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

If the North America hierarchy of the Location dimension contains the ordered elements California, Oregon, and Washington, the example returns California.

```
ElementFirst("planning_sample:Location", "North America")
```

**ElementIndex**

ElementIndex returns the index number of an element within a dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementIndex(server_name:dimension, hierarchy, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name qualified by the server name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td></td>
<td>If the element is not a member of the dimension specified, the function returns 0.</td>
</tr>
</tbody>
</table>

**Example**

Brazil has an index value of three in the Region dimension. The example returns 3.

```
ElementIndex('planning_sample:Region', 'South America', 'Brazil')
```

**ElementIsAncestor**

ElementIsAncestor determines whether element1 is an ancestor of element2 in the specified dimension. The function returns 1 if element1 is an ancestor of element2, otherwise the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementIsAncestor(dimension, hierarchy, element1, element2)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In the Western hierarchy of the Region dimension, the element Europe is an ancestor of Germany. The example returns 1.

```
ElementIsAncestor('Region', 'Western', 'Europe', 'Germany')
```

**ElementIsComponent**

ElementIsComponent determines whether element1 is a child of element2 in the specified dimension. The function returns 1 if element1 is a child of element2, otherwise the function returns 0. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementIsComponent(dimension, hierarchy, element1, element2)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In the dimension Region, the element Central Europe is a consolidation of two elements, Germany and France. The example returns 1.

**Note:** this function returns 1 only for immediate children. In the above example, Germany is a child of Central Europe. Further, Central Europe is a child of Europe.

```
ElementIsComponent('Region', 'Countries', 'Germany', 'Central Europe')
```

However, because the function returns 1 only for immediate children, the following example returns 0:

```
ElementIsComponent('Region', 'Countries', 'Germany', 'Europe')
```

**ElementIsParent**

ElementIsParent determines whether element1 is a parent of element2 in the specified dimension. The function returns 1 if element1 is a parent of element2, otherwise the function returns 0. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementIsParent(dimension, hierarchy, element1, element2)
```
**Argument | Description**
--- | ---
dimension | A valid dimension name.
hierarchy | The name of the hierarchy within the dimension.
element1 | The name of an element within the dimension.
element2 | The name of an element within the dimension.

**Example**

In the dimension Region, the consolidated element Central Europe is the parent of both Germany and France. Accordingly, the example returns 1.

**Note:** this function returns 1 only for immediate parents. In the above example, Europe is a parent of Central Europe. Further, Central Europe is a parent of Germany.

```
ElementIsParent('Region', 'Countries', 'Central Europe', 'Germany')
```

However, because Europe is not an immediate parent of Germany, the following example returns 0:

```
ElementIsParent('Region', 'Countries', 'Europe', 'Germany')
```

**ElementLevel**

ElementLevel returns the level of an element within a dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementLevel(dimension, hierarchy, element)
```

**Argument | Description**
--- | ---
dimension | A valid dimension name.
hierarchy | The name of the hierarchy within the dimension.
element | The name of an element within the dimension.

**Example**

```
ElementLevel('Region', 'Countries', 'Europe')
```

In the Region dimension, individual nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3). The example returns 2, as Europe is a Level 2 element.
**ElementName**

ElementName returns the element of a dimension that corresponds to the index argument.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementName(server_name:dimension, hierarchy, index)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name qualified by the server name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>index</td>
<td>A value less than or equal to the number of elements in the dimension. If this argument is less than 1, or greater than the number of elements in the dimension, the function returns 0.</td>
</tr>
</tbody>
</table>

**Example**

This example returns 'Belgium', which is the element within the Countries hierarchy of the Region dimension with an index value of 2.

```
ElementName(planning_sample:'Region', 'Countries', 2)
```

**ElementNext**

ElementNext returns the element name that follows the element specified as an argument to the function.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementNext(dimension, hierarchy, element)
```
<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name. Some installations may need to qualify the dimension name with the server name, as in server_name:dimension.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

If the Location dimension contains the ordered elements California, Oregon, and Washington, the example returns Washington.

```
ElementNext("Location","Cities", "Oregon")
```

**ElementParent**

ElementParent returns the parent of an element in a specified dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementParent(dimension, hierarchy, element, index)
```

<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of consolidated elements (parents) that use the element argument as a child.</td>
</tr>
</tbody>
</table>

**Example**

In the dimension Model, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. In the structure of the Model dimension, Total Wagons is defined first, Total 4WD is defined second.

```
ElementParent('Model', 'Automobile', 'Wagon 4WD', 2)
```

The example returns Total 4WD, as this is the second instance of a parent to Wagon 4WD within the Model dimension.
**ElementParentCount**

ElementParentCount returns the number of parents of an element in a specified dimension. This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementParentCount(dimension, hierarchy, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In the Model dimension, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. The function returns 2.

```
ElementParentCount('Model', 'Automobile', 'Wagon 4WD')
```

**ElementType**

ElementType returns information about the element type of a specified element. ElementType returns N if the element is a numeric element, S if the element is a string element, and C if the element is a consolidated element.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ElementType(dimension, hierarchy, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

The element Europe is a consolidated element of the Region dimension, so the example returns C.

```
ElementType('Region', 'Countries', 'Europe')
```

**ElementWeight**

ElementWeight returns the weight of a child in a consolidated element.

This function is valid in both TM1 rules and TurboIntegrator processes.
**Syntax**

```
ElementWeight(dimension, hierarchy, element1, element2)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of a child of the consolidated element.</td>
</tr>
</tbody>
</table>

**Example**

The element Variable Costs, which is a child of Gross margin, has a weight of -1. The following example returns -1.

```
ElementWeight('Account1', 'SubAccount1', 'Gross margin', 'Variable Costs')
```

**ELISANC**

ELISANC determines whether element1 is an ancestor of element2 in the specified dimension. The function returns 1 if element1 is an ancestor of element2, otherwise the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ELISANC(dimension, element1, element2)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In the dimension Region, the element Europe is an ancestor of Germany. The example returns 1.

```
ELISANC('Region', 'Europe', 'Germany')
```

**ELISCOMP**

ELISCOMP determines whether element1 is a child of element2 in the specified dimension. The function returns 1 if element1 is a child of element2, otherwise the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ELISCOMP(dimension, element1, element2)
```
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

### Example

In the dimension *Region*, the element *Central Europe* is a consolidation of two elements, *Germany* and *France*. The following example returns 1.

**Note:** this function returns 1 only for immediate children. In this example, *Germany* is a child of *Central Europe*. Further, *Central Europe* is a child of *Europe*.

```
ELISCOMP('Region','Germany','Central Europe')
```

However, because the function returns 1 only for immediate children, the following example returns 0:

```
ELISCOMP('Region','Germany','Europe')
```

### ELISPAR

ELISPAR determines whether element1 is a parent of element2 in the specified dimension. The function returns 1 if element1 is a parent of element2, otherwise the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

### Syntax

```
ELISPAR(dimension, element1, element2)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

### Example

In the dimension *Region*, the consolidated element *Central Europe* is the parent of both *Germany* and *France*. Accordingly, the following example returns 1.

**Note:** this function returns 1 only for immediate parents. In this example, *Europe* is a parent of *Central Europe*. Further, *Central Europe* is a parent of *Germany*.

```
ELISPAR('Region','Central Europe','Germany')
```

However, because *Europe* is not an immediate parent of *Germany*, the following example returns 0:

```
ELISPAR('Region','Europe','Germany')
```
ELLEV

ELLEV returns the level of an element within a dimension.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

```
ELLEV(dimension, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

Example

```
ELLEV('Region', 'Europe')
```

In the Region dimension, individual nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3). The example returns 2, as Europe is a Level 2 element.

ELPAR

ELPAR returns the parent of an element in a specified dimension.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

```
ELPAR(dimension, element, index)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of consolidated elements (parents) that use the element argument as a child.</td>
</tr>
</tbody>
</table>
Example
In the dimension Model, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. In the structure of the Model dimension, Total Wagons is defined first, Total 4WD is defined second.

ELPAR('Model','Wagon 4WD',2)

The example returns Total 4WD, as this is the second instance of a parent to Wagon 4WD within the Model dimension.

ELPARN
ELPARN returns the number of parents of an element in a specified dimension.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
ELPARN(dimension, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
</tbody>
</table>

Example
In the Model dimension, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. The function returns 2.

ELPARN('Model','Wagon 4WD')

ELWEIGHT
ELWEIGHT returns the weight of a child in a consolidated element.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
ELWEIGHT(dimension, element1, element2)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of a consolidated element within the dimension.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of a child of the consolidated element.</td>
</tr>
</tbody>
</table>

Example
The element Variable Costs, which is a child of Gross margin, has a weight of -1.
The following example returns -1.

```plaintext
EElWEIGHT('Account1','Gross margin','Variable Costs')
```

### LevelCount

LevelCount returns the number levels in a dimension.

This function is valid in both TM1 rules and TurboIntegrator processes.

#### Syntax

```plaintext
LevelCount(dimension, hierarchy)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name. Some installations may need to qualify the dimension name with the server name, as in <code>server_name:dimension</code>.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>

#### Example

```plaintext
LevelCount('Region', 'Countries')
```

In the Region dimension, the various nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3).

![LevelCount Diagram](image)

There are four levels in the Region dimension, so the example returns the value 4.

### Financial Rules Functions

Rules functions used to manage financial information.

#### FV

FV returns the value of an annuity at the time of the last payment. An annuity is a series of payments made at equal intervals of time. Payments are assumed to be made at the end of each period.

This function is valid in both TM1 rules and TurboIntegrator processes.

#### Syntax

```plaintext
FV(payment, interest, periods)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>payment</td>
<td>The amount of the payment made per period.</td>
</tr>
<tr>
<td>interest</td>
<td>The interest rate paid per period.</td>
</tr>
<tr>
<td>periods</td>
<td>The number of periods in the annuity.</td>
</tr>
</tbody>
</table>

**Example**

This example returns the value of an annuity at the end of 5 years, with payments of $1,000 per year at 14% interest.

\[
FV(1000, .14, 5)
\]

**PAYMT**

PAYMT returns the payment amount of an annuity based on a given initial value or principal, an interest rate, and a number of periods. An annuity is a series of payments made at equal intervals of time.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
PAYMT(principal, interest, periods)
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>principal</td>
<td>The present value, or the total amount that a series of future payments is worth now.</td>
</tr>
<tr>
<td>interest</td>
<td>The interest rate paid per period.</td>
</tr>
<tr>
<td>periods</td>
<td>The number of periods in the annuity. Payments are assumed to be made at the end of each period.</td>
</tr>
</tbody>
</table>

**Example**

This example returns the payment on a 5-year annuity that is paid yearly, with a principal of $100,000 at 14% interest.

\[
PAYMT(100000, .14, 5)
\]

**PV**

PV returns the initial or principal value of an annuity.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

\[
PV(payment, interest, periods)
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>payment</td>
<td>The amount of the payment made.</td>
</tr>
</tbody>
</table>
**Argument** | **Description**  
--- | ---  
interest | The interest rate paid per period.  
periods | The number of periods in the annuity. Payments are assumed to be made at the end of each period.

**Example**

This example returns the principal value of an annuity with 5 yearly payments of $1,000 at 14% interest.

\[
PV(1000, .14, 5)
\]

**Hierarchy Rules Functions**

Functions to manage hierarchies in rules.

**Hierarchy**

If there is only one hierarchy included in the supplied dimension, Hierarchy returns the name of the hierarchy. Otherwise, it returns an empty string. Hierarchy is valid in TM1 rules only.

With the introduction of support for multiple hierarchies in TM1, it is necessary to identify which hierarchies are in context when multiple hierarchies are being used.

Hierarchy cannot be used in TurboIntegrator processes. The presence of this function in a process will prevent the process from compiling.

**Syntax**

\[
\text{Hierarchy (DimName)};
\]

**Example**

This example returns 'Quarter', which is the only hierarchy in the Quarter dimension.

\[
\text{Hierarchy ('Quarter')};
\]

**HierarchyCount**

HierarchyCount returns the number of hierarchies in the supplied dimension. HierarchyCount is valid in TM1 rules only.

HierarchyCount cannot be used in TurboIntegrator processes. The presence of this function in a process will prevent the process from compiling.

**Syntax**

\[
\text{HierarchyCount (DimName)};
\]
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
</tbody>
</table>

**Example**

This example returns 3, which is the number of hierarchies in the model dimension.

```plaintext
HierarchyCount ('model');
```

**HierarchyIndex**

HierarchyIndex returns a 1-based index if the hierarchy is in the supplied dimension, 0 otherwise. HierarchyIndex is valid in TM1 rules only.

HierarchyIndex cannot be used in TurboIntegrator processes. The presence of this function in a process will prevent the process from compiling.

**Syntax**

```plaintext
HierarchyIndex (DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>A valid hierarchy name that you want to find the index position of in DimName.</td>
</tr>
</tbody>
</table>

**Example**

This example returns 3, which is the index position of the CustomerTarget hierarchy in the model dimension.

```plaintext
HierarchyIndex ('model', 'CustomerTarget');
```

**HierarchyN**

HierarchyN returns the name of the hierarchy at a specified position in the supplied dimension and an empty string if the index is out of scope. HierarchyN is valid in TM1 rules only.

HierarchyN cannot be used in TurboIntegrator processes. The presence of this function in a process will prevent the process from compiling.

**Syntax**

```plaintext
HierarchyN (DimName, index);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>index</td>
<td>A value less than or equal to the number of hierarchies in the dimension. If this argument is less than 1, or greater than the number of hierarchies in the dimension, the function returns 0.</td>
</tr>
</tbody>
</table>

**Example**

This example returns 'CustomerTarget', which is the third hierarchy in the model dimension.

```
HierarchyN ('model', 3);
```

**Logical Rules Functions**

Logical operators to use in rules.

**CONTINUE**

When included as part of a rules expression, CONTINUE allows a subsequent rule with the same area definition to be executed. Normally, TM1 only executes the first rule encountered for a given area.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
CONTINUE
```

**Arguments**

None.

**Example**

```
['Jan']= if(!region @= 'Argentina',10,CONTINUE);
['Jan']=20;
```

In this example, all cells identified by January and Argentina are assigned a value of 10. Cells identified by Jan and any other Region element are assigned a value of 20.

**IF**

IF returns one value if a logical expression you specify is TRUE and another value if it is FALSE.

This function is valid in TM1 rules only.

TurboIntegrator uses its own IF function that is capable of evaluating multiple logical expressions.

**Syntax**

```
IF(expression, true_value, false_value)
```
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>expression</td>
<td>Any value or expression that can be evaluated to TRUE or FALSE.</td>
</tr>
<tr>
<td>true_value</td>
<td>The value that is returned if expression is TRUE.</td>
</tr>
<tr>
<td>false_value</td>
<td>The value that is returned if expression is FALSE.</td>
</tr>
</tbody>
</table>

### Example

IF(1<2, 4, 5) returns 4.

IF(1>2, 'ABC', 'DEF') returns 'DEF'.

### STET

The STET function cancels the effect of a rule for a particular element.

This is a TM1 rules function, valid only in TM1 rules. This function cannot be used in TurboIntegrator processes.

#### Syntax

```
STET
```

#### Arguments

None.

#### Example

In this example, the rule dictates that the value for Sales is always 100, except for the intersection of Sales and the element France from the Region dimension.

```
['Sales'] = IF(!Region @= 'France', STET, 100);
```

### Mathematical Rules Functions

Mathematical operators to use in rules.

#### ABS

ABS returns the absolute value of a number.

This function is valid in both TM1 rules and TurboIntegrator processes.

#### Syntax

```
ABS(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>The number for which you want to find the absolute value.</td>
</tr>
</tbody>
</table>
**Example**

ABS(-1.2) returns 1.2

**ACOS**

ACOS returns the angle, in radians, whose cosine is x.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ACOS(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>The cosine of the angle you want to find. x must be between -1 and 1; otherwise the function returns an error.</td>
</tr>
</tbody>
</table>

**Example**

ACOS(0) returns 1.5708.

**ASIN**

ASIN returns the angle, in radians, whose sine is x.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ASIN(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>The sine of the angle you want to find. x must be between -1 and 1; otherwise the function returns an error.</td>
</tr>
</tbody>
</table>

**Example**

ASIN(1) returns 1.5708.

**ATAN**

ATAN returns the angle, in radians, whose tangent is x. The result is between -\(\pi/2\) and +\(\pi/2\).

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
ATAN(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>The tangent of the angle you want to find.</td>
</tr>
</tbody>
</table>
Example
ATAN(1) returns .7854.

COS
COS returns the cosine of an angle expressed in radians.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>An angle, expressed in radians, for which you want to find the cosine.</td>
</tr>
</tbody>
</table>

Example
COS(0) returns 1.

EXP
EXP returns the natural anti-log of a number.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A number for which you want to find the natural anti-log.</td>
</tr>
</tbody>
</table>

Example
EXP(1) returns 2.71828.

INT
INT returns the largest integer that is less than or equal to a specified value.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A numeric value.</td>
</tr>
</tbody>
</table>

Example
INT(5.6) returns 5.
INT(-5.6) returns -6.

**ISUND**

ISUND returns 1 if a specified value is undefined; otherwise it returns 0.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
ISUND(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A number or expression.</td>
</tr>
</tbody>
</table>

**Example**

ISUND(5.2) returns 0.
ISUND(1/0) returns 1.

**LN**

LN returns the natural logarithm (base e) of a number.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
LN(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A positive number. The function returns an error if x is negative or zero.</td>
</tr>
</tbody>
</table>

**Example**

LN(10) returns 2.302585093.

**LOG**

LOG returns the base 10 logarithm of a positive number.
This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```plaintext
LOG(x)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A positive number. The function returns an error if x is negative or zero.</td>
</tr>
</tbody>
</table>

**Example**

LOG(10) returns 1.
MAX

MAX returns the largest number in a pair of values.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

\[
\text{MAX(num1, num2)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>num1</td>
<td>The first in a pair of values.</td>
</tr>
<tr>
<td>num2</td>
<td>The second in a pair of values.</td>
</tr>
</tbody>
</table>

Example

MAX(10, 3) returns 10.

MIN

MIN returns the smallest number in a pair of values.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

\[
\text{MIN(num1, num2)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>num1</td>
<td>The first in a pair of values.</td>
</tr>
<tr>
<td>num2</td>
<td>The second in a pair of values.</td>
</tr>
</tbody>
</table>

Example

MIN(10, 3) returns 3.

MOD

MOD returns the remainder of dividing a number by a divisor.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

\[
\text{MOD(number, divisor)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number for which you want to find the remainder.</td>
</tr>
<tr>
<td>divisor</td>
<td>The value by which the number argument is divided.</td>
</tr>
</tbody>
</table>
**Example**

MOD(10, 3) returns 1.

**RAND**

RAND generates a random number that is uniformly distributed between 0 and 1. The random number generator is seeded when TM1 is loaded.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

```
RAND .
```

**Arguments**

None.

**Example**

RAND generates a random number that is uniformly distributed between 0 and 1.

**ROUND**

ROUND rounds a given number to the nearest integer. Rounding can be done in a variety of valid ways.

This function is valid in both TM1 rules and TurboIntegrator processes.

The most basic form of rounding is to replace an arbitrary number by an integer. There are many ways of rounding a number y to an integer q.

The most common ones are:

- **Round to nearest**
  
  q is the integer that is closest to y (see "Round away from zero" for tie-breaking rules).

- **Round towards zero** (or truncate)
  
  q is the integer part of y, without its fraction digits.

- **Round down** (or take the floor)
  
  q is the largest integer that does not exceed y.

- **Round up** (or take the ceiling)
  
  q is the smallest integer that is not less than y.

- **Round away from zero**
  
  If y is an integer, q is y; else q is the integer that is closest to 0 and is such that y is between 0 and q.

TurboIntegrator essentially uses the **Round down** method of floor(x + .5). Microsoft Excel uses the **Round to nearest** method. This can result in different integers depending on whether you are using a TurboIntegrator process or working in Excel.

**Syntax**

```
ROUND(number)
```

**Argument**

Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number you want to round.</td>
</tr>
</tbody>
</table>
Example
ROUND(1.46) returns 1.

ROUND
ROUND rounds a given number at a specified decimal precision.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
ROUND(number, decimal)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number you want to round.</td>
</tr>
<tr>
<td>decimal</td>
<td>The decimal precision at which to apply the rounding. If this argument is positive, the function rounds the specified number of digits to the right of the decimal point. If this argument is negative, the function rounds the specified number of digits to the left of the decimal point. The decimal argument must be between -15 and 15, inclusive.</td>
</tr>
</tbody>
</table>

Example
ROUND(1.46, 1) returns 1.5.
ROUND(1.466, 2) returns 1.47.
ROUND(234.56, -1) returns 230.00.
ROUND(234.56, 0) returns 235.00.

SIGN
SIGN determines if a number is positive, negative, or zero. The function returns 1 if the number is positive, -1 if the number is negative, and 0 if the number is zero.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
SIGN(number)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>A number.</td>
</tr>
</tbody>
</table>

Example
SIGN(-2.5) returns -1.

SIN
SIN returns the sine of a given angle.
This function is valid in both TM1 rules and TurboIntegrator processes.
Syntax

SIN(x)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A value, expressed in radians, for which you want the sine.</td>
</tr>
</tbody>
</table>

Example

SIN(1.5708) returns 1.

SQRT

SQRT returns the square root of a given value.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

SQRT(x)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>Any positive value. SQRT returns an error if x is negative.</td>
</tr>
</tbody>
</table>

Example

SQRT(16) returns 4.

TAN

TAN returns the tangent of a given angle.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

TAN(x)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A value, expressed in radians, for which you want the tangent.</td>
</tr>
</tbody>
</table>

Example

TAN(0) returns 0.
TAN(.7854) returns 1.

Text Rules Functions

Rules to manage text in rules.
CAPIT
CAPIT applies initial capitalization to every word in a string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
</tbody>
</table>

Example
CAPIT('first quarter sales') returns 'First Quarter Sales'.

CHAR
CHAR returns the character identified by a given ASCII numeric code.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>An ASCII code number. This number must be between 1 and 255, inclusive.</td>
</tr>
</tbody>
</table>

Example
CHAR(100) returns 'd'.

CODE
CODE returns the ASCII numeric code for a specified character within a string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
<tr>
<td>location</td>
<td>A number specifying the character within the string for which you want to find the ASCII code value.</td>
</tr>
</tbody>
</table>

Example
CODE('321', 2) returns 50.
CODE('End', 3) returns 100.
DELET
DELET returns the result of deleting a specified number of characters from a specified starting point within a string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
DELET(string, start, number)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
<tr>
<td>start</td>
<td>The character at which to begin deletion.</td>
</tr>
<tr>
<td>number</td>
<td>The number of characters to delete.</td>
</tr>
</tbody>
</table>

Example
DELET('payment', 3, 3) returns 'pant'.

FILL
FILL repeats a given string as necessary to return a string of a specified length.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
FILL(string, length)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string. This string is repeated as necessary to achieve the specified length.</td>
</tr>
<tr>
<td>length</td>
<td>The length of the string you want the function to return.</td>
</tr>
</tbody>
</table>

Example
FILL('-', 5) returns '-----'.
FILL('ab', 5) returns 'ababa'.

INSRT
INSRT inserts one string into another string at a specified insertion point.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax
INSRT(string1, string2, location)
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string1</td>
<td>A text string.</td>
</tr>
<tr>
<td>string2</td>
<td>A text string.</td>
</tr>
<tr>
<td>location</td>
<td>The character in string2 at which you want to insert string1. The function inserts string1 into string2 immediately prior to the character you specify.</td>
</tr>
</tbody>
</table>

**Example**

`INSRT('ABC', 'DEF', 2) returns 'DABCEF'.`

**LONG**

LONG returns the length of a string.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

`LONG(string)`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
</tbody>
</table>

**Example**

`LONG('Sales') returns 5.`

**LOWER**

LOWER converts all upper case characters in a string to lower case.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

`LOWER(string)`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
</tbody>
</table>

**Example**

`LOWER('First Quarter Sales') returns 'first quarter sales'.`

**NUMBR**

NUMBR converts a string to a number. The string passed to the NUMBR function must use. (period) as the decimal separator and , (comma) as the thousand separator. Any other decimal/thousand separators will cause incorrect results.

This function is valid in both TM1 rules and TurboIntegrator processes.
**Syntax**

NUMBR(string)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string you want to convert to a number. All characters other than '0' through '9', '+', '-', '.', and 'E' are ignored.</td>
</tr>
</tbody>
</table>

**Example**

NUMBR('-5.6') returns -5.6.
NUMBR('-5A.B6C') returns -5.6.

**SCAN**

SCAN returns a number indicating the starting location of the first occurrence of a specified substring within a string. If the substring does not occur in the given string, the function returns 0.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

SCAN(substring, string)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>substring</td>
<td>The substring you are trying to locate.</td>
</tr>
<tr>
<td>string</td>
<td>The string within which you are searching for the substring.</td>
</tr>
</tbody>
</table>

The arguments to this function are case-sensitive. The capitalization used in the `substring` argument must exactly match the capitalization used in the `string` argument for the function to return a non-zero value.

**Example**

SCAN('scribe', 'described') returns 3.

However, SCAN('Scribe', 'described') returns 0, because the case in the `substring` argument (Scribe) does not match the case in the `string` argument (described).

**STR**

STR converts a number to a string.

This function is valid in both TM1 rules and TurboIntegrator processes.

**Syntax**

STR(number, length, decimal)
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number being converted to a string. This number can contain a positive or negative sign. This number can contain decimal places.</td>
</tr>
<tr>
<td>length</td>
<td>The length of the string in the function result, including sign, separators, decimal, or decimal places. If the number of digits in the number is less than the length parameter, the function might insert leading blank spaces to attain this length after inserting sign, separators, decimal, or decimal places. If the number of digits in the number exceeds the length parameter, the function truncates the number to attain this length. If the length parameter is specified, it must be a positive number greater than &quot;0&quot;. If the length parameter is not specified, the number parameter is preserved and the length of the function result includes sign, separators, decimal, and decimal places.</td>
</tr>
<tr>
<td>decimal</td>
<td>The number of decimal places to include in the function result. If this parameter is &quot;0&quot; or not specified, a decimal point is not included. If the number specified has more decimal places than the number of decimal places requested, the function result is rounded.</td>
</tr>
</tbody>
</table>

**Examples**

<table>
<thead>
<tr>
<th>Function call</th>
<th>Number</th>
<th>Length</th>
<th>Decimal</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>STR(3.14159, 6, 2)</td>
<td>3.14159</td>
<td>6</td>
<td>2</td>
<td>&quot;  3.14&quot;</td>
</tr>
<tr>
<td>STR(-3.14, 6, 0)</td>
<td>-3.14159</td>
<td>6</td>
<td>0</td>
<td>&quot;    -3&quot;</td>
</tr>
<tr>
<td>STR(3.14159, 5, 3)</td>
<td>3.14159</td>
<td>5</td>
<td>3</td>
<td>&quot;3.142&quot;</td>
</tr>
<tr>
<td>STR(1000000, 4, 0)</td>
<td>1000000</td>
<td>4</td>
<td>0</td>
<td>&quot;1000&quot;</td>
</tr>
<tr>
<td>Note that the number is truncated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STR(1000000, 4, 2)</td>
<td>1000000</td>
<td>4</td>
<td>2</td>
<td>&quot;1000000.00&quot;</td>
</tr>
<tr>
<td>Note that the number is not truncated because</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function call</td>
<td>Number</td>
<td>Length</td>
<td>Decimal</td>
<td>Result</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>STR(10,2,4)</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>&quot;10.0000&quot;</td>
</tr>
<tr>
<td>STR(1000000,5,0)</td>
<td>1000000</td>
<td>5</td>
<td>0</td>
<td>&quot;1,000&quot;</td>
</tr>
<tr>
<td>STR(1000000,10,5)</td>
<td>1000000</td>
<td>10</td>
<td>5</td>
<td>&quot;1,000,000.00000&quot;</td>
</tr>
</tbody>
</table>

Note that the number is truncated. This is what is returned if comma separators are specified.

SUBST

SUBST returns a substring of a given string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

```
SUBST(string, beginning, length)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string from which you want to extract the substring.</td>
</tr>
<tr>
<td>beginning</td>
<td>The character at which the substring begins.</td>
</tr>
<tr>
<td>length</td>
<td>The length of the substring.</td>
</tr>
</tbody>
</table>

Example

SUBST('Retirement', 3, 4) returns 'tire'.

TRIM

TRIM returns the result of trimming any leading and trailing blanks from a string.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

```
TRIM(string)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
</tbody>
</table>
Example
TRIM(' First Quarter ') returns 'First Quarter'.

UPPER
UPPER converts a text string to upper case.
This function is valid in both TM1 rules and TurboIntegrator processes.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A text string.</td>
</tr>
</tbody>
</table>

Example
UPPER('First Quarter Results') returns FIRST QUARTER RESULTS.

Miscellaneous Rules Functions
Rules functions not found in other categories.

FEEDERS
When you use a SKIPCHECK declaration to restore the sparse consolidation in a TM1 rule, you must also ensure that all rules-derived cells are identified by feeder statements. To do this, insert a FEEDERS declaration immediately following all rules statements:

FEEDERS;

Immediately following the FEEDERS declaration you should create feeders statements that identify the rules-derived cells in the cube.

For a complete discussion of TM1 rules, including sparse consolidation and the creation of feeders, please refer to TM1 Rules.

FEEDSTRINGS
Rule-generated string values are not displayed when a view is zero-suppressed unless the string resides in a cell that is fed. To enable feeding of string cells, insert the FEEDSTRINGS declaration as the first line of your rule.

FEEDSTRINGS;

Once this declaration is in place, you can set up feeders for string cells in a cube view, and rely on the string to be available to other rules even if the view is zero-suppressed. Statements that define feeders for string cells should be created below the FEEDERS declaration in your rule.

As in the case of numeric feeders, a feed to a consolidated cell results in feeding of all components of the consolidation. Because you can store strings in consolidated cells, you must pay special attention if such cells are used to feed other cells. Overuse of string feeders can result in calculation explosions and poor application performance.

For a complete discussion of TM1 rules, including the creation of feeders, please refer to TM1 Rules.
**SKIPCHECK**

You can restore sparse consolidation and improve performance by inserting a SKIPCHECK declaration at the beginning of the TM1 rule.

During consolidations, TM1 uses a sparse consolidation algorithm to skip over cells that contain zero or are empty. This algorithm speeds up consolidation calculations in cubes that are highly sparse. A sparse cube is a cube in which the number of populated cells as a percentage of total cells is low.

When consolidating data in cubes that have rules defined, TM1 turns off this sparse consolidation algorithm because one or more empty cells may in fact be calculated by a rule. (Skipping rules-calculated cells will cause consolidated totals to be incorrect). When the sparse consolidation algorithm is turned off, every cell is checked for a value during consolidation. This can slow down calculations in cubes that are very large and sparse.

```
SKIPCHECK;
```

If your rule uses a FEEDSTRINGS statement, the SKIPCHECK statement should be the second statement in your rule. If your rule does not use a FEEDSTRINGS statement, the SKIPCHECK statement should be the first statement in your rule.

When you use SKIPCHECK to restore sparse consolidation, you must also ensure that your rule includes a FEEDERS declaration and that all rules-derived cells are identified by feeder statements.

For a complete discussion of TM1 rules, including sparse consolidation and the creation of feeders, please refer to *TM1 Rules.*
Chapter 3. Macro Functions

IBM Planning Analytics includes a set of macro functions that you can incorporate in Microsoft Excel macros. You can use macro functions in TM1 Perspectives to access servers, cube data and structures, and TM1 options.

**Note:** Before running these macros, you must load the TM1 Add-In (Tm1p.xla). For information about loading addins, see the Microsoft Excel help.

### Accessing Macro Functions from Microsoft Excel 2010 and Later

**Procedure**
1. Right-click the sheet tab of the active worksheet.
2. From the shortcut menu, click **Insert**.
3. Double-click **MS Excel 4.0 Macro**.
4. Click the cell where you want to place the macro function.
5. Click **Formulas**, and then click **Insert Function**.
6. From the category list, select **TM1**.
7. Select the function you want to insert, and then click **OK**.
8. Type values for the arguments.
9. Click **OK** to place the function in the current cell in the macro sheet.

### Accessing Macro Functions from VBA Modules

To access macro functions from VBA modules, use the Run method.

```
Run ("macro_function", arg1, ...)
```

**Example**

```
Sub ElemList()
    Worksheets("Sheet1").Select
    Cells(3,5).Select
    ActiveCell.Value = Run ("E_PICK", "local:Region")
End Sub
```

This procedure calls the E_PICK macro function, which accesses a list of elements in the Region dimension. The selected element populates a cell in the Sheet1 worksheet.

### D_PICK

D_PICK calls a dialog box that lists all available dimensions in the local data directory and on connected remote servers. The dimension you select in the dialog box becomes the value of the D_PICK function.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
D_PICK
```
D_FSAVE

D_FSAVE lets you create or update very large dimensions whose dimension worksheets would exceed the row limit of an Excel worksheet.

To use the D_FSAVE function, create a delimited ASCII file called dim.dit, where dim is the name of the dimension you want to create or update. This file must reside in your local server data directory.

The structure of the ASCII file must match a dimension worksheet, as follows:

• Include three fields per line.
• In the first field, specify the element type (C for consolidated; N for numeric element; S for string element; blank for consolidation component).
• In the second field, specify the element name.
• In the third field, specify the weight, if needed. The default weight is 1.0.

Separate the fields using the delimiter defined in your operating system. In Windows, this delimiter is defined by the List Separator entry in the Regional Setting Properties dialog box.

If there are errors in the structure of the ASCII file such as misplaced or undefined elements, an error message displays.

This TM1 macro function is valid in Excel macros and VBA modules only.

Syntax

D_FSAVE(file)

Argument | Description
--- | ---
file | The name of a delimited ASCII file that has the file extension .dit. Do not include the file extension. This file must reside in your local TM1 data directory.

Example

=D_FSAVE("Region")

This example reads an ASCII file named Region.dit and creates or updates the Region dimension.

Note: D_FSAVE can be used to create or update dimensions on remote servers. However, the function always looks for the .dit file in the local data directory (as defined in Tm1p.ini). You must be sure that the .dit file for the dimension you want to create/update resides in your local data directory, then specify the server on which you want to create/update the dimension by prefixing the .dit file with the server name.

=D_FSAVE("TM1Serv:Region")

This example looks for a file named Region.dit in the local server data directory, but writes the Region dimension to the data directory for the TM1Serv server.
**D_SAVE**

D_SAVE saves the active worksheet as a dimension worksheet file (dim.xdi). The name of the workbook is used as the file name. TM1 then creates or updates the dimension specified by the workbook name.

If the active worksheet does not conform to a dimension worksheet format or is missing information, an error message displays. For example, you must define all elements used in a level-1 consolidation as numeric elements (N).

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
D_SAVE
```

**Arguments**

None.

**DBProportionalSpread**

DBProportionalSpread distributes a specified value to the leaves of a consolidation proportional to existing cell values.

The function is analogous to the Proportional Spread data spreading method, which is described in detail in the *TM1 Perspectives and TM1 Architect* documentation.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
DBProportionalSpread( value, server:cube, e1, e2, e3..., e16 )
```

**Argument**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value you want to distribute.</td>
</tr>
<tr>
<td>server:cube</td>
<td>The name of the cube, prefixed with the appropriate server name, into which you want to distribute the value. For example, to distribute values to the Sales cube on the Accounting server, you would specify Accounting:Sales.</td>
</tr>
<tr>
<td>e1...e16</td>
<td>The names of the elements that identify the consolidation whose leaves will accept the distributed value.</td>
</tr>
</tbody>
</table>

**Example**

```
```

This example distributes the value 2000 to the children of the consolidation identified by the elements Actual, Argentina, S Series 1.8L Sedan, Sales, and 1 Quarter. It distributes values to the Sales cube on the Accounting server.
**E_PICK**

E_PICK calls the Subset Editor, listing all elements in the specified dimension. The element name you select in the Subset Editor becomes the return value of the E_PICK function.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
E_PICK(Dimension, Alias, Subset, Element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>A valid dimension name. The dimension can reside in the local data directory or on a remote server to which you are connected. Use a server name prefix to indicate the server location. For the local server, specify local:dim. For a remote server, specify servername:dim.</td>
</tr>
<tr>
<td>Alias</td>
<td>The name of an alias that exists for the subset. When this parameter is set, the alias is applied when the subset is opened in the Subset Editor and the function returns the alias for the element you select. If you choose not to set an Alias parameter you must pass an empty string to the function.</td>
</tr>
<tr>
<td>Subset</td>
<td>The name of the subset to be opened in the Subset Editor when E_PICK is called. The Alias parameter must be supplied to use this parameter. The Alias parameter can be defined as an empty string (&quot;&quot;). If you choose not to set a Subset parameter you must pass an empty string to the function.</td>
</tr>
<tr>
<td>ElementNameOrIndex</td>
<td>The name or index number of the element to be pre-selected when the Subset Editor opens. If you choose not to set an ElementNameOrIndex parameter you must pass an empty string to the function.</td>
</tr>
</tbody>
</table>

**Example 1**

```
=E_PICK("TM1SERV:Region"," "," ","")
```

This example opens the Region dimension in the Subset Editor.

```
=E_PICK("TM1SERV:Region","Deutsch","Europe","Argentina")
```

This example opens the Europe subset in the Subset Editor. The Deutsche alias is applied and the Argentina element is pre-selected when the Subset Editor opens.

```
=E_PICK("TM1SERV:Region"," "," ",14)
```

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This example opens the Region dimension in the Subset Editor, with the 14th element in the dimension definition pre-selected.

**I_EXPORT**

I_EXPORT exports data from the specified cube to a delimited ASCII file, which is created in the current user's 'My Documents' directory. In most cases, the 'My Documents' directory is C:\Users\<user_name>\Documents.

**Note:** I_EXPORT applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to export a large cube, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
I_EXPORT(cube, file, zero, calcs)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>A valid cube name. The cube can reside in your local data directory or on a remote server to which you are connected. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>file</td>
<td>The name of the delimited ASCII file to be created. The file extension .cma is used; do not specify it.</td>
</tr>
<tr>
<td>zero</td>
<td>Specifies whether zero values are included. Specify TRUE to include them, FALSE to exclude them.</td>
</tr>
<tr>
<td>calcs</td>
<td>Specifies whether calculated values are included. Specify TRUE to include them, FALSE to exclude them.</td>
</tr>
</tbody>
</table>

**Example**

```
=I EXPORT("local:92act4d","Download",FALSE,TRUE)
```

This example exports data from the cube 92act4d to the file Download.cma. Zero values are excluded and calculated values are included.

**I_NAMES**

You can use I_NAMES to create a list of element names. This function reads through a delimited ASCII file and writes all the unique names in the specified column to the corresponding column in the active worksheet.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
I_NAMES(file, column)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>The name of an delimited ASCII file, whose file extension is .cma. Do not include the file extension.</td>
</tr>
<tr>
<td>column</td>
<td>A number that specifies both the field in the ASCII file from which to read names and the column in the active worksheet to which those names are written.</td>
</tr>
</tbody>
</table>

**Example**

```
=I_NAMES("98Sales",3)
```

This example inspects the file 98sales.cma. All unique names in the third column are written to column C of the active worksheet.

---

**I_PROCESS**

I_PROCESS reads in the records of an ASCII file, one at a time, into the first row of the active worksheet. Each field populates a different cell. The worksheet is recalculated after each record is read in.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
I_PROCESS(file)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>The name of a delimited ASCII file, whose file extension is .cma. Do not include the file extension.</td>
</tr>
</tbody>
</table>

**Example**

```
=I_PROCESS("98Sales ")
```

This example reads in each record of the file 98sales.cma into the first row of the active worksheet.

---

**M_CLEAR**

M_CLEAR clears and reloads all dimensions in memory. It does not clear cubes and it does not restart the server.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
M_CLEAR
```

**Arguments**

None.
**N_CONNECT**

N_CONNECT establishes a connection to a remote server. If the connection is successful, N_CONNECT returns no value. If a connection cannot be established, server error messages are returned.

**Note:** The N_CONNECT function is not supported when a server is using Integrated Login or IBM Cognos 8 security for authentication. This function can only connect to a server that is configured to use standard TM1 authentication.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
N_CONNECT(server, client, password)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>server</td>
<td>The name of a remote server. This server must be registered on the Admin Server that your client references.</td>
</tr>
<tr>
<td>client</td>
<td>The username that connects to the specified server.</td>
</tr>
<tr>
<td>password</td>
<td>The password for the specified client.</td>
</tr>
</tbody>
</table>

**Example**

```
=N_CONNECT("Sales","USR2","Swordfish")
```

This example establishes a connection to the remote server named Sales, using the client name USR2 and the password Swordfish.

---

**N_DISCONNECT**

N_DISCONNECT disconnects you from all remote servers to which you are connected. The function does not disconnect you from your local server. N_DISCONNECT returns TRUE if it successfully disconnects you from all servers to which you are connected. It returns FALSE if it cannot disconnect from any remote server.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
N_DISCONNECT
```

**Arguments**

None.

---

**OPTGET**

OPTGET returns the current value of an option in the Tm1p.ini file.

This TM1 macro function is valid in Excel macros and VBA modules only.
**Syntax**

OPTGET(option)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>option</td>
<td>A valid TM1 option name.</td>
</tr>
</tbody>
</table>

**Valid Option Values**

<table>
<thead>
<tr>
<th>Valid Option Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdminHost</td>
<td>Returns the name or address of the Admin Host your client references.</td>
</tr>
<tr>
<td>AnsiFiles</td>
<td>Returns T if the ANSI character set is currently used to import data from delimited ASCII files. Returns F if the ASCII character set is currently used.</td>
</tr>
<tr>
<td>DataBaseDirectory</td>
<td>Returns the full path to the data directory for the local server.</td>
</tr>
<tr>
<td>GenDBRW</td>
<td>Returns F if the slice worksheet contains DBR formulas. Returns T if the slice worksheet contains DBRW formulas.</td>
</tr>
<tr>
<td>NoChangeMessage</td>
<td>Returns T if this option is set to return the message NO CHANGE when a DBSn formula points to a C-level cell. Returns F if this option is set to F.</td>
</tr>
</tbody>
</table>

**Example**

=OPTGET("DataBaseDirectory")

This example returns the full path to the data directory for the local server.

**OPTSET**

OPTSET sets a value for a specified TM1 option.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

OPTSET(option, value)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>option</td>
<td>A valid TM1 option name.</td>
</tr>
<tr>
<td>value</td>
<td>A valid value for the specified option.</td>
</tr>
<tr>
<td>Valid Option Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AdminHost</td>
<td>Specify the name of the Admin Host on which an Admin Server is running.</td>
</tr>
<tr>
<td>AnsiFiles</td>
<td>Specify a value that sets the character set used during data imports. Specify T to use the ANSI character set. Specify F to use the ASCII character set.</td>
</tr>
<tr>
<td>DataBaseDirectory</td>
<td>Specify a value that sets the full path to the data directory for the local server.</td>
</tr>
<tr>
<td>GenDBRW</td>
<td>Specify a value that determines which formula TM1 uses to link values in slice worksheets to cubes. Specify T to generate DBRW formulas when slice worksheets are created. Specify F to generate DBR formulas.</td>
</tr>
<tr>
<td>NoChangeMessage</td>
<td>Specify a value that determines whether TM1 displays the message NO CHANGE when a DBSn formula points to a C-level cell. Specify T to display the message. Specify F to display the value only.</td>
</tr>
</tbody>
</table>

**Example**

```excel
=OPSET("DataBaseDirectory","c:\Tm1data")
```

This example sets the local data directory to c:\Tm1data.

---

**PublishSubset**

PublishSubset publishes a named private subset on a server. If you attempt to publish a private subset for which an identically named public subset exists, you will be prompted to overwrite the existing public subset.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```excel
PublishSubset(dimension, subset)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>The server-prefixed name of the dimension containing the private subset you want to publish. For example, to publish a subset of the Region dimension on the Finance server, you would pass &quot;Finance:Region&quot; as the dimension argument.</td>
</tr>
<tr>
<td>subset</td>
<td>The name of the private subset you want to publish.</td>
</tr>
</tbody>
</table>
**PublishView**

PublishView publishes a named private view on a server. This function cannot publish a private view that uses private subsets.

All private subsets in a private view must first be published with the PublishSubset macro function. If you attempt to publish a private view for which an identically named public view exists, you will be prompted to overwrite the existing public view.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
PublishView(cube, view)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The server-prefixed name of the cube containing the private view you want to publish. For example, to publish a view of the Projections cube on the Finance server, you would pass &quot;Finance:Projections&quot; as the cube argument.</td>
</tr>
<tr>
<td>view</td>
<td>The name of the private view you want to publish.</td>
</tr>
</tbody>
</table>

**QUDEFINE**

QUDEFINE sets and saves parameters for TM1 query sets. QUDEFINE is the equivalent of creating a query set using the View Extract dialog box.

You can run queries created with this function using the View Extract dialog box.

You can also use the query set as an argument to the QUEXPORT, QULOOP, and QUSUBSET macro functions.

**Note:** QUDEFINE applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to create a query that encompasses a large section of a cube, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
QUDEFINE(cube, query, range, LowLim, HiLim, SkpZeroes, SkpCons)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be queried. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>query</td>
<td>The name of the query set to be saved for future use.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>range</td>
<td>A range of worksheet cells that includes one column for each dimension in the cube. When you run the query, TM1 examines only the cube cells identified by the elements specified or referenced in the range. The range must contain one column for each dimension in the cube. The order of the columns must be the same as the dimensions in the cube. In each column, you specify or reference the elements to be included. To include a subset of elements, list the element names or specify a subset name. Write the name of the subset preceded by the backslash character (). For example, \quarter specifies the quarter subset. To include all elements in a dimension (the ALL subset), leave the column blank. You can use DBR functions to populate the cells in the range. If the functions return blank values for any column in the range, QUDEFINE uses the ALL subset for the dimension associated with that column.</td>
</tr>
<tr>
<td>LowLim</td>
<td>The lowest cell value to be considered for export.</td>
</tr>
<tr>
<td>HighLim</td>
<td>The highest cell value to be considered for export.</td>
</tr>
<tr>
<td>SkpZeroes</td>
<td>Specifies whether cells containing zeroes are skipped. Specify TRUE to exclude them, FALSE to include them.</td>
</tr>
<tr>
<td>SkpCons</td>
<td>Specifies whether cells containing consolidated values are skipped. Specify TRUE to exclude them, FALSE to include them.</td>
</tr>
</tbody>
</table>

Example

```excel
=QUDEFINE("local:98sales", "Topsell", Sheet1!B3:F5, 3000, 5000, TRUE, TRUE)
```

This example creates a query set that contains elements listed in Sheet1, in the cell range B3:F5. When you run this query, TM1 inspects only cube cells identified by these elements and exports non-consolidated values in the range 3000 to 5000.

