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- Web Intelligence requires the Java Runtime Environment (JRE) 1.4.2_01. The currently installed JRE is {0}. Contact your administrator to upgrade to 1.4.2_01 or select the [default VM] entry in the [Java Plug-in Control Panel], if you already have the required version installed. (WIJ 11111)...956
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11.4 Web Intelligence Server (WIS) Error Messages

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At least one query in the document is empty. (WIS 30001) ............................................... 970
Your security profile does not include permission to edit queries. (WIS 30251) ......................... 970
Your security profile does not include permission to edit documents. (WIS 30252) .............................................. 970
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<td>RWI 00315 - RWI 00605</td>
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</tr>
<tr>
<td></td>
<td>RWI 00606 - RWI 00850</td>
<td>1049</td>
</tr>
<tr>
<td>11.7</td>
<td>Custom Data Source (CDS) Framework Error Messages</td>
<td>1057</td>
</tr>
<tr>
<td></td>
<td>Custom Data Source User Interface Framework error messages</td>
<td>1057</td>
</tr>
<tr>
<td></td>
<td>Web Services Custom Data Source Plugin error messages</td>
<td>1062</td>
</tr>
<tr>
<td></td>
<td>Custom Data Source Framework error messages</td>
<td>1066</td>
</tr>
</tbody>
</table>
1  What's new, how and where to get help

1.1  What's New in 4.2 SP6

Linking to other reports within the same document

To give immediate access to other reports within the same document, you can define hyperlinks that are called intra-document links.

For more information, see Linking to other reports within the same document [page 505].

Breaks - Amounts added into the break footer

When you insert a break, the break footer is now automatically filled with the appropriate amounts.

For more information, see Using breaks [page 357].

Applying security filtering when opening a document

When creating a document on a relational .unx universe with Business Security Profiles, you can specify that security on data is applied when opening the document without any need to perform a refresh. This saves time to all users of the document, namely for users who receive a document through the scheduling process.

For more information, see Applying security filtering when opening a document [page 241].

Interactive Viewer

For more information regarding what's new in Web Intelligence Interactive Viewer, refer to the What’s New section of the SAP BusinessObjects Web Intelligence Interactive Viewer User Guide.

New look and feel

The default Cascading Style Sheet (CSS) has been enhanced to provide a new look and feel to your documents. Tables now have headers with a grey background, the alternate colors property for rows has been removed, and the autofit property is disabled by default.
Charts also benefit from enhancements: they now have automatic titles, a new overlapping columns setting is available, the legend is no longer automatically displayed, a new palette has been added, and many more improvements.

For more information, see Formatting your reports using Cascading Style Sheets [page 437].

**Funnel and Pyramid charts**

Represent different stages of your sale process and identify potential enhancements using funnel and pyramid charts.

For more information, see Funnel and Pyramid charts [page 373].

**Time dimensions**

Drive time-based business analyses using time dimensions and customized calendars for personalized reporting.

For more information, see Using time dimensions [page 311].

**Stored procedures**

Relational .UNX universes now support stored procedures. This allows for better migration of Desktop Intelligence documents.

For more information, see Stored procedures [page 75].

**Refresh options**

Select the data providers you want to refresh when refreshing a document.

For more information, see Defining queries as refreshable [page 191].

**New PageInSection() function**

Use the new PageInSection() to return a page number in a specific section.

For more information, see PagInSection [page 816].
.CSV and .TXT as data source

You can now use .CSV and .TXT files as data sources in the HTML client.
For more information, see Building and running queries [page 61].

Export to PDF with bookmarks

Export your documents to PDF and leverage bookmarks to facilitate their navigation using the new Display Bookmarks option.
For more information, see Exporting documents, reports or data [page 514].

1.2 Documentation for SAP BusinessObjects Web Intelligence

The Web Intelligence documentation provides complete instructions for performing interactive analysis on data from the BI launch pad using the SAP BusinessObjects Web Intelligence HTML or Applet interfaces, or using SAP BusinessObjects Web Intelligence Rich Client which can be launched and installed from the BI launch pad.

The image below will help you find specific sections of the documentation you might be interested in. Click one of the tiles to access its dedicated sections.
To access online help

Procedure

1. Open Web Intelligence.
2. From the Help button dropdown list in the application toolbar, select Help Contents.

To access the Web Intelligence guide via the internet

You can find Web Intelligence guides on the SAP Help Portal.

At the SAP Help Portal (http://help.sap.com/) the following guides are available:

- SAP BusinessObjects Web Intelligence User's Guide - a complete guide to working with corporate data from the BI launch pad using the Web Intelligence Applet, Web Intelligence HTML, and Web Intelligence Rich Client interface.
  - The Web Intelligence Rich Client (Desktop interface) allows you to perform analysis offline as well as with corporate data. This interface can be installed and accessed in the following ways:
    ○ via the BI launch pad
œ as a part of the BI platform

**i Note**

As of BI 4.1 Support Package 5, the SAP BusinessObjects Web Intelligence Rich Client User’s Guide and online help and the Building SAP BusinessObjects Web Intelligence queries based on BEx queries guide have been merged into the SAP BusinessObjects Web Intelligence User’s Guide.

- *Using Functions, Formulas and Calculations in Web Intelligence* - detailed information on the formula language and advanced calculation-related topics such as calculation contexts and smart measures.
2  About Web Intelligence

Web Intelligence provides business users with flexible and intuitive ad hoc reporting tools and interactive analytics – on the Web, desktop, or mobile device.

You can also:
- Deliver personalized business intelligence to your colleagues, customers, and partners
- Improve productivity by giving users an intuitive tool and clearing IT backlogs
- Get the insights you need, when you need them, no matter where you are

⚠️ Caution

Web Intelligence has open or freely configurable entry fields in which you can enter data that are stored in a system. These fields are not intended for storing personal data. To ensure data protection and privacy, we do not recommend entering personal data without the authorization of your organization and additional security measures.

Security rights

Depending on your license, user, and security rights, you can analyze the data in reports. For example, you can perform the following actions:
- Filter data
- Drill down on data to reveal more details
- Merge data from multiple data sources
- Display and view data in charts

Customized interface

The Central Management Console (CMC) administrator can customize the user interface by hiding elements, such as panels, panes, toolboxes, menus, and menu items. If a user interface element that you need is not available, contact your CMC administrator.

Data sources

Data in Web Intelligence documents can come from:
- Universes, which organize data from relational or OLAP databases into objects or hierarchies
- Personal data providers (such as Microsoft Excel or .csv files)
- BEx queries based on SAP Info Cubes
- Web services
- Analysis View workspaces
- Relational database queries via Free-Hand SQL statements
- You can connect to the SAP HANA (High-Performance Analytical Appliance) data source to use in-memory computing. SAP HANA universes based on SAP HANA views with variables are supported in Web Intelligence.

You build data providers to retrieve data from data sources and create reports from the data in data providers.

2.1 Getting to know Web Intelligence and the BI Launch Pad

2.1.1 About the Web Intelligence interfaces

Four interfaces are available for Web Intelligence documents.

You select the interface you prefer in BI launch pad Web Intelligence preferences.

Via the BI launch pad, you can use the Web Intelligence HTML interface and Web Intelligence Applet interface to create documents that analyze data. Web Intelligence Rich Client allows you to work locally without a connection to a repository. Web Intelligence Interactive Viewer is a modern version of Web Intelligence and allows you to consult documents and reports in a redesigned interface dedicated to report consulting. For more information on Web Intelligence Interactive Viewer, refer to the Web Intelligence Interactive Viewer User Guide.

The interface launched when you open a document to View or Modify in the BI launch pad depends on your Web Intelligence BI launch pad Preferences settings.

Client parity starting from 4.2 SP3

Starting from 4.2 SP3, new functionalities are available in the HTML client so that it is aligned with the capabilities offered by the Java applet:

- Save as (4.2 SP3)
- Format Number (4.2 SP3)
- Conditional Formatting (4.2 SP3)
- Create documents with BEx queries and Excel spreadsheets as data sources (4.2 SP3)
- Create ranking, subqueries and complex filters (4.2 SP3)
- Change Source wizard (4.2 SP3)
- Use Free-Hand SQL queries as a data source (4.2 SP4)
- Use RTL alignment (4.2 SP4)
- Format multiple report elements simultaneously (4.2 SP5)
- Create documents using .CSV or .TXT files as data sources (4.2 SP6)
<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Intelligence HTML interface</td>
<td>Also sometimes referred to as the DHTML interface. You launch this interface in the BI launch pad. Depending on your permissions, you can do the following:</td>
</tr>
<tr>
<td></td>
<td>- Create and edit queries based on No data source, .unx, and .unv universes, SAP HANA views, BEx queries, FHSQ queries, and Excel files.</td>
</tr>
<tr>
<td></td>
<td>- View, create, edit and refresh all types of reports.</td>
</tr>
<tr>
<td>Web Intelligence Applet interface</td>
<td>Also sometimes referred to as the Java applet. You launch this interface in the BI launch pad. Depending on your permissions, you can do the following:</td>
</tr>
<tr>
<td></td>
<td>- Create and edit queries based on No data source, .unx and .unv universes, SAP HANA views, BEx queries, FHSQ queries, Analysis views (Analysis View workspaces), and Excel files.</td>
</tr>
<tr>
<td></td>
<td>- View, create, edit and refresh all types of reports.</td>
</tr>
</tbody>
</table>
Web Intelligence Rich Client, also referred to as Desktop, is a version of Web Intelligence that is installed on your computer and allows you to create and edit queries, and view, create, edit and refresh reports. There are two ways to have Web Intelligence Rich Client installed on your computer:

- From BI launch pad.
- As part of a BI platform installation.

**Note**

When you have launched Web Intelligence Rich Client once and closed it, the quick start icon is available in the Microsoft Windows toolbar. This quick start icon allows you to launch the interface rapidly.

Web Intelligence Rich Client can be used to create and edit queries based on no data source, .unx and .unv universes, SAP HANA views and Excel and text files.

Data sources you can access depend on the connection mode:

<table>
<thead>
<tr>
<th>Data source</th>
<th>Standalone</th>
<th>Offline</th>
<th>Connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>.unv universe</td>
<td>No</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>.unx dimensional universe</td>
<td>No</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>.unx relational universe</td>
<td>No</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>.unx multi-source universe</td>
<td>No</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>SAP HANA views</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>BEx query</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Free-hand SQL query</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Analysis Views and Microsoft Analysis Services 2005</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Excel file</td>
<td>Yes **</td>
<td>Yes **</td>
<td>Yes</td>
</tr>
<tr>
<td>Text file</td>
<td>Yes **</td>
<td>Yes **</td>
<td>Yes</td>
</tr>
<tr>
<td>CSV file</td>
<td>Yes **</td>
<td>Yes **</td>
<td>Yes</td>
</tr>
<tr>
<td>Web Services</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* In this case, you have imported the universe, and you still need to enter a CMS password to access the universe.

** Locally installed only.
Interface | Description
--- | ---
Web Intelligence Interactive Viewer | Also sometimes referred to as the Interactive Viewer. The Interactive Viewer is an interface dedicated to report consulting. It doesn’t feature report design and editing capabilities. It is designed to optimize the viewing experience and enhance analysis possibilities thanks to its sorting, ranking, folding and drilling abilities.

**Tip**

In the BI launch pad preferences, you can choose in which Web Intelligence interface to open documents when you right-click a document and select **View**. When you right-click a document and **Modify**, a different Web Intelligence user interface appears. For example, you can link cells to documents in the Web Intelligence HTML interface only, but you can work with queries based on QaaWS (Query as a Web Service) data sources only in the Web Intelligence Applet or Rich Client interfaces.

You may need to use two Web Intelligence interfaces—one for viewing and one for modifying documents. In that case, use the Web Intelligence HTML interface to view documents and the Web Intelligence applet or rich client interface to modify documents.

### Feature differences between the Web Intelligence interfaces

This section provides you with an overview of the main functional differences that exist between all the Web Intelligence interfaces as of BI 4.1 Support Package 03. The availability of certain features depends on which interface you are using.

**Setting up and using the Web Intelligence interfaces**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
<th>Web Intelligence Interactive Viewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Web Intelligence locally and offline</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Use Right To Left (RTL) alignment based on the Preferred viewing locale setting</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>User Prompt Input appears in the side panel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

* You can install Web Intelligence Rich Client from the BI launch pad or the administrator can install the BI Platform, which includes Web Intelligence Rich Client, on your computer from the SAP Software Download Center.
## Creating and working with documents in each interface

<table>
<thead>
<tr>
<th>Feature</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
<th>Web Intelligence Interactive Viewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a folder in which local documents and universes are stored by default on your local machine</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Edit and refresh a document using a SAP HANA view data source</td>
<td>Yes</td>
<td>Yes</td>
<td>In Connected mode only.</td>
<td>Refresh only</td>
</tr>
<tr>
<td>Edit and refresh a document using a BEx query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Refresh only</td>
</tr>
<tr>
<td>Edit and refresh a document using a Free-hand SQL query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Refresh only</td>
</tr>
<tr>
<td>Edit and refresh a document using an Analysis View data source</td>
<td>Refresh only</td>
<td>Yes</td>
<td>Yes</td>
<td>Refresh only</td>
</tr>
<tr>
<td>Edit and refresh a document using a text source</td>
<td>Refresh only *</td>
<td>Refresh only *</td>
<td>Yes</td>
<td>Refresh only *</td>
</tr>
<tr>
<td>Edit and refresh a document using a web service data source</td>
<td>Refresh only</td>
<td>Yes</td>
<td>Refresh only</td>
<td></td>
</tr>
<tr>
<td>Send a Web Intelligence document to another user in the CMS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Send a Web Intelligence document by FTP</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Export a document as a CSV file</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Export a document as a CSV archive file</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Save a document as a CSV archive file</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Export a document as a PDF, text, Excel or Excel 2007 file</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Save a document as a PDF, text, Excel or Excel 2007 file</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Save a document to the corporate repository</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Autosave documents to My Favorites folder</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* If the file has previously been copied into the BusinessObjects Enterprise Platform.

## Building queries

The table below does not mention Web Intelligence Interactive Viewer, as it is designed for report consulting only.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build queries on an Analysis View data source</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Build queries on Excel files saved locally</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Build queries on Excel files saved to the CMS *</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Build queries on SAP HANA views</td>
<td>Yes</td>
<td>Yes</td>
<td>In Connected mode only.</td>
</tr>
<tr>
<td>Build queries on BEx queries</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Building queries on Free-hand SQL queries</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Build queries on text files</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Access Data mode</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Access the Change Source options in the Data Access table</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Change the data source of queries based on text and Excel files.</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>For OLAP .unx universes, when filtering on measures, you can only type a constant.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Select all the members at a level in a hierarchy that is organized into levels</td>
<td>Yes only for OLAP .unx</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Excel files have to be exported first into the BI launch pad for Life Cycle management.

**Creating reports**

The table below does not mention Web Intelligence Interactive Viewer, as it is designed for report consulting only.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access a “Highlight All” button in the “Find” box to highlight all occurrences of a text string in a report page.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Create and edit conditional formatting</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>View the alignment grid from the report editor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>View the “More on this function” button in the formula editor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Publishing, formatting and sharing reports

<table>
<thead>
<tr>
<th>Feature</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
<th>Web Intelligence Interactive Viewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set a hyperlink to another document in the CMS</td>
<td>Yes, with a wizard</td>
<td>Yes, no wizard</td>
<td>Yes, no wizard</td>
<td>No</td>
</tr>
<tr>
<td>Publish content as a web service</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Print documents directly from the interface</td>
<td>Export to PDF first</td>
<td>Yes</td>
<td>Yes</td>
<td>Export to PDF first</td>
</tr>
</tbody>
</table>

Related Information

Changing the data source of a query [page 183]

2.1.2 Application components

Web Intelligence offers several components that you can use to create, edit and navigate documents.

The application has the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main toolbar</td>
<td>You use the main toolbar to open, save and print documents, track data changes and display the report outline. The main toolbar appears in the File tab when the application is in Design mode.</td>
</tr>
<tr>
<td>Toolbars</td>
<td>You work with data providers and perform report design and analysis tasks using the toolbars. Toolbars appear at the top of the application in Data and Design mode only. In Data mode, only those toolbars related to working with data providers are active.</td>
</tr>
<tr>
<td>Side Panel</td>
<td>The Side Panel groups several panes that provide different views of the current document.</td>
</tr>
<tr>
<td>File and Properties tabs</td>
<td>The File and Properties tabs are only available in Design and Data mode. The File tab contains the main file menu tools. The Properties tab allows you to set View, Document, and Application properties.</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Status Bar</td>
<td>The Status Bar appears beneath the Report Panel and allows you to perform actions such as activating data tracking or changing the display mode. It can be activated and deactivated in the View menu of the Properties tab.</td>
</tr>
<tr>
<td>Report Filter toolbar</td>
<td>This toolbar is used to add simple filters to reports.</td>
</tr>
<tr>
<td>Drill toolbar</td>
<td>When Drill is activated in a document, this toolbar appears. It shows the active drill objects.</td>
</tr>
</tbody>
</table>

**Related Information**

To create simple report filters [page 573]
Side Panel tabs in Web Intelligence [page 28]
Drilling down on report data [page 550]

### 2.1.2.1 Side Panel tabs in Web Intelligence

The tabs available in the Side Panel depend on the Web Intelligence interface you are using and the mode in which you are viewing the document.

**Web Intelligence interfaces and document modes**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Rich Client</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data</td>
<td>Design</td>
<td>Reading</td>
</tr>
<tr>
<td>Document Summary</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Navigation Map</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Report Map</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Input Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>User Prompt Input</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Shared Elements</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Comments</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Available Objects</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Document Structure and Filters</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Web Service Publisher</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The tabs allow you to access to panes in which you can view and configure document information and objects.

- The **Document Summary** pane provides an overview of the document properties.
The Navigation Map and Report Map panes list all the reports in a document.
The Input Controls pane allows you to add and edit input controls applied to the document.
The Web Service Publisher pane lists the BI services published from the document.
The Available Objects pane lists the data providers and objects available for inclusion in reports.
The Document Structure and Filters pane displays the structure of the document in a tree view, and displays filters applied to different report elements.
The Data pane appears only in Data mode and allows you to navigate the data providers in a document.
The User Prompt Input pane lists the default values for a prompt. You can also enter text in the values text box. Multiple items are separated by a semi-colon (;).
The Shared Elements pane lists all the shared elements used in the document.
The Comments pane lists all the comments in the document.

2.1.3 Understanding the BI launch pad

The BI launch pad consists of the following areas:

- Toolbar
- Home and Documents tabs
- My Applications Icons

**Toolbar**

The Applications menu allows you to start Web Intelligence.
The Preferences menu allows you to set the following application preferences:

- General preferences
- Password
- Locale and time zone preferences
- The Web Intelligence preferences

**BI launch pad panes**

The BI launch pad consists of the following objects:
The main tabs: Home, Documents, and any open documents.

<table>
<thead>
<tr>
<th>Tab pane</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>Shows recently viewed documents, unread messages, unread alerts, and recently run documents.</td>
</tr>
</tbody>
</table>
### Tab pane

<table>
<thead>
<tr>
<th>Tab pane</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documents</strong></td>
<td>Allows you to navigate through the available folders and documents. Click on a folder tab to display any documents in that folder. You can view, organize, and manage documents in this pane.</td>
</tr>
<tr>
<td>Web Intelligence documents</td>
<td>One tab for each open document.</td>
</tr>
</tbody>
</table>

### Related Information

- About setting Web Intelligence preferences [page 47]

### 2.1.3.1 To log into the BI launch pad

To access Web Intelligence via the BI launch pad, you need to log in.

### Prerequisites

Before you can perform interactive analysis from the BI launch pad, you need the following information:

- a URL to the BI launch pad (for example `http://[hostname]:8080/BOE/BI`).
- your user name and password
- your authentication, which controls the resources available to you

Contact your administrator for these details if you do not already know them.

**i Note**

By default the server name is not displayed on the BI launch pad log on page.

### Context

To launch SAP BusinessObjects Web Intelligence:

### Procedure

1. Launch a web browser.
2. Point your browser to the BI launch pad bookmark or URL.
   - The login page appears.
3. If the System box is blank, type the name of the server followed by a colon (:), and then type the port number. The default port number is 6400.

4. In the Username box, type your user name.

5. In the Password box, type your password.

6. In the Authentication box, select the authentication provided to you by your administrator.

7. Click Log On.
   The BI launch pad home page appears.

2.1.3.2 To log out of the BI launch pad

You need to log out when you have finished working in the BI launch pad instead of simply closing your web browser.

Context

Logging out ensures that any preferences you modified during your session are saved.
BI administrators can track how many users are logged into the system at any given time and use this information to optimize system performance.

Procedure

Click Log off on the BI launch pad toolbar.

2.1.3.3 To start Web Intelligence in the BI launch pad

You can launch Web Intelligence in more than one way.

Procedure

To start Web Intelligence, in the BI launch pad, do one of the following:

- Click Applications ➔ Web Intelligence ➔.
- Select Web Intelligence in the application shortcuts.
- Open a Web Intelligence document.
Web Intelligence starts. The Web Intelligence tab is active in the main pane. To check which interface has started (Web Intelligence HTML, Web Intelligence Applet, or Web Intelligence Rich Client), click Preferences and select Web Intelligence.

Related Information

Building and running queries [page 61]
Choosing the viewing and design interfaces [page 48]

2.1.3.4 To open a document from the repository

You can open a document from the corporate repository.

Procedure

1. In the BI launch pad, click the Documents tab to show the documents available in the repository.
2. Click the Folders tab, and navigate to the folder containing your document.
3. Select the document, right-click and select View to open the document in Reading mode, or Modify to open the document in Design mode.

The version of Web Intelligence that opens depends on the View and Modify settings in the BI launch pad Web Intelligence preferences.

Note

When the Refresh on open document property is selected in the document properties, the document displays the latest information each time you open it. The Refresh on open option is dependent on the following settings in the CMC (configured by the BI administrator):

- In Applications Web Intelligence Manage list, select Properties. In the Automatic Document Refresh on Open Security Right Setting section, the property Automatic Refresh security setting is enabled.
- In Applications Web Intelligence Manage list, select User Security. When you select a user profile and click View Security, verify that the Document - disable automatic refresh on open security right is disabled.

Related Information

Choosing the viewing and design interfaces [page 48]
2.1.3.5 To delete a document from the repository

You can delete a document from the corporate repository, if you have been granted the permission to do so.

Procedure

1. Log into the BI launch pad
2. Click the Documents tab to show the documents available in the repository.
3. Navigate to the folder that contains the document you want to delete.
4. Right-click the document that you want to delete and click Organize.
5. Click Delete.

2.2 Configuring Web Intelligence Rich Client

You can use SAP BusinessObjects Web Intelligence Rich Client to work with secured or unsecured documents, with or without a connection to a Central Management Server.

⚠️ Caution

Web Intelligence has open or freely configurable entry fields in which you can enter data that are stored in a system. These fields are not intended for storing personal data. To ensure data protection and privacy, we do not recommend entering personal data without the authorization of your organization and additional security measures.

The Web Intelligence Rich Client interface lets you create documents and edit, format, print, and save them. The following are common scenarios for using this interface:

- You do not want to install a CMS or an application server.
- You cannot connect to a CMS while traveling or working in a location without network access.
- You want to work with documents continuously, if there are server-side interruptions or performance issues.
- You want to improve calculation performance.

You can install Web Intelligence Rich Client interactively from the SAP BusinessObjects Business Intelligence launch pad, or the administrator can install the BI Platform, which includes Web Intelligence Rich Client, on your computer from the SAP Software Download Center.
2.2.1 To install Web Intelligence Rich Client from the BI launch pad

You can download Web Intelligence Rich Client to your computer from the BI launch pad.

Procedure

1. Log into the BI launch pad.
2. Click Preferences.
3. Click Web Intelligence.
4. In the Modify section, click (installation required) after Desktop (Rich Client, Windows only, installation required).
   A panel appears asking you if you want to run or save WebSetup.exe on your computer.
5. Click Run.
   Web Intelligence Rich Client is downloaded to your computer and launched when you launch the application from the BI launch pad. Due to the file size, this process might take a few minutes.
6. Click Save & Close.
7. If you receive HTTP connection errors in the report pages, refer to the following topic and then contact your BI administrator to obtain the information required to define your proxy settings: Defining the Proxy Settings in Web Intelligence Rich Client [page 44].

Results

iNote
When you install Web Intelligence Rich Client to your local computer, the online help system is also installed to your local computer.

Related Information

Connection modes [page 37]
About the Web Intelligence interfaces [page 21]
2.2.2 To install Web Intelligence Rich Client from the SAP Software Download Center

When you install the BI platform on your computer, you also install Web Intelligence Rich Client.

Prerequisites

You have access to the SAP Software Download Center and have administrator rights to install applications on your computer.

Procedure

1. Refer to the following guides on the SAP Help Portal (http://help.sap.com/):
   ○ For BI Platform installation instructions: the UNIX or Windows version of the Business Intelligence Platform Installation Guide for SAP BusinessObjects Business Intelligence platform 4.2
   ○ For information on installing and configuring Web Intelligence Rich Client on your computer: the Web Intelligence Rich Client Installation Guide
2. To download the BI Platform, go to the SAP Software Download Center (https://support.sap.com/swdc)

2.2.3 Online help in a Web Intelligence Rich Client installation

If you install Web Intelligence Rich Client from the BI launch pad, the online help system is installed to your computer.

Every time you open Web Intelligence Rich Client, and regardless of which work mode you are in, the help that appears when you click the Help icon is that which was installed on your computer.

Note

To update the Web Intelligence Rich Client interface and its help on your computer, you can re-install this interface from the BI launch pad preferences or ask the administrator to install the BI Platform, which includes Web Intelligence Rich Client, on your computer.

You can make help available by specifying a local folder or a URL where Web Intelligence Rich Client can access the help.

Related Information
2.2.3.1 To specify the folder or URL for online help

You can select either select a folder for Web Intelligence online help or enter a URL.

Procedure

1. Launch Web Intelligence Rich Client.
2. Click the Options button in the upper right corner, or when a document is open, click Properties Application.
3. In the Web Intelligence Options dialog box, select the General tab.
4. Click Browse next to Help and select a folder.
   You can also type a URL as the location of the online help.
5. Click Open, then OK.

2.2.4 Web Intelligence Rich Client processes

You can manage certain notification processes for Web Intelligence Rich Client.

Windows Notification Area

Any time you open the Web Intelligence Rich Client, an icon appears in the Windows notification area and remains during a Windows session. The icon represents the processes of Web Intelligence that continue running in the background.

You use the Web Intelligence Rich Client notification icon to do the following:

- Launch the application in a new window.
- Exit Web Intelligence Rich Client.
2.2.4.1 To activate and deactivate the Web Intelligence Rich Client background process

You can activate or deactivate the Web Intelligence Rich Client background process.

Context

If you activate the Web Intelligence Rich Client background process, you improve the loading time of documents.

Procedure

1. Launch the Web Intelligence Rich Client.
2. Click the Options button in the upper right corner, or when a document is open, click Properties. Application
3. In the Web Intelligence Options dialog box, select the General tab.
4. In the Web Intelligence Rich Client process section, do one of the following:
   ○ To activate the background process, select Keep process active after closing last window. This is the default setting.
   ○ To deactivate the background process, deselect Keep process active after closing last window. This will also close the quick start icon.
5. Click OK.

2.2.5 Connection modes

Web Intelligence Rich Client uses different connection modes.

You can use Web Intelligence Rich Client in the following connection modes: Connected, Offline, or Standalone.

2.2.5.1 About connection security rights and working locally

BI administrators can use the Download connection locally security right in the CMS to control connection security rights in Web Intelligence Rich Client.

When the Download connection locally security right is granted to connection objects a local refresh is performed if the middleware is correctly installed and configured. When the security right is denied, no local
refresh is executed. The refresh is delegated to the server side. Query creation and modification is possible only for queries not using secured connection.

When working with a document from BusinessObjects XI 4.0 or earlier, save the document and reopen it. The security right will be correctly applied.

**i Note**
The BI administrator must define the security associated with the data source connection, for example the sensitive data source connection information that can be downloaded locally and by which users.

When the security option has been activated:
- No connection information transit is allowed to the client side (extra secure mode).
- In a limited offline mode, it is not possible to refresh locally.
- In a fully offline mode, reports can be opened, viewed and modified, but not refreshed, and the query cannot be modified.

**i Note**
When working with multiple queries in a document, the refresh action works only for non-secured data source connections. A warning is displayed when at least one query is using a secured data source connection.

### 2.2.5.2 Connected mode

In **Connected** mode, you work while connected to a SAP BI BusinessObjects CMS (Central Management Server).

You can work with documents on the CMS or with local secured or unsecured documents. According to your security rights in the CMS, you can do the following:
- import documents and universes from the CMS
- open, create, edit, and refresh local documents
- save documents locally
- export documents to the CMS

**Security in Connected mode**

When you work with documents in **Connected** mode, the security rights of your user account are applied by the CMS.

**Connecting to the CMS in Connected mode**

There are two ways of launching Web Intelligence Rich Client, and each connects to the CMS differently:
When you launch Web Intelligence Rich Client from the BI launch pad, it connects to the CMS within the same BI launch pad session, so no login is required. Communication with the CMS goes through HTTP to an application server, which reroutes the calls to the CMS and repository. No local middleware is required.

When you launch Web Intelligence Rich Client locally via the Windows Start menu or by double-clicking a .wid document, Web Intelligence Rich Client connects to the CMS in client-server mode using the OCA/CORBA framework of the Enterprise SDK. You need the appropriate database middleware on your local machine.

**Note**

In order to connect to an Essbase OLAP data source from SAP BusinessObjects OLAP products including universe design tool, Web Intelligence Rich Client and Web Intelligence, ensure that Essbase Client middleware is properly installed and configured on machines hosting those SAP BusinessObjects OLAP products. Specifically, ensure that Essbase Client environment variables ARBORPATH and ESSBASEPATH are created and set as Windows system environment variables instead of Windows user environment variables.

**Related Information**

To work on an existing document locally in Connected mode [page 40]
To work in Connected mode from the BI launch pad [page 39]

### 2.2.5.2.1 To work in Connected mode from the BI launch pad

In **Connected** mode, security is handled by the CMS. You work with documents as you do when working in the BI launch pad.

**Context**

You do not need database middleware on your local machine when you launch Web Intelligence Rich Client from the BI launch pad.

**Procedure**

1. Log into the BI launch pad.
2. Click **Preferences** at the top of the BI portal.
3. In the **Preferences** dialog box, select **Web Intelligence**.
4. In the Modify section, select Desktop.
5. Click Save & Close to close the Preferences dialog box.
6. In the BI launch pad, click the Documents tab.
7. Right-click a document and select Modify.

Web Intelligence Rich Client is launched on your computer in the Connected mode. If it is not yet installed on your computer, it is installed from the BI launch pad.

If Web Intelligence Rich Client was already running on your computer, launching from the BI launch pad opens a new instance of the application. The document is not opened in the application instance that was already open.

Related Information

Connection modes [page 37]

2.2.5.2.2 To work on an existing document locally in Connected mode

You can launched Web Intelligence Rich Client in Connected mode.

Prerequisites

To launch Web Intelligence Rich Client in Connected mode locally, it must be installed on your computer. You must have already connected at least once to the CMS you want to work with using Web Intelligence Rich Client from the BI launch pad.

You need to have the middleware required to connect to the CMS installed on your computer. In the Connected mode, security is handled by the CMS.

Procedure

1. Launch the Web Intelligence Rich Client from the Windows Start menu.
2. Select a document from the Recent Documents dialog box.
3. In the User Identification dialog box, enter a valid user name and password.
4. Select an authentication mode from the list.
   
   Do not choose Standalone from the System dropdown list if you want to work in Connected mode. When you choose standalone authentication you work in Standalone mode, with no CMS connection.
5. Click Log in.
Results

If Web Intelligence Rich Client was already running on your computer, launching it again opens a new instance of the application.

Related Information

Connection modes [page 37]

2.2.5.3 Offline mode

In Offline mode, you are not connected to a CMS but CMS security still applies.

You can work with local documents and universes that are secured by the CMS you select at login, or with unsecured local documents and universes. You can do the following:

- open local documents
- create documents (requires local universe and local connection server)
- edit documents
- refresh documents (requires local universe and local connection server)
- save documents locally

In Offline mode, you cannot import documents from or export documents to a CMS.

Security in Offline mode

When you connect to a CMS in Connected mode, your security rights in that CMS are downloaded to your computer. Each document and universe downloaded from a CMS contains within it an access control list identifying groups and users that have access rights to the document. In Offline mode, CMS security rights are applied by matching the access rights for the document or universe against the locally stored security file. For example, if a document was downloaded from a CMS to your local machine, and you do not have the right to open the document in the CMS from which it was downloaded, you cannot open the document on your local machine. If the security settings on objects do not allow working in offline mode, those objects cannot be included when the document is used later.

Before you can work in Offline mode with documents or universes secured by a CMS, you must first have connected to that CMS at least once in Connected mode. This causes in the CMS security information to be downloaded to your local machine and the CMS appears as a choice in the System dropdown list on the User Identification page. You can then log in in Offline mode and work with no CMS connection because the CMS security information is readable from the local file.

When working in Offline mode, you must have the appropriate universes and database middleware installed on your machine to be able to create or refresh documents. If you do not, you can still open, edit, and save documents locally as long as you have the appropriate security rights.
The security information for a CMS is stored in a local security information file with the LSI extension. One computer can store LSI files for multiple CMSs.

2.2.5.3.1 To work in Offline mode

There are a few ways you can work in Web Intelligence Rich Client in offline mode.

Prerequisites

You must have already connected at least once to the CMS from which the document you want to work was exported, by launching Web Intelligence Rich Client from within the BI launch pad and opening the document in it.

Procedure

1. Launch Web Intelligence Rich Client.
2. Do one of the following to open a document:
   ○ In the Recent Documents list of the Open Document pane, select a document exported from the CMS whose security details are stored on your local machine.
   ○ Click Open in the toolbar, then browse to and double-click a .wid file.
3. In the User Identification dialog box, select the CMS from the System dropdown list.
4. Type your username and password.
5. Select the authentication method from the Authentification dropdown list.
6. Select Use in Offline mode.
7. Click Log On.

2.2.5.3.2 To select default folders for local documents and universes

In Web Intelligence Rich Client, you can select a folder where local documents and universes are stored by default on your local machine.

Procedure

1. In a Web Intelligence document in Design mode, click Application in the Properties tab.
2. In the **Web Intelligence Options** dialog box, select the **General** tab.
4. Next to **Universes**, click **Browse**, and select a folder for universes.
5. Click **OK** to close the **Web Intelligence Options** dialog box.

### 2.2.5.4 Standalone mode

In **Standalone** mode, you are not connected to a CMS and no security is enforced.

You can work with local, unsecured documents and universes only. You can do the following:

- open, create, edit, and refresh documents
- save documents locally

You cannot import documents from or export documents to a CMS.

The middleware required to create and refresh local, unsecured documents with local, unsecured universes must be installed on the computer on which you run Web Intelligence Rich Client.

### 2.2.5.4.1 To work in Standalone mode

You can work on documents in Web Intelligence Rich Client in Standalone mode.

**Prerequisites**

Any middleware required to work with unsecured documents and universes must be installed on your computer.

**Procedure**

1. Launch Web Intelligence Rich Client.
2. Select **Open** from the menu, navigate to and double-click a .wid document.
3. In the **User Identification** dialog box, select **Standalone** from the **System** dropdown list.
4. Click **Log On**.
2.2.5.5 Defining the Proxy Settings in Web Intelligence Rich Client

You define the proxy settings when you use an internet proxy server to access any URLs or images in your reports.

Context

You do not need to define these settings for images that are embedded in a report. Check the settings on your internet browser or contact your BI administrator to obtain the information required to define your proxy settings.

To define the proxy settings, perform the steps below:

Procedure

1. Launch Web Intelligence Rich Client.
2. Click the Options button in the upper right corner, or when a document is open, click Properties Application.
3. In the Web Intelligence Options dialog box, click the Proxy tab.
4. Define your Http Proxy Host.
5. Define the Http Proxy Port.
6. Define your Https Host and Port Settings, or select same as Http Proxy.
7. Click OK to save the settings and close the Web Intelligence Options dialog box.

2.2.6 Connection modes in Web Intelligence Rich Client

The connection mode in which you work in Web Intelligence Rich Client determines the actions you can complete within a document.

The following topics explain the different connection modes.

2.2.6.1 Working with universes in Connected mode

When you perform desktop data analysis in Connected mode, you access CMS universes remotely.

The CMS applies the security rights directly, exactly as if you were performing data analysis from the BI launch pad.
2.2.6.2 Working with universes in Offline mode

You cannot access universes on the CMS remotely, because in Offline mode you are working without a CMS connection.

To create or refresh a document in Offline mode, you must have first connected to the CMS in Connected mode so that a local security information (LSI) file containing your security rights to the resources in the CMS is downloaded to your computer.

When you create or refresh a document in Offline mode, you can use:
- locally installed universes that are not secured by the CMS
- locally installed universes which you are authorized to access, as verified by the LSI file

2.2.6.3 Working with universes in Standalone mode

In Standalone mode in Web Intelligence Rich Client, you can work with a local universe, without need of a connection to the CMS.

In Standalone mode, you cannot access local, CMS-secured universes. You must access the CMS universes remotely. You can only work with unsecured, locally installed universes.

The middleware required to create and refresh local, unsecured documents with local, unsecured universes must be installed on the computer where you perform desktop analysis.

When you copy the universe file locally, it should be saved in the following folder:
<install_path>\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\Universes.

2.2.7 To set the default universe for a document

You can set the default universe in the Web Intelligence Options dialog box.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Click the Options button in the upper right corner, or when a document is open, click Properties Application.
3. In the Web Intelligence Options dialog box, select the General tab.
4. In the Select default universe section, click Select a universe.
5. Click Browse.
6. In the Universe dialog box, select a universe and click Select.
7. Click OK to close the Web Intelligence Options dialog box.
2.2.8 To set viewing preferences

You can set Web Intelligence Rich Client viewing preferences in the Web Intelligence Options dialog box.

Procedure

1. Launch Web Intelligence Rich Client.
2. Click the Options button in the upper right corner, or when a document is open, click Properties.
3. In the Web Intelligence Options dialog box, select the Viewing tab.
4. Select a measurement unit for report display in the Measurement unit section.
5. To display a grid for the alignment of report elements, select Show grid.
6. To align report elements to the grid automatically, select Snap to grid.
7. To set the amount of space between the lines in the grid, set the value in Grid spacing.
8. Click OK to close the Web Intelligence Options dialog box.

2.2.9 To change your password

You can change your password in the BI launch pad preferences.

Procedure

1. Launch Web Intelligence Rich Client from the Windows Start menu and connect to the server so that you are in Connected mode.
2. Select Preferences from the BI launch pad toolbar.
3. Select Change Password.
4. Type your current password in the Old Password box.
5. Type your new password in the New Password box.
6. Type your new password again in the Confirm New Password box.

i Note

If this option is grayed out, then your ability to change your password has been disabled by the BI Administrator.
Results

Your password is changed to the new password.

Related Information

To work on an existing document locally in Connected mode [page 40]

2.3 Setting up preferences, the interface and the document locale

2.3.1 About setting Web Intelligence preferences

Use the Preferences tab of the BI launch pad to do the following:

<table>
<thead>
<tr>
<th>Preferences pane items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td>Set the user default settings. These are Administrator defined.</td>
</tr>
<tr>
<td>Change Password</td>
<td>Change your password. Enter your old password, then enter the new password twice.</td>
</tr>
<tr>
<td>Locales and Time Zone</td>
<td>Set the Product Locale, Preferred Viewing Locale, and Current Time Zone.</td>
</tr>
<tr>
<td>Analysis edition for OLAP</td>
<td>Set the Accessibility mode. (Not described here.)</td>
</tr>
<tr>
<td>Web Intelligence</td>
<td>Choose the interfaces you want to use for View and Modify modes. Select a default universe. Set the drill options. Set the saving priorities when saving as Excel. Select your preferred document orientation.</td>
</tr>
<tr>
<td>BI workspaces</td>
<td>Set a default style. (Not described here.)</td>
</tr>
<tr>
<td>Crystal Reports</td>
<td>Set Crystal Reports options. (Not described here.)</td>
</tr>
</tbody>
</table>

Related Information

Understanding the BI launch pad [page 29]
2.3.1.1 Choosing the viewing and design interfaces

You can set options to determine how you view and explore existing documents and how you create documents or edit and analyze existing documents.

You set these options in the Preferences panel in the BI launch pad.

Depending on your permissions and the Web Intelligence interface that you are using, you have a choice of Reading mode, Design mode, and Data mode.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML (no download required)</td>
<td>You view documents using the Web Intelligence HTML interface within the BI launch pad.</td>
</tr>
<tr>
<td>Applet (download required)</td>
<td>You view documents using the Web Intelligence Applet interface, also known as the Java applet, within the BI launch pad.</td>
</tr>
<tr>
<td>Note</td>
<td>This interface requires the download of a Java applet.</td>
</tr>
<tr>
<td>Desktop (Rich Client, Windows only, installation required)</td>
<td>You view documents using Web Intelligence Rich Client, a standalone interface that works outside the BI launch pad and allows you to work with documents without being connected to a corporate repository.</td>
</tr>
<tr>
<td>Note</td>
<td>Web Intelligence Rich Client must be installed on your local machine.</td>
</tr>
<tr>
<td>PDF</td>
<td>You view documents statically in PDF format.</td>
</tr>
</tbody>
</table>

In the BI launch pad, you have the following choice of Modify interfaces:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML (no download required)</td>
<td>You create, edit and analyze documents using the Web Intelligence HTML interface within the BI launch pad.</td>
</tr>
<tr>
<td>Applet (download required)</td>
<td>You create, edit and analyze documents using the Web Intelligence Applet interface within the BI launch pad. You can select Design or Data mode.</td>
</tr>
<tr>
<td>Interface</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Desktop (Rich Client, Windows only, installation required)</td>
<td>You create and edit documents using Web Intelligence Rich Client, also known as Desktop, a standalone interface that works outside the BI launch pad and allows you to work with documents without being connected to a corporate repository. You can select Design or Data mode.</td>
</tr>
<tr>
<td>i Note</td>
<td>This interface requires the download of a Java applet.</td>
</tr>
<tr>
<td>i Note</td>
<td>Web Intelligence Rich Client must be installed on your local machine.</td>
</tr>
</tbody>
</table>

Once you open a document in a specific interface, you remain in that interface for the rest of your session. For example, if you select HTML as your Read interface and Web Intelligence Applet as your Modify interface, you remain in the Web Intelligence HTML interface even if you switch to Design mode (which uses the Modify interface) within the application.

Also, if you open a document using the Modify command with a specific interface chosen, the document will continue to open in that interface, even if you change the modify selection. This is important if you are using a feature that is available in one Web Intelligence interface, but not another, as in the case of documents based on BEx queries.

### Related Information

About Web Intelligence [page 20]

#### 2.3.1.1 To change the document view settings in the BI launch pad

In the BI launch pad preferences, you can select the type of document view and the Web Intelligence version that appears when you open a document to read or modify.

### Procedure

1. Click Preferences in the BI launch pad to open the Preferences dialog box.
2. Click Web Intelligence in the Preferences list.
3. Select the viewing interface from the View options.

   This setting determines which version of Web Intelligence opens your document in Reading mode.
4. Select the design interface from the **Modify** options.
   This setting determines which version of Web Intelligence opens your document in **Design** modes.

5. Click **Save and Close**.
   These changes take effect the next time you open a Web Intelligence document.

### 2.3.1.2 Setting application modes

Depending on the Web Intelligence application mode you are in, you can build queries, documents and reports and analyze the data in reports.

<table>
<thead>
<tr>
<th>Application Mode</th>
<th>Description</th>
</tr>
</thead>
</table>
| Data             | In **Data** mode, you can do the following:  
  - Create, edit and manage queries that supply data to reports.  
  - Add and rename data providers.  
  - Change the source from which a data provider draws its data.  
  All the data providers used by the current document appear in a list in **Data** mode, and all toolboxes not related to working with data providers are disabled. |
| Reading          | **Reading** mode allows you to do the following:  
  - View reports.  
  - Track changes in and drill down on report data.  
  The main application toolbar and the Side Panel are available in **Reading** mode. Toolboxes are not available. |
| Design           | **Design** mode allows you to do the following:  
  - Perform a wide range of analysis tasks.  
  - Add and delete report elements such as tables or charts.  
  - Apply conditional formatting rules.  
  - Enhance reports with formulas and variables.  
  - Work with the report structure or with the report populated with data. Working with the report structure only allows you to make modifications without accessing the server. When you work with reports populated with data, each change you make is applied on the server.  
  **Tip**  
  If you are making numerous modifications, we recommend that you work with the report structure, and to populate the report with data when you have finished your modifications.  

! Restriction  
The **Data** mode is not available in the Web Intelligence HTML interface.
2.3.1.2.1 To switch between application modes

Depending on the mode you choose, the toolboxes and toolbars relevant to the mode are made available and other toolboxes and toolbars are either invisible or disabled.

Procedure

In a Web Intelligence document, do one of the following:

○ To work in Data mode, click Data.

  i Note
  
  Data mode is only available in Web Intelligence Applet interface and Web Intelligence Rich Client.

○ To work in Reading mode, click Reading in the top corner of the toolbar.

○ To work in Design mode with only the report structure showing, click the arrow on the Design button and select Structure Only from the dropdown list.

○ To work in Design mode with report data, click the arrow on the Design button and select With Data from the dropdown list.

2.3.2 Interface and document locales

Locales determine the appearance of the application interface (for example, menu items and button text) and data (for example, date and number formatting) in relation to local preferences.

The locales used by Web Intelligence are:

<table>
<thead>
<tr>
<th>Locale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product locale</td>
<td>The language and interface alignment control of the Web Intelligence application interface. This locale can be selected in the following locations:</td>
</tr>
<tr>
<td></td>
<td>• In the Web Intelligence HTML or Web Intelligence Applet interface, the setting is in the BI launch pad preferences.</td>
</tr>
<tr>
<td></td>
<td>• In the Web Intelligence Rich Client, the setting is in the Application Properties.</td>
</tr>
<tr>
<td>Preferred viewing locale</td>
<td>The preferred locale for displaying document data. This locale can be selected in the following locations:</td>
</tr>
<tr>
<td></td>
<td>• In the Web Intelligence HTML or Web Intelligence Applet interface, the setting is in the BI launch pad preferences.</td>
</tr>
<tr>
<td></td>
<td>• In the Web Intelligence Rich Client, the setting is in the Application Properties.</td>
</tr>
</tbody>
</table>
Right to left alignment in Web Intelligence

The alignment of the application interface is from right to left (RTL) when you select Arabic or Hebrew. As of Web Intelligence 4.2, any document can be viewed from right to left or left to right. To specify the orientation used by default, you can:

- set a user preference for every document in the BI Launch Pad Preferences menu,
- set a preference for the current document only in the Document Summary.

You can set a parameter that overrides the document settings to define the default orientation of every Web Intelligence document. Depending on this parameter, a document created with a left-to-right alignment for instance can be viewed with a right-to-left alignment.

⚠️ Caution

The user interface, the printouts, the output generation (PDF and Excel files) and scheduled documents inherit the orientation set by default. If you create a document with a right to left orientation, the generated PDF will have the same orientation.

The parameter defined in the BI Launch Pad menu overrides the parameter defined for the document. If you have not defined a default orientation in the BI Launch Pad, the document will be displayed according to the parameter set at the document level.

ℹ️ Note

In Connected mode, Web Intelligence Rich Client does not take into account user preferences defined in the BI Launch Pad. You have to change the document orientation manually at document level in the Document Summary.

Product locale and Right to Left interface alignment

When you choose Arabic or Hebrew for the Product locale, the Web Intelligence application interface elements are always right to left (RTL), in effect mirroring the left to right (LTR) alignment. For example, the side panel for an RTL locale is on the right, whereas in an LTR locale, the side panel is on the left.
Preferred viewing locale and Right to Left Alignment

When you choose Arabic, Hebrew, Farsi, Urdu or Divehi for the Preferred viewing locale, depending on the system settings selected by the BI administrator, the elements and data in documents created in this locale may be right to left (RTL). For example, in a cross table, in an LTR locale the side header column is on the left. In an RTL locale, the side header column is on the right.

i Note
Charts are LTR, per the SAP Globalization product standards.

Related Information

To set the Product locale in the BI launch pad [page 54]
To link the current document locale to a document in the BI launch pad [page 55]
To set the Preferred viewing locale in the BI launch pad [page 57]
To set the Product locale in Web Intelligence Rich Client [page 53]
To associate a locale with a document in Web Intelligence Rich Client [page 55]
To set the Preferred viewing locale in Web Intelligence Rich Client [page 56]
To set the document orientation from right to left in the current report [page 57]
To set the document orientation from right to left in all reports [page 58]

2.3.2.1 The Product locale

The Product locale controls the user interface.
For example, the Product locale determines the menu items and button text.

2.3.2.1.1 To set the Product locale in Web Intelligence Rich Client

You can set the Product locale for Web Intelligence Rich Client in the Web Intelligence Options dialog box.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Properties tab, click Application.
3. In the **Web Intelligence Options** dialog box, select the *Locale* tab.
4. Choose a locale from the *Product locale* list.
5. Click **OK** to close the **Web Intelligence Options** dialog box.

**2.3.2.1.2 To set the Product locale in the BI launch pad**

In the BI launch pad preferences, you can choose the product locale.

**Procedure**

1. Click **Preferences** on the BI launch pad toolbar to open the **Preferences** dialog box.
2. Click **Locales and Time Zone** in the **Preferences** list to display the available options.
3. Select the product locale from the *Product Locale* list.
4. Click **Save and Close**.

**2.3.2.2 The document locale in documents**

The document locale, generated by Web Intelligence, formats the data in documents.

For example, the document locale determines the display of dates and numbers.

By default, the browser locale is used. You can permanently associate the current document locale with a document by saving the document with the *Permanent regional formatting* option selected in the **Document Summary** dialog box. When you select this option the document data is always formatted using the document locale you have set. This applies to all users who view the document, not just the user who activates *Permanent regional formatting*.

In Web Intelligence Rich Client, if the *Use the document locale to format the data* setting is selected in the application properties, the document locale determines how date and number formats.

**Related Information**

To associate a locale with a document in Web Intelligence Rich Client [page 55]
2.3.2.2.1 To associate a locale with a document in Web Intelligence Rich Client

You can associate a locale with a document in Web Intelligence Rich Client.

Prerequisites

This task does not work in the Web Intelligence HTML interface or Web Intelligence Applet interface.

Procedure

1. In a Web Intelligence document in Design mode, click Document on the Properties tab.
2. In the Document Summary dialog box, select Permanent regional formatting.
3. Click OK to close the Document Summary dialog box.
4. Save the document.

2.3.2.2.2 To link the current document locale to a document in the BI launch pad

In the BI launch pad preferences, you can choose the locale language for open documents in Web Intelligence.

Procedure

1. Click Preferences on the BI launch pad toolbar to open the Preferences dialog box.
2. Click Web Intelligence in the Preferences list.
3. In the section When viewing a document, select one of the following:
   ○ Use the document locale to format the data
   ○ Use my preferred viewing locale to format the data
4. Click Save and close.

Related Information

The Preferred viewing locale [page 56]
To set the Preferred viewing locale in the BI launch pad [page 57]
2.3.2.3 The Preferred viewing locale

The Preferred viewing locale is the locale you select that affects the display of document data.

When you create a document, your Preferred viewing locale is always assigned as the initial document locale, whether or not the locale settings give the Preferred viewing locale priority.

**i Note**

If the settings do not give your Preferred viewing locale priority, the data is formatted according to the document locale saved with the document.

In Web Intelligence Rich Client, if the locale settings give your Preferred viewing locale priority through the Use the Preferred viewing locale to format the data setting in the application properties, the document locale is set to the Preferred viewing locale when you open a document. When you save the document, this document locale is saved with the document.

2.3.2.3.1 To set the Preferred viewing locale in Web Intelligence Rich Client

You can set the Preferred viewing locale for Web Intelligence Rich Client in the Web Intelligence Options dialog box.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. In the Properties tab, click Application.
3. In the Web Intelligence Options dialog box, select the Locale tab.
4. Select a locale from the Preferred viewing locale dropdown list.
5. Click OK to close the Web Intelligence Options dialog box.
6. Close and reopen any open documents so that the locale setting is changed in the documents.
2.3.2.3.2 To set the Preferred viewing locale in the BI launch pad

In the BI launch pad preferences, you can choose a Preferred Viewing Locale language for Web Intelligence.

Procedure

1. Click Preferences on the BI launch pad toolbar to display the Preferences dialog box.
2. Click Locales and Time Zone in the Preferences list to display the available options.
3. Select the preferred viewing locale from the Preferred Viewing Locale list.
4. Click Web Intelligence to display the Web Intelligence options.
5. If you want data to be formatted using the preferred viewing locale, click Use my Preferred Viewing Locale to format the data beneath When viewing a document.
6. Click Save and Close.

2.3.2.4 The Preferred document orientation

The document orientation parameter enables you to define a default orientation for a single document, or every document.

When you create a document, you can select its orientation. You can also set this parameter for every document you open or edit in Web Intelligence via the BI Launch Pad.

Use this parameter whenever you need to change a document’s orientation. For instance, if you are viewing a document that has been created using the Arabic or Hebrew locale, you can set the document’s orientation from left to right without altering the original document.

2.3.2.4.1 To set the document orientation from right to left in the current report

The parameter in the Document Summary only applies to the document you are currently working on.

Context

To edit this parameter, make sure you are in Design mode.
**Procedure**

1. In the *Document Summary*, click *Edit*.
2. To view the document from right to left, check *Right to Left Content Alignment*.
3. Click *OK*.

### 2.3.2.4.2 To set the document orientation from right to left in all reports

The BI Launch Pad orientation parameter overrides the document orientation preference defined when the document was created.

**Context**

When you set a default orientation in the BI Launch Pad preferences, it applies to all reports.

**Procedure**

1. In BI Launch Pad, click *Preferences > Web Intelligence*.
   - In Web Intelligence Rich Client interface, click *Tools > Options > Locale*.
2. In *Select your preferred document orientation*, select the default document orientation you want to use.
3. Click *Save & Close*.

### 2.3.3 Selecting the measurement unit

The measurement unit parameter enables you to select the unit in which measurements should be done in Web Intelligence.

This parameter is useful when you have a specific amount of space in your report to allocate to specific report elements, such as a header or footer for example. The parameter is available in the *Applications* tab of the properties. You can also find it in the *Tools > Options* menu in the Applet and Rich Client interfaces.

By default, the measurement unit is inches in the HTML interface, and centimeters in the Applet and Rich Client interfaces.
2.3.4 Increasing or decreasing the display size of a report in Web Intelligence

You can zoom in and out in Web Intelligence reports using the zoom percentage list box on the bottom toolbar.

You can decrease and enlarge the report size from 10% to 500%.

In the Web Intelligence HTML interface, you can use the browser zoom feature to increase or decrease the display size. However, the text size setting within a browser does not change the size of text in a Web Intelligence report.

⚠️ Restriction

Microsoft Windows allows users to change the display size of text and other items on the computer screen using a magnifier tool. This tool is not supported in the Web Intelligence interfaces.
3  Building and running queries

3.1  Introduction to query building

In Web Intelligence, every reporting or analysis operation is done on what is called a query.

A query is a business question you ask to the application, and the application uses it in return to retrieve data. To help you phrase your business question correctly, the query uses elements called objects that contain pre-defined data.

In your company, the data are stored in storage units to which you go to find specific and meaningful information about customers, revenues, products and so on. In Web Intelligence, these storage units are called data sources. You run queries on top of them to retrieve data. When you run a query, it searches the data source to answer your business question. For example, you can use a query to ask for the sales margins per product over a time period.

The following sections provide information on the different objects available to create queries, the various types of data sources supported in Web Intelligence and how you can create queries on top on them.
### 3.2 Building and running queries

You build queries using the Web Intelligence *Query Panel*. The data sources you can use for a query depend on the interface you are using.

#### Available data sources for the Web Intelligence interfaces

<table>
<thead>
<tr>
<th>Data source</th>
<th>Web Intelligence HTML</th>
<th>Web Intelligence Applet</th>
<th>Web Intelligence Rich Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>No data source</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Universe (.unx or .unv)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>BEx query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SAP HANA Views</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Free-hand SQL query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Analysis View</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
You run the query to return data in a report which you can then analyze further by, for example, filtering or ranking its data.

Measures are common to all queries. Measures return data, often numeric, that is calculated based on the other objects in the query (dimensions or hierarchies). For more information on measures, see Measures [page 69].

Queries based on universes can be hierarchical or non-hierarchical. Non-hierarchical queries organize data in dimensions which have no hierarchical relationship. For example, a query containing a customer dimension and a revenue measure calculates revenue per customer. For more information on universe queries, see Building queries on universes [page 74].

Hierarchies organize data into hierarchical relationships. For example, a geographical hierarchy can contain data about countries, states and cities (different levels of the hierarchy). A query containing a geographical hierarchy and a revenue measure calculates revenue at the different levels of the hierarchy (country, state, city). For more information on hierarchies, see Hierarchies [page 67].

Whether a universe query is hierarchical or non-hierarchical depends on the database from which the universe retrieves its data.

You can create a blank document that does not use a data source.
To connect to an Essbase OLAP data source from SAP BusinessObjects OLAP products including universe design tool, Web Intelligence Rich Client and Web Intelligence via the BI launch pad, the BI administrator must ensure that Essbase client environment variables `ARBORPATH` and `ESSBASEPATH` are created and set as Windows system environment variables on machines hosting those SAP BusinessObjects OLAP products.

### 3.3 Query properties

Query have properties that you can set to fine-tune the data you want to retrieve when running a query.

The table below details the different query properties available.

<table>
<thead>
<tr>
<th>Option</th>
<th>Select to...</th>
<th>Available in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max rows retrieved</td>
<td>To select a maximum numbers of rows for retrieval. If you use this option, you also need to set maximum number of rows to be retrieved.</td>
<td>All instances.</td>
</tr>
<tr>
<td>Retrieve duplicate rows</td>
<td>To include duplicate rows. In a database, the same data may be repeated over many rows. You can choose to have these repeated rows returned in a query, or to have only unique rows returned. This option is not available in BEx queries, or if it is not supported by the underlying database.</td>
<td>Relational and OLAP <code>.unx</code> files. Not available in BEx queries.</td>
</tr>
<tr>
<td>Sample result set</td>
<td>To return a sample result set. To use fixed sampling, click <strong>Fixed</strong>. Sampling is not available in BEx queries. The <strong>Fixed</strong> option is visible, but not activated if this option is not supported by your data source.</td>
<td>Relational <code>.unx</code> and <code>.unv</code> files. Not available in OLAP <code>.unx</code> or BEx queries.</td>
</tr>
</tbody>
</table>
| Retrieve empty rows | To include empty rows in the result.                                          | • OLAP `.unx`  
• BEx queries                                      |
| Reset contexts on refresh | To reset the contexts when refreshing the document or query. If you use this option, you need to select a context when you refresh a query. | All instances.                        |
| Delete trailing blanks | To delete trailing blanks from data providers’ values.                       | All instances.                        |
3.4 Customizing the query panel

You can customize the query panel and save your preferences. This avoids having to reset your preferences each time you open the query panel. The following settings are user-based, and saved when you close the query panel:

- The size of the query panel if you maximize it. This setting is saved only if you maximize the query panel. The query panel position is not saved and is always centered by default.
- The visibility or non-visibility of the Data Outline, Query Filters and Data Preview panes.

**Restriction**

This feature only applies to the HTML interface.

3.5 Objects available in queries

You can use a variety of objects in Web Intelligence queries. The following objects can be used in Web Intelligence queries:

- classes and subclasses
- dimensions
- attributes
- hierarchies
- level objects
- members
- named sets
- calculated members
- measures

Objects are displayed in the Available Objects pane. Objects can be arranged by:

- Alphabetical order
- Query
- Data Source
- Navigation paths

3.5.1 Classes and subclasses

A class is a folder containing objects. A sub-class is a sub-folder.

Classes organize objects into logical groups. When you create queries on the universe, classes help you to find the objects that represent the information that you want to use in a query.
3.5.2 Analysis dimensions

An analysis dimension contains a collection of related hierarchies.

Analysis dimensions do not appear as result objects in queries. If you select an analysis dimension, its default hierarchy appears in the query.

Analysis dimensions use the following icon:

3.5.3 Dimensions

A dimension can represent non-hierarchical data in a report.

For example, in a query containing a non-hierarchical [Customer] dimension and the [Revenue] measure, the results show the revenue generated by each customer in non-hierarchical columns.

In hierarchical data sources, hierarchies appear beneath the dimensions on which they are based in the list of available objects. When you include the dimension in a query hierarchical data is returned.

Dimensions use the following icon:

Restriction

Web Intelligence only supports hierarchies based on STRING data types in reports on top of OLAP connections. If your OLAP hierarchies are based on other data types such as DATE or INTEGER, their data will be converted as STRING.

Related Information

Hierarchies [page 67]
3.5.4 Attributes

An attribute is an object attached to a parent object that provides additional descriptive information about the parent. Age for instance can be an attribute of the Customer dimension.

An attribute can be associated with dimensions, hierarchies, measures and levels. There is no notion of hierarchy between an attribute and its parent object, both objects remain independent.

Each value of a parent object can have only one associated value of any attribute. Using the example in the above topic, each Customer value can have only one associated value in the Age attribute.

If, due to incorrect universe design, an attribute tries to return multiple values for one parent object value, its cell displays a #MULTIVALUE error message.

Attributes use the following icon: ⭐

**Note**

For .unv universes, created with the universe design tool, attributes are referred to as details, and apply to relational data sources.

Measure Attributes

In an OLAP business layer, measure attributes provides additional information about the formatted value. Measure attributes were originally created to support BEx queries formatted values. Formatted values usually consist of strings made of number with formatted characters such as currency symbols, for instance. Because of this specificity, the way measure attributes are processed varies depending on how you use them.

In an explicit aggregation, measure attributes are processed like dimensions. If you use the SUM function in a table footer for instance, Web Intelligence aggregates the unique values of the measure attribute and then proceeds to count them. However, if you use a measure attribute in a default aggregation, the aggregation is delegated to its data source. This happens when you drop a measure attribute in the body of a table for instance.

Related Information

Dimensions [page 65]
Measures [page 69]
Default aggregation [page 257]
Explicit aggregation [page 258]
Examples of default and explicit aggregation [page 258]
3.5.5 Hierarchies

A hierarchy is a set of data members arranged in levels or parent-child relationships.

For example, a [Geography] hierarchy might contain the [Country], [State] and [City] levels. Hierarchical objects are used in BEx and OLAP data sources.

Hierarchies produce hierarchical columns in the result set produced by the query. You can expand the items in the hierarchy to explore its data. For example, you can expand the [California] level in a [Geography] hierarchy to explore data related to California.

You can select which members appear in the result set by using the Member Selector dialog box accessed via the Query Panel.

In hierarchical data sources, hierarchies are associated with a dimension and appear beneath the dimension with which they are associated in the list of available objects. The following information is also displayed with the hierarchy objects:

<table>
<thead>
<tr>
<th>Display object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
<td>This is the Web Intelligence default hierarchy, it is the placeholder for the retrieved hierarchy.</td>
</tr>
<tr>
<td>![Image]</td>
<td>A white checkmark (V) in a black circle. This is the validation or toggle, and indicates that this object is the ‘active’ hierarchy in BEx, Microsoft Analysis Services (MSAS), and Essbase. In MSAS, the term default is used to describe the active hierarchy.</td>
</tr>
<tr>
<td>![Image]</td>
<td>This applies to BEx queries. This is the version number of the SAP BW hierarchy that was used at design time. For these hierarchies, Web Intelligence now displays the version of the hierarchy after the hierarchy name. For example: Country hierarchy [2]. The BEx query designer can prepend a string before the version number for clarity, for example: [version 2]. This version is also displayed in the report table header.</td>
</tr>
</tbody>
</table>

**Restriction**

Web Intelligence only supports dimensions and hierarchies based on STRING data types in reports on the top of OLAP connections. If your OLAP dimensions and hierarchies are based on other data types such as DATE or INTEGER, their data will be converted as STRING.

**Related Information**

Dimensions [page 65]
Hierarchical queries [page 71]
Using time dimensions [page 311]
3.5.6 Level objects

A level is a set of members in a hierarchy at the same distance from the root of the hierarchy.

For example, [City] might be a level in a [Geography] hierarchy which contains members such as [Los Angeles] and [San Francisco]. The level names are prepended by their depth. The numbers are contiguous, and always start from the root with the number 1 as follows:

1 - Level a
2 - Level b
3 - Level c

Levels produce flat columns in the result set generated by the query. For example, a query containing the [Country] level and [Revenue] objects produces a result such as the following:

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>10,123,121</td>
</tr>
<tr>
<td>France</td>
<td>8,232,231</td>
</tr>
<tr>
<td>Germany</td>
<td>7,342,342</td>
</tr>
<tr>
<td>UK</td>
<td>9,343,092</td>
</tr>
</tbody>
</table>

Not all hierarchies contain levels.

Levels use the following icon:

Using BW and SAP HANA hierarchy levels as individual objects

When executing a document, Web Intelligence automatically creates level objects for BEx and SAP HANA level hierarchies and displays them in the document outline as details of the hierarchies’ objects. There are no modifications in the Query Panel.

Since they are processed as individual objects, you can use them to feed any chart or table. You can also use them in formulas, filter them, rank them, sort them and so on.

Restriction

- Level objects are created only for SAP HANA level hierarchies, not for SAP HANA parent-child hierarchies.
- You can’t merge level objects.

Related Information

Building queries on BEx queries [page 111]
3.5.7 Members

A member is an individual data item in a hierarchy. For example, the [Geography] hierarchy can contain members such as [France] at the [Country] level, or [Las Vegas] at the [City] level.

You select individual members from a hierarchy for inclusion in the query result if you do not want to include all members in the hierarchy. You can also define a named set containing a set of members.