Note: If lowlim or highlim is a string comprised of numeric characters, Excel requires the string to be enclosed in a series of four double quotation marks and single ampersands, as follows:

````excel
""""&"0123"&"
````
QUDEFINEEX

QUDEFINEEX sets and saves parameters for TM1 query sets. It is the equivalent of creating a query set using the View Extract dialog box. This function is identical to the QUDEFINE macro, with the exception that QUDEFINEEX includes an argument that allows you to exclude rules-derived values from the query.

You can run queries created with this function using the View Extract dialog box.

You can also use the query set as an argument to the QUEXPORT, QULOOP, and QUSUBSET macro functions.

Note: QUDEFINEEX applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to create a query that encompasses a large section of a cube, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

Syntax

```
QUDEFINEEX(cube, query, range, lowlim, hilim, skpZeroes, skpCons, skpRuleVals)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be queried.</td>
</tr>
<tr>
<td>query</td>
<td>The name of the query set to be saved for future use.</td>
</tr>
<tr>
<td>range</td>
<td>A range of worksheet cells that includes one column for each dimension in the cube. When you run the query, TM1 examines only the cube cells identified by the elements specified or referenced in the range. The range must contain one column for each dimension in the cube. The order of the columns must be the same as the dimensions in the cube. In each column, you specify or reference the elements to be included. To include a subset of elements, list the element names or specify a subset name. Write the name of the subset preceded by the backslash character (). For example, \quarter specifies the quarter subset. To include all elements in a dimension (the ALL subset), leave the column blank. You can use DBR functions to populate the cells in the range. If the functions return blank values for any column in the range, QUDEFINEEX uses the ALL subset for the dimension associated with that column.</td>
</tr>
<tr>
<td>lowlim</td>
<td>The lowest cell value to be considered for export.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>highlim</td>
<td>The highest cell value to be considered for export.</td>
</tr>
<tr>
<td>skpZeros</td>
<td>Specifies whether cells containing zeroes are skipped.</td>
</tr>
<tr>
<td>skpCons</td>
<td>Specifies whether cells containing consolidated values are skipped.</td>
</tr>
<tr>
<td>skpRuleVals</td>
<td>Specifies whether cells containing rules-derived values are skipped.</td>
</tr>
</tbody>
</table>

**Example**

```
=QUDEFINEEX("local:SalesCube", "Topsell", Sheet1!B3:F5, 3000, 5000, TRUE, TRUE, FALSE)
```

This example creates a query set that contains elements listed in Sheet1, in the cell range B3:F5. When you run this query, TM1 inspects only cube cells identified by these elements and exports non-consolidated values in the range 3000 to 5000, including those derived through rules.

**Note:** If lowlim or highlim is a string comprised of numeric characters, Excel requires the string to be enclosed in a series of four double quotation marks and single ampersands, as follows:

```
""""&"0123"&"""
```

**QUEXPORT**

QUEXPORT exports cells values from the specified cube to a delimited ASCII file.

To create the query set, use the QUDEFINE function.

Each output record has the following format:

- The name of the cube containing the exported values
- Names of elements that identify the cell location of a single exported value
- The exported value

For a five-dimensional cube, TM1 creates records containing seven fields:

```
"cube name", "elem1", "elem2", "elem3", "elem4", "elem5", value
```

**Note:** QUEXPORT applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to export values from a large query set, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
QUEXPORT(cube, query, file)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be queried. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>query</td>
<td>The name of an existing query set.</td>
</tr>
<tr>
<td>file</td>
<td>The name of the delimited ASCII file (.cma) to contain the exported cube data. Do not include the file extension. The file is created in the local data directory.</td>
</tr>
</tbody>
</table>

**Example**

```excel
=QUEXPORT("sales:98sales", "Sedans", "Sedans")
```

This example exports data from the 98sales cube using the query set Sedans. The records are written to the file Sedans.cma.

---

**QULOOP**

QULOOP exports data that meets query set criteria from the specified cube. TM1 reads in each output record, one at a time, into the first row of the active worksheet. Each field populates a different cell. The worksheet is recalculated after each record is read in.

Each output record has the following format:

- The name of the cube containing the exported values
- The names of elements that identify the cell location of a single exported value
- The exported value

For a five-dimensional cube, TM1 creates records containing seven fields:

```
"cube name", "elem1", "elem2", "elem3", "elem4", "elem5", value
```

Use QULOOP in conjunction with a DBSn formula to populate cells in a cube.

**Note:** QULOOP applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to export values from a large query set, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```excel
QULOOP(cube, query)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be queried. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>query</td>
<td>The name of an existing query set.</td>
</tr>
</tbody>
</table>

**Example**

=QULOOP("sales:98sales", "Sedans")

This example exports data from the 98sales cube using the query set Sedans.

### QUSUBSET

QUSUBSET is the equivalent of running a query from the View Extract dialog box when called from the Subset Editor.

**Note:** QUSUBSET applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to run a query that returns a large number of elements, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

QUSUBSET(cube, query, dimension, subset)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be queried. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>query</td>
<td>The name of an existing query.</td>
</tr>
<tr>
<td>dimension</td>
<td>The name of a dimension for which the query exists.</td>
</tr>
<tr>
<td>subset</td>
<td>The name of the dimension subset to be created, which will contain the list of elements that meet the criteria of the subset. For example, a subset can return the list of regions in which car sales exceed a specified amount.</td>
</tr>
</tbody>
</table>

**Example**

=QUSUBSET("sales:98sales", "Top", "Region", "Topsales")

This example creates the Topsales subset for the Region dimension based on the criteria of the Top query.
**R_SAVE**

R_SAVE saves the active worksheet as a rules worksheet and compiles it into an .rux file. The workbook must have the same name as the cube for which the rules are being compiled.

Any rules statements that prevent the rules from compiling are written to the tm1erlog.cma file, in the local data directory.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
RSAVE
```

**Arguments**

None.

---

**SUBDEFINE**

SUBDEFINE creates a dimension subset consisting of element names found in the active worksheet.

When SUBDEFINE creates the subset, it will be created as a private subset.

If the named subset already exists as a private subset when the function is run, it will overwrite the existing private subset by that name.

If the named subset already exists as a public subset, SUBDEFINE still creates the subset as private. If you want to overwrite the existing named public subset, you will need to publish the private subset that was created by the SUBDEFINE function to overwrite the existing public subset.

**Note:** SUBDEFINE applies a lock to the server, preventing other users from accessing the server during function execution. If you use this function to create a subset with a large number of elements, the server might be inaccessible for a significant amount of time.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
SUBDEFINE(dimension, subset, range)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>The name of the dimension for which you want to create a subset. Use a server name prefix to indicate the server location. For the local server, specify local:dim. For a remote server, specify servername:dim.</td>
</tr>
<tr>
<td>subset</td>
<td>The name of the dimension subset.</td>
</tr>
<tr>
<td>range</td>
<td>The range of worksheet cells containing the names of elements in the dimension. Any cell values in the range that are not valid elements are ignored.</td>
</tr>
</tbody>
</table>

**Example**

```
=SUBDEFINE("local:Model", "Smith", B7:M7)
```
This example creates a subset called Smith for the Model dimension. The subset contains elements found in the cell range B7:M7.

**SUBPICK**

SUBPICK calls a dialog box that lists all the elements in the specified subset. The elements you select are inserted in the active worksheet, starting at the current cell position.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```plaintext
SUBPICK(dimension, subset, vertical)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>The name of the dimension containing subsets. Use a server name prefix to</td>
</tr>
<tr>
<td></td>
<td>indicate the server location. For the local server, specify local:dim. For</td>
</tr>
<tr>
<td></td>
<td>a remote server, specify servername:dim.</td>
</tr>
<tr>
<td>subset</td>
<td>The name of the subset whose elements you want to select.</td>
</tr>
<tr>
<td>vertical</td>
<td>Specify TRUE to insert the element names vertically, from the current cell</td>
</tr>
<tr>
<td></td>
<td>downward. Specify FALSE to insert the element names horizontally, from the</td>
</tr>
<tr>
<td></td>
<td>current cell rightward.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
=SUBPICK("local:Model", "Smith", TRUE, )
```

This example inserts selected elements from the Smith subset into the active worksheet. The elements are arranged vertically, starting from the current cell downward.

**T_CLEAR**

T_CLEAR clears all changes or additions to cube data from memory.

**Note:** T_CLEAR does not prompt you to save to disk any cube data in RAM. Any unsaved data is cleared without saving to disk. Therefore, if you want to save any cube data currently in RAM, call the T_SAVE function first.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```plaintext
T_CLEAR
```

**Arguments**

None.
**T_CREATE**

T_CREATE creates a cube that has up to eight dimensions, which is the limit in older versions of TM1.

**Note:** If you use T_CREATE to create a cube with the name of an existing cube, TM1 replaces the existing cube and deletes all of its data.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
T_CREATE(cube,d1,d2[,d3,d4,d5,d6,d7,d8])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be created. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>d1...d8</td>
<td>Names of up to eight existing dimensions, in the order you want them stored in the cube. You must specify at least two dimensions.</td>
</tr>
</tbody>
</table>

**Example**

```
=T_CREATE("local:Sales","Region","Products","Month")
```

This example creates a cube named Sales. This new cube has three dimensions, in the following order: Region, Products, and Month.

**T_CREATE16**

T_CREATE16 creates a cube that has up to sixteen dimensions.

**Note:** If the first argument to this function is an existing cube name, TM1 replaces the existing cube and deletes all of its data.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
T_CREATE16(cube,d1,d2[,d3,...,d16])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube to be created. Use a server name prefix to indicate the server location. For the local server, specify local:cube. For a remote server, specify servername:cube.</td>
</tr>
<tr>
<td>d1...d16</td>
<td>Names of up to sixteen existing dimensions, in the order you want them stored in the cube. You must specify at least two dimensions.</td>
</tr>
</tbody>
</table>
Example

=T_CREATE("Sales","Region","Products","Month")

This example creates a cube named Sales. This new cube has three dimensions, in the following order:
Region, Products, and Month.

T_PICK

T_PICK calls a dialog box that lists all available cubes on the local and remote TM1 servers. The cube
name you select in the dialog box becomes the value of the T_PICK function. Your macro inserts the cube
name in the first cell of the active worksheet.

This TM1 macro function is valid in Excel macros and VBA modules only.

Syntax

T_PICK

Arguments

None.

T_SAVE

T_SAVE saves all cube data currently in RAM to disk. T_SAVE can be used only to save data on a local
server; the function does not work with remote servers. T_SAVE does not prompt you about saving data
for individual cubes.

This TM1 macro function is valid in Excel macros and VBA modules only.

Syntax

T_SAVE

Arguments

None.

TM1RECALC

TM1RECALC forces a recalculation of all open worksheets. It is the equivalent of pressing F9 in Excel. A
similar macro function, TM1RECALC1, forces a recalculation of only the active worksheet.

This TM1 macro function is valid in Excel macros and VBA modules only.

Syntax

TM1RECALC

Arguments

None.
**TM1RECALC1**

TM1RECALC1 forces a recalculation of the active worksheet. It is the equivalent of pressing SHIFT-F9 in Excel. A similar macro function, TM1RECALC, forces a recalculation of all open worksheets.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
TM1RECALC1
```

**Arguments**

None.

---

**VUSLICE**

VUSLICE creates a slice worksheet from the specified cube view. The slice is inserted starting at the top left cell (A1 or R1C1) in the active worksheet.

This TM1 macro function is valid in Excel macros and VBA modules only.

**Syntax**

```
VUSLICE(cube, view)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of an existing cube. Use a server name prefix to indicate the server location. For the local server, specify <code>local:cube</code>. For a remote server, specify <code>servername:cube</code>.</td>
</tr>
<tr>
<td>view</td>
<td>The name of a view associated with the cube.</td>
</tr>
</tbody>
</table>

**Example**

```
=VUSLICE("local:98sales","Quarterly")
```

This example copies data from the Quarterly view of the 98sales cube into the active worksheet.

---

**W_DBSENABLE**

W_DBSENABLE enables (or disables) automatic recalculation of DBS functions in a worksheet.

Normally when a DBS function is inserted in a worksheet, the function is not executed until the sheet is recalculated with either the F9 or SHIFT+F9 keys. You can use the W_DBSENABLE function to immediately execute DBS functions as they are created in a worksheet.

**Note:** DBS functions will not run at all in VBA modules unless W_DBSENABLE is set to TRUE.

This TM1 macro function is valid in Excel macros and VBA modules only.
### Syntax

=W_DBSENABLE(LogicalFlag)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LogicalFlag</td>
<td>If TRUE, DBS functions are executed immediately when inserted into or called from a worksheet. If FALSE, DBS functions are executed only when the worksheet is explicitly recalculated.</td>
</tr>
</tbody>
</table>
Chapter 4. Worksheet Functions

IBM Planning Analytics Worksheet functions return a numeric or string value. You can use TM1 worksheet functions anywhere in an IBM Planning Analytics for Microsoft Excel or TM1 Perspectives worksheet.

To access these functions in Microsoft Excel, choose Formulas > Insert Function.

**Note:** If you are using Planning Analytics for Microsoft Excel, you must first enable the IBM Cognos Office Reporting TM1 addin.

If a worksheet function references an object on a remote server, you must prefix the object with the server name and a colon. For example, to refer to the SalesCube cube on the SData server, use SData:SalesCube. You must be connected to the server referenced by the function to receive accurate values in your worksheet. If you are not connected to the server, TM1 worksheet functions return *KEY_ERR*.

TM1 worksheet functions accept strings, values, or cell references as arguments. Strings must be enclosed in quotation marks. Numeric element names must be enclosed in double quotation marks. For example ""14357"". Cell references must refer to valid arguments for a given function. You can use standard conventions for absolute and relative cell references in worksheet functions.

Due to a limitation with Microsoft Excel, worksheet functions can contain no more than 30 arguments. When you construct a cube reference, one argument must be the cube name, which leaves 29 arguments for specifying the cube dimensions.

If you record a worksheet macro in Microsoft Excel that includes TM1 functionality, the resulting macro may include undocumented TM1 worksheet functions. We may, however, modify or discontinue these undocumented functions in future releases without notification.

Worksheet functions **cannot** be used in TM1 rules or in TurboIntegrator processes.

**DBR**

DBR retrieves a value from a specified TM1 cube.

When all element arguments (e1, e2, etc.) to the function are leaf elements, the DBR function can also be used to write values to the specified cube, provided that the user has appropriate access privileges to the relevant cube, dimensions, elements, and/or cells. When you enter a value in a cell containing such a DBR function, the value is sent to the server.

This worksheet function is valid in worksheets only.

**Syntax**

```
DBR(cube, e1, e2, [...en])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube from which to retrieve the value.</td>
</tr>
</tbody>
</table>
**Argument**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>e1,...,en</td>
<td>Dimension element names that define the intersection of the cube containing the value to be retrieved. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements. Numeric element names must be enclosed in double quotation marks. For example &quot;&quot;14357&quot;&quot;.</td>
</tr>
</tbody>
</table>

**Example**

```python
DBR("92act4d", "California", "3.5 Diskettes", "Net Sales","January")
```

In this example, 92act4d is the cube name, and the function returns the value at the intersection of California, 3.5 Diskettes, Net Sales, and January.

**DBRA**

DBRA retrieves the value of a specified element attribute. The value returned can be either a string or numeric value, depending on the attribute type.

The DBRA function can also be used to write element attribute values to the server. When you enter a value, either string or numeric, in a cell containing a DBRA function, the corresponding element attribute is updated on the server.

This worksheet function is valid in worksheets only.

**Syntax**

```
DBRA(server:dimension, element, attribute)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>server:dimension</td>
<td>A valid dimension name, prefixed with the appropriate server name and a colon, for example, &quot;SData:Region&quot; references the Region dimension on the SData server. If the dimension is not prefixed with a server name, the DBRA function attempts to run against the local server.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>attribute</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
</tbody>
</table>

**Example**

```python
DBRA("SData:Model", "L Series 1.8L Sedan", "ManufactureCode")
```

In this example, the function returns the value of the Manufacture Code attribute of the L Series 1.8L Sedan element in the Model dimension on the SData server.
**DBRW**

DBRW retrieves a value from a specified TM1 cube.

When all element arguments (e1, e2, etc.) to the function are leaf elements, the DBRW function can also be used to write values to the specified cube, provided that the user has appropriate access privileges to the relevant cube, dimensions, elements, and/or cells.

DBRW works the same as the DBR function, with one major difference; DBRW reduces network traffic and may improve performance on wide area networks.

In worksheets with a large number of TM1 worksheet functions, DBRW forces TM1 to execute functions in "bundles" rather than individually. Normal DBR functions are executed individually during a worksheet recalculation. DBRW functions force TM1 to execute two passes over the worksheet. In the first pass, all changed values in cells containing DBRW functions are sent in a single bundle to the cube. In the second pass, cube values are sent in a single bundle back to the worksheet. Consequently, the worksheet recalculates twice when DBRW functions are executed.

DBRW bundling occurs when the function is used in a standalone cell. When DBRW functions are used in complex calculations, the function operates as a DBR function so no performance gains accrue.

This worksheet function is valid in worksheets only.

**Syntax**

```
DBRW(cube, e1, e2[,...en])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube from which to retrieve the value.</td>
</tr>
<tr>
<td>e1,..en</td>
<td>Dimension element names that define the intersection of the cube containing the value to be retrieved. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements. Numeric element names must be enclosed in double quotation marks.</td>
</tr>
</tbody>
</table>

**Example**

```
DBRW("92act4d", "California", "3.5 Diskettes", "NetSales", "January")
```

In this example, the function returns the value at the intersection of California, 3.5 Diskettes, Net Sales, and January in the 92act4d cube.

**DBS**

DBS sends a numeric value to a TM1 cube. This function cannot send a string to a cube. To send strings, use the DBSS function.

When you build a DBS function with the **TM1 > Edit Formula** option, the Edit Formula dialog box prompts you through a series of steps to build each function argument in the correct sequence.

If the cube does not exist or one of the arguments is invalid, the function returns KEY ERROR.

This worksheet function is valid in worksheets only.
Syntax

DBS(value, cube, e1, e2[,...en])

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value being sent.</td>
</tr>
<tr>
<td>cube</td>
<td>The cube to which the value is sent.</td>
</tr>
<tr>
<td>e1, ...en</td>
<td>The names of elements defining the intersection in the cube to which the value is sent. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension of the cube, and so on. These arguments can also be the names of aliases for dimension elements. Numeric element names must be enclosed in quotation marks.</td>
</tr>
</tbody>
</table>

Example

In this example, the function sends the value 5342 into the cube 92act4d at the intersection of California, 3.5 Diskettes, Net Sales, and January.

DBS(5342,"92act4d","California","3.5 Diskettes", "NetSales", "January")

DBSA

DBSA sends a value to a specified element attribute. The value sent can be either a string or numeric value, depending on the attribute type.

This worksheet function is valid in worksheets only.

Syntax

DBSA(att_value, dimension, element, att_name)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>att_value</td>
<td>The value you want to send.</td>
</tr>
<tr>
<td>dimension</td>
<td>A valid dimension name. The dimension name must be prefixed with the appropriate server name and a colon, for example, &quot;SData:Region&quot; references the Region dimension on the SData server. If the dimension is not prefixed with a server name, the DBSA function will attempt to run against the local server.</td>
</tr>
<tr>
<td>element</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>att_name</td>
<td>The attribute to which you want to send a value. att_name must be a valid attribute of the element specified by elem_name.</td>
</tr>
</tbody>
</table>
DBSS

DBSS sends a string to a cube of any number of dimensions. This function cannot send a numeric value to a cube. Use the DBS function to send numeric values.

When you build a DBSS function with the **TM1 > Edit Formula** option, the Edit Formula dialog box prompts you through a series of steps to build each function argument in the correct sequence.

If the cube does not exist or one of the arguments is invalid, the function returns KEY ERROR.

This worksheet function is valid in worksheets only.

**Syntax**

```
DBSn(string, cube, e1, e2,...en)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string being sent.</td>
</tr>
<tr>
<td>cube</td>
<td>The cube to which the string is sent.</td>
</tr>
<tr>
<td>e1, ...en</td>
<td>The names of elements defining the intersection in the cube to which the string is sent. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension of the cube, and so on. These arguments can also be the names of aliases for dimension elements.</td>
</tr>
</tbody>
</table>

**Example**

```
DBSS("Smith","Info","California","Last Name")
```

In this example, the formula sends the string Smith to the cube Info at the intersection of California and Last Name.

DBSW

DBSW sends a numeric value to a TM1 cube. This function cannot send a string to a cube. To send strings, use the DBSS function.

This function works the same as the DBS function, with one major difference; DBSW reduces network traffic and may improve performance on wide area networks.

In worksheets with a large number of cube references, DBSW forces TM1 to send values in bundles rather than individually. Normal DBS functions are updated individually during a recalculation. DBSW references force TM1 to send all changed values within a worksheet in a single bundle.

In such circumstances you can safely use a DBS/DBR function as an argument to a DBS function.

**Note:** If you use VBA to calculate a worksheet containing DBSW functions, you must call the TM1 macro function to calculate the worksheet. Do not use the VB Calculate method to calculate a worksheet.
containing DBSW functions; doing so causes each DBSW function to be executed individually, defeating the purpose of the function and resulting in decreased performance.

This worksheet function is valid in worksheets only.

**Syntax**

```
DBSW(value, cube, e1, e2[,...en])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value being sent.</td>
</tr>
<tr>
<td>cube</td>
<td>The cube to which the value is sent.</td>
</tr>
<tr>
<td>e1, ...en</td>
<td>The names of elements defining the intersection in the cube to which the value is sent. Arguments e1 through en are sequence sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension of the cube, and so on. These arguments can also be the names of aliases for dimension elements. Numeric element names must be enclosed in quotation marks.</td>
</tr>
</tbody>
</table>

**Example**

```
DBSW(5342,"92act4d","California","3.5 Diskettes", "NetSales", "January")
```

**DFRST**

DFRST returns the first element of a specified dimension.

This worksheet function is valid in worksheets only.

**Syntax**

```
DFRST(server_name:dimension)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
</tbody>
</table>

**Example**

```
DFRST("planning_sample:Location")
```

If the dimension Location contains the ordered elements California, Oregon, and Washington, the example returns California.
**DIMIX**

DIMIX returns the index number of an element within a dimension. This worksheet function is valid in worksheets only.

**Syntax**

\[
\text{DIMIX}(\text{server_name:dimension}, \text{element})
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension.</td>
</tr>
<tr>
<td></td>
<td>If the element is not a member of the dimension specified, the function returns 0. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

\[
\text{DIMIX("planning_sample: Location","Washington")}
\]

If the dimension Location contains the ordered elements California, Oregon, and Washington, the example returns the value 3, as Washington is the third element of the dimension.

**DIMNM**

DIMNM returns the element of a dimension that corresponds to the Index argument. If you include the optional Alias parameter to this function, the function returns the alias for the selected element.

When you double-click a cell containing a DIMNM function, the Dimension dialog box opens. You can then select a new element to place in your worksheet. The DIMNM function automatically updates the Index argument to reflect the new element.

This worksheet function is valid in worksheets only.

**Syntax**

\[
\text{DIMNM}(\text{server_name:Dimension, Index, [Alias]})
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>Index</td>
<td>A value less than or equal to the number of elements in the dimension.</td>
</tr>
<tr>
<td>Alias</td>
<td>The name of an alias that exists for the dimension. This is an optional argument. If it is used, the function returns the alias for the specified element.</td>
</tr>
</tbody>
</table>
**DIMSIZ**

DIMSIZ returns the number of elements within a specified dimension.
This worksheet function is valid in worksheets only.

**Syntax**

\[
\text{DIMSIZ(dimension)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
</tbody>
</table>

**Example**

DIMSIZ("Accounts")

If the Accounts dimension contains 19 elements, the example returns the value 19.

**DNEXT**

DNEXT returns the element name that follows the element specified as an argument to the function.
This worksheet function is valid in worksheets only.

**Syntax**

\[
\text{DNEXT(server:dimension, element)}
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>server:dimension</td>
<td>A valid dimension name, prefixed with the appropriate server name and a colon, for example, &quot;SData:Region&quot; references the Region dimension on the SData server. If the dimension is not prefixed with a server name, the DNEXT function will attempt to run against the local server.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

DNEXT("Production:Location","Oregon")

If the Location dimension on the Production server contains the ordered elements California, Oregon, and Washington, the example returns Washington.
**DNLEV**

DNLEV returns the number of hierarchy levels in a dimension. This worksheet function is valid in worksheets only.

**Syntax**

\[ \text{DNLEV}(\text{dimension}) \]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
</tbody>
</table>

**Example**

\[ \text{DNLEV}(\text{"Region"}) \]

In the Region dimension, the various nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3).

In the Region dimension there are four hierarchy levels (0, 1, 2, and 3). Therefore, the example returns the value 4.

**DTYPE**

DTYPE returns information about the element type of the specified element. It returns "N" if the element is a numeric element, "S" if the element is a string element. This worksheet function is valid in worksheets only.

**Syntax**

\[ \text{DTYPE}(\text{dimension, element}) \]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>
Example

DTYPE("Region","Europe")

The element Europe in the dimension Region is a consolidated element, so the example returns "C".

ELCOMP

ELCOMP returns the name of a child of a consolidated element in a specified dimension. If the element argument is not a consolidated element, the function returns 0.

This worksheet function is valid in worksheets only.

Syntax

ELCOMP(dimension, element, index)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of children in the specified element.</td>
</tr>
</tbody>
</table>

Example

ELCOMP("Region","Central Europe",2)

In the dimension Region, the consolidated element Central Europe is a consolidation of the children Germany and France. Accordingly, the example returns France.

ELCOMPN

ELCOMPN returns the number of components in a specified element. If the element argument is not a consolidated element, the function returns 0.

This worksheet function is valid in worksheets only.

Syntax

ELCOMPN(dimension, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a consolidated element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>
Example

In the Region dimension, the element Scandanavia is a consolidation of three elements. The example returns 3.

**ELISCOMP**

ELISCOMP determines whether element1 is a child of element2 in the specified dimension. The function returns TRUE if element1 is a child of element2, otherwise the function returns FALSE.

This worksheet function is valid in worksheets only.

**Syntax**

`ELISCOMP(dimension, element1, element2)`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

`ELISCOMP("Region","Germany","Central Europe")`

In the dimension Region, the element Central Europe is a consolidation of two elements, Germany and France. The example returns TRUE.

Note that this function returns TRUE only for immediate children. In the above example, Germany is a child of Central Europe. Further, Central Europe is a child of Europe. However, because the function returns TRUE only for immediate children, the following example returns False:

`ELISCOMP("Region","Germany","Europe")`

**ELISPAR**

ELISPAR determines whether element1 is a parent of element2 in the specified dimension. The function returns TRUE if element1 is a parent of element2, otherwise the function returns FALSE.

This worksheet function is valid in worksheets only.

**Syntax**

`ELISPAR(dimension, element1, element2)`

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<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element1</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

```
ELISPAR("Region","Central Europe","Germany")
```

In the dimension Region, the consolidated element Central Europe is the parent of both Germany and France. Accordingly, the example returns TRUE.

Note that this function returns TRUE only for immediate parents. In the above example, Europe is a parent of Central Europe. Further, Central Europe is a parent of Germany. However, because Europe is not an immediate parent of Germany, the following example returns FALSE:

```
ELISPAR("Region","Europe","Germany")
```

---

**ELLEV**

ELLEV returns the level of an element within a dimension.

This worksheet function is valid in worksheets only.

**Syntax**

```
ELLEV(dimension, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

```
ELLEV("Region","Europe")
```

In the Region dimension, individual nations (Level 0) add up to regions (Level 1). The regions then add up to super-regions (Level 2), which in turn add up to the world (Level 3).
The example returns 2, as Europe is a Level 2 element.

ELPAR

ELPAR returns the parent of an element in a specified dimension

This worksheet function is valid in worksheets only.

Syntax

ELPAR(dimension, element, index)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of consolidated elements (parents) that use the element argument as a child.</td>
</tr>
</tbody>
</table>

Example

ELPAR("Model","Wagon 4WD",2)

In the dimension Model, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. In the structure of the Model dimension, Total Wagons is defined first, Total 4WD is defined second.

The example returns Total 4WD, as this is the second instance of a parent to Wagon 4WD within the Model dimension.

ELPARN

ELPARN returns the number of parents of an element in a specified dimension.

This worksheet function is valid in worksheets only.

Syntax

ELPARN(dimension, element)
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of an element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

#### Example

**ELPARN("Model","Wagon 4WD")**

In the Model dimension, the element Wagon 4WD is a child of both Total Wagons and Total 4WD. Therefore, both Total Wagons and Total 4WD are parents of Wagon 4WD. The function returns 2.

### ELSLEN

ELSLLEN returns the length of a string element within a dimension. If the element specified is not a member of the dimension specified, or is not a string element, the function returns 0.

This worksheet function is valid in worksheets only.

#### Syntax

**ELSLEN(dimension, element)**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>element</td>
<td>The name of a string element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

#### Example

**ELSLEN("Region","Washington")**

The element Washington is a string element 10 characters in length. The example returns 10.

### ELWEIGHT

ELWEIGHT returns the weight of a child in a consolidated element.

This worksheet function is valid in worksheets only.

#### Syntax

**ELWEIGHT(dimension, element1, element2)**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>element1</td>
<td>The name of a consolidated element within the dimension. This argument can also be the name of an alias for a dimension element.</td>
</tr>
<tr>
<td>element2</td>
<td>The name of a child of the consolidated element. This argument can also be the name of an alias for a dimension element.</td>
</tr>
</tbody>
</table>

**Example**

ELWEIGHT("Account1","Gross margin","Variable costs")

As the following figure shows, the element Variable costs, which is a child of Gross margin, has a weight of -1.

<table>
<thead>
<tr>
<th>Children of 'Gross margin'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Sales</td>
</tr>
<tr>
<td>Variable Costs</td>
</tr>
</tbody>
</table>

The example returns -1.

**SUBNM**

SUBNM returns the element of a dimension subset corresponding to the IndexOrName argument. If you include the optional Alias parameter to this function, the function returns the alias for the selected element.

When you double-click a cell containing a SUBNM function, the Subset Editor opens. You can then select a new element to place in your worksheet. The selected element becomes the return value of the SUBNM function, and the function automatically updates the IndexOrName argument to reflect the new element.

This worksheet function is valid in worksheets only.

**Syntax**

SUBNM(Dimension, Subset, IndexOrName, [Alias])

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>Subset</td>
<td>The name of a subset of the dimension.</td>
</tr>
<tr>
<td>IndexOrName</td>
<td>An index into the subset or the name of an element in the subset. If an index, a positive integer less than or equal to the total number of elements in the specified subset. If a name, a string representing the name of an element of the subset.</td>
</tr>
</tbody>
</table>
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alias</td>
<td>The name of an alias that exists for the subset. This is an optional argument. If it is used, the specified alias is applied when the Subset Editor opens and the function returns the alias for the selected element.</td>
</tr>
</tbody>
</table>

### Example

**SUBNM**("Region","Top Producers",2)

The Top Producers subset of the Region dimension contains the ordered elements United States, Germany, Great Britain, and Mexico. Because the Index argument points to the second element in the subset, the example returns Germany.

**SUBNM**("Region","Top Producers","Germany","Deutsch")

This example returns the Deutsch alias for the Germany element (Deutschland) from the Top Producers subset of the Region dimension.

### SUBSIZ

SUBSIZ returns the number of elements in a dimension subset.

This worksheet function is valid in worksheets only.

**Syntax**

```plaintext```
SUBSIZ(dimension, subset)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>subset</td>
<td>The name of a subset of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

**SUBSIZ**("Region","Top Producers")

The Top Producers subset of the Region dimension contains four elements: United States, Germany, Great Britain, and Mexico.

The example returns 4.

### TABDIM

TABDIM returns the dimension name that corresponds to a given index argument.

The function always returns a dimension based on the original order of dimensions in the specified cube, even if the order of dimensions in the cube has been changed through the TM1 Cube Optimizer.

This worksheet function is valid in worksheets only.
Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>index</td>
<td>A positive value less than or equal to the total number of dimensions in the cube.</td>
</tr>
</tbody>
</table>

Example

TAXBIN("98sales",3)

The cube 98sales contains five dimensions: account1, actvsbud, model, month, and region. The example returns model, the third dimension of 98sales.

**TM1ELLIST**

TM1ELLIST returns a downwards array vector of values. It is useful because you can get a set of element values from a TM1 model by using a single formula.

**Note:**

- TM1ELLIST does not overwrite or insert into any non-formula space like a Dynamic Report. It is up to the workbook designer to consume the plural value response correctly.
- TM1ELLIST returns an array of values, however, only the first element is displayed if the function is placed into a singular value store.

This worksheet function is valid in worksheets only.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServerDimension</td>
<td>A dimension, specified using the format server:dimension.</td>
</tr>
<tr>
<td>SetName</td>
<td>A named set. If this argument is empty, all elements of the dimension are used.</td>
</tr>
<tr>
<td>Elementlist</td>
<td>An array of values that specifies a list of elements to constitute a set. For example, ElementList can reference a cell range. When this argument is supplied, the named set specified by the SetName argument is ignored. If this argument is empty, the elements from the set specified by the SetName argument are used.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Required/Optional</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
</tr>
<tr>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AliasOverride</td>
<td>A string that defines the alias used for the set. When this argument is supplied, it overrides the default alias property defined by the subset specified by the SetName argument. If this argument is empty, the alias from the set specified by the SubsetName argument is used.</td>
</tr>
<tr>
<td>ExpandAbove</td>
<td>A Boolean flag to turn on or off the set Expand Above property. When this argument is supplied, it overrides the default Expand Above property defined by the subset specified by the Set argument. If the argument value is 1, consolidated members expand upward when drilling. If the argument value is 0, consolidated members expand downward when drilling. If this argument is empty, the Expand Above property from the subset specified by the Subset argument is used.</td>
</tr>
<tr>
<td>MDXOverride</td>
<td>An MDX statement that applies to the subset specified by the SubsetName/ElementList argument. When this argument is supplied, it overrides the default MDX filter defined by the subset specified by the SetName argument. If this argument is empty or omitted, the members from the set specified by the SetName argument are used.</td>
</tr>
<tr>
<td>IndentRate</td>
<td>An integer value to indicate how many indentations are applied to each level when drilling down on a consolidated member. If the argument value is 0, no auto-indentation is performed. IndentRate is relative to the set level of the set elements. If this argument is empty or omitted, one indentation is applied to each level as you drill down on a consolidated member.</td>
</tr>
<tr>
<td>IndentCharacter</td>
<td>IndentChar sets the symbol used to provide in-string indentation, the default is the en-space character (the normal space symbol).</td>
</tr>
</tbody>
</table>

**Example**

```
TM1ELLIST("PlanSamp:plan_currency","All currencies")
```

TM1ELLIST returns an array of elements based on given arguments.

To retrieve all the returned values, a named range can be created in Excel, referring to the formula. To do this, create a named range and enter the TM1ELLIST formula in the **Refers To** column.
Select desired number of cells (based on the return array size) in Excel, type = [namedrange], and hit CTRL+Shift+Enter.

The Excel INDEX function can then be used to extract a single element for the range.

**TM1GLOBALSANDBOX**

TM1GLOBALSANDBOX returns the current global active sandbox for the user.

**Note:** This function is valid only in Planning Analytics for Microsoft Excel and in Planning Analytics websheets. It is not supported in IBM TM1 Perspectives.

**Syntax**

`TM1GLOBALSANDBOX(SERVER)`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>The name of the TM1 server.</td>
<td>Required</td>
</tr>
</tbody>
</table>

**Example**

`TM1GLOBALSANDBOX("Planning Sample")`
**TM1INFO**

TM1INFO returns information about the current TM1 version and client.

**Note:** This function is valid only in Planning Analytics for Microsoft Excel and in Planning Analytics websheets. It is not supported in IBM TM1 Perspectives.

**Syntax**

```
TM1INFO("Property Name")
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Name</td>
<td>The property name can be one of the following:</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td><strong>clientversion</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Returns the full client version number. For example, 10.2.10000</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>clientversionmajor</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Returns the major client version number.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>clientversionminor</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Returns the minor client version number.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>clientversionpatch</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Returns fix pack and hotfix number.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>client</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Returns the name of the client. For example, cor or websheet.</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

```
TM1INFO("clientversion")
```

**TM1PRIMARYDBNAME**

TM1PRIMARYDBNAME returns the primary TM1 server name that the user is authenticated through, even if the user is implicitly logged into multiple TM1 servers. This function doesn't accept any arguments.

**Note:** This function is valid only in Planning Analytics for Microsoft Excel and in Planning Analytics websheets. It is not supported in IBM TM1 Perspectives.

**Syntax**

```
TM1PRIMARYDBNAME()
```

**TM1RptElIsConsolidated**

TM1RptElIsConsolidated returns a Boolean value to indicate whether an element in an Active Form is consolidated. This worksheet function is used to create Active Forms.

This worksheet function is valid in worksheets only.

**Syntax**

```
TM1RptElIsConsolidated(RptRowFormula, Element)
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RptRowFormula</td>
<td>An absolute reference to a cell containing a TM1RptRow formula.</td>
</tr>
<tr>
<td>Element</td>
<td>A relative reference to a cell containing an element from TM1RptRow formula.</td>
</tr>
</tbody>
</table>

**TM1RptElIsExpanded**

TM1RptElIsExpanded returns a boolean value to indicate whether an element is expanded in a row subset within an Active Form. This worksheet function is used to create Active Forms. This worksheet function is valid in worksheets only.

**Syntax**

```
TM1RptElIsExpanded(RptRowFormula, Element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RptRowFormula</td>
<td>An absolute reference to a cell containing a TM1RptRow formula.</td>
</tr>
<tr>
<td>Element</td>
<td>A relative reference to a cell containing an element from TM1RptRow formula.</td>
</tr>
</tbody>
</table>

**TM1RptElLev**

TM1RptElLev returns an integer value for an element level relative to root in the subset. This worksheet function is used to create Active Forms. This function is distinct from the ElLev worksheet function. This worksheet function is valid in worksheets only.

**Syntax**

```
TM1RptElLev(RptRowFormula, Element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RptRowFormula</td>
<td>An absolute reference to a TM1RptRow formula cell.</td>
</tr>
<tr>
<td>Element</td>
<td>A relative reference to a cell containing an element from TM1RptRow formula.</td>
</tr>
</tbody>
</table>

**TM1RptFilter**

TM1RptFilter defines the filter applied to an Active Form column dimension. This worksheet function is used to create Active Forms. This worksheet function is valid in worksheets only.
## Syntax

TM1RptFilter(ReportView, Tuple, FilterFunction, FilterValue, SortOrder)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReportView</td>
<td>A cell reference to a cell that contains a TM1RptView formula. The filter applies to the view specified by TM1RptView formula.</td>
</tr>
<tr>
<td>Tuple</td>
<td>A tuple string specifying the element in the column dimension to which the filter applies. For example, [month].[Feb].</td>
</tr>
<tr>
<td>FilterFunction</td>
<td>One of the following filter function names: TOPCOUNT, BOTTOMCOUNT, TOPPERCENT, BOTTOMPERCENT, TOPSUM, BOTTOMSUM.</td>
</tr>
<tr>
<td>FilterValue</td>
<td>A filter value.</td>
</tr>
<tr>
<td>SortOrder</td>
<td>One of the following two sort orders: asc, desc.</td>
</tr>
</tbody>
</table>

**Example**

=TM1RptFilter($B$4,"[month].[Jan]","TOPCOUNT",5,"asc")

---

## TM1RptRow

TM1RptRow sets the Active Form master row definition. The master row definition governs the behavior of all rows in the Active Form. This worksheet function is used to create Active Forms.

This worksheet function is valid in worksheets only.

### Syntax

TM1RptRow(ReportView, Dimension, Subset, SubsetElements, Alias, ExpandAbove, MDXStatement, Indentations, ConsolidationDrilling)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReportView</td>
<td>A reference to a cell that contains a TM1RptView formula.</td>
</tr>
<tr>
<td>Dimension</td>
<td>A dimension, specified using the format tm1_server_name:dimension_name.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Subset</td>
<td>A named subset. If this argument is empty, all elements of the dimension will be used.</td>
</tr>
<tr>
<td>SubsetElements</td>
<td>A cell range reference that specifies a list of elements to constitute a subset. When this argument is supplied, the named subset specified by the Subset argument is ignored. If this argument is empty, the elements from the subset specified by the Subset argument are used.</td>
</tr>
<tr>
<td>Alias</td>
<td>A string that defines the alias used for the subset. When this argument is supplied, it overrides the default alias property defined by the subset specified by the Subset argument. If this argument is empty, the alias from the subset specified by the Subset argument are used.</td>
</tr>
<tr>
<td>ExpandAbove</td>
<td>A Boolean flag to turn on or off the subset Expand Above property. When this argument is supplied, it overrides the default Expand Above property defined by the subset specified by the Subset argument. If the argument value is 1, consolidated elements expand upward when drilling. If the argument value is 0, consolidated elements expand downward when drilling. If this argument is empty, the Expand Above property from the subset specified by the Subset argument is used.</td>
</tr>
<tr>
<td>MDXStatement</td>
<td>An MDX statement that applies to the subset specified by the Subset argument. When this argument is supplied, it overrides the default MDX filter defined by the subset specified by the Subset argument. If this argument is empty or omitted, the elements from the subset specified by the Subset argument are used.</td>
</tr>
<tr>
<td>Indentations</td>
<td>An integer value to indicate how many indentations are applied to each level when drilling down on a consolidated element. If the argument value is 0, no auto-indentation is performed. This is an optional argument. When the value is missing, one indentation is applied to each level as you drill down on a consolidated element.</td>
</tr>
</tbody>
</table>
### ConsolidationDrilling

A Boolean flag to turn on or off drilling on consolidated elements. When this argument value is 1, users can drill down on consolidated elements in the Active Form. When this argument value is 0, users cannot drill down on consolidated elements in the Active Form. This is an optional argument. When the argument is missing, the default behavior is to allow drilling on consolidated elements.

#### Example

=TM1RptRow($B$9,"sdata:region","","[AR]01'!$B$17:$B$18","",1","",5, 0)

---

### TM1RptTitle

TM1RptTitle defines an Active Form title dimension. This worksheet function is used to create Active Forms. This worksheet function is valid in worksheets only.

#### Syntax

TM1RptTitle(Dimension,Element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>A dimension, specified using the format tm1_name:dimension_name.</td>
</tr>
<tr>
<td>Element</td>
<td>A cell reference to a cell containing a SUBNM function which returns an element name.</td>
</tr>
</tbody>
</table>

#### Example

TM1RptTitle("SData:model",$C$7)

---

### TM1RptView

TM1RptView defines the view displayed in an Active Form. This worksheet function is used to create Active Forms. This worksheet function is valid in worksheets only.

#### Syntax

TM1RptView(ViewID,ZeroSuppression,TM1RptTitle,...)
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ViewID</td>
<td>A name for the view using the format tm1_name:cube_name:unique_id.</td>
</tr>
<tr>
<td>ZeroSuppression</td>
<td>A Boolean flag to turn on or off the zero suppression property for the view. 1 = on, 0 = off</td>
</tr>
<tr>
<td>TM1RptTitle</td>
<td>For each title dimension in the Active Form, include a TM1RptTitle function as an argument to TM1RptView.</td>
</tr>
<tr>
<td>FormatRange</td>
<td>The formatting range for the Active Form.</td>
</tr>
<tr>
<td></td>
<td>When you create an Active Form, a named range called TM1RPTFMTRNG is created to include all formatting range cells. You can use this named range as an argument.</td>
</tr>
<tr>
<td>IDColumn</td>
<td>The column containing format IDs in the Active Form.</td>
</tr>
<tr>
<td></td>
<td>When you create an Active Form, a named range called TM1RPTFMTIDCOL is created to include all formatting range cells. You can use this named range as an argument.</td>
</tr>
</tbody>
</table>

**Example**

```excel
=TM1RPTVIEW("SData:SalesCube:6", 0,
TM1RPTTITLE("SData:actvsbud", $C$6),
TM1RPTTITLE("SData:model", $C$7),
TM1RPTTITLE("SData:account1", $C$8),
TM1RPTFMTRNG,
TM1RPTFMTIDCOL)
```

**TM1User**

TM1User returns the user name of the current TM1 user.

If the current TM1 user is not connected to a server, or if the specified server is not running, TM1User returns an empty string.

If TM1User is executed against a server that is configured to use CAM authentication, the function returns the internal user name/CAMID, not the display name.

This worksheet function is valid in worksheets only.

**Syntax**

```excel
TM1User("ServerName")
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServerName</td>
<td>The name of the server to which the TM1 user is connected.</td>
</tr>
</tbody>
</table>
Example

TM1User("SData")

If a user named BrianT is logged in to the SData server, and that user executes the TM1User function, the above example returns BrianT.

**VIEW**

VIEW creates an optimized view of the cube specified by the cube argument.

A single VIEW function is created when you slice a view from a cube browse.

All DBR and DBRW formulas that refer to the VIEW function can then access this optimized view. In this way, results are returned much faster.

Multiple VIEW functions can reside in the same spreadsheet if you have blocks of DBR formulas that refer to different TM1 views or cubes.

This worksheet function is valid in worksheets only.

**Syntax**

```
VIEW(cube, e1,e2[,...en])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube from which to retrieve data.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Either specific elements in the slice to be used as titles, or the string &quot;!&quot;. The string &quot;!&quot; indicates that the corresponding dimension is a row or column in the view. These arguments can also be the names of aliases for dimension elements.</td>
</tr>
</tbody>
</table>

**Example**

```
VIEW("93sales",$B$2,$B$3,$B$4,"!","!")
```
Chapter 5. TurboIntegrator Functions

TM1 TurboIntegrator lets you manipulate TM1 data and metadata when you define a process.