Related Information

Hierarchies [page 67]
Named sets [page 69]

3.5.8 Named sets

A named set is a named expression that returns a set of members. Named sets can be defined in OLAP databases, or in universes based on relational or OLAP databases.

3.5.9 Calculated members

Calculated members are members returned by a Multidimensional Expression (MDX) statement. MDX is the language used to access hierarchical data in OLAP databases. The administrator of an OLAP database can create calculated members that are available to MDX queries that access the database.

Calculated members use the following icon:  

3.5.10 Measures

Measures are objects composed of numeric data that represent calculations and aggregate functions that map to statistical and analytic data in the database. In a business layer, measures represent the factual information (data).

Measures return results based on the objects with which they are associated in a query. For example, a query containing the [Customer] dimension and [Revenue] measure returns revenue by customer. A query
containing the [Geography] hierarchy and [Revenue] measure returns revenue calculated for all the different aggregations possible in the hierarchy.

Aggregating the information must make sense for the object to be a measure. For example, [Revenue] is the calculation of the number of items sold multiplied by item price. Measures are often located in a Measures class.

By default, measures are calculated by aggregating detailed values returned from the database.

Smart measures are a special kind of measure that are calculated by the database itself and returned by the query already aggregated. In certain situations, smart measures impact the way in which calculations are displayed. For more information on smart measures, see the Using functions, formulas and calculations in Web Intelligence guide.

Measure objects use the following icon:

**Related Information**

Hierarchies [page 67]

### 3.6 Query and document user rights

Rights are defined by BI administrators.

BI administrators can view and edit queries even when the access rights have been limited to a restricted subset of users. Whether you can view, create, modify, or delete queries and their related objects, documents or reports, depends on your assigned user rights.

**Related Information**

General rights [page 947]
Document rights [page 948]
Connection rights [page 950]

### 3.7 Non-hierarchical queries

You build a non-hierarchical query using dimensions, attributes and measures.

Dimensions represent business objects such as customers or cities. Measures derive results, usually numerical, from the dimensions you include in the query. For example, a query containing the [Customer] dimension and the [Revenue] measure returns revenue by customer.
Non-hierarchical queries produce result sets in which dimensions are not related. Each object in the query produces one flat column in the result set.

Non-hierarchical queries do not include the following objects: hierarchies, levels, members or named sets.

**Related Information**

To build a query on a universe [page 76]
Measures [page 69]
Hierarchies [page 67]
Hierarchical member selection and query filters [page 78]

### 3.8 Hierarchical queries

A hierarchical query contains at least one hierarchy object.

You can build hierarchical queries on universes that support hierarchical data or on BEx queries which access SAP Info Queries directly. Hierarchical data can come from relational or OLAP databases, depending on how the data is structured in the universe.

**Note**

A relational data source is not a true hierarchy; it is a defined path between attributes.

You can include hierarchies either as result or filter objects. When you build a hierarchical query, the Web Intelligence *Query Panel* provides you with additional features for working with hierarchical data.

For example, if you include a hierarchy as a result object, you have the ability to choose members from the hierarchy to appear in the result. The features available in the hierarchical query panel also depend on the source of the hierarchical data you are accessing.

The result set generated by a hierarchical query allows you to perform hierarchical data analysis. Each hierarchy object in the query produces a hierarchical column in the report. You can expand members to reveal their child members.

**Tip**

When running or refreshing a BEx query that contains a hierarchical object, make sure to put it first in the *Query Panel*. Indeed, it significantly decreases the execution time of the query.

**Example**

If you expand the [US] member to reveal US states in a [Geography] hierarchy, then measures in the block are aggregated depending on the member with which they are associated.

A hierarchical query containing the [Customers] hierarchy and the [Unit Sales] and [Store Cost] measures gives the following result set:
### Related Information

Hierarchical member selection in BEx queries [page 82]
Measures [page 69]
Hierarchies [page 67]
Hierarchical member selection and query filters [page 78]
Selecting members of a hierarchy [page 77]

### 3.8.1 Including multiple hierarchies in a query

When you combine multiple hierarchies in a query, the results for all the combinations of members in the different hierarchies appear in the resulting document.

**Example**

**Including two hierarchies in a query**

You have two hierarchies, [Gender] (containing the members [All], [Male] and [Female]) and [Customer Geography]. Combined in a query with a measure, the two hierarchies give the following result:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>All Gender</td>
<td>$29,358,677</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>$10,000,000</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>$19,358,677</td>
</tr>
<tr>
<td>France</td>
<td>All Gender</td>
<td>$2,644,017</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>$1,058,677</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>$1,285,340</td>
</tr>
<tr>
<td>Pierre</td>
<td>All Gender</td>
<td>$1,249</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>$1,249</td>
</tr>
<tr>
<td>Alain</td>
<td>All Gender</td>
<td>$1,155</td>
</tr>
<tr>
<td>Customer Geography</td>
<td>Gender</td>
<td>Internet Sales Amount</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>$1,155</td>
</tr>
</tbody>
</table>

3.9 To create a document without a data source

You can create a document without selecting a data source.

Context

One reason you might want to create a document with no data source is if you want to create a "template" document that contains the standard title page as the first report, standard copyright text as the second report, and so on. You can set the header and footer layouts, and even include empty tables and charts that are formatted. Later on, you can connect the document to a data source using a query.

i Note

The rights set for you by the BI administrator determine your access to data sources and ability to create documents in Web Intelligence.

Procedure

1. Open Web Intelligence.
2. Do one of the following:
   ○ In Reading mode, click the New icon in the toolbar.
   ○ In Design or Data mode, in the File tab, click the New icon.

i Note

If you have just launched Web Intelligence Rich Client, click Blank Document in the New Document dialog box.

3. Select No data source, and click OK.

Results

A blank document opens. The Available Objects pane contains no objects.
3.10 Building queries on universes

Universes present data from relational or OLAP data sources as collections of related objects.

Universes contain the following types of data:

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational</td>
<td>Relational data is organized as a collection of related objects (dimensions, details and measures). You combine universe objects in a query which you run to generate a report. For example, a query containing the Customer dimension and the Revenue measure generates a report showing revenue generated by customer.</td>
</tr>
<tr>
<td>Hierarchical</td>
<td>Hierarchical data is organized as members in related hierarchies. For example, a Geography hierarchy can contain levels showing countries, states and cities. A query built on the Geography hierarchy and Revenue measure generates a report showing revenue generated at different levels of the hierarchy (revenue by country, by state and by city). The query automatically calculates the revenue values at different levels of the hierarchy.</td>
</tr>
</tbody>
</table>

**i Note**

- In queries based on .unv or .unx universes, Web Intelligence only takes into account the following display properties that are set in the information design tool [Format Editor](#):
  - .unx format universes: only properties defined in the **Data** tab are supported.
  - .unv format universes: only properties defined in the **Number** tab are supported.
- You can set the default universe for Web Intelligence documents in the BI launch pad preferences. If you select a default universe for universe-based queries, then when you create a document, the **Select a universe** dialog box shows the default universe. For more information on setting a default universe, consult the [Business Intelligence Launch Pad User Guide](#).

**Related Information**

Hierarchies [page 67]
3.10.1 Stored procedures

A stored procedure is a compiled SQL program consisting of one or more SQL statements that are stored and run on a database server, outside of the application.

It is stored as executable code in a relational database. Universes can leverage stored procedures to allow Web Intelligence to run queries that are based on stored procedures authored in the information design tool. As of 4.2 SP6, both .UNV and .UNX relational universes support stored procedures.

Depending on its definition, a stored procedure can return one or multiple result sets when you run it. A stored procedure offers increased database performance:

● It encapsulates code, and database operations appear only once. This improves debugging as well as maintainability.
● Changes to the database schema affect the source in one place only, the stored procedure. Any schema change becomes a database administration task rather than a code revision.
● Being stored on the database server, you can set tighter security restrictions. This saves more trusted permissions for the well-protected stored procedures themselves.
● It is compiled and stored outside of the application, and can therefore use more sensitive variables within the SQL syntax, such as passwords or personal data.

Restriction

● You cannot create query filters or use sorts on objects based on stored procedure universes.
● You cannot view or edit query scripts on objects based on stored procedure universes.
● Input parameters that modify table structures at runtime aren’t supported.

3.10.2 Hidden objects

The universe designer has the possibility to hide objects in a universe.

If the universe designer hides an object in the universe, you can no longer create a new report based on this object. However, the existing reports that use this universe object are still valid, meaning that report blocks using that object still display the data related to it. In the Available Objects pane of the Side Panel, the hidden objects is still visible.

However, the hidden object is no longer be visible and usable in the universe outline of the Query Panel. For existing reports using the object that is now hidden, it still appears in the Results Objects pane according to the query definition; but in the universe outline of the Query Panel, the hidden object is not visible. Note that if you remove the object from the query, then the object is definitively lost as it doesn’t appear in the universe outline.

If you do a universe change source towards a target universe that contains hidden objects, the match happens normally if and only if the target universe contains a hidden object with the same name and the same ID.
3.10.3 To build a query on a universe

You can build a query using a universe as a data source.

Procedure

1. Open Web Intelligence and click the New icon in the File toolbar.
2. Select the universe on which you want to create a document.
   
   If you are using the Web Intelligence Rich Client, click Select.

   You can set the default universe for Web Intelligence documents in the BI launch pad preferences. If you select a default universe for universe-based queries, then when you create a document, the Select a universe dialog box shows the default universe. For more information on setting a default universe, consult the Business Intelligence Launch Pad User Guide.

   The Query Panel opens.
3. Select and drag dimensions and measures that you want to include in the query into the Result Objects pane.

   For some OLAP .unv and .unx universes, you are required to select a measure for your query.

   To add all the objects in the class to the Result Objects pane, double-click the class folder.

   To view the details of an object, move your mouse over the object in the Result Objects. A tooltip shows the object details. To copy the content for reuse in another application, right-click the object and select Object Description. The Object Description dialog box displays all of the details. You can also select the text in the text box and paste it in another application.

4. Repeat the previous step until the query contains all the objects you want to include.
5. Select the objects on which you want to define query filters and drag them to the Query Filters pane. To create a quick filter on an object, select the object in the Result Objects pane then click the Add a quick filter icon in the Result Objects toolbar.

   If the query is based on a HANA universe, and if the views contain HANA variables or input parameters or both, there will be query prompts. If you add prompts in the Quick Filters pane, there could be a duplication of prompts. We recommend that you run the query prior to defining any query prompts to know what prompts may already exist.

6. Set the scope of analysis and other query properties. For information on scopes of analysis, see Setting the scope of analysis [page 93].
7. To remove an object from the Result Objects or Query Filters panes, click the Remove icon in the top corner of the pane.
8. To remove all objects from the Result Objects or Query Filters panes, click the Remove All icon in the top corner of the pane.

9. Click Run Query. When you have more than one query and you want to run just one query, click Run Queries and select the query that you want to run.

\[\text{i Note}\]
- If a document is created with two data providers (queries) based on same data source (universe) and you change the source of one of the queries, the source of the other data provider is not changed.
- If you are querying a HANA data source that uses input parameters, then when you run the query, you can encounter prompts that require you to enter values for variables and parameters. The values available in the prompts come directly from the HANA data source.

**Related Information**

- To preview query results [page 179]
- Non-hierarchical queries [page 70]
- HANA query prompts in Web Intelligence [page 216]

### 3.10.4 Selecting members of a hierarchy

When you have hierarchical members in a query, you use the Member Selector dialog box to select members of the hierarchy to appear in the report generated from the query result set.

After you have selected members, they appear below the hierarchy object in the Query Panel.

You can select members explicitly, or implicitly through functions. For example, you can explicitly select the [California] and [Los Angeles] members of the [Geography] hierarchy. You can select the child members of the [US] member (to give US states). You can also select the members included in a named set, for example Top Cities by Revenue to include the cities that generate the most revenue.

**Related Information**

- Overview of the Member Selector dialog box [page 79]
- Hierarchical member selection and query filters [page 78]
3.10.4.1 Hierarchical member selection and query filters

When you filter members in a query filter, you also impact measure aggregation. This is different from hierarchy member selection in the Member Selector dialog box, which does not impact measures.

Example

Member selection and hierarchical filtering

In this example you have the following data:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$29,358,677.22</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
<tr>
<td>Germany</td>
<td>$2,894,312.34</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>$119,871.08</td>
</tr>
<tr>
<td>Hessen</td>
<td>$794,876.08</td>
</tr>
</tbody>
</table>

If you select only the France-related members in the Member Selector dialog box, the measure value for All Customers is not impacted:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$29,358,677.22</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
</tbody>
</table>

If you filter Germany and its child members using a query filter, the All Customers measure is affected because the German figures no longer appear in the aggregation:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$26,464,364.08</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
</tbody>
</table>
3.10.4.2 Overview of the Member Selector dialog box

You use the Member Selector dialog box, accessed via the Query Panel to visualize and select members in a hierarchy.

You can work with members explicitly, or with sets of members given, for example, by functions, named sets or hierarchy levels.

You can also use the Member Selector dialog box to define prompts, which allow users to select which members they wish to include in a hierarchy when they run the query.

You launch the Member Selector dialog box from hierarchy objects that you add to the query in the Query Panel.

The following table describes the tabs available in the Member Selector dialog box.

<table>
<thead>
<tr>
<th>Tab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>The Members tab displays the members arranged hierarchically. Calculated members appear at the position in the hierarchy defined by the BI administrator.</td>
</tr>
<tr>
<td>Levels</td>
<td>The Levels tab shows the hierarchy levels (if the hierarchy supports levels), named sets and calculated members. If a hierarchy doesn’t contain any level, you’ll see an icon along with a No values to display message.</td>
</tr>
<tr>
<td>Prompts</td>
<td>The Prompts allows you to defer member selection until the query is run, whereupon a prompt appears that allows the users to select members.</td>
</tr>
</tbody>
</table>

**i Note**

In the Member Selector dialog box, you can select the display of the technical and business names of objects or hierarchy objects. The Technical Name (also known as the unique name) is the name that identifies the object in addition to its Business Name (also known as the caption name). Technical Names are not localized whereas Business Names are. For example, a Business Name would be ‘Customer’, and the Technical Name could be ZCUSTOMER.

Related Information

Selecting members of a hierarchy [page 77]
3.10.4.3 To select hierarchy members

You select hierarchy members for your query via the Query Panel.

Context

⚠️ Caution

In the HTML interface, if you select a node that has linked nodes in the Member Selector dialog box, they are selected as well after you run the query. If you open the Member Selector dialog box after you have run the query, you can see that linked nodes are also selected.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Members tab, select members for inclusion in the query.
6. Click OK to close the Member Selector dialog box.

The selected members appear below the hierarchy object in the Result Objects pane. When you run the query, only those members are included in the query result.

Results

If you do not select members, the default member for the hierarchy as defined in the database is used in the query result. If no default member is defined, the top-level member is used.
3.10.4.4 To select hierarchy members explicitly

You select members from hierarchies for your query via the Query Panel.

**Context**

⚠️ **Caution**
In the HTML interface, if you select a node that has linked nodes in the Member Selector dialog box, they are selected as well after you run the query. If you open the Member Selector dialog box after you have run the query, you can see that linked nodes are also selected.

**Procedure**

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. In the Members tab, select the members by clicking the checkbox next to the member in the hierarchy display.
   The members appear in the list of selected members in the Member Selector dialog box.
4. Do one of the following for a member:
   - To select all members in the hierarchy, from the All Members Select dropdown list, click Select. You can use this option to include all members, even if the hierarchy structure changes in the future.
   - To select members down to a named level, select a level from the Select All Members until Named Level list. A named level is, for instance, Country or City. You want level Country or City, whatever its position in the hierarchy.
   - To select all members until a specific level, select the level from the Select All Members until list.
5. Click OK to close the Member Selector dialog box.
   The members you selected appear below the hierarchy object in the Query Panel.

**Related Information**

To select hierarchy members [page 80]
To search for members in the Member Selector dialog box [page 88]
### 3.10.4.4.1 Hierarchical member selection in BEx queries

You use the *Member Selector* dialog box, available from a hierarchy object in the *Query Panel*, to select members of a hierarchy for your query.

The following hierarchy illustrates member selection behavior in BEx queries.

<table>
<thead>
<tr>
<th>World</th>
<th>EMEA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Europe</td>
</tr>
<tr>
<td></td>
<td>Middle East</td>
</tr>
<tr>
<td></td>
<td>Africa</td>
</tr>
<tr>
<td></td>
<td>North America</td>
</tr>
<tr>
<td></td>
<td>Asia PAC</td>
</tr>
<tr>
<td></td>
<td>Asia</td>
</tr>
<tr>
<td></td>
<td>Pacific</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
</tr>
<tr>
<td></td>
<td>Philippines</td>
</tr>
<tr>
<td></td>
<td>New Zealand</td>
</tr>
<tr>
<td></td>
<td>South America</td>
</tr>
</tbody>
</table>

**Hierarchy selection rules**

<table>
<thead>
<tr>
<th>Rule</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you select a member of a hierarchy at a given level, all of the parent members in the hierarchy are selected.</td>
<td>The root is always selected. It is not possible to select one specific level.</td>
</tr>
</tbody>
</table>
| If you deselect a member when its parent member is already selected, all child members of the parent are also deselected. | If Pacific and all its child members are already selected and you deselect Australia, Philippines and New Zealand are also deselected. The following member selections appear:  
  - Europe  
  - Pacific |
| If you select a member with some of its child members already selected, all child members are selected. | If Europe is selected and you select EMEA, the Middle East and Africa are also selected. The following member selections appear:  
  - EMEA  
  - Children of EMEA |
<table>
<thead>
<tr>
<th>Rule</th>
<th>Example</th>
</tr>
</thead>
</table>
| If you select a member when descendant members are already selected, all children of the member, and all siblings of the selected descendant members are also selected. | If you select Asia PAC when Australia was already selected, Asia, Pacific (children of Asia PAC) and Philippines and New Zealand (siblings of Australia) are also selected. The following member selections appear:  
  - Asia PAC  
  - Children of Asia PAC  
  - Pacific  
  - Children of Pacific |

**Related Information**

Restrictions when using BEx queries [page 115]
Hierarchical member selection in BEx queries [page 82]

### 3.10.4.5 To select hierarchy members in OLAP universes by relationship

You can select hierarchy members in OLAP relational universes via the *Query Panel*.

**Procedure**

1. Open a Web Intelligence document in *Design* or *Data* mode.
2. In the *Data Access* tab, in the *Data Providers* subtab, click *Edit*. The *Query Panel* appears.
3. Add a hierarchy object to the *Result Objects* pane in the *Query Panel*.
4. Click the arrow next to the hierarchy object to launch the *Member Selector* dialog box.
5. In the *Members* tab, right-click a member. The menu displays the following options:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>Adds all child members of the member to the list of selected members. The members appear as <em>Children of [selected member]</em> in the list.</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>You cannot include children and descendants of the same member. If you select <em>Descendants</em>, then select <em>Children</em>, the descendants are removed from the list and replaced by children.</td>
</tr>
<tr>
<td>Descendants</td>
<td>Adds all descendant members of the member to the list of selected members. The members appear as <em>Descendants of [selected member]</em> in the list.</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>You cannot include children and descendants of the same member. If you select <em>Children</em>, then select <em>Descendants</em>, the children are removed from the list and replaced by descendants.</td>
</tr>
<tr>
<td>Parent</td>
<td>The member immediately above the selected member is its parent. This option adds the parent member of the member to the list of selected members. The member appears as <em>Parent of [selected member]</em> in the list.</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>You cannot include the parent and ancestors of the same member. If you select <em>Ancestors</em>, then select <em>Parent</em>, the ancestors are removed from the list and replaced by the parent.</td>
</tr>
<tr>
<td></td>
<td>The <em>Parent</em> function is not available in BEx queries.</td>
</tr>
<tr>
<td>Ancestors</td>
<td>All members above the selected member in the hierarchy are its ancestors. This option adds the ancestor members of the member to the list of selected members. The members appear as <em>Ancestors of [selected member]</em> in the list.</td>
</tr>
<tr>
<td></td>
<td>You cannot include the ancestors and parent of the same member in the list. If you select <em>Parent</em>, then select <em>Ancestors</em>, the parent is removed from the list and replaced by the ancestors.</td>
</tr>
<tr>
<td></td>
<td>The <em>Ancestors</em> function is not available in BEx queries.</td>
</tr>
<tr>
<td>Siblings</td>
<td>All members at the same level as the selected member and that share the same parent are its siblings. The members appear as <em>Siblings of [selected member]</em> in the list.</td>
</tr>
<tr>
<td></td>
<td>This option adds the selected member and its sibling members to the list of selected members.</td>
</tr>
<tr>
<td></td>
<td>The <em>Siblings</em> function is not available in BEx queries.</td>
</tr>
</tbody>
</table>

6. Click **OK** to close the *Member Selector* dialog box.
The selected members appear below the hierarchy object in the Result Objects pane. When you run the query, only those members are included in the query result.

**Related Information**

To select hierarchy members [page 80]
To select BEx query hierarchy members by relationship [page 124]

### 3.10.4.6 About level-based member selection

You can select all members of a hierarchy to a specified depth. All members of the selected hierarchy until the specified depth are displayed in the report.

You can select members of a hierarchical object by level in the Levels tab in the Member Selector dialog box, accessed from the Query Panel.

When a hierarchy variable is defined on a characteristic, only one default hierarchy is displayed in the Query Panel universe outline.

### 3.10.4.7 To select hierarchy members from a level

You can select all the members at a level in a hierarchy organized into levels in Web Intelligence Applet interface or Web Intelligence Rich Client accessed via the BI launch pad.

**Context**

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not all hierarchies are organized into levels.</td>
</tr>
</tbody>
</table>

**Procedure**

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Levels tab, select the levels you want to include.
   The members appear as All members of the [selected level] level in the Summary list.

6. Click OK to close the Member Selector dialog box.
   The selected members appear below the hierarchy object in the Result Objects pane. When you run the query, only those members are included in the query result.

Related Information

To select hierarchy members [page 80]

3.10.4.8 To select calculated members

You can edit calculated members in the Query Panel.

Prerequisites

The database on which your universe is based supports calculated members.

i Note

BEx queries can only be edited in Web Intelligence Applet interface or Web Intelligence Rich Client accessed via the BI launch pad.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Levels tab, select a calculated member.

i Note

- The position of the calculated member in the hierarchy is determined by the BI administrator.
- You cannot apply functions, for example Children or Parent, to a calculated member.

6. Click OK to close the Member Selector dialog box.
   The selected members appear below the hierarchy object in the Result Objects pane. When you run the query, only those members are included in the query result.
Related Information

To select hierarchy members [page 80]
Calculated members [page 69]

3.10.4.9 To select named sets

You can select named sets in the Query Panel.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   
   The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Levels tab, select a named set from within the Named Sets folder.
6. Click OK to close the Member Selector dialog box.
   
   The selected members appear below the hierarchy object in the Result Objects pane. When you run the query, only those members are included in the query result.

Results

You can also include a named set by selecting it from the list of available query objects. Named sets appear beneath the analysis dimension containing the hierarchy with which they are associated. When you select a named set, its parent hierarchy is included as a result object and the named set appears as a member selection beneath the hierarchy object.
3.10.4.10 To exclude hierarchy members

You exclude members from hierarchies in the Query Panel.

Context

i Note
You cannot exclude members in BEx queries.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. Select the members or member sets that you want to exclude.
6. Click Exclude next to the selected members.
7. Click OK to close the Member Selector dialog box. The excluded members appear below the hierarchy object in the Result Objects pane. When you run the query, these members are excluded from the hierarchy.

3.10.4.11 To search for members in the Member Selector dialog box

You can search a hierarchy for specific members in the Member Selector dialog box.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Members tab, click the Search button to launch the Search dialog box.
6. Type text in the Search text box.
You can use wildcards in the search.

<table>
<thead>
<tr>
<th>Wildcard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Replaces any string of characters</td>
</tr>
<tr>
<td>?</td>
<td>Replaces any individual character</td>
</tr>
</tbody>
</table>

7. Select one of the following:
   ○ Click Search in Text to search the display text of the members.
   ○ Click Search in Key to search their database keys.

8. Click OK to close the Member Selector dialog box.

### 3.10.4.12 To build prompts for selecting members using the Member Selector dialog box

You can defer member selection until the query is run. If you do so, the user are prompted to select members when they run the query.

### Context

**i Note**

Selection of member prompts is restricted to explicit selection of members. The user cannot select members using functions such as Ancestors or Parent.

To build member-selection prompts:

### Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the **Prompts** tab, click **Enable Parameter**.

**Note**
When you select this option, the selections in the other tabs are deactivated.

6. Enter text in the **Prompt Text** box.
7. If you want the prompt to select the previously-chosen values by default when it is displayed, click **Keep last values selected**.
8. If you want the prompt to select default values when it is displayed, click **Set default values**, then **Edit** and select the default values.
9. Click **OK** to close the **List of Values** dialog box.
10. Click **OK** to close the **Member Selector** dialog box.
    The prompt text appears beneath the hierarchy in the **Query Panel**.

**Related Information**

To select BEx query hierarchy members by relationship [page 124]

### 3.10.5 Resolving ambiguous queries

An ambiguous query is a query that contains one or more objects that can potentially return more than one type of information.

In a universe, certain dimensions may have values that are used for two different purposes in the database. For example, the [Country] dimension in the query below can return two types of information:

- Customers and the country in which they spent their vacation.
- Customers and the country from which they have made their reservation.

The role that Country plays in this query is ambiguous. A country can be either the country where a vacation was sold, or a country where a vacation is reserved. One is existing information (sales), and the other is future information (reservations).

To avoid ambiguities in a query, the universe designer identifies the different ways that objects can be used in the universe, and implements restrictions on how these objects can be combined. These restrictions are called contexts.

### 3.10.5.1 Contexts in a query

A context is a defined group of objects that share a common business purpose.

This business purpose is usually the type of information that these related objects represent. For example, a sales context is a grouping of all the objects that can be used to create sales queries. A reservations context is a grouping of all the objects that can be used in reservation queries. Contexts are defined in the universe by the universe designer.
You can combine any objects within the same context to create a query. You can also combine objects in different contexts. If you use an object that is common to multiple contexts in a query and it is not possible to determine the best context that fits all the other objects in the query, you are prompted to choose the context to apply.

### 3.10.5.2 To choose a context when you run a query

When you create a query or refresh a document, you may be asked to choose a context before the query can run. Contexts are set up in a universe to avoid ambiguous queries.

**Context**

You need to choose a context each time you run the query if the Reset contexts on refresh query property is selected in the Query Properties panel. You will also need to choose contexts if you select the Clear contexts option in the query properties.

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>• After selecting the Clear contexts option, the next prompt on contexts will still show the last selected context and if you want to select another context, you must first remove the existing selection.</td>
</tr>
<tr>
<td>• Clearing the Reset contexts on refresh setting does not apply to LOV refresh in Prompts. The user will be prompted for the context if the prompt requires it.</td>
</tr>
<tr>
<td>• LOV’s that prompt for context are not supported in the Web Intelligence HTML interface.</td>
</tr>
<tr>
<td>• Before you schedule a document that contains multiple contexts, you must first select a context. To do this, follow the steps below.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>! Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• If you are migrating an XI 3.1 Desktop Intelligence document to BI 4.1 Web Intelligence using the Report Conversion Tool, you also must have a context selected, otherwise the contexts are lost during the conversion.</td>
</tr>
<tr>
<td>• In queries based on UNIX universes:</td>
</tr>
<tr>
<td>○ Clearing the Reset contexts on refresh setting does not apply to LOV refresh in prompts. The user will still be prompted for the context if the prompt requires it.</td>
</tr>
<tr>
<td>○ Lists of values that require a prompt context are not supported in the Web Intelligence HTML interface.</td>
</tr>
</tbody>
</table>

**Procedure**

1. In a Web Intelligence document containing multiple contexts, run the query or refresh the document. The Select a Context dialog box appears.
2. Select a context.
Results

If prompts have been set for the document, then the Prompts dialog box appears. Otherwise the document content reflects the context you have selected.

Related Information

To reset contexts when a query is refreshed [page 92]

3.10.5.3 To reset contexts when a query is refreshed

You can allow contexts to be refreshed every time you refresh a query in the Query Panel

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click the Query Properties icon on the Query Panel toolbar to display the Query Properties dialog box.
4. Select Reset contexts on refresh.
5. Click OK to close the Query Properties dialog box.

Related Information

To choose a context when you run a query [page 91]

3.10.5.4 To clear contexts from a query

You can clear the contents of a query in the Query Properties dialog box.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Click the Query Properties icon on the Query Panel toolbar to display the Query Properties dialog box.
4. Click Clear contexts.
5. Click OK to close the Query Properties dialog box.

### 3.10.6 Setting the scope of analysis

The scope of analysis for a query is extra data that you can retrieve from the database that is available to offer more details on the results returned.

This extra data does not appear in the initial result report, but it remains available in the data cube, and you can pull this data into the report to allow you to access more details at any time. This process of refining the data to lower levels of detail is called drilling down on an object.

**Note**

The Scope of Analysis Panel option in the Query Panel is only available for relational .unx universes and not for OLAP universes or BEx queries.

In the universe, the scope of analysis corresponds to the hierarchical levels below the object selected for a query. For example, a scope of analysis of one level down for the object Year, would include the object Quarter, which appears immediately under Year.

You can set this level when you build a query. It allows objects lower down the hierarchy to be included in the query, without them appearing in the Result Objects pane. The hierarchies in a universe allow you to choose your scope of analysis, and correspondingly the level of drill available. You can also create a custom scope of analysis by selecting specific dimensions to be included in the scope.

**Related Information**

Retrieving more levels of data to the report [page 543]
To drill out of the scope of analysis [page 543]
Prompt when drill requires additional data option [page 544]

### 3.10.6.1 Levels of scope of analysis

You can set different levels for a scope of analysis in a document.

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>Only the objects that appear in the Result Objects pane are included in the query.</td>
</tr>
<tr>
<td>Level</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>● one level</td>
<td>For each object in the Result Objects pane, one, two, or three objects lower down the hierarchy tree are included in the query. The data from these objects is stored in the cube until you add them to the document.</td>
</tr>
<tr>
<td>● two levels</td>
<td></td>
</tr>
<tr>
<td>● three levels</td>
<td></td>
</tr>
<tr>
<td>custom</td>
<td>All objects added manually to the Scope of analysis pane are included in the query.</td>
</tr>
</tbody>
</table>

→ Tip

Including a scope of analysis in a document increases the document size significantly because the data necessary for the scope you specify is saved with the document. It is not visible in the reports unless you start the Drill Mode and drill down to the data to display the corresponding values.

In order to minimize the size of documents and optimize performance, include a scope of analysis only in documents where you are certain that users will need to drill.

3.10.6.2 To set the scope of analysis

You can set a scope of analysis for a query in the Scope of Analysis Panel at the bottom of the Query Panel.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Click the Scope of Analysis Panel button.
   The Scope of Analysis Panel appears at the bottom of the Query Panel. The default scope of analysis is None. Each dimension in the Result Objects pane appears in the Scope of analysis pane.
4. Click the down arrow in the Scope level dropdown list box and select a level for the scope of analysis.
   The level appears in the list box and the dimensions that are hierarchically below each dimension in the Result Objects pane appear in the Scope of analysis pane.
5. If you want to add selected dimensions to the scope of analysis or create a custom scope of analysis, select dimensions in the data outline and drag them across to the Scope of analysis pane.
3.10.6.3 To deactivate a scope of analysis in a query

You can deactivate a scope of analysis a Web Intelligence document in Design or Data mode.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
3. In the Query Panel, click the Scope of Analysis Panel icon to show the Scope of Analysis pane.
4. In the Scope of analysis pane, set the Scope level to none.
5. Click Run Query.

3.10.7 Viewing the script generated by a query

When you build a query, it generates SQL or Multidimensional Expression (MDX) script behind the scenes to run against the database to return the query result.

SQL is the query language understood by all relational databases. MDX is the query language understood by OLAP databases.

You can view and edit the SQL generated by the query. You can view MDX queries but you cannot edit them.

Note

You cannot view the script of queries that call database stored procedures.

3.10.7.1 To view and edit the generated script

You can view and edit generated query script in the Query Script viewer dialog box.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click the View Script button on the query toolbar to display the Query Script viewer dialog box.
You cannot edit the query SQL if the query contains optional prompts. Remove the optional prompts from the query before attempting to edit the SQL.

If script cannot be edited, values supplied in response to prompts appear directly in the query.

For example, if "UK" was supplied in response to a prompt on [Country], a line similar to the following appears in the query:

```
Resort_country.country In ('UK')
```

If no value has yet been supplied for the prompt, the Web Intelligence syntax for prompts (described below) appears in the query.

4. To make the generated script editable, click Use custom query script.

When you make the script editable, the Web Intelligence syntax for prompts appears in the query.

For example, a line similar to the following appears in the query:

```
Resort_Country.country = @prompt('Enter Country:','A','Resort\Country', Mono,Free,Persistent,,User:0)
```

5. Click Validate after editing the script to check that your edits are valid.

6. If you are using Web Intelligence Rich Client or the Web Intelligence Applet interface, you can click Copy to copy the script to the clipboard.