This is accomplished through the use of functions in the Prolog, Metadata, Data, and Epilog sub-tabs within the Advanced tab of the TurboIntegrator window. These sub-tabs include generated statements based on settings and options you select when defining a TurboIntegrator process. Any functions you create must appear after the generated statements. For details on creating processes with TurboIntegrator, see the TM1 TurboIntegrator documentation.

The TurboIntegrator functions in this section are sorted by category.

There is no interface to assist in the creation of TurboIntegrator functions. Enter functions by hand directly in the appropriate sub-tab within the Advanced tab. String arguments to TurboIntegrator functions must be enclosed in single quotation marks. A semi-colon (;) must be included to indicate the end of each function in the TurboIntegrator window.

In addition to these TurboIntegrator functions, you can also incorporate all standard TM1 Rules functions in a process definition, with the exception of the STET function.

Each argument to TurboIntegrator functions is limited to 256 bytes. A TurboIntegrator function can accept multiple arguments, and each argument is limited to 256 bytes.

TurboIntegrator reserved words

To prevent errors in your TurboIntegrator scripts, you should avoid creating variables with names that match any of the words listed in the following categories.

There are four categories of reserved words in TurboIntegrator:

• Rules function names - See Chapter 2, “Rules Functions,” on page 93 for a complete listing of all rules function names.
• TurboIntegrator function names - See Chapter 5, “TurboIntegrator Functions,” on page 203 for a complete listing of all TurboIntegrator function names.
• Implicit local variable names - See “TurboIntegrator Local Variables” on page 397 for a complete listing of all TurboIntegrator implicit local variables names.
• TurboIntegrator keywords - These keywords are reserved and should not be used as variables in your scripts:
  – break
  – else
  – elseif
  – end
  – endif
  – if
  – while

ASCII and Text TurboIntegrator Functions

These functions pertain to ASCII and Text.

ASCIIDelete

ASCIIDelete deletes an ASCII file.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

ASCIIDelete(FileName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileName</td>
<td>The name of the ASCII file you want to delete. If a full path is not specified, TM1 searches for the file in the server data directory.</td>
</tr>
</tbody>
</table>

Example

This example deletes the ASCII file named 2002Q1Results.cma from the C:\exported_data directory.

ASCIIDelete('C:\exported_data\2002Q1Results.cma');

ASCIIOutput

ASCIIOutput writes a comma-delimited record to an ASCII file.

This function is valid in TM1 TurboIntegrator processes only.

The ASCII file is opened when the first record is written, and is closed when the TurboIntegrator procedure (Prolog, Metadata, Data, or Epilog) containing the ASCIIOutput function finishes processing.

Each output record generated by ASCIIOutput is limited to 8000 bytes. If an output record exceeds 8000 bytes, the record is truncated and a warning is logged in the TM1ProcessError.log file.

When ASCIIOutput encounters a String argument that pushes the output record beyond the 8000 byte limit, it ignores that argument and any further arguments. For example, if there are 10 String arguments and output for the first seven arguments total 7950 bytes while the output for the eighth argument is 51 bytes, only the output for the first seven arguments will be written to the record. If there are ten String arguments and the first argument is over 8000 bytes, no output will be written to the record.

If you use the ASCIIOutput function to write to the same file in multiple procedures (tabs) of a TurboIntegrator process, the file will be overwritten each time it is opened for a new procedure.

The ASCIIOutput function generates a minor error if an error occurs while writing the ASCII file. In addition, the function returns a value upon execution: 1 if the function successfully writes the ASCII file and 0 on failure.

Note: The error will be generated and the value returned only when ASCIIOutput is writing to a disk other than the one that the server is running on. For example, if the server is running on the C: drive and ASCIIOutput is writing to the F: drive, and the F: drive runs out of space, the error will be trapped and the server remains alive. If the server is running on the C: drive while ASCIIOutput is also writing to the C: drive, and that drive runs out of space, the server will terminate (as expected).

Note: The ability to execute the ASCIIOutput function when the data source is a cube view is determined by the Allow Export as Text capability assignment, which is set per user group. If a user is a member of a group which is denied the ability to export data as text, any attempt by the user to execute ASCIIOutput results in the process exiting with a permission error. The process message log indicates "Execution was aborted. No security access for ASCIIOutput."

For details on how the Allow Export as Text capability is set, see "Capability Assignments" in TM1 Operations.

Note: The ASCIIOutput function places the 0x1A hexadecimal character at the end of all generated files. However, TM1 Web cannot open a Websheet that contains the 0x1A hexadecimal character.

If you use ASCIIOutput to export TM1 data to an ASCII file and then attempt to open the file in a TM1 Websheet, you will encounter the following error.
Error occurred while converting the MS Excel workbook into XML format, hexadecimal value 0x1A is an invalid character.

If you remove the 0x1A hexadecimal character from the Websheet, the file will open in TM1 Web.

Syntax

```
ASCIIOutput(FileName, String1, String2, ...Stringn);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileName</td>
<td>A full path to the ASCII file to which you want to write the record. Path must include a file extension.</td>
</tr>
<tr>
<td>String1...Stringn</td>
<td>A string that corresponds to each field you want to create in the ASCII file. This argument can be a string or a TurboIntegrator variable for a string.</td>
</tr>
</tbody>
</table>

Example

This example writes a record to the NewCube.cma ASCII file. Each field in the record corresponds to a variable assigned by TurboIntegrator to a column in your data source.

```
ASCIIOutput('NewCube.cma', V1, V2, V3, V4, V5);
```

**NumberToString**

NumberToString converts a number to a string, using the decimal separator for the current user locale. This function is valid in TM1 TurboIntegrator processes only.

In Microsoft Windows, the decimal separator is a Regional Options setting.

The output of this function is similar to the 'general' number format; it does not use thousands separators and uses the minus sign (-) to denote negative numbers.

Syntax

```
NumberToString(Value);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The real value that you want to convert to a string.</td>
</tr>
</tbody>
</table>

Example

```
 nRET = NumberToString(1234.5);
```

**NumberToStringEx**

NumberToStringEx converts a number to a string, using the passed string format, decimal separator, and thousands separator.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```
NumberToStringEx(Value, NumericFormat, DecimalSep, ThousandsSep);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The real value that you want to convert to a string.</td>
</tr>
<tr>
<td>FormatString</td>
<td>A TM1 numeric format string that defines the format for the function output. Numeric formats are described in IBM Cognos TM1 Perspectives, TM1 Architect, and TM1 Web documentation.</td>
</tr>
<tr>
<td>DecimalSep</td>
<td>The decimal separator to be used in the output string.</td>
</tr>
<tr>
<td>ThousandsSep</td>
<td>The thousands separator to be used in the output string.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
sRet=NUMBERTOSTRINGEX(7895.23,'#,0.#####', ',', '.');
ASCIIOUTPUT('number_to_string.txt',sRet);
```

Will return in ascii file;

7.895,23

**SetInputCharacterSet**

SetInputCharacterSet function lets you specify the character set used in a TurboIntegrator data source. This function is valid in TM1 TurboIntegrator processes only.

When a TurboIntegrator process reads an external file as input, it needs to know the character set in which that external file was written. If the file contains a valid byte-order-mark, TM1 functions will correctly convert the file to UTF-8 if required.

For formats lacking a valid byte-order-mark, the characters must be converted from some other encoding to UTF-8. If the proper converters are present on the machine hosting the server, the input file will be converted to the Unicode character set required by TM1.

**Syntax**

```plaintext
SetInputCharacterSet (CharacterSet);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CharacterSet</td>
<td>The character encoding in the input file to be used by the TurboIntegrator process. If the CharacterSet argument is not a known character type, the type defaults to the system locale.</td>
</tr>
</tbody>
</table>

**Character Encoding**

<table>
<thead>
<tr>
<th>Encoding</th>
<th>System Locale</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM1CS_ISO_8859_1</td>
<td>ISO-8859-1 Latin-1, Western Europe</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_2</td>
<td>ISO-8859-2 Latin-2, Central Europe</td>
</tr>
<tr>
<td>Character Encoding</td>
<td>System Locale</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_3</td>
<td>ISO-8859-3 Latin-3, South Europe</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_4</td>
<td>ISO-8859-4 Latin-4, North Europe</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_5</td>
<td>ISO-8859-5 Latin/Cyrillic</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_6</td>
<td>ISO-8859-6 Latin/Arabic</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_7</td>
<td>ISO-8859-7 Latin/Greek</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_8</td>
<td>ISO-8859-8 Latin/Hebrew</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_9</td>
<td>ISO-8859-9 Latin-5, Turkish</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_10</td>
<td>ISO-8859-10 Latin-6, Nordic,</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_11</td>
<td>ISO-8859-11 Latin/Thai</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_13</td>
<td>ISO-8859-13 Latin-7, Baltic Rim</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_14</td>
<td>ISO-8859-14 Latin-8, Celtic</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_15</td>
<td>ISO-8859-15 Latin-9, replaces ISO-8859-1</td>
</tr>
<tr>
<td>TM1CS_ISO_8859_16</td>
<td>ISO-8859-16 Latin-10, South-Eastern Europe</td>
</tr>
<tr>
<td>TM1CS_WCP1250</td>
<td>Microsoft Windows Central Europe</td>
</tr>
<tr>
<td>TM1CS_WCP1251</td>
<td>Windows Cyrillic</td>
</tr>
<tr>
<td>TM1CS_WCP1252</td>
<td>Windows Latin-1 multilingual</td>
</tr>
<tr>
<td>TM1CS_WCP1253</td>
<td>Windows Greek</td>
</tr>
<tr>
<td>TM1CS_WCP1254</td>
<td>Windows Turkish</td>
</tr>
<tr>
<td>TM1CS_WCP1255</td>
<td>Windows Hebrew</td>
</tr>
<tr>
<td>TM1CS_WCP1256</td>
<td>Windows Arabic</td>
</tr>
<tr>
<td>TM1CS_WCP1257</td>
<td>Windows Baltic</td>
</tr>
<tr>
<td>TM1CS_WCP1258</td>
<td>Windows Vietnam</td>
</tr>
<tr>
<td>TM1CS_WCP874</td>
<td>Windows Thai</td>
</tr>
<tr>
<td>TM1CS_WCP932</td>
<td>Windows Japanese</td>
</tr>
<tr>
<td>TM1CS_WCP936</td>
<td>Windows Simplified Chinese</td>
</tr>
<tr>
<td>TM1CS_WCP949</td>
<td>Windows Korean</td>
</tr>
<tr>
<td>Character Encoding</td>
<td>System Locale</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>TM1CS_WCP950</td>
<td>Windows Traditional Chinese</td>
</tr>
<tr>
<td>TM1CS_KOI8R</td>
<td>Russian and Cyrillic (KOI8-R)</td>
</tr>
<tr>
<td>TM1CS_GBP18030</td>
<td>PRC version UNICODE</td>
</tr>
<tr>
<td>TM1CS_BIG5</td>
<td>Traditional Chinese</td>
</tr>
<tr>
<td>TM1CS_SHIFTJIS</td>
<td>JIS 0201 + JIS 0208, slightly different from CP932</td>
</tr>
<tr>
<td>TM1CS_SJIS0213</td>
<td>JIS 0213-2004, non-BMP required.</td>
</tr>
<tr>
<td>TM1CS_EUC_JP</td>
<td>EUC Japanese</td>
</tr>
<tr>
<td>TM1CS_EUC_CN</td>
<td>EUC Simplified Chinese</td>
</tr>
<tr>
<td>TM1CS_EUC_KR</td>
<td>EUC Korean</td>
</tr>
<tr>
<td>TM1CS_UTF8</td>
<td>UTF-8</td>
</tr>
<tr>
<td>TM1CS_UTF16</td>
<td>UTF-16 Little Endian</td>
</tr>
<tr>
<td>TM1CS_UTF16ESC</td>
<td>UNICODE notation</td>
</tr>
<tr>
<td>TM1CS_UTF32</td>
<td>UTF-32 Little Endian</td>
</tr>
<tr>
<td>TM1CS_OS_DEFAULT</td>
<td>operating system default</td>
</tr>
<tr>
<td>TM1CS_LOCALPATH</td>
<td>local encoding but UNICODE notation on non-native.</td>
</tr>
</tbody>
</table>

**Example**

```java
SetInputCharacterSet('TM1CS_ISO_8859_11');
```

This example specifies that the input character set for the TurboIntegrator data source is ISO-8859-11 Latin/Thai.

**SetOutputCharacterSet**

SetOutputCharacterSet lets you specify the character set to be used when writing to a text file using TextOutput in a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

The function with the TextOutput function.

Used with TextOutputs.

**Syntax**

```java
SetOutputCharacterSet( FileName, CharacterSet );
```
**SetOutputEscapeDoubleQuote**

SetOutputEscapeDoubleQuote allows you to escape double quotes that appear in element names or data values when exporting a cube view to a .csv file.

This function is valid in TM1 TurboIntegrator processes only.

When SetOutputEscapeDoubleQuote is included in your TurboIntegrator script and set to 1, the exported file retains the double quote positions as they appear in your source cube view by escaping each double quote within another pair of double quotes. For example, if an element in your source view is named "Region", the element is exported as """"Region"""" in the .csv output file.

When SetOutputEscapeDoubleQuote is not included in your TurboIntegrator script or is set to 0, the exported file does not escape any double quotes that appear in your source cube.

SetOutputEscapeDoubleQuote is used in conjunction with the ASCIIOutput function, which is the function that actually writes the output file. SetOutputEscapeDoubleQuote should precede ASCIIOutput in your TurboIntegrator script, and both functions should use the same FileName parameter value.

**Syntax**

SetOutputEscapeDoubleQuote(FileName, Num);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileName</td>
<td>A full path to the file to which you want to write the cube view. Path must include a file extension.</td>
</tr>
<tr>
<td>Num</td>
<td>A flag that determines if double quotes are escaped in the output file. 1 indicates that double quotes will be escaped in the output file. 0 indicates that double quotes will not be escaped in the output file.</td>
</tr>
</tbody>
</table>

**Example**

SetOutputEscapeDoubleQuote('C:\temp\cube1.csv', 1);

This example escapes any double quotes encountered in the source cube view when writing output to the C:\temp\cube1.csv file.
StringToNumber

StringToNumber converts a string to a number, using the decimal separator for the current user locale. If the input string is an invalid number string, the value returned will be an invalid floating point value. In Microsoft Windows, the decimal separator is a Regional Options setting.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

StringToNumber(String);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to convert to a number.</td>
</tr>
</tbody>
</table>

Example

nRET = StringToNumber('123.45');

StringToNumberEx

StringToNumberEx converts a string to a number, using the passed decimal separator and thousands separator. If the input string is an invalid number string, the value returned will be an invalid floating point value.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

StringToNumberEx(String, DecimalSep, ThousandsSep);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string that you want to convert to a number.</td>
</tr>
<tr>
<td>DecimalSep</td>
<td>The decimal separator to be used in the output number.</td>
</tr>
<tr>
<td>ThousandsSep</td>
<td>The thousands separator to be used in the output number.</td>
</tr>
</tbody>
</table>

Example

nRET = StringToNumberEx('12453.45', ' . ', ' , ');

TextOutput

TextOutput writes a comma-delimited record to a text file.

This function is valid in TM1 TurboIntegrator processes only.

By default TextOutput writes characters in the locale character set of the server machine. To create a file in a different character set, call the function SetOutputCharacterSet before calling TextOutput.

The text file is opened when the first record is written, and is closed when the TurboIntegrator procedure (Prolog, Metadata, Data, or Epilog) containing the TextOutput function finishes processing.

If you use the TextOutput function to write to the same file in multiple procedures (tabs) of a TurboIntegrator process, the file will be overwritten each time it is opened for a new procedure.
Each output record generated by TextOutput is limited to 8000 bytes. If an output record exceeds 8000 bytes, the record is truncated and a warning is logged in the TM1ProcessError.log file.

When TextOutput encounters a String argument that pushes the output record beyond the 8000 byte limit, it ignores that argument and any further arguments. For example, if there are 10 String arguments and output for the first seven arguments total 7950 bytes while the output for the eighth argument is 51 bytes, only the output for the first seven arguments will be written to the record. If there are ten String arguments and the first argument is over 8000 bytes, no output will be written to the record.

The TextOutput function generates a minor error if an error occurs while writing the text file. In addition, the function returns a value upon execution: 1 if the function successfully writes the text file and 0 on failure.

The error will be generated and the value returned only when TextOutput is writing to a disk other than the one that the server is running on. For example, if the server is running on the C: drive and TextOutput is writing to the F: drive, and the F: drive runs out of space, the error will be trapped and the server remains alive. If the server is running on the C: drive while TextOutput is also writing to the C: drive, and that drive runs out of space, the server will terminate (as expected).

**Note:** The ability to execute the TextOutput function when the data source is a cube view is determined by the **Allow Export as Text** capability assignment, which is set per user group. If a user is a member of a group which is denied the ability to export data as text, any attempt by the user to execute TextOutput results in the process exiting with a permission error. The process message log indicates "Execution was aborted. No security access for TextOutput."

For details on how the **Allow Export as Text** capability is set, see "Capability Assignments" in the IBM Cognos TM1 Operations documentation.

**Syntax**

```
TextOutput(FileName, String1, String2, ... Stringn);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileName</td>
<td>A full path to the text file to which you want to write the record. Path must include a file extension.</td>
</tr>
<tr>
<td>String1...Stringn</td>
<td>A string that corresponds to each field you want to create in the text file. This argument can be a string or a TurboIntegrator variable for a string.</td>
</tr>
</tbody>
</table>

**Example**

```
TextOutput('NewCube.cma', V1, V2, V3, V4, V5);
```

This example writes a record to the NewCube.cma file. Each field in the record corresponds to a variable assigned by TurboIntegrator to a column in your data source.

**Attribute Manipulation TurboIntegrator Functions**

These functions facilitate the manipulation of attributes.

**ATTRNL**

ATTRNL returns a numeric attribute for a specified element of a dimension.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

```plaintext
ATTRNL(DimName, ElName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the ]Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

Example

In this example, the function returns the numeric value of the Engine Size attribute of the L Series 1.8L Sedan element in the Model dimension for the French locale.

```plaintext
ATTRNL('Model', 'L Series 1.8L Sedan', 'Engine Size', 'fr');
```

**ATTRSL**

AttrSL returns a string attribute for a specified element of a dimension.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
AttrSL(DimName, ElName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the ;Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user’s current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr locale. If the attribute value for fr is not available, the base attribute value is returned</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Currency attribute of the 10100 element in the Plan_Business_Unit dimension for the French locale.

```
AttrSL('Plan_Business_Unit', '10100', 'Currency', 'fr');
```

**AttrDelete**

AttrDelete deletes an element attribute from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
AttrDelete(DimName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to delete an element attribute.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name of the attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

This example deletes the InteriorColor element attribute for the Model dimension.

```plaintext
AttrDelete('Model', 'InteriorColor');
```

**AttrInsert**

AttrInsert creates a new element attribute for a dimension. The function can create a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
AttrInsert(DimName, PrevAttr, AttrName, Type);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create an element attribute.</td>
</tr>
<tr>
<td>PrevAttr</td>
<td>The attribute that precedes the attribute you are creating.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name you want to assign to the new attribute.</td>
</tr>
</tbody>
</table>
| Type       | The type of attribute. There are three possible values for the Type argument:  
             • N - Creates a numeric attribute.  
             • S - Creates a string attribute.  
             • A - Creates an alias attribute. |

**Example**

This example creates the InteriorColor string attribute for the Model dimension. This attribute is inserted after the Transmission attribute.

```plaintext
AttrInsert('Model', 'Transmission', 'InteriorColor','S');
```

**AttrPutN**

AttrPutN assigns a value to a numeric element attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
AttrPutN( Value, DimName, ElName, AttrName, [LangLocaleCode] );
```
<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The numeric value you want to assign to an element attribute.</td>
</tr>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the value 2257993 to the ProdCode attribute of the S Series 1.8L Sedan in the Model dimension.

```
AttrPutN(2257993, 'Model', ' S Series 1.8L Sedan ', 'ProdCode');
```

**AttrPutS**

AttrPutS assigns a value to a string element attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
AttrPutS(Value, DimName, ElName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The value you want to assign to an element attribute.</td>
</tr>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
</tbody>
</table>
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the Value applies. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

### Example

This example assigns the string Beige to the InteriorColor attribute of the S Series 1.8L Sedan in the Model dimension.

```plaintext
AttrPutS('Beige', 'Model', 'S Series 1.8L Sedan', 'InteriorColor');
```

### ChoreAttrDelete

ChoreAttrDelete deletes a chore attribute from the TM1 database. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ChoreAttrDelete(AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The name of the chore attribute you want to delete.</td>
</tr>
</tbody>
</table>

### Example

This example deletes the Description attribute for chores on your TM1 server.

```plaintext
ChoreAttrDelete('Description');
```

### ChoreAttrInsert

ChoreAttrInsert creates a new attribute for chores on your TM1 server. The function can create a string, numeric, or alias attribute. This function is valid in TM1 TurboIntegrator processes only.

**Attention:** If you update an existing chore attribute, you must first delete the existing attribute using the function ChoreAttrDelete. You can then use ChoreAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

**Syntax**

```plaintext
ChoreAttrInsert( PrevAttrName, NewAttrName, AttrType);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for chores, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new chore attribute.</td>
</tr>
</tbody>
</table>
| AttrType      | The type of attribute. There are three possible values for the AttrType argument:  
                          • N - Creates a numeric attribute.  
                          • S - Creates a string attribute.  
                          • A - Creates an alias attribute. |

**Example**

This example creates the Description string attribute for chores. This attribute is inserted after the Owner attribute.

```plaintext
ChoreAttrInsert('Owner', 'Description', 'S');
```

**ChoreAttrN**

ChoreAttrN returns a numeric attribute for a specified chore.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ChoreAttrN(ChoreName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChoreName</td>
<td>A valid chore name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the chore.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Division_Code attribute of the Import chore.

```plaintext
ChoreAttrN('Import', 'Division_Code');
```

**ChoreAttrNL**

ChoreAttrNL returns an attribute's numeric value for a specified chore with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ChoreAttrNL(ChoreName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChoreName</td>
<td>A valid chore name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the chore.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the )Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Division_Code attribute of the Import chore for the French locale.

```
ChoreAttrNL('Import', 'Division_Code', 'fr');
```

**ChoreAttrPutN**

ChoreAttrPutN assigns a value to a numeric chore attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ChoreAttrPutN(NumericValue, ChoreName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a chore attribute.</td>
</tr>
<tr>
<td>ChoreName</td>
<td>The chore for which you want to assign an attribute value.</td>
</tr>
</tbody>
</table>
Argument | Description
---|---
AttrName | The attribute whose value you want to assign.
LangLocaleCode | This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.

Example
This example assigns the value 7161994 to the Division_Code attribute of the Import chore for the French language locale code.

ChoreAttrPutN(7161994, 'Import', 'Division_Code', 'fr');

ChoreAttrPutS
ChoreAttrPutS assigns a value to a string chore attribute.
This function is valid in TM1 TurboIntegrator processes only.

Syntax
ChoreAttrPutS(String, ChoreName, AttrName, [LangLocaleCode]);

Argument | Description
---|---
String | The string you want to assign to a chore attribute.
ChoreName | The chore for which you want to assign an attribute value.
AttrName | The attribute whose value you want to assign.
LangLocaleCode | This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.

Example
This example assigns the string value Ricci to the Owner attribute of the Import chore, for the French language locale code.

ChoreAttrPutS('Ricci', 'Import', 'Owner', 'fr');
ChoreAttrS

ChoreAttrS returns a string attribute for a specified chore.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ChoreAttrS(ChoreName, AttrName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChoreName</td>
<td>A valid chore name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the chore.</td>
</tr>
</tbody>
</table>

Example

In this example, the function returns the string value of the Owner attribute of the Exchange_Rate_Updates chore.

ChoreAttrS('Exchange_Rate_Updates', 'Owner');

ChoreAttrSL

ChoreAttrSL returns a string attribute value for a specified chore with respect to a given locale.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ChoreAttrSL(ChoreName, AttrName, [LangLocaleCode]);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChoreName</td>
<td>A valid chore name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the chore.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Owner attribute of the Depreciate_Inventory chore for the French locale.

```plaintext
ChoreAttrSL('Depreciate_Inventory', 'Owner', 'fr');
```

**CreateHierarchyByAttribute**

CreateHierarchyByAttribute creates a simple 3-level hierarchy from a single attribute.

The new hierarchy consists of a single high-level root element, a middle-level of consolidations representing existing attribute values, and a lower-level of dimension leaves that include the associated attribute value.

This function is valid in TM1 TurboIntegrator processes only.

**Note:** This function creates a hierarchy from the current set of attribute values, but the system does not automatically keep the hierarchy in-sync with the attribute data as it changes. Modelers must regenerate the hierarchy as needed.

**Syntax**

```plaintext
CreateHierarchyByAttribute(DimName, AttrName [, emptyParent [, rootName ] ] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the attribute. A hierarchy of the same name as the dimension will be created.</td>
</tr>
</tbody>
</table>
Argument | Description
---|---
AttrName | The name of the attribute to create the hierarchy from.
emptyParent | Specifies the name of a consolidation to create, which collects dimension leaves that don't have an attribute value. If passed as an empty string, the function does not create a consolidation.
rootName | Overrides the root element name which by default is named after the attribute.

**Example**

```sql
CreateHierarchyByAttribute ('Country', 'City');
```

This example creates a hierarchy from the City attribute in the Country dimension.

**CubeAttrDelete**

CubeAttrDelete deletes a cube attribute from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```sql
CubeAttrDelete(AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The name of the cube attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

This example deletes the Description attribute for cubes on your TM1 server.

```sql
CubeAttrDelete('Description');
```

**CubeAttrInsert**

CubeAttrInsert creates a new attribute for cubes on your TM1 server. The function can create a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

⚠️ **Attention:** If you update an existing cube attribute, you must first delete the existing attribute using the function CubeAttrDelete. You can then use CubeAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

**Syntax**

```sql
CubeAttrInsert( PrevAttrName, NewAttrName, AttrType);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for cubes, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new cube attribute.</td>
</tr>
</tbody>
</table>
| AttrType     | The type of attribute. There are three possible values for the AttrType argument:  
|              | • N - Creates a numeric attribute.                                           |
|              | • S - Creates a string attribute.                                            |
|              | • A - Creates an alias attribute.                                            |

**Example**

This example creates the Description string attribute for cubes. This attribute is inserted after the Owner attribute.

```
CubeAttrInsert('Owner', 'Description', 'S');
```

**CubeAttrPutN**

CubeAttrPutN assigns a value to a numeric cube attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeAttrPutN(NumericValue, CubeName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a cube attribute.</td>
</tr>
<tr>
<td>CubeName</td>
<td>The cube for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
</tbody>
</table>
| LangLocaleCode | This optional parameter specifies the language locale code to which the NumericValue applies.  
|              | Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the }Cultures control dimension.  
|              | When the LangLocaleCode is not specified or is omitted, the base attribute value is updated. |
Example
This example assigns the value 07161994 to the AccountingCode attribute of the Sales cube for the French language locale code.

```
CubeAttrPutN(07161994, 'Sales', 'AccountingCode','fr');
```

**CubeAttrPutS**
CubeAttrPutS assigns a value to a string cube attribute.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```
CubeAttrPutS(String, CubeName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a cube attribute.</td>
</tr>
<tr>
<td>CubeName</td>
<td>The cube for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

Example
This example assigns the string value Prototype to the Description attribute of the Sales cube for the French language locale code.

```
CubeAttrPutS('Prototype', 'Sales', 'Description','fr');
```

**CubeATTRNL**
CubeATTRNL returns a numeric attribute value for a specified cube with respect to a given locale.
This function is valid in TM1 TurboIntegrator processes.

**Syntax**
```
CubeATTRNL(CubeName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the cube.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Product cube for the French locale.

```prpl
CubeATTRNL('Product', 'Accounting_Code', 'fr');
```

**CubeATTRSL**

CubeATTRSL returns a string attribute value for a specified cube with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes.

**Syntax**

```
CubeATTRSL(CubeName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the cube.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Owner attribute of the Product cube for the French locale.

```java
CubeATTRSL('Product', 'Owner', 'fr');
```

**DimensionAttrDelete**

DimensionAttrDelete deletes a dimension attribute from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```java
DimensionAttrDelete(AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The name of the dimension attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

This example deletes the Description attribute for dimensions on your TM1 server.

```java
DimensionAttrDelete('Description');
```
**DimensionAttrInsert**

DimensionAttrInsert creates a new attribute for dimensions on your TM1 server. The function can create a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Attention:** If you update an existing dimension attribute, you must first delete the existing attribute using the function DimensionAttrDelete. You can then use DimensionAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

**Syntax**

```
DimensionAttrInsert( PrevAttrName, NewAttrName, AttrType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for dimensions, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new dimension attribute.</td>
</tr>
</tbody>
</table>
| AttrType       | The type of attribute. There are three possible values for the AttrType argument:  
|                | • N - Creates a numeric attribute.                                            |
|                | • S - Creates a string attribute.                                             |
|                | • A - Creates an alias attribute.                                             |

**Example**

This example creates the Description string attribute for dimensions. Because there is no PrevAttrName parameter, this attribute is inserted as the first attribute for dimensions on your TM1 server.

```
DimensionAttrInsert('', 'Description', 'S');
```

**DimensionAttrPutN**

DimensionAttrPutN assigns a value to a numeric dimension attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionAttrPutN(NumericValue, DimensionName, AttrName, [LocalLangCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the numeric value applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the value 07161994 to the AccountingCode attribute of the Models dimension for the French language locale code.

```plaintext
DimensionAttrPutN(07161994, 'Models', 'AccountingCode','fr');
```

**DimensionAttrPutS**

DimensionAttrPutS assigns a value to a string dimension attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DimensionAttrPutS(String, DimensionName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the numeric value applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the string value Prototype to the Description attribute of the Model dimension for the French language locale code.

```plaintext
DimensionAttrPutS('Prototype', 'Model', 'Description','fr');
```
**DimensionATTRNL**

DimensionATTRNL returns a numeric attribute value for a specified dimension with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DimensionATTRNL(DimName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the )Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Plan_Business_Unit dimension for the French locale.

```plaintext
DimensionATTRNL('Plan_Business_Unit', 'Accounting_Code', 'fr');
```

**DimensionATTRSL**

DimensionATTRSL returns a string attribute value for a specified dimension with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```
DimensionATTRSL(DimName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Plan_Business_Unit dimension for the French locale.

```
DimensionATTRSL('Plan_Business_Unit', 'Manager', 'fr');
```

**ElementATTRNL**

ElementATTRNL returns a numeric attribute for a specified element of a dimension. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ElementATTRNL(DimName, HierName, ElName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

### Example

In this example, the function returns the numeric value of the Engine Size attribute of the L Series 1.8L Sedan element in the Model dimension for the French locale. This example applies to the 2015 hierarchy.

```
ATTRNL('Model', '2015', 'L Series 1.8L Sedan', 'Engine Size', 'fr');
```

### ElementATTRSL

ElementATTRSL returns a string attribute for a specified element of a dimension. This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```
ElementATTRSL(DimName, HierName, ElName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element of the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the element.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user’s current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr locale. If the attribute value for fr is not available, the base attribute value is returned</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Currency attribute of the 10100 element in the Plan_Business_Unit dimension for the French locale.

```
ElementgetAttribute('Plan_Business_Unit', '10100', 'Currency', 'fr');
```

**ElementAttrPutN**

ElementAttrPutN assigns a value to a numeric element attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ElementAttrPutN( Value, DimName, HierName, ElName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The numeric value you want to assign to an element attribute.</td>
</tr>
</tbody>
</table>
### Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

### Example

This example assigns the value 2257993 to the ProdCode attribute of the S Series 1.8L Sedan in the Automobile hierarchy of the Model dimension.

```plaintext
ElementAttrPutN(2257993, 'Model', 'Automobile', 'S Series 1.8L Sedan', 'ProdCode');
```

### ElementAttrPutS

ElementAttrPutS assigns a value to a string element attribute.

This function is valid in TM1 TurboIntegrator processes only.

### Syntax

```plaintext
ElementAttrPutS(Value, DimName, HierName, ElName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>The value you want to assign to an element attribute.</td>
</tr>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the Value applies. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the string Beige to the InteriorColor attribute of the S Series 1.8L Sedan in the Automobile hierarchy of the Model dimension.

```plaintext
ElementAttrPutS('Beige', 'Model', 'Automobile', 'S Series 1.8L Sedan', 'InteriorColor');
```

**ElementAttrInsert**

ElementAttrInsert creates a new element attribute for a dimension. The function can create a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ElementAttrInsert(DimName, HierName, PrevAttr, AttrName, Type);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create an element attribute.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>PrevAttr</td>
<td>The attribute that precedes the attribute you are creating.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name you want to assign to the new attribute.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of attribute. There are three possible values for the Type argument:</td>
</tr>
<tr>
<td></td>
<td>• N - Creates a numeric attribute.</td>
</tr>
<tr>
<td></td>
<td>• S - Creates a string attribute.</td>
</tr>
<tr>
<td></td>
<td>• A - Creates an alias attribute.</td>
</tr>
</tbody>
</table>

**Example**

This example creates the InteriorColor string attribute in the Automobile hierarchy in the Model dimension. This attribute is inserted after the Transmission attribute.

```plaintext
ElementAttrInsert('Model', 'Automobile', 'Transmission', 'InteriorColor', 'S');
```
**ElementAttrDelete**

ElementAttrDelete deletes an element attribute from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ElementAttrDelete(DimName, HierName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to delete an element attribute.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name of the attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

This example deletes the InteriorColor element attribute from the Automobile hierarchy in the Model dimension.

```
ElementAttrDelete('Model', 'Automobile', 'InteriorColor');
```

**HierarchyAttrPutN**

HierarchyAttrPutN assigns a value to a numeric attribute in a specified hierarchy within a dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyAttrPutN(NumericValue, DimensionName, HierName, AttrName, [LocalLangCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LocalLangCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LocalLangCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LocalLangCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>
Example
This example assigns the value 07161994 to the AccountingCode attribute of the Models dimension for the French language locale code. This change is applied to the Receivables hierarchy in the Models dimension.

HierarchyAttrPutN(07161994, 'Models', 'Receivables', 'AccountingCode','fr');

HierarchyAttrPutS
HierarchyAttrPutS assigns a value to a string attribute in a specified hierarchy within a dimension. This function is valid in TM1 TurboIntegrator processes only.

Syntax
HierarchyAttrPutS(String, DimensionName, HierName, AttrName, [LangLocaleCode] );

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

Example
This example assigns the string value Prototype to the Description attribute of the Model dimension for the French language locale code. This change is applied to the Receivables hierarchy in the Model dimension.

HierarchyAttrPutS('Prototype', 'Model', 'Receivables', 'Description','fr');

HierarchyATTRN
HierarchyATTRN returns a numeric attribute for a specified hierarchy within a dimension. This function is valid in TM1 TurboIntegrator processes only.

Syntax
HierarchyATTRN(DimName, HierName, AttrName);
### Argument Table

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

### Example

In this example, the function returns the numeric value of the Accounting_Code attribute of the Plan_Business_Unit dimension. This example applies to the Equipment hierarchy.

```
HierarchyATTRN('Plan_Business_Unit', 'Equipment', 'Accounting_Code');
```

#### HierarchyATTRSN

HierarchyATTRSN returns a string attribute for a specified hierarchy within a dimension. This function is valid in TM1 TurboIntegrator processes only.

### Syntax

```
HierarchyATTRSN(DimName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

### Example

In this example, the function returns the string value of the Manager attribute of the Plan_Business_Unit dimension. This example applies to the Equipment hierarchy.

```
HierarchyATTRSN('Plan_Business_Unit', 'Equipment', 'Manager');
```

#### HierarchyATTRNL

HierarchyATTRNL returns a numeric attribute value for a specified hierarchy within a dimension with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

### Syntax

```
HierarchyATTRNL(DimName, HierName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value.</td>
</tr>
</tbody>
</table>

Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension.

When the LangLocaleCode is not specified or is omitted, the user’s current locale is used as the LangLocaleCode argument.

If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned.

For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Plan_Business_Unit dimension for the French locale. This function applies to the Equipment hierarchy.

```
Hierarchy ATTRNL('Plan_Business_Unit', 'Equipment', 'Accounting_Code', 'fr');
```

**HierarchyATTRSL**

HierarchyATTRSL returns a string attribute value for a specified hierarchy within a dimension with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
Hierarchy ATTRSL(DimName, HierName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the {Cultures} control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Plan_Business_Unit dimension for the French locale. This function applies to the Equipment hierarchy.

```
HierarchyATTRSL('Plan_Business_Unit', 'Equipment', 'Manager', 'fr');
```

**HierarchySubsetATTRS**

HierarchySubsetATTRS returns a string attribute for a specified subset associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetATTRS(DimName, HierName, SubName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
</tbody>
</table>
### Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

### Example

In this example, the function returns the string value of the Manager attribute of the Sales subset from Europe hierarchy in the Plan_Business_Unit dimension.

```plaintext
HierarchySubsetATTRS('Plan_Business_Unit', 'Europe', 'Sales', 'Manager');
```

### HierarchySubsetATTRN

HierarchySubsetATTRN returns a numeric attribute for a specified subset associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```plaintext
HierarchySubsetATTRN(DimName, HierName, SubName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

### Example

In this example, the function returns the numeric value of the Accounting_Code attribute of the Sales subset from the Europe hierarchy in the Plan_Business_Unit dimension.

```plaintext
HierarchySubsetATTRN('Plan_Business_Unit', 'Europe', 'Sales', 'Accounting_Code');
```

### HierarchySubsetATTRSL

HierarchySubsetATTRSL returns an attribute's string value for a specified subset (and locale) associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```plaintext
HierarchySubsetATTRSL(DimName, HierName, SubName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Sales subset (from the Europe hierarchy) for the French locale.

```
HierarchySubsetATTRSL('Plan_Business_Unit', 'Europe', 'Sales', 'Manager', 'fr');
```

**HierarchySubsetATTRNL**

HierarchySubsetATTRNL returns an attribute's numeric value for a specified subset (and locale) associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetATTRNL(DimName, HierName, SubName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Sales subset (from the Europe hierarchy) for the French locale.

HierachySubsetATTRNL('Plan_Business_Unit', 'Europe', 'Sales', 'Accounting_Code', 'fr');

**HierarchySubsetAttrPutS**

HierarchySubsetAttrPutS assigns a string value to an attribute for a specified subset associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

HierarchySubsetAttrPutS(String, DimName, HierName, SubName, AttrName, [LangLocaleCode]);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the string value Prototype to the Description attribute of the Z subset (from the 2016 hierarchy in the Model dimension) for the French language locale code.

```
HierarchySubsetAttrPutS('Prototype', 'Model', '2016', 'Z', 'Description','fr');
```

**HierarchySubsetAttrPutN**

HierarchySubsetAttrPutN assigns a numeric value to an attribute for a specified subset associated with a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetAttrPutN(NumericValue, DimName, HierName, SubName, AttrName, [LocalLangCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
</tbody>
</table>
**Argument** | **Description**
--- | ---
LangLocaleCode | This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.

**Example**
This example assigns the value 07161994 to the AccountingCode attribute of the Z subset (from the 2016 hierarchy in the Models dimension) for the French language locale code.

```
HierarchySubsetAttrPutN(07161994, 'Models', '2016', 'Z', 'AccountingCode','fr');
```

**HierarchySubsetAttrInsert**
HierarchySubsetAttrInsert creates a new attribute for subsets on your TM1 server. The function creates a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

⚠️ **Attention:** If you update an existing subset attribute, you must first delete the existing attribute using the function HierarchySubsetAttrDelete. You can then use HierarchySubsetAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

```
HierarchySubsetAttrInsert( Dimension, Hierarchy, PrevAttrName, NewAttrName, AttrType);
```

**Argument** | **Description**
--- | ---
Dimension | The name of the dimension whose subsets are being updated.
Hierarchy | The name of a hierarchy in a dimension.
PrevAttrName | The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for subsets, leave this argument empty.
NewAttrName | The name you want to assign to the new subset attribute.
AttrType | The type of attribute. There are three possible values for the AttrType argument:
• N - Creates a numeric attribute.
• S - Creates a string attribute.
• A - Creates an alias attribute.
Example
This example creates the Description string attribute for subsets in the Z hierarchy of the Model dimension. Because there is no PrevAttrName parameter, this attribute is inserted as the first attribute for subsets on your TM1 server.

```
HierarchySubsetAttrInsert('Model', 'Z', '', 'Description', 'S');
```

**HierarchySubsetAttrDelete**
HierachySubsetAttrDelete deletes a subset attribute from the TM1 database.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```
HierarchySubsetAttrDelete(Dimension, Hierarchy, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>The name of the dimension whose subset attribute is being deleted.</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>The name of a hierarchy in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name of the dimension attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**
This example deletes the Description attribute for subsets from the Z hierarchy in the Model dimension.

```
HierarchySubsetAttrDelete('Model', 'Z', 'Description');
```

**ProcessAttrDelete**
ProcessAttrDelete deletes a process attribute from the TM1 database.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```
ProcessAttrDelete(AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The name of the process attribute you want to delete.</td>
</tr>
</tbody>
</table>

**Example**
This example deletes the Description attribute for processes on your TM1 server.

```
ProcessAttrDelete('Description');
```
ProcessAttrInsert

ProcessAttrInsert creates a new attribute for processes on your TM1 server. The function can create a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

**Attention:** If you update an existing process attribute, you must first delete the existing attribute using the function ProcessAttrDelete. You can then use ProcessAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

**Syntax**

```
ProcessAttrInsert( PrevAttrName, NewAttrName, AttrType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for processes, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new process attribute.</td>
</tr>
</tbody>
</table>
| AttrType     | The type of attribute. There are three possible values for the AttrType argument:  
• N - Creates a numeric attribute.  
• S - Creates a string attribute.  
• A - Creates an alias attribute. |

**Example**

This example creates the Description string attribute for processes. This attribute is inserted after the Owner attribute.

```
ProcessAttrInsert('Owner', 'Description', 'S');
```

ProcessAttrN

ProcessAttrN returns a numeric attribute for a specified process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ProcessAttrN(ProcessName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessName</td>
<td>A valid process name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the process.</td>
</tr>
</tbody>
</table>
Example
In this example, the function returns the numeric value of the Store_Code attribute of the Daily_Sales process.

```
ProcessAttrNL('Daily_Sales', 'Store_Code');
```

**ProcessAttrNL**

ProcessAttrNL returns an attribute's numeric value for a specified process with respect to a given locale. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ProcessAttrNL(ProcessName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessName</td>
<td>A valid process name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the process.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the jCultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned</td>
</tr>
</tbody>
</table>

Example

In this example, the function returns the numeric value of the Store_Code attribute of the Daily_Sales process for the French locale.

```
ProcessAttrNL('Daily_Sales', 'Store_Code', 'fr');
```
ProcessAttrPutN

ProcessAttrPutN assigns a value to a numeric process attribute.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

```
ProcessAttrPutN(NumericValue, CubeName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a process attribute.</td>
</tr>
<tr>
<td>ProcessName</td>
<td>The process for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

Example

This example assigns the value 8051997 to the Store_Code attribute of the Daily_Sales process for the French language locale code.

```
ProcessAttrPutN(8051997, 'Daily_Sales', 'Store_Code', 'fr');
```

ProcessAttrPutS

ProcessAttrPutS assigns a value to a string process attribute.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

```
ProcessAttrPutS(String, ProcessName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a process attribute.</td>
</tr>
<tr>
<td>ProcessName</td>
<td>The process for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
</tbody>
</table>
**Argument** | **Description**
--- | ---
LangLocaleCode | This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.

**Example**
This example assigns the string value Ricci to the Owner attribute of the Import_Transactional process, for the French language locale code.
```
ProcessAttrPutS('Ricci', 'Import_transactional', 'Owner', 'fr');
```

**ProcessAttrS**
ProcessAttrS returns a string attribute for a specified process. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```
ProcessAttrS(ProcessName, AttrName);
```

**Argument** | **Description**
--- | ---
ProcessName | A valid process name.
AttrName | The attribute for which you want to retrieve a value. This argument must be a valid attribute of the process.

**Example**
In this example, the function returns the string value of the Owner attribute of the Refresh_Cubes process.
```
ProcessAttrS('Refresh_Cubes', 'Owner');
```

**ProcessAttrSL**
ProcessAttrSL returns a string attribute value for a specified process with respect to a given locale. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```
ProcessAttrSL(ProcessName, AttrName, [LangLocaleCode]);
```

**Argument** | **Description**
--- | ---
ProcessName | A valid process name.
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the process.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the jCultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Owner attribute of the Exchange_Rate_Update process for the French-Canada locale.

```
ProcessAttrSL('Exchange_Rate_Update', 'Owner', 'fr-CA');
```

**SubsetATTRS**

SubsetATTRS returns a string attribute for a specified subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetATTRS(DimName, SubName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Sales subset from the Plan_Business_Unit dimension.

```
SubsetATTRS('Plan_Business_Unit', 'Sales', 'Manager');
```

**SubsetATTRN**

SubsetATTRN returns a numeric attribute for a specified subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetATTRN(DimName, SubName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value of the Accounting_Code attribute of the Sales subset from the Plan_Business_Unit dimension.

```
SubsetATTRN('Plan_Business_Unit', 'Sales', 'Accounting_Code');
```

**SubsetATTRSL**

SubsetATTRSL returns an attribute's string value for a specified subset with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetATTRSL(DimName, SubName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Sales subset for the French locale.