7. If you are using Web Intelligence Rich Client, you can click Print to print the script.

Related Information

Filtering data with query prompts [page 214]
To remove a prompt [page 224]

3.10.8 Restricting the amount of data returned by a query

You can restrict the amount of data returned by queries by setting the maximum number of rows a query can return, using a sampled result set, choosing whether to retrieve empty rows, and choosing whether to retrieve duplicate rows.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Click the **Query Properties** icon on the **Query Panel** toolbar.

4. In the **Query Properties** dialog box, select any of the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Select to...</th>
<th>Available in</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max rows retrieved</strong></td>
<td>To select a maximum numbers of rows for retrieval. If you use this option, you also need to set maximum number of rows to be retrieved.</td>
<td>All instances.</td>
</tr>
<tr>
<td><strong>Retrieve duplicate rows</strong></td>
<td>To include duplicate rows.</td>
<td>Relational and OLAP .unx files. Not available in BEx queries.</td>
</tr>
<tr>
<td></td>
<td>In a database, the same data may be repeated over many rows. You can choose to have these repeated rows returned in a query, or to have only unique rows returned.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This option is not available in BEx queries, or if it is not supported by the underlying database.</td>
<td></td>
</tr>
<tr>
<td><strong>Sample result set</strong></td>
<td>To return a sample result set. To use fixed sampling, click <strong>Fixed</strong>. Sampling is not available in BEx queries. The <strong>Fixed</strong> option is visible, but not activated if this option is not supported by your data source.</td>
<td>Relational .unx and .unv files. Not available in OLAP .unx or BEx queries.</td>
</tr>
<tr>
<td><strong>Retrieving empty rows</strong></td>
<td>To include empty rows in the result.</td>
<td></td>
</tr>
</tbody>
</table>

5. Click **OK** to return to the **Query Panel**.

**Related Information**

- Sample result set query property [page 98]
- Max rows retrieved query property [page 97]
- Building queries on BEx queries [page 111]

**3.10.8.1 Max rows retrieved query property**

The **Max rows retrieved** query property determines the maximum number of rows of data that are displayed when a query is run.

If you only need a certain amount of data, you can set this value to limit the number of rows of data in your document.

**Max rows retrieved** is applied at the database level if the database supports it. If not, rows are discarded after retrieval from the database.

**Max rows retrieved** does not distinguish between levels in hierarchical data. If **Max rows retrieved** is set to 3, the data in the first table below is truncated as in the second table.
### Customers Unit Sales Store Cost

<table>
<thead>
<tr>
<th>Customers</th>
<th>Unit Sales</th>
<th>Store Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>276,773</td>
<td>234,555</td>
</tr>
<tr>
<td>CA</td>
<td>45,506</td>
<td>67,999</td>
</tr>
<tr>
<td>OR</td>
<td>32,104</td>
<td>56,700</td>
</tr>
</tbody>
</table>

The Sample result set query property also applies a restriction on the number of rows in the query, but at the database level. If you set Max rows retrieved to 2000 and Sample result set to 1000, the query retrieves a maximum of 1000 rows only.

This setting can be overridden by the limits set by the BI administrator in your security profile. For example, if you set the Max rows retrieved setting to 400 rows, but your security profile limits you to 200 rows, only 200 rows of data will be retrieved when you run the query.

**Related Information**

- Sample result set query property [page 98]
- Restricting the amount of data returned by a query [page 96]

### 3.10.8.2 Sample result set query property

The Sample result set property in the Query Panel determines the maximum number of rows that a query returns.

This restriction is applied at the database level, in the generated script that is used to return the data.

**Note**

The Sample result set option is only available for relational .unx and .unw universes, and not for OLAP .unx universes or BEx queries.

The Fixed option uses fixed sampling. At each data refresh, the query returns the same rows. If you do not set the Fixed option, the sampling is random. At each data refresh, the query returns a different set of sampled rows.

Sample result set is more efficient than the Max rows retrieved property, which discards rows beyond the maximum limit only after retrieving all the rows in the query.
Not all databases support sampling. If it is not supported, the option is deactivated. Similarly, the Fixed option may not be supported by certain databases, in which case the Fixed option is deactivated. Sampling is not available in BEx queries or OLAP universes.

Related Information

Max rows retrieved query property [page 97]
Building queries on BEx queries [page 111]
Restricting the amount of data returned by a query [page 96]

3.10.9 To set the maximum amount of time a query can run

You can set the maximum running time for a query in the Query Properties dialog box.

Context

i Note
This feature is not available for BEx queries.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click the Query properties button on the Query Panel toolbar to display the Query Properties dialog box.
4. Select Max retrieval time (s) and enter the amount of time in seconds.
5. Click OK to close the dialog box and return to the Query Panel.
3.10.10 To allow other users to edit queries

By default, queries can by edited only by the user who created them. You can give the ability to edit queries to users who have edit query rights assigned by the BI administrator.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click the Query Properties icon on the Query panel toolbar to display the Query Properties dialog box.
4. Click Allows other users to edit queries.
5. Click OK to return to the Query Panel.

3.10.11 Using combined queries

A combined query is a group of queries that work together to return a single result.

**i Note**

You can only use the combined query feature with relational universes.

You can combine queries in three relationships:

- union
- intersection
- minus

A UNION query takes all the data from both queries, eliminates duplicate rows, and builds a combined data set.

An INTERSECTION query returns the data that is common to both queries.

A MINUS query returns the data in the first query that does not appear in the second.

**Example**

*Union, intersection and minus queries*

In this example you have two queries that return lists of countries as shown in the following table:

<table>
<thead>
<tr>
<th>Query</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query 1</td>
<td>US; UK; Germany; France</td>
</tr>
<tr>
<td>Query 2</td>
<td>US; Spain</td>
</tr>
</tbody>
</table>

The different types of combined query return the following values:
### Related Information

Building queries on BEx queries [page 111]

### 3.10.11.1 An example of a combined query

Combined queries allow you to answer questions that are otherwise difficult or impossible to frame in standard query.

#### Note

You can only use the combined query feature with relational universes.

#### Example

**Return a data set using a combined query**

The Island Resorts Marketing sample universe contains the dimension Year, which, with Customers, returns guests who have already stayed in a resort, and Reservation Year with Customers returns guests who have reserved to stay in the future. Because of the structure of the database and universe, these objects are incompatible, which means that you cannot include them in the same block in a report.

What if you want to return a single list of years that includes those years where more than n guests stayed in a resort and those years where more than n guests reserved to stay in a resort? You can do this using a combined query, as follows:

<table>
<thead>
<tr>
<th>Query</th>
<th>Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query 1</td>
<td>Years where more than n guests stayed in a resort</td>
</tr>
<tr>
<td>UNION</td>
<td></td>
</tr>
<tr>
<td>Query 2</td>
<td>Years where more than n guests reserved to stay in a resort</td>
</tr>
</tbody>
</table>

The union between these two queries returns the list of years that you want.
3.10.11.2 How combined queries are generated

Combined queries work at the database level by altering the query submitted to the database. They do so by generating query script containing UNION, INTERSECTION and MINUS operators.

If your database does not support the type of combination in your query, the combination occurs after data retrieval. Multiple queries return data to the report and this data is then resolved into the same result generated by a database-level combined query.

**Note**
You can only use the combined query feature with relational universes.

3.10.11.3 To build a combined query

If your query is based on a relational universe, you can create a combined query that allows you to answer a question that is otherwise difficult or impossible to frame in a standard query.

**Procedure**

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Create an initial query in the Query Panel.

**Note**
You can only use the combined query feature with relational universes.

4. Click the Add a Combined Query icon on the toolbar to display the Combined Queries panel beneath the list of query objects.
   The Combined Queries panel shows the current query. You can change the query name by clicking the query in the panel, selecting Edit Name from the menu, then typing a new name in the Name box in the dialog box that appears.
5. Click Add a query. The second query appears in the Combined Queries pane and has the following conditions:
   ○ It is combined with the original query in a UNION relationship.
   ○ It is named Combined Query #n.
6. To switch to the query, select it in the Combined Queries pane.

**Note**
To delete a query, select it in the Combined Queries pane and press the Delete key, or drag and drop the query to the universe outline.
7. To change the combination type, select the operator. The operator moves through the sequence UNION, MINUS, INTERSECTION.

8. Build each query within the combined query as you build any normal query.

9. Click Run Query.

Related Information

To open for edit the data provider of an existing query [page 178]

3.10.11.4 Combined query structure

The queries within a combined query must return the same number of objects of the same data type and the objects must be in the same order.

You cannot combine queries when the number of objects in the query results and the data types of those objects are not identical. For example, you cannot combine a query that returns Year with a query that returns Year and Revenue, or combine a query that returns Year with a query that returns Revenue.

You must also pay attention to the semantics of your combined queries. While it is possible to combine a query that returns Year with a query that returns Region, if both dimensions are of the same data type, the result - a mixed list of years and regions - is unlikely to be meaningful. Typically, if your first query contains a Year dimension, your second query also contains a dimension that returns a list of years.

i Note
You can only use the combined query feature with relational universes.

3.10.11.4.1 Example: A query of guest occupancy and reservation rates per year

You want to build a query that returns a list of years consisting of years where more than n guests stayed in a resort and years where more than n guests placed reservations to stay in a resort.

Context

i Note
This task requires access to the Island Resorts Marketing sample universe in Web Intelligence.
Procedure

1. In Web Intelligence, create a document and select the Island Resorts Marketing universe in the list of universes.
2. In the Query Panel, drag the Year, Number of Guests, and Future Guests objects to the Result Objects pane.
3. Drag the Number of Guests object to the Query Filters pane and create a report filter that restricts Number of Guests to greater than n.
4. Click the Add a combined query icon. Below the list of objects in the Query Panel, the Combined Query pane appears, displaying the two queries joined by a union.
5. Click the second query and remove the Year and Number of Guests objects.
6. Drag the Reservation Year object to the Result Objects pane.
7. Drag the Future Guests object to the Query Filters pane and create a report filter that restricts the future guests to greater than n.
8. Click Run Query.

Results

The query returns the combined list of years and reservation years.

Related Information

To build a query on a universe [page 76]

3.10.11.5 Combined query precedence

The order of execution in a combined query is crucial in determining the final result.

In the simplest form of combined query you combine two or more queries in a relationship as follows:

<table>
<thead>
<tr>
<th>INTERSECTION</th>
<th>Query 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query 2</td>
<td></td>
</tr>
</tbody>
</table>
In such a case, the first result to be calculated is the intersection between Combined Query n and Combined Query n + 1. The next result is the intersection between the first result and the result of Combined Query n + 2. Query execution continues in this way through all the queries in the relationship. This gives the following result for the above example:

<table>
<thead>
<tr>
<th>Query</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query 1</td>
<td>US; UK; France; Germany</td>
</tr>
<tr>
<td>Query 2</td>
<td>US; France; Finland</td>
</tr>
<tr>
<td>INTERSECTION of 1 and 2</td>
<td>US; France</td>
</tr>
<tr>
<td>Query 3</td>
<td>US; Spain</td>
</tr>
<tr>
<td>Final INTERSECTION</td>
<td>US</td>
</tr>
</tbody>
</table>

### 3.10.11.5.1 Nested combined queries

By default, each time you add a combined query, it is combined at the initial combination level with existing queries.

Each added query extends the list of combined queries. If you add Query 3 to Query 1 and Query 2, which are already combined in a UNION relationship, you get the following result:

```
UNION
Query 1
Query 2
Query 3
```

You can also nest combined queries in complex, multi-level relationships to control the order of execution, as in the following example, which combines the result of Query 1 MINUS Query 2 in an INTERSECT relationship with Query 3.

```
Combined Query 1

MINUS
INTERSECT
Combined Query 2
Query 3
```

In an LTR locale, query groups are processed from right to left and from top to bottom within each group. In an RTL locale, query groups are processed from left to right and from top to bottom within each group. The way query groups are processed depends on the Preferred Viewing Locale you have selected in the BI launch pad preferences. Some locales, like the English locale, use the left-to-right (LTR) interface positioning, whereas others, like the Arabic locale, use the right-to-left (RTL) interface positioning.
<table>
<thead>
<tr>
<th>Query</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query 1</td>
<td>US; UK; Spain; Germany</td>
</tr>
<tr>
<td>Query 2</td>
<td>Germany</td>
</tr>
<tr>
<td>Query 1 MINUS Query 2</td>
<td>US; UK; Spain</td>
</tr>
<tr>
<td>Query 3</td>
<td>US; Spain; Finland</td>
</tr>
<tr>
<td>(Query 1 MINUS Query 2) INTERSECT</td>
<td>US; Spain</td>
</tr>
<tr>
<td>Query 3</td>
<td></td>
</tr>
</tbody>
</table>

### i Note

If your database directly supports the type of combined query you wish to execute, the script generated from the query contains the combination operators directly. In this case the order of precedence depends on the order of precedence defined in the database. See your database administrator for more details.

### 3.10.11.5.2 To set the order of precedence of combined queries

You set an order of precedence in combined queries by placing queries into nested groups.

#### Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Build the queries you want to organize in the Combined Queries panel.
3. To nest a pair of queries, click the Add new combined query node button. This action creates a combined query node.
4. Drag and drop a query on to the query with which you want to associate the nested pair. The new combined query node is by default a UNION relationship.
5. Continue adding queries to the nested group by dragging and dropping them on to the space between any two queries already in the group.
6. To create further nested groups within an existing higher-precedence group, repeat the previous two steps.
7. Click the combination operators of all the groups in the query to change them as required.
8. Run the query.
3.11 Building queries on data files

You can build queries on data files, such as text or Excel files, that are available either locally or in the CMS.

Text files

If you are using the Applet, you can only refresh documents based on text files if they have been previously copied to the CMS.

Only the Web Intelligence Rich Client and HTML client let you build queries on data files.

Excel files

If you are using the Applet, you can only build queries on Excel files if you have previously copied them to the CMS. You cannot build queries on Excel files saved locally.

Only the Web Intelligence Rich Client and HTML client let you build queries on Excel files saved locally.

Related Information

To build a query on a text file [page 108]
To build a query on an Excel file [page 109]
To edit a query based on a text file [page 110]
To edit a query based on an Excel file [page 111]
3.11.1 To build a query on a text file

You can only build a query using a text file as a data source in the Web Intelligence Rich Client or HTML interface. Using the Applet, you can only refresh a document based on a text file if it has been previously copied to the CMS.

Procedure

1. In the Rich Client or HTML interface, do one of the following:
   - Click New in the File menu.
   - In the Create a new Web Intelligence Document dialog box, select Text as the data source.
   - In the Data Access tab, in the Data Providers subtab, select From Text from the New Data Provider dropdown list.
2. Click Browse and select the text file.
3. Set the options to import data from the file.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Separator</td>
<td>The character that separates the data relating to each result object.</td>
</tr>
<tr>
<td>Tabulation</td>
<td>data is tab-separated</td>
</tr>
<tr>
<td>Space</td>
<td>data is separated by spaces</td>
</tr>
<tr>
<td>Character</td>
<td>data is separated by the character you specify</td>
</tr>
<tr>
<td>Text Delimiter</td>
<td>The character that encloses the data relating to each result object.</td>
</tr>
<tr>
<td>Double quote</td>
<td>data is enclosed in double quotes</td>
</tr>
<tr>
<td>Single quote</td>
<td>data is enclosed in single quotes</td>
</tr>
<tr>
<td>None</td>
<td>data is not enclosed</td>
</tr>
<tr>
<td>First row contains column names</td>
<td>The first row in each column supplies the name of the column.</td>
</tr>
<tr>
<td>Locale</td>
<td>The locale of the data in the text file. For example, if the locale is French (France), commas in numbers are interpreted as indicating decimals because decimals contain commas in French.</td>
</tr>
<tr>
<td>CharSet</td>
<td>The character set used by the text file.</td>
</tr>
<tr>
<td>Date Format</td>
<td>The date format to use in the report.</td>
</tr>
</tbody>
</table>

4. Click Next. The Query Panel opens and displays the data in the text file as report objects.
5. Click Run query to create a report based on the data from the text file. When you have more than one query and you want to run just one query, click Run Queries and select the query that you want to run.
3.11.2 To build a query on an Excel file

You can build a query using an Excel file as a data source.

Context

You can use Excel files saved locally or available in the CMS.

**Note**

If you are using the Applet and want to build a query on an Excel file saved locally, make sure to copy it first to the CMS, as the Applet does not allow to create queries based on Excel files saved locally.

For information on saving Excel files to the CMS, consult the Saving objects directly to the CMS topic in the BI Launch Pad help.

Procedure

1. To build a query using an Excel file, do one of the following:
   - Click New in the File menu.
   - In the Create a new Web Intelligence Document dialog box, select Excel as the data source.
   - In the Data Access tab, in the Data Providers subtab, select From Excel from the New Data Provider dropdown list.
2. Click Browse to select the file you want to use.
3. Set the options to import data from the file.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sheet Name</strong></td>
<td>The name of the worksheet containing the data.</td>
</tr>
<tr>
<td><strong>Field Selection</strong></td>
<td><strong>All Fields</strong></td>
</tr>
<tr>
<td><strong>Range Definition</strong></td>
<td>The data in the specified range is treated as query data.</td>
</tr>
<tr>
<td><strong>Range Name</strong></td>
<td>The data in the named range is treated as query data.</td>
</tr>
</tbody>
</table>

*Restriction*

Web Intelligence only supports a contiguous cell or Range Name selection.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First row contains column names</td>
<td>The first row in the range supplies the names of the result objects.</td>
</tr>
</tbody>
</table>

4. Click **Next**.

   The **Query Panel** opens and displays the data in the Excel file as report objects. In the **Query Properties** side pane, you can choose to make the query refreshable and/or editable depending on your user requirements.

5. Click **Run query** to create a report based on the data from the Excel file. When you have more than one query and you want to run just one query, click **Run Queries** and select the query that you want to run.

### 3.11.3 To edit a query based on a text file

You can edit a query based on a text file in the **Query Panel** in the Web Intelligence Rich Client or HTML interface. Using the Applet, you can only refresh a document based on a text file if it has been previously copied to the CMS.

#### Procedure

1. Open Web Intelligence Rich Client in **Design** or **Data** mode.
2. In the **Data Access** tab, in the **Data Providers** subtab, click **Edit**.
3. Edit the query in the **Query Panel**.

   **Caution**
   
   If you select a different file containing source data for the **Source Path**, the structure of the new file must match the structure of the existing file.

4. Edit the options for importing data from the file by clicking **Edit Settings** in the **Query Definition** pane. In the **Query Properties** side pane, you can choose to make the query refreshable and/or editable depending on your user requirements.
5. Click **Run query** to apply your changes to the query.
3.11.4 To edit a query based on an Excel file

You can edit a query based on an Excel file in the Query Panel.

Procedure

1. Open Web Intelligence in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
3. Edit the query in the Query Panel.

Caution

If you select a different file containing source data for the Source Path, the structure of the new file must match the structure of the existing file.

4. Edit the options for importing data from the file by clicking Edit Settings in the Query Definition section.
5. In the Query Properties side pane, you can choose to make the query refreshable, depending on your user requirements.
6. Click Run query to apply your changes to the query.

Results

You can also go to the Data mode, and in the Data Provider tab in the side panel, right-click the query and select from the options in the contextual menu, which include Refresh, Edit, Purge, Delete, Rename, Copy, and Change Source.

3.12 Building queries on BEx queries

BEx queries (SAP Business Explorer queries) are queries created using the SAP BEx Query Designer, based on SAP Info Cubes in a SAP Business Warehouse (SAP BW).

BEx queries retrieve the metadata from the data source. You use Web Intelligence to connect to a BEx query by using a BI Consumer services (BICS) connection, and retrieve data via the BEx query for reporting purposes.

You can create, edit and refresh documents and reports based on BEx queries using any of the three available interfaces.

Web Intelligence automatically maps data from the BEx query to hierarchies, attributes, dimensions and measures as in universe-based hierarchical queries. Direct access into a SAP BEx query (through a BICS connection) does not allow you to rename, modify, or add metadata. You do not create a universe for BEx queries.

The resulting microcube is represented in the Available Objects pane as a tree of objects, but uses a subset of the features available in universe-based hierarchical queries. For example, the Siblings, Parent and
Ancestor member functions are not available for BEx queries in the Member Selector dialog box. These restrictions are noted in the documentation relating to the features.

**i Note**

- You can only access BEx queries that have the flag *Allow External Access to the Query* enabled in the SAP BEx Query Designer.
- The object mapping is not all equivalent, refer to the equivalents and restrictions pages to ensure that the queries can be used correctly.
- Web Intelligence can create a document on a BEx query only when the BEx query connection authentication is pre-defined. Prompted authentication mode is not supported on the BEx query at document creation.

**Related Information**

To create a query based on a BEx query that has no variables [page 132]

### 3.12.1 Which interfaces should you use to work with BEx queries?

To build queries, view reports, edit, or refresh reports, you use the interfaces described below.

**Building queries**

To create a document or build a query based on a BEx query, you should use one of the following:

- The Web Intelligence Applet interface, accessible from the BI launch pad
- The Web Intelligence HTML interface (accessible from the BI launch pad)
- Web Intelligence Rich Client installed from the SAP Business Objects suite

**Working with reports**

To view reports, edit, or refresh reports, you can use any of the Web Intelligence interfaces:

- The Web Intelligence HTML interface (accessible from the BI launch pad)
- The Web Intelligence Applet interface (accessible from the BI launch pad)
- The Web Intelligence Rich Client downloaded and installed from the BI launch pad
- Web Intelligence Rich Client installed as a component of the SAP Business Objects suite
3.12.2 Supported BEx query metadata

Web Intelligence supports some metadata found in BEx queries.

The following SAP BW metadata features are supported:

- Characteristics (including Time and Unit)
- Display Attributes
- Navigational Attributes
- Hierarchies
- Basic Key Figures
- Calculated Key Figures/Formulas
- Restricted Key Figures
- Variables
- Custom Structures

The metadata types are mapped to universe objects that can be used to build your queries and run reports.

**Restriction**

Characteristics or key figures dependent on BEx text variables are not supported by Web Intelligence. Your input won't be reflected in the report's objects.

How BEx query metadata is mapped

<table>
<thead>
<tr>
<th>BEx query metadata</th>
<th>Web Intelligence 4.x object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
<td>Dimension</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>Hierarchy level</td>
<td>N/A (levels are displayed in the Member Selector dialog box)</td>
</tr>
<tr>
<td>Attribute</td>
<td>Attribute</td>
</tr>
<tr>
<td>Characteristic properties (Key, Caption, Short description, Medium description, Long description)</td>
<td>Attribute</td>
</tr>
<tr>
<td>Key figure without unit/currency</td>
<td>Measure (numeric)</td>
</tr>
<tr>
<td></td>
<td>Property formatted value (string)</td>
</tr>
<tr>
<td>Key figure with unit/currency</td>
<td>Measure (numeric)</td>
</tr>
<tr>
<td></td>
<td>Property unit/currency (string)</td>
</tr>
<tr>
<td></td>
<td>Property formatted value (string)</td>
</tr>
</tbody>
</table>
How SAP Business Warehouse Characteristics map to Web Intelligence dimension objects

For data sources based on BEx queries, SAP Business Warehouse (BW) characteristics are mapped to dimension objects in Web Intelligence. Depending on the SAP BW Characteristic data type, these dimensions have a specific type assigned (STRING or DATE).

Although you have defined a BW characteristic in the SAP BW as a numerical data type (NUMC), BW treats the characteristic as a text character string (STRING). Consequently, when it is used in a Web Intelligence document, it is treated as a text character string (STRING). It is not considered a numeric data type.

How SAP BW Key Figures map to Web Intelligence measure objects

For data sources based on BEx queries, SAP BW (BW) Key Figures are mapped to measure objects in Web Intelligence. Depending on the BW Key Figure data type, these measures have a specific type assigned STRING, DATE or NUMERIC).

However, in the BEx query design, if the Key Figure and Characteristic objects are arranged in columns and rows so that the result set columns contain different object types in each row, and the measure object in the Web Intelligence report to shows up as type "STRING". For Web Intelligence, in order to be agnostic, the rule applies that one column equals one data type. The data type "STRING" is thus applied when it recognizes heterogeneous data types in the column. This is the case when the Key Figure Structure is on the Columns Axis only. You can also put both structures on the same axis in your BEx Query.

Example

When a BEx query has a structure that contains UNIT (Currency, for example), TIME (Date, for example) , a formula ("City is X percent of State" for example) and a string-based Characteristic (City for example), each, when added, is a separate row for the column. A Key Figure (for example Order Amount) is added in the Columns section. When you execute the BEx query, a table appears that contains these different objects/types in the rows of the column.

i Note

- UNIT and STRING are DataTypes you cannot get in a DataCell (DataCell = each intersection of two BEx structures). You can have NUMERIC (there is INTEGER and DOUBLE), PERCENT, DATE, and TIME. When creating a Web Intelligence report against this query, the measure object is shown as "STRING" due to the different object/types included in the result set for the column.
- If you want to manipulate the results by adding aggregations, for example, you have the choice to change the mapped Web Intelligence measure in the report by converting it via a formula into different data types.
### 3.12.3 Restrictions when using BEx queries

#### i Note

The BI administrator must ensure that the BEx query complies with reporting restrictions described in the table below.

#### Calculations

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local calculations (“Rank”, “Minimum”...)</td>
<td>The key figures on which the local calculation are defined are removed from the BEx query. Avoid the use of these, and use instead the equivalent calculation function in the report.</td>
</tr>
</tbody>
</table>
| Calculations/Local calculations    | Measures which use “Calculate Single Value as” will be omitted because they would produce inconsistent results within the client tools. The calculation depends heavily on the layout of the data requested (for example, the order in which characteristics are requested, if the result line is switched on or off, and #) and could therefore be misinterpreted. To avoid those misinterpretations, these calculations are automatically switched off. You should not use the following calculation functions:  
  - %GT  
  - %CT  
  - SUMCT  
  - SUMRT  
  - Leaf  
  They might not work correctly within the client tools (same reason as above). It is not feasible to filter them out, as the knowledge about the calculations are not exposed through the interface, therefore the query designer should make sure that those calculations are not used. If you switch on the Multidimensional Expression (MDX) Flag in the BEx Query Designer, the usage of those calculations is checked. |
| Formula with calculation           | We recommend that you avoid using Formula with calculation because it may not be supported in the report layout, for example in the case of a Percentage Share of Results report. |
Data characteristics

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decimal number</td>
<td>The BEx query decimal number definition is not consumed in Web Intelligence. Use the formatted value instead if you need to keep the exact decimal setting in your report. You can also apply the decimal setting in the table and chart of your report.</td>
</tr>
<tr>
<td>Variables on default values</td>
<td>Do not define variables on default values in BEx queries. The variables will be prompted without an effect on the BEx query. Instead, define the default value in the filter.</td>
</tr>
<tr>
<td>OR operator</td>
<td>Not supported. The OR operator is not supported from some OLAP data sources such as BEx queries, and OLAP universes on the top of Microsoft Analysis Services (MSAS) and Oracle Essbase.</td>
</tr>
<tr>
<td>Merge on key for OLAP business object</td>
<td>The data synchronization of the same object from the same source (cube or BEx query) is based on the internal key of the value of these objects.</td>
</tr>
<tr>
<td>BEx query measure aggregation</td>
<td>Measures which aggregate with the SUM function, aggregate the sum in Web Intelligence. Other types of measure aggregation are delegated.</td>
</tr>
<tr>
<td>Complex selection</td>
<td>When a variable is defined to support the complex selection, there is no equivalent. This is limited to range selection.</td>
</tr>
<tr>
<td>Zero suppression</td>
<td>Rows of zero values are not removed from the result table.</td>
</tr>
<tr>
<td>Query default layout</td>
<td>Default positions of characteristics in Rows / Columns are not reproduced.</td>
</tr>
<tr>
<td>Result rows</td>
<td>We recommend that you rely on Web Intelligence summaries instead.</td>
</tr>
<tr>
<td>Drill-replace capability</td>
<td>There is no drill-replace capability on an object from a BEx query (there is no navigation path).</td>
</tr>
<tr>
<td>Attributes in result sets and filters</td>
<td>Cannot be used in the result set and in filters at the same time.</td>
</tr>
</tbody>
</table>

Filters

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filters as default values</td>
<td>Not supported, these are removed from the BEx query. The filter will be ignored, or, if a variable is used, the variable prompt will display, but the user response is ignored. Move any restriction based on a variable into the filter zone in order for it to be taken into account for reporting.</td>
</tr>
<tr>
<td>Measures</td>
<td>Cannot be used in filters.</td>
</tr>
</tbody>
</table>
### Hierarchies

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower level nodes</td>
<td>Lower level nodes are always shown after the main node.</td>
</tr>
<tr>
<td>Row/Column display as hierarchy</td>
<td>It is not possible to show an overall hierarchy out of an axis hierarchy. The characteristics, hierarchies, and key figures that make up the hierarchy are retained.</td>
</tr>
<tr>
<td>Expand to level</td>
<td>By default, hierarchies are not expanded to a given level. Level00 is always the default level. To reproduce this behavior, expand the table and chart in the report, then save the document. Your IT administrator can redefine this default value in the Central Management Console, but note that if the value is set too high, Web Intelligence retrieves the entire hierarchy data which will have an important impact on the performance and stability of the system. The report creator should always indicate explicitly the number of the hierarchy levels they want to retrieve while designing their report queries.</td>
</tr>
<tr>
<td>Ranking and hierarchies</td>
<td>Ranking on a table where there is a hierarchy does not take into account the hierarchical structure of the data. When you define a ranking in a table that contains a hierarchy, the ranking becomes flat.</td>
</tr>
<tr>
<td>Position of lower level nodes</td>
<td>These are always below the upper levels.</td>
</tr>
<tr>
<td>Hierarchical measure structures</td>
<td>Hierarchical measure structures are displayed as a flat list of measures, but you can use hierarchical non-measure structures.</td>
</tr>
<tr>
<td>Hierarchical display of an entire axis</td>
<td>This is not supported. You can achieve similar results directly within Web Intelligence.</td>
</tr>
<tr>
<td>Hierarchies in result sets and filters</td>
<td>Cannot be used in the result set and in filters at the same time.</td>
</tr>
</tbody>
</table>

### Prompts

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables ready for input</td>
<td>If you define variables ready for input in BEx Query Designer, it is not always possible to manually enter a string in the prompt panel in Web Intelligence. In this situation, you can only select from a list of values.</td>
</tr>
</tbody>
</table>
Query structure

<table>
<thead>
<tr>
<th>BEx query feature</th>
<th>Web Intelligence restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of objects allowed in a query</td>
<td>Do not use more than 50 objects in a BEx query, otherwise an error occurs.</td>
</tr>
<tr>
<td>Variables dependent on compound characteristics and the parent object</td>
<td>When there are dependencies between variables in compound characteristics and their parent, the dependencies are not guaranteed.</td>
</tr>
<tr>
<td>Query stripping</td>
<td>Available for .unv, OLAP, and BEx query sources. For other types of sources it is not available.</td>
</tr>
<tr>
<td>Query exceptions</td>
<td>These are not taken into account in Web Intelligence. Apply conditional formatting in Web Intelligence instead.</td>
</tr>
<tr>
<td>Conditions</td>
<td>Do not use conditions. When the query is run, the conditions, if present in the query, are not applied.</td>
</tr>
<tr>
<td>Default Layout</td>
<td>The Web Intelligence access in general does not take the default layout of the BEx query into account. Use the Query Panel to obtain the following effects:</td>
</tr>
<tr>
<td></td>
<td>● Arrangement of characteristics in rows and columns</td>
</tr>
<tr>
<td></td>
<td>● Default presentation (for example, Text / Key-Presentation)</td>
</tr>
<tr>
<td></td>
<td>● Structure members with the state hidden (can be shown) or visible</td>
</tr>
</tbody>
</table>

Related Information

Query stripping in documents [page 239]

3.12.4 Accessing BEx queries

You must meet certain conditions before you can access BEx queries.

1. You can only access BEx queries that have the Allow External Access to the Query option enabled in the BEx Query Designer.
2. You must have the appropriate security rights to access and use the BEx queries for reporting.

The BI administrator defines the connection in the Central Management Console (CMC), or you can use the information design tool to publish the connection to the CMC. The simplest method is to use the CMC.
3.12.4.1 To enable access to BEx queries

BEx queries can only be accessed by other tools including Web Intelligence if the BEx query property *Allow External Access to the Query* is enabled in the BEx Query Designer.

**Procedure**

1. In the BEx Query Designer, select the query that you want to access with Web Intelligence.
2. In the *Properties* pane, select *Advanced*, and ensure that *Allow External Access to the Query* is selected.
3. Save the query.
4. Repeat the above steps for all BEx queries that you want to make available to Web Intelligence.

3.12.4.2 To define a BICS connection with the Central Management Console

You can connect to BEx queries via BICS connections that have been created and saved in the Central Management Console (CMC).

**Prerequisites**

You need the appropriate administrator rights to define a BICS connection in the CMC.

**Context**

You can define a connection to a single BEx query or to an InfoProvider containing several BEx queries.

**Procedure**

1. Log in to the CMC.
2. Choose *OLAP connections*.
3. Define a new connection.
   - In the *New Connection* window, in the *Provider* dialog box, select *SAP Business Information Warehouse*.
4. Enter the connection information and your system details.
5. Save the connection.
Next Steps

To connect to a BEx query, you also define a BICS connection in the information design tool.

3.12.4.3 To define a BICS connection in the information design tool

To connect to a BEx query, you can define a BICS connection in the information design tool. You can define a connection to a single BEx query or to an InfoProvider containing several BEx queries.

Procedure

1. In the information design tool, use the New OLAP Connection wizard to define an OLAP connection and choose the SAP BW SAP BICS Client middleware driver.
2. Publish the connection to a repository where it can be accessed by Web Intelligence.

Results

You can now use Web Intelligence to select the connection and connect to the BEx query.

3.12.5 Building a Web Intelligence query on a BEx query

When you have connected to a BEx query, Web Intelligence maps the BEx query metadata to the Web Intelligence query objects.

You use the Web Intelligence Query Panel to select the appropriate objects to build a hierarchical query. You can add filters and prompts in the same way as you create queries on universes, but there are restrictions in certain situations, refer to the section Restrictions when using BEx queries.

Related Information

Restrictions when using BEx queries [page 115]
Hierarchical member selection in BEx queries [page 82]
3.12.5.1 Hierarchical queries

A hierarchical query contains at least one hierarchy object.

You can build hierarchical queries on universes that support hierarchical data or on BEx queries which access SAP Info Queries directly. Hierarchical data can come from relational or OLAP databases, depending on how the data is structured in the universe.

**i Note**

A relational data source is not a true hierarchy; it is a defined path between attributes.

You can include hierarchies either as result or filter objects. When you build a hierarchical query, the Web Intelligence Query Panel provides you with additional features for working with hierarchical data.

For example, if you include a hierarchy as a result object, you have the ability to choose members from the hierarchy to appear in the result. The features available in the hierarchical query panel also depend on the source of the hierarchical data you are accessing.

The result set generated by a hierarchical query allows you to perform hierarchical data analysis. Each hierarchy object in the query produces a hierarchical column in the report. You can expand members to reveal their child members.

**Tip**

When running or refreshing a BEx query that contains a hierarchical object, make sure to put it first in the Query Panel. Indeed, it significantly decreases the execution time of the query.

**Example**

If you expand the [US] member to reveal US states in a [Geography] hierarchy, then measures in the block are aggregated depending on the member with which they are associated.

A hierarchical query containing the [Customers] hierarchy and the [Unit Sales] and [Store Cost] measures gives the following result set:

<table>
<thead>
<tr>
<th>Customers</th>
<th>Unit Sales</th>
<th>Store Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>364,707</td>
<td>371,579</td>
</tr>
<tr>
<td>US</td>
<td>276,773</td>
<td>234,555</td>
</tr>
<tr>
<td>CA</td>
<td>45,506</td>
<td>67,999</td>
</tr>
<tr>
<td>OR</td>
<td>32,104</td>
<td>56,700</td>
</tr>
<tr>
<td>Albany</td>
<td>10,324</td>
<td>12,325</td>
</tr>
</tbody>
</table>

**Related Information**

Hierarchical member selection in BEx queries [page 82]

Measures [page 69]
3.12.5.2 Scaling factors in BEx queries

When a BEx query contains measures that are mapped from scaled key figures, the factor of scaling on the measure is displayed in the resulting report.

When the scaling factor is changed for the key figure, this change is reflected in the report when the report is refreshed. The scaling factor is displayed for the measure name in the report, and for the measure attribute in the Query Panel.

3.12.5.3 Hierarchy node variables in BEx queries

When a prompt is present on a characteristic of a hierarchy node in a BEx query, this is referred to as a hierarchy node variable.

If there is a hierarchy node variable, the member selection function is disabled for the hierarchy. The prompt related to the hierarchy node variable appears at run time.

3.12.5.4 Hierarchical member selection in BEx queries

You use the Member Selector dialog box, available from a hierarchy object in the Query Panel, to select members of a hierarchy for your query.

The following hierarchy illustrates member selection behavior in BEx queries.

<table>
<thead>
<tr>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMEA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Europe</td>
</tr>
<tr>
<td>Middle East</td>
</tr>
<tr>
<td>Africa</td>
</tr>
<tr>
<td>North America</td>
</tr>
<tr>
<td>Asia PAC</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Asia</td>
</tr>
<tr>
<td>Pacific</td>
</tr>
<tr>
<td>Australia</td>
</tr>
<tr>
<td>Philippines</td>
</tr>
</tbody>
</table>
### Hierarchy selection rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you select a member of a hierarchy at a given level, all of the parent members in the hierarchy are selected.</td>
<td>The root is always selected. It is not possible to select one specific level.</td>
</tr>
</tbody>
</table>
| If you deselect a member when its parent member is already selected, all child members of the parent are also deselected. | If Pacific and all its child members are already selected and you deselect Australia, Philippines and New Zealand are also deselected. The following member selections appear:  
  - Europe  
  - Pacific                                                                 |
| If you select a member with some of its child members already selected, all child members are selected.                     | If Europe is selected and you select EMEA, the Middle East and Africa are also selected. The following member selections appear:  
  - EMEA  
  - Children of EMEA                                                                                                             |
| If you select a member when descendant members are already selected, all children of the member, and all siblings of the selected descendant members are also selected. | If you select Asia PAC when Australia was already selected, Asia, Pacific (children of Asia PAC) and Philippines and New Zealand (siblings of Australia) are also selected. The following member selections appear:  
  - Asia PAC  
  - Children of Asia PAC  
  - Pacific  
  - Children of Pacific                                                                                                          |

### Related Information

- Restrictions when using BEx queries [page 115]
- Hierarchical member selection in BEx queries [page 82]
3.12.5.4.1 To select BEx query hierarchy members by relationship

You can select by relationship the members in a hierarchy for your BEx query.

Context

Procedure

1. Open in Design or Data mode a Web Intelligence document that uses a BEx query.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Members tab, right-click a member to which you want to apply a function.
   The menu displays the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>Adds all child members of the member to the list of selected members.</td>
</tr>
<tr>
<td></td>
<td>The members immediately below the selected member are its children.</td>
</tr>
<tr>
<td></td>
<td>The members appear as Children of [selected member] in the list.</td>
</tr>
</tbody>
</table>

**i Note**

You cannot include children and descendants of the same member. If you had already selected Descendants before selecting Children, the descendants are removed from the list and replaced by children.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descendants</td>
<td>Adds all descendant members of the member to the list of selected members. All members below the selected member in the hierarchy are its descendants. The members appear as <em>Descendants of [selected member]</em> in the list.</td>
</tr>
<tr>
<td>Note</td>
<td>You cannot include children and descendants of the same member. If you had already selected <em>Children</em> before selecting <em>Descendants</em>, the children are removed from the list and replaced by descendants.</td>
</tr>
<tr>
<td>Parent</td>
<td>The <em>Parent</em> function is not available in BEx queries.</td>
</tr>
<tr>
<td>Ancestors</td>
<td>The <em>Ancestors</em> function is not available in BEx queries.</td>
</tr>
<tr>
<td>Siblings</td>
<td>The <em>Siblings</em> function is not available in BEx queries.</td>
</tr>
<tr>
<td>Descendants until Named Level</td>
<td>Use the list of level names to choose the level.</td>
</tr>
<tr>
<td>Descendants until</td>
<td>Choose the number of levels that you want to include in the selection.</td>
</tr>
</tbody>
</table>

6. Click **OK** to close the *Member Selector* dialog box. The selected members appear below the hierarchy object in the *Result Objects* pane. When you run the query, only those members are included in the query result.

| Note                | You cannot exclude hierarchy members in BEx queries.                                                                                     |

**Related Information**

To select hierarchy members [page 80]
About level-based member selection [page 85]
To build prompts for selecting members using the Member Selector dialog box [page 89]
Hierarchical member selection and query filters [page 78]
3.12.5.4.2 To search for members in the Member Selector dialog box

You can search a hierarchy for specific members in the Member Selector dialog box.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Members tab, click the Search button to launch the Search dialog box.

   **Note**
   The search is always performed on the entire hierarchy stored in the database, not on the members already retrieved in the Member Selector dialog box.

6. Type text in the Search text box.
   You can use wildcards in the search.

<table>
<thead>
<tr>
<th>Wildcard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Replaces any string of characters</td>
</tr>
<tr>
<td>?</td>
<td>Replaces any individual character</td>
</tr>
</tbody>
</table>

7. Select one of the following:
   - Click Search in Text to search the display text of the members.
   - Click Search in Key to search their database keys.

8. Click OK to close the Member Selector dialog box.
3.12.5.4.3 To build prompts for selecting members using the Member Selector dialog box

You can defer member selection until the query is run. If you do so, the user are prompted to select members when they run the query.

Context

Note
Selection of member prompts is restricted to explicit selection of members. The user cannot select members using functions such as Ancestors or Parent.

To build member-selection prompts:

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Prompts tab, click Enable Parameter.

Note
When you select this option, the selections in the other tabs are deactivated.

6. Enter text in the Prompt Text box.
7. If you want the prompt to select the previously-chosen values by default when it is displayed, click Keep last values selected.
8. If you want the prompt to select default values when it is displayed, click Set default values, then Edit and select the default values.
9. Click OK to close the List of Values dialog box.
10. Click OK to close the Member Selector dialog box.

The prompt text appears beneath the hierarchy in the Query Panel.

Related Information

To select BEx query hierarchy members by relationship [page 124]
3.12.5.4.4 To select members based on relative depth from a selected node

You can define to which depth of a hierarchy for which information is retrieved. Use the member selector to define the relative depth.

Context

Restriction
Web Intelligence does not support scenarios that have a static hierarchy for a hierarchy node variable and a variable hierarchy for result displays. The prompted hierarchy is always used for results display and filtering that affects the LOV of that hierarchy in the prompts dialog box. You must use the same hierarchy for the hierarchy node variable and a prompt LOV.

Note
This feature is only available when the BEx query has a hierarchy node variable on the characteristic that you are using for the query.

Procedure

1. Open in Design or Data mode a Web Intelligence document that uses a BEx query.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Add a hierarchy object to the Result Objects pane in the Query Panel.
4. Click the arrow next to the hierarchy object to launch the Member Selector dialog box.
5. In the Relative Depth tab, select:
   - All hierarchy node descendants for the query to handle all the descendants of the selected hierarchy node.
   - Hierarchy members based on the relative depth in order to return data from a relative depth in the hierarchy. Select the number of levels below the selected node for which data is returned. You can set a different depth level for each hierarchy node variable.
6. Click OK to close the Member Selector dialog box.

Results

When you run the query, you are prompted to select a node, and the query returns the data from the selected node down to the specified depth.
3.12.5.4.5 To select members based on levels from a selected node

You can define the number of levels of a hierarchy from which to retrieve more detailed data.

**Procedure**

1. Open in *Design* or *Data* mode a Web Intelligence document that uses a BEx query.
2. In the *Data Access* tab, in the *Data Providers* subtab, click *Edit*. The *Query Panel* appears.
3. Add a hierarchy object to the *Result Objects* pane in the *Query Panel*.
4. Click the arrow next to the hierarchy object to launch the *Member Selector* dialog box.
5. In the *Levels* tab, select *Enable levels* and select the levels down to which you want to return data.
6. Click *OK* to close the *Member Selector* dialog box.

**Results**

When you run the query, data is retrieved down to the selected level. If you select a different hierarchy at refresh time, the level selection still applies on the new hierarchy and returns nodes and values of the new hierarchy, down to the selected level.

3.12.5.5 About the Set Variables dialog box

The *Set Variables* dialog box is prompted before the *Query Panel* so you can manage variables of a BEx query.

When you first create a document based on a BEx query that contains variables, if the query has at least one mandatory or optional variable, the *Set Variables* dialog box automatically appears and displays all the variables and their default values, if any. When you save the variable values, the *Query Panel* appears and you can select the objects for your document.

**Note**

Currently, the *Set Prompt* check box for each variable is not displayed automatically when you first select the BEx query for your document. When the transient universe has been created and the *Query Panel* displays the objects, you can open the *Set Variables* dialog box and access the *Set Prompt* dialog box.

**Caution**

If the BI administrator allows manual entry of values for a prompt, so that a start and end key selection is changed to a values list, and your document was created when manual entry was not allowed, you need to do the following for your document:


- Purge the document.
- Change the default values for query prompts to be compatible with multivalue selection.

**Related Information**

Selecting prompt values in the Prompts dialog box [page 577]

### 3.12.5.6 Managing mandatory variables with no default values

You can use the *Set Variables* dialog box to define how the variable with no default value is managed for the users.

When the report is published to multiple users, you can ensure that the user is presented with a prompt default value that makes sense.

To use the BEx default values, in the *Set Variables*, select the option *Use BEx query defined default values at runtime*. How the BEx default values are used depends on the settings in the *Set Variables* dialog box and how the user responds to the *Purge Last Selected Prompt Values* prompt when the query is purged.

⚠️ **Caution**

You cannot hide prompts and retrieve default values from BEx at the same time. Conversely, you have to display prompts to be able to see dynamic values. If a document is purged with the *Purge Last Selected Prompt Values* option but you have defined a default value and the *Use BEx query defined default values at runtime* option is unchecked, it will still be retrieved after the purge as this value comes from the *Query Panel*.

**Workflow when the query designer chooses to use the BEx query default values at runtime**

1. When the query contains a BEx mandatory variable, the designer chooses to use the BEx variable default value and selects *Use BEx query defined default values at runtime*.
2. When a user runs the report, the query displays the prompt for the BEx variable. The default value proposed is ‘A’. The user chooses a different value (‘C’, for example).
3. The report contains the results for the user’s selected value ‘C’.
4. The user purges the report. The purge process displays a warning message asking if the user wants to purge the last selected prompt value (‘C’).

If the user:

- Selects *Purge Last Selected Prompt Values*, the query will retrieve ‘A’ as the default prompt value, since *Use BEx query defined default values at runtime* was selected at query design time.
- Does not select **Purge Last Selected Prompt Values**, the query will retrieve 'C' as the default prompt value, since this value was the last selected prompt value.

**Workflow when the query designer chooses not to use the BEx query default values at runtime**

1. When the query contains a BEx mandatory variable, the designer chooses not to use the BEx variable default value ('A', for example), but chooses a different value 'B', for example). The designer has not selected **Use BEx query defined default values at runtime**.
2. When a user runs the report, the query displays the prompt for the BEx variable. The default value proposed is 'B', the value selected by the query designer. However, the user chooses a different value ('C', for example).
3. The report contains the results for the user's selected value 'C'.
4. The user purges the report. The purge process displays a warning message asking the if the user wants to purge the last selected prompt value ('C').

If the user:
- Selects **Purge Last Selected Prompt Values**, the query will retrieve 'A' as the default prompt value, since **Use BEx query defined default values at runtime** was selected at query design time.
- Does not select **Purge Last Selected Prompt Values**, the query will retrieve 'B' as the default prompt value, since this value was selected in the **Set Variables** dialog box at query design time.

### 3.12.5.7 The Selection Option in prompts on BEx variables

If there is a characteristics value variable that is of type **Selection Option**, Web Intelligence interprets it as a complex prompt.

The BI administrator can change this behavior to be an INLIST or BETWEEN operator, which allows multivalue selection of variables on a **Selection Option** prompt. When this happens the start and end value selection is changed to a multivalues list.

⚠️ **Caution**

If a query was created when the **Selection Option** selection was interpreted as BETWEEN, then any values selected for this prompt do not work. You need to do the following for any document created before the change in selection behavior:
- Purge the document.
- Change the default values for query prompts to be compatible with multivalue selection.
3.12.5.8 To create a query based on a BEx query that has no variables

You can create a query using BEx data that contains no variables.

**Prerequisites**

To access the BEx query, it must have the *Allow External Access to the Query* option enabled in the BEx Query Designer.

**Procedure**

1. In a Web Intelligence document in *Design* or *Data* mode, click the *New* icon in the *File* toolbar.
2. In the *Select a data source* list, select *BEx*, then *OK*.
3. Select the appropriate BICS connection in the dialog box.
4. Select the BEx query in the side pane and click *OK*. When a BICS connection is based on an InfoCube, there may be several BEx queries available.
   When there are variables in the BEx query, depending on the variable type, the *Set Variables* dialog box appears and you define the variable properties (see the link below for more information about BEx variables and the *Set Variables* dialog box. The *Query Panel* appears, displaying the objects in the query as hierarchies, dimensions and attributes. If you cannot see the BEx query that you want to use, use the BEx Query Designer to ensure that the *Allow External Access to the Query* option is selected in the query.
5. Build the query and query filters using the available objects.

   **i Note**
   - When you create a Web Intelligence query based on a BEx query that contains one mandatory variable (or more) that does not have a default value, when you select a list of values or try to use the *Member Selector* dialog box, an error message appears. Use the *Set Variables* dialog box to set values for the mandatory variable.
   - You cannot filter on attributes in BEx queries.
   - If the BEx query you connected includes SAP server-side variables, you can change the value of the variable in the *Query Panel*. Click the *Set Variables* icon in the *Query Panel* toolbar, and select a new variable.

6. Click *Run Query*. When you have more than one query and you want to run just one query, click *Run Queries* and select the query that you want to run.
3.12.5.9 To create a document based on a BEx query that uses variables

You can create a document based on a BEx query that contains variables.

**Procedure**

1. In a Web Intelligence document in *Design or Data* mode, click the *New* icon in the *File* toolbar.
2. In the *Select a data source* list, select *BEx*, then *OK*.
3. Select the appropriate BICS connection in the dialog box.
4. Select the BEx query in the side pane and click *OK*. When a BICS connection is based on an InfoCube, there may be several BEx queries available.
   When there are variables in the BEx query, depending on the variable type, the Set Variable dialog box appears and you define the variable properties. See the table below for more information about defining BEx variables and using the *Set Variables* dialog box.
5. Build the query and query filters using the available objects.

**Note**

- When you create a Web Intelligence query based on a BEx query that contains one mandatory variable (or more) that does not have a default value, when you select a list of values or try to use the *Member Selector* dialog box, an error message appears. Use the *Set Variables* dialog box to set values for the mandatory variable.
- You cannot filter on attributes in BEx queries.
- If the BEx query you connected includes SAP server-side variables, you can change the value of the variable in the *Query Panel*. Click the *Set Variables* icon in the *Query Panel* toolbar, and select a new variable.

**Results**

When you have selected a BEx query that contains variables, you use the *Set Variables* dialog box to define or modify the value(s) of the variable(s). The steps you have to perform depend on the variable type (mandatory or optional), and on whether there is a default value or not.
Setting variables for BEx queries

<table>
<thead>
<tr>
<th>When the BEx Query has...</th>
<th>Do this...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory variable(s) where at least one variable has no default value.</td>
<td>Use the Set Variables dialog box to fill in any mandatory variables. The OK button is enabled when all mandatory variables have a value. After this, the Query Panel is appears and the outline shows the content of the BEx query as generated in the transient universe. At this point, you can open the Set Variables dialog box again and change the Set Prompts properties.</td>
</tr>
</tbody>
</table>

**i Note**

If at this point you cancel the Set Variables dialog box settings:

a. If you are using the Applet interface, the main Web Intelligence interface appears with no document open. If another document was already open at step you will already have been prompted to save or discard the changes when you started to create the BEx query.

b. If you are using the Rich Client interface, this returns the interface to the home page.

Mandatory variable(s) with default values (optional variables have no effect on the behavior).

The Set Variables automatically appears when the transient universe is created, the Query Panel displays the metadata.

Only optional variable(s), at least one of the variables has no default.

The transient universe is created and the Query Panel displays the metadata without opening the Set Variables dialog box.

Optional variables that all have default values. There are no mandatory variables.

The transient universe is created and the Query Panel displays the metadata without opening the Set Variables dialog box.

You can now run the query for your document. You can modify variables later by accessing the Set Variables dialog box through the Query Panel.

### 3.12.5.10 To add a second BEx query data provider to a document

Your current document is already based on a BEx query and you want to add a second BEx query as an additional data provider.

**Procedure**

1. In a Web Intelligence document in Design or Data mode, click the Add new data provider icon in the File toolbar.
2. In the Select a data source list, select BEx, then OK.
3. Select the appropriate BICS connection in the dialog box.
4. Select the BEx query in the side pane and click OK. When a BICS connection is based on an InfoCube, there may be several BEx queries available.
When there are variables in the additional BEx query, depending on the variable type, the Set Variables dialog box appears and you define the variable properties. See the table below for more information about defining BEx variables and using the Set Variables dialog box.

5. Build the query and query filters using the available objects.

### i Note

- When you create a Web Intelligence query based on a BEx query that contains one mandatory variable (or more) that does not have a default value, when you select a list of values or try to use the Member Selector dialog box, an error message appears. Use the Set Variables dialog box to set values for the mandatory variable.
- You cannot filter on attributes in BEx queries.
- If the BEx query you connected includes SAP server-side variables, you can change the value of the variable in the Query Panel. Click the Set Variables icon in the Query Panel toolbar, and select a new variable.

### Results

## Setting variables for an additional BEx query

<table>
<thead>
<tr>
<th>When the BEx Query has...</th>
<th>Do this...</th>
<th></th>
</tr>
</thead>
</table>
| Mandatory variables where at least one variable has no default value. | When you select the new BEx query, the Set Variables dialog box displays all the variables of the newly added BEx query and their default values, if any. Only variables of the newly added data provider are displayed. If variables are shared by the original BEx query and the new BEx query, then the values of those variables are not pre-filled by the values entered for initial query. Although the merge option of BEx variables is active, no merge is applied at this stage. Provide the mandatory variables and click OK. The Query Panel appears and the outline shows the content of the new BEx query, generated by the underlying transient universe. Create and execute the query. The prompts dialog box displays and shows the variables of the two data providers depending on the option “Merge BEx variables” of the document:  
  - Merge is active: the dialog box merges the prompts that are shared by the two BEx queries. The values to be displayed are the values entered previously for the first data provider.  
  - Merge is not active: the dialog box displays each prompt separately, with separate values entered for each data provider. |   |
| Mandatory variables with default values (optional variables have no effect on the behavior). | The transient universe is created and the Query Panel displays the metadata without opening the Set Variables dialog box. |   |
When the BEx Query has... | Do this...
---|---
Only optional variables, at least one of the variables has no default. | The transient universe is created and the Query Panel displays the metadata without opening the Set Variables dialog box.
Optional variables that all have default values. There are no mandatory variables. | The transient universe is created and the Query Panel displays the metadata without opening the Set Variables dialog box.

### 3.12.5.11 To edit a document based on a BEx query

You edit data providers in a BEx query in the Set Variables dialog box.

**Prerequisites**

The document has multiple data providers; some of them (not all) are based on BEx Queries.

**Context**

When editing data providers, the Set Variables dialog box appears when a mandatory variable exists and has no values. This situation can only happen if a mandatory variable was added to one of the underlying BEx Queries after the document was created and saved.

**Procedure**

1. In a Web Intelligence document, in the Data Access tab, click Edit. The Set Variables dialog box is displayed with variables of the BEx Query related to the first Data Provider based on BEx in the document, having mandatory variables with no values. All variables of the BEx Query are displayed, not only the mandatory variables that are missing values.
2. Fill in the values for the missing mandatory variables and click OK. The Set Variables dialog box appears with variables of the BEx Query related to the second Data Provider based on BEx in the document, having mandatory variables with no values. All variables of the BEx Query are displayed, not only the mandatory variables that are missing values.
3. Fill in the values for the missing mandatory variables for the second BEx query and click OK.
4. Repeat the previous step until there are no more BEx data providers with mandatory variables and no default values. The Query Panel appears and displays the available objects.
5. The prompts dialog box displays and shows the variables of all data Providers depending on the option “Merge BEx variables” of the document:
   a. When Merge BEx variables is enabled: the dialog box merges the prompts that are shared by the BEx Queries. The values to be displayed are the values entered previously for the first data provider.
b. **Merge BEx variables** is disabled: the dialog box displays each prompt separately, with separate values entered for each data provider.

**Results**

When you have entered the prompt values, you can run the query for the document.

### 3.12.5.12 To cancel an edit

You can cancel an edit action in a BEx query.

**Context**

You have a Web Intelligence document that has one or more Data Providers open for edit.

**Procedure**

1. In the *Data Access* tab, click *Edit*.
   The *Set Variables* dialog box is displayed with variables of the BEx Query related to the first Data Provider based on BEx in the document, having mandatory variables with no values. All variables of the BEx Query are displayed, not only the mandatory variables that are missing values.
2. Cancel the *Set Variables* dialog box.
   The entire action of edit is cancelled, not only the *Set Variables* dialog box. The *Set Variables* dialog box is not displayed for the other data providers.

### 3.12.5.13 About previewing data when a BEx query has variables

Variables with missing values have no impact on this function.

The prompts dialog box (runtime prompts) displays and invites user to answer variables in all cases. In addition, at this stage the variables should already have been answered in the *Set Variables* dialog box either at document creation time, or when the query is edited. You can preview the query in the same way as any other document.
3.12.6 Runtime Configuration

This section describes the configuration options that can be set at runtime to change the behavior of the BW Direct Access in the Semantic Layer and in the BI tools.

All these options are Java runtime options and need to be provided for the Java Virtual Machine (JVM) in the Central Management Console (CMC).

You can provide them through the Adaptive Processing Server command line, in property files, or even through environment variables.

An example of the Adaptive Processing Server command line is as follows:

```
-DoptionName=optionValue
```

**Note**

The Adaptive Processing Server uses parameters defined for the SAP Java Virtual Machine (SAP JVM). Refer to SAP JVM documentation for more information. For information on modifying a server’s command line, refer to the *Business Intelligence Platform Administrator Guide*.

The following lists are valid for BI 4.1 versions Support Package (SP) 01 and higher. Some of these options are also available in BI 4.0.

### Infoprovider Browsing

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long name:</td>
<td></td>
<td></td>
<td>Yes as of SP04</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>sap.sl.bics.BExExternalAccessDetentionMode</td>
<td>rfcPerInfoQuery, rfcProperty, infoArea, false</td>
<td>Set the Multidimensional Expression (MDX) compliance detection mechanism for BEx queries when browsing BW infoareas/info-cubes. For more information, refer to the “SAP BW Browsing Runtime Configuration” below.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short name:</td>
<td></td>
<td></td>
<td>Yes as of SP04</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>BEXExternalAccessDetentionMode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value:</td>
<td></td>
<td></td>
<td>Yes as of SP05</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>rfcPerInfoQuery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long name:</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sap.sl.bics.browsingImplementation</td>
<td>bics, olapClient</td>
<td>Set the SL implementation to use for BW query browsing.</td>
<td>Yes as of SP05</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Default value:</td>
<td>bics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## List of Values

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long name: sap.sl.bics.lovSizeLimit</td>
<td>n &gt; 0</td>
<td>Set the maximum number of members for a list of values.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: lovSizeLimit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: 5000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap.sl.bics.intervalLimitForBigSets</td>
<td>n &gt; 0</td>
<td>Set the maximum number of intervals that can be retrieved for members that exceed the number of LOV (see property bicslovlimit).</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: intervalLimitForBigSets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap.sl.bics.variableComplexSelectionMapping</td>
<td>multivalue interval</td>
<td>Defines the method of selecting values for BEx characteristic variables of the type Selection Option.</td>
<td>No</td>
<td>Yes</td>
<td>Yes as of SP0 5</td>
</tr>
<tr>
<td>Short name: variableComplexSelectionMapping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: interval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⚠️ **Caution**

If the BI administrator allows manual entry of values for a prompt so that a start and end value selection is changed to a values list, and a document was created when manual entry was not allowed, a document owner needs to do the following for a document:

- Purge the document.
- Change the default values for query prompts to be compatible with multivalue selection.
<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sap.sl.bics.variableComplexSelectionUse</td>
<td>true/false</td>
<td>Enables the selection options (with condition operators such as =, !=, &gt;=, &lt;=, BETWEEN, or NOT BETWEEN) in prompts on BEx variables.</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>sap.sl.bics.defaultHierarchyDepthRetrieved</td>
<td>n &gt; 0</td>
<td>Set the expandToLevel value for hierarchies when fetching data; n is 1-based. 0 means &quot;use the expand-to-level value of the BEx query&quot;.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>sap.sl.bics.expandNotAssignedNodes</td>
<td>true/false</td>
<td>Expand the not assigned node when no member selection has been set on a dimension or hierarchy.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Note**

This parameter directly impacts the variableComplexSelectionMapping. If variableComplexSelectionUse is set to false, then the variableComplexSelectionMapping parameter is ignored.

---

**Member Selection and Result Set Scope**

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sap.sl.bics.defaultHierarchyDepthRetrieved</td>
<td>n &gt; 0</td>
<td>Set the expandToLevel value for hierarchies when fetching data; n is 1-based. 0 means &quot;use the expand-to-level value of the BEx query&quot;.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>sap.sl.bics.expandNotAssignedNodes</td>
<td>true/false</td>
<td>Expand the not assigned node when no member selection has been set on a dimension or hierarchy.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Long name: sap.sl.bics.depthRelativeTo</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short name: depthRelativeTo</td>
<td>top</td>
<td>Defines the behavior of the relative depth used in member selectors:</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Default value: top</td>
<td>root</td>
<td>'top' means 'depth relative to the selected top node, including out-of-bounds selected nodes that belong to another root'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>node</td>
<td>'root' means 'depth relative to the selected root node only, and out-of-bounds nodes are excluded'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'node' means 'depth relative to each selected node'</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Diagnosis and Debug

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long name: sap.sl.bics.profileRFC</td>
<td>true</td>
<td>Enable/disable the BW RFC tracing, and choose a specific tracing format if enabled.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: profileRFC</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: false</td>
<td>txt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>xml</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>csv</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long name: sap.sl.bics.traceBICSResultSet</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short name: traceBICSResultSet</td>
<td>1</td>
<td>Print result sets.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Default value: undefined</td>
<td>undefined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## BW Statistics

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sap.sal.bics.postBWstatistics</td>
<td>true</td>
<td>Activates the following BW statistics events:</td>
<td>No</td>
<td>No</td>
<td>Yes as of SP03</td>
</tr>
<tr>
<td>Long name</td>
<td>False</td>
<td>• 20100: fetches BEx’s characteristic members</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20101: fetches BEx query’s results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20102: submits BEx variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20103: opens a BEx query using BICS API.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20104: synchronizes with BW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20105: set variable’s input string</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short name</td>
<td>postBWstatistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value:</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Miscellaneous

<table>
<thead>
<tr>
<th>Option</th>
<th>Possible Values</th>
<th>Description</th>
<th>In 4.0</th>
<th>In 4.1</th>
<th>In 4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sap.sl.bics.reverseKeyFigureStructure</td>
<td>1</td>
<td>Reverse axis of Structure containing KeyFigures (ROWS &lt;-&gt; COL-UMNS).</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name</td>
<td>Reverse_KF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value:</td>
<td>undefined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td>Possible Values</td>
<td>Description</td>
<td>In 4.0</td>
<td>In 4.1</td>
<td>In 4.2</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Long name: sap-sl-bics-retrieveHierarchyLevels</td>
<td>true</td>
<td>Retrieve the BW levels for every hierarchy, or completely skip them.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: retrieveHierarchyLevels</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: true</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap-sl-bics-recycleGroupingSetView</td>
<td>true</td>
<td>Recycle and share a single query view for all grouping sets.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: recycleGSView</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: true</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap-sl-bics-inlineGroupingSet</td>
<td>true</td>
<td>Inline grouping set in the main query if possible.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: inlineGroupingSet</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: false</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap-sl-bics-displayKeyInResultSet</td>
<td>true</td>
<td>Always fetch the member display keys when executing a query.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: displayKeyInResultSet</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: false</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap-sl-bics-useDesignTimeService</td>
<td>true</td>
<td>Use the design time services of BICS/BW.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: useDesignTimeService</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: true</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td>Possible Values</td>
<td>Description</td>
<td>In 4.0</td>
<td>In 4.1</td>
<td>In 4.2</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Long name: sap.sl.bics.useDesignTimeQueryForRefresh</td>
<td>true</td>
<td>Use the design-time query for refresh workflows as well.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: useDesignTimeQueryForRefresh</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: false</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap.sl.bics.useConcurrentDesignTimeQuery</td>
<td>true</td>
<td>Instantiate the design-time query early in a concurrent thread.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: useConcurrentDesignTimeQuery</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: true</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long name: sap.sl.bics.useFallbackWithKeyForMemberResolution</td>
<td>true</td>
<td>If text is not found, input is considered a key; 4.0 SP8 and 4.1 SP2+.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short name: useFallbackWithKeyForMemberResolution</td>
<td>false</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default value: false</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SAP BW Browsing Runtime Configuration

This section explains the runtime configuration to get the Multidimensional Expression (MDX) compliance information (detectMdxCompliance).

Previously, access to a dedicated system InfoArea (SystemMdxQueriesTopLevel) was hard-coded and you could not configure it. As of BI 4.0 SP5, you can configure this method.