```
SubsetATTRSL('Plan_Business_Unit', 'Sales', 'Manager', 'fr');
```

**SubsetATTRNL**

SubsetATTRNL returns an attribute's numeric value for a specified subset with respect to a given locale. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetATTRNL(DimName, SubName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>A valid dimension name.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the dimension.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

Example
In this example, the function returns the numeric value of the Accounting_Code attribute of the Sales subset for the French locale.

SubsetATTRNL('Plan_Business_Unit', 'Sales', 'Accounting_Code', 'fr');

SubsetAttrPutS
SubsetAttrPutS assigns a string value to an attribute for a specified subset.
This function is valid in TM1 TurboIntegrator processes only.

Syntax
SubsetAttrPutS(String, DimensionName, SubName, AttrName, [LangLocaleCode]);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
</tbody>
</table>
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

### Example

This example assigns the string value Prototype to the Description attribute of the Z subset (from the Model dimension) for the French language locale code.

```
SubsetAttrPutS('Prototype', 'Model', 'Z', 'Description','fr');
```

### SubsetAttrPutN

**SubsetAttrPutN** assigns a numeric value to an attribute for a specified subset.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```
SubsetAttrPutN(NumericValue, DimensionName, SubName, AttrName, [LocalLangCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a dimension attribute.</td>
</tr>
<tr>
<td>DimensionName</td>
<td>The dimension for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of a subset in a dimension.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>
Example

This example assigns the value 07161994 to the AccountingCode attribute of the Z subset (from the Models dimension) for the French language locale code.

```plaintext
SubsetAttrPutN(07161994, 'Models', 'Z', 'AccountingCode', 'fr');
```

SubsetAttrInsert

SubsetAttrInsert creates a new attribute for subsets on your TM1 server. The function creates a string, numeric, or alias attribute.

This function is valid in TM1 TurboIntegrator processes only.

⚠️ **Attention:** If you update an existing subset attribute, you must first delete the existing attribute using the function SubsetAttrDelete. You can then use SubsetAttrInsert to recreate the attribute with your desired changes.

**Important:** If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

Syntax

```plaintext
SubsetAttrInsert( Dimension, PrevAttrName, NewAttrName, AttrType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>The name of the dimension whose subsets are being updated.</td>
</tr>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for subsets, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new subset attribute.</td>
</tr>
<tr>
<td>AttrType</td>
<td>The type of attribute. There are three possible values for the AttrType argument:</td>
</tr>
<tr>
<td></td>
<td>• N - Creates a numeric attribute.</td>
</tr>
<tr>
<td></td>
<td>• S - Creates a string attribute.</td>
</tr>
<tr>
<td></td>
<td>• A - Creates an alias attribute.</td>
</tr>
</tbody>
</table>

Example

This example creates the Description string attribute for subsets in the Model dimension. Because there is no PrevAttrName parameter, this attribute is inserted as the first attribute for subsets on your TM1 server.

```plaintext
SubsetAttrInsert('Model', '', 'Description', 'S');
```

SubsetAttrDelete

SubsetAttrDelete deletes a subset attribute from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

SubsetAttrDelete(Dimension, AttrName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>The name of the dimension whose subset attribute is being deleted.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name of the dimension attribute you want to delete.</td>
</tr>
</tbody>
</table>

Example

This example deletes the Description attribute for subsets in the Model dimension.

SubsetAttrDelete('Model', 'Description');

ViewAttrDelete

ViewAttrDelete deletes a view attribute for a specific cube from the TM1 database.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ViewAttrDelete(CubeName, AttrName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube whose view attribute is being deleted.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The name of the view attribute you want to delete.</td>
</tr>
</tbody>
</table>

Example

This example deletes the Description attribute for views of the Sales cube on your TM1 server.

ViewAttrDelete('Sales', 'Description');

ViewAttrInsert

ViewAttrInsert creates a new attribute for views of a specific cube on your TM1 server. The function can create a string, numeric, or alias attribute.
This function is valid in TM1 TurboIntegrator processes only.

Attention: If you update an existing view attribute, you must first delete the existing attribute using the function ViewAttrDelete. You can then use ViewAttrInsert to recreate the attribute with your desired changes.

Important: If you attempt to update an existing attribute without first deleting it, the insert fails without a warning or error. The existing attribute remains unchanged; it is neither updated nor overwritten.

Syntax

ViewAttrInsert( CubeName, PrevAttrName, NewAttrName, AttrType);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube for which you want to insert a view attribute.</td>
</tr>
<tr>
<td>PrevAttrName</td>
<td>The attribute that precedes the attribute you are creating. If there is no previous attribute or you want the new attribute to be the first attribute for views, leave this argument empty.</td>
</tr>
<tr>
<td>NewAttrName</td>
<td>The name you want to assign to the new view attribute.</td>
</tr>
</tbody>
</table>
| AttrType     | The type of attribute. There are three possible values for the AttrType argument:  
|              | • N - Creates a numeric attribute.                                         |
|              | • S - Creates a string attribute.                                          |
|              | • A - Creates an alias attribute.                                          |

**Example**

This example creates the Description string attribute for views of the Sales cube. This attribute is inserted after the Owner attribute.

```plaintext
ViewAttrInsert('Sales', 'Owner', 'Description', 'S');
```

**ViewAttrN**

ViewAttrN returns a numeric attribute for a specified view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewAttrN(CubeName, ViewName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>A valid cube name.</td>
</tr>
<tr>
<td>ViewName</td>
<td>A valid view name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the view.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value for the Category_Code attribute of the Product view of the Sales cube.

```plaintext
ViewAttrN('Sales', 'Product', 'Category_Code');
```
**ViewAttrNL**

ViewAttrNL returns an attribute's numeric value for a specified view with respect to a given locale.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewAttrNL(CubeName, ViewName, AttrName, [LangLocaleCode]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube for the view whose attribute value you want to retrieve.</td>
</tr>
<tr>
<td>ViewName</td>
<td>A valid view name.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the view.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the</td>
</tr>
<tr>
<td></td>
<td>international language codes listed in the }Cultures control dimension.</td>
</tr>
<tr>
<td></td>
<td>When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument.</td>
</tr>
<tr>
<td></td>
<td>If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute</td>
</tr>
<tr>
<td></td>
<td>value does not exist for an associated parent LangLocaleCode, the base attribute value is returned.</td>
</tr>
<tr>
<td></td>
<td>For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the numeric value for the Category_Code attribute of the Product view of the Sales cube, for the French locale.

```
ViewAttrNL('Sales', 'Product', 'Category_Code', 'fr');
```

**ViewAttrPutN**

ViewAttrPutN assigns a value to a numeric view attribute.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

```plaintext
ViewAttrPutN(NumericValue, CubeName, ViewName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NumericValue</td>
<td>The value you want to assign to a view attribute.</td>
</tr>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

Example

This example assigns the value 8222001 to the Category_Code attribute of the Product view of the Sales cube, for the French language locale code.

```plaintext
ViewAttrPutN(8222001, 'Sales', 'Product', 'Category_Code', 'fr');
```

ViewAttrPutS

ViewAttrPutS assigns a string value to an attribute for a specified view.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
ViewAttrPutS(String, CubeName, ViewName, AttrName, [LangLocaleCode] );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The string you want to assign to a view attribute.</td>
</tr>
<tr>
<td>CubeName</td>
<td>The cube parent of the view for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name of the view for which you want to assign an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute whose value you want to assign.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code to which the NumericValue applies. Valid LangLocaleCode values correspond to the ISO 639-1 international language codes listed in the }Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the base attribute value is updated.</td>
</tr>
</tbody>
</table>

**Example**

This example assigns the string value Rocheford to the Owner attribute of the Individual_Stores view of the Sales cube, for the French language locale code.

```plaintext
ViewAttrPutS('Rocheford', 'Sales', 'Individual_Stores', 'Owner','fr');
```

**ViewAttrS**

ViewAttrS returns a string attribute for a specified view. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewAttrS(CubeName, ViewName, AttrName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you want to return an attribute value.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you want to return an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the view.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewAttrS('Plan_Business_Unit', 'Sales', 'Manager');
```

In this example, the function returns the string value of the Manager attribute of the Sales view of the Plan_Business_Unit cube.

**ViewAttrSL**

ViewAttrSL returns an attribute's string value for a specified view with respect to a given locale. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewAttrSL(CubeName, ViewName, AttrName, [LangLocaleCode]);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you want to return an attribute value.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you want to return an attribute value.</td>
</tr>
<tr>
<td>AttrName</td>
<td>The attribute for which you want to retrieve a value. This argument must be a valid attribute of the view.</td>
</tr>
<tr>
<td>LangLocaleCode</td>
<td>This optional parameter specifies the language locale code for which you want to return a value. Valid LangLocaleCode values correspond to the international language codes listed in the Cultures control dimension. When the LangLocaleCode is not specified or is omitted, the user's current locale is used as the LangLocaleCode argument. If an attribute value does not exist for the LangLocaleCode, the value for an associated parent LangLocaleCode is returned. If an attribute value does not exist for an associated parent LangLocaleCode, the base attribute value is returned. For example if the LangLocaleCode is fr-CA, the function returns the attribute value for the fr-CA (French-Canada) locale if available. If the attribute value for fr-CA is not available, the function attempts to return the attribute value for the parent fr (French) locale. If the attribute value for fr is not available, the base attribute value is returned.</td>
</tr>
</tbody>
</table>

**Example**

In this example, the function returns the string value of the Manager attribute of the Sales view of the Plan_Business_Unit cube, for the French-Canada locale.

```
ViewAttrSL('Plan_Business_Unit', 'Sales', 'Manager', 'fr-CA');
```

**Chore Management TurboIntegrator Functions**

These functions pertain to managing chores.

**ChoreError**

ChoreError causes the immediate termination of a chore. It can be called from any process within a chore. The ChoreError TurboIntegrator function causes an immediate termination of a single chore. Chores terminated with this function are flagged with an error status. This function is valid in TM1 TurboIntegrator processes only.
ChoreQuit

ChoreQuit causes the immediate termination of a chore. It can be called from any process within a chore. The current chore is terminated with an error status, and a message is written to the server log file indicating that ChoreQuit was called to terminate the chore.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

ChoreQuit;

Arguments

None.

ChoreRollback

ChoreRollback initiates a chore rollback. When used inside a TurboIntegrator process, this function throws out all pending edits and cancels further processing. An error message appears in the tm1server.log and tm1processorerrorXXX.log files.

When used in a single-commit mode chore, ChoreRollback throws out all pending edits from all previous processes and chore execution stops with an error code. When used in a multi-commit mode chore, ChoreRollback throws out all pending edits from the current processes and chore execution stops with an error code. Changes that have already been committed cannot be rolled back.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

ChoreRollback;

Arguments

None.

SetChoreVerboseMessages

SetChoreVerboseMessages is used to turn on (or off) more verbose reporting of messages to the Tm1s.log file. You can use this function to debug chores in which several processes call each other with the ExecuteProcess function.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

SetChoreVerboseMessages(Flag);

Passing a zero value turns off the output of these messages, passing a non-zero value enables the output of more verbose messages. By default this flag is off.
Use this function to turn on (or off) more verbose reporting of messages to the Tm1s.log file. This function is best used as an aid to debugging chores in which several processes call one another through use of the ExecuteProcess function.

Passing a zero value turns off the output of these messages, passing a non-zero value enables the output of more verbose messages. By default this flag is off.

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag</td>
<td>Set to a non-zero value to enable more verbose messaging. Set to zero (default) to turn off verbose messaging.</td>
</tr>
</tbody>
</table>

## Cube Manipulation TurboIntegrator Functions

These functions pertain to manipulating cubes.

### AddCubeDependency

AddCubeDependency lets you predefine cube inter-dependencies to avoid lock contention problems during normal system use.

In normal operations, cube dependencies are established when data which crosses cube boundaries (such as data that is derived by a rule that references an external cube) is retrieved. To create the dependency information, the server must lock the cubes while the dependency is established, potentially maintaining the lock during a long view calculation. Since this is a 'write' lock, other users are prevented from accessing the cubes. The AddCubeDependency function allows the dependency to be established when the server starts up, preventing later lock contention as no new dependency need be established.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```
AddCubeDependency(BaseCube, DependentCube);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaseCube</td>
<td>The name of the cube upon which the DependentCube is dependent.</td>
</tr>
<tr>
<td>DependentCube</td>
<td>The name of a cube that depends on another cube (BaseCube) for data. Most commonly, this would be a cube that uses rules to pull data from an external cube.</td>
</tr>
</tbody>
</table>

#### Example

Consider a cube named 'SalesCube' that includes the rule `['net']=!Units * DB('PriceCube', ... );`

In this example, 'SalesCube' is the dependent cube, as it is dependent on values in the base cube named 'PriceCube' to calculate the value of 'net'. To establish this dependency, you should run the following function in a TurboIntegrator process: `AddCubeDependency('PriceCube', 'SalesCube');`

To establish dependency at server load time, you can create a process that runs the AddCubeDependency function, schedule the process as a chore, and then define that chore as one of the StartupChores in Tm1s.cfg.
**CellGetN**

CellGetN retrieves a value from a numeric cube cell.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

`CellGetN(Cube, e1, e2 [,...en]);`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube from which you want to retrieve a value.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Dimension element names that define the intersection of the cube containing the value to be retrieved. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables. If any of the dimensions in your cube use hierarchies, you can also use the 'HierarchyName': 'ElementName' convention to specify an element within a specific hierarchy. In this case, the sequence of arguments must still adhere to the order of dimensions in the cube. For example, if you want to reference multiple elements from hierarchies in the second dimension of your cube, all such arguments must appear after the argument for the first dimension in the cube and before the argument for the third dimension in the cube.</td>
</tr>
</tbody>
</table>

**Example of CELLGETN and variables**

When this function is used in a conditional statement (IF), the statement is the portion containing the condition, not the entire conditional block. After a minor error, execution continues with the next statement. TurboIntegrator processing has no knowledge that it was in a conditional once the minor error is processed, so the next statement is the next line, not the line after the ENDIF;.

To avoid this situation, use variables for any operation that could encounter a minor error and then use the variables in the conditional statement.

```v1 = CELLGETN('PNLCube', 'fred', 'argentina', 'Sales', 'Jan'); IF (v1 = 454); ASCIIOUTPUT('bug.txt', 'if logic not working properly'); ENDIF;```
**Example of CellGetN without hierarchies**

This example illustrates a function that uses simple element names as arguments and does not reference any hierarchies. It retrieves the numeric value at the intersection of the Actual, Argentina, S Series 1.8L Sedan, Sales, and Jan elements in the Sales cube.

```
CellGetN('Sales', 'Actual', 'Argentina', 'S Series1.8L Sedan', 'Sales', 'Jan');
```

**Example of CellGetN referencing multiple hierarchies**

This example illustrates a function that references multiple hierarchies in the Model dimension. It retrieves the numeric value at the intersection of the Actual, Argentina, S Series (from the vehicles hierarchy in the model dimension), 2.8 Litre (from the enginesize hierarchy in the model dimension), and Jan elements in the Sales cube.

```
CellGetN('Sales', 'Actual', 'Argentina', ('vehicles':'S Series', 'enginesize':'2.8 Litre'), 'Sales', 'Jan');
```

**Note:** This example artificially breaks the line of code for easier reading.

**CellGetS**

CellGetS retrieves a value from a string cube cell.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CellGetS(Cube, e1, e2 [,...en]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube from which you want to retrieve a value.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Dimension element names that define the intersection of the cube containing the value to be retrieved. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.</td>
</tr>
</tbody>
</table>

See the note at “CellGetN” on page 264 concerning IF logic with this function.

**Example**

```
CellGetS('Personnel', 'Rep', 'Europe', 'Product');
```

This example retrieves the string value at the intersection of the Rep, Europe, and Product elements in the Personnel cube.

**CellIncrementN**

CellIncrementN increments an existing numeric cell value by a specified value.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```
CellIncrementN(x, Cube, e1, e2 [,...en]);
```

<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A numeric value that you want to add to an existing cell value.</td>
</tr>
<tr>
<td>Cube</td>
<td>The name of the cube to which you want to send the value.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Dimension element names that define the intersection of the cube to receive the value. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.</td>
</tr>
</tbody>
</table>

**Example**

```
CellIncrementN(1000, 'y2ksales', 'Actual', 'Argentina', 'S Series 1.8L Sedan', 'Sales', 'Jan');
```

This example increments the value at the intersection of the Actual, Argentina, S Series 1.8L Sedan, Sales, and Jan elements in the y2ksales cube by 1000.

**CellIsUpdateable**

CellIsUpdateable determines whether a cube cell can be written to. The function returns 1 if the cell can be written to, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CellIsUpdateable(Cube, e1, e2 [,...en]);
```

<table>
<thead>
<tr>
<th><strong>Argument</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube to which you want to write a value.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Dimension element names that define the cell to which you want to write a value. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.</td>
</tr>
</tbody>
</table>

**Example**

```
CellIsUpdateable ('y2ksales', 'Actual', 'Argentina', 'S Series 1.8L Sedan', 'Sales', 'Jan');
```
This example determines if the cell defined by the elements Actual, Argentina, S Series 1.8L Sedan, Sales, and Jan in the y2ksales cube can be written to. If the cell can receive a value, the function returns 1, otherwise it returns 0.

**CellPutN**

CellPutN sends a numeric value to a cube cell.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CellPutN(x, Cube, e1, e2, ..., en);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>A numeric value.</td>
</tr>
<tr>
<td>Cube</td>
<td>The name of the cube to which you want to send the value.</td>
</tr>
<tr>
<td>e1, e2, ..., en</td>
<td>Dimension element names that define the intersection of the cube to receive the value.</td>
</tr>
</tbody>
</table>

Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.

**Note:** If you supply invalid arguments to the `CellPutN()` function in a TurboIntegrator process when the cube does not exist, an error is sent to the `tm1server.log`.

**Example**

```
CellPutN(12345, 'y2ksales', 'Actual', 'Argentina', 'S Series 1.8L Sedan', 'Sales', 'Jan');
```

This example sends the value 12345 to the intersection of the Actual, Argentina, S Series 1.8L Sedan, Sales, and Jan elements in the y2ksales cube.

**CellPutProportionalSpread**

CellPutProportionalSpread distributes a specified value to the leaves of a consolidation proportional to existing cell values. CellPutProportionalSpread replaces existing cell values; it cannot be used to add to or subtract from existing cell values.

The function is analogous to the Proportional Spread data spreading method, which is described in detail in the *TM1 Perspectives and TM1 Architect* documentation. If you must add to or subtract from existing cell values, use the Proportional Spread method, which can be executed through the user interface or through data spreading syntax.

**Note:** When using CellPutProportionalSpread to distribute a value to the leaves of a consolidation, only those leaves already containing non-zero values are changed. This is because zero values cannot be incremented or decremented proportionally; any proportion of zero is still zero.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

CellPutProportionalSpread( value, cube, e1, e2, e3...,en );

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value you want to distribute.</td>
</tr>
<tr>
<td>cube</td>
<td>The name of the cube into which you want to distribute the value.</td>
</tr>
<tr>
<td>e1...en</td>
<td>The names of the elements that identify the consolidation whose leaves will accept the distributed value. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.</td>
</tr>
</tbody>
</table>

**Example**

CellPutProportionalSpread(7000,'SalesCube', 'Actual','North America', 'S Series 1.8L Sedan', 'Sales', 'Jan')

This example distributes the value 7000 to the children of the consolidation in the SalesCube identified by the elements Actual, North America, S Series 1.8L Sedan, Sales, and Jan.

**CellPutS**

CellPutS sends a string value to a cube cell.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

CellPutS(String, Cube, e1, e2 [,...en]);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>A string.</td>
</tr>
<tr>
<td>Cube</td>
<td>The name of the cube to which you want to send the string.</td>
</tr>
<tr>
<td>e1,...en</td>
<td>Dimension element names that define the intersection of the cube to receive the string. Arguments e1 through en are sequence-sensitive. e1 must be an element from the first dimension of the cube, e2 must be an element from the second dimension, and so on. These arguments can also be the names of aliases for dimension elements or TurboIntegrator variables.</td>
</tr>
</tbody>
</table>
**Example**

```
CellPutS('jones', 'Personnel', 'Rep', 'Europe', 'Product');
```

This example sends the string 'jones' to the intersection of the Rep, Europe, and Product elements in the personnel cube.

**CubeClearData**

CubeClearData clears all of the data in a cube. This function is much faster than doing an operation such as creating a view to cover the entire cube, and then doing a ViewZeroOut() to zero out the entire cube.

When you use CubeClearData to clear data from a cube, any cells in the cube that are fed with feeders are also cleared. You must resave the rule that establishes the feeders or use the CubeProcessFeeders function to restore the fed cells.

This function is valid in TM1 TurboIntegrator processes only.

**Note:** This call just deletes the cube data, it does not delete and re-create the cube itself. This has implications when sandboxes are used. If a cube is deleted and then re-created any sandboxes a user may have will be discarded, since the cube against which those sandboxes were created was deleted (even though a cube may have been re-created with the same name). If however the CubeClearData() call is used, the sandbox data will still be considered valid, since the cube against which the sandbox was created continues to exist.

**Syntax**

```
CubeClearData( name-of-cube-as-string );
```

**Argument**

The name of the cube to clear, as a string.

**Example**

```
CubeClearData( 'expense' );
```

**CubeCreate**

CubeCreate creates a cube from specified dimensions. The order of dimensions specified in the function will be the order of dimensions in the cube definition. After execution, CubeCreate automatically saves the resulting .cub file to disk.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeCreate(Cube, d1, d2 [,...dn]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name you want to assign to the cube.</td>
</tr>
<tr>
<td>d1,...dn</td>
<td>The names of dimensions that comprise the cube. You must specify at least two, but no more than 256, dimensions.</td>
</tr>
</tbody>
</table>
Example

CubeCreate('y2ksales', 'Actvsbud', 'Region', 'Model', 'Account1', 'Month');

This example creates a cube named y2ksales using the dimensions Actvsbud, Region, Model, Account1, and Month.

CubeDestroy

CubeDestroy deletes a specified TM1 cube.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeDestroy(Cube);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube you want to delete.</td>
</tr>
</tbody>
</table>

Example

CubeDestroy('y2ksales');

This example deletes the cube named y2ksales.

CubeDimensionCountGet

CubeDimensionCountGet returns the number of dimensions in a cube.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeDimensionCountGet(CubeName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube for which you want to determine the number of dimensions.</td>
</tr>
</tbody>
</table>

Example

CubeDimensionCountGet('Sales');

In this example, the function returns the number of dimensions in the Sales cube.

CubeExists

CubeExists determines whether a specific cube exists on the server from which a TurboIntegrator process is executed. The function returns 1 if the cube exists on the server, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeExists(CubeName);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube whose existence you want to confirm.</td>
</tr>
</tbody>
</table>

**Example**

CubeExists('Inventory');

This example determines if the Inventory cube exists on the server.

**CubeGetLogChanges**

CubeGetLogChanges returns the Boolean value of the Logging property for a specified cube.

The Logging property is set in the TM1 Security Assignments dialog box and stored in the }CubeProperties control cube. If Logging is turned on for a cube, the function returns 1. If logging is turned off the function returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

CubeGetLogChanges(CubeName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube for which you want to return the value of the Logging property.</td>
</tr>
</tbody>
</table>

**Example**

CubeGetLogChanges('2002sales');

If Logging is turned on for the 2002sales cube, the function returns 1.

**CubeSaveData**

CubeSaveData() serializes a cube.

This function is valid in TM1 TurboIntegrator processes only.

To improve performance, transaction logging may be disabled while loading data. To safeguard newly loaded data in the unlikely event of a server crash, the changes can be serialized to disk. SaveDataAll has been used to serialize data to disk and to truncate the transaction log. When processing a SaveDataAll command, the server acquires a READ lock on every cube and an IX lock on every changed cube. This can cause significant contention with user activity if SaveDataAll is run during periods of user activity.

Typically not all the cubes affected by SaveDataAll need to be serialized since not all cubes are typically loaded with new data. CubeSaveData is used to serialize an individual cube to disk. CubeSaveData serializes the cube's data that has been committed to memory including the modifications that have been performed against it in the current TurboIntegrator process but not yet committed.

**Syntax**

CubeSaveData(Cube);
**Argument** | **Description**
---|---
Cube | The name of the cube you want to serialize.

**Example**

```
CubeSaveData ('SalesCube');
```

Consider the following TurboIntegrator process code:

```
CellPutN(500, 'y2ksales', 'Actual', 'Argentina', 'S Series 1.8 L Wagon', 'Sales', 'Jan');
CubeSaveData('y2ksales');
CellPutN(1000, 'y2ksales', 'Actual', 'Argentina', 'S Series 1.8 L Wagon', 'Sales', 'Jan');
```

When the CubeSaveData command is processed, the value of 500 for the January Sales cell will be included in the cube's serialization to disk, even though it has not yet been committed. The update of the January Sales cell to 1000 will not be part of the serialization.

**Transaction Log**

A new transaction entry appears in the Transaction log when CubeSaveData has been run. When processing a transaction log file during recovery, all updates to a cube that have been applied so far will be discarded when a CubeSaveData directive against the cube is encountered as all of the updates have already been serialized to the cube.

**Server Crash Recovery**

The SaveDataAll command takes advantage of the fact that all cubes are locked during its processing and truncates the transaction log knowing that all updates performed before serialization have been safely stored to disk. This is not the case for CubeSaveData so you must modify the way data recovery is performed when a cube has been serialized.

The transaction log file could contain records that represent changes that are older than the most recent data in the cube and should not be applied when data is being recovered.

**CubeSetConnParams**

CubeSetConnParams is used to encrypt the password for a virtual cube in the `CubeProperties` cube. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeSetConnParams(cubeName, providerName, dataSourceLocation, dataSourceName, dataSourceCatalog, userID, password, sapClientID, sapClientLang, providerString);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cubeName</td>
<td>The name of the cube for which you want to set the password.</td>
</tr>
<tr>
<td>providerName</td>
<td></td>
</tr>
<tr>
<td>dataSourceLocation</td>
<td>Name your administrator assigns to a set of catalogs at a particular location. In Microsoft Analysis Services, this is the name of a registered server.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>dataSourceName</td>
<td>The name assigned by your administrator to a particular collection of databases (Cubes, Dimensions and other objects). For MAS, this is the name of the database.</td>
</tr>
<tr>
<td>dataSource catalog</td>
<td></td>
</tr>
<tr>
<td>UserID</td>
<td>A valid username for the database.</td>
</tr>
<tr>
<td>Password</td>
<td>Password to use for this data source.</td>
</tr>
<tr>
<td>sapClientID</td>
<td>SAP client ID</td>
</tr>
<tr>
<td>sapClientLang</td>
<td>SAP language setting.</td>
</tr>
<tr>
<td>providerString</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

CubeSetConnParams(sc, TM1OLAP, tm1server, , sdata, admin, apple, , , );

**CubeSetLogChanges**

CubeSetLogChanges sets the Logging property for a cube.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

CubeSetLogChanges(Cube, LogChanges);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube for which you want to set the LOGGING property.</td>
</tr>
<tr>
<td>LogChanges</td>
<td>The Boolean value you want to assign to the property. 1= LOGGING on, 0 = LOGGING off.</td>
</tr>
</tbody>
</table>

**CubeTimeLastUpdated**

CubeTimeLastUpdated returns a serial value that indicates the date and time at which a specified cube was last updated.

The serial value that is returned by this function uses a starting time of Jan 1 1900 12:00:00 A.M., which is equivalent to the value 1.0. Dates are represented by integers, while times are represented as decimal numbers between .0 and .999999. This is consistent with the way date and time serial values are stored and reported in Microsoft Excel.

**Note:** By default, TM1 date and time serial values use a starting time of Jan 1 1960 12:00:00 A.M. To resolve the inconsistency between Excel and TM1 date and time serial values, you can set UseExcelSerialDate=T in your Tm1s.cfg file to instruct the TM1 server to use date and time serial values that conform to Excel standards.

This function is valid in TM1 TurboIntegrator processes only.
Syntax
CubeTimeLastUpdated(cube);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td>The name of the cube.</td>
</tr>
</tbody>
</table>

Example
CubeTimeLastUpdated('Sales');

This example returns a value corresponding to the time when the Sales cube was last updated.

CubeUnload
CubeUnload unloads a specified cube, along with all associated cube views, from memory.
This function is valid in TM1 TurboIntegrator processes only.

Syntax
CubeUnload(CubeName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube you want to unload from memory.</td>
</tr>
</tbody>
</table>

Example
CubeUnload('ManufacturingBudget');

This example unloads the ManufacturingBudget cube, and any associated views, from server memory.

Data Reservation TurboIntegrator Functions
Use the following TurboIntegrator functions to programmatically obtain, release and manage Data Reservations.

For more details about using the Data Reservation feature, see "Using Data Reservations" in the IBM Cognos TM1 for Developers documentation.

CubeDataReservationAcquire
CubeDataReservationAcquire acquires a Data Reservation for the specified cube, user and tuple.
This function is valid in TM1 TurboIntegrator processes only.

Syntax
CubeDataReservationAcquire(Cube, User, bForce, Address, [AddressDelimiter])

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
</tbody>
</table>
**Argument** | **Description**
--- | ---
User | Name of the owner for the new reservation. The user name supplied will be validated to make sure it is an existing user.
bForce | Boolean value that determines the behavior if the requested reservation conflicts with an existing reservation. If set to 0 (false), then the request is rejected if it conflicts with an existing reservation. If set to 1 (true) and the user running the TurboIntegrator process has the DataReservationOverride capability, then the conflicting reservations are released, and the requested one is granted.
Address | Tokenized string sequence of element names that define the tuple. The order must match the original dimension order of the cube. All the cells in the cube contained by the tuple make up the region being reserved. You can choose one element from each dimension or use an empty string between the delimiters to select an entire dimension. Depending on where the element is located in the hierarchy, the request reserves a single cell, a slice, or the entire cube.
AddressDelimiter | Optional character string that is used to separate element names in the Address parameter. Default value is '|'.

**Return Value**
Boolean - returns true if the acquisition succeeded.

**Example**
```python
CubeDataReservationAcquire('DRTestCube','User1',0,'ElemX|ElemY|ElemZ');
```
The following example sets the bForce parameter to 1 to force the DR request if a conflict exists and uses a different delimiter character for the AddressDelimiter parameter.
```python
CubeDataReservationAcquire('DRTestCube','User2',1,'ElemX*ElemY*ElemZ','*');
```

**CubeDataReservationRelease**
CubeDataReservationRelease releases the specified Data Reservation.
If the user specified is not the same as the owner of the reservation, then the release will only succeed if the user specified has the DataReservationOverride capability enabled.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**
```python
CubeDataReservationRelease(Cube, User, Address,[AddressDelimiter])
```

**Argument** | **Description**
--- | ---
Cube | Name of the cube.
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Name of the owner of the reservation. The user name supplied will be validated to make sure it is an existing user.</td>
</tr>
<tr>
<td>Address</td>
<td>Tokenized string sequence of element names that define the tuple. The order must match the original dimension order of the cube.</td>
</tr>
<tr>
<td>AddressDelimiter</td>
<td>Optional character string that is used to separate element names in the Address parameter. Default value is '</td>
</tr>
</tbody>
</table>

**Return Value**

Boolean - returns true if the release succeeded.

**Example**

```plaintext
CubeDataReservationRelease('DRTestCube','User1','ElemX|ElemY|ElemZ');
```

The following example uses a different character for the AddressDelimiter parameter.

```plaintext
CubeDataReservationRelease('DRTestCube','User2','ElemX*ElemY*ElemZ','*');
```

### CubeDataReservationReleaseAll

CubeDataReservationReleaseAll releases multiple existing Data Reservations.

All reservations fully contained by the specified address that match the user filter will be released. A blank user filter means all users.

If the user filter specified is not the same as the user running the TurboIntegrator proces, then the DataReservationOverride capability must be enabled.

Using a blank user filter and all wildcards in the address field releases all reservations.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
CubeDataReservationReleaseAll(Cube, UserFilter, Address, [AddressDelimiter])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>UserFilter</td>
<td>User name filter to match against existing reservations.</td>
</tr>
<tr>
<td>Address</td>
<td>Tokenized string sequence of element names that define the tuple. The order must match the original dimension order of the cube.</td>
</tr>
<tr>
<td>AddressDelimiter</td>
<td>Optional character string that is used to separate element names in the Address parameter. Default value is '</td>
</tr>
</tbody>
</table>
Return Value

Boolean - returns true if no errors.

Example

CubeDataReservationReleaseAll('DRTestCube','User1','ElemX|ElemY|ElemZ');

The following example releases all reservations in the specified cube for all users.

CubeDataReservationReleaseAll('DRTestCube','','||');

CubeDataReservationGet

CubeDataReservationGet finds existing reservations on a specific cube for all or one user.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeDataReservationGet(Index, Cube, User, [AddressDelimiter]) returns Address;

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>A one-based loop index to use for iterating through reservations on the</td>
</tr>
<tr>
<td></td>
<td>specified cube.</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube to search.</td>
</tr>
<tr>
<td>User</td>
<td>Reservation owner name to use as a filter.</td>
</tr>
<tr>
<td></td>
<td>If left blank, the function returns reservations for any owner.</td>
</tr>
<tr>
<td></td>
<td>If a name is provided, the function filters the results for just the</td>
</tr>
<tr>
<td></td>
<td>specified owner.</td>
</tr>
<tr>
<td>AddressDelimiter</td>
<td>Optional character string that is used to separate element names in the</td>
</tr>
<tr>
<td></td>
<td>returned Address parameter.</td>
</tr>
<tr>
<td></td>
<td>Default value is '</td>
</tr>
</tbody>
</table>

Return Value

Address - Reservation creation time, name of the reservation owner and Element address of the reservation. Creation time comes first, followed by delimiter, followed by UserID, followed by delimiter, followed by Elements IDs separated by the delimiter in order of dimensions in the cube (original order).

An empty string is returned if there is no entry for the specified index.

The format of the return value is:

[creation time][delimiter][owner name][delimiter][element1][delimiter] [element2][delimiter]...[elementN]

For example:

"20100622211601|Fred Bloggs|Element1|Element2|Element3"

Note: The reservations can change while iterating the list of reservations so the use of index is not guaranteed to give a complete list of reservations. Reservations can be added or removed at any position in the list, so reservations can be skipped or repeated when looping through index values.
If the owner filter is specified, then the index applies only to the members of the filtered list. If the list of reservations has owners as follows: User1, User1, User2 and the request specifies an owner of User2 then an index of 1 will retrieve the third member of the list.

**Example**

<table>
<thead>
<tr>
<th>CubeDataReservationGet(1, 'DRTCTestCube', 'User1', '*');</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeDataReservationGet(1, 'DRTCTestCube', '');</td>
</tr>
</tbody>
</table>

The following sample would find all the reservations owned by user Fred Bloggs in the Expense Input cube and do "something useful" with them:

```plaintext
vIndex = 1;
vCube = 'Expense Input';
vUserFilter = 'Fred Bloggs';
vDelimiter = '|';
vAddress = CubeDataReservationGet( vIndex, vCube, vUserFilter, vDelimiter);
WHILE (vAddress @<> ' '){
  vSep1 = SCAN( vDelimiter, vAddress);
  vDRUser = SUBST( vAddress, 1, vSep1 - 1);
  vDRAddress = SUBST( vAddress, vSep1 + 1, LONG(vDRAddress) - vSep1);
  # do something meaningful with the user and reservation address here
  vIndex = vIndex + 1;
  vAddress = CubeDataReservationGet( vIndex, vCube, vUserFilter, vDelimiter);
}END;
```

**CubeDataReservationGetConflicts**

CubeDataReservationGetConflicts finds existing reservations on a specific cube that would conflict with the specified user, address and tuple.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeDataReservationGetConflicts(Index, Cube, User, Address, [AddressDelimiter])returns ConflictAddress;
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>A one-based loop index to use for iterating through conflicts that satisfy this query.</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube to search</td>
</tr>
<tr>
<td>User</td>
<td>The query will search for reservations that will conflict with this user.</td>
</tr>
<tr>
<td>Address</td>
<td>Tokenized string sequence of element names that define the tuple. The order must match the original dimension order of the cube.</td>
</tr>
<tr>
<td>AddressDelimiter</td>
<td>Optional character string that is used to separate element names in the Address parameter. Default value '</td>
</tr>
</tbody>
</table>

**Return Value**

ConflictAddress - Reservation creation time, name of the reservation owner and Element address of the reservation. The creation time comes first, followed by delimiter, followed by UserID, followed by
delimiter, followed by Elements IDs separated by the delimiter in order of dimensions in the cube (original order).

An empty string is returned if there is no entry for the specified index.

The format of the return value is:

```
[creation time][delimiter][owner name][delimiter][element1][delimiter]
[element2][delimiter]..[delimiter][elementN]
```

For example:
"20100622211601|Fred Bloggs|Element1|Element2|Element3"

**Note:** The reservations can change while iterating the list of conflict reservations so the use of index is not guaranteed to give a complete list of reservations. Reservations can be added or removed at any position in the list, so reservations can be skipped or repeated when looping through index values.

**CubeDRAcquire**

CubeDRAcquire acquires a Data Reservation for the specified cube, user and tuple. While the CubeDataReservationAcquire applies to dimensions with a single hierarchy, this function applies to dimensions with one or more hierarchies.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeDRAcquire(Cube, User, bForce, Element-list)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>User</td>
<td>Name of the owner for the new reservation. The user name supplied will be validated to make sure it is an existing user.</td>
</tr>
<tr>
<td>bForce</td>
<td>Boolean value that determines the behavior if the requested reservation conflicts with an existing reservation.</td>
</tr>
<tr>
<td></td>
<td>If set to 0 (false), then the request is rejected if it conflicts with an existing reservation.</td>
</tr>
<tr>
<td></td>
<td>If set to 1 (true) and the user running the TurboIntegrator process has the DataReservationOverride capability, then the conflicting reservations are released, and the requested one is granted.</td>
</tr>
<tr>
<td>Element-list</td>
<td>Coordinates are expressed as a variable-length list of individual element name arguments. Each of the element name parameters is expected to be hierarchy-qualified. If the dimension has one hierarchy only, then use the name of the dimension. Otherwise, use the name of the intended hierarchy. Elements are specified in a '&lt;hierarchy&gt;':'&lt;element&gt;' format, with each instance separated by a comma.</td>
</tr>
</tbody>
</table>

**Return Value**

Boolean - returns true if the acquisition succeeded.
Example

CubeDRAcquire('DRTestCube','User1',0,'Hier1':'ElemX','Hier2':'ElemY','Hier3':'ElemZ');

The following example sets the bForce parameter to 1 to force the DR request if a conflict exists and uses a different delimiter character for the AddressDelimiter parameter.

CubeDRAcquire('DRTestCube','User2',1,'Hier1':'ElemX','Hier2':'ElemY','Hier3':'ElemZ');

CubeDRRelease

CubeDRRelease releases the specified Data Reservation. While the CubeDataReservationRelease applies to dimensions with a single hierarchy, this function applies to dimensions with one or more hierarchies.

If the user specified is not the same as the owner of the reservation, then the release will only succeed if the user specified has the DataReservationOverride capability enabled.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeDRRelease(Cube, User, Element-list)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>User</td>
<td>Name of the owner of the reservation.</td>
</tr>
<tr>
<td></td>
<td>The user name supplied will be validated to make sure it is an existing user.</td>
</tr>
<tr>
<td>Element-list</td>
<td>Coordinates are expressed as a variable-length list of individual element name arguments. Each of the element name parameters is expected to be hierarchy-qualified. If the dimension has one hierarchy only, then use the name of the dimension. Otherwise, use the name of the intended hierarchy. Elements are specified in a '&lt;hierarchy&gt;':'&lt;element&gt;' format, with each instance separated by a comma.</td>
</tr>
</tbody>
</table>

Return Value

Boolean - returns true if the release succeeded.

Example

CubeDRRelease('DRTestCube','User1','Hier1':'ElemX','Hier2':'ElemY','Hier3':'ElemZ');

The following example uses a different character for the AddressDelimiter parameter.

CubeDRRelease('DRTestCube','User2','Hier1':'ElemX','Hier2':'ElemY','Hier3':'ElemZ');

CubeDRReleaseAll

CubeDRReleaseAll releases multiple existing Data Reservations. While the CubeDataReservationReleaseAll applies to dimensions with a single hierarchy, this function applies to dimensions with one or more hierarchies.

All reservations fully contained by the specified address that match the user filter will be released. A blank user filter means all users.
If the user filter specified is not the same as the user running the TurboIntegrator process, then the DataReservationOverride capability must be enabled.

Using a blank user filter and all wildcards in the address field releases all reservations. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeDRReleaseAll(Cube, UserFilter, Element-list)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>UserFilter</td>
<td>User name filter to match against existing reservations.</td>
</tr>
<tr>
<td>Element-list</td>
<td>Coordinates are expressed as a variable-length list of individual element</td>
</tr>
<tr>
<td></td>
<td>name arguments. Each of the element name parameters is expected to be</td>
</tr>
<tr>
<td></td>
<td>hierarchy-qualified. If the dimension has one hierarchy only, then use the</td>
</tr>
<tr>
<td></td>
<td>name of the dimension. Otherwise, use the name of the intended hierarchy.</td>
</tr>
<tr>
<td></td>
<td>Elements are specified in a '&lt;hierarchy&gt;':'&lt;element&gt;' format, with each</td>
</tr>
<tr>
<td></td>
<td>instance separated by a comma.</td>
</tr>
</tbody>
</table>

**Return Value**

Boolean - returns true if no errors.

**Example**

```
CubeDRReleaseAll('DRTestCube','User1','Hier1':'ElemX','Hier2':'ElemY','Hier3':'ElemZ');
```

The following example releases all reservations in the specified cube for all users.