- **Reverting to the infoArea configuration for the InfoArea dedicated system**
  You can still use this configuration on a new BW system, and it is very efficient for small systems. However, it does not scale up. This method is for BW systems prior to BW version 7.30.
  To activate this method, set the jvmArg to:

  ```
  sap.sl.bics.detectMdxCompliance=infoArea
  ```

  This is the default value for BI 4.0 up to version SP4.
  This is not the default value for BI 4.0 version SP5 and higher.
  This method works well with different languages.

- **Configuring the BO or BI system to access the BW system with an RFC call per InfoQuery**
  This method is for BW systems prior to version 7.30. It is still usable on new BW system, however it is not efficient for an InfoProvider with a lot of InfoQueries. For large systems, it is more efficient for retrieving information than the InfoArea system.
To activate this method, set the jvmArgs to:

```
sap.sl.bics.detectMdxCompliance=rfcPerInfoQuery
```

This is the default value.

- **Configuring the BI system to access the BW system with an RFC call**

  This method is for BW systems from version 7.30 and 7.31. Refer to SAP note 1647346.
  This method is less efficient than the former method for small systems, however the performance is good and it scales up. Internally, an RFC call is done for a cluster of SAP BW nodes. It does not have any max number limitations. All information is received with several RFC calls for a limited number of nodes.
  To activate this method, set the jvmArg to:

  ```
sap.sl.bics.detectMdxCompliance=rfcProperty
  ```

  This is not the default value.

  To override the number of nodes per RFC calls, set jvArm:

  ```
sap.sl.bics.mdxComplianceInfoPerRfc=100
  ```

  This is the default value. Folders appear in English.

- **Deactivation of the MDX compliant flag retrieval**

  All InfoQuery queries will be assumed to be flagged as MDX compliant. Only deactivate the MDX compliant flag retrieval if all InfoQuery queries are verified to be MDX compliant.
  To deactivate the MDX compliant flag retrieval, set the jvmArg to:

  ```
sap.sl.bics.detectMdxCompliance=false
  ```

  This is not the default value.

### 3.13 Building queries on SAP HANA views with SAP HANA Direct Access

You can build queries on SAP HANA views with SAP HANA Direct Access data providers.

You can use SAP HANA views as data sources to create reports without using universes. With SAP HANA Direct Access, a transient universe is generated on the fly so that you can create queries on a SAP HANA view. These queries are then executed for data retrieval in Web Intelligence reports.

SAP HANA Direct Access data providers can be created on relational connections or OLAP connections.

You can execute query scripts using SQL for relational connections, or MDX for OLAP connections. These connections can be defined and published from information design tool (IDT), universe design tool (UDT) or the Central Management Console (CMC).

As of the 4.2 SP5 release, each time you connect to an SAP HANA system, Web Intelligence updates the following session variables for managing workload in SAP HANA by creating workload classes and workload class mappings:

- USER
- APPLICATIONUSER
This feature is supported for both SAP HANA relational (JDBC/ODBC) and OLAP connections from HANA SP08 onwards.

You can also use SAP HANA connections based on SAP HANA 2.0.

**Restriction**
Only secured connections defined in the CMS are supported, you cannot use personal connections.

Every Web Intelligence client supports SAP HANA Direct Access.

SAP HANA Direct Access data providers support the same functions as other Web Intelligence data providers. You can:

- Rename a SAP HANA Direct Access data provider
- Duplicate an existing SAP HANA Direct Access data provider
- Delete/Remove an existing SAP HANA Direct Access data provider
- Purge data (and prompt answer values) for a SAP HANA Direct Access data provider
- Refresh data for a SAP HANA Direct Access data provider
- Edit an existing SAP HANA Direct Access data provider with the Query Panel
- Export data from an existing SAP HANA Direct Access data provider
- Merge SAP HANA Direct Access data provider objects with another data provider
- Create Variables/Formulas from SAP HANA Direct Access data provider objects

### 3.13.1 SAP HANA view metadata

A transient universe is a universe created at runtime for the purpose of a query. The universe is not persisted and cannot be accessed.

At the design time, Web Intelligence generates a transient universe that can display different metadata, depending on the connection type, relational or OLAP. At the runtime, the transient universe based on the SAP HANA view can be generated every time the SAP HANA view is modified in order to regenerate the query before executing it.

### SAP HANA view metadata for relational connections

The table below details the mapping between SAP HANA metadata and the relational transient universe metadata.

<table>
<thead>
<tr>
<th>SAP HANA view metadata</th>
<th>Relational universe metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes</td>
<td>Dimensions under folders representing their parent attribute views</td>
</tr>
</tbody>
</table>
### SAP HANA view metadata for OLAP connections

The table below details the mapping between SAP HANA metadata and the metadata displayed in Web Intelligence.

<table>
<thead>
<tr>
<th>SAP HANA view metadata</th>
<th>OLAP universe metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute views</td>
<td>Analysis Dimensions</td>
</tr>
<tr>
<td>Attributes</td>
<td>Dimensions under Analysis Dimensions</td>
</tr>
<tr>
<td>Calculated/Restricted columns</td>
<td>Dimensions representing their parent</td>
</tr>
<tr>
<td>Measure aggregations (SUM, COUNT, COUNT</td>
<td>Aggregate in Analysis Dimensions</td>
</tr>
<tr>
<td>DISTINCT, AVG, VAR, STDDEV MIN, MAX)</td>
<td>representing their parent attribute</td>
</tr>
<tr>
<td>SAP HANA variables</td>
<td>Universe prompt parameters (manageable</td>
</tr>
<tr>
<td>SAP HANA input parameters</td>
<td>in the query panel)</td>
</tr>
</tbody>
</table>

### SAP HANA view metadata for SAP HANA HTTP Info Access connections

The table below details the mapping between SAP HANA metadata and the OLAP transient universe metadata.
### SAP HANA view metadata

<table>
<thead>
<tr>
<th>Attribute views</th>
<th>OLAP universe metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>Measures</td>
</tr>
<tr>
<td>Attributes</td>
<td>Measures</td>
</tr>
<tr>
<td>Measures</td>
<td>Measures</td>
</tr>
<tr>
<td>Measure aggregations (SUM, COUNT, COUNT DISTINCT, AVG, VAR, STDDEV MIN, MAX)</td>
<td>By default, all SAP HANA measures are set to Delegated in SAP HANA universes or for SAP HANA Direct Access</td>
</tr>
<tr>
<td>Calculated/Restricted columns</td>
<td>Dimensions or measures, depending on the attribute type in SAP HANA Studio</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent-child Hierarchies</th>
<th>Level-based Hierarchies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent-child hierarchies under their key dimension</td>
<td>Level-based hierarchies under their key dimension</td>
</tr>
<tr>
<td>SAP HANA variables</td>
<td>Prompt parameters (manageable in the query panel)</td>
</tr>
<tr>
<td>SAP HANA input parameters</td>
<td>Prompt parameters (manageable in the query panel)</td>
</tr>
</tbody>
</table>

### 3.13.2 To build queries on SAP HANA views

You can build queries using a SAP HANA view as a data source.

**Procedure**

1. Open Web Intelligence and click the New icon in the File toolbar.
2. Click SAP HANA.
3. Select a secured SAP HANA connection.
4. Select a SAP HANA analytic view or a SAP HANA calculation view.
   - You can also search for a SAP HANA view on a given SAP HANA connection using the search bar. The search bar is case insensitive.
5. Click OK.
6. **Optional:** If the SAP HANA view you have selected has mandatory variables or input parameters with no default values, provide answers to the prompts in the Variable Manager wizard and click OK.
7. In the Query Panel, drag dimensions and measures you want to include in the query in the Result Objects pane.

   **Note**
   
   On an OLAP connection, the dimensional query panel opens so you can use the Member Selector on SAP HANA hierarchies. For SAP HANA HTTP connections, the features available in the query panel are equal to that of BEx queries.

8. Select the objects on which you want to define query filters and drag them to the Query Filters pane. To create a quick filter on an object, select the object in the Result Objects pane then click the Add a quick filter icon in the Result Objects toolbar.
9. Set the scope of analysis and other query properties.
10. Click Run Query.

Related Information

HANA query prompts in Web Intelligence [page 216]

3.13.3 Defining query limits

SAP HANA Direct Access data providers use transient universes, which means that they bypass universes and therefore do not offer the same range of settings compared to other data providers.

Your database administrator can set query limits directly at the connection level in Information Design Tool and Universe Design Tool for relational connections, or in the CMC for OLAP connections.

These limit the amount of data returned by a query:

- **Query Execution Timeout**: limits the time for the query execution. The limit is expressed in seconds.
- **Max Cells**: limits the number of cells returned by a query. This restricts the number of cells returned, but does not restrict the database from processing all cells in the query. It only limits the number once the databases has started to send rows.
  
  **i Note**
  This setting is only available for SAP HANA OLAP connections.

- **Max Rows**: limits the number of rows returned by a query. This restricts the number of rows returned, but does not restrict the database from processing all rows in the query. It only limits the number once the databases has started to send rows.
  
  **i Note**
  This setting is only available for SAP HANA relational connections.

Query limits are supported in SAP HANA Online mode.

Related Information

Retrieving partial results [page 161]
3.13.4 To define query limits for SAP HANA OLAP connections

You can limit the amount of time a query can run or the number of cells you want the database to retrieve.

**Context**

**Procedure**

1. On the CMC home screen, click **OLAP connections**.
2. Right-click an SAP HANA connection.
3. Click **Organize** > **Edit**.
4. In the **Maximum Number of Cells** and **Query Timeout** entry fields, set the limits you want to apply to the connection.

3.13.5 Managing mandatory variables with the Variable Manager

The **Variable Manager** is a wizard that lets you manage the variables of a data source. Use it to answer prompts for SAP HANA variables and input parameters in documents that use SAP HANA views as data sources.

The **Variable Manager** is displayed before the query panel so that you can:

- View available data source variables coming from the database
- Set or edit values for every data source variable
- Fix or prompt values of data source variables upon refresh with the **Set as prompt** option for each SAP HANA variable

The **Variable Manager** is available when you edit or add new data providers to a document based on an SAP HANA view. It is displayed automatically if the SAP HANA view has at least one mandatory input parameter or SAP HANA variable without a default value. If there are mandatory or optional input parameters or SAP HANA variables with default values, you can still access the **Variable Manager**. Click the **Variable Manager** icon (️) in the **Query Panel** to change the values or the prompts.

You can also use the default values defined in SAP HANA Studio. To do so, check the **Use BEx/HANA defined default values at runtime** option.
3.13.6 To merge or unmerge SAP HANA variables

You can merge or unmerge SAP HANA variables in a Web Intelligence.

**Context**

This is useful when a Web Intelligence document has multiple data providers based on the same SAP HANA view.

**Procedure**

1. Go to the document properties.
2. Check or uncheck *Merge prompts (BEx or HANA Variables)* to merge or unmerge SAP HANA variables.

3.13.7 Formulas for Web Intelligence HANA Direct Access data providers

Once you have created an SAP HANA Direct Access data provider in a Web Intelligence document, you can use the Data Provider functions.

The following table describes the expected values for the Data Provider functions based on SAP HANA Direct Access.

<table>
<thead>
<tr>
<th>Data Provider Function</th>
<th>Expected value for HANA Direct Access Data Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection(dp)</td>
<td>'DB Layer : <strong>&quot;my-dbLayer&quot;</strong>. DB Type : <strong>&quot;my-dbType&quot;</strong>' for SAP HANA Direct Access Data Provider (as for universe data providers)</td>
</tr>
<tr>
<td></td>
<td><strong>&quot;DB Layer : &quot;JDBC&quot;. DB Type : &quot;HANA&quot;&quot;</strong></td>
</tr>
<tr>
<td>DataProvider(obj)</td>
<td>Name of the data provider, for example, 'Query 1 on MyHANAView'</td>
</tr>
<tr>
<td>DataProviderKeyDate(dp)</td>
<td>Empty string ('')</td>
</tr>
<tr>
<td>DataProviderKeyDateCaption(dp)</td>
<td>Empty string ('')</td>
</tr>
<tr>
<td>DataProviderSQL(dp)</td>
<td>SQL/MDX script of the data provider, for example, 'SELECT * FROM COUNTRY'</td>
</tr>
<tr>
<td>DataProviderType(dp)</td>
<td>SAP HANA Direct Access</td>
</tr>
<tr>
<td>IsPromptAnswered([dp:]prompt_string)</td>
<td>Determines whether a prompt has been answered for this data provider</td>
</tr>
<tr>
<td>LastExecutionDate(dp)</td>
<td>Date on which a data provider was last refreshed</td>
</tr>
</tbody>
</table>
### Data Provider Function

<table>
<thead>
<tr>
<th>Data Provider Function</th>
<th>Expected value for HANA Direct Access Data Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>LastExecutionDuration(dp)</td>
<td>Time in seconds taken by the last refresh of a data provider</td>
</tr>
<tr>
<td>LastExecutionTime(dp)</td>
<td>Time at which a data provider was last refreshed</td>
</tr>
<tr>
<td>NumberOfDataProviders()</td>
<td>Number of data providers in a report</td>
</tr>
<tr>
<td>NumberOfRows(dp)</td>
<td>Number of rows in a data provider</td>
</tr>
<tr>
<td>RefValueDate()</td>
<td>Date of the reference data used for data tracking</td>
</tr>
<tr>
<td>RefValueUserResponse([dp]:prompt_string[:Index])</td>
<td>Response to a prompt when the reference data was the current data</td>
</tr>
<tr>
<td>UniverseName(dp)</td>
<td>Name of SAP HANA view used by SAP HANA Direct Access Data Provider</td>
</tr>
<tr>
<td>UserResponse([dp]:prompt_string[:Index])</td>
<td>Response to a data provider prompt</td>
</tr>
<tr>
<td>QuerySummary(dp)</td>
<td>Query Specification Summary used by SAP HANA Direct Access Data Provider</td>
</tr>
</tbody>
</table>

### 3.14 Building queries on SAP HANA views in SAP HANA Online mode

In SAP HANA Online mode, you can create Web Intelligence documents with live data leveraging the power of SAP HANA.

You can use SAP HANA Online mode to build queries on SAP HANA views and delegate every calculation or operation to SAP HANA. When you delegate calculations to SAP HANA, Web Intelligence no longer needs to fill its cache in order to create queries and can bypass the Query Panel. As a result, you can create queries on the fly in a transient universe. This enables quicker interactions between Web Intelligence and SAP HANA and provides better performance for data refresh.

The SAP HANA view metadata correspond to the transient universe available objects and are displayed in the Web Intelligence report outline as available objects. You can create or insert report blocks using these data source objects. In SAP HANA Online mode, every report operation that requires a calculation is delegated to SAP HANA via a query execution that only returns data you actually need.

If you need to use a feature or function that SAP HANA Online mode does not support, you can switch to the classic offline mode at any given time.

As of the 4.2 SP5 release, each time you connect to an SAP HANA system, Web Intelligence updates the following session variables for managing workload in SAP HANA by creating workload classes and workload class mappings:

- USER
- APPLICATIONUSER
- APPLICATION
- APPLICATIONCOMPONENTTYPE

This feature is supported for both SAP HANA relational (JDBC/ODBC) and OLAP connections from HANA SP08 onwards.
You can also use SAP HANA connections based on SAP HANA 2.0.

**Restriction**

SAP HANA Online mode is available for secured HANA connections only. You cannot use personal connections defined in Information Design Tool (IDT) or Universe Design Tool (UDT).

### 3.14.1 User interface limitations in Design mode

The *Design* mode is the default perspective when you create or modify a Web Intelligence document. However, since the online mode does not support every feature present in offline mode, there are few modifications in the user interface and menu toolbars.

#### Pane modifications

<table>
<thead>
<tr>
<th>Pane</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Documents Summary**         | Use this pane to read, print and edit the document summary.  
The following options can be checked/unchecked:  
- Refresh on open  
- Permanent regional formatting  
- Hide warning icons in charts  
- Merge prompts |
| **Navigation Map**            | Use this pane to navigate and switch through reports. |
| **Input Control**             | Use this pane to add or reset input controls and change filter values. You can also show the input control map. |
| **User Prompt Input**         | Use this pane to change the values set in prompt input for SAP HANA variables and input parameters.  

**Note**  
Only for the DHTML client. |
<p>| <strong>Available Objects</strong>         | In SAP HANA Online mode, the SAP HANA view metadata corresponding to the transient universe objects are displayed in the report outline as available objects for the document. |</p>
<table>
<thead>
<tr>
<th>Pane</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document Structure and Filters</strong></td>
<td>Use this pane to view and modify the document structure. The only change concerns the Hide cell/table and Format table options at the block table/chart/cell level. The following options can be checked/unchecked:</td>
</tr>
<tr>
<td></td>
<td>• Show table headers</td>
</tr>
<tr>
<td></td>
<td>• Show table footers</td>
</tr>
<tr>
<td></td>
<td>• Hide always</td>
</tr>
<tr>
<td><strong>Comments</strong></td>
<td>Use this pane to manage comments in your document.</td>
</tr>
<tr>
<td><strong>Shared Elements</strong></td>
<td>! Restriction</td>
</tr>
<tr>
<td></td>
<td>Shared elements aren’t supported in SAP HANA Online mode.</td>
</tr>
</tbody>
</table>

### Menu toolbar modifications

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quick Commands</strong></td>
<td>The <strong>Edit Query</strong> button is deactivated.</td>
</tr>
<tr>
<td><strong>Report Elements</strong></td>
<td>In the <strong>Behavior</strong> Tab, only the <strong>Hide</strong> option is enabled.</td>
</tr>
<tr>
<td><strong>Data Access</strong></td>
<td>• <strong>New Data Providers</strong> becomes <strong>New Data Source</strong>: users can add new SAP HANA views</td>
</tr>
<tr>
<td></td>
<td>• <strong>Purge Data</strong> becomes <strong>Reset Prompts</strong>: reset or purge answer values for SAP HANA variables or input parameters</td>
</tr>
<tr>
<td></td>
<td>• New menu called <strong>New Variable</strong>: insert new variables (measures only)</td>
</tr>
<tr>
<td></td>
<td>• The <strong>Merge Objects</strong>, <strong>Change Source</strong> and <strong>Export Data</strong> panes are deactivated</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>• The <strong>Group</strong> menu is deactivated</td>
</tr>
<tr>
<td><strong>Formatting and Page Setup</strong></td>
<td>• The <strong>Formula Bar</strong> is available with a restricted list of formula functions supported in SAP HANA Online mode. This means that the formula editor displays only functions/operators supported in SAP HANA Online mode.</td>
</tr>
<tr>
<td></td>
<td>• The <strong>Status Bar</strong> displays the current status of the document, either online or offline.</td>
</tr>
</tbody>
</table>
3.14.2 To create a document in SAP HANA Online mode

**Context**

**Procedure**

1. Click the *New* icon in the *File* toolbar.
2. Click *SAP HANA Online*.
3. Select a secured SAP HANA relational connection.
4. Select a SAP HANA calculation view or a SAP HANA analytic view.
   You can also search for a SAP HANA view on a given SAP HANA connection via the search bar.
5. Click *OK*.
6. Provide answers for the SAP HANA variables and input parameters.
7. Click *OK*.
   Objects are now visible in the report outline.
8. Drag and drop objects in the report to create or modify report blocks.

### Note

If you are querying a SAP HANA view that uses input parameters, then when you run the query, you can encounter prompts that require you to enter values for variables and parameters. The values available in the prompts come directly from the SAP HANA view.

3.14.3 To add a new data source

You can have multiple SAP HANA views for a single document.

**Context**

When you add a data source, its available objects are displayed in the report outline under the name of the SAP HANA view.
Procedure

1. Click *New Data Source*.
2. Select a secured SAP HANA relational connection.
3. Select a SAP HANA calculation view or a SAP HANA analytic view.
   You can also search for a SAP HANA view on a given SAP HANA connection using the search bar.
4. Click *OK*.

   **Note**

   If you are querying a SAP HANA view that uses input parameters, then when you run the query, you can encounter prompts that require you to enter values for variables and parameters. The values available in the prompts come directly from the SAP HANA view.

5. Provide answers for the SAP HANA variables and input parameters.
6. Click *OK*.
   New available objects are displayed in the report outline under the name of the SAP HANA view.

3.14.4 To remove a data source

When you remove a SAP HANA view data source from a document in SAP HANA Online mode, all report blocks based on this SAP HANA view are removed automatically from the document.

Context

Procedure

1. In the *Available Objects* pane, right-click an SAP HANA view you want to remove.
2. Click *Delete*.
3.14.5 To reset prompts

You can reset or purge all answer values for HANA variables or input parameters in a document in SAP HANA Online mode.

Context

Procedure

1. In the Data Access tab, click Reset Prompts.
2. When asked if you are sure you want to reset prompts, click OK.

3.14.6 To switch to Web Intelligence offline mode

You can go back to Web Intelligence Classic mode at any given time.

Context

SAP HANA Online mode does not support every feature available in Classic mode. When you leave SAP HANA Online and switch to Classic mode. Make sure that you save the document before disconnecting.

i Note

SAP HANA Online cannot be reactivated in the document you are working on once you have left it. If you leave SAP HANA Online without saving the document first, it is converted to a normal Web Intelligence document.

Procedure

1. In the Data Access tab in the toolbar, click Disconnect from SAP HANA. You are prompted to save the document before disconnecting. If you have not saved the document, click Cancel and save the document.
2. Click Disconnect.
3.14.7 Formulas, functions and operators in SAP HANA Online mode

You can add formulas in tables or charts using the formula editor. The formulas available in SAP HANA Online mode are restricted, and the formula editor will only display formulas that are available.

Refer to Using functions, formulas and calculations in Web Intelligence to see the full list of supported formulas, functions and operators.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended syntax keywords are not supported in SAP HANA Online mode.</td>
</tr>
</tbody>
</table>

3.14.8 Providing answers to SAP HANA variables or input parameters

The SAP HANA view that you have selected when you created a document might contain SAP HANA variables and input parameters that need to be answered before you can create queries.

Providing answers to SAP HANA variables or input parameters means that you declare a value for every variable of input parameter that requires one. In SAP HANA Online mode, you must answer SAP HANA variables and input parameters whenever you create or refresh a document.

When you answer variables or prompts that have a default value, it means that they are mandatory and that you must answer them. You can skip optional variables or prompts.

3.14.9 Refreshing data

In SAP HANA Online mode, you can refresh the entire document.

When you refresh a document in SAP HANA Online mode, every report block in the entire document is refreshed. Having multiple tables in a report generates multiple queries on SAP HANA that can affect performance.

You might run a single query for instance that is split between five different tables, all based on the same data provider. When you refresh the document, Web Intelligence generates five different queries on SAP HANA to refresh the five tables.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>If an SAP HANA view contains SAP HANA variables or input parameters, you will be prompted to provide prompt answers values before you can refresh the document.</td>
</tr>
</tbody>
</table>
Related Information

Providing answers to SAP HANA variables or input parameters [page 159]

3.14.10 Navigation paths

When drilling in SAP HANA Online mode, you drill along what is called a navigation path. It corresponds to the dimension hierarchies contained in the SAP HANA view on which the document you are working on is based.

In the Available Objects pane, you can view navigation paths. Using navigation paths, you can see how Web Intelligence drills in your data and navigate through SAP HANA objects.

The navigation path is generated from the level-based hierarchies of the SAP HANA view on which the document is based. To each level-based hierarchy corresponds a navigation path, and levels of a hierarchy correspond to levels of the navigation path.

3.14.11 To display navigation paths

Display navigation paths whenever you want to see how drilling has been performed on your data.

Context

Make sure your document is based on an SAP HANA view that contains level-based hierarchies.

Procedure

1. Click the Available Objects pane.
2. Click Arranged by at the bottom of the pane.
3. Click Navigation paths.

Results

You can now see the navigation path in the Available Objects pane.
3.14.12 Retrieving partial results

In the SAP HANA options, you can limit the results returned in data blocks by Web Intelligence when running a query.

The data retrieved is restricted by default to a limit of 5000 rows, and the timeout limit is set to 60 seconds.

If the retrieved data of at least one of the data blocks exceeds the limits set in the SAP HANA options, a partial result set is returned when you refresh the document. A warning icon displayed in the status bar and in the data blocks lets you know if they display partial results. It is possible to hide the warning icon displayed in a chart or a table. In the document properties, check *Hide warning icons in charts and tables.*

⚠️ Caution

Make sure that the values you enter correspond to the values set by your administrator at a connection level. If the values you enter in Web Intelligence exceed the values set by your administrator, they are not taken into account during the data retrieval.

Max Rows

If you want the database to return only a partial result set, you can limit the number of rows retrieved. Whenever the limit is exceeded, the query stops and the database returns a partial result set.

This option is available in the *Data Access > Options* menu.

Query Execution Timeout

You can set a time limit for queries. Whenever the timeout limit is exceeded, the query stops and the database returns a partial result set.

This option is available in the *Data Access > Options* menu.

Related Information

Max rows retrieved query property [page 97]
To set the maximum amount of time a query can run [page 99]

3.14.13 Displaying online query statistics per block

Use the *Online Query Statistics* command to see the query statistics for each data block in a Web Intelligence document based on SAP HANA online.
This command is only available in With Data mode inside the Design mode.

This option provides the following information:

- Data source: name of the SAP HANA view
- Last execution date: date when the query was last run
- Last execution duration: duration of the refresh
- Last execution time: time when the query was last run
- Number or rows: number of rows retrieved
- Status: indicates whether the data block displays a partial result set or all data

### 3.14.14 To display online query statistics per block

**Context**

**Procedure**

1. Right-click a data block.
2. Select Online Query Statistics.

### 3.15 Building queries on Core Data Services views

You can build queries on Core Data Service (CDS) views in Web Intelligence.

CDS views, also referred to as SAP S/4 HANA views, are created in SAP ABAP Developer Tools. As such, they can’t be consumed in Web Intelligence.

For Web Intelligence to recognize a CDS view, you have to convert it to a virtual BEx query directly in SAP ABAP Developer Tools. To consume CDS views as virtual BEx queries in Web Intelligence, make sure to ask your administrator to add the following line to the CDS view’s DLL file:

```plaintext
@analytics{query:true}
```

Once you have converted the CDS view to a virtual BEx query, create an OLAP connection using BICS connectivity either in the Information Design Tool or the Central Management Console, and publish it to a repository.
3.16 Building queries on relational connections using Free-Hand SQL statements

In Web Intelligence, you can use a Free-hand SQL (FHSQL) statement to query an RDBMS database.

FHSQL data providers are useful when you have complex SQL statements that use advanced database functions not supported by the standard semantic layer. You can copy, paste or write new statements using the Query Script Editor, define prompts with static lists of values, use existing secured relational connections to the database, and parse statements for SQL errors.

FHSQL data providers use secured relational connections which accept SQL statements. The BI administrator publishes these connections in the CMS using the SAP BusinessObjects Universe Design Tool or SAP BusinessObjects Information Design Tool.

In 4.2 SP4, a new connection security right gives BI administrators the possibility to decide whether creating and running custom SQL scripts is allowed on a given relational connections. If the right is denied, the connection doesn’t appear when creating a document based on an FHSQL data source or adding a new FHSQL data provider to an existing document. The Use connection for Free-Hand SQL scripts right can be managed in the Central Management Console. It is denied by default for every relational connection, and your BI administrator has to explicitly grant it. This right works together with the Query script – enable viewing (SQL, MDX…) right. Make sure that you have both rights granted.

<table>
<thead>
<tr>
<th>Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Intelligence supports Hadoop data sources, but custom SQL is not supported.</td>
</tr>
<tr>
<td>If you use SQL statements that return multiple result sets, only the first result set will be displayed; the others will be ignored.</td>
</tr>
<tr>
<td>You cannot use the Change Source Wizard with FHSQL queries.</td>
</tr>
</tbody>
</table>

Reusing Desktop Intelligence documents in Web Intelligence

Using the Report Conversion Tool, you can convert a Desktop Intelligence document into a Web Intelligence document based on FHSQL statement. You can then open the document in Web Intelligence and in the Query Panel edit the statement.

For more information on FHSQL report conversions, refer to the Report Conversion Tool Guide.
3.16.1 To build a query using a Free-hand SQL statement

You can query an RMDBS database using a Free-hand SQL (FHSQL) statement. As of SAP BusinessObjects Web Intelligence 4.2 SP4, you can now edit queries based on FHSQL data providers using the HTML interface.

Procedure

1. Click New Free-Hand SQL.
   You can also add a FHSQL data provider to an existing document by clicking the Data Access tab, then, in the Data Providers subtab, click Edit Add Query From FHSQL.
2. Select a relational connection.
3. Enter or paste a SQL statement.
4. Click Validate to check the statement for SQL errors.

   Web Intelligence runs the SQL against the database and displays any error message that the database returns. Refer to the following topic for keys you should not use: Unsupported keywords in FHSQL SQL statements [page 168]

   When you submit a modified SQL statement, it is checked first by the database. If the SQL is invalid, then the SQL changes are not applied. If the SQL is valid, the FHSQL data provider saves it and applies it automatically to the data source, making the following updates:
   - Any new SQL columns are added in the data source as new objects.
   - The SQL columns with the same name and data type as existing data source objects are retained.
   - Old data source objects are deleted if they did not map with the newly retrieved SQL columns.
5. Once you have resolved any SQL errors, click OK to accept the SQL statement.
6. In the Query Panel, you can do the following:
   - View the objects in the query.
   - Edit the properties of the data source objects.
   - Change the FHSQL connection.
   - Access the SQL for editing using the Edit SQL button.
7. Click Run Query.

3.16.2 The FHSQL data provider configuration options in the Query Panel

When you have set a valid connection to the data source, the FHSQL data provider connects to the database in order to parse the SQL.

If the SQL is valid, a set of result objects appears in the Query Panel. The following table lists the default values for the Object Properties in the Query Panel.
<table>
<thead>
<tr>
<th>Data source object property</th>
<th>Default values</th>
<th>Actions you can perform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Column name</td>
<td>Change the column or object name.</td>
</tr>
<tr>
<td>Qualification</td>
<td></td>
<td>Change the object qualification. Possible values include Dimension, Measure, and Attribute.</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td>Use values such as STRING, NUMBER, and DATE/DATETIME.</td>
</tr>
<tr>
<td></td>
<td>• Dimension for STRING and DATE/DATETIME data type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Measure for NUMBER data type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• STRING for SQL characters such as VARCHAR, LONGVARCHAR, and so on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• NUMBER for SQL numeric objects such as INT, FLOAT, DOUBLE, and so on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DATE for SQL Date, SQL DateTime or SQL Timestamp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>! Restriction</td>
<td>FHSQL does not support SQL BLOB/BINARY data types.</td>
</tr>
<tr>
<td>Aggregate Function</td>
<td>SUM for Measure. For other objects, there is no default value.</td>
<td>Change the object aggregation function for measures. Possible values include: None, Sum (by default), Max, Min, Count, Average</td>
</tr>
<tr>
<td>Associated Dimension</td>
<td>No default value</td>
<td>Change the object associated dimension for the attribute (ex-detail).</td>
</tr>
</tbody>
</table>
FHSQl Query Properties

In the Query Properties, you can edit the query name, change the connection, and manage the following refresh options:

<table>
<thead>
<tr>
<th>Refresh option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Rows Retrieved</td>
<td>By default, this option is disabled and there is no limit to the number of rows retrieved. You can set the range value to [0,¥]. If you do this, the FHSQl data provider limits the number of rows retrieved to the maximum rows given and returns a partial result set.</td>
</tr>
<tr>
<td></td>
<td>For more information on this option, see Max rows retrieved query property [page 97].</td>
</tr>
<tr>
<td>Max Retrieval Time (s)</td>
<td>By default, this option is disabled and there is no limit to the query execution time.</td>
</tr>
<tr>
<td></td>
<td>You can set the Max Retrieval Time (s) (in seconds) to the range value of [0,¥]. If you do this, the FHSQl data provider controls the query time; stopping it if it exceeds the given timeout. It returns a partial result set of whatever data is already fetched when the timeout occurred.</td>
</tr>
</tbody>
</table>

3.16.3 Using the @Variable and @Prompt functions in FHSQl SQL statements

You can use the @Variable and @Prompt functions in FHSQl statements in Web Intelligence.

For general information on working with these functions, refer to the Information Design Tool User Guide or the Universe Design Tool User Guide.

@Variable functions and FHSQl

You can use the @Variable syntax in SQL statements to insert BusinessObjects variables into the SQL. The FHSQl data provider substitutes these variables before executing the SQL.

Restriction

FHSQl does not support User Attributes as configurable in the CMC User Attribute Management area in the @Variable syntax.
@Prompt functions and FHSQl

When a user selects a value in a prompt, FHSQl data provider substitutes this value for the @Prompt syntax and then executes the SQL against the database to retrieve data.

When the FHSQl parses the @Prompt syntax in order to validate the SQL or get the data structure, the FHSQl data provider substitutes the @Prompt syntax with:

- Default values (if set)
- The first values of the associated static LOV (if set)
- Placeholders if no default values or static LOV are defined:

<table>
<thead>
<tr>
<th>Prompt Data Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRING</td>
<td>‘string’</td>
</tr>
<tr>
<td>NUMBER</td>
<td>0</td>
</tr>
<tr>
<td>DATE</td>
<td>Current Date</td>
</tr>
</tbody>
</table>

! Restriction
Optimal prompts are not supported.

3.16.4 Formulas for Web Intelligence FHSQl data providers

Once you have created a FHSQl data provider in a Web Intelligence document, you can use the Data Provider functions.