```
CubeDRReleaseAll('DRTestCube','','');
```

**CubeDRGet**

CubeDRGet finds existing reservations on a specific cube for all or one user. While the CubeDataReservationGet applies to dimensions with a single hierarchy, this function applies to dimensions with one or more hierarchies. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeDRGet(Index, Cube, User, Element-list) returns Address;
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>A one-based loop index to use for iterating through reservations on the</td>
</tr>
<tr>
<td></td>
<td>specified cube.</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube to search.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| User       | Reservation owner name to use as a filter.  
If left blank, the function returns reservations for any owner.  
If a name is provided, the function filters the results for just the specified owner. |
| Element-list | Coordinates are expressed as a variable-length list of individual element name arguments. Each of the element name parameters is expected to be hierarchy-qualified. If the dimension has one hierarchy only, then use the name of the dimension. Otherwise, use the name of the intended hierarchy.  
Elements are specified in a `<hierarchy>`:`<element>` format, with each instance separated by a comma. |

**Return Value**

Address - Reservation creation time, name of the reservation owner and Element address of the reservation. Creation time comes first, followed by delimiter, followed by UserID, followed by delimiter, followed by Elements IDs separated by the delimiter in order of dimensions in the cube (original order).

An empty string is returned if there is no entry for the specified index.

The format of the return value is:

```
[creation time][delimiter][owner name][delimiter][element1][delimiter]
[element2][delimiter]...[elementN]
```

For example:

```
"20100622211601|Fred Bloggs|Element1|Element2|Element3"
```

**Note:** The reservations can change while iterating the list of reservations so the use of index is not guaranteed to give a complete list of reservations. Reservations can be added or removed at any position in the list, so reservations can be skipped or repeated when looping through index values.

If the owner filter is specified, then the index applies only to the members of the filtered list. If the list of reservations has owners as follows: User1, User1, User2 and the request specifies an owner of User2 then an index of 1 will retrieve the third member of the list.

**Example**

```vbnet
CubeDRGet(1, 'DRTestCube', 'User1', '*');
CubeDRGet(1, 'DRTestCube', '');
```

The following sample would find all the reservations owned by user Fred Bloggs in the Expense Input cube and do "something useful" with them:

```vbnet
vIndex = 1;
vCube = 'Expense Input';
vUserFilter = 'Fred Bloggs';
vHier = 'Currency';
vElem = 'Local Currency';
vAddress = CubeDRGet( vIndex, vCube, vUserFilter, vHier:vElem);
WHILE (vAddress @<> '');
vSep1 = SCAN( vHier:vElem, vAddress);
    vDRUser = SUBST( vAddress, 1, vSep1 - 1);
    vDRAddress = SUBST( vAddress, vSep1 + 1, LONG(vDRAddress) - vSep1);
    # do something meaningful with the user and reservation address here
    vIndex = vIndex + 1;
```
CubeDRGetConflicts

CubeDRGetConflicts finds existing reservations on a specific cube that would conflict with the specified user. While the CubeDataReservationGetConflicts applies to dimensions with a single hierarchy, this function applies to dimensions with one or more hierarchies.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

CubeDRGetConflicts(Index, Cube, User, Element-list) returns ConflictAddress;

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>A one-based loop index to use for iterating through conflicts that satisfy this query.</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube to search</td>
</tr>
<tr>
<td>User</td>
<td>The query will search for reservations that will conflict with this user.</td>
</tr>
<tr>
<td>Element-list</td>
<td>Coordinates are expressed as a variable-length list of individual element name arguments. Each of the element name parameters is expected to be hierarchy-qualified. If the dimension has one hierarchy only, then use the name of the dimension. Otherwise, use the name of the intended hierarchy. Elements are specified in a '&lt;hierarchy&gt;':'&lt;element&gt;' format, with each instance separated by a comma.</td>
</tr>
</tbody>
</table>

Return Value

ConflictAddress - Reservation creation time, name of the reservation owner and Element address of the reservation. The creation time comes first, followed by delimiter, followed by UserID, followed by delimiter, followed by Elements IDs separated by the delimiter in order of dimensions in the cube (original order).

An empty string is returned if there is no entry for the specified index.

The format of the return value is:

```
[creation time][delimiter][owner name][delimiter][element1][delimiter]
[element2][delimiter]...[elementN]
```

For example:

"20100622211601|Fred Bloggs|Element1|Element2|Element3"

**Note:** The reservations can change while iterating the list of conflict reservations so the use of index is not guaranteed to give a complete list of reservations. Reservations can be added or removed at any position in the list, so reservations can be skipped or repeated when looping through index values.

Date and Time TurboIntegrator Functions

These functions format and parse dates and times in a wide variety of formats and locales.
**FormatDate**

FormatDate formats a date value according to a formatter defined with the NewDateFormatter function. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
FormatDate(Date, <Pattern>, <Index>)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
</table>
| Date      | A date value.  
The type of value, serial or UNIX, should correspond to the formatter used. |
| Pattern   | Pattern used for formatting dates.  
Refer to http://userguide.icu-project.org/formatparse/datetime for a complete list of format syntax.  
If an empty string is passed, then the format is determined by the locale based on the FormatterStyle and FormatterType parameters that were used with the NewDateFormatter function. |
| Index     | Index returned by a call to the NewDateFormatter function.  
The default value is 0.  
If no date formatter exists at the index, then a default formatter is used as though it had been created with the following call:  
NewDateFormatter('', 'Etc/UTC', 'serial', 'medium', 'date') |

**Example**

```plaintext
sDate = FormatDate(18000);
```

**NewDateFormatter**

NewDateFormatter defines a date formatter. It returns an index for use in the ParseDate and FormatDate functions. The indices start at 0 and go up by one for each call to NewDateFormat. Date formatters are valid during execution of the process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
NewDateFormatter(Locale, <TimeZone>, <UseUNIXTime>, <FormatterStyle>, <FormatterType>, <TimeType>)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
</table>
| Locale    | Locale used for parsing or formatting dates.  
If an empty string is passed, then the operating system locale is used. Locales are specified in the format language[_territory][.variant]. For example, cs_CK is the Czech language and Czech Republic. |
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TimeZone</strong></td>
<td>Timezone used for parsing or formatting dates. Refer to <a href="http://en.wikipedia.org/wiki/List_of_tz_database_time_zones">http://en.wikipedia.org/wiki/List_of_tz_database_time_zones</a> for a complete list of time zones. If not specified, the time zone used is UTC (’Etc/UTC’).</td>
</tr>
<tr>
<td><strong>UseUNIXTime</strong></td>
<td>If ‘unix’ is specified, then times are treated as milliseconds since January 1, 1970. Otherwise, they are treated in TM1 serial format. Note that only dates later than January 1, 1970 can be processed even if TM1 serial format is used.</td>
</tr>
<tr>
<td><strong>FormatterStyle</strong></td>
<td>Controls the date format used when an empty pattern is specified to the FormatDate or ParseDate functions. Valid values are ‘full’, ‘long’, ‘medium’ or ‘short’. The default is ‘medium’.</td>
</tr>
<tr>
<td><strong>FormatterType</strong></td>
<td>Controls the type of format used when an empty pattern is specified to the FormatDate or ParseDate functions. Valid values are ‘time’, ‘date’ or ‘datetime’. The default is ‘date’.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
dfUNIX = NewDateFormatter('', 'Etc/UTC', 'unix');
dfStyleFullDateTime = NewDateFormatter('en_us', 'America/Toronto', 'serial', 'full', 'datetime');
```

**ParseDate**

ParseDate parses a date string according to a formatter defined with the NewDateFormatter function. A date value that is either serial or UNIX, depending on the formatter specified, is returned. If the date cannot be parsed then an undefined value is returned. This can be tested with the ISUND function. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ParseDate (DateString, <Pattern>, <Index>)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DateString</strong></td>
<td>A date string.</td>
</tr>
<tr>
<td><strong>Pattern</strong></td>
<td>Pattern used for parsing dates. Refer to <a href="http://userguide.icu-project.org/formatparse/datetime">http://userguide.icu-project.org/formatparse/datetime</a> for a complete list of format syntax. If an empty string is passed, then the format is determined by the locale based on the FormatterStyle and FormatterType parameters that were used with the NewDateFormatter function.</td>
</tr>
</tbody>
</table>
## Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>Index returned by a call to the NewDateFormatter function. The default value is 0. If no date formatter exists at the index, then a default formatter is used as though it had been created with the following call: NewDateFormatter('', 'Etc/UTC', 'serial', 'medium', 'date')</td>
</tr>
</tbody>
</table>

### Example

```java
nDate = ParseDate('2011/11/24', 'yyyy/MM/dd');
```

---

### Dimension Manipulation TurboIntegrator Functions

These functions facilitate the manipulation of dimensions.

#### DimensionCreate

DimensionCreate creates a new dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```java
DimensionCreate(DimName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name you want to assign to the dimension.</td>
</tr>
</tbody>
</table>

**Example**

```java
DimensionCreate('Product');
```

This example creates the Product dimension.

#### DimensionDeleteAllElements

DimensionDeleteAllElements deletes all the elements in a dimension. This function is useful for recreating dimension hierarchies.

**Note:** Deleting an element deletes all cube data identified by that element. However, if you use DimensionDeleteAllElements to delete elements, then recreate those elements with the same names in the Metadata tab, any data points in a cube identified by the elements will be retained after rebuilding the dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```java
DimensionDeleteAllElements(DimName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension from which you want to delete all elements.</td>
</tr>
</tbody>
</table>
Example

```
DimensionDeleteAllElements('Model');
```

This example deletes all elements in the Model dimension.

**DimensionDeleteElements**

DimensionDeleteElements deletes all elements from a dimension using the subset of elements. All elements in the referenced subset are deleted, including C level elements.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionDeleteElements (DimensionName, Subset )
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimensionName</td>
<td>The name of the dimension from which you want to delete the subset of elements.</td>
</tr>
<tr>
<td>Subset</td>
<td>The list of elements to delete from the indicated dimension. The subset is usually temporary.</td>
</tr>
</tbody>
</table>

**DimensionDestroy**

DimensionDestroy deletes a dimension from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionDestroy(DimName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```
DimensionDestroy('Product');
```

This example deletes the Product dimension from the TM1 database.

**DimensionElementComponentAdd**

DimensionElementComponentAdd adds a component (child) to a consolidated element. You can't use this function in the Epilog procedure of a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionElementComponentAdd(DimName, ConsolidatedElName, ElName, ElWeight);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element.</td>
</tr>
<tr>
<td>ElWeight</td>
<td>The weight of the child element.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DimensionElementComponentAdd('Measures', 'Net Sales', 'Expenses', -1);
```

This example adds the child Expenses to the Net Sales consolidation in the Measures dimension. The child has a weight of -1 in the consolidation.

**DimensionElementComponentAddDirect**

DimensionElementComponentAddDirect adds a component (child) to a consolidated element by directly editing a dimension.

This function is valid in TM1 TurboIntegrator processes only.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like `DimensionElementComponentAdd`) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```plaintext
DimensionElementComponentAddDirect(DimName, ConsolidatedElName, ElName, ElWeight);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element.</td>
</tr>
<tr>
<td>ElWeight</td>
<td>The weight of the child element.</td>
</tr>
</tbody>
</table>

**Example**

```
DimensionElementComponentAddDirect('Measures', 'Net Sales', 'Expenses', -1);
```

This example adds the child Expenses to the Net Sales consolidation in the Measures dimension. The child has a weight of -1 in the consolidation.

**DimensionElementComponentDelete**

DimensionElementComponentDelete deletes a component (child) from a consolidated element. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionElementComponentDelete(DimName, ConsolidatedElName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```
DimensionElementComponentDelete('Region', 'Benelux', 'Belgium');
```

This example deletes the Belgium child from the Benelux consolidation in the Region dimension.

**DimensionElementComponentDeleteDirect**

DimensionElementComponentDeleteDirect deletes a component (child) from a consolidated element by directly editing the dimension. This function is valid in TM1 TurboIntegrator processes only.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like DimensionElementComponentDelete) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:
• When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.

• When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```plaintext
DimensionElementComponentDeleteDirect(DimName, ConsolidatedElName,ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DimensionElementComponentDeleteDirect('Region', 'Benelux','Belgium');
```

This example deletes the Belgium child from the Benelux consolidation in the Region dimension.

**DimensionElementDelete**

DimensionElementDelete deletes an element from a dimension.

**Note:** Deleting an element deletes all cube data identified by that element.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DimensionElementDelete(DimName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension that contains the element you want to delete.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DimensionElementDelete('Region', 'Belgium');
```

This example deletes the element Belgium from the Region dimension.
**DimensionElementDeleteDirect**

DimensionElementDeleteDirect deletes an element from a dimension by directly editing the dimension. This function is valid in TM1 TurboIntegrator processes only.

**Note:** Deleting an element deletes all cube data identified by that element.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like DimensionElementDelete) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```plaintext
DimensionElementDeleteDirect(DimName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension that contains the element you want to delete.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DimensionElementDeleteDirect('Region', 'Belgium');
```

This example deletes the element Belgium from the Region dimension.

**DimensionElementExists**

DimensionElementExists determines whether a specific element exists in a dimension on the server from which a TurboIntegrator process is executed. The function returns 1 if the element exists in the dimension on the server, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DimensionElementExists(DimName, ElName);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension that contains the element that you want to find. The dimension must exist on the server where the TurboIntegrator process is executed.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element that you want to find.</td>
</tr>
</tbody>
</table>

**Example**

This example determines whether the element Belgium exists in the Region dimension on the server.

```plaintext
DimensionElementExists('Region', 'Belgium');
```

**DimensionElementInsert**

DimensionElementInsert adds an element to a dimension. You can use this function to add numeric, string, or consolidated elements. You can't use this function in the Data or Epilog procedures of a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DimensionElementInsert(DimName, InsertionPoint, ElName, ElType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension to which you want to add an element.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The element being added to the dimension will be inserted immediately before this existing element. If this parameter is an empty string ('&quot;'), the new element is added to the end of the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name that you want to assign to the new element.</td>
</tr>
<tr>
<td>ElType</td>
<td>The element type. There are three possible ElType values: N - Signifies a numeric element. S - Signifies a string element. C - Signifies a consolidated element.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DimensionElementInsert('Region', 'Belgium', 'Netherlands', 'S');
```

This example adds the string element Netherlands to the Region dimension. Netherlands is added immediately before Belgium in the dimension.
Example with an empty insertion point

```java
DimensionElementInsert('Region','','Netherlands','S');
```

This example adds the string element Netherlands to the Region dimension. Netherlands is added to the end of the dimension.

**DimensionElementInsertDirect**

DimensionElementInsertDirect adds an element to a dimension by directly editing the dimension. You can use this function to add numeric, string, or consolidated elements.

This function is valid in TM1 TurboIntegrator processes only.

The default method of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like DimensionElementInsert) are used in the metadata tab of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element insertion needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```java
DimensionElementInsertDirect(DimName, InsertionPoint, ElName, ElType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension to which you want to add a new element.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The element being added to the dimension will be inserted immediately before this existing element. If this parameter is empty, the new element is added to the end of the dimension. Note that this function is optimized for the case where the InsertionPoint is passed as an empty string.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new element.</td>
</tr>
</tbody>
</table>
### ElType

The element type. There are three possible ElType values:

- **N** - Signifies a numeric element.
- **S** - Signifies a string element.
- **C** - Signifies a consolidated element.

### Example

```plaintext
DimensionElementInsertDirect('Region', 'Belgium', 'Netherlands','N');
```

This example adds the numeric element Netherlands to the Region dimension. Netherlands displays immediately before Belgium in the dimension definition.

### DimensionElementPrincipalName

DimensionElementPrincipalName returns the principal name of an element or element alias.

TurboIntegrator must use principal element names when updating dimensions; element aliases cannot be used. This function is useful for determining principal element names while attempting to update a dimension when only element aliases are available to the TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```plaintext
DimensionElementPrincipalName( DimName, ElName )
```

#### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension from which you want to retrieve a principal element name.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element name. ElName can be either an element alias or a principal element name.</td>
</tr>
</tbody>
</table>

#### Example

If ElName is not in the currently saved version of DimName, the function returns ElName.

If ElName is in DimName, whether as an element alias or a principal element name, it returns the principal name of the element.

### DimensionExists

DimensionExists determines whether a specific dimension exists on the server from which a TurboIntegrator process is executed. The function returns 1 if the dimension exists on the server, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

```plaintext
DimensionExists(DimName);
```
**Argument** | **Description**
--- | ---
DimName | The name of the dimension whose existence you want to confirm.

**Example**

`DimensionExists('Region');`

This example determines if the Region dimension exists on the server.

**DimensionHierarchyCreate**

DimensionHierarchyCreate creates a new hierarchy in an existing dimension. The hierarchy cannot have the same name as the dimension.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

`DimensionHierarchyCreate(DimName, HierName);`

**Argument** | **Description**
--- | ---
DimName | The name of the existing dimension that will contain the hierarchy.
HierName | The name that you want to assign to the hierarchy. You cannot use the name of the dimension.

**Example**

`DimensionHierarchyCreate('Vehicles', 'Trucks');`

This example creates the empty Trucks hierarchy in the Vehicles dimension.

**DimensionSortOrder**

DimensionSortOrder sets a sort type and sense for dimension elements and for components of consolidated elements within a dimension. The sort order defined by DimensionSortOrder determines how the subset displays in the Subset Editor.

DimensionSortOrder sets properties for a dimension; the dimension is not actually sorted until it is saved on the server.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

`DimensionSortOrder(DimName, CompSortType, CompSortSense, ElSortType, ElSortSense);`

**Argument** | **Description**
--- | ---
DimName | The name of the dimension for which you want to set a sort order.
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CompSortType</td>
<td>Defines how components of consolidated elements appear in the dimension. There are two CompSortType values:</td>
</tr>
<tr>
<td></td>
<td>ByInput - Retains the order in which components were originally inserted into consolidations.</td>
</tr>
<tr>
<td></td>
<td>ByName - Sorts components of consolidations by name.</td>
</tr>
<tr>
<td>CompSortType</td>
<td>Defines the sort sense for components of consolidations. This is a required argument, but it applies only when the CompSortType is ByName.</td>
</tr>
<tr>
<td></td>
<td>There are two possible CompSortSense values:</td>
</tr>
<tr>
<td></td>
<td>Ascending - Sorts components of consolidations in ascending alphabetical order.</td>
</tr>
<tr>
<td></td>
<td>Descending - Sorts components of consolidations in descending alphabetical order.</td>
</tr>
<tr>
<td>ElSortType</td>
<td>Defines a sort order for dimension elements. There are four possible ElSortType values:</td>
</tr>
<tr>
<td></td>
<td>ByInput - Retains the order in which elements were originally inserted into the dimension.</td>
</tr>
<tr>
<td></td>
<td>ByName - Sorts dimension elements by name.</td>
</tr>
<tr>
<td></td>
<td>ByLevel - Sorts dimension elements by level.</td>
</tr>
<tr>
<td></td>
<td>ByHierarchy - Sorts dimension elements by hierarchy.</td>
</tr>
<tr>
<td>ElSortSense</td>
<td>Defines the sort sense for dimension elements. This is a required argument, but it applies only when the ElSortType is ByName or ByLevel.</td>
</tr>
<tr>
<td></td>
<td>There are two possible ElSortSense values:</td>
</tr>
<tr>
<td></td>
<td>Ascending - Sorts dimension elements in ascending order, either alphabetically or by level.</td>
</tr>
<tr>
<td></td>
<td>Descending - Sorts dimension elements in descending order, either alphabetically or by level.</td>
</tr>
</tbody>
</table>

### Example

```plaintext
DimensionSortOrder ('Region', 'ByName', 'Descending', 'ByLevel', 'Ascending');
```

This example sets a sort order for the Region dimension. All dimension elements are sorted by level in ascending order, and any components of consolidations are sorted in descending alphabetical order.

### DimensionTimeLastUpdated

DimensionTimeLastUpdated returns a serial value that indicates the date and time at which a specified dimension was last updated.

The serial value returned by this function uses a starting time of Jan 1 1900 12:00:00 A.M., which is equivalent to the value 1.0. Dates are represented by integers, while times are represented as decimal.
numbers between .0 and .999999. This is consistent with the way date/time serial values are stored and reported in Microsoft Excel.

**Note:** By default, TM1 date/time serial values use a starting time of Jan 1 1960 12:00:00 A.M. To resolve the inconsistency between Excel and TM1 date/time serial values, you can set UseExcelSerialDate=T in your Tm1s.cfg file to instruct the TM1 server to use date/time serial values that conform to Excel standards.

This function is valid in TM1 TurboIntegrator processes only.

### Syntax

`DimensionTimeLastUpdated(dimension);`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>The name of the dimension.</td>
</tr>
</tbody>
</table>

### Example

`DimensionTimeLastUpdated('Region');`

This example returns information on when the Region dimension was last updated.

### DimensionTopElementInsert

**DimensionTopElementInsert** creates a root element in a dimension. If the dimension already has a single root, then this element will not be created.

This function is valid in TM1 TurboIntegrator processes only.

### Syntax

`DimensionTopElementInsert(DimName, InsertionPoint, ElName);`

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create a root element.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The root element being added to the dimension will be inserted immediately before this existing element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new root element.</td>
</tr>
</tbody>
</table>

### Example

`DimensionTopElementInsert('Region', 'Netherlands', 'World');`

This example adds the root element World to the Region dimension. World is inserted displays immediately before Netherlands in the dimension definition.
**DimensionTopElementInsertDirect**

DimensionTopElementInsertDirect creates a root element in a dimension by directly editing the dimension. If the dimension already has a single root, then this element will not be created.

This function is valid in TM1 TurboIntegrator processes only.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like DimensionTopElementInsert) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```
DimensionTopElementInsertDirect(DimName, InsertionPoint, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create a root element.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The root element being added to the dimension will be inserted immediately before this existing element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new root element.</td>
</tr>
</tbody>
</table>

**Example**

```
DimensionTopElementInsertDirect('Region', 'Netherlands', 'World');
```

This example adds the root element World to the Region dimension. World is inserted displays immediately before Netherlands in the dimension definition.

**DimensionUpdateDirect**

DimensionUpdateDirect performs a full rewrite of a dimension that has been subject to direct editing in a TurboIntegrator process, essentially compacting the memory footprint of the dimension.

A dimension that undergoes a series of direct-only edits (element deletions, in particular) will eventually use more memory than its fully-rewritten counterpart would. This function can optionally be used after directly editing a dimension with DimensionElementInsertDirect, DimensionElementDeleteDirect, DimensionElementComponentAddDirect, DimensionElementComponentDeleteDirect, and/or...
DimensionTopElementInsertDirect. Calling DimensionUpdateDirect incurs an initial full-copy memory cost, however it can be used to guarantee that the dimension is at its smallest possible memory footprint after processing is complete.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DimensionUpdateDirect(DimName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension you want to rewrite.</td>
</tr>
</tbody>
</table>

**Example**

```
DimensionUpdateDirect('Region');
```

This example rewrites the Region dimension.

---

**Hierarchy Manipulation TurboIntegrator Functions**

These functions facilitate hierarchy manipulation.

**HierarchyContainsAllLeaves**

HierarchyContainsAllLeaves returns true only if the specified hierarchy contains the full set of leaf elements that are present in the dimension. That is, it contains all the leaf elements that can be seen in the special Leaves hierarchy. If the specified hierarchy is missing one or more leaf elements, this function returns false.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyContainsAllLeaves(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the all leaves hierarchy.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy you are determining as an all leaves hierarchy.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyContainsAllLeaves('Region', 'Leaves');
```

This example determines if the Leaves hierarchy, in the Region dimension, contains all leaf members.

**HierarchyCreate**

HierarchyCreate creates a new hierarchy in an existing dimension. The hierarchy cannot have the same name as the dimension.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```
HierarchyCreate(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the existing dimension that will contain the hierarchy.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name you want to assign to the hierarchy. You cannot use the name of the dimension.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyCreate('Vehicles', 'Trucks');
```

This example creates the empty Trucks hierarchy in the Vehicles dimension.

**HierarchyDeleteAllElements**

HierarchyDeleteAllElements deletes all the elements in a hierarchy. This function is useful for recreating dimension hierarchies.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyDeleteAllElements(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension from which you want to delete all elements.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyDeleteAllElements('Equipment', 'Helmets');
```

This example deletes all elements in the Helmets hierarchy in the Equipment dimension.

**HierarchyDeleteElements**

HierarchyDeleteElements deletes leaf elements from a hierarchy using a subset of elements.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyDeleteElements(DimensionName, HierarchyName, Subset)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimensionName</td>
<td>The name of the dimension from which you want to delete the subset of elements.</td>
</tr>
</tbody>
</table>
### HierarchyDestroy

HierarchyDestroy deletes a hierarchy from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchyDestroy(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the hierarchy.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchyDestroy('Product','Transmissions');
```

This example deletes the Transmissions hierarchy from the TM1 database.

### HierarchyElementComponentAdd

HierarchyElementComponentAdd adds a component (child) to a consolidated element. You can't use this function in the Epilog procedure of a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchyElementComponentAdd(DimName, HierName, ConsolidatedElName, ElName, ElWeight);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>HierName</td>
<td>The hierarchy of the specified dimension.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The element to which you want to add a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element.</td>
</tr>
</tbody>
</table>
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ElWeight</td>
<td>The weight of the child element.</td>
</tr>
</tbody>
</table>

### Example

HierarchyElementComponentAdd('Measures', 'Europe', 'Net Sales', 'Expenses', -1);

This example adds the child Expenses to the Net Sales consolidation in the Europe hierarchy of the Measures dimension. The child has a weight of -1 in the consolidation.

### HierarchyElementComponentAddDirect

HierarchyElementComponentAddDirect adds a component (child) to a consolidated element by directly editing a dimension.

This function is valid in TM1 TurboIntegrator processes only.

The default method of editing a dimension in Cognos TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like HierarchyElementComponentAdd) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

### Syntax

HierarchyElementComponentAddDirect(DimName, HierName, ConsolidatedElName, ElName, ElWeight);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>HierName</td>
<td>The hierarchy of the specified dimension.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element to which you want to add a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element.</td>
</tr>
<tr>
<td>ElWeight</td>
<td>The weight of the child element.</td>
</tr>
</tbody>
</table>
Example
HierarchyElementComponentAddDirect('Measures', 'Europe', 'Net Sales', 'Expenses', -1);

This example adds the child Expenses to the Net Sales consolidation in the Europe hierarchy of the Measures dimension. The child has a weight of -1 in the consolidation.

HierarchyElementComponentDelete
HierarchyElementComponentDelete deletes a component (child) from a consolidated element.

This function is valid in TM1 TurboIntegrator processes only.

Syntax
```
HierarchyElementComponentDelete(DimName, HierName, ConsolidatedElName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element you want to delete.</td>
</tr>
</tbody>
</table>

Example
```
HierarchyElementComponentDelete('Region', 'Western', 'Benelux', 'Belgium');
```

This example deletes the Belgium child from the Benelux consolidation in the Western hierarchy of the Region dimension.

HierarchyElementComponentDeleteDirect
HierarchyElementComponentDeleteDirect deletes a component (child) from a consolidated element by directly editing the dimension.

This function is valid in TM1 TurboIntegrator processes only.

The default method of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like HierarchyElementComponentDelete) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed...
to support data loading is performed using direct calls in the Data procedure. When the Metadata
procedure is empty, the process skips an entire iteration over the external datasource, which can result
in faster data loads.

**Syntax**

```
HierarchyElementComponentDeleteDirect(DimName, HierName, ConsolidatedElName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ConsolidatedElName</td>
<td>The consolidated element from which you want to delete a child.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the child element you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyElementComponentDeleteDirect('Region', 'Western', 'Benelux', 'Belgium');
```

This example deletes the Belgium child from the Benelux consolidation in the Western hierarchy of the Region dimension.

**HierarchyElementDelete**

**HierarchyElementDelete** deletes an element from a hierarchy.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyElementDelete(DimName, HierName, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension that contains the element you want to delete.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element you want to delete from the hierarchy.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyElementDelete('Region', 'Western', 'Belgium');
```

This example deletes the element Belgium from the Western hierarchy in the Region dimension.

**HierarchyElementDeleteDirect**

**HierarchyElementDeleteDirect** deletes an element from a dimension by directly editing the dimension.

This function is valid in TM1 TurboIntegrator processes only.
Note: Deleting an element deletes all cube data identified by that element.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like DimensionElementDelete) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

Syntax

HierarchyElementDeleteDirect(DimName, HierName, ElName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension that contains the element you want to delete.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element you want to delete.</td>
</tr>
</tbody>
</table>

Example

HierarchyElementDeleteDirect('Region', 'Western', 'Belgium');

This example deletes the element Belgium from the Western hierarchy in the Region dimension.

HierarchyElementExists

HierarchyElementExists determines whether a specific elements exists in a hierarchy on the server from which a TurboIntegrator process is executed. The function returns 1 if the elements exists in the hierarchy on the server, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

HierarchyElementExists(DimName, HierName, ElName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the element whose existence you want to confirm.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element you want to find in the hierarchy.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext```
HierarchyElementExists('Region', 'Western', 'Belgium');
```

This example determines whether element Belgium from the Western hierarchy in the Region dimension exists on the server.

**HierarchyElementInsert**

HierarchyElementInsert adds an element to a dimension. You can use this function to add numeric, string, or consolidated elements. You can't use this function in the Data or Epilog procedures of a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext```
HierarchyElementInsert(DimName, HierName, InsertionPoint, ElName, ElType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension to which you want to add a new element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The element being added to the dimension will be inserted immediately before this existing element. If this parameter is empty, the new element is added to the end of the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new element.</td>
</tr>
<tr>
<td>ElType</td>
<td>The element type. There are three possible ElType values:</td>
</tr>
<tr>
<td></td>
<td>N - Signifies a numeric element.</td>
</tr>
<tr>
<td></td>
<td>S - Signifies a string element.</td>
</tr>
<tr>
<td></td>
<td>C - Signifies a consolidated element.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext```
HierarchyElementInsert('Region', 'Western', 'Belgium', 'Netherlands', 'N');
```

This example adds the numeric element Netherlands to the Western hierarchy in the Region dimension. Netherlands displays immediately before Belgium in the dimension definition.
**HierarchyElementInsertDirect**  
HierarchyElementInsertDirect adds an element to a dimension by directly editing the dimension. You can use this function to add numeric, string, or consolidated elements.

This function is valid in TM1 TurboIntegrator processes only.

The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like HierarchyElementInsert) are used in the metadata tab of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element insertion needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```plaintext
HierarchyElementInsertDirect(DimName, HierName, InsertionPoint, ElName, ElType);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension to which you want to add a new element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The element being added to the dimension will be inserted immediately before this existing element. If this parameter is empty, the new element is added to the end of the dimension.</td>
</tr>
<tr>
<td></td>
<td>Note that this function is optimized for the case where the InsertionPoint is passed as an empty string.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new element.</td>
</tr>
<tr>
<td>ElType</td>
<td>The element type. There are three possible ElType values:</td>
</tr>
<tr>
<td></td>
<td>N - Signifies a numeric element.</td>
</tr>
<tr>
<td></td>
<td>S - Signifies a string element.</td>
</tr>
<tr>
<td></td>
<td>C - Signifies a consolidated element.</td>
</tr>
</tbody>
</table>
Example

\[
\text{HierarchyElementInsertDirect('Region', 'Western', 'Belgium', 'Netherlands','N');}
\]

This example adds the numeric element Netherlands to the Western hierarchy in the Region dimension. Netherlands displays immediately before Belgium in the dimension definition.

**HierarchyElementPrincipalName**

HierarchyElementPrincipalName returns the principal name of an element or element alias.

TurboIntegrator must use principal element names when updating dimensions; element aliases cannot be used. This function is therefore useful for determining principal element names while attempting to update a dimension when only element aliases are available to the TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyElementPrincipalName( DimName, HierName, ElName )
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension from which you want to retrieve a principal element name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>An element name. ElName can be either an element alias or a principal element name.</td>
</tr>
</tbody>
</table>

**Example**

If ElName is not in the currently saved version of DimName, the function returns ElName.

If ElName is in DimName, whether as an element alias or a principal element name, it returns the principal name of the element.

**HierarchyExists**

HierarchyExists determines whether a specific hierarchy exists on the server from which a TurboIntegrator process is executed. The function returns 1 if the hierarchy exists on the server, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyExists(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the hierarchy whose existence you want to confirm.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>
Example

HierarchyExists('Region', 'Europe');

This example determines if the Europe hierarchy, in the Region dimension, exists on the server.

**HierarchyHasOrphanedLeaves**

HierarchyHasOrphanedLeaves returns 1 if there are one or more elements in the specified hierarchy that are not components of a parent element in that hierarchy.

The function returns 1 if the hierarchy exists on the server, otherwise it returns 0. This function returns 0 if all leaf elements in the hierarchy are a component of one or more parent elements. Values stored against such elements will not be aggregated.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

HierarchyHasOrphanedLeaves(DimName, HierName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that contains the hierarchy being reviewed.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy you are reviewing for orphaned leaf members.</td>
</tr>
</tbody>
</table>

Example

HierarchyHasOrphanedLeaves('Region', 'Europe');

This example determines if the Europe hierarchy, in the Region dimension, contains any orphaned leaves.

**HierarchySortOrder**

HierarchySortOrder sets a sort type and sense for dimension elements and for components of consolidated elements within a dimension. The sort order defined by DimensionSortOrder determines how the subset displays in the Subset Editor.

DimensionSortOrder sets properties for a dimension; the dimension is not actually sorted until it is saved on the server.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

HierarchySortOrder(DimName, HierName, CompSortType, CompSortSense, ElSortType, ElSortSense);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension for which you want to set a sort order.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CompSortType</td>
<td>Defines how components of consolidated elements appear in the dimension. There are two CompSortType values: ByInput - Retains the order in which components were originally inserted into consolidations. ByName - Sorts components of consolidations by name.</td>
</tr>
<tr>
<td>CompSortSense</td>
<td>Defines the sort sense for components of consolidations. This is a required argument, but it applies only when the CompSortType is ByName. There are two possible CompSortSense values: Ascending - Sorts components of consolidations in ascending alphabetical order. Descending - Sorts components of consolidations in descending alphabetical order.</td>
</tr>
<tr>
<td>ElSortType</td>
<td>Defines a sort order for dimension elements. There are four possible ElSortType values: ByInput - Retains the order in which elements were originally inserted into the dimension. ByName - Sorts dimension elements by name. ByLevel - Sorts dimension elements by level. ByHierarchy - Sorts dimension elements by hierarchy.</td>
</tr>
<tr>
<td>ElSortSense</td>
<td>Defines the sort sense for dimension elements. This is a required argument, but it applies only when the ElSortType is ByName or ByLevel. There are two possible ElSortSense values: Ascending - Sorts dimension elements in ascending order, either alphabetically or by level. Descending - Sorts dimension elements in descending order, either alphabetically or by level.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchySortOrder ('Region', 'Europe', 'ByName', 'Descending','ByLevel', 'Ascending');
```

This example sets a sort order for the Europe hierarchy in the Region dimension. All dimension elements are sorted by level in ascending order, and any components of consolidations are sorted in descending alphabetical order.

**HierarchyTimeLastUpdated**

HierarchyTimeLastUpdated indicates when a specified dimension hierarchy was last updated. The function returns a real number that represents the current day (including the hour, minute, second, and millisecond) since the beginning of the year 1900.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```plaintext
HierarchyTimeLastUpdated(dimension, hierarchy);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>The name of the dimension.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchyTimeLastUpdated('Region', 'Europe');
```

This example returns information on when the Europe hierarchy of the Region dimension was last updated. If a value of 42548.<hours>.<minutes>.<milliseconds> is returned, you can divide 42548 by 365 to obtain (approximately) 116. When added to the started of 1900, the result is a current year of 2016.

**HierarchyTopElementInsert**

HierarchyTopElementInsert creates a root element in a dimension. If the dimension already has a single root, then this element will not be created.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchyTopElementInsert(DimName, HierName, InsertionPoint, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create a root element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The root element being added to the dimension will be inserted immediately before this existing element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new root element.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchyTopElementInsert('Region', 'Western', 'Netherlands', 'World');
```

This example adds the root element World to the Western hierarchy of the Region dimension. World is inserted displays immediately before Netherlands in the dimension definition.

**HierarchyTopElementInsertDirect**

HierarchyTopElementInsertDirect creates a root element in a dimension by directly editing the dimension. If the dimension already has a single root, then this element will not be created.

This function is valid in TM1 TurboIntegrator processes only.
The default means of editing a dimension in TM1 is to use a whole-copy editing pattern. In that pattern, an editing copy of the dimension is created, edits are applied to the editing copy, then finally the actual dimension is rewritten using the editing copy as a template. TurboIntegrator supports whole-copy editing automatically whenever dimension editing TurboIntegrator functions (like HierarchyTopElementInsert) are used in the Metadata procedure of the process. TurboIntegrator automatically creates the editing copy and applies editing operations to it, then rewrites the actual dimension at the end of the Metadata procedure.

Direct edits are different in that no editing copy is involved. Instead, the operations are performed directly on the actual dimension. There are two different, specialized use cases for which this type of direct editing is intended:

- When the purpose of the TurboIntegrator process is to make a small change to a large dimension. In this case, direct editing will be more efficient because it avoids copying and completely rewriting the large dimension.
- When the purpose of the TurboIntegrator process is to load large volumes of data into a cube. In this case the process' Metadata procedure is deliberately kept empty, and any element modification needed to support data loading is performed using direct calls in the Data procedure. When the Metadata procedure is empty, the process skips an entire iteration over the external datasource, which can result in faster data loads.

**Syntax**

```
HierarchyTopElementInsertDirect(DimName, HierName, InsertionPoint, ElName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension for which you want to create a root element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>InsertionPoint</td>
<td>An existing dimension element. The root element being added to the dimension will be inserted immediately before this existing element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name you want to assign to the new root element.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyTopElementInsertDirect('Region', 'Western', 'Netherlands', 'World');
```

This example adds the root element World to the Western hierarchy of the Region dimension. World is inserted displays immediately before Netherlands in the dimension definition.

**HierarchyUpdateDirect**

HierarchyUpdateDirect performs a full rewrite of a hierarchy that has been subject to direct editing in a TurboIntegrator process, essentially compacting the memory footprint of the hierarchy.

A dimension that undergoes a series of direct-only edits (element deletions, in particular) will eventually use more memory than its fully-rewritten counterpart would. This function can optionally be used after directly editing a dimension with HierarchyElementInsertDirect, HierarchyElementDeleteDirect, HierarchyElementComponentAddDirect, HierarchyElementComponentDeleteDirect, and/or HierarchyTopElementInsertDirect. Calling HierarchyUpdateDirect incurs an initial full-copy memory cost, however it can be used to guarantee that the dimension is at its smallest possible memory footprint after processing is complete.
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchyUpdateDirect(DimName, HierName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension you want to rewrite.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchyUpdateDirect('Region', 'Western');
```

This example rewrites the Western hierarchy of the Region dimension.

---

## ODBC TurboIntegrator Functions

These functions facilitate the ODBC manipulation.

### ODBCClose

ODBCClose closes a connection to an ODBC data source.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ODBCClose(Source);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>The name of an open ODBC data source.</td>
</tr>
</tbody>
</table>

**Example**

```
ODBCClose('Accounting');
```

This example closes the connection to the Accounting ODBC source.

### ODBCOpen

ODBCOpen opens an ODBC data source for output.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ODBCOpen(Source, ClientName, Password);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>An ODBC data source name.</td>
</tr>
</tbody>
</table>
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>A valid client on the data source.</td>
</tr>
<tr>
<td>Password</td>
<td>A password for the ClientName.</td>
</tr>
</tbody>
</table>

### Example

```
ODBCOpen('Accounting', 'Jdoe', 'Bstone');
```

This example opens the Accounting ODBC data source for the Jdoe client using the password Bstone.

### ODBCOPENEx

ODBCOPENEx opens an ODBC data source for output specifying that the connection should be opened as a Unicode connection.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

Format is: `ODBCOPENEx (dataset name, dataset client name, client password, (use-Unicode-interface flag) )`

```
ODBCOpenEx(Source, ClientName, Password, UseUnicodeODBC);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>An ODBC data source name.</td>
</tr>
<tr>
<td>ClientName</td>
<td>A valid client on the data source.</td>
</tr>
<tr>
<td>Password</td>
<td>A password for the ClientName.</td>
</tr>
<tr>
<td>UseUnicodeODBC</td>
<td>Defines the type of Unicode connection to use.</td>
</tr>
</tbody>
</table>

#### Example

```
ODBCOpenEx( TestTable, sa, , 1 );
```

```python
cinese= ;
cinese = CHARW( 37123 );
fieldval = chinese | SomeNewText;
sql= Update TestTable set ForeName = N | fieldval | WHERE CustomerId= 1
ODBCOUTPUT( Unicode, sql );
```

The result SQL statement looks like:

```
Update TestTable set ForeName = N?SomeNewText WHERE CustomerId = 1
```

### ODBCOOutput

ODBCOutput executes an SQL update query against an open ODBC data source. You should use the ODBCOpen function to open the data source before calling ODBCOOutput, and use ODBCClose to close the data source before exiting the process.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

ODBCOutput(Source, SQLQuery, [SQLQuery2, SQLQuery3, ...]);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>The ODBC data source against which you want to run a query.</td>
</tr>
<tr>
<td>SQLQuery</td>
<td>An SQL query statement. Though ODBCOutput was developed to update tables, it can be used to execute any SQL query on the data source. In circumstances where the SQL query statement exceeds 255 characters, you should split the query into multiple SQLQuery arguments (SQLQuery2, SQLQuery3, etc.). This lets you create query statements that exceed the 255 character limit for TurboIntegrator arguments. When the ODBCOutput function is executed, all SQLQuery arguments are concatenated and the query is successfully executed.</td>
</tr>
</tbody>
</table>

Example

ODBCOutput('Accounting', 'INSERT [CategoryID], [CategoryName]FROM Categories;');

This example executes the specified query against the Accounting data source.

SetODBCUnicodeInterface

SetODBCUnicodeInterface sets whether the ODBC interface should use the Unicode wide functions or the regular single-byte character functions. Setting this function to 1 uses the wide character ODBC interface.

Some ODBC driver support either the older single-byte interface as well as a Unicode style 'wide-character' interface, where characters are passed and retrieved as 16-bit quantities. If the driver chosen does not support one or the other style, a flag is provided to force TurboIntegrator to use a particular style of interface.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

SetODBCUnicodeInterface=1

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use the wide character ODBC interface.</td>
</tr>
<tr>
<td>0</td>
<td>Use the single-byte interface.</td>
</tr>
</tbody>
</table>

Process Control TurboIntegrator Functions

These functions pertain to process control.
ExecuteCommand

ExecuteCommand executes a command line during a process. You can use ExecuteCommand to run a desktop application, but not a service.

If you use ExecuteCommand to run an executable, the following conditions apply:

- If the CommandLine argument specifies only the name of a file to be executed, a Windows server looks for the file in both the server database directory and in the directory where Tm1s.exe resides. A UNIX server looks for the file only in the server database directory.
- If the CommandLine argument uses a relative path prefix, both the Windows and UNIX server attempt to locate the file in the server database directory only.
- On either the Microsoft Windows or UNIX server, you can pass an absolute path to the CommandLine argument to execute a file in any location.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
ExecuteCommand(CommandLine, Wait);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CommandLine</td>
<td>The command line you want to execute.</td>
</tr>
<tr>
<td>Wait</td>
<td>Indicates if the process should wait for the command to complete execution</td>
</tr>
<tr>
<td></td>
<td>before continuing to the next process statement. An argument value of 0</td>
</tr>
<tr>
<td></td>
<td>causes the process to proceed to the next statement without waiting for the</td>
</tr>
<tr>
<td></td>
<td>command line to execute. An argument value of 1 causes the process to</td>
</tr>
<tr>
<td></td>
<td>wait for the command line to successfully execute before proceeding to the</td>
</tr>
<tr>
<td></td>
<td>next statement.</td>
</tr>
</tbody>
</table>

ExecuteProcess

ExecuteProcess lets you execute a TurboIntegrator process from within another process.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
ExecuteProcess(ProcessName, [ParamName1, ParamValue1, ParamName2, ParamValue2]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessName</td>
<td>The name of the process to be executed. This process must reside on the</td>
</tr>
<tr>
<td></td>
<td>same server as the process from which ExecuteProcess is called. If the</td>
</tr>
<tr>
<td></td>
<td>process named by this argument cannot be found at runtime, the calling</td>
</tr>
<tr>
<td></td>
<td>process is immediately terminated. (TurboIntegrator does not check for a</td>
</tr>
<tr>
<td></td>
<td>valid ProcessName at compilation.)</td>
</tr>
<tr>
<td>ParamName</td>
<td>The name of an existing parameter of the process to be executed. This</td>
</tr>
<tr>
<td></td>
<td>argument is required only if the process to be executed uses parameters.</td>
</tr>
</tbody>
</table>
Argumen | Description
--- | ---
ParamValue | A valid value for the ParamName parameter. If you specify a ParamName argument, you must specify a corresponding ParamValue. The ParamName and ParamValue arguments must occur in ordered pairs, with the name of the parameter followed by the value. You must specify a ParamName and corresponding ParamValue for each parameter of the process to be executed.

The parameter names passed in the ExecuteProcess function are matched at runtime against the parameter names specified in the process to be executed. If the passed names cannot be found in the parameter list of the process to be executed, a serious error results, causing the immediate termination of the process from which ExecuteProcess is called.

Return Values

ExecuteProcess returns a real value that can be tested against one of the following return value functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessExitByChoreQuit()</td>
<td>indicates that the process exited due to execution of the ChoreQuit function</td>
</tr>
<tr>
<td>ProcessExitNormal()</td>
<td>indicates that the process executed normally</td>
</tr>
<tr>
<td>ProcessExitMinorError()</td>
<td>indicates that the process executed successfully but encountered minor errors</td>
</tr>
<tr>
<td>ProcessExitByQuit()</td>
<td>indicates that the process exited because of an explicit &quot;quit&quot; command</td>
</tr>
<tr>
<td>ProcessExitWithError()</td>
<td>indicates that the process exited normally, with a message written to tm1server.log</td>
</tr>
<tr>
<td>ProcessExitSeriousError()</td>
<td>indicates that the process exited because of a serious error</td>
</tr>
<tr>
<td>ProcessExitOnInit()</td>
<td>indicates that the process aborted during initialization</td>
</tr>
<tr>
<td>ProcessExitByBreak()</td>
<td>indicates that the process exited because it encountered a ProcessBreak function</td>
</tr>
</tbody>
</table>

Example

To record when a process called by ExecuteProcess fails because of a serious error, use code similar to the following:

```plaintext
return_value = ExecuteProcess('create_sales_cube');
ASCIIOutput('C:\temp\process_return_value.txt', 'Process exited with serious errors at', TIME, 'on', TODAY);if(return_value = ProcessExitSeriousError() )
endif;
```
**GetProcessErrorFileDirectory**

GetProcessErrorFileDirectory returns the full pathname, with trailing slash, of the directory where TurboIntegrator process error files are written. By default, all process error log files are written to the data directory of the server on which the process resides.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
GetProcessErrorFileDirectory;
```

**Arguments**

None.

**GetProcessErrorFilename**

GetProcessErrorFilename returns the name of the TurboIntegrator process error log file associated with a process. If the process has not yet generated an error log file, the function returns an empty (null) string.

**Important:** A process error log file is not generated until all statements in a given process tab (Prolog, Metadata, Data, or Epilog) have executed. Accordingly, you can use GetProcessErrorFilename to check if any previous tabs have generated an error log file, but you cannot use the function to determine if the current process tab causes errors to be written to a log file.

For example, by determining that GetProcessErrorFilename returns a non-null string in the Epilog tab, you can tell that errors were generated in the Prolog, Metadata, or Data tabs. However, you cannot use GetProcessErrorFilename in the Data tab to determine if the Data tab generates errors.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
GetProcessErrorFilename;
```

**Arguments**

None.

**GetProcessName**

GetProcessName returns as a string the name of the current process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
GetProcessName()
```

**Arguments**

None.

```
Name = GetProcessName();
```
The If statement allows a process to execute a statement or series of statements when a given expression is true. You can use arithmetic operators, logical operators, and comparison operators to construct an expression.

The TurboIntegrator If statement differs from the Rules IF function in that the TurboIntegrator statement can accept multiple ElseIf or Else statements to evaluate multiple expressions, while the Rules IF function can evaluate only one expression.

You can nest up to 20 If/ElseIf/Else statements in a TurboIntegrator process. If you exceed 20 nested If/ElseIf/Else statements, you will receive an error when attempting to save the process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
If(expression);
statement1;
ElseIf(expression);
statement2;
ElseIf(expression);
statement3;
Else;
statement4;
EndIf;
```

**Arguments**

None.

**Examples**

```plaintext
If (x=5);
    ASCIIOutput('c:\temp\if.txt','x equals five');
ElseIf (x=1);
    ASCIIOutput ('c:\temp\if.txt', 'x equals one');
ElseIf (x=2);
    ASCIIOutput ('c:\temp\if.txt', 'x equals two');
ElseIf (x=3);
    ASCIIOutput ('c:\temp\if.txt', 'x equals three');
ElseIf (x=4);
    ASCIIOutput ('c:\temp\if.txt', 'x equals four');
Else;
    ASCIIOutput ('c:\temp\if.txt', 'x falls outside expected range');
EndIf;
```

This example evaluates the value of X. If X=5, the ASCIIOutput function is executed to write the string "x equals five" to c:\temp\if.txt. If X does not equal 5, the first ElseIf statement is evaluated. If X=1, the ASCIIOutput function is executed to write the string "x equals one" to c:\temp\if.txt. This processing continues until the EndIf is executed.

Simple If statements can also be constructed without the use of ElseIf, as in this example:

```plaintext
IF(expression);
    statement1;
ELSE;
    statement2;
ENDIF;
```

**ItemReject**

ItemReject rejects a source record and places it in the error log, along with a specified error message.

This function is valid in TM1 TurboIntegrator processes only.
### Syntax

```plaintext
ItemReject(ErrorString);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ErrorString</td>
<td>The error message you want written to the error log when a record is rejected.</td>
</tr>
</tbody>
</table>

### Example

```plaintext
ItemReject('Value outside of acceptable range.');
```

This example places a source record in the error log, along with the error message 'Value outside of acceptable range.' when the source record contains a value that is beyond a defined range.