The following table describes the expected values for the Data Provider functions when you use a FHSQl statement to create a query.

<table>
<thead>
<tr>
<th>Data Provider Function</th>
<th>Expected value for FHSQl Data Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection(dp)</td>
<td>’DB Layer: &quot;my-dbLayer&quot;, DB Type: &quot;my-dbType&quot;’ (as for universe data providers)</td>
</tr>
<tr>
<td></td>
<td>For example, ’DB Layer: &quot;JDBC&quot;, DB Type : &quot;Oracle 11&quot;’</td>
</tr>
<tr>
<td>DataProvider(obj)</td>
<td>Name of the data provider, for example, ’SQL 1 on MyConnection’</td>
</tr>
<tr>
<td>DataProviderKeyDate(dp)</td>
<td>Empty string (’’)</td>
</tr>
<tr>
<td>DataProviderKeyDateCaption(dp)</td>
<td>Empty string (’’)</td>
</tr>
<tr>
<td>DataProviderSQL(dp)</td>
<td>SQL statement of the data provider, for example, ’SELECT * FROM COUNTRY’</td>
</tr>
<tr>
<td>DataProviderType(dp)</td>
<td>’FreeHandSQL’</td>
</tr>
</tbody>
</table>
Data Provider Function | Expected value for FHSQl Data Provider
--- | ---
IsPromptAnswered([dp;]prompt_string) | Determines whether a prompt has been answered for this data provider
LastExecutionDate(dp) | Date on which a data provider was last refreshed
LastExecutionDuration(dp) | Time in seconds taken by the last refresh of a data provider
LastExecutionTime(dp) | Time at which a data provider was last refreshed
NumberOfDataProviders() | Number of data providers in a report
NumberOfRows(dp) | Number of rows in a data provider
QuerySummary(dp) | Empty string ("")
RefValueDate() | Date of the reference data used for data tracking
RefValueUserResponse([dp;]prompt_string[:index]) | Response to a prompt when the reference data was the current data
UniverseName(dp) | Empty string ("")
UserResponse([dp;]prompt_string[:index]) | Response to a data provider prompt

### 3.16.5 Unsupported keywords in FHSQl SQL statements

Web Intelligence does not support certain DDL SQL keywords or commands in FHSQl SQL statements.

The unsupported DDL SQLs keywords and commands are:

- DROP TABLE [table]
- TRUNCATE TABLE [table]
- DELETE FROM `table` WHERE [condition]
- CREATE TABLE [table]
- ALTER TABLE [table]
- INSERT
- UPDATE
- ORDER BY

**i Note**

The ORDER BY keyword is supported but doesn’t sort your data in the report. As a workaround, you can either sort your data manually using the sorting feature, or use the RowIndex() function that returns the row number in the query result. Create a variable using the function and sort your data block with the RowIndex column. Note however that the sort on the RowIndex column is ignored if there are merged dimensions, or if Web Intelligence projected and aggregated data on topest levels.
3.17 Building queries on Analysis View data sources

SAP BusinessObjects Analysis is an OLAP analysis tool that allows users to interactively define analyses to explore data in OLAP data sources.

Users can export data in their analysis as Analysis Views, for use in other applications including SAP BusinessObjects Web Intelligence.

You can build queries on Analysis Views to analyze their data in Web Intelligence documents. The data in the Analysis View appears in the Query Panel as report objects such as hierarchies, dimensions and attributes.

**Note**

Queries built with SAP BusinessObjects Analysis and based on SAP HANA views are not supported in Web Intelligence. In general, Analysis Views with custom objects are not supported. Only analysis views coming directly from SAP BW are supported.

3.17.1 To build a query on an Analysis View

You can build a query on an Analysis View in the Web Intelligence Applet interface or Web Intelligence Rich Client.

**Procedure**

1. Open a Web Intelligence document in Design or Data mode, select Data Access New From Analysis View to display the Select an Analysis View dialog box.

2. To build a query using an Analysis view, do one of the following:
   - Click New in the File menu, select Analysis View and click OK.
   - In the Create a new Web Intelligence Document dialog box, select Analysis View as the data source.
   - In the Data Access tab, in the Data Providers subtab, select From Analysis View from the New Data Provider dropdown list.

3. Select the folder containing the Analysis View from the Folders list.

4. Select the Analysis View in the Side Panel.
   - The Query Panel appears, displaying the data in the Analysis View as a report object.

5. Click Run Query. When you have more than one query and you want to run just one query, click Run Queries and select the query that you want to run.
3.18  Building queries on web service data sources

In the Web Intelligence Rich Client, the Web Services plug-in enables you to create a document using "Document as a Web Service" (DaaWS) as a data source.

**Note**
You cannot use web service data sources in documents in the Web Intelligence Applet or HTML interfaces.

Although this plug-in is developed for DaaWS consumption, it can also be used for generic Web Service with the following properties:

- Simple Object Access Protocol (SOAP) 1.1
- Web Services Description Language (WSDL) 1.0
- Document and RPC literal
- Public WSDLs

For generic web services, Web Intelligence Rich Client does not support:

- Schemas with cyclic references
- Nested imports, only one level of imports is supported
- Attribute elements in an XML schema
- Schemas referring to specific platforms like Microsoft or Java types like: http://microsoft.com/wSDL/types/, maps, objects and so on.

**Note**
For information on how to develop, configure, and deploy Custom Data Provider Plug-in, see the Custom Data Provider Plug-in Developer Guide.

3.18.1  Prerequisite for using the Web Service plug-in

Before you use the Web Service plug-in to create a Web Intelligence document, the BI administrator must ensure you have a DaaWS or a generic web service WSDL as input to the Web Service plug-in. DaaWS exposes a set of Web Intelligence report part contents as a web service that can be called within and outside of Web Intelligence clients.

For more information on creating a DaaWS WSDL, see the related topic below.

**Related Information**

Sharing content with other applications [page 921]
3.18.1.1 Proxy settings for the Web Service plug-in

When using internet proxy server to access any URLs or WSDLs through the Web Service plug-in, the BI administrator must update the proxy settings in the `net.properties` file located at: `<BOBJ_INST_DIR>/SAP BusinessObjects Enterprise XI 4.1/win64_x86/jdk/jre/` with the following information:

- Provide the values for the following HTTP parameters:

  ```
  http.proxyHost=<http proxy hostname>
  http.proxyPort=<http proxy port number>
  http.nonProxyHosts=<http hosts for which proxy is not required>
  ```

  Where:
  - `proxyHost` is the name of the proxy server. For example, `proxy.mydomain.com`
  - `proxyPort` is the port number to use. By default, the value is 80.
  - `nonProxyHosts` is list of hostnames separated by `'|'` which can be accessed directly within the network, ignoring the proxy server. The default value is: `localhost & 127.0.0.1`

- Provide the following values for HTTPS parameters:

  ```
  https.proxyHost=<http proxy hostname>
  https.proxyPort=<http proxy port number>
  ```

  Where:
  - `proxyHost` is the name of the proxy server. For example, `proxy.mydomain.com`
  - `proxyPort` is the port number to use. By default the value is 443. The HTTPS protocol handlers use the `http nonProxyHosts` list.

  **Note**
  The `.pac` files are not supported. The BI administrator has to explicitly configure the proxy server in the proxy settings.

3.18.2 To build a query based on a web service

**Context**

You can build queries that use Document as a Web Service (DaaS) or any generic web service as a data source.

**Procedure**

1. Launch Web Intelligence Rich Client and connect to the CMS that is configured for web services.
2. To build a query using a web service as a data source, do one of the following:
- Click **New** in the **File** menu, and select **Web Services**.
- In the **Create a new Web Intelligence Document** dialog box, select **Web Services** as the data source.
- In the **Data Access** tab, in the **Data Providers** subtab, select **From Web Service** from the **New Data Provider** dropdown list.

3. Enter the URL from the QaaWS service in the **Source Path** text box and click **Submit**.

**i Note**
This URL must be to a CMS enabled for web services.

Sample URL: `http://dewdftv00458q.dhcp.corp:80/dsws/qawsservices/biws?WSDL=1&cuid=AcFqxUlczKVptBMyi4M1ziY`

Where:
- **Server name**: `http://dewdftv00458q.dhcp.corp:80/`
- **Web service**: `dsws/qawsservices/biws?WSDL=1&cuid=AcFqxUlczKVptBMyi4M1ziY`

The **Service Details** and **Message Details** sections appear in the same dialog box.

4. In the **Service Details** section, set the following if they are not configured by default:
   a. From the **Service Name** dropdown list, select the QaaWS service.
   b. From the **Port Name** dropdown list, select the port name.
   c. From the **Operation Name** dropdown list, select the operation name.

5. To enable SSO authentication, select the **SSO Enabled** check box.

**i Note**
If SSO has not been enabled on the CMS, this option is not visible in the dialog box.

If you select the **SSO Enabled** check box, the login and password cannot be configured.

In SSO authentication, the session ID of Web Intelligence is used for authentication. When you log onto Web Intelligence Rich Client using the Windows NT or Standalone authentication mode, the SSO option is disabled. Hence, you must enter the login credentials to access the web service. When logging into Web Intelligence Rich Client using any other authentication modes, you can either provide login and password information or use the SSO authentication mode to access web services.

**i Note**
The SSO authentication is supported only if the Web Intelligence Rich Client is connected to the CMS on which the web service is deployed. Otherwise, you must provide login credentials to access the web service. If the Web Intelligence Rich Client is connected to a different CMS, you cannot refresh the documents created by using SSO authentication.

6. If you are not using SSO authentication, provide authentication details:
   a. If the **SSO Enabled** option is available in the dialog box, ensure that it is not selected.
   b. In the **Message Details** section, from the **Input Message** list, select **login**, enter the CMS user name in the "Enter Value" text box.
   c. In the same list, select **password**, enter the password for the CMS user in the **Enter Value** text box, and click **Apply**.
To set a report filter for the GetReportBlock operation, do the following:

a. In the Message Details section, from the Output Message list, click + to expand the dimension on which a filter has to be applied.

b. Select an object, enter a value in the Enter Value text box, and click Apply.

c. Select operator, and select a value from the Select Value dropdown list.

Note
Specify the value and operator only for the dimensions to which you want to apply the filter.

To set filters for a generic web service, do the following:

a. In the Message Details section, from the Input Message list, select an input field, enter a value in the Enter Value field.

b. In the Output Message list, select output fields.

You must select at least one field in the Output Message panel. To select multiple fields in the Output Message panel, press the Control key, and select the fields.

9. Click Next.

Note
You can use the Reset button to remove the value for each field in the Message Details section of the Select Web Service details panel. The Reset All button can be used to remove the values for all the fields in the Message Details section.

Results

The Query Panel appears. Save the query and configure it as necessary.

Related Information

BI service structure [page 927]
GetReportBlock_<blockname> [page 927]
Drill_<blockname> [page 930]

3.18.3 To edit a query based on a web service

Procedure

1. In Web Intelligence Rich Client, open the document in Design or Data mode.

2. In the Data Access tab, in the Data Providers subtab, click Edit.
3. Edit the following query parameters in the Query Panel:
   - **Object Properties**: You can edit the object properties such as name, qualification, type, aggregate function, and aggregate dimension.
   - **Query Properties**: You can edit query properties such as Name, Source URL, Refreshable, and Editable.

   **Note**
   If you edit the source URL in the Query Panel, ensure that the new URL from the QaaWS service has the same structure as the WSDL that it replaces.

   - **Query Definition**: You can edit the query definition by clicking Edit settings.

4. Click Run query to apply your changes.

**Results**

A new report is displayed.

**Next Steps**

For information on creating Custom Data Provider plug-in, see the Custom Data Provider Plug-in Developer Guide.

### 3.19 To create a query on a different data source in an existing document

If you have the right to edit queries in the Web Intelligence Rich Client or Applet interface, then you can select additional data sources in an existing document.

**Procedure**

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, select a data source from the New Data Provider dropdown list.
3. Build and run the query.
3.20 The Data mode in Web Intelligence

You can use the Data mode in the Web Intelligence Applet interface and Web Intelligence Rich Client to view, explore and manage all the queries in a document.

In Data view, only the toolboxes in the Data Access tab are available.

**i Note**

Data mode is not available in the Web Intelligence HTML interface.

3.20.1 To view and filter the data in a data provider

You can filter data in a data provider based on the values you specify.

**Procedure**

1. Open a Web Intelligence document in Web Intelligence Rich Client or the Web Intelligence Applet interface in Data mode.
2. Double-click a data provider to open it.

**i Note**

If the data provider contains multiple contexts or grouping sets, they appear in a dropdown list at the top right of the list pane. Each context or grouping set appears as Result n. Select a context or grouping set from the list to display its data.

3. To filter the data, click the arrow on a column header and do one of the following:
   - Select a value from the dropdown list.
   - Select Custom and define a custom filter.
     
     A custom filter contains a filter operators and values that you select from the list of values or type directly. The number of values you can specify depends on the operator. The custom filters are as follows:

<pre><code> | Operator       | Description         |
 |----------------|---------------------|
 | is anything    | The data is not filtered. |
</code></pre>
<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>is</td>
<td>The data is equal to a single value, which is the same action as selecting a single value from the dropdown list.</td>
</tr>
<tr>
<td>does not equal</td>
<td>The data is not equal to a single value. All values apart from that value are displayed.</td>
</tr>
<tr>
<td>is in</td>
<td>The data is in a list of values. Only the selected values are displayed.</td>
</tr>
<tr>
<td>is not in</td>
<td>The data is not in a list of values. All values apart from the selected values are displayed.</td>
</tr>
<tr>
<td>is empty</td>
<td>Only rows with empty values are displayed.</td>
</tr>
<tr>
<td>is not empty</td>
<td>Only rows with non-empty values are displayed.</td>
</tr>
<tr>
<td>begins with</td>
<td>Only rows that begin with the text you type are displayed.</td>
</tr>
<tr>
<td>ends with</td>
<td>Only rows that end with the text you type are displayed.</td>
</tr>
<tr>
<td>contains</td>
<td>Only rows that contain the text you type are displayed.</td>
</tr>
<tr>
<td>does not contain</td>
<td>Only rows that do not contain the text you type are displayed.</td>
</tr>
</tbody>
</table>

The filter also restricts the display in the other column. For example, if you filter the column for the Customer dimension to show three values only, the Order Amount column displays only the values that correspond to the remaining Customer values.

### 3.20.2 To switch to Data mode

In the Web Intelligence Applet interface or Web Intelligence Rich Client you can access the Data mode.

**Procedure**

1. Open a Web Intelligence document in the Web Intelligence Applet interface or Web Intelligence Rich Client.

   **Note**
   
   Data mode is not available in the Web Intelligence HTML interface.

2. Click Data in the top toolbar.

   The data providers used in the query are listed, along with information about the data provider, such as the number or rows it contains and its last refresh date.
3.20.3 To manage queries using the Data Manager

You can view, explore and manage all the queries in a document using the Data Manager.

Context

The Data Manager lists all the queries and allows you to perform actions such as renaming a query or changing the source of the data on which a query is based.

Procedure

1. Open a Web Intelligence document in Web Intelligence Rich Client or the Web Intelligence Applet interface in Data mode.
   The Data mode lists the objects in the selected query. Only the toolbox items relevant to managing queries are available.
2. Do one of the following:
   ○ To refresh a query, right-click it in the list and select Refresh.
   ○ To edit a query, right-click it and select Edit, or in the Data Providers tab, click Edit. The Query Panel for the query you selected appears.
   ○ To purge a query of data, do one of the following:
     ○ Right-click it and select Purge from the menu.
     ○ Click Purge in the Data Provider tab.
   ○ To delete a query, right-click it in the list and select Delete.
   ○ To rename a query, right-click it and select Rename, then type the new name.
   ○ To copy a query, right-click it in the list and select Copy.
   ○ To change the data source:
     ○ In the list of data providers, right-click the query whose source you want to change and select Change Source.
     ○ In the Data tab in the Side Panel, right-click the data source or query and select Change Source.
     ○ In the Data Access tab, in the Tools tab, click Change Source and select the query whose source you want to change. In the case where you are changing the data source for more than one query based on the same data source, select one of the queries that uses that data source.

   The Change Source Wizard appears. See To change the data source of a query [page 187] for information on using this wizard.

Related Information

Changing the data source of a query [page 183]
3.21 To open for edit the data provider of an existing query

If you are able to edit queries, then you can open the Query Panel to edit the data provider.

**Procedure**

1. Open a Web Intelligence document in *Design* or *Data* mode.
2. Do one of the following:
   - In the toolbar above the Side Panel, click the *Edit data provider* button.
   - In the *Data Access* tab, in the *Data Providers* subtab, click *Edit*.

**Results**

The *Query Panel* appears.

3.22 To set the keydates of queries

You can set keydates in a query that uses an SAP BW data source.

**Procedure**

1. Open a Web Intelligence document in *Design* or *Data* mode.
2. In the *Data Access* tab, in the *Data Providers* subtab, select *Keydates*.
3. Select *Use the default date for all queries* to set each query to its default keydate.
4. Select *Set date for all queries* and choose the date to specify a keydate for all queries.
5. Select *Prompt users when refreshing data* to display a prompt for the keydate whenever a query containing a key date is refreshed.

**Results**

To change keydate value variables, open the query for edit in the *Query Panel* and click the *Set Variables* icon.
3.23 To preview query results

You can activate a preview pane in the Query Panel.

Prerequisites

You have defined the result objects and filter objects in the Query Panel.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click Show/Hide Data Preview Pane on the Query Panel toolbar to display the Data Preview pane.

3.24 To sort query results

You can sort the results returned by a query.

Context

The sorts are added directly to the script generated by the query and the database returns the query results already sorted.

For example, sorts added to queries that generate SQL appear in the ORDER BY clause of the generated SQL.

Note

Sorting is not available in queries based on OLAP data sources.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Click **Sort** on the **Result Objects** toolbar to display the **Sort** dialog box.
3. Click **Insert sort object** and select an object in the **Select an Object** dialog box.
4. Select the sort direction from the **Sort type** list.
5. Repeat the previous steps to add additional sorts to the query.
6. Select an object and click **Delete selection** to remove a sort from the query, or click **Delete All** to remove all sorts from the query.
7. Click **OK** to close the **Sorts** dialog box.
   The sorts are added to the script generated by the query.

**Related Information**

To open for edit the data provider of an existing query [page 178]

### 3.25 Interrupting and canceling queries

You can interrupt or cancel a query before all the data is returned to the document and choose the data you want to display.

When you click **Cancel** in the **Retrieving Data** dialog box, in most cases Web Intelligence directs the database to stop processing the query and gives you back control of the document.

Query cancellation relies heavily on the type of database Web Intelligence is running on. Not all databases can interrupt queries which can impact the behavior of Web Intelligence. The cancellation is either handled by the database itself or by Web Intelligence.

Databases that support query cancellation are listed below.

- Relational
- OLAP
- SAP HANA Direct Access
- Personal Data Providers

When a database supports query cancellation, it interrupts the query which allows Web Intelligence to give you back control of the document. The returned results are partially updated and the values displayed in the document do not accurately reflect the definition of the query.

When a database does not support query cancellation, the query cannot be interrupted. Web Intelligence still gives you back control of the document, but the abandoned query continues to run in the background. To avoid slowing down both database and Web Intelligence performance, the limit of abandoned queries has been set to 10 by default.

If you try to cancel a query after this limit has been reached, Web Intelligence only gives you back control of the document when one of the other abandoned pending queries is complete, or when the current query refresh action is complete.
iNote

In the Web Intelligence HTML interface, when you cancel an ongoing query, the Web Intelligence HTML interface returns to the previous state of the document, and the option to interrupt data retrieval is not available.

BW databases

BW databases are a specific case. They do not support query cancellation after you have ordered a refresh command. When you cancel a query, Web Intelligence sends a cancel order to the database so that you can get back control of the document. However, the refresh action will still be carried out and completed in the background by the database.

3.25.1 To interrupt or cancel a query

You can use Web Intelligence to interrupt or cancel a query.

Context

Procedure

1. In a Web Intelligence document, click the Refresh icon.
2. In the Retrieving Data dialog box, click Cancel.
3. Select one of the following options in the Interrupt Data Retrieval dialog box:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restore the results from the previous data retrieval.</td>
<td>Restores the values to the document that were retrieved the last time the query was run or when the query was abandoned. The values displayed will not be the most up-to-date information available on the database. You can run the query later to retrieve the up-to-date values from the database.</td>
</tr>
<tr>
<td>Purge all data from the document.</td>
<td>Displays the document empty of values. The structure and formatting of the document is retained. You can run the query later to return the up to date values from the database.</td>
</tr>
<tr>
<td>Return the partial results.</td>
<td>Displays the new values retrieved so far in the appropriate parts of the document. The rest of the document will display the values retrieved the last time the query was run or abandoned.</td>
</tr>
</tbody>
</table>

4. Click OK.
3.26 To remove a query

You can remove a query in the Query Panel.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
   The Query Panel appears.
3. At the bottom of the Query Panel, select the tab for the query you want to remove.
4. Right-click and select Delete.
5. Click Run Query.

Related Information

To open for edit the data provider of an existing query [page 178]

3.27 To duplicate a query

You can duplicate a query in the Query Panel.

Prerequisites

You must run the query first before you are allowed to duplicate it.

Context

→ Tip
If you want to build a different query on a universe already included in the document, instead of starting from scratch, duplicate the existing query on that universe and then modify it.
Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. At the bottom of the Query Panel, select the tab for the query you want to duplicate.
4. Right-click the tab and select Duplicate.
5. Click Run Query.

Related Information

To open for edit the data provider of an existing query [page 178]

3.28 Changing the data source of a query

You can change the data source of a query using the Change Source Wizard.

The Change Source Wizard is useful, for example, when you want to develop a document on a universe in a test environment, and then change to the universe when it has been moved or copied to the production environment.

You can also use the Change Source Wizard to change the source of a universe created with the universe design tool (UNV) to the same universe when migrated to the information design tool (UNX).

When you change the data source, you must map the objects coming from the current data source and used in the document to objects in the target data source.

! Restriction

The Change Source Wizard is not available for Free-hand SQL queries, Excel, CSV, Text files, Analysis Views, and Web Service data sources. Open the Query Panel, and in the Query Properties tab, select a different Source Path file.

Supported paths

The following table lists the data source options supported by the Change Source Wizard.
<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
<th>UNV universe</th>
<th>UNIX universe on relational data source</th>
<th>UNIX universe on OLAP data source</th>
<th>UNX BEx query universe</th>
<th>SAP HANA Direct Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNV universe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UNIX universe on relational data source</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UNIX universe on OLAP data source</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UNX BEx query universe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SAP HANA Direct Access</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**i Note**

When changing between these two sources, extensive remapping of objects may be required.

As of the 4.2 SP3 release, additional paths are supported:

- SAP BW Direct Access > SAP BW Authored Universe
- SAP BW Direct Access > SAP HANA Direct Access
- SAP HANA Authored Universe > SAP HANA Direct Access

When you change the document from any data source type to a BEx query that has mandatory variables with no default values, Web Intelligence applies the most appropriate values to the variables.

**What if I have custom SQL scripts?**

As of the 4.2 SP5 release, custom SQL scripts are preserved after a change source if they meet the following criteria:

- The query language of the target source is the SQL language script (as opposed to MDX, for instance).
- The target source is based on a relational universe or a SAP HANA Direct Access using a relational connection.
- The target source supports the custom SQL option.
- The data structure is maintained in the target query:
  - The number of result objects is the same.
  - The data-type for each result object is the same.
  - The combined queries structures, if there are combined queries based on custom SQL scripts, are the same.
There is no SQL checking during the change source process. Web Intelligence runs a SQL check when you refresh the document after the change source.

**Related Information**

- Object validation rules [page 186]
- Web Intelligence mapping strategies for data sources [page 185]

### 3.28.1 Web Intelligence mapping strategies for data sources

The Web Intelligence *Change Source Wizard* uses a list of criteria to map objects in data sources.

By default, the *Change Source Wizard* uses the following mapping order strategy.

<table>
<thead>
<tr>
<th>Strategy Name</th>
<th>Strategy Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same ID</td>
<td>To map with a valid object that has the same ID</td>
</tr>
<tr>
<td>Same technical name</td>
<td>To map with a valid object that has the same technical name, if it exists.</td>
</tr>
<tr>
<td>Same path</td>
<td>To map with a valid object that has the same path, the path including both the objects name and type.</td>
</tr>
<tr>
<td>Closest name</td>
<td>To map with a valid object that has the closest name. If Web Intelligence encounters several objects with the same name but different object types, then it selects the first one in list based on the ID.</td>
</tr>
<tr>
<td>Same name</td>
<td>To map with a valid object with exactly the same name.</td>
</tr>
</tbody>
</table>

The *Change Source Wizard* applies these strategies in the following order, until it finds an object to map in the target data source:

- Same ID
- Same technical name
- Same path
- Closest name

If no matching object is found in the target data source, the *Change Source Wizard* flags it for removal. However, you can still select the strategies to apply.

### Mapping results

Depending on the number of objects in your query, it can take a few seconds for Web Intelligence to show the list of mapped objects. You can check the results of the mapping with the *Change Source Wizard*. The icons displayed next to each object that has been mapped indicate the result of the mapping.
Change Source Wizard object map icons

<table>
<thead>
<tr>
<th>Object map icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="checkmark" alt="Green" /></td>
<td>The object has been mapped successfully.</td>
</tr>
<tr>
<td><img src="lock" alt="Green" /></td>
<td>The object has been mapped, however the path is ambiguous. An ambiguous mapping occurs when the current data source object does not have the same name or path as the recommended object in the target universe. This icon remains even if you decide to manually map the object.</td>
</tr>
<tr>
<td><img src="exclamation" alt="Exclamation" /></td>
<td>A source object could not be found in the data source because either the data source is no longer available or the object was removed from the data source.</td>
</tr>
<tr>
<td><img src="exclamation" alt="Exclamation" /></td>
<td>The source object type could not be deduced from the current context.</td>
</tr>
<tr>
<td>![Exclamation] (X)</td>
<td>Web Intelligence cannot map this object to any object in the target data source. The object appears as Remove object in the target data source.</td>
</tr>
</tbody>
</table>

! Restriction
If you do not assign to it an object from the target data source, the unmapped object is permanently removed from the query when you complete the data source change.

Related Information

- Changing the data source of a query [page 183]
- Object validation rules [page 186]

3.28.2 Object validation rules

The change source algorithm enforces rules that define what objects are valid for mapping.

Combined with the selected strategies, the following rules can help you fine-tune the change of data source:

- A validation rule based on object type
- A validation rule based on object data type

Mapping setting options

<table>
<thead>
<tr>
<th>Mapping settings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same object type only</td>
<td>Select this option to map to an object of the same type.</td>
</tr>
</tbody>
</table>
### Mapping settings

<table>
<thead>
<tr>
<th>Mapping settings</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Similar object type** | Select this option to map to an object that is of a similar type.  
When you select this option, the following rules apply:  
- A dimension can only be mapped to a hierarchy, a level, a dimension attribute or a measure attribute.  
- A dimension attribute can only be mapped to a dimension.  
- A dimension or measure attribute can only be mapped to a dimension.  
For example, if you want to convert a Dimension object to a Hierarchy object, you can choose **Similar object type** for the mapping setting. |
| **Any object type** | Select this option to allow a mapping to any object type.                                                                                      |
| **Same data type only** | Select this option to map to an object of the same data type.                                                                                 |
| **Similar data type** | Select this option to allow a mapping to an object of a similar data type.  
When you select this option, the following rules apply:  
- An object of data type Member to an object of any data type  
- An object of any defined type to an object of type Member  
- Object of type Date, DateTime, Time, or CalendarDate type to any object of type Date, DateTime, Time, or CalendarDate. |
| **Any data type**   | Select this option to allow a mapping to an object of any data type.                                                                           |

### Related Information

Changing the data source of a query [page 183]
To change the data source of a query [page 187]

### 3.28.3 To change the data source of a query

Where possible, current and target objects are mapped by default based on their name, object type, data type and location in the data source.

### Context

**i Note**

- When using an Excel, Free Hand SQL, web service, CSV or Text data source, the **Change Source** option is not available. Open the **Query Panel**, and in the **Query Properties** tab, select a different **Source Path** file.  
- If the query contains custom SQL, it will be lost during the change source operation.
**Procedure**

1. Do one of the following:
   - In the *Design* mode:
     - In the list of data providers, right-click the query whose source you want to change and select *Change Source*.
   - In the *Data* mode:
     - In the list of data providers, right-click the query whose source you want to change and select *Change Source*.
     - In the *Data* tab in the Side Panel, right-click the data source or query and select *Change Source*.
     - In the *Data Access* tab, in the *Tools* subtab, click *Change Source* and from the dropdown list, select the query whose data source you want to change.

2. Specify whether you want to work with an existing data source that is already used in the document or a new one.

   **Note**
   When you have other queries in your document based on the data source you have selected, use the *Apply changes in all queries sharing the same data source* option to apply the data source changes to all these queries. If you select this option, then the *Object Mapping list* shows all objects from all the queries in the same list.

3. Click *Next*.

4. **Optional**: If your target data source has mandatory HANA variables or BEx variables without default values, provide answers the prompts in the *Set Variables* or *Variable Manager* dialog boxes and click *OK*.

5. Define a mapping strategy order using the left and right arrows to add or remove strategies, and the up and down buttons to order them as you see fit.

   While editing the mapping strategy, you can also edit the mapping settings by clicking the *Settings* button. To know more about the mapping settings, refer to the *Object Validation Rules* section.

6. Click *Next*.

7. **Optional**: If you want to fine-tune the automatically generated mapping results, click the checkbox next to an object whose mapping you want to edit and click *Strategies* to create your own custom mapping strategy.

   **Tip**
   You can also map an object manually. To do so, click the ... button next to an object you want to edit and select an object.

8. Click *Finish*.

9. Save the document to apply the change source.

**Related Information**

To open for edit the data provider of an existing query [page 178]
3.28.4 Changing the source path of a custom data provider

When using an Excel file, Free-hand SQL or a text file as a data source, the Change Source option is not available. However you can change the source path of custom data providers. Changing the file path enables you to modify the access path to a custom data provider you are using as a data source. Change the source path whenever you have moved your original data source and need to indicate its new path.

In the Query Properties tab of the Query Panel, use the ... (browse) button to indicate a different source path. The new source path must point to the original data source. For FHSQ data sources, the browse button enables you to indicate any valid connection available.

Restriction

In the HTML interface of the 4.2 SP3 release, you cannot change the file path of an Excel data provider.

3.29 Working with multiple queries and data providers

You can include one or multiple queries in a document. These queries can be based on any supported data source.

For example, you can include product sales data and customer data in the same document. In this case, your corporate data for product line sales is available on one universe and customer data is available on another universe. You want to present product line sales results and information on customer age groups in the same report. To do this, you create a single document that includes two queries; one query on each universe. You can then include and format results from both queries in the same report.

Defining multiple queries in a single document is necessary when the data you want to include in a document is available in multiple data sources, or when you want to create several differently-focused queries on the same data source. You can define multiple queries when you create a document or add more queries to an existing document. You can present the information from all of the queries on a single report or on multiple reports in the same document.

Note

We recommend that you use no more than 15 data providers in a Web Intelligence document. The amount of data providers you use can affect the time it takes to refresh document data and even the performance of the Web Intelligence Processing Server.
3.29.1 Multiple queries, combined queries and synchronized queries compared

Multiple queries can be related in a document in different ways.

- Basic multiple queries draw unrelated data from different sources.
- Synchronized queries relate the data from different queries around a dimension that contains data common to both queries. These dimensions are called merged dimensions. You merge dimensions after you have created and run your multiple queries.
- Combined queries generate SQL containing the \texttt{UNION}, \texttt{INTERSECT} and \texttt{MINUS} operators (if the database supports them) or simulate the effect of these operators. Combined queries allow you to answer complex business questions that are difficult to formulate using standard queries.

\begin{tabular}{|l|l|}
\hline
\textbf{Option} & \textbf{Description} \\
\hline
\textlt{Insert a table in a new report} & Display the data in a new report in the document \\
\hline
\textlt{Insert a table in the current report} & Display the data in the currently selected report in a new table \\
\hline
\textlt{Include the result objects in the document without generating a table} & Include the data in the document without displaying the data on a report. \\
\hline
\end{tabular}

You can add queries to an existing document.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit. The Query Panel appears.
3. Click the Add a combined query icon in the toolbar.
4. Select a data source, if necessary.
5. Select objects for the additional query.
6. Click Run Query.
7. In the New Query box, specify in how the added data should be displayed:
8. Click OK.

Related Information

To open for edit the data provider of an existing query [page 178]
To build a query on an Analysis View [page 169]
To create a query based on a BEx query that has no variables [page 132]
To build a query on a universe [page 76]
Building queries on data files [page 107]
To build a query based on a web service [page 171]

3.30 Defining queries as refreshable

You can select the queries to refresh when refreshing a document.

After you have refreshed a document that contains several data providers once, you can decide not to refresh specific queries for further refreshes. In this case, the data provider keeps the dataset retrieved from the previous refresh and stored in the document cube. This improves refresh performance when you do not need to refresh queries whose data you know do not evolve in time, as there is no need to fetch the database to retrieve results.