---

### ItemSkip

**ItemSkip** forces a process to skip the current data source item. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ItemSkip;
```

**Arguments**

None.

### ProcessBreak

**ProcessBreak** stops processing source data and proceeds to the Epilog portion of a process. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ProcessBreak;
```

**Arguments**

None.

### ProcessError

**ProcessError** causes an immediate termination of a process. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ProcessError;
```

**Arguments**

None.
ProcessExists

ProcessExists determines whether a specific TurboIntegrator process exists.

The ProcessExists function returns one of three possible values:

- If a TurboIntegrator process with the specified name does not exist, the function returns 0.
- If a process with the specified name does exist and is valid, the function returns 1.
- If a process with the specified name does exist, but has compilation errors, the function returns -1.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
ProcessExists(ProcessName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessName</td>
<td>The name of the process for which you are trying to determine status.</td>
</tr>
</tbody>
</table>

ProcessExitByChoreRollback

ProcessExitByChoreRollback initiates a chore rollback and exits with an error code. Similar to ChoreRollback, when used inside a TurboIntegrator process, this function throws out all pending edits and cancels further processing. An error message appears in the tm1server.log and tm1processorerrorXXX.log files.

When used in a single-commit mode chore, ProcessExitByChoreRollback throws out all pending edits from all previous processes and exits.

When used in a multi-commit mode chore, ProcessExitByChoreRollback throws out all pending edits from the current processes and then exits. Changes that have already been committed cannot be rolled back.

ProcessExitByChoreRollback returns the error code number.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
ProcessExitByChoreRollback;
```

Arguments

None.

ProcessExitByProcessRollback

ProcessExitByProcessRollback initiates a process rollback and exits with an error code. Similar to ProcessRollback, when used inside a TurboIntegrator process, this function throws out all pending edits and cancels further processing. An error message appears in the tm1server.log and tm1processorerrorXXX.log files.

When used in a single-commit mode chore, ProcessExitByProcessRollback throws out all pending edits from all previous processes and exits.

When used in a multi-commit mode chore, ProcessExitByProcessRollback throws out all pending edits from the current process and then exits. Changes that have already been committed cannot be rolled back.

ProcessExitByProcessRollback returns the error code number.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

ProcessExitByProcessRollback;

Arguments

None.

ProcessQuit

ProcessQuit terminates a TurboIntegrator process.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ProcessQuit;

Arguments

None.

ProcessRollback

ProcessRollback initiates a process rollback. When used inside a TurboIntegrator process, this function throws out all pending edits and cancels further processing. An error message appears in the tm1server.log and tm1processorerrorXXX.log files.

Note: In IBM Planning Analytics version 2.0.8 or later, when a TurboIntegrator process rolls back and restarts, the process is now represented in the tm1server.log file as three steps: starting, restarting because of lock contention or rollback, and then finishing.

An entry is added to the tm1server.log file that shows the TurboIntegrator process as restarting due to lock contention or rollback instead of just starting. This logging is enabled by default without setting any specific debug options.

When used in a single-commit mode chore, ProcessRollback throws out all pending edits from all previous processes and continues execution at the next process in the chore. If lock contention is encountered after the call to ProcessRollback, the entire chore is restarted.

When used in a multi-commit mode chore, ProcessRollback throws out all pending edits from the current process and then continues execution at the next process in the chore. Changes that have already been committed cannot be rolled back. If lock contention is encountered after the call to ProcessRollback, only the current process is restarted.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

ProcessRollback;

Arguments

None.

RunProcess

RunProcess lets you run TurboIntegrator processes in parallel, each on its own thread that is managed by TM1 Server. This approach speeds up data load and other operations where TurboIntegrator processes are used to divide the work.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

```plaintext
RunProcess(ProcessName, [ParamName1, ParamValue1, ParamName2, ParamValue2]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessName</td>
<td>The name of the process to be run. This process must reside on the same server as the process from which RunProcess is called.</td>
</tr>
<tr>
<td></td>
<td>If the process named by this argument cannot be found at runtime, the calling process is immediately terminated. (TurboIntegrator does not check for a valid ProcessName at compilation.)</td>
</tr>
<tr>
<td>ParamName</td>
<td>The name of an existing parameter of the process to be run. This argument is required only if the process to be run uses parameters.</td>
</tr>
<tr>
<td>ParamValue</td>
<td>A valid value for the ParamName parameter. If you specify a ParamName argument, you must specify a corresponding ParamValue.</td>
</tr>
<tr>
<td></td>
<td>The ParamName and ParamValue arguments must occur in ordered pairs, with the name of the parameter followed by the value. You must specify a ParamName and corresponding ParamValue for each parameter of the process to be run.</td>
</tr>
</tbody>
</table>

The parameter names passed in the RunProcess function are matched at runtime against the parameter names specified in the process to be run. If the passed names cannot be found in the parameter list of the process to be run, a serious error results, causing the immediate termination of the process from which RunProcess is called.

**Return values**

RunProcess returns a string. The string is the JobID, or an empty string if an error occurs.

**Synchronized**

Synchronized is used in a TurboIntegrator script to force serial execution of a designated set of TurboIntegrator processes.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

The synchronized() function uses the following syntax.

```plaintext
synchronized (lockName);
```

Synchronized takes a single required parameter that is a user-defined name for a lock object. This lock object name can be used in multiple TurboIntegrator processes in order to serialize their execution as a group.

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lockName</td>
<td>The user-defined name of a lock object on which to synchronize. Names are case-insensitive and embedded spaces are ignored. Names may not exceed 1023 characters in length. String/Yes/None</td>
</tr>
</tbody>
</table>
Semantics

A TurboIntegrator process may make any number of calls to synchronized(), with any number of lock objects. Serializing is effective from the time synchronized() is called, until the containing transaction completes.

For example, if synchronized() is called from a subprocess (Ps) of master process (Pm) or master chore (Cm), the Lock Object is "released" when Pm or Cm completes. The exception is that a SaveDataAll (SDA) prematurely "ends" a transaction mid-process execution; this applies to Lock Objects as well.

The synchronized() call may be placed anywhere within a TurboIntegrator script, but serialization applies to the entire TurboIntegrator process when it is encountered.

Consider a TurboIntegrator process with a synchronized() call somewhere in the "middle" of its script, and an operation O1 preceding that call. Two instances of this TurboIntegrator process may start at the same time. It is possible for one instance to run to completion, including its call to synchronized(), before the second instance reaches its synchronized() call. In this case, the two processes appear to the user to have run concurrently. If, instead, the second process does reach its synchronized() call before the first completes, it will undo any work it had done (O1) and wait for the first to complete. In this case, the two processes appear to the user to have serialized.

To avoid such confusion, and to optimize the use of synchronized(), it is recommended (but not enforced) that synchronized() calls be the first statements of a TurboIntegrator process.

Example

Consider that TurboIntegrator process P needs to update two cubes, Cube_1 and Cube_2.

Other TurboIntegrator processes may also need to update Cube_1 or Cube_2.

To cause all TurboIntegrator processes that will update Cube_1 or Cube_2, to run one at a time, P could call synchronized() in the following way:

```plaintext
sCube_1='Cube_1';
sCube_2='Cube_2';
sE1='Elm1';
sE2='Elm2';
sE4='Units';
sE5='Price';
Synchronized( sCube_1 );
Synchronized( sCube_2 );
CellPutn( 111, sCube_1, sE1, sE2 );
CellPutn( 9.99, sCube_2, sE4, sE5 );
# ...
```

Other TurboIntegrator processes that will update Cube_1 or Cube_2 must also call

synchronized( sCube_1 ) and/or synchronized( sCube_2 ) in a similar way.

In this example, the two lock objects' names were chosen to be the same as the cubes' names. But a lock object's name does not have to be the same as other TM1 objects (cubes, dimensions, subsets).

While

The While statement allows a process to repeat a series of statements while a given condition is true. While statements can be nested.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
WHILE(logical expression);
statement1;
statement2;
```
... statement n; END;

**Note:** All WHILE statements must conclude with an END statement.

**Arguments**
None.

---

**Rules Management TurboIntegrator Functions**
These functions facilitate rules management.

**CubeProcessFeeders**
CubeProcessFeeders reprocesses all feeders in the rules for a specified cube.

This function reprocesses all feeders in the rules for a specified cube. The feeders are normally reprocessed automatically when a rule file edit is saved, however, if the data changes, and those data changes will change some conditional feeders, this function will need to be called to get those conditional feeders re-evaluated.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeProcessFeeders(CubeName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube for which you want to reprocess feeders.</td>
</tr>
</tbody>
</table>

**Example**

```
CubeProcessFeeders('2003sales');
```

This example reprocesses all feeders in the rules for the 2003sales cube.

**CubeRuleAppend**
CubeRuleAppend appends a single line of rule text to a TM1 cube rule.

Essentially, this function adds a single line of text to a rule (.rux) file. The line of text is typically a rule statement, but can also be a comment. If there is no rule associated with the cube at the time this function is executed, a new rule will be created, containing only the passed line.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CubeRuleAppend(CubeName, RuleText, IsCalculationRule);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube associated with the rule to which you want to append a line of text.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| RuleText          | The single line of text you want to append to the rule.  
The entire line of text you add must be enclosed in single quotes and must adhere to rules syntax conventions.  
If the line of text includes any element references, the element names must be enclosed in double single quotes to escape the single quotes that normally enclose element names. For example, a reference to an element named CL3 must be specified as `[''CL3'']'`.  
The following are examples of valid lines of text you might append to a rule:  
`[''CL3''] = [''CL4''] + [''Trial''];`  
'skipcheck;'  
`[''Trial''] => [''CL3''];'                                                                                                                                                                                                                                         |
| IsCalculationRule | The IsCalculationRule parameter declares whether the line should be inserted just above any feeder section that might exist in the cube rule. If the IsCalculationRule parameter is omitted, or passed as 0.0, then the new line will simply be appended to the end of the rule.  
Because rule (.rux) files consist of a calculation section followed by an optional feeder section, any appended lines that are calculation rule statements (or corresponding comments) should use a 1.0 for this argument to ensure that the new line is inserted in at the appropriate location in the rule file. |

**Examples**

```csharp
CubeRuleAppend( 'MyCube', '[''CL3''] = [''CL4''] + [''Trial''];', 1.0 );
```

This example inserts the calculation statement `['CL3'] = ['CL4'] + ['Trial'];` at the end of the calculation section of the rule for the MyCube cube.

```csharp
CubeRuleAppend( 'MyCube', '[''Trial''] => [''CL3''];', 0.0 );
```

This example inserts the feeder statement `['Trial'] => ['CL3'];` at the end of the rule for the MyCube cube.

**CubeRuleDestroy**

CubeRuleDestroy deletes any rule that exists for a specified cube.  
This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```csharp
CubeRuleDestroy(CubeName);
```
### Argument Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube associated with the rule that you want to delete</td>
</tr>
</tbody>
</table>

**Example**

```
CubeRuleDestroy('SalesProjections');
```

This example deletes the rule for the SalesProjections cube.

### DeleteAllPersistentFeeders

DeleteAllPersistentFeeders deletes any .feeder files that have persisted. When this function is used, all cubes are marked as "do not save feeders" so a subsequent SaveData will not persist feeders which means all feeders will be re-calculated on a server re-start.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
DeleteAllPersistentFeeders;
```

**Arguments**

None.

### ForceSkipCheck

ForceSkipCheck forces the query to perform as if the cube had a SKIPCHECK in the rules.

This function is valid in TM1 TurboIntegrator processes only.

This means that the query will process only values actually in the cube, as opposed to (the no SKIPCHECK case) where every possible cell would be enumerated looking for values. This function sets the state of the view query to select only values in the cube. The function must be added to the Prolog section of the TurboIntegrator process. By placing the ForceSkipCheck() in the Prolog it effects the entire view query of data elements to follow.

**Syntax**

```
ForceSkipCheck()
```

**Arguments**

None.

### RuleLoadFromFile

RuleLoadFromFile creates a TM1 rule for a specified cube from a text file. Each rule statement must end with a semi-colon (;) and comments must be prefixed with the # character. If a rule already exists for the specified cube, the rule is overwritten by the rule created by RuleLoadFromFile.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
RuleLoadFromFile(Cube, TextFile);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube for which you want to create a rule.</td>
</tr>
<tr>
<td>TextFile</td>
<td>The name of the text file from which you want to create a rule. You can specify the full path to this file, including file name and extension. (Example 1 below.) If you specify only the file name and extension, TurboIntegrator looks for the file in the server's data directory. If you do not specify a file extension, TurboIntegrator assumes the .rux extension by default. (Example 2 below.)</td>
</tr>
</tbody>
</table>

If you leave the TextFile argument empty, TurboIntegrator looks for a source file with the same name as the cube (but with a .rux extension) in the server's data directory. (Example 3 below.)

Example

```plaintext
RuleLoadFromFile('Sales', 'C:\temp\cuberule.txt');
```

This example uses the contents of the cuberule.txt file in the C:\temp directory to create a rule for the Sales cube.

```plaintext
RuleLoadFromFile('Sales', 'cuberule.rux');
```

This example creates a rule for the Sales cube using the file named cuberule.rux in the server's data directory.

```plaintext
RuleLoadFromFile('Sales', '');
```

This example creates a rule for the Sales cube using the file named Sales.rux in the server's data directory.

Sandbox Functions

These functions are used with sandboxes.

GetUseActiveSandboxProperty

GetUseActiveSandboxProperty returns a Boolean value that indicates whether a process reads and writes data to the base data or to the user's active sandbox.

This function is valid in TM1 TurboIntegrator processes only.

The default is for processes to read and write to the base data.

- If the return is 0, the process is currently reading and writing to the base data.
- If the return is 1, the process is currently reading and writing to the active sandbox.

**Note:** This function returns the permanent value for this property as set in the Architect / Server Explorer user interface unless you have used the SetUseActiveSandboxProperty function in the process. In that case, the value for this property is determined by the value that was last set with the SetUseActiveSandboxProperty function.
Syntax

GetUseActiveSandboxProperty()

Arguments

None.

Example

return_value = GetUseActiveSandboxProperty();

This example will return a Boolean value indicating whether the process is currently reading and writing cube data to the active sandbox or to the base data.

ServerActiveSandboxGet

ServerActiveSandboxGet returns the name of the user's active sandbox. If the user has no active sandbox, an empty string is returned. Because chores run in the context of a special admin user, and can have no active sandbox, this function always returns an empty string when executed using a chore.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

ServerActiveSandboxGet();

Arguments

None.

Example

return_value = ServerActiveSandboxGet();

This example will return the active sandbox of the user executing the TI process in which the function call is made.

ServerActiveSandboxSet

ServerActiveSandboxSet sets the active sandbox of the executing user. An empty string is used to clear the executing user's active sandbox. This function throws an error if the executing user does not own a sandbox with the passed name.

Because chores run in the context of a special admin user, and can have no active sandbox, this function always throws an error when executed using a chore.

**Note:** For a TurboIntegrator process to read and write values in the context of the executing user's active sandbox, the UseActiveSandbox property must be set. See “GetUseActiveSandboxProperty” on page 328 and “SetUseActiveSandboxProperty” on page 337.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

ServerActiveSandboxSet(SandboxName)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SandboxName</td>
<td>A string value. The name of a sandbox owned by the executing user.</td>
</tr>
</tbody>
</table>
Example: Set the executing user's active sandbox to "Best case"

ServerActiveSandboxSet('Best case');

Example: Clear the executing user's active sandbox and set context back to the base data

ServerActiveSandboxSet('');

**ServerSandboxClone**

ServerSandboxClone clones an existing sandbox into a new sandbox.

Sandboxes are private workspaces in which a user can enter and store data values separate from TM1 base data. Sandboxes are stored on disk and, when in use, in memory.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

ServerSandboxClone(sandboxName, newSandboxName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sandboxName</td>
<td>A string value. The name of a sandbox owned by the executing user.</td>
</tr>
<tr>
<td>newSandboxName</td>
<td>A string value. The name of a sandbox to be created as a clone of sandboxName.</td>
</tr>
</tbody>
</table>

**Example**

ServerSandboxClone( 'Best case', 'Second best case');

**ServerSandboxCreate**

ServerSandboxCreate creates a new sandbox.

Sandboxes are private workspaces in which a user can enter and store data values separate from TM1 base data. Sandboxes are stored on disk and, when in use, in memory.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

ServerSandboxCreate( sandboxName );

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sandboxName</td>
<td>A string value. The name of a sandbox to be created.</td>
</tr>
</tbody>
</table>

**Example**

ServerSandboxCreate( 'My sandbox' );
**ServerSandboxesDelete**

ServerSandboxesDelete allows administrators to discard user sandboxes that match certain criteria. Sandboxes are private workspaces in which a user can enter and store data values separate from TM1 base data. Sandboxes are stored on disk and, when in use, in memory.

This function operates server side and is available through TurboIntegrator and the API function ServerSandboxesDelete. Using this feature in a TurboIntegrator process, administrators can schedule maintenance using automated chores.

This function is valid in TM1 TurboIntegrator processes only.

**Description**

This function uses a "predicate" to describe the sandbox being deleted. A predicate can be read as: "Delete sandboxes whose attribute is condition value."

For example: "Delete sandboxes whose size is greater than 10 MB." In this example, the attribute is the "size" of the sandbox, the condition is "greater than", and the value is "10 MB".

There are two optional delimiter character parameters to the TurboIntegrator function. Because a sandbox has no restrictions on which characters can be used in their name, administrators can supply their own "safe" delimiter when needed.

For example, `ServerSandboxesDelete( 'client:=:Admin, name:=:best case scenario' );`

In the following example, the colon character is used in the sandbox name ("best::case::scenario") so another delimiter is needed:

```
ServerSandboxesDelete( 'client|=|Admin# name|=|best::case::scenario', '|', '#' );
```

**Note:** The exact syntax of a predicate differs between the TurbIntegrator and API forms of this function.

**Syntax**

```
ServerSandboxesDelete(string,string,string)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicates</td>
<td>The name of the process to be executed. This process must reside on the same server as the process from which RunProcess is called. Required</td>
</tr>
<tr>
<td></td>
<td>String</td>
</tr>
<tr>
<td></td>
<td>No default</td>
</tr>
<tr>
<td></td>
<td>An arbitrary length list of predicates. Each predicate is a string containing three tokens. The first token indicates an attribute of a sandbox. The second indicates a condition, for example &quot;&gt;&quot; or &quot;=&quot;. The third token is a possible value of the attribute on which sandboxes should be conditionally filtered. The entire string may not exceed 10,000 characters in length.</td>
</tr>
</tbody>
</table>
**Argument** | **Description**
---|---
PredicateDelimiter | Optional String
  default is : (colon)
  Optional delimiter character.
  The string may not exceed 1 character in length.

PredicateListDelimiter | Optional String
  default is , (comma)
  Optional delimiter character.
  The string may not exceed 1 character in length.

---

**Filter Attributes**

Filter attributes are properties of a sandbox on which it can be conditionally matched. Attribute names and their corresponding valid conditions are case insensitive and ignore embedded whitespace. For example, the following two calls are both valid:

```
ServerSandboxesDelete( 'client:=:Admin' );
ServerSandboxesDelete( 'C L I E N T : = :Admin' );
```

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Valid Conditions</th>
<th>Value Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>UpdateDate</td>
<td>Timestamp of the last write action performed in the sandbox.</td>
<td>&lt;, =, &gt;.</td>
<td>Timestamp in international standard format, i.e. YYYY-MM-DD. Days are the most granular units.</td>
</tr>
<tr>
<td>AccessDate</td>
<td>Timestamp of the last unload of a sandbox.</td>
<td>&lt;, =, &gt;.</td>
<td>Timestamp in international standard format, i.e. YYYY-MM-DD. Days are the most granular units.</td>
</tr>
<tr>
<td>CreationDate</td>
<td>Timestamp of the creation of a sandbox.</td>
<td>&lt;, =, &gt;.</td>
<td>Timestamp in international standard format, i.e. YYYY-MM-DD. Days are the most granular units.</td>
</tr>
<tr>
<td>Size</td>
<td>The in-memory size of a sandbox.</td>
<td>&lt;, =, &gt;.</td>
<td>Size following log4cxx's conversion rules (see configuration parameter AuditLogMaxTemp FileSize) For example, 10 MB. Kilobytes are the most granular units.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of a sandbox.</td>
<td>=, containing.</td>
<td>String.</td>
</tr>
<tr>
<td>Client</td>
<td>The owning client of a sandbox.</td>
<td>=.</td>
<td>String.</td>
</tr>
<tr>
<td>Group</td>
<td>A group of which the owning client of a sandbox is a member.</td>
<td>=.</td>
<td>String.</td>
</tr>
</tbody>
</table>
Logging and Returns

Sandbox deletion is logged using the preexisting audit logging functionality. Additionally, a more detailed report of the effects of sandbox administration is included in the debug log (tm1server.log) at INFO level. This report will include the list of affected sandboxes, as well as some of their attributes, and any errors encountered.

ServerSandboxesDelete returns only a success or failure status.

Semantics

Predicate List

Multiple predicates passed in a single call to ServerSandboxesDelete are conjunctive. In other words, for a sandbox to match the passed criteria, all predicates must be true. Multiple calls to ServerSandboxesDelete can be used to achieve disjunctive behavior. Only one occurrence of each attribute is allowed per call to ServerSandboxesDelete. For example, passing client twice is invalid as a sandbox has only one owning client. When multiple occurrences of an attribute are detected, a warning displays in the detailed report, however, the operation will not abort in failure. In such a case, the predicates are tested as with any other query, but the results set is always empty.

Locking

To avoid massive locking issues, ServerSandboxesDelete looks at the sandboxes of a client as a point-in-time snapshot and then, when possible, release any locks that would ensure a serializable transaction. Because of this behavior, once a client is "passed" in the iteration of all clients, a sandbox matching the filter criteria may be added to that client before the maintenance transaction completes. This behavior is similar to the behavior that occurs when a sandbox is added to the client immediately after the transaction completes.

Scope

Members of the ADMIN (super-user) and the DataAdmin groups will have access to all sandboxes of all clients. They must explicitly specify the client attribute to limit the scope of their call to ServerSandboxesDelete to only their own sandboxes. All other users have access to only their own sandboxes; if they specify a different client, or a group to which they do not belong, the function will abort in failure and return a privilege error.

In-Use Sandboxes

When a sandbox meets the criteria for deletion, but is currently in use, that sandbox will not be deleted. An entry will appear in the debug log info-level report indicating the occurrence.

Access and Update Dates

Date attributes can be matches with, at most, day granularity. Because of this restriction, recording of these attributes is correspondingly granular. Last Update Date is not updated on individual cell writes. Instead, the system records the unload date of a sandbox that has had something written to it while it was loaded in memory. For such sandboxes, Last Access Date and Last Update Date will be the same. Only Last Access Date is updated on the unloading of a sandbox from memory. Also, because in-memory sandboxes are not subject to ServerSandboxesDelete, Last Access Date is not updated when a sandbox is loaded into memory.

For example, consider the follow usage scenario:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Load Sandbox S</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Write 1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Read 1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Unload Sandbox</td>
</tr>
</tbody>
</table>
A user is working with sandbox over the course of two days (perhaps for a much shorter period encompassing the day change.) At time 4, when the sandbox is unloaded, Last Update Date is set to 2, rather than 1 where the last update actually occurred. Last Access Date is also set to 2 at time 4 in this case. If Write1 were instead a read, only Last Access Date would be set to 2, while Last Update Date wouldn't be changed.

**Example**

```
ServerSandboxesDelete('client:=:Admin, name:=:best case scenario');
```

**ServerSandboxDiscardAllChanges**

ServerSandboxDiscardAllChanges discards all changes in an existing sandbox.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ServerSandboxDiscardAllChanges( sandboxName );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sandboxName</td>
<td>A string value. The name of a sandbox owned by the executing user.</td>
</tr>
</tbody>
</table>

**Example**

```
ServerSandboxDiscardAllChanges('MySandbox');
```

**ServerSandboxMerge**

ServerSandboxMerge merges a source sandbox into an existing target sandbox. If the target sandbox is not specified, the source sandbox is merged into base.

Sandboxes are private workspaces in which a user can enter and store data values separate from TM1 base data. Sandboxes are stored on disk and, when in use, in memory.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ServerSandboxMerge( src, tgt, conflictRes, waitForLocks);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
</table>
| src      | The name of the source sandbox owned by the executing user to be merged with the <tgt> sandbox.  
<p>|          | The &lt;src&gt; sandbox is not changed. Required                                                    |
| String   |                                                                                     |</p>
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tgt</td>
<td>The name of a sandbox owned by the executing user to be merged with the <code>&lt;src&gt;</code> sandbox. The <code>&lt;tgt&gt;</code> sandbox is updated. If <code>&lt;tgt&gt;</code> is blank, you are merging <code>&lt;src&gt;</code> with base data and updating base. Required. To leave this parameter blank, use 2 concatenated single quotes: <code>''</code>.</td>
</tr>
<tr>
<td>conflictRes</td>
<td>The <code>&lt;conflictRes&gt;</code> parameter is ignored. Optional Numeric</td>
</tr>
<tr>
<td>waitForLocks</td>
<td>The <code>&lt;waitForLocks&gt;</code> parameter is an integer that indicates whether to wait for locks to guarantee serialization. 1 means wait for locks, catch any conflict exceptions, and retry instead of allowing the chore or process to roll back. 0 means do not wait for locks. Allow exceptions that cause rollback. Optional Numeric</td>
</tr>
</tbody>
</table>

**Example**

Merge mySandbox to base.

```plaintext
ServerSandboxMerge(mySandbox, '');
```

**ServerSandboxExists**

ServerSandboxExists tests for the existence of the passed sandbox. 1 is returned when the passed sandbox exists, 0 otherwise.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ServerSandboxExists( sandboxname )
```

or

```plaintext
ServerSandboxExists( sandboxname , username )
```

**Arguments**

The name of the sandbox whose existence is being tested. ServerSandboxExists takes an optional string parameter, the owning client's name. The calling client can use the optional parameter to specify a client other than themselves if the calling client has the appropriate privileges. A privilege error will result if the specified client is not the executing client and the executing client is not a member of the DataAdmin or ADMIN groups. If the optional parameter is not used, the active client's sandboxes are the subject.
Example

The following snippet shows how the `ServerSandboxExists`, `ServerSandboxGet`, and `ServerSandboxListCountGet` functions can be used to iterate the sandboxes of user called User1 and output those sandboxes to a text file. The TurboIntegrator process would successfully execute for members of the Admin or Data Admin groups and for user called User1. The TurboIntegrator process would fail with a privilege error for any other users.

```
SandboxIndex = 1;
NumSandboxes = ServerSandboxListCountGet( 'User1' );
WHILE( SandboxIndex <= NumSandboxes );
    SandboxName = ServerSandboxGet( SandboxIndex, 'User1' );
    IF( ServerSandboxExists( SandboxName, 'User1' ) = 1 );
        ASCIIOUTPUT( 'C:\User1Sandboxes.txt', SandboxName );
    ENDIF;
    SandboxIndex = SandboxIndex + 1;
END;
```

**ServerSandboxGet**

ServerSandboxGet returns the name of the sandbox identified by the number $N$, where $N$ is the parameter entered.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ServerSandboxGet( index )
```

or

```
ServerSandboxGet( index, username )
```

**Arguments**

The index of the requested sandbox in the user’s sandbox collection. The index space will be contiguous, so the first occurrence of an empty string return can be used to break iteration. Also, deleting a sandbox will alter the indexes of any sandboxes that follow that sandbox in the list.

`ServerSandboxGet` takes an optional string parameter, the owning client’s name. The calling client can use the optional parameter to specify a client other than themselves if the calling client has the appropriate privileges. A privilege error will result if the specified client is not the executing client and the executing client is not a member of the DataAdmin or ADMIN groups. If the optional parameter is not used, the active client’s sandboxes are the subject.

**Example**

The following snippet shows how the `ServerSandboxExists`, `ServerSandboxGet`, and `ServerSandboxListCountGet` functions can be used to iterate the sandboxes of user called User1 and output those sandboxes to a text file. The TurboIntegrator process would successfully execute for members of the Admin or Data Admin groups and for user called User1. The TurboIntegrator process would fail with a privilege error for any other users.

```
SandboxIndex = 1;
NumSandboxes = ServerSandboxListCountGet( 'User1' );
WHILE( SandboxIndex <= NumSandboxes );
    SandboxName = ServerSandboxGet( SandboxIndex, 'User1' );
```
ServerSandboxListCountGet

ServerSandboxListCountGet returns the count of sandboxes as a number.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ServerSandboxListCountGet()

or

ServerSandboxListCountGet( username )

Arguments

ServerSandboxListCountGet takes an optional string parameter, the owning client's name. The calling client can use the optional parameter to specify a client other than themselves if the calling client has the appropriate privileges. A privilege error will result if the specified client is not the executing client and the executing client is not a member of the DataAdmin or ADMIN groups. If the optional parameter is not used, the active client's sandboxes are the subject.

Example

The following snippet shows how the ServerSandboxExists, ServerSandboxGet, and ServerSandboxListCountGet functions can be used to iterate the sandboxes of user called User1 and output those sandboxes to a text file. The TurboIntegrator process would successfully execute for members of the Admin or Data Admin groups and for user called User1. The TurboIntegrator process would fail with a privilege error for any other users.

SetUseActiveSandboxProperty

SetUseActiveSandboxProperty controls whether a process reads and writes cube data to the base data or to the user's active sandbox. The default is for processes to read and write to the base data.

The scope of this function applies only to the current running process and temporarily overrides the permanent value for this property that is set in the Architect / Server Explorer user interface.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

```plaintext
SetUseActiveSandboxProperty(PropertyValue)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PropertyValue</td>
<td>A Boolean value that indicates whether the process should use the active sandbox context when reading and writing cube data. If PropertyValue = 0, the process will disregard the active sandbox context and read/write to the base data. If PropertyValue = 1, the process will read/write cube data to the active sandbox.</td>
</tr>
</tbody>
</table>

Example

```plaintext
SetUseActiveSandboxProperty(1);
```

This example will cause the process to read/write cube data to the active sandbox for the rest of this execution.

Security TurboIntegrator Functions

These functions pertain to security.

AddClient

AddClient creates a new client on the server. Changes applied through the AddClient functions do not take effect until the Metadata procedure in a process is completed. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```plaintext
AddClient(ClientName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>The name of the client you want to add to the server. The client name is limited to 255 characters/bytes.</td>
</tr>
</tbody>
</table>

Example

```plaintext
AddClient('Brian');
```

This example adds the client Brian to the server.
AddGroup
AddGroup creates a new user group on the server. Changes applied through the AddGroup function do not take effect until the Metadata procedure in a process is completed. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.

Syntax
AddGroup(GroupName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupName</td>
<td>The name of the group you want to create.</td>
</tr>
</tbody>
</table>

Example
AddGroup('Finance');

This function adds the Finance user group to the server.

AssignClientToGroup
AssignClientToGroup assigns an existing client on a server to an existing user group. This function assigns an existing client on a server to an existing user group.

This function is valid in TM1 TurboIntegrator processes only.

Syntax
AssignClientToGroup(ClientName, GroupName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>The name of the client you want to assign to a group.</td>
</tr>
<tr>
<td>GroupName</td>
<td>The group to which you want to assign the client.</td>
</tr>
</tbody>
</table>

Example
AssignClientToGroup('Brian', 'Finance');

This example assigns the existing client Brian to the existing user group Finance.

AssignClientPassword
AssignClientPassword assigns a password to an existing client on a server. AssignClientPassword returns 1 if the password assignment is successful and returns 0 if the assignment fails.

This function is valid in TM1 TurboIntegrator processes only.

Syntax
AssignClientPassword (ClientName, Password);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>The name of the client for which you want to assign a password.</td>
</tr>
<tr>
<td>Password</td>
<td>The password you want to assign to the client. When assigning a password, use plain text. TM1 will encrypt the password on the server. Passwords must be at least five characters in length.</td>
</tr>
</tbody>
</table>

**Example**

AssignClientPassword ('Brian', 'flyfisher');

This example assigns the password ‘flyfisher’ to the client named Brian.

**AssociateCAMIDToGroup**

AssociateCAMIDToGroup creates an association between a TM1 user group and a CAMID.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

AssociateCAMIDToGroup(GroupName, CAMID, CAMIDDefDisplayValue);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupName</td>
<td>The name of the TM1 group you want to associate with the CAMID.</td>
</tr>
<tr>
<td>CAMID</td>
<td>The name of the CAMID group. If the CAMID does not exist, it will be created in the }ClientCAMAssociatedGroups control cube.</td>
</tr>
<tr>
<td>CAMIDDefDisplayValue</td>
<td>The alias of the CAMID group.</td>
</tr>
</tbody>
</table>

**CellSecurityCubeCreate**

CellSecurityCubeCreate creates a security cube from an existing cube using a reduced set of dimensions. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

CellSecurityCubeCreate ('DataCube', '0:0:1:0');

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the data cube.</td>
</tr>
</tbody>
</table>
**Argument**  
**DimensionMap**  
String specifying whether the dimension at each position should be used in the security cube. The order of dimensions is the original cube order. A 1 for each included dimension and a 0 for an excluded one. Each value separated by a colon.

**Boolean return**  
True if the operation succeeded. A major error otherwise.

**Additional information**  
The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Creates the cell security cube.

**Example**

```
CellSecurityCubeCreate ('DataCube', '0:0:1:0');
```

This example creates an RDCLS cube from the cube called Data Cube.

**CellSecurityCubeDestroy**

CellSecurityCubeDestroy destroys a security cube that was created from an existing cube. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
CellSecurityCubeDestroy ('DataCube', '0:0:1:0');
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the data cube.</td>
</tr>
<tr>
<td>Boolean return</td>
<td>True if the operation succeeded. A major error otherwise.</td>
</tr>
<tr>
<td>Additional info</td>
<td>The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Destroys the cell security cube.</td>
</tr>
</tbody>
</table>

**Example**

```
CellSecurityCubeDestroy ('DataCube');
```

**DeleteClient**

DeleteClient deletes a client from the server. Changes applied through the DeleteClient function do not take effect until the Metadata procedure in a process is completed. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```plaintext
DeleteClient(ClientName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>The name of the client you want to delete from the server.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DeleteClient('Brian');
```

This example removes the client Brian from the server.

**DeleteGroup**

DeleteGroup deletes a user group from the server. Changes applied through the DeleteGroup function do not take effect until the Metadata procedure in a process is completed. This function, like all functions that update metadata, should not be used in the Data or Epilog tabs of a process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
DeleteGroup(GroupName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupName</td>
<td>The group you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
DeleteGroup('Finance');
```

This example deletes the Finance user group from the server.

**ElementSecurityGet**

ElementSecurityGet retrieves the security level assigned to a specified group for a dimension element.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ElementSecurityGet(DimName, ElName, Group);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you are retrieving a security level.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you are retrieving a security level.</td>
</tr>
<tr>
<td>Group</td>
<td>The user group for which you are retrieving a security level.</td>
</tr>
</tbody>
</table>
Example

ElementSecurityGet('Region', 'Germany', 'Budgeting');

This example returns the security level assigned to the Budgeting user group for the Germany element of the Region dimension.

ElementSecurityPut

ElementSecurityPut assigns a security level to a specified group for a dimension element.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ElementSecurityPut(Level, DimName, ElName, Group);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
</table>
| Level        | The security level you are assigning. There are six possible Level values:  
|              | • None       |
|              | • Read       |
|              | • Write      |
|              | • Reserve    |
|              | • Lock       |
|              | • Admin      |
| DimName      | The parent dimension of the element for which you are assigning a security level. |
| ElName       | The element for which you are assigning a security level. |
| Group        | The user group for which you are assigning a security level. |

Example

ElementSecurityPut('Reserve', 'Region', 'Germany', 'Budgeting');

This example assigns Reserve security to the Budgeting group for the Germany element of the Region dimension.

HierarchyElementSecurityGet

HierarchyElementSecurityGet retrieves the security level assigned to a specified group for a dimension element.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

HierarchyElementSecurityGet(DimName, HierName, ElName, Group);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the element for which you are retrieving a security level.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you are retrieving a security level.</td>
</tr>
<tr>
<td>Group</td>
<td>The user group for which you are retrieving a security level.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchyElementSecurityGet('Region', 'Europe', 'Germany', 'Budgeting');
```

This example returns the security level assigned to the Budgeting user group for the Germany element. The element appears in the Europe hierarchy of the Region dimension.

**HierarchyElementSecurityPut**

HierarchyElementSecurityPut assigns a security level to a specified group for a dimension element.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchyElementSecurityPut(Level, DimName, HierName, ElName, Group);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>The security level you are assigning. There are six possible Level values:</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>ElName</td>
<td>The element for which you are assigning a security level.</td>
</tr>
<tr>
<td>Group</td>
<td>The user group for which you are assigning a security level.</td>
</tr>
</tbody>
</table>
Example

```
HierarchyElementSecurityPut('Reserve', 'Region', 'Europe', 'Germany', 'Budgeting');
```

This example assigns Reserve security to the Budgeting group for the Germany element. The element appears in the Europe hierarchy of the Region dimension.

**RemoveCAMIDAssociation**

RemoveCAMIDAssociation removes all associations between TM1 user groups and a specified CAMID. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
RemoveCAMIDAssociation(CAMID, RemoveCAMID);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMID</td>
<td>The name of the CAMID group for which you want to remove all security associations.</td>
</tr>
<tr>
<td>RemoveCAMID</td>
<td>Determines if the specified CAMID is deleted from the ClientCAMAssociatedGroups control cube. 0 leaves the CAMID in the control cube. 1 deletes the CAMID from the control cube.</td>
</tr>
</tbody>
</table>

**RemoveCAMIDAssociationFromGroup**

RemoveCAMIDAssociationFromGroup removes an association between a TM1 user group and a CAMID. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
RemoveCAMIDAssociationFromGroup(GroupName, CAMID);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupName</td>
<td>The name of the TM1 user group for which you want to remove the association.</td>
</tr>
<tr>
<td>CAMID</td>
<td>The name of the CAMID group for which you want to remove the association.</td>
</tr>
</tbody>
</table>

**RemoveClientFromGroup**

RemoveClientFromGroup removes a specified client from a user group. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
RemoveClientFromGroup(ClientName, GroupName);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClientName</td>
<td>The client you want to remove.</td>
</tr>
<tr>
<td>GroupName</td>
<td>The user group from which you want to remove the client.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
RemoveClientFromGroup('Brian', 'Finance');
```

This example removes the client Brian from the Finance user group.

**SetHierarchyGroupsSecurity**

SetHierarchyGroupsSecurity sets the security level for all existing groups for the specified dimension hierarchy.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SetHierarchyGroupsSecurity(securityLevel, dimension, hierarchy)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>securityLevel</td>
<td>The security level that you are assigning. There are six possible values:</td>
</tr>
<tr>
<td></td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Read</td>
</tr>
<tr>
<td></td>
<td>• Write</td>
</tr>
<tr>
<td></td>
<td>• Reserve</td>
</tr>
<tr>
<td></td>
<td>• Lock</td>
</tr>
<tr>
<td></td>
<td>• Admin</td>
</tr>
<tr>
<td>dimension</td>
<td>Name of the dimension.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>Name of the dimension hierarchy.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
SetHierarchyGroupsSecurity('Reserve', 'Region', 'Europe');
```

This example assigns Reserve security to all existing groups in the Europe hierarchy of the Region dimension.

**SetHierarchyElementGroupsSecurity**

SetHierarchyElementGroupsSecurity sets the security level for a specified element from a hierarchy in a dimension.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

SetHierarchyElementGroupsSecurity(securityLevel, dimension, hierarchy, element)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>securityLevel</td>
<td>The security level you are assigning. There are six possible values:</td>
</tr>
<tr>
<td></td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Read</td>
</tr>
<tr>
<td></td>
<td>• Write</td>
</tr>
<tr>
<td></td>
<td>• Reserve</td>
</tr>
<tr>
<td></td>
<td>• Lock</td>
</tr>
<tr>
<td></td>
<td>• Admin</td>
</tr>
<tr>
<td>dimension</td>
<td>Name of the dimension.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>Name of the dimension hierarchy.</td>
</tr>
<tr>
<td>element</td>
<td>The element for which you are assigning a security level.</td>
</tr>
</tbody>
</table>

Example

SetHierarchyElementGroupsSecurity('Reserve', 'Region', 'Europe', 'Germany');

This example assigns Reserve security to the Germany element of the Europe hierarchy in the Region dimension.

SetDimensionGroupsSecurity

SetDimensionGroupsSecurity sets the security level for all existing groups for the specified dimension. This function is valid in TM1 TurboIntegrator processes only.

Syntax

SetDimensionGroupsSecurity(securityLevel, dimension)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>securityLevel</td>
<td>The security level you are assigning. There are six possible values:</td>
</tr>
<tr>
<td></td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Read</td>
</tr>
<tr>
<td></td>
<td>• Write</td>
</tr>
<tr>
<td></td>
<td>• Reserve</td>
</tr>
<tr>
<td></td>
<td>• Lock</td>
</tr>
<tr>
<td></td>
<td>• Admin</td>
</tr>
<tr>
<td>dimension</td>
<td>Name of the dimension.</td>
</tr>
</tbody>
</table>
**Example**

```plaintext
SetDimensionGroupsSecurity('Reserve', 'Region');
```

This example assigns Reserve security to all existing groups in the Region dimension.

---

**SetElementGroupsSecurity**

SetElementGroupsSecurity sets the security level for a specified element in a dimension. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SetElementGroupsSecurity(securityLevel, dimension, element)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>securityLevel</td>
<td>The security level you are assigning. There are six possible values:</td>
</tr>
<tr>
<td>dimension</td>
<td>Name of the dimension.</td>
</tr>
<tr>
<td>element</td>
<td>The element for which you are assigning a security level.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
SetElementGroupsSecurity('Reserve', 'Region', 'Germany');
```

This example assigns Reserve security to the Germany element of the Region dimension.

---

**SecurityOverlayGlobalLockCell**

SecurityOverlayGlobalLockCell is used to restrict the access rights of a node to read-only by locking it. It uses the global overlay so all users are affected. The overlay cube must be created prior to using this command. The elements provided in the address must be only for the dimensions used in the overlay. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SecurityOverlayGlobalLockCell(bLock, Cube, element1,..., elementN)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bLock</td>
<td>If 1 lock it. 0 unlock it</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>elementN</td>
<td>Overlay element name that defines the tuple. The order must match the original dimension order of the cube.</td>
</tr>
<tr>
<td>Boolean return</td>
<td>True if the operation succeeded. A major error otherwise.</td>
</tr>
<tr>
<td>Additional information</td>
<td>The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Creates the default global security overlay cube. Global overlays apply to all users.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
SecurityOverlayGlobalLockCell(1,'Sales','MA');
SecurityOverlayGlobalLockCell(0,'Products','MA','2011');
```

In the first example, there is only one dimension used for the overlay. The second example uses two dimensions.

**SecurityOverlayCreateGlobalDefault**

SecurityOverlayCreateGlobalDefault is used to create or destroy a Security Overlay cube, and to set the overlay for a given area of a data cube.

Creating a data cube with a name that signifies an overlay cube will cause the data cube to be made into an overlay if the server is restarted. When the cube is loaded it will be configured as an overlay if a matching data cube is found.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SecurityOverlayCreateGlobalDefault (Cube, DimensionMap)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>DimensionMap</td>
<td>String specifying whether the dimension at each position should be used in the overlay. The order of dimensions is the original cube order. A 1 for each included dimension and a 0 for an excluded one. Each value separated by a colon.</td>
</tr>
<tr>
<td>Boolean return</td>
<td>True if the operation succeeded. A major error otherwise.</td>
</tr>
<tr>
<td>Additional information</td>
<td>The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Creates the default global security overlay cube. Global overlays apply to all users</td>
</tr>
</tbody>
</table>
SecurityOverlayDestroyGlobalDefault

SecurityOverlayDestroyGlobalDefault is used to destroy a Security Overlay cube, and to set the overlay for a given area of a data cube.

Creating a data cube with a name that signifies an overlay cube will cause the data cube to be made into an overlay if the server is restarted. When the cube is loaded it will be configured as an overlay if a matching data cube is found.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

SecurityOverlayDestroyGlobalDefault (Cube)

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>Boolean return</td>
<td>True if the operation succeeded. A major error otherwise.</td>
</tr>
<tr>
<td>Additional info.</td>
<td>The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Creates the default global security overlay cube. Global overlays apply to all users.</td>
</tr>
</tbody>
</table>

Example

SecurityOverlayDestroyGlobalDefault(‘DataCube’);

SecurityOverlayGlobalLockNode

SecurityOverlayGlobalLockNode is used to restrict the access rights of a node to read-only by locking it. It uses the global overlay so all users are affected. The overlay cube must be created prior to using this command. The elements provided in the address must be only for the dimensions used in the overlay.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

SecurityOverlayGlobalLockNode(bLock, Cube, Address, [AddressDelimiter])

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bLock</td>
<td>If 1 lock it. 0 unlock it</td>
</tr>
<tr>
<td>Cube</td>
<td>Name of the cube.</td>
</tr>
<tr>
<td>Address</td>
<td>Tokenized string sequence of overlay element names that define the tuple. The order must match the original dimension order of the cube.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Address return</td>
<td>Optional character string used to separate element names in the Address parameter. Default value ‘</td>
</tr>
<tr>
<td>Boolean return</td>
<td>True if the operation succeeded. A major error otherwise.</td>
</tr>
<tr>
<td>Additional information</td>
<td>The GrantSecurityAccess property must be set for this TurboIntegrator process to succeed. Creates the default global security overlay cube. Global overlays apply to all users.</td>
</tr>
</tbody>
</table>

**Examples**

```plaintext
SecurityOverlayGlobalLockNode(1,'Sales','MA');
SecurityOverlayGlobalLockNode(0,'Products','MA | 2011');
SecurityOverlayGlobalLockNode(0,'Products', 'MA : 2011', ':');
```

In the first example there is only one dimension used for the overlay. The other two examples use two dimensions.

**SecurityRefresh**

SecurityRefresh reads all the security control cubes and regenerates the internal structures in the server that are used by TM1 API functions.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SecurityRefresh;
```

**Arguments**

None.

**Server Manipulation TurboIntegrator Functions**

These functions facilitate server manipulation.

**BatchUpdateFinish**

BatchUpdateFinish instructs the server to exit batch update mode.

This function is valid in TM1 TurboIntegrator processes only.

**Semantics**

When multiple processes are running in batch update mode and applying changes to a single cube, the TM1 locking scheme may prevent one of the processes from updating the cube. This is by design; when one process obtains a lock to write changes to a cube, other processes will be prevented from writing to that cube in the interest of maintaining data integrity.

This locking scheme can be illustrated using an example of two processes, Process 1 and Process 2, that update a single cube.
• Both processes start and call the BatchUpdateStart function to initiate batch updates.
• Each process operates on a unique data source.
• Process 1 completes processing data and calls the BatchUpdateFinish function. The process obtains a write lock to the cube and commits changes.
• While Process 1 still holds a write lock to the cube, Process 2 completes processing data and calls the BatchUpdateFinish function. However, because Process 1 retains the lock, Process 2 cannot obtain a lock to the cube. All data changes applied in Process 2 are rolled back and Process 2 is restarted. This ensures data integrity.

![Diagram of batch update process]

Depending on the size of the datasource for Process 2, the data rollback and process re-execution can cause a noticeable decrease in performance. To address this performance issue, consider using the BatchUpdateFinishWait function in place of BatchUpdateFinish.

**Syntax**

BatchUpdateFinish(SaveChanges);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SaveChanges</td>
<td>A flag that instructs the server to either save or discard changes committed while in batch update mode. Specify 0 to save changes, 1 to discard changes.</td>
</tr>
</tbody>
</table>

**Example**

BatchUpdateFinish(0);

This example instructs the server to save changes to TM1 data and exit batch update mode.
**BatchUpdateFinishWait**

BatchUpdateFinishWait is identical to BatchUpdateFinish except the process waits until the lock becomes available and then commits changes. If a process calls BatchUpdateFinishWait but is unable to secure a cube write lock to commit changes, the process waits until the lock becomes available and then commits changes.

This function is valid in TM1 TurboIntegrator processes only.

Data changes applied in the process are not rolled back and the process is not re-executed.

**Note:** While waiting for the cube write lock, the process releases any read locks it acquired for other objects during process execution. Because these read locks are released before the process can commit changes to the cube, the objects for which the read locks are released can be modified before the cube is updated. This can lead to data inconsistency when using BatchUpdateFinishWait.

We recommend that BatchUpdateFinishWait be used only in controlled situations where you know that other processes are not modifying data or metadata related to the process that calls BatchUpdateFinishWait.

**Syntax**

```plaintext
BatchUpdateFinishWait(SaveChanges);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SaveChanges</td>
<td>A flag that instructs the server to either save or discard changes committed while in batch update mode. Specify 0 to save changes, 1 to discard changes.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
BatchUpdateFinishWait(0);
```

This example instructs the server to save changes to TM1 data and exit batch update mode.

**BatchUpdateStart**

BatchUpdateStart enables batch updates.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
BatchUpdateStart;
```

**Arguments**

None.

**DisableBulkLoadMode**

DisableBulkLoadMode disables bulk load processing.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

See “EnableBulkLoadMode” on page 354 for details.
**EnableBulkLoadMode**

EnableBulkLoadMode enables bulk load processing for a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

You can enable Bulk Load Mode in either the Prolog or Epilog section of a TurboIntegrator process. For efficiency, enable Bulk Load Mode in the first, or very close to the first, statement in the Prolog section of your process.

After enabling Bulk Load Mode in a process, it can only be disabled on the last line in the Epilog section. If you attempt to disable Bulk Load Mode anywhere else in the process, the process will not compile.

If the mode is enabled in one TurboIntegrator process, it remains enabled until explicitly disabled or until the chore completes. This means you can enable the mode in a process within a chore and then run a series of TurboIntegrator processes before disabling it. You can also enter and exit Bulk Load Mode repeatedly, using the mode only for certain critical parts of a chore.

Use the following TurboIntegrator commands to enable and disable Bulk Load Mode in a TurboIntegrator process.

```plaintext
EnableBulkLoadMode();
```

Use the following TurboIntegrator function only on the last line in the Epilog section of your TI process when using Bulk Load Mode.

```plaintext
DisableBulkLoadMode();
```

**RefreshMdxHierarchy**

RefreshMdxHierarchy updates the MDX hierarchies in a server without requiring you to restart the server.

Use this function after configuring or editing the custom named hierarchy levels for a dimension in the }HierarchyProperties control cube.

For details on using named levels with dimensions, see the related section in the IBM Cognos *TM1 for Developers* documentation.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
RefreshMdxHierarchy(dimensionName, hierarchy)
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimensionName</td>
<td>Optional string parameter to specify a specific dimension to update. Leave</td>
</tr>
<tr>
<td></td>
<td>this parameter blank to update all dimensions.</td>
</tr>
<tr>
<td>hierarchy</td>
<td>The name of the hierarchy within the dimension. This is an optional parameter.</td>
</tr>
</tbody>
</table>

**Example**

Update all dimensions:

```plaintext
RefreshMdxHierarchy('');
```
To update only the customers dimension:

```
RefreshMdxHierarchy('customers');
```

**SaveDataAll**

SaveDataAll saves all TM1 data from server memory to disk and restarts the log file.

This function is valid in TM1 TurboIntegrator processes only.

**Using SaveDataAll in a Chore**

SaveDataAll commits all changes a chore makes prior to calling the SaveDataAll function.

While a chore is running, it accumulates locks on the objects it accesses. The commit operation initiated by the SaveDataAll function temporarily releases all these locks. Once the commit is complete, SaveDataAll reacquires all the locks it had before so it can continue to access the objects it was working on.

There is a brief window during the commit operation where the locks are released and another user or TurboIntegrator process could delete objects the original chore was using. When the original chore attempts to reacquire the locks on those objects, the objects will not be available and the chore will cease processing. In this case, an error similar to the following is written to the Tm1s.log file:

```
844 WARN 2008-04-01 16:40:09,734 TM1.Server TM1ServerImpl::FileSave could not reacquire lock on object with index 0x200002ca
```

**Lock contention and using SaveDataAll at the end of TurboIntegrator processes**

Using SaveDataAll as last command in a TurboIntegrator process can increase lock contention in TM1 TurboIntegrator processes.

In IBM TM1 versions, SaveDataAll was often added to the end of a TurboIntegrator process that loads data with logging disabled. The SaveDataAll provided a way to write data from memory to disk directly after a successful import, so that the newly imported data would not be lost in case of a mishap, such as a server crash.

However, adding SaveDataAll as the last command can result in numerous TurboIntegrator import processes, each one with SaveDataAll as last command. This technique worked in TM1 Version 9.0 and older due to the previous lock model which used only the global write lock. At any given time in earlier versions only one write operation could take place. Therefore competing concurrent SaveDataAll operations never occurred from multiple concurrent write operations.

Version 9.1 and newer introduced a more granular lock-by-object model that enables concurrent write operations, if these write operations do not compete for the same resources. If they do compete for the same resources, a lock contention occurs forcing one of the processes to rollback. So now two TurboIntegrator import processes may run simultaneously if they do not share any objects, for example, if they import into two different cubes.

The TurboIntegrator function SaveDataAll relies on the transaction logfile tm1s.log and involves all objects within a data model. Therefore, two TurboIntegrator import processes, both using the function SaveDataAll, cannot run in parallel: one will be executed, the other one (and its TurboIntegrator process) will be forced to rollback. The same is true if the TurboIntegrator processes are part of chores: only one chore will proceed to execute the TurboIntegrator function SaveDataAll, the other chore will be forced to rollback.

A rollback is undesirable from a performance point of view, as it increases the total execution time of a TurboIntegrator process or chore. Competing concurrent SaveDataAll operations will always lead to a lock contention and to a rollback.

There are two possible solutions to avoid competing concurrent SaveDataAll operations:

- Do not use the TurboIntegrator function SaveDataAll. Instead enable Cube Logging for the import cubes.
- If enabling Cube Logging for the import cubes cannot be done for performance reasons, within the TM1 application there should be only one process calling the TurboIntegrator function SaveDataAll. Use a stand-alone, single, distinct chore to execute the SaveDataAll operation.

**Syntax**

```
SaveDataAll;
```

**Arguments**

None.

**ServerShutdown**

ServerShutdown shuts down a server running as an application. ServerShutdown cannot be used to shut down a server running as a Windows service.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ServerShutDown(SaveData);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SaveData</td>
<td>A Boolean value that indicates whether the server should save changes to disk before shutting down. If SaveData = 0, the server shuts down without saving changes. If SaveData = 1, the server saves changes from memory to disk before shutting down.</td>
</tr>
</tbody>
</table>

**Example**

```
ServerShutdown(1);
```

This example shuts down the server and saves data to disk.

### Subset Manipulation TurboIntegrator Functions

These functions facilitate subset manipulation.

**HierarchySubsetAliasSet**

HierarchySubsetAliasSet sets the alias attribute to be used in a subset. HierarchySubsetAliasSet returns 1 if successful, 0 otherwise.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetAliasSet(DimName, HierName, SubName, AliasName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to set the alias.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to set the alias.</td>
</tr>
<tr>
<td>AliasName</td>
<td>The alias you want to use in the subset.</td>
</tr>
</tbody>
</table>

**HierarchySubsetCreate**

HierarchySubsetCreate creates an empty public subset of a specified hierarchy and dimension.

When the optional AsTemporary argument is set to 1, the subset is temporary and persists only for the duration of the TurboIntegrator process or chore in which the subset is created.

**Note:**

For TM1 Server version 11.2.0 and earlier, temporary subsets were visible and usable only by the process that created it and any of its child processes. Temporary subsets were not visible to the ancestor and sibling processes. You could create same-named subsets in sibling child processes with the same parent process.

For TM1 Server version 11.3.0 and later, these temporary subsets are visible to the ancestor and sibling processes. If a parent TurboIntegrator process A invokes two child TurboIntegrator processes A1 and A2, and the child TurboIntegrator process A1 creates a temporary subset S, the temporary subset S exists for the duration of the parent TurboIntegrator process A. You cannot create a temporary subset with the same name S in the sibling TurboIntegrator process A2 since the subset is visible and usable by siblings A1 and A2.

While a temporary subset exists, the temporary subset takes precedence over any same-named public subset. If another TurboIntegrator function references a subset that exists in both a temporary and permanent state, the function operates upon the temporary subset.

There is no locking associated with a temporary subset, as a temporary subset is never saved. This can result in improved performance, because there is no need for TurboIntegrator to wait for locks to be released before operating upon a temporary subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetCreate(DimName, HierName, SubName, [AsTemporary]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset you are creating.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name you want to assign to the subset.</td>
</tr>
<tr>
<td>AsTemporary</td>
<td>This is an optional argument that specifies whether the subset being created is temporary. 1 indicates a temporary subset, 0 indicates a permanent subset. If this argument is omitted, the subset is permanent.</td>
</tr>
</tbody>
</table>
Example

```plaintext
HierachySubsetCreate('Region', 'European', 'Northern Europe', 1);
```

This example creates the temporary Northern Europe subset of the European hierarchy in the Region dimension. You can use SubsetElementInsert to add elements to the subset.

**HierachySubsetDeleteAllElements**

HierachySubsetDeleteAllElements deletes all elements from a public subset of a dimension hierarchy. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierachySubsetDeleteAllElements(DimName, HierName, SubsetName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset from which you want to delete elements.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset from which you want to delete elements. This must be a public subset. TurboIntegrator cannot access private objects.</td>
</tr>
</tbody>
</table>

Example

```plaintext
HierachySubsetDeleteAllElements('Region', 'European', 'Central Europe');
```

This example deletes all elements from the Central Europe subset of the European hierarchy in the Region dimension.

**HierachySubsetDestroy**

HierachySubsetDestroy deletes a subset from the TM1 database. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierachySubsetDestroy(DimName, HierName, SubName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset you are deleting.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of the subset you want to delete.</td>
</tr>
</tbody>
</table>

Example

```plaintext
HierachySubsetDestroy('Region', 'European', 'Northern Europe');
```

This example deletes the Northern Europe subset of the European hierarchy in the Region dimension.
**HierarchySubsetElementExists**

HierarchySubsetElementExists determines whether a specific element exists within a specific public subset on the server from which a TurboIntegrator process is executed. HierarchySubsetElementExists cannot be used to determine if an element exists in a private subset.

If the element exists in the specified subset, the function returns 1, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchySubsetElementExists(DimName, HierName, SubsetName, ElementName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension parent of the subset containing the element whose existence you want to confirm.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy in the specified dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The public subset containing the element whose existence you want to confirm.</td>
</tr>
<tr>
<td>ElementName</td>
<td>The element whose existence you want to confirm.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchySubsetElementExists('Region', 'Eastern', 'Europe', 'Italy');
```

This example determines if the Italy element exists in the Europe subset of the Eastern hierarchy from the Region dimension.

**HierarchySubsetElementDelete**

HierarchySubsetElementDelete deletes an element from a subset of a dimension hierarchy.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
HierarchySubsetElementDelete(DimName, HierName, SubName, Index);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset from which you want to delete an element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset from which you want to delete an element.</td>
</tr>
<tr>
<td>Index</td>
<td>The index number of the element you want to delete from the subset.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
HierarchySubsetElementDelete('Region', 'European', 'Northern Europe', 3);
```
This example deletes the third element from the Northern Europe subset of the European hierarchy in the Region dimension.

**HierarchySubsetElementGetIndex**

HierarchySubsetElementGetIndex retrieves the index of an element in a subset of a dimension hierarchy. The function returns the index of the first occurrence of the specified element. If the element does not exist in the subset or cannot be found, then zero is returned. If the dimension or subset cannot be found or an out-of-range start index is specified, then an error is thrown and the TurboIntegrator function is stopped.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetElementGetIndex(DimName, HierName, SubsetName, ElementName, StartIndex);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset that contains the element.</td>
</tr>
<tr>
<td>ElementName</td>
<td>The element name to search for in the subset.</td>
</tr>
<tr>
<td>StartIndex</td>
<td>The index number to begin searching from. The value must be</td>
</tr>
<tr>
<td></td>
<td>between 1 and the size of the subset.</td>
</tr>
</tbody>
</table>

**Example**

```
HierarchySubsetElementGetIndex('Region', 'Country', 'Europe', 'Italy', 3);
```

This example retrieves the index for Italy from the Europe subset of the Country hierarchy in the Region dimension. The search starts at index 3.

**HierarchySubsetElementInsert**

HierarchySubsetElementInsert adds an element to an existing subset in a dimension hierarchy. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetElementInsert(DimName, HierName, SubName, ElName, Position);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset to which you want to add an element.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of the subset to which you are adding an element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the element you want to add to the subset. The element must exist in the TM1 database.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Position</td>
<td>A value that indicates the index position of the element within the subset.</td>
</tr>
</tbody>
</table>

**Example**

HierarchySubsetElementInsert('Region', 'European', 'Northern Europe', 'Finland', 3);

This example adds the element Finland to the Northern Europe subset of the European hierarchy in the Region dimension. Finland is the third element in the subset definition.

**HierarchySubsetExists**

HierarchySubsetExists determines if a specific public subset exists on the server from which a TurboIntegrator process is executed. The function returns 1 if the subset exists on the server, otherwise it returns 0. Note that this function cannot be used to determine the existence of private subsets.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

HierarchySubsetExists(DimName, HierName, SubsetName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that is the parent of the subset whose existence you want to confirm.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The name of the public subset whose existence you want to confirm</td>
</tr>
</tbody>
</table>

**Example**

HierarchySubsetExists('Region', 'Industrialized', 'Northern Europe');

This example determines if the Northern Europe subset exists within the Industrialized hierarchy of the Region dimension.

**HierarchySubsetGetSize**

HierarchySubsetGetSize returns the number of elements in a subset of a dimension hierarchy.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

HierarchySubsetGetSize(DimName, HierName, SubsetName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to determine size.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset for which you want to determine size.</td>
</tr>
</tbody>
</table>
Example

HierarchySubsetGetSize('Region', 'Eastern', 'EurAsia');

This function returns the number of elements in the EurAsia subset of the Eastern hierarchy in the Region dimension.

HierarchySubsetGetElementName

HierarchySubsetGetElementName returns the name of the element at a specified index location within a given subset of a dimension hierarchy.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

HierarchySubsetGetElementName(DimName, HierName, SubsetName, ElementIndex);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent of the subset from which you want to retrieve an element name.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset from which you want to retrieve an element name.</td>
</tr>
<tr>
<td>ElementIndex</td>
<td>A number representing the position within the subset of the element you want to retrieve.</td>
</tr>
</tbody>
</table>

Example

HierarchySubsetGetElementName('Region', 'Western', 'Americas', 4);

This example returns the name of the fourth element in the Americas subset of the Western hierarchy in Region dimension.

HierarchySubsetIsAllSet

HierarchySubsetIsAllSet sets a subset to use all elements of the parent dimension.

HierarchySubsetIsAllSet returns 1 if successful, 0 otherwise.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

HierarchySubsetIsAllSet(DimName, HierName, SubName, Flag);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to use all elements.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to use all dimension elements.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Flag</td>
<td>Any non-zero value specifies that the subset uses all the current elements from the parent dimension and will dynamically update to use all elements from the parent dimension whenever the subset is called. Specifying a zero value freezes the elements in the subset as the current set of all elements in the parent dimension. The subset will not dynamically update to use all dimension elements in the future.</td>
</tr>
</tbody>
</table>

**HierarchySubsetMDXGet**

HierarchySubsetMDXGet retrieves the MDX expression used to create a subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetMDXGet(DimName, HierName, SubName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to retrieve the MDX expression.</td>
</tr>
</tbody>
</table>

**Example**

```
mdxString = HierarchySubsetMDXGet('Cities', 'Italy', 'testsubset');
```

**HierarchySubsetMDXSet**

HierarchySubsetMDXSet applies a specified MDX expression to an existing public subset of a hierarchy.

If the passed MDX expression is valid, the specified subset is saved as a dynamic subset defined by the MDX expression.

If the passed MDX expression is an empty string, the subset is converted to a static subset that contains the elements that are in place when HierarchySubsetMDXSet is executed.

The function returns the number of elements that the subset contains.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
HierarchySubsetMDXSet(DimName, HierName, SubName, MDX_expression);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>HierName</td>
<td>The name of the hierarchy within the dimension.</td>
</tr>
</tbody>
</table>
## Argument
| SubName | The subset to which you want to apply the MDX expression. SubName must be a public subset. If this subset does not exist, an error is logged. |
| MDX_expression | The MDX expression that you want to apply to the subset. If the MDX expression is invalid, TurboIntegrator processing stops, the subset is not modified, and an error is logged. |

If the MDX_expression argument is an empty string, the subset is converted to a static subset.

### Example

```text
HierarchySubsetMDXSet('Cities', 'World', 'Sub1', '{ [Cities].[Cities].[level000].members }');
```

This example updates the Sub1 subset of the World hierarchy to a dynamic subset that contains the current leaf elements of the Cities dimension. When leaf elements are added or removed from the Cities dimension, the mySub1 subset is dynamically updated to reflect the changes in the parent dimension.

### SubsetAliasSet

SubsetAliasSet sets the alias attribute to be used in a subset. SubsetAliasSet returns 1 if successful, 0 otherwise.

This function is valid in TM1 TurboIntegrator processes only.

### Syntax

```text
SubsetAliasSet( DimName, SubName, AliasName );
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to set the alias.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to set the alias.</td>
</tr>
<tr>
<td>AliasName</td>
<td>The alias you want to use in the subset.</td>
</tr>
</tbody>
</table>

### SubsetCreate

SubsetCreate creates an empty public subset of a specified dimension.

When the AsTemporary argument is set to 1, the subset is temporary and persists only for the duration of the TurboIntegrator process or a single-commit chore in which the subset is created. If a parent TurboIntegrator process invokes child TurboIntegrator processes by using the ExecuteProcess or ExecuteProcessWithReturn function, and the temporary subset is created in one of these child TurboIntegrator processes, the subset persists for the duration of the parent TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

### Note:

For TM1 Server version 11.2.0 and earlier, temporary views and subsets were visible and usable only by the process that created it and any of its child processes. Temporary views and subsets were not visible to the ancestor and sibling processes. You could create same-named subsets in sibling child processes with the same parent process.
For TM1 Server version 11.3.0 and later, these temporary subsets are visible to the ancestor and sibling processes. If a parent TurboIntegrator process A invokes two child TurboIntegrator processes A1 and A2, and the child TurboIntegrator process A1 creates a temporary subset S, the temporary subset S exists for the duration of the parent TurboIntegrator process A. You cannot create a temporary subset with the same name S in the sibling TurboIntegrator process A2 since the subset is visible and usable by siblings A1 and A2.

A chore is a special case of a parent TurboIntegrator process that invokes a child TurboIntegrator process that is scheduled to run at a specific time. You can use two types of chores.

**Single-commit**
Within the scope / execution tree of a single-commit chore, a temporary subset of the same name can be created only for one child TurboIntegrator process.

**Multi-commit**
Within the scope / execution tree of a multi-commit chore, which commits after every child TurboIntegrator process, every child TurboIntegrator process can create a temporary subset of the same name because a temporary subset will not persist after a commit.

While a temporary subset exists, the temporary subset takes precedence over any same-named public or private subset. If another TurboIntegrator function references a subset that exists in both a temporary and permanent state, the function operates upon the temporary subset.

There is no locking associated with a temporary subset because a temporary subset is never saved. This can result in improved performance because there is no need for TurboIntegrator to wait for locks to be released before operating upon a temporary subset.

**Syntax**

```
SubsetCreate(DimName, SubName, [AsTemporary]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset you are creating.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name that you want to assign to the subset.</td>
</tr>
<tr>
<td>AsTemporary</td>
<td>This is an optional argument that specifies whether the subset that is being created is temporary. 1 indicates a temporary subset. 0 indicates a permanent subset. If this argument is omitted, the subset is permanent.</td>
</tr>
</tbody>
</table>

**Example**

```
SubsetCreate('Region', 'Northern Europe', 1);
```

This example creates the temporary Northern Europe subset of the Region dimension. You can use `SubsetElementInsert` to add elements to the subset.

**SubsetCreateByMDX**

SubsetCreateByMDX creates a public subset based on a passed MDX expression.

When the AsTemporary argument is set to 1, the subset is temporary and persists for the duration of the TurboIntegrator process or a single-commit chore in which the subset is created. If a parent TurboIntegrator process invokes child TurboIntegrator processes by using the ExecuteProcess or ExecuteProcessWithReturn function, and the temporary subset is created in one of these child TurboIntegrator processes, the subset persists for the duration of the parent TurboIntegrator process.
This function is valid in TM1 TurboIntegrator processes only.

**Note:**

For TM1 Server version 11.2.0 and earlier, temporary views and subsets were visible and usable only by the process that created it and any of its child processes. Temporary views and subsets were not visible to the ancestor and sibling processes. You could create same-named subsets in sibling child processes with the same parent process.

For TM1 Server version 11.3.0 and later, these temporary subsets are visible to the ancestor and sibling processes. If a parent TurboIntegrator process A invokes two child TurboIntegrator processes A1 and A2, and the child TurboIntegrator process A1 creates a temporary subset S, the temporary subset S exists for the duration of the parent TurboIntegrator process A. You cannot create a temporary subset with the same name S in the sibling TurboIntegrator process A2 since the subset is visible and usable by siblings A1 and A2.

A chore is a special case of a parent TurboIntegrator process that invokes a child TurboIntegrator process. You can use two types of chores.

**Single-commit**

Within the scope / execution tree of a single-commit chore, a temporary subset of the same name can be created only for one child TurboIntegrator process.

**Multi-commit**

Within the scope / execution tree of a multi-commit chore, which commits after every child TurboIntegrator process, every child TurboIntegrator process can create a temporary subset of the same name because a temporary subset will not persist after a commit.

While a temporary subset exists, the temporary subset takes precedence over any same-named public or private subset. If another TurboIntegrator function references a subset that exists in both a temporary and permanent state, the function operates upon the temporary subset.

There is no locking associated with a temporary subset because a temporary subset is never saved. This can result in improved performance because there is no need for TurboIntegrator to wait for locks to be released before operating upon a temporary subset.

**Syntax**

```plaintext
SubsetCreatebyMDX(SubName, MDX_Expression, [AsTemporary]);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubName</td>
<td>The name you want to assign to the subset.</td>
</tr>
<tr>
<td>MDX_Expression</td>
<td>An MDX expression that returns a subset.</td>
</tr>
<tr>
<td>AsTemporary</td>
<td>This is an optional argument that specifies whether the subset that is being created is temporary. 1 indicates a temporary subset. 0 indicates a permanent subset. If this argument is omitted, the subset is permanent.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
SubsetCreatebyMDX('0-level months', '{TM1SORT( {TM1FILTERBYLEVEL( {TM1SUBSETALL([month]), 0}, ASC) }, 1 )');
```

This example creates a temporary subset that is named '0-level months' based on an MDX expression that returns a subset that consists of all 0-level elements in the Month dimension, which is sorted in ascending alphabetical order.
Example of temporary subset used by parent process

In this example, two processes are created. The parent process, Process-A, calls the child process, Process-B. Process-B creates a temporary subset that Process-A uses as the data source.

Process-A/prolog:

```prolog
ExecuteProcess('Process-B');
DatasourceDimensionSubset = 'My2003Months';
```

Process-B/prolog:

```prolog
SubsetCreateByMdx('My2003Months', '{[plan_time].[Jan-2003],[plan_time].[Jul-2003]}', 1);
```

**SubsetDeleteAllElements**

SubsetDeleteAllElements deletes all elements from a public subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```prolog
SubsetDeleteAllElements(DimName, SubsetName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset from which you want to delete elements.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset from which you want to delete elements. This must be a public subset. TurboIntegrator cannot access private objects.</td>
</tr>
</tbody>
</table>

**Example**

```prolog
SubsetDeleteAllElements('Region', 'Central Europe');
```

This example deletes all elements from the Central Europe subset of the Region dimension.

**SubsetDestroy**

SubsetDestroy deletes a subset from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```prolog
SubsetDestroy(DimName, SubName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset you are deleting.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of the subset you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```prolog
SubsetDestroy('Region', 'Northern Europe');
```

This example deletes the Northern Europe subset of the Region dimension.
**SubsetElementDelete**

SubsetElementDelete deletes an element from a subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetElementDelete(DimName, SubName, Index);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset from which you want to delete an element.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset from which you want to delete an element.</td>
</tr>
<tr>
<td>Index</td>
<td>The index number of the element you want to delete from the subset.</td>
</tr>
</tbody>
</table>

**Example**

```
SubsetElementDelete('Region', 'Northern Europe', 3);
```

This example deletes the third element from the Northern Europe subset of the Region dimension.

**SubsetElementExists**

SubsetElementExists determines whether a specific element exists within a specific public subset on the server from which a TurboIntegrator process is executed. SubsetElementExists cannot be used to determine if an element exists in a private subset.

If the element exists in the specified subset, the function returns 1, otherwise it returns 0.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetElementExists(DimName, SubsetName, ElementName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The dimension parent of the subset containing the element whose existence you want to confirm.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The public subset containing the element whose existence you want to confirm.</td>
</tr>
<tr>
<td>ElementName</td>
<td>The element whose existence you want to confirm.</td>
</tr>
</tbody>
</table>

**Example**

```
SubsetElementExists('Region', 'Europe', 'Italy');
```

This example determines if the Italy element exists in the Europe subset of the Region dimension.
**SubsetElementGetIndex**

SubsetElementGetIndex retrieves the index of an element in a subset. The function returns the index of the first occurrence of the specified element.

If the element does not exist in the subset or cannot be found, then zero is returned. If the dimension or subset cannot be found or an out-of-range start index is specified, then an error is thrown and the TurboIntegrator function is stopped.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetElementGetIndex(DimName, SubsetName, ElementName, StartIndex);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset that contains the element.</td>
</tr>
<tr>
<td>ElementName</td>
<td>The element name (or alias) to search for in the subset.</td>
</tr>
<tr>
<td>StartIndex</td>
<td>The index number to begin searching from. The value must be between 1 and the size of the subset.</td>
</tr>
</tbody>
</table>

**Example**

```
SubsetElementGetIndex('Region', 'Europe', 'Italy', 3);
```

This example retrieves the index for Italy from the Europe subset of the Region dimension. The search starts at index 3.

**SubsetElementInsert**

SubsetElementInsert adds an element to an existing subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetElementInsert(DimName, SubName, ElName, Position);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset to which you want to add an element.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of the subset to which you are adding an element.</td>
</tr>
<tr>
<td>ElName</td>
<td>The name of the element you want to add to the subset. The element must exist in the TM1 database.</td>
</tr>
<tr>
<td>Position</td>
<td>A value that indicates the index position of the element within the subset.</td>
</tr>
</tbody>
</table>
Example

```
SubsetElementInsert('Region', 'Northern Europe', 'Finland', 3);
```

This example adds the element Finland to the Northern Europe subset of the Region dimension. Finland is the third element in the subset definition.

**SubsetExists**

SubsetExists determines whether a specific public subset exists on the server from which a TurboIntegrator process is executed.

The function returns 1 if the subset exists on the server, otherwise it returns 0. Note that this function cannot be used to determine the existence of private subsets.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetExists(DimName, SubsetName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The name of the dimension that is the parent of the subset whose existence you want to confirm.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The name of the public subset whose existence you want to confirm</td>
</tr>
</tbody>
</table>

**Example**

```
SubsetExists('Region', 'Northern Europe');
```

This example determines if Northern Europe subset of the Region cube exists on the server.

**SubsetExpandAboveSet**

SubsetExpandAboveSet sets the Expand Above property for a subset. The function returns 1 if successful, otherwise it returns 0.

When this property is set to TRUE, children of a consolidation are displayed above the consolidation when the consolidation displays on a row, and to the left of the consolidation when the consolidation displays on a column.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetExpandAboveSet(DimName, SubsetName, ExpandAboveFlag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to set the Expand Above property.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset for which you want to set the Expand Above property.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| ExpandAboveFlag     | Set ExpandAboveFlag to 1 to set the Expand Above property to TRUE. When this property is TRUE, consolidations expand above on rows and to the left on columns.  
|                     | Set ExpandAboveFlag to 0 to set the Expand Above property to FALSE. When this property is FALSE, consolidations expand below on rows and to the right on columns. |

**Example**

```plaintext
SubsetExpandAboveSet('Region', 'Europe', 1);
```

This example sets the Expand Above property to TRUE for the Europe subset of the Region dimension.

**SubsetFormatStyleSet**

SubsetFormatStyleSet applies an existing display style to a named subset.

Display styles are defined for specific elements. If you apply an existing display style to a subset that includes elements that are not included in the display style, no formatting is applied to those elements.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SubsetFormatStyleSet(DimName, SubsetName, FormatName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset to which you want to apply a display style.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The name of the subset to which you are applying a display style.</td>
</tr>
<tr>
<td>FormatName</td>
<td>The name of the existing display style you want to apply to the subset.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
SubsetFormatStyleSet('Region', 'Northern Europe', 'BoldCurrencyLeftJustified');
```

This example applies the BoldCurrencyLeftJustified display style to the Northern Europe subset of the Region dimension.

**SubsetGetElementName**

SubsetGetElementName returns the name of the element at a specified index location within a given subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
SubsetGetElementName(DimName, SubsetName, ElementIndex);
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent of the subset from which you want to retrieve an element name.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset from which you want to retrieve an element name.</td>
</tr>
<tr>
<td>ElementIndex</td>
<td>A number representing the position within the subset of the element you want to retrieve.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext```
SubsetGetElementName('Region', 'Americas', 4);
```

This example returns the name of the fourth element in the Americas subset of the Region dimension.

**SubsetGetSize**

SubsetGetSize returns the number of elements in a subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext```
SubsetGetSize(DimName, SubsetName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to determine size.</td>
</tr>
<tr>
<td>SubsetName</td>
<td>The subset for which you want to determine size.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext```
SubsetGetSize('Region', 'EurAsia');
```

This function returns the number of elements in the EurAsia subset of the Region dimension.

**SubsetIsAllSet**

SubsetIsAllSet sets a subset to use all elements of the parent dimension. SubsetIsAllSet returns 1 if successful, 0 otherwise.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext```
SubsetIsAllSet(DimName, SubName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset for which you want to use all elements.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to use all dimension elements.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Flag</td>
<td>Any non-zero value specifies that the subset uses all the current elements from the parent dimension and will dynamically update to use all elements from the parent dimension whenever the subset is called. Specifying a zero value freezes the elements in the subset as the current set of all elements in the parent dimension. The subset will not dynamically update to use all dimension elements in the future.</td>
</tr>
</tbody>
</table>

**SubsetMDXGet**

SubsetMDXGet retrieves the MDX expression used to create a subset.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetMDXGet(DimName, SubName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset for which you want to retrieve the MDX expression.</td>
</tr>
</tbody>
</table>

**Example**

```
mdxString = SubsetMDXGet('Cities', 'testsubset');
```

**SubsetMDXSet**

SubsetMDXSet applies a specified MDX expression to an existing public subset.

If the passed MDX expression is valid, the specified subset is saved as a dynamic subset defined by the MDX expression.

If the passed MDX expression is an empty string, the subset is converted to a static subset that contains the elements that are in place when SubsetMDXSet is executed.

The function returns the number of elements that the subset contains.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
SubsetMDXSet(DimName, SubName, MDX_expression);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset.</td>
</tr>
<tr>
<td>SubName</td>
<td>The subset to which you want to apply the MDX expression. SubName must be a public subset. If this subset does not exist, an error is logged.</td>
</tr>
</tbody>
</table>
### Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDX_expression</td>
<td>The MDX expression that you want to apply to the subset. If the MDX expression is invalid, TurboIntegrator processing stops, the subset is not modified, and an error is logged. If the MDX_expression argument is an empty string, the subset is converted to a static subset.</td>
</tr>
</tbody>
</table>

### Examples

SubsetMDXSet( 'YZProducts', 'mySub1', '{ Filter( [YZProducts].[YZProducts].members, IsLeaf( [YZProducts].[YZProducts].currentmember ) ) }' );

This example updates the mySub1 subset to a dynamic subset that contains the current leaf elements of the YZProducts dimension. When leaf elements are added or removed from the YZProduct dimension, the mySub1 subset is dynamically updated to reflect the changes in the parent dimension.

One possible use of the SubsetMDXSet function is to apply an MDX expression to update an existing subset, and then immediately convert the subset to static.

SubsetMDXSet( 'YZProducts', 'mySub1', '{ [YZProducts].[YZProducts].[level000].members }' );
SubsetMDXSet( 'YZProducts', 'mySub1', '' );

This two-call sequence updates the mySub1 subset to a static subset that contains the current top-level elements of the YZProducts dimension.

The first call of SubsetMDXSet applies the { [YZProducts].[YZProducts]. [level000].members } MDX expression to the mysub1 subset, resulting in a dynamic subset that includes all top-level (level 0) elements of the YZProducts dimension.

The second call of SubsetMDXSet passes an empty string as the MDX_expression argument, so the mysub1 subset is converted to a static subset.

---

### View Manipulation TurboIntegrator Functions

These functions pertain to view manipulation.

#### PublishView

PublishView publishes a named private view on the server.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

PublishView(Cube, View, PublishPrivateSubsets, OverwriteExistingView);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The name of the cube containing the private view to be published.</td>
</tr>
<tr>
<td>View</td>
<td>The name of the private view to be published.</td>
</tr>
<tr>
<td>Argument</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PublishPrivateSubsets</td>
<td>This Boolean argument (1 or 0) determines if any private subsets present in the view should also be published.</td>
</tr>
<tr>
<td></td>
<td>If PublishPrivateSubsets is true (1), all private subsets used in the view are published along with the view.</td>
</tr>
<tr>
<td></td>
<td>If this argument is false (0), private subsets are not published. A public view cannot contain private subsets, so the view will not be published and an error will be written to the TurboIntegrator log file.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> If a private subset contains another private subset as a user-defined consolidation, the subset can never be published using the PublishView function, regardless of the value of the PublishPrivateSubsets argument.</td>
</tr>
<tr>
<td>OverwriteExistingView</td>
<td>This Boolean argument (1 or 0) determines if any existing identically named public view should be overwritten when the private view is published.</td>
</tr>
<tr>
<td></td>
<td>If OverwriteExistingView is true (1), any existing identically named public view will be overwritten when the private view is published.</td>
</tr>
<tr>
<td></td>
<td>If this argument is false (0), the public view will not be overwritten, the private view will not be published, and an error will be written to the TurboIntegrator log file.</td>
</tr>
</tbody>
</table>

### DisableMTQViewConstruct

DisableMTQViewConstruct disables multi-threaded query processing when calculating a view to be used as a TurboIntegrator datasource for a single TurboIntegrator process. When MTQQuery=T in the tms1.cfg file, DisableMTQViewConstruct can be called to override this value on a TurboIntegrator process.

This function must appear in the Prolog, it has no effect in any other procedure within a process.

This function is valid in TM1 TurboIntegrator processes only.

#### Syntax

**Note:** If the value of the MTQ parameter is 1 (or OFF), this functionality is turned off entirely and cannot be overridden.

The value of **MTQQuery** can be overridden on a single TurboIntegrator process by calling the DisableMTQViewConstruct function.

If **MTQQuery** = T (the default), DisableMTQViewConstruct can be called to disable the functionality for individual TurboIntegrator processes.

After enabling DisableMTQViewConstruct in a process, it can only be disabled on the last line in the Epilog section. If you attempt to use DisableMTQViewConstruct anywhere else in the process, the process will not compile.

If the mode is enabled in one TurboIntegrator process, it remains enabled until explicitly disabled or until the chore completes. This means you can enable the mode in a process and then run a series of TurboIntegrator processes before disabling it.
Example
Use the following TurboIntegrator commands to disable multi-threaded query processing when calculating a view to be used as a TurboIntegrator datasource for a single TurboIntegrator process.

```
DisableMTQViewConstruct()
```

See also “EnableMTQViewConstruct” on page 376.

**EnableMTQViewConstruct**
EnableMTQViewConstruct enables multi-threaded query processing when calculating a view to be used as a TurboIntegrator datasource for a single TurboIntegrator process. When MTQQuery=F in the tms1.cfg file, EnableMTQViewConstruct can be called to override this value on a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

**Note:** If the value of the MTQ parameter is 1 (or OFF), this functionality is turned off entirely and cannot be overridden.

The value of MTQQuery can be overridden on a single TurboIntegrator process by calling the EnableMTQViewConstruct function.

If MTQQuery=F in the tms1.cfg file on the server where this function is run, EnableMTQViewConstruct can be called to override this value on a single TurboIntegrator process.

You can enable EnableMTQViewConstruct in either the Prolog or Epilog section of a TurboIntegrator process. For efficiency, enable EnableMTQViewConstruct in the first, or very close to the first, statement in the Prolog section of your process.

**Example**
Use the following TurboIntegrator commands to enable multi-threaded query processing when calculating a view to be used as a TurboIntegrator datasource for a single TurboIntegrator process.

```
EnableMTQViewConstruct()
```

See also “DisableMTQViewConstruct” on page 375.

After enabling EnableMTQViewConstruct in a process, it can only be disabled on the last line in the Epilog section. If you attempt to use disable DisableMTQViewConstruct anywhere else in the process, the process will not compile.

If the mode is enabled in one TurboIntegrator process, it remains enabled until explicitly disabled or until the chore completes. This means you can enable the mode in a process and then run a series of TurboIntegrator processes before disabling it.

**ViewColumnDimensionSet**
ViewColumnDimensionSet sets a column dimension for a TM1 view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewColumnDimensionSet(CubeName, ViewName, DimName, StackPosition);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you are setting the column dimension.</td>
</tr>
</tbody>
</table>
### ViewColumnDimensionSet

**Description**

ViewColumnDimensionSet sets the dimension for which you want to set as a column dimension for the view.

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the column dimension.</td>
</tr>
<tr>
<td>DimName</td>
<td>The dimension you want to set as a column dimension for the view.</td>
</tr>
<tr>
<td>StackPosition</td>
<td>A number that indicates the stack position of the dimension in the view. This is a 1-based number. 1 indicates the top-most stack position. 2 indicates a position below 1, and so on.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewColumnDimensionSet('98sales', 'Quarter1', 'Month', 1);
```

This example sets Month as a column dimension for the 1Quarter view of the 98sales cube. In the event of stacked column dimensions, Month is placed in the top-most position.

### ViewColumnSuppressZeroesSet

**Description**

ViewColumnSuppressZeroesSet suppresses or enables the display of columns containing only zero values in a TM1 cube view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewColumnSuppressZeroesSet(Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you want to suppress or enable the display of zero values.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you want to enable or suppress the display of zeroes.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that enables or suppresses zeroes.</td>
</tr>
</tbody>
</table>

Specify 1 to suppress the display of columns containing only zeroes in the view. Specify 0 to enable the display of columns containing only zeroes.

**Example**

```plaintext
ViewColumnSuppressZeroesSet('99sales', '1st QuarterActuals', 1);
```

This example suppresses the display of any columns containing only zeroes in the 1st Quarter Actuals view of the 99sales cube.
ViewConstruct
ViewConstruct constructs, pre-calculates, and stores a Stargate view in memory on a server. This function is useful for pre-calculating and storing large views so they can be quickly accessed after a data load or update.

This function is valid in TM1 TurboIntegrator processes only.

Syntax
```
ViewConstruct(CubeName, ViewName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The cube from which you want to construct the view.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view you want to construct. This view must be an existing public view on the server.</td>
</tr>
</tbody>
</table>

Example
```
Viewconstruct('99sales', '1st Quarter Actuals');
```

This example creates the view 1st Quarter Actuals of the 99sales cube.

ViewCreate
ViewCreate creates an empty view of a specified cube.

When the optional AsTemporary argument is set to 1, the view is temporary and persists only for the duration of the TurboIntegrator process or chore in which the view is created.

Note:  
For TM1 Server version 11.2.0 and earlier, temporary views were visible and usable only by the process that created it and any of its child processes. Temporary views were not visible to the ancestor and sibling processes. You could create same-named views in sibling child processes with the same parent process.

For TM1 Server version 11.3.0 and later, these temporary views are visible to the ancestor and sibling processes. If a parent TurboIntegrator process A invokes two child TurboIntegrator processes A1 and A2, and the child TurboIntegrator process A1 creates a temporary view S, the temporary view S exists for the duration of the parent TurboIntegrator process A. You cannot create a temporary view with the same name S in the sibling TurboIntegrator process A2 since the view is visible and usable by siblings A1 and A2.

While a temporary view exists, the temporary view takes precedence over any same-named public view. If another TurboIntegrator function references a view that exists in both a temporary and permanent state, the function operates upon the temporary view.

Temporary objects have transaction scope. When a transaction is committed, all temporary objects are cleaned up. If a chore is run in single-commit mode where all processes in the chore are logically run within the context of one transaction, then temporary objects that are created in a process still exist, visible, and available for use, in subsequent processes run by the chore. However, in multi-commit mode, these processes are cleaned up at commit time of the transaction that wrapped the execution of the process that created the temporary object.

There is no locking associated with a temporary view, as a temporary view is never saved. This can result in improved performance, because there is no need for TurboIntegrator to wait for locks to be released before operating upon a temporary view.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

ViewCreate(Cube, ViewName, <AsTemporary>);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you are creating.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name you want to assign to the view.</td>
</tr>
<tr>
<td>AsTemporary</td>
<td>This is an optional argument that specifies whether the view being created is temporary. 1 indicates a temporary view, 0 indicates a permanent view. If this argument is omitted, the view is permanent.</td>
</tr>
</tbody>
</table>

Example

This example creates a temporary view named 1st Quarter Actuals from the Sales cube.

ViewCreate('Sales', '1st Quarter Actuals', 1);

ViewCreateByMDX

ViewCreateByMDX creates a view with a specified MDX expression.

When the optional AsTemporary argument is set to 1, the view is temporary and persists only for the duration of the TurboIntegrator process or chore in which the view is created.

Note:

For TM1 Server version 11.2.0 and earlier, temporary views were visible and usable only by the process that created it and any of its child processes. Temporary views were not visible to the ancestor and sibling processes. You could create same-named views in sibling child processes with the same parent process.

For TM1 Server version 11.3.0 and later, these temporary views are visible to the ancestor and sibling processes. If a parent TurboIntegrator process A invokes two child TurboIntegrator processes A1 and A2, and the child TurboIntegrator process A1 creates a temporary view S, the temporary view S exists for the duration of the parent TurboIntegrator process A. You cannot create a temporary view with the same name S in the sibling TurboIntegrator process A2 since the view is visible and usable by siblings A1 and A2.

While a temporary view exists, the temporary view takes precedence over any same-named public view. If another TurboIntegrator function references a view that exists in both a temporary and permanent state, the function operates upon the temporary view.

Temporary objects have transaction scope. When a transaction is committed, all temporary objects are cleaned up. If a chore is run in single-commit mode where all processes in the chore are logically run within the context of one transaction, then temporary objects that are created in a process still exist, visible, and available for use, in subsequent processes run by the chore. However, in multi-commit mode, these processes are cleaned up at commit time of the transaction that wrapped the execution of the process that created the temporary object.

There is no locking associated with a temporary view, as a temporary view is never saved. This can result in improved performance because there is no need for TurboIntegrator to wait for locks to be released before operating upon a temporary view.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```
ViewCreateByMDX(Cube, ViewName, MDX_expression, <AsTemporary>);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you are creating.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name you want to assign to the view.</td>
</tr>
<tr>
<td>MDX_expression</td>
<td>A string value containing a valid MDX view expression.</td>
</tr>
<tr>
<td>AsTemporary</td>
<td>This is an optional argument that specifies whether the view being created is temporary. 1 indicates a temporary view; 0 indicates a permanent view. If this argument is omitted, the view is permanent.</td>
</tr>
</tbody>
</table>

**Example**

This example, based on the Planning Sample database, creates a temporary view named Account in the plan_BudgetPlan cube.

```
ViewCreateByMDX('plan_BudgetPlan', 'Account', 'select {
[plan_version].[FY 2003 Budget]} on 0,
{[plan_business_unit].[10300]} on 1 from plan_budgetplan where
[plan_department].[200][plan_chart_of_accounts].[41101][plan_exchange_rates].[local]
[plan_source].[goal][plan_time].[Jan-2003]', 1);
```

**ViewDestroy**

ViewDestroy deletes a view from the TM1 database.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewDestroy(Cube, ViewName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you are deleting.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name of the view you want to delete.</td>
</tr>
</tbody>
</table>

**Example**

```
ViewDestroy('99sales', '1st Quarter Actuals');
```

This example deletes the 1st Quarter Actuals view of the 99sales cube.
**ViewExists**

ViewExists determines whether a specific public view exists on the server from which a TurboIntegrator process is executed. The function returns 1 if the view exists on the server, otherwise it returns 0. Note that this function cannot be used to determine the existence of private views.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewExists(CubeName, ViewName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The name of the cube that is the parent of the view whose existence you want to confirm.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name of the public view whose existence you want to confirm</td>
</tr>
</tbody>
</table>

**Example**

```
ViewExists('Inventory', 'FebClosing');
```

This example determines if FebClosing view of the Inventory cube exists on the server.

**ViewExtractFilterByTitlesSet**

ViewExtractFilterByTitlesSet sets an option to filter by titles on consolidated values that are excluded from a view or any associated view extracts.

TM1 allows the storing of strings on calculated values. When you exclude a calculated value from a view or view extract you may want to exclude the message string also from the view.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewExtractFilterByTitlesSet (Cube, ViewName, FilterByTitles, Temporary);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you are setting the option.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the option.</td>
</tr>
<tr>
<td>FilterByTitles</td>
<td>A binary value that turns the option on or off. Specify 0 to include titles stored on consolidated values. This is the current and default behavior. Specify 1 to exclude titles stored on consolidated values.</td>
</tr>
<tr>
<td>Temporary</td>
<td>A Boolean value that indicates whether the settings are temporary.</td>
</tr>
</tbody>
</table>
ViewExtractSkipCalcsSet

ViewExtractSkipCalcsSet sets an option to include/exclude consolidated values in a view and any associated view extracts. A view extract is a TM1 view exported as an ASCII comma-delimited (.cma) file.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

ViewExtractSkipCalcsSet is the equivalent of the Skip Consolidated Values option in the View Extract dialog box.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewExtractSkipCalcsSet (Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you are setting the option.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the option.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that turns the option on or off. Specify 1 to exclude consolidated values from the view extract. Specify 0 to include consolidated values.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewExtractSkipCalcsSet ('99sales', '1st Quarter Actuals', 1);
```

This example turns on the Skip Consolidated Values option for the 1st Quarter Actuals view. The view extract will not include any consolidated values.

**Note about the impact of enabling a specific combination of view manipulation functions**

Consider the scenario when all of these conditions are true:

- the measure is a string
- `ViewExtractSkipCalcsSet = 1`
- `ViewExtractSkipConsolidatedStringsSet = 0` (function is not used)
- `ViewExtractSkipRuleValuesSet = 0` (function is not used)

In this scenario, the output is different, depending on whether you enable the `ViewExtractSkipZeroesSet` function.

- If you set `ViewExtractSkipZeroesSet = 0`, the TM1 server enumerates every possible cube cell, not just the existing data cells. This situation is rather unusual, since enumerating all possible cells means that the number of cells scanned is the product of the sizes of all of the dimensions of the cube. This product can quickly become very large. In this mode, the `ViewExtractSkipCalcsSet` function skips all consolidated cells, even if the measure is a string.
- If you set `ViewExtractSkipZeroesSet = 1`, the TM1 server scans only the cells actually in the cube. In this mode, a string stored on a consolidated cell is treated as a simple leaf (the cell after all has a simple
value and is a leaf). Therefore, even though the ViewExtractSkipCalcsSet function is enabled, the entry is not skipped since this cell is not a calculated consolidated cell. In this case, if you want the entries to be skipped, you must enable the ViewExtractSkipConsolidatedStringsSet function.

**ViewExtractSkipConsolidatedStringsSet**

ViewExtractSkipConsolidatedStringsSet sets an option to exclude strings on consolidated values that are excluded from a view or any associated view extracts. A view extract is a TM1 view exported as an ASCII comma-delimited (.cma) file.

TM1 allows the storing of strings on calculated values. When you exclude a calculated value from a view or view extract you may want to exclude the message string also from the view.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewExtractSkipConsolidatedStringsSet (Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you are setting the option.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the option.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that turns the option on or off. Specify 0 to include strings stored on consolidated values. Specify 1 to exclude strings stored on consolidated values.</td>
</tr>
</tbody>
</table>

**Note:** Read about the impact of enabling a specific combination of view manipulation functions.

**Example**

```plaintext
ViewExtractSkipConsolidatedStringsSet ('99sales', '1st QuarterActuals', 1);
```

This example turns on the Skip Rule for Consolidated String option for the extract created from the 1st Quarter Actuals view. The extract will not include any string on the consolidated value.

**ViewExtractSkipRuleValuesSet**

ViewExtractSkipRuleValuesSet sets an option to include/exclude rule-calculated values in a view and any associated view extracts. A view extract is a TM1 view exported as an ASCII comma-delimited (.cma) file.

ViewExtractSkipRuleValuesSet is the equivalent of the Skip Rule Calculated Values option in the View Extract dialog box.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewExtractSkipRuleValuesSet (Cube, ViewName, Flag);
```
**ViewExtractSkipRuleValuesSet**

ViewExtractSkipRuleValuesSet sets an option to include/exclude rule-calculated values from a view and any associated view extracts. A view extract is a TM1 view exported as an ASCII comma-delimited (.cma) file.

ViewExtractSkipRuleValuesSet is the equivalent of the Skip Rule Calculated Values option in the View Extract dialog box.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewExtractSkipRuleValuesSet (Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you are setting the option.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the option.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that turns the option on or off. Specify 1 to exclude rule-calculated values from the extract. Specify 0 to include rule-calculated values.</td>
</tr>
</tbody>
</table>

**Example**

```
ViewExtractSkipRuleValuesSet ('99sales', '1st QuarterActuals', 1);
```

This example turns on the Skip Rule Calculated Values option for the extract created from the 1st Quarter Actuals view. The extract will not include any rule-calculated values.

**ViewExtractSkipZeroesSet**

ViewExtractSkipZeroesSet sets an option to include/exclude zero values in a view and any associated view extracts. A view extract is a TM1 view exported as an ASCII comma-delimited (.cma) file.

ViewExtractSkipZeroesSet is the equivalent of the Skip Zero/Blank Values option in the View Extract dialog box.

**Note:** This function affects views as they exist on the server. The scope of this function is not restricted to extracts generated from a view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewExtractSkipZeroesSet (Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you are setting the Skip Zeroes option.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the Skip Zeroes option.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that turns the option on or off. Specify 1 to exclude zeroes from the extract. Specify 0 to include zeros. When UNDEFVALS is used to represent zeroes, the values are not excluded when the Flag argument is 1.</td>
</tr>
</tbody>
</table>

**Note:** Read about the impact of enabling a specific combination of view manipulation functions.
Example

ViewExtractSkipZeroesSet ('99sales', '1st Quarter Actuals', 1);

This example turns on the Skip Zeroes option for the extract created from the 1st Quarter Actuals view. The extract will not include any zero or blank values.

ViewMDXSet

ViewMDXSet sets the MDX expression for an existing MDX view.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ViewMDXSet(Cube, ViewName, MDX_expression);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you are creating.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name you want to assign to the view.</td>
</tr>
<tr>
<td>MDX_expression</td>
<td>A string value containing a valid MDX view expression.</td>
</tr>
</tbody>
</table>

Example

ViewMDXSet('Sales', 'Account', 'select {[plan_version].[FY 2003 Budget]} on 0, {[plan_business_unit].[10300]} on 1 from plan_budgetplan where [plan_department].[200][plan_chart_of_accounts].[41101][plan_exchange_rates].[local] [plan_source].[goal][plan_time].[Jan-2003]');

This example sets the MDX expression for the "Account" view from the "Sales" cube.

ViewMDXGet

ViewMDXGet retrieves the MDX expression for an existing MDX view.
This function is valid in TM1 TurboIntegrator processes only.

Syntax

ViewMDXGet(Cube, ViewName);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you are creating.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The name you want to assign to the view.</td>
</tr>
</tbody>
</table>

Example

ViewMDXGet('Sales', 'Account');

This example retrieves the MDX expression from the "Account" view.
**ViewRowDimensionSet**

ViewRowDimensionSet sets a row dimension for a TM1 view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewRowDimensionSet(CubeName, ViewName, DimName, StackPosition);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you are setting the row dimension.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the row dimension.</td>
</tr>
<tr>
<td>DimName</td>
<td>The dimension you want to set as a row dimension for the view.</td>
</tr>
<tr>
<td>StackPosition</td>
<td>A number that indicates the stack position of the dimension in the view.</td>
</tr>
<tr>
<td></td>
<td>This is a 1-based number. 1 indicates the left-most stack position.</td>
</tr>
<tr>
<td></td>
<td>2 indicates a position to the right of 1, and so on.</td>
</tr>
</tbody>
</table>

**Note:** It is possible for a TM1 client to set a Tm1p.ini parameter (BrowseDisplayReadsRightToLeft=T) that reverses the orientation of data in the Cube Viewer. When the orientation of data is reversed, the stack positions are also reversed. 1 indicates the right-most stack position. 2 indicates a position to the left of 1, and so on.

**Example**

```
ViewRowDimensionSet('98sales', 'Quarter1', 'Month', 1)
```

This example sets Month as a row dimension for the Quarter1 view of the 98sales cube. In the event of stacked row dimensions, Month is placed in the left-most position.

**ViewRowSuppressZeroesSet**

ViewRowSuppressZeroesSet suppresses or enables the display of rows containing only zero values in a TM1 cube view.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ViewRowSuppressZeroesSet(Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you want to suppress or enable the display of zero values.</td>
</tr>
</tbody>
</table>
### ViewRowSuppressZeroesSet

The view for which you want to enable or suppress the display of zeroes.

- **Flag**: A binary value that enables or suppresses zeroes. Specify 1 to suppress the display of rows containing only zeroes in the view. Specify 0 to enable the display of rows containing only zeroes.

**Example**

```plaintext
ViewRowSuppressZeroesSet('99sales', '1st Quarter Actuals', 1);
```

This example suppresses the display of any rows containing only zeroes in the 1st Quarter Actuals view of the 99sales cube.

### ViewSubsetAssign

ViewSubsetAssign assigns a named subset to a cube view.

**Note:** It is possible to create a temporary subset with the CreateSubset or CreateSubsetByMDX functions. If you attempt to use ViewSubsetAssign to assign a temporary subset to a permanent view, the function will fail with error notification.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewSubsetAssign(Cube, ViewName, DimName, SubName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view to which you are assigning a subset.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view to which you are assigning a subset.</td>
</tr>
<tr>
<td>DimName</td>
<td>The parent dimension of the subset you are assigning to the view.</td>
</tr>
<tr>
<td>SubName</td>
<td>The name of the subset you want to assign to the view.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewSubsetAssign('99sales', '1st Quarter Actuals', 'Month', 'Q1');
```

This example assigns the Q1 subset of the Month dimension to the 1st Quarter view.

### ViewSuppressZeroesSet

ViewSuppressZeroesSet suppresses or enables the display of all rows and columns containing only zero values in a TM1 cube view.

This function is valid in TM1 TurboIntegrator processes only.
**Syntax**

```plaintext
ViewSuppressZeroesSet(Cube, ViewName, Flag);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view for which you want to suppress or enable the display of zero values.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you want to enable or suppress the display of zeroes.</td>
</tr>
<tr>
<td>Flag</td>
<td>A binary value that enables or suppresses zeroes. Specify 1 to suppress the display of rows or columns containing only zeroes in the view. Specify 0 to enable the display of rows and columns containing only zeroes.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewSuppressZeroesSet('99sales', '1st Quarter Actuals', 1);
```

This example suppresses the display of any rows or columns containing only zeroes in the 1st Quarter Actuals view of the 99sales cube.

**ViewTitleDimensionSet**

ViewTitleDimensionSet sets a title dimension for a TM1 view. This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```plaintext
ViewTitleDimensionSet(CubeName, ViewName, DimName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you are setting the title dimension.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the title dimension.</td>
</tr>
<tr>
<td>DimName</td>
<td>The dimension you want to set as a title dimension for the view.</td>
</tr>
</tbody>
</table>

**Example**

```plaintext
ViewTitleDimensionSet('98sales', 'Quarter1', 'Month');
```

This example sets Month as a title dimension for the 1Quarter view of the 98sales cube.

**ViewTitleElementSet**

ViewTitleElementSet sets a title element for a TM1 view. ViewTitleElementSet is used in conjunction with the ViewTitleDimensionSet function. This function is valid in TM1 TurboIntegrator processes only.
Syntax

```
ViewTitleElementSet(CubeName, ViewName, DimName, Index);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CubeName</td>
<td>The parent cube of the view for which you are setting the title element.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view for which you are setting the title element.</td>
</tr>
<tr>
<td>DimName</td>
<td>The parent dimension of the title element.</td>
</tr>
<tr>
<td>Index</td>
<td>An index into the specified dimension that indicates the element to be set as the title element.</td>
</tr>
</tbody>
</table>

**Example**

```
ViewTitleElementSet('98sales', 'Quarter1', 'Model',3);
```

This example sets the third element of the Model dimension as a title element for the Quarter1 view of the 98sales cube.

**ViewZeroOut**

ViewZeroOut sets all data points in a view to zero.

This function is valid in TM1 TurboIntegrator processes only.

**Note:** When using ViewZeroOut on a cube which has UNDEFVALS enabled, the values in the view will be set to zero, not the UNDEFVAL state.

Syntax

```
ViewZeroOut(Cube, ViewName);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>The parent cube of the view you want to zero out.</td>
</tr>
<tr>
<td>ViewName</td>
<td>The view you want to zero out.</td>
</tr>
</tbody>
</table>

**Example**

```
ViewZeroOut('99sales', '1st Quarter Actuals');
```

This example sets all data points in the 1st Quarter Actuals view to zero.

**Miscellaneous TurboIntegrator Functions**

These functions facilitate miscellaneous tasks.
AddInfoCubeRestriction

AddInfoCubeRestriction filters InfoCube data as it is pulled into TM1. Use this function to restrict the values that are imported for a specified characteristic. This function must be placed in the Prolog. The function can be called multiple times to filter more than one characteristic in a single process.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRING CharactName</td>
<td>Contains the technical name of the characteristic to be restricted. The data type has to be a character string with a length equal to or less than 30.</td>
</tr>
<tr>
<td>STRING sign</td>
<td>Contains either I (= inclusive) or E (= exclusive). Exclusive is the logical NOT for the restriction specified by this row. The data type has to be a character of length 1.</td>
</tr>
<tr>
<td>STRING compOperator</td>
<td>Contains the relational comparative operator. The data type has to be a character string of length 2. Valid comparative operators are: 'EQ' = equal, 'NE' = not equal, 'LT' = less than, 'GT' = greater than, 'LE' = less or equal, 'GE' = greater or equal, 'BT' = between, 'NB' = not between</td>
</tr>
<tr>
<td>STRING lowValue</td>
<td>Contains the low value for the operator specified in the row before. The data type has to be a character string with a length equal to or less than 60.</td>
</tr>
<tr>
<td>STRING highValue</td>
<td>Contains the high value for the operator specified two rows before. The data type has to be a character string with a length equal to or less than 60. It is only needed for the operators BT and NB, otherwise it is ignored, and in this case an empty string should be placed here.</td>
</tr>
</tbody>
</table>

Example

The following example returns all characteristic values between 1997 and 2000.

AddInfoCubeRestriction('0CALYEAR','E','BT','1997','2000');
The following example returns all characteristic values not between 1997 and 2000.

```
AddInfoCubeRestriction('0CALYEAR', 'I', 'NB', '1997', '2000');
```

The following example returns all characteristic values not equal to USD.

```
AddInfoCubeRestriction('0DOC_CURRCY', 'I', 'NE', 'USD', '');
```

**ExecuteJavaN**

ExecuteJavaN executes a Java™ TurboIntegrator process that returns a number. If you want to execute a Java TurboIntegrator process that returns a string, use ExecuteJavaS.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
ExecuteJavaN('JavaTIClass', ['OptionalParameter1', 'OptionalParameter2', ...])
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JavaTIClass</td>
<td>The fully qualified name of the Java TurboIntegrator class you want to execute.</td>
</tr>
<tr>
<td>OptionalParameters</td>
<td>Optional parameters that are passed to the Java TurboIntegrator process itself. You can pass as many parameters as necessary, including none. You can pass only strings as parameters, you cannot pass numbers. You can use the StringToNumber TurboIntegrator function to pass numbers to Java TurboIntegrator scripts. For more information, see &quot;StringToNumber&quot; in the TM1 Reference.</td>
</tr>
</tbody>
</table>

A Java TurboIntegrator class, which returns a number and can be called from ExecuteJavaN, must use the following pattern:

```java
package com.example;
import com.ibm.cognos.tm1.javati.JavaTI;
@JavaTI
public class MyTestTI {
    public static double MyTestTI (String [] args) {
        ...
        return ...;
    }
}
```

**Example**

```
ExecuteJavaN('com.example.MyTestTI', 'First', 'Second', 'Third');
```

**ExecuteJavaS**

ExecuteJavaS executes a Java TurboIntegrator process that returns a string. If you want to execute a Java TurboIntegrator process that returns a number, use ExecuteJavaN.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

ExecuteJavaS('JavaTIClass', ['OptionalParameter1', 'OptionalParameter2', ...])

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JavaTIClass</td>
<td>The fully qualified name of the Java TurboIntegrator class you want to execute.</td>
</tr>
<tr>
<td>OptionalParameters</td>
<td>Optional parameters that are passed to the Java TurboIntegrator process itself. You can pass as many parameters as necessary, including none.</td>
</tr>
<tr>
<td></td>
<td>You can pass only strings as parameters, you cannot pass numbers. You can use the StringToNumber TurboIntegrator function to pass numbers to Java TurboIntegrator scripts. For more information, see &quot;StringToNumber&quot; in the TM1 Reference.</td>
</tr>
</tbody>
</table>

A Java TurboIntegrator class, which returns a string and is called from ExecuteJavaS, must use the following pattern.

```java
package com.example;
import com.ibm.cognos.tm1.javati.JavaTI;
@JavaTI
public class MyTestTI {
    public static String MyTestTI (String [] args) [
        ...
    return ...;
    }
}
```

Example

ExecuteJavaS('com.example.MyTestTI', 'First', 'Second', 'Third');

Expand

Expand expands TurboIntegrator variable names, enclosed in % signs, to their values at run time. A common use of the Expand function is to pass the value of TurboIntegrator variables to the ODBCOutput function.

If the variable name represents a string variable, the entire variable expression must be enclosed on quotes. For example, "%V1%".

If Expand is fed with a numerical value, an implicit type conversion is performed and the numerical value is converted into a string.

That string has a fixed minimum length of 10 characters. If the converted number is too small to fill 10 characters, it is padded with leading spaces. Only three leading decimal characters are converted. For example, a numerical value of 0.123456789 is converted into the string "0.123".

This function is valid in TM1 TurboIntegrator processes only.

Syntax

Expand(String);
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>Any string that includes TurboIntegrator variable names enclosed in % signs.</td>
</tr>
</tbody>
</table>

**Example**

```
ODBCOutPut( 'TransData', Expand( 'INSERT INTO SALES( MONTH, PRODUCT, SALES )
VALUES ( "%V0%", "%V1%",%V2% )' ) );
```

This example illustrates the use of the Expand function within the ODBCOutput function. The example inserts records into a relational table named Sales that consists of three columns: Month, Product, and Sales.

The Expand function converts the variables V0, V1, and V2 to their actual values within the view. Assuming that the first value in the view is 123.456, and is defined by the elements Jan and Widget

```
Expand( 'INSERT INTO SALES( MONTH, PRODUCT, SALES )
VALUES ("%V0%", "%V1%",%V2% )' )
```

becomes

```
'INSERT INTO SALES ( MONTH, PRODUCT, SALES ) VALUES ( Jan, Widget,123.456 )'
```

at run time.

**FileExists**

FileExists determines whether a specified file exists. The function returns 1 if the file exists, 0 if it does not.

This function is valid in TM1 TurboIntegrator processes only.

**Syntax**

```
FileExists(File);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The name of a file. If a full path is not specified, TM1 searches for the file in the server data directory.</td>
</tr>
</tbody>
</table>

**Example**

```
FileExists('C:\tm1s7\pdata\model.dim');
```

This example determines if the model.dim file exists.

**LogOutput**

LogOutput writes a message to the tm1server.log file when an error of a specified severity level is encountered in a TurboIntegrator process.

This function is valid in TM1 TurboIntegrator processes only.

**Prerequisite**

To enable message logging from TurboIntegrator, you must add the TM1.TILogOutput debugger to the tm1-log.properties file and set the debugger to the desired level. For example, adding `TM1.TILogOutput=DEBUG` to `tm1-log.properties` enables logging for all severity levels. For details
on the tm1-log.properties file, see "Configuring and Enabling Server Message Logging" in TM1 Operations.

Syntax

```
LogOutput('SeverityLevel', 'MessageString');
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SeverityLevel</td>
<td>The severity level that initiates logging to the tm1server.log file. Valid values for this argument are:</td>
</tr>
<tr>
<td></td>
<td>• 'DEBUG'</td>
</tr>
<tr>
<td></td>
<td>• 'INFO'</td>
</tr>
<tr>
<td></td>
<td>• 'WARN'</td>
</tr>
<tr>
<td></td>
<td>• 'ERROR'</td>
</tr>
<tr>
<td></td>
<td>• 'FATAL'</td>
</tr>
<tr>
<td>MessageString</td>
<td>The message you want to write to the tm1server.log file. The message string can be a string enclosed in single quotes or can be another TurboIntegrator function that returns a string.</td>
</tr>
</tbody>
</table>

Examples

```
LogOutput('WARN', 'TI process encountered a warning condition');
```

```
LogOutput('ERROR', TM1User());
```

**TM1User**

TM1User returns a string giving the current TM1 client. When executed in a process that the user is running directly, it will return the user's TM1 client name. When executed in a chore that the user runs directly, it will also return the user's TM1 client name.

If run from a scheduled chore, it will return a name in the form $R*<chore name>$, for example, $R*UpdateRegionDimension$.

This function is valid in TM1 TurboIntegrator processes only.

Syntax

```
TM1User()
```

**WildcardFileSearch**

WildcardFileSearch lets you use wildcard characters to search for files in a specified directory.

The results of the WildCardFileSearch function may vary depending on the operating system in use. Files in a Windows directory are sorted in alphabetical order while files in a UNIX directory are sorted in random order. Because the order of sorting varies between the operating systems, the identical WildCardFileSearch function executed against identical directories, one on Windows and one on UNIX, will yield different results.

This function is valid in TM1 TurboIntegrator processes only.
Syntax

WildcardFileSearch( Pathname, PriorFilename);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathname</td>
<td>A pathname to files for which you want to search. The pathname must end in a filename, which can contain a wildcard sequence using the * and/or ? characters. The ? wildcard character matches any single character. The * wildcard character matches zero or more characters.</td>
</tr>
<tr>
<td>PriorFilename</td>
<td>The name of an existing file in the specified directory. This filename cannot contain wildcard characters. The wildcard search specified by the Pathname argument will commence AFTER this file. If you pass an empty string as the PriorFilename argument, the WildcardFileSearch function returns the first file that matches the wildcard sequence specified by the Pathname argument.</td>
</tr>
</tbody>
</table>

Example

The following example shows the use of the WildcardFileSearch function to determine the first server log file generated in 2004:

```plaintext
file = WildcardFileSearch( 'C:\Program Files\Cognos\TM1\Custom\TM1Data\SData\tm1s2004*.log', '' );
```

This example returns the first file matching the wildcard sequence 'tm1s2004*.log' from the C:\Program Files\Cognos\TM1\Custom\TM1Data\SData\ directory.

Because server log files are named and saved with sequential time stamps, and because the second parameter to WildcardFileSearch is empty, the function returns the first server log file starting with the characters 'tm1s2004'. This would be the first server log file generated in the year 2004.

The following example shows the use of the WildcardFileSearch function to return the first server log file generated after tm1s20040211153827.log was generated:

```plaintext
file = WildcardFileSearch( 'C:\Program Files\Cognos\TM1\Custom\TM1Data\SData\tm1s*.log', 'tm1s20040211153827.log' );
```

This example begins searching the C:\Program Files\Cognos\TM1\Custom\TM1Data\SData\ directory immediately after the tm1s20040211153827.log file, and returns the first subsequent file matching the 'tm1s*.log' wildcard sequence.

tm1s20040220175522.log is the first file that occurs after tm1s20040211153827.log and matches the wildcard sequence. Accordingly, the example returns tm1s20040220175522.log.
IBM Planning Analytics variables are listed here by categories.

**TurboIntegrator Local Variables**

When you execute a TurboIntegrator process, a set of implicit local variables is generated. Local variables exist only in the context of the process in which they are used, and are not available outside of the process. Local variables are destroyed when a process exits. These variables, listed below, can be overwritten to manipulate a process.

**DatasourceASCIIDecimalSeparator**

This TurboIntegrator local variable sets the decimal separator to be used in any conversion of a string to a number or a number to a string. If you set this variable you must also set the `DatasourceASCIIThousandSeparator` variable.

The character specified must be a standard ASCII printable character, with a decimal value between 33 and 127 inclusive.

**Syntax**

```
DatasourceASCIIDecimalSeparator='Char';
```

or

```
DatasourceASCIIDecimalSeparator=Char(xx);
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>The ASCII character to be used as a separator.</td>
</tr>
<tr>
<td></td>
<td>The character can be specified as a character</td>
</tr>
<tr>
<td></td>
<td>enclosed in single quotes, or as an ASCII Char</td>
</tr>
<tr>
<td></td>
<td>decimal code without quotes.</td>
</tr>
</tbody>
</table>

Either of the following examples sets the comma character (,) as the separator.

```
DatasourceASCIIDecimalSeparator=',';
```

```
DatasourceASCIIDecimalSeparator=Char(44);
```

**DatasourceASCIIDelimiter**

This TurboIntegrator local variable sets the ASCII character to be used as a field delimiter when the `DatasourceType` is 'CHARACTERDELIMITED'.

The character specified must be a standard ASCII printable character, with a decimal value between 33 and 127 inclusive.

**Syntax**

```
DatasourceASCIIDelimiter='Char';
```
DatasourceASCIIDelimiter=Char(xx);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>The ASCII character to be used as a delimiter. The character can be specified as a character enclosed in single quotes, or as an ASCII Char decimal code without quotes.</td>
</tr>
</tbody>
</table>

Either of the following examples sets the hyphen character (-) as the field delimiter.

DatasourceASCIIDelimiter='-';

DatasourceASCIIDelimiter=Char(45);

DatasourceASCIIHeaderRecords
This TurboIntegrator local variable indicates the number of records to be skipped before processing the data source.

Syntax

DatasourceASCIIHeaderRecords=N;

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>The number of records to be skipped before processing the data source.</td>
</tr>
</tbody>
</table>

DatasourceASCIIQuoteCharacter
This TurboIntegrator local variable sets the ASCII character used to enclose the fields of the source file when DatasourceType is 'CHARACTERDELIMITED'.

The character specified must be a standard ASCII printable character, with a decimal value between 33 and 127 inclusive.

Syntax

DatasourceASCIIQuoteCharacter='Char';

or

DatasourceASCIIQuoteCharacter=Char(xx);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>The ASCII character that encloses fields in the data source. The character can be specified as a character enclosed in single quotes, or as an ASCII Char decimal code without quotes.</td>
</tr>
</tbody>
</table>
Either of the following examples sets the asterisk character (*) as the field delimiter.

DatasourceASCIIQuoteCharacter='*';

DatasourceASCIIQuoteCharacter=Char(42);

DatasourceASCIIThousandsSeparator

This TurboIntegrator local variable sets the thousands separator to be used in any conversion of a string to a number or a number to a string.

If you set this variable you must also set the DatasourceASCIIDecimalSeparator variable.

The character specified must be a standard ASCII printable character, with a decimal value between 33 and 127 inclusive.

**Syntax**

DatasourceASCIIThousandsSeparator='Char';

or

DatasourceASCIIThousandsSeparator=Char(xx);

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>The ASCII character to be used as a separator. The character can be specified as a character enclosed in single quotes, or as an ASCII Char decimal code without quotes.</td>
</tr>
</tbody>
</table>

Either of the following examples sets the period character (.) as the thousands separator.

DatasourceASCIIThousandsSeparator='.';

DatasourceASCIIThousandsSeparator=Char(46);

DatasourceCubeview

This TurboIntegrator local variable sets the view to process if the DatasourceType is 'VIEW'.

**Syntax**

DatasourceCubeview='ViewName';

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ViewName</td>
<td>The name of the view to be processed. This must be an existing view of the cube specified by the DataSourceNameForServer variable.</td>
</tr>
</tbody>
</table>

DatasourceDimensionSubset

This TurboIntegrator local variable sets the subset to process if the DatasourceType is 'SUBSET'.

DatasourceNameForServer=Dimension name is also needed in conjunction with DATASOURCEDIMENSIONSUBSET so TM1 can identify where the subset is located.
DatasourceDimensionSubset='SubsetName';

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsetName</td>
<td>The name of the subset to be processed.</td>
</tr>
</tbody>
</table>

DatasourceNameForServer

This TurboIntegrator local variable sets the name of the data source (.cma file, cube name, ODBC source) used by the server when executing the process.

Syntax

DatasourceNameForServer='Name';

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>For a .cma data source, the full path of the .cma file.</td>
</tr>
<tr>
<td></td>
<td>For cubes, the cube name prefaced with the string 'local:'.</td>
</tr>
<tr>
<td></td>
<td>For an ODBC source, the source name.</td>
</tr>
</tbody>
</table>

DatasourceNameForClient

This TurboIntegrator local variable sets the name of the data source (.cma file, cube name, ODBC source) used by the client when creating or editing the process.

Syntax

DatasourceNameForClient='Name';

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>For a .cma data source, the full path of the .cma file.</td>
</tr>
<tr>
<td></td>
<td>For cubes, the cube name prefaced with the string 'local:'.</td>
</tr>
<tr>
<td></td>
<td>For an ODBC source, the source name.</td>
</tr>
</tbody>
</table>

DataSourceODBOCatalog

This TurboIntegrator local variable sets the name of the database collection that contains the cubes, dimensions or other objects to which you want to connect. For Microsoft Analysis Services, this is the name of the database.

Syntax

DataSourceODBOCatalog='Catalog';
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog</td>
<td>The name of the database collection to which you want to connect.</td>
</tr>
</tbody>
</table>

**DataSourceODBOConnectionString**

This TurboIntegrator local variable sets any additional connection parameters that may be required to connect to the OLAP server.

**Syntax**

```
DataSourceODBOConnectionString='String';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The value used to define additional connection parameters.</td>
</tr>
<tr>
<td></td>
<td>Assign these parameters to this variable, delimited by semi-colons.</td>
</tr>
</tbody>
</table>

**DataSourceODBOCubeName**

This TurboIntegrator local variable sets the name of the cube from the OLAP server that you want to use as a data source.

**Syntax**

```
DataSourceODBOCubeName='Name';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The name of the cube to be used.</td>
</tr>
</tbody>
</table>

**DataSourceODBOHierarchyName**

This TurboIntegrator local variable sets the name of the hierarchy for the specific dimension you are using as a data source. You use this variable for other OLAP products, such as SAP BW, where a hierarchy is a separate object.

This variable is not used with TM1 data sources.

**Syntax**

```
DataSourceODBOHierarchyName='Name';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The name of the hierarchy for a specific dimension.</td>
</tr>
</tbody>
</table>

**DataSourceODBOLocation**

This TurboIntegrator local variable sets the name of the location (system) where the OLAP server is running.

TM1 uses this variable, but other OLAP servers do not. For TM1, this is the location where the Admin Host is running.
**Syntax**

```
DataSourceODBOLocation='Location';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>The name of the location (system) for the OLAP server.</td>
</tr>
</tbody>
</table>

**DataSourceODBOProvider**

This TurboIntegrator local variable sets the name of the ODBO provider that you want to use as a data source. This is the full name that is assigned by the ODBO provider manufacturer to identify their multidimensional database server.

You must use the name of an ODBO provider that is installed on your server.

**Syntax**

```
DataSourceODBOProvider='Provider';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider</td>
<td>The name of the ODBO provider to use as a data source.</td>
</tr>
<tr>
<td>Commonly-used provider names include:</td>
<td></td>
</tr>
<tr>
<td>TM1 OLE DB MD Provider</td>
<td></td>
</tr>
<tr>
<td>Microsoft OLE DB Provider for OLAP Services 8.0</td>
<td></td>
</tr>
<tr>
<td>SAP BW OLE DB Provider</td>
<td></td>
</tr>
</tbody>
</table>

**DataSourceODBOSAPClientID**

This TurboIntegrator local variable sets the client number that corresponds to the UI version on the SAP server to which you want to connect.

**Syntax**

```
DataSourceODBOSAPClientID='ID';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>A number that corresponds to the UI version on the SAP server. For example, 498.</td>
</tr>
</tbody>
</table>

**DataSourceODBOSAPClientLanguage**

This TurboIntegrator local variable sets the language specification for the language of the SAP system to which you want to connect.

**Syntax**

```
DataSourceODBOSAPClientLanguage='Language';
```
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>The language specification of the SAP system. For US English, use EN. For German, use DE. For other languages, refer to your SAP documentation.</td>
</tr>
</tbody>
</table>

**DatasourcePassword**

This TurboIntegrator local variable sets the password used to connect to the data source.

**Syntax**

```
DatasourcePassword='Password';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password</td>
<td>The password used to connect to the data source set with DatasourceNameForServer.</td>
</tr>
</tbody>
</table>

**DatasourceQuery**

This TurboIntegrator local variable sets the query string to use with the data source.

**Syntax**

```
DatasourceQuery='Query';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
<td>The query string to use with the data source that was set with DatasourceNameForServer.</td>
</tr>
</tbody>
</table>

**DataSourceSAPUsingRoleAuths**

The DataSourceSAPUsingRoleAuths local variable instructs the TurboIntegrator process to ignore security information when processing an SAP datasource. This variable must be placed in the Prolog.

**Syntax**

```
DataSourceSAPUsingRoleAuths='0'
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Security information is ignored when processing an SAP datasource.</td>
</tr>
<tr>
<td>1</td>
<td>Security information is read when processing an SAP datasource.</td>
</tr>
</tbody>
</table>
**DataSourceSAPUsingTexts**

The DataSourceSAPUsingTexts local variable instructs the TurboIntegrator process to ignore characteristic descriptions when processing an SAP datasource, resulting in a decreased memory consumption and increased performance. This variable must be placed in the Prolog.

**Syntax**

```
DataSourceSAPUsingTexts='0'
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Characteristic descriptions <em>are ignored</em> when processing an SAP datasource. The characteristic technical name is imported into TM1 as both an element name and alias.</td>
</tr>
<tr>
<td>1</td>
<td>Characteristic descriptions <em>are read</em> when processing an SAP datasource.</td>
</tr>
</tbody>
</table>

**DatasourceType**

This TurboIntegrator local variable sets the type of the data source.

**Syntax**

```
DataSourceType='Type';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Valid types include: 'CHARACTERDELIMITED', 'POSITIONDELIMITED', 'VIEW', 'SUBSET', ODBC' and 'OLEDBOLAP', 'SAPCHARACTERISTICTEXTS'</td>
</tr>
</tbody>
</table>

**DatasourceUsername**

This TurboIntegrator local variable sets the name used to connect to the data source.

**Syntax**

```
DatasourceUserName='Name';
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The name used to connect to the data source set with DatasourceNameForServer.</td>
</tr>
</tbody>
</table>

**MinorErrorLogMax**

This TurboIntegrator local variable defines the number of minor errors that will be written to the TM1ProcessError.log file during process execution. If this variable is not defined in the process, the default number of minor errors written to the log file is 1000.

**Syntax**

```
MinorErrorLogMax=N;
```
Argument | Description
--- | ---
N | Value indicating the number of errors that should be written to the log file. Specify an integer greater than zero to set the maximum number of errors written to the log file. Specify a value of 0 to log no errors during process execution. Specify a value of -1 to allow an unlimited number of minor errors to be written to the log file.

The following table provides an example error log message and the corresponding result.

<table>
<thead>
<tr>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>MinorErrorLogMax=750;</td>
<td>The log file will accept up to 750 errors.</td>
</tr>
<tr>
<td>MinorErrorLogMax=0;</td>
<td>No errors will be written to the log file.</td>
</tr>
<tr>
<td>MinorErrorLogMax=-1;</td>
<td>No limit on the number of errors written to the log file.</td>
</tr>
</tbody>
</table>

**NValue**
When the DatasourceType is 'VIEW', this TurboIntegrator local variable determines the value of the current cell when Value_Is_String is 0. (That is, when the current cell is numeric.)

**Syntax**

Nvalue=N;

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>The value of the current cell.</td>
</tr>
</tbody>
</table>

**OnMinorErrorDoItemSkip**
This TurboIntegrator local variable instructs TurboIntegrator to skip to the next record when a minor error is encountered while processing a record.

This variable is useful in scenarios where a single bad field/value in a record causes multiple minor errors. For example, if you have 100 CELLPUTN functions in a process and one of the fields in a given record is 'bad' or invalid, the minor error count is incremented by 100. (1 for each CELLPUTN function that encounters the error.) These 100 minor errors count towards the minor error limit defined by MinorErrorLogMax. A TurboIntegrator process fails when it surpasses the number of minor errors defined by MinorErrorLogMax.

If OnMinorErrorDoItemSkip=1; is included in the Prolog tab of the process, the process immediately skips to the next record when a 'bad' or invalid field is encountered in a source record. Using the above example, this results in the minor error count being incremented by just 1, rather than 100.
Syntax

OnMinorErrorDoItemSkip=N;

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Value indicating if item should be skipped when a minor error is encountered. 1 (or any other non-zero value) dictates that the process should skip to the next record when a minor error is encountered. 0 indicates that TurboIntegrator should continue processing the current record when a minor error occurs.</td>
</tr>
</tbody>
</table>

SValue

When the DatasourceType is 'VIEW', this TurboIntegrator local variable determines the value of the current cell when Value_Is_String is not 0. (That is, when the current cell contains a string.)

Syntax

Svalue='String';

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>The value of the current cell.</td>
</tr>
</tbody>
</table>

TM1ProcessError.log file

When a TurboIntegrator process encounters an error, it generates a TM1ProcessError.log file. This log file is saved to the data directory of the server on which the process resides.

A TM1ProcessError.log file contains a list of errors that are encountered by the process. For each error encountered, the log file records the tab and line that caused the error, along with a brief description of the error.

When a process error log file is generated, TM1 assigns a unique name that lets you readily identify which TurboIntegrator process generated the error file and the time at which the file was created. File names are assigned with the following convention:

TM1ProcessError_<time stamp>_<process name>.log.

In this convention, <time stamp> is the time (expressed as yyyymmddhhmms GMT) at which the file was generated and <process name> is the name of the TurboIntegrator process that caused the errors.

For example, an error file named TM1ProcessError_20040224203148_CreateSalesCube.log indicates that the error file was generated at 20:31:48 GMT on February 24, 2004 and that it contains errors that are caused by the CreateSalesCube process.

Manual intervention is required to delete or archive these log files. A new log file is generated each time a TurboIntegrator process has an error (1 log file per TurboIntegrator execution).

Many TurboIntegrator process error logs might be generated for TurboIntegrator processes that run frequently and generate an error on each execution. Many log files generated in the TM1 database log directory might impact performance of the TM1 database when it creates or updates log files.

The Planning Analytics Administration ability to download log files might be impacted by a large number of files in the TM1 database log directory. It’s recommended to limit the number of files in the TM1 database logging directory to under 2000 files.
**Value_Is_String**

When the DatasourceType is 'VIEW', this TurboIntegrator local variable determines whether the current cell should be treated as a string or a numeric value.

**Syntax**

\[
\text{Value\_Is\_String=}N; \\
\]

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Value indicating if the current cell is a string or a numeric value. 0 dictates that the cell is a number; anything else means the cell is treated as a string.</td>
</tr>
</tbody>
</table>

**TurboIntegrator Global Variables**

This type of TurboIntegrator variable is associated with an individual TM1 chore or with an individual process and any attendant sub-processes. There are two types of global variables: implicit and user-defined. Implicit global variables are described here. User-defined global variables are described below.

Global variables can be used in two ways:

- Global variables can be declared within a process that is part of a given chore. Once declared, the global variables are available to all other processes that are part of the chore. The variables persist while the chore is executing and for the duration of the current server session. Global variables are destroyed upon server shutdown.

- Global variables can be declared in one process and be made available to any subsequent processes called by the ExecuteProcess( ) function. These sub-processes must use the same global variable declaration statements (described below) to access the global variables.

In the event that a global variable name is identical to a local variable name, the local variable definition takes precedence and overrides the global variable.

Global variables are declared in a TurboIntegrator process using one of the following two functions:

- **NumericGlobalVariable('VariableName');**
  
  Use this function to declare a numeric global variable.

- **StringGlobalVariable('VariableName');**
  
  Use this function to define a string global variable.

**Implicit Global Variables**

When you execute a TurboIntegrator process, a set of implicit global variables is generated. If the process generating the variables is part of a chore, these global variables are available to and can be shared by all other processes within the chore.

In addition, all implicit global variables in a process are available to and can be shared by any subsequent processes called by the ExecuteProcess( ) function.

Though implicit variables are generated by the TurboIntegrator process, you must declare a variable before it can be used in a process.
Implicit global variables are declared in a TurboIntegrator process using the
NumericGlobalVariable('VariableName');

Click a link below for details on a specific implicit global variables.

- DataMinorErrorCount.
- MetadataMinorErrorCount.
- ProcessReturnCode.
- PrologMinorErrorCount.

For example, to use the PrologMinorErrorCount implicit global variable in a process, you must first declare
the variable as follows:

```
NumericGlobalVariable('PrologMinorErrorCount');
```

DataMinorErrorCount

This TurboIntegrator global variable counts the minor errors that occur in the Data portion of a
TurboIntegrator process. For each minor error encountered, the variable value is incremented by 1.

**Syntax**

```
DataMinorErrorCount=N;
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>The number of minor errors encountered in the Data portion of the process.</td>
</tr>
</tbody>
</table>

MetadataMinorErrorCount

This TurboIntegrator global variable counts the minor errors that occur in the Metadata portion of a
TurboIntegrator process. For each minor error encountered, the variable value is incremented by 1.

**Syntax**

```
MetadataMinorErrorCount=N;
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>The number of minor errors encountered in the Metadata portion of the process.</td>
</tr>
</tbody>
</table>

ProcessReturnCode

This TurboIntegrator global variable stores the exit status of the most recently executed TurboIntegrator
process.

**Syntax**

```
ProcessReturnCode=StatusCode;
```

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProcessExitByBreak()</td>
<td>Indicates that the process exited because it encountered a ProcessBreak function.</td>
</tr>
<tr>
<td>Status Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ProcessExitByChoreQuit()</td>
<td>Indicates that the process exited due to execution of the ChoreQuit function.</td>
</tr>
<tr>
<td>ProcessExitByChoreRollback()</td>
<td>Indicates that the process exited because it encountered a ChoreRollback function.</td>
</tr>
<tr>
<td>ProcessExitByProcessRollback()</td>
<td>Indicates that the process exited because it encountered a ProcessRollback function.</td>
</tr>
<tr>
<td>ProcessExitByQuit()</td>
<td>Indicates that the process exited because of an explicit quit command.</td>
</tr>
<tr>
<td>ProcessExitMinorError()</td>
<td>Indicates that the process executed successfully but encountered minor errors.</td>
</tr>
<tr>
<td>ProcessExitNormal()</td>
<td>Indicates that the process executed normally.</td>
</tr>
<tr>
<td>ProcessExitOnInit()</td>
<td>Indicates that the process aborted during initialization.</td>
</tr>
<tr>
<td>ProcessExitSeriousError()</td>
<td>Indicates that the process exited because of a serious error.</td>
</tr>
<tr>
<td>ProcessExitWithMessage()</td>
<td>Indicates that the process exited normally, with a message written to tm1server.log.</td>
</tr>
</tbody>
</table>

**PrologMinorErrorCount**

This TurboIntegrator global variable counts the minor errors that occur in the Prolog portion of a TurboIntegrator process. For each minor error encountered, the variable value is incremented by 1.

**Syntax**

```
PrologMinorErrorCount=N;
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>The number of minor errors encountered in the Prolog.</td>
</tr>
</tbody>
</table>

**TurboIntegrator User Variables**

This type of variable is associated with an individual TM1 user, not with any particular process or chore. User variables can be manipulated from within any TurboIntegrator process or chore while the user with which the variable is associated is logged on to the server.

User variables must be explicitly declared. Once declared, user variables persist for the life of the user's TM1 session (until the user logs off or is disconnected from the server).

User variables are declared in a TurboIntegrator process using one of the following two functions:

- `NumericGlobalVariable('VariableName')`: Use this function to declare a numeric user variable.
- `StringGlobalVariable('VariableName')`: Use this function to define a string user variable.
User variables are created the first time such a declaration is encountered in any running TurboIntegrator process.

Once created, the variable name may be referenced and used just like any local or global variable, expect that the variable value persists across processes and chores only for as long as the user who created the variable is logged on to the server.
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