The following data providers can be declared as refreshable:

- Excel
- Text
- FHSQML
- Relational universes (.UNV or .UNX)
- Multidimensional universes (.UNX)
- SAP BW
- SAP HANA Direct Access

You declare queries as refreshable when editing them in the Query Properties dialog box by checking the Refreshable checkbox. Clicking the dropdown menu next to the refresh icon lets you know which queries are set as refreshable. You can also check the status of a query using the QuerySummary() function.

If you have not defined at least one query as refreshable, the Refresh icon is disabled. Otherwise, in the dropdown menu next to the Refresh icon, only the refreshable queries are enabled and can be individually refreshed.
3.31 Refreshing queries in parallel

Parallel Data Provider Refresh feature improves data refresh performance in Web Intelligence documents that contain multiple data providers.

To refresh queries in parallel, Web Intelligence spreads all data providers on several threads. This feature is activated by default, and Web Intelligence can refresh up to 64 queries in parallel. Data providers based on relational, OLAP and BICS connections are supported, as well as personal data providers (text files, FHSQl).

Restriction
Excel data providers are not supported.

You can decrease that value in the Central Management Console if the hardware running Web Intelligence does not support such a workload. Make sure that your hardware has enough cores to guarantee optimal performance.

Two global parameters are available in the Central Management Console:

- Maximum Parallel Queries per document: set the maximum number of data providers Web Intelligence can refresh in parallel per document. The default value is set to 64.
- Enable Parallel Queries for Scheduling: enable or disable the parallel query processing when scheduling documents. This option is enabled by default.

We also encourage you to fine-tune each database connection with a parameter that lets you specify the number of queries that can be run in parallel. This parameter, called Maximum parallel queries, is available:

- In the Central Management Console or Information Design Tool for OLAP and BICS connections.
- In Information Design Tool or Universe Design Tool for relational connections.

For each connection, the number of data providers that can be refresh in parallel is set to 4 by default. The database administrator can change this value according to the database hardware. For text files however, the default value is set to 1.

Example
In this example, all default values have been kept and each connection supports a maximum of 4 parallel refresh jobs.

<table>
<thead>
<tr>
<th>Connection</th>
<th>Number of Data Provider to Refresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 OLAP connections</td>
<td>6 (5 on Connection 1, 1 on Connection 2)</td>
</tr>
<tr>
<td>1 Relational connection</td>
<td>2</td>
</tr>
</tbody>
</table>
### Connection

<table>
<thead>
<tr>
<th>Connection</th>
<th>Number of Data Provider to Refresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BICS connection</td>
<td>2</td>
</tr>
<tr>
<td>Excel files from a personal data provider</td>
<td>2</td>
</tr>
</tbody>
</table>

Both Excel files are refreshed sequentially as they are not supported by the parallel data provider refresh feature.

Four of the data providers of the first OLAP connection are refreshed in parallel on threads 1, 2, 3 and 4. The fifth one is queued and will be processed after one of the data provider (of any connection) has been refreshed, while the one coming from the second OLAP connection is refreshed on thread 5 since it is from a different connection.

The four data providers of both relational and BICS connection are refreshed in parallel on threads 5, 6, 7 and 8.

**Note**

Whenever there are more data providers of the same type than the defined value, they are queued and wait for other data providers to finish.

### Related Information

- To modify the number of data providers refreshed in parallel per document [page 193]
- To disable parallel query processing for scheduling [page 194]
- To modify the number of data providers refreshed in parallel for a specific OLAP connection [page 194]

### 3.31.1 To modify the number of data providers refreshed in parallel per document

#### Context

#### Procedure

1. On the CMC home screen, click *Servers*.
2. Click *Web Intelligence Services*.
3. Right-click *Web Intelligence Processing Server* and click *Properties*.
4. In the *Maximum Parallel Queries* entry field, enter a number.
   The possible values range from 0 to 64.

   **Note**
   If you enter 0, you disable the parallel data provider refresh function.

### 3.31.2 To disable parallel query processing for scheduling

**Context**

**Procedure**

1. On the CMC home screen, click *Servers*.
2. Click *Web Intelligence Services*.
3. Right-click *Web Intelligence Processing Server* and click *Properties*.
4. Uncheck *Enable Parallel Queries for Scheduling*.

### 3.31.3 To modify the number of data providers refreshed in parallel for a specific OLAP connection

**Context**

**Procedure**

1. On the home screen, click *OLAP Connections*.
2. Browse the connection you want to configure and right-click it.
3. Select *Organize* ➔ *Edit*. 
4. In the *Maximum Parallel Queries* entry field, enter a number. The possible values range from 1 to 64.

**Note**
If you enter 1, data providers will be refreshed sequentially.

## 3.32 Filtering data using query filters

Query filters are defined on the query; they limit the data retrieved from the data source and returned to the document. Query filters allow you to:

- retrieve only the data you need to answer a specific business question
- hide the data you don’t want specific users to see when they access the document
- minimize the quantity of data returned to the document to optimize performance

For example, you can filter the Year dimension to view only sales revenue for Year 2003; or filter the Annual Income dimension to view only customers whose annual income is equal to or greater than $1.5M.

**Example**

**In Q4 2002, which stores in my sales region gained margins above $130K?**

As Regional Marketing Manager for Texas, you are only interested in analyzing margins for Texas, but the sales universe includes data US-wide. In addition, you only want to view information for stores where margins reached over your 4Q 2002 quarterly target figure of $130K. To create a document with only the information you need, you apply a filter on the State, Year, and Quarter dimensions and a filter on the Margin measure.

Filter objects

```
AND
Year Equal to 2002
Quarter Equal to Q4
State Equal to Texas
Margin Greater than or equal to 130000
```

To avoid displaying the filtered values Texas, 2002, and Q4 in the table columns Year, Quarter, and State, you exclude the Year, Quarter, and State objects from the Result Objects pane. When you generate the report, the report values correspond to Texas stores with 4Q 2002 margins greater than or equal to $130K:

<table>
<thead>
<tr>
<th>Store name</th>
<th>Sales Revenue</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-Fashion Houston</td>
<td>307,914</td>
<td>133,802</td>
</tr>
<tr>
<td>e-Fashion Houston Leighton</td>
<td>316,232</td>
<td>136,055</td>
</tr>
</tbody>
</table>
3.32.1 Structure of query filters

Query filters contain a filtered object, operator, and operand.

For example, in the filter `[Country] In list (US;France), the [Country] dimension is the filtered object, In list is the operator, and the list of values (US;France) is the operand. The filter removes all values of [Country] other than US and France from the query result.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtered object</td>
<td>The Filtered object is the object whose values are filtered. Dimensions, attributes, measures, hierarchies and levels can be used as filtered objects. With the exception of BEx queries, the Filtered object is not required to appear as a result object in the query. For example, a query that contains the [Customer] and [Revenue] objects can filter on the [Region] object. If the filter is [Region] Equal to &quot;South West&quot;, the query returns only those customers in the South West region.</td>
</tr>
<tr>
<td>Operator</td>
<td>The Operator is used to compare the filtered object with the operand. For example, the Equal to operator retains only those values of the filtered object that correspond exactly to the value of the operand.</td>
</tr>
<tr>
<td>Operand</td>
<td>The Operand supplies the value or values used to filter the object. The next table describes the operand types.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operand types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operand type</td>
<td>Description</td>
</tr>
<tr>
<td>Constant</td>
<td>The Constant operand is used to type values directly. For example, you can use a constant to type “France” into the filter [Country] Equal to France. The operand cannot be a constant if the Filtered object is a hierarchy, unless the hierarchy is used in conjunction with the Matches pattern or Different from pattern operator.</td>
</tr>
<tr>
<td>List of Values</td>
<td>The List of Values operand is used to select values from the list associated with the filtered object. For example, if the filtered object is [City], you can use List of Values to select one or more of the cities associated with the object.</td>
</tr>
<tr>
<td>Prompt</td>
<td>A Prompt is a dynamic filter that is answered when the query is refreshed.</td>
</tr>
</tbody>
</table>

Using simple report filters [page 573]
To create simple report filters [page 573]
### Operand type and Description

<table>
<thead>
<tr>
<th>Operand type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universe object</td>
<td>You can select an object from the universe to filter the filtered object against its values.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>You cannot select a universe object as an operand on some OLAP data sources or the filtered object is a hierarchy.</td>
</tr>
<tr>
<td>Result from another query</td>
<td>You can compare the filtered object against the values returned by another query.</td>
</tr>
</tbody>
</table>

### Related Information

Building queries on BEx queries [page 111]

### 3.32.1.1 Query filter and prompt operators

You use operators to compare filtered objects.

The function of each operator depends on its context. Operators can perform mathematical operations and concatenate strings, as well as perform a wide variety of comparisons yielding Boolean results.

#### 3.32.1.1.1 Equal to operator

Use the Equal to operator to obtain data equal to a value.

For example, to return data for the US only, create the filter "[Country] Equal to US".

#### 3.32.1.1.2 Not Equal to operator

Use the Not Equal to operator to obtain data not equal to a value.

For example, to return data for all countries except the US create the filter "Country Not Equal to US".

**Note**

This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx queries.
3.32.1.1.3 Greater than operator

Use the Greater than operator to retrieve data greater than a value.

For example, to retrieve data for customers aged over 60, create the filter "[Customer Age] Greater than 60".

<i>Note</i>
This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx queries.

3.32.1.1.4 Greater than or Equal to operator

Use the Greater than or equal to operator to retrieve data greater than or equal to a value.

For example, to retrieve data for revenue starting from $1.5M, create the filter "[Revenue] Greater than or equal to 1500000".

<i>Note</i>
This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx hierarchies.

3.32.1.1.5 Less than operator

Use the Less than operator to retrieve data lower than a value.

For example, to retrieve data for exam grades lower than 40, create the filter "[Exam Grade] Less than 40".

<i>Note</i>
This operator cannot be used for OLAP .unx universes, hierarchies in filters, or for hierarchies in BEx queries.

3.32.1.1.6 Less than or Equal to operator

Use the Less than or equal to operator to retrieve data less than or equal to a value.

For example, to retrieve data for customers whose age is 30 or less, create the filter "[Age] Less than or equal to 30".

<i>Note</i>
This operator cannot be used for OLAP .unx universes, hierarchies in filters or for hierarchies in BEx queries.
3.32.1.1.7 Between operator

Use the **Between** operator to retrieve data between two boundary values including the two boundary values. The first value declared must be lower than the second value.

For example, to retrieve data for weeks starting at week 25 and finishing at 36 (including week 25 and week 36), create the filter "[Week] Between 25 and 36".

---

**Note**

This operator cannot be used for OLAP universe or BEx hierarchies in filters.

3.32.1.1.8 Not between operator

Use the **Not between** operator to retrieve data outside the range of two values.

For example, to retrieve data for all the weeks of the year, except for and not including weeks 25 through 36, create the filter "[Week] Not between 25 and 36".

---

**Note**

This operator cannot be used for OLAP universe or for BEx hierarchies in filters.

3.32.1.1.9 In list operator

Use the **In list** operator to retrieve data corresponding to values in a list of values.

For example, to retrieve data only for the US, UK and Japan, create the filter [Country] In list. when you can type values in the **Type a value** field, you enter US;UK;Japan.

When used in a query filter with a hierarchical list of values, either from a dimension associated with a hierarchical list of values or a hierarchy object, In list allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the In list operator allows the selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

When used in a report filter, In list produces a flat list of values.

3.32.1.1.10 Not In List operator

Use the **Not in list** operator to retrieve data that does not correspond to multiple values.

For example, if you do not want to retrieve data for the US, UK and Japan, create the filter "[Country] Not in list". In the **Type a value** field, you enter US;UK;Japan.
When used with a hierarchical list of values, either from a dimension associated with a hierarchical list of values, a hierarchy object or a level object, Not in list allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the Not in list operator allows selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

### 3.32.1.1.11 Matches Pattern operator

Use the Matches pattern operator to retrieve data that includes a specific string or part of a string.

For example, to retrieve customers whose date of birth is 1972, create the filter [DOB] Matches pattern "1972".

If you’re using a wildcard, use the "%" character for every data source, except for BEx data sources. For BEx data sources, use the "*" character.

**Note**
This operator cannot be used for BEx hierarchies.

### 3.32.1.1.12 Different From Pattern operator

Use the Different from pattern operator to return data that doesn’t include a specific string.

For example, to retrieve customers whose date of birth is not 1972, create the filter [DOB] Different from pattern '72'.

**Note**
This operator cannot be used for BEx or OLAP .unx universe parent-based hierarchies.

### 3.32.1.1.13 Both operator

Use the Both operator to retrieve data that corresponds to two values.

For example, to retrieve customers who have both fixed and mobile telephone numbers, create the filter [Account Type] Both 'Fixed' And 'Mobile'.

**Note**
This operator is not supported for filters based on hierarchy objects, or in universes based on OLAP data sources.
3.32.1.14 Except operator

Use the Except operator to retrieve data that corresponds to one value and excludes another.

For example, to retrieve customers who have only a fixed telephone number and no mobile telephone number, create the filter [Account Type] 'Fixed' Except 'Mobile'.

The Except operator is more restrictive than Different from or Not in list. For example, a report that returns customers and that includes the filter [Lines] Different From 'Accessories' excludes all sales records where the item sold is part of the 'Accessories' line. If the same customer has purchased Accessories and non-Accessories items, the customer still appears in the report, but their spending total includes only non-Accessories sales.

If the filter is [Lines] Except 'Accessories', only customers who have bought no accessories are included in the report.

i Note
This operator is not supported in universes based on OLAP data sources.

Related Information

Not In List operator [page 199]

3.32.1.15 Restrictions on filter operators

The following table lists the restrictions on prompt and filter operators based on the filtered object and query type.

<table>
<thead>
<tr>
<th>Object</th>
<th>Available filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level-based hierarchy</td>
<td>Equal to</td>
</tr>
<tr>
<td></td>
<td>Not equal to</td>
</tr>
<tr>
<td></td>
<td>In list</td>
</tr>
<tr>
<td></td>
<td>Not in list</td>
</tr>
<tr>
<td></td>
<td>Matches pattern</td>
</tr>
<tr>
<td></td>
<td>Different from pattern</td>
</tr>
<tr>
<td>Parent-child hierarchy</td>
<td>Equal to</td>
</tr>
<tr>
<td></td>
<td>In list</td>
</tr>
<tr>
<td></td>
<td>Matches pattern</td>
</tr>
</tbody>
</table>
### 3.32.2 Types of query filter

Several types of query filters are available in Web Intelligence.

<table>
<thead>
<tr>
<th>Query filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predefined filters</td>
<td>Filters created by the BI administrator.</td>
</tr>
<tr>
<td>Custom filters</td>
<td>User-defined queries</td>
</tr>
<tr>
<td>Quick filters</td>
<td>A simplified form of custom filter.</td>
</tr>
<tr>
<td>Prompts</td>
<td>You can define these dynamic filters to display a question or a list of values so that you or other users can select different filter values at each run query.</td>
</tr>
</tbody>
</table>

You can mix different types of filters on a single query.

#### 3.32.2.1 Predefined query filters

Predefined filters make the specific data you most typically need for reports permanently available.

They are created by a BI administrator and saved with the universe. Predefined filters often contain complex expressions that require a detailed knowledge of the database structure. Including predefined filters on the universe means you don’t need to create the same custom filters every time you create a new document based on the same universe.

You cannot view the component parts of predefined filters or edit predefined filters.

#### 3.32.2.1.1 Sets

A set filter is a predefined query filter that is defined directly on the universe. It combines data from multiple objects that you may use in a query, or want to include in more complex queries.

Sets are built in the information design tool by your universe designer, but are consumed in Web Intelligence. They allow you to build and combine multiple lists of values with their restrictions, into a single entity called a set filter that is available to in the Query Panel. Ultimately, the goal is to create complex query filters that return data that would normally require time and skill to build in the Query Panel. A set filter saves time and provides information that is not always easy to get to.

For more information on how to create and manage sets, refer to the Information Design Tool User Guide.
3.32.2.1.2 To select a predefined query filter

When you select a predefined query filter and run the query, the data corresponding to the query filter you selected appears in the report.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Double-click a predefined filter or drag it to the Query Filters pane.

Related Information

To open for edit the data provider of an existing query [page 178]

3.32.2.2 Quick filters

Quick filters allow you to quickly define the values you want to retrieve for a specific result object without launching the Filter Editor.

By default, Quick filters use the Equal to operator if you select a single value or the InList operator if you select multiple values.

For example:

- If you select the [Payment Status] dimension and the value "unpaid?", you are creating the following filter: [Payment Status] Equal to "unpaid?"
- If you select the [Country] dimension and the values US, Japan, Germany, you are creating the following filter: [Country] InList "US; Japan; Germany?"

i Note
Quick filters are not available in BEx queries.

Related Information

Building queries on BEx queries [page 111]
3.32.2.2.1 To create or remove a quick filter

You can create and remove quick filters in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Select the object you want to filter.
3. Click the Add Quick Filter icon in the top corner of the Result Objects pane. The Add Quick Filter dialog box appears. The values for the selected object are listed.
4. Select the values you want to retrieve from the database and click the arrow next to the Selected Value(s) list. For example, to filter the query for values in Q1, select the [Quarter] dimension, then select Q1 from the list of values.
5. Click OK. The new filter appears on the Query Filters pane.
6. To remove the filter, select it in the Query Filters pane and press the Delete key.
7. Click Run Query.
8. Save the document.

Related Information

To open for edit the data provider of an existing query [page 178]

3.32.2.3 Custom query filters

You create custom query filters to limit document data to information corresponding to a specific business question or the business information needs of a specific group of users.

For example, you can create custom filters to retrieve sales results data for specific dates, products, or services, or to view customer information only for customers who are high wage earners or who live in a particular region.
3.32.2.3.1 To add and remove custom query filters

You can edit and remove custom query filters in the Query Filters pane.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Select the object you want to filter and drag it to the Query Filters pane. The query filter appears in an outline in the Query Filters pane.
3. Click the arrow next to the default operator (In list) and select a query operator from the list of operators.
4. Click the arrow next to the query filter and select the type of filter you want to apply:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>You compare the object against a constant value to filter the query result.</td>
</tr>
<tr>
<td>Value(s) from List</td>
<td>You compare the object against values from a list of values to filter the query result.</td>
</tr>
<tr>
<td>Prompt</td>
<td>You create a filter which requires the user to supply filter values on data refresh.</td>
</tr>
<tr>
<td>Object from this query</td>
<td>You compare the object against the values returned by an object from in the same query.</td>
</tr>
<tr>
<td>Result from another query, Result from another query (Any), Result from another query (All)</td>
<td>You compare the object against the values returned by an object from another query (the filtering query) to filter the query result.</td>
</tr>
</tbody>
</table>

5. Type/select the constant, list of values or object you want to include in the filter.
6. To remove the filter, do one of the following:
   ○ Select the filter and press Delete on your keyboard.
   ○ Click Remove in the top corner of the Query Filters pane.
   ○ To remove all filters, click Remove All in the top corner of the Query Filters pane.

Related Information

To open for edit the data provider of an existing query [page 178]
3.32.2.3.2 To select values from a list of values

When selecting from a list of values in a query, items in the list can appear either as a single or multi-column list or a hierarchy, depending on the object.

Context

In a multi-column list, additional columns provide related values to the main value. In a hierarchical list, values appear in a hierarchical relationship.

When you refresh a document with prompts, lists of values for the prompts appear in a flat list without multiple columns.

Procedure

1. In a list of values, select items that you want to appear.
   ○ If the list of values does not appear when a dialog box opens, refresh the list, or search the list to retrieve values. Some list of values require an initial search to display values because the list is too large to be loaded in full.
   ○ If the list of values is divided into ranges, use the control above the list to navigate through the ranges. Some large lists of values are divided into ranges to reduce the amount of data retrieved from the database. When you select a range, the list displays the values in that range.
   ○ If the list of values depends on other lists of values, specify the dependent values in the prompt dialog box that appears. A list of values can be dependent on other lists of values, for example when it is part of a hierarchical list of values. For example, if the list of values contains cities, and the City object is part of the hierarchy Country > Region > City, you need to specify values for country and region first to filter the list of cities.

   i Note
   Dependent lists of values appear in queries only. They do not appear when you are selecting from a list of values in a report.

   When you first display the list of values, you see the Prompts dialog box in which you specify the dependent values. Once you have specified the dependent values, you can select the values from the filtered list.
   ○ To display the value keys in OLAP or BEx queries, click Show/hide key values. Key values are not indicated in the list of Selected Values, only in the list of available values. Some lists of values contain key values, which are unique values that can be used to identify values with the same display value. If the list of values contains multiple columns, only the key of the filtering column is displayed.
   ○ To search for values in the list, type the search text in the box below the list and select one of the following options from the Search icon dropdown list.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match case</td>
<td>The search is case-sensitive.</td>
</tr>
<tr>
<td></td>
<td>This option is not available when the Search in keys or Search on database options are selected.</td>
</tr>
<tr>
<td>Search in keys</td>
<td>The search uses unique value keys rather than display values.</td>
</tr>
<tr>
<td></td>
<td>This option is available only in lists of values that support key values.</td>
</tr>
<tr>
<td>Search on database</td>
<td>The search includes all values stored in the database rather than being restricted to the values loaded into the list. It improves search accuracy but reduces search speed.</td>
</tr>
<tr>
<td></td>
<td>This option is available only in lists of values that support database searches.</td>
</tr>
<tr>
<td></td>
<td>Database searching improves search accuracy at the cost of performance. It is useful when not all values in the list of values were retrieved. This can happen when the total number of values in the list exceeds the Max rows retrieved query property.</td>
</tr>
<tr>
<td></td>
<td>Database searching is particularly useful when the list of values is hierarchical because values are loaded from the database only in response to their parent value being expanded in the hierarchy. For example, in a geographical hierarchy, the child values of the California value (cities in California) are not loaded from the database until the value is expanded. If the option is selected, the search includes these items even when the California value has not been expanded.</td>
</tr>
</tbody>
</table>

The search includes all ranges if the list of values is divided into ranges.

In search patterns, the "*" wildcard represents any string of characters and the '?' wildcard represents any single character. For example, the value "March" can be returned by the search patterns "M*" or "Mar?h". To include the "*" and "?" characters literally rather than as wildcards, precede them with "\" in the search pattern.

- Type values from the list directly if the list supports direct data entry or select values from the list.

2. Click OK or Run Query, as applicable.

**Related Information**

- Max rows retrieved query property [page 97]
- Selecting prompt values in the Prompts dialog box [page 577]
3.32.2.3.3 Filtering a query on values returned from another query

You can filter a query on values returned from another query.

**Note**

When using query filters based on values returned from another query with a large amount of data, performance can be affected due to converting and formatting operations. We recommend using query filters based on values returned from another query only when you are working with small data sets.

For example, if you want to return results for all the countries in Query 1 that have a corresponding country in Query 2, you can filter the [Query 1].[Country] object on the values of the [Query 2].[Country] object.

The filtered query must be in a universe based on a relational (RDBMS) data source. The query that supplies the filtering values (filtering query) can be based on a relational, OLAP or local data source.

When you are building a query on a query, the filtering query does not appear in the list of queries that can be used as filtering queries until it has been run or saved.

The query filter can filter against all or any of the values returned by the filtering query. The supported combinations of operator and filter mode appear in the table below. If you do not choose an operator from the table, the *Result from another query* menu item is not available.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Filter mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal to</td>
<td>Any</td>
<td>Keep values in the filtered query that are equal to any value returned by the filtering query.</td>
</tr>
<tr>
<td>Greater than</td>
<td>Any</td>
<td>Keep values in the filtered query that are greater than/greater than or equal to any of the values in the filtering query. In other words, keep values in the filtered query that are greater than/</td>
</tr>
<tr>
<td>Greater than or equal to</td>
<td>All</td>
<td>Keep values in the filtered query that are greater than all of the values in the filtering query. In other words, keep values in the filtered query that are greater than/</td>
</tr>
<tr>
<td>Greater than or equal to</td>
<td>All</td>
<td>Keep values in the filtered query that are greater than or equal to the minimum value returned by the filtering query.</td>
</tr>
</tbody>
</table>

For example, if you want to return results for all the countries in Query 1 that have a corresponding country in Query 2, you can filter the [Query 1].[Country] object on the values of the [Query 2].[Country] object.
### 3.32.2.4 Combining query filters

You can retrieve data that answers several criteria by combining filters in the same query.

Typical business questions require you to retrieve information that matches more than one criteria. For example, if you are analyzing customer services data, you will most likely want to focus on customers for a specific time period and also for a specific region, and probably also for a specific level of customer service contract.

#### Example

Analyze sales revenue this year at stores where the floor size is over 4,000 square feet and sales revenue figures are equal to or less than $1.5M

In this example, you are an operations manager for a retail chain. You want to analyze information about the large retail stores in your chain that are making less than the sales revenue figure your company has set as the target.

To do this:
1. Add a predefined filter on the [Year] dimension to specify that you only want to retrieve values for this year.
2. Create a second filter on the [Sales Floor Size] dimension to specify that you only want to retrieve data for stores where the floor size is greater than 4,000 square feet.
3. Create a third filter on the [Sales Revenue] measure to specify that you only want to retrieve data for stores where the sales revenue figures are equal to or less than $1.5M.
4. Combine these three filters with the \textit{And} operator:

\begin{itemize}
\item \textit{And}
\item Last Year
\item Sales Floor Size Group Greater than or equal to: 4000
\item Sales Revenue Less than 1,500,000
\end{itemize}

When you run the query, only data for stores that satisfy all three criteria will be returned to the report.

**Related Information**

To combine query filters [page 210]
Nested query filters [page 211]

**3.32.2.4.1 To combine query filters**

You can combine query filters in the \textit{Query Filters} pane.

**Procedure**

1. In a Web Intelligence document in \textit{Design or Data} mode, open the Data Provider for edit. The \textit{Query Panel} appears.
2. Create the filters and add them to the \textit{Query Filters} pane. Filters are combined by default with the \textit{And} operator.
3. Click the operator or the arrow next to the operator checkbox and select the other operator to toggle between \textit{And} and \textit{Or}.

**Note**

The \textit{Or} operator is not supported from some OLAP data sources such as BEx queries, and OLAP .unx universes on the top of Microsoft Analysis Services (MSAS) and Oracle Essbase.
Related Information

Combining query filters [page 209]
To open for edit the data provider of an existing query [page 178]

3.32.2.4.2 Nested query filters

Nested query filters allow you to create more complex filter conditions than is possible when you combine filters at the same level.

When you nest filters, you set the order in which they are evaluated. For example, you can return the data given by two query filters joined in an Or relationship (where either one filter condition or the other is true) and then further restrict this data by applying another filter to it. In this case, the two filters in an Or relationship are nested, then compared with the other filter in an And relationship.

Example

List all sales made in Japan either in Q4 or where the revenue was greater than 1000000

To answer this question, you create the following nested query filter:

| And | Country Equal To Japan |
| Or  | Quarter Equal To Q4 |
|     | Revenue Greater Than 1000000 |

This combination of query filters first returns sales data where the sale was made in Q4 or the revenue was greater than 1000000, then restricts this data further by returning only those sales made in Japan.

Related Information

To nest query filters [page 212]
Combining query filters [page 209]
3.32.2.4.2.1 To nest query filters

You can create nested query filters in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Drag and drop a report object onto an existing query filter. A query filter outline on the report object appears in a nested AND relationship with the existing query filter.
3. Define the new query filter.

Related Information

To open for edit the data provider of an existing query [page 178]
Nested query filters [page 211]
Combining query filters [page 209]

3.32.3 How levels filter hierarchical queries

A level used as a query filter removes the specified members from the level and all their child members from the hierarchy.

The filter also impacts measure aggregation.

Example

Filtering on a level

You have the following data on which the level filter [Country] Not equal to Germany is applied.

You apply the filter by dragging the [Country] level to the Query Filters pane in the Query Panel, selecting the Not equal to operator and selecting “Germany” from the list of values of the level.

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$29,358,677.22</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
</tbody>
</table>
After filtering, the data appears as follows:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$26,464,364.88</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
</tbody>
</table>

When the filter is applied, Germany and all descendant members are filtered from the hierarchy. The value of [Internet Sales Amount] for All Customers is also reduced because the value for Germany is no longer part of the aggregation.

### 3.32.4 How measures filter hierarchical queries

A filter on a measure applies to all levels in a hierarchy and does not impact measure aggregation in the filtered result.

**Example**

**Filtering on a measure**

You have the following data, to which you apply the filter [Internet Sales Amount] Greater than 500,000.

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$29,358,677.22</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Hauts de Seine</td>
<td>$263,416.19</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
<tr>
<td>Germany</td>
<td>$2,894,312.34</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>$119,871.08</td>
</tr>
<tr>
<td>Hessen</td>
<td>$794,876.08</td>
</tr>
</tbody>
</table>

The filtered data appears as follows:
### Customer Geography

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>$29,358,677.22</td>
</tr>
<tr>
<td>France</td>
<td>$2,644,017.71</td>
</tr>
<tr>
<td>Seine (Paris)</td>
<td>$539,725.80</td>
</tr>
<tr>
<td>Germany</td>
<td>$2,894,312.34</td>
</tr>
<tr>
<td>Hessen</td>
<td>$794,876.08</td>
</tr>
</tbody>
</table>

The filter is applied to all members, irrespective of their level in the hierarchy, and the aggregated measures are not impacted by the removal of the filtered members. For example, the All Customers amount remains at $29,358,677.22.

### 3.33 Filtering data with query prompts

A query prompt is a dynamic filter in a document that displays a question every time a user opens or refreshes the data in a document.

Users answer prompts by either typing or selecting the values they want to view when they refresh the data. The query then retrieves from the database only the values specified in the Prompts dialog box.

Prompts allow multiple users viewing a single document to specify a different sub-set of the database information and display it in the same report tables and charts. Prompts also reduce the time it takes for the data to be retrieved from the database.

A prompt contains the following elements:

- a filtered object
- an operator
- a message

For example, to prompt users to select a specific year, you define a prompt on the [Year] dimension:

**Year Equal To ("Which year?")**

In this prompt, the filtered object is [Year], the operator is Equal To, and the prompt message is "Which year?".

You can define prompts on dimensions, measures, attributes, hierarchies and levels. For example, you can filter the [Year] dimension to return values for a specific year, filter the [Sales Revenue] measure to return values for a range of revenue figures, or filter the [Geography] hierarchy to return members from the hierarchy.

#### i Note

- Prompts of type universe parameter can have dynamic default values set through a formula expression in the information design tool. Web Intelligence displays them as regular default values.
- In Web Intelligence Rich Client or Web Intelligence Applet interface, for OLAP .unx universes, when filtering on measures, you can only type a constant.
- In Web Intelligence Rich Client or Web Intelligence Applet interface, you cannot add measures or detail objects in the filter panel for BEx queries.
You can create multiple prompts, related by the AND or OR operators, in the same query. You can also nest prompts. When the user runs a query, the prompts are displayed.

**i Note**

On BEx queries and OLAP .unx universes, you can only use the AND operator.

Prompts appear in the script generated by the query as either the value supplied in response to the prompt or as special prompt syntax. For example, a prompt on [Country] can appear in generated SQL as:

```sql
Resort_Country.country  =  @prompt('Enter Country:','A', 'Resort\Country', Mono,Free,Persistent,,User:0)
```

or as

```sql
Resort_country.country In ('UK')
```

Prompts can be optional. You are not obliged to supply values for optional prompts. If you do not supply a value, the prompt is ignored.

**Related Information**

Selecting prompt values in the Prompts dialog box [page 577]

### 3.33.1 Merged prompts

When a document contains multiple data providers, any prompts that include objects with the same data type, operators of the same operator type, and that use the same prompt text are merged.

When all the data providers are refreshed, a single prompt message appears for such prompts.

The List of Values displayed by the merged prompt is the list associated with the object in the prompt that has the most display property constraints.

### 3.33.2 Complex prompts

Complex prompts let you provide multiple answer values to a single prompt.

You can create complex prompts on top of BEx variables of type Selection Option or SAP HANA variables of type Range.

The operators supported by complex prompts are:

- Between
- Not Between
- Equal to
3.33.3 Hierarchical prompts

Depending on the filter operator in the prompt, you can select items from different levels of the list of values, or at the lowest level only.

The following objects display their lists of values hierarchically in a prompt:

- Hierarchies
- Levels
- Dimensions associated with a hierarchical list of values

A hierarchical list of values appears in tree form. You can navigate up and down the tree to the items you want.

3.33.4 HANA query prompts in Web Intelligence

In Web Intelligence, HANA universes behave like any other relational UNX universe; variables and input parameters in SAP HANA information models are associated with the corresponding tables in the data foundation.

If there are variables and input parameters, then when you run a query in the Query Panel, prompts will appear that require you to enter values for the variables and parameters, and also when the document is refreshed. The values available in the prompts come directly from a HANA source.

For more information on HANA universes and query prompts at the universe level, see the Information Design Tool User Guide.

**Note**

If you add prompts in the Query Panel, there could be a duplication of prompts. We recommend that you run the query prior to defining any query prompts to know what prompts may already exist.

3.33.5 Query filter and prompt operators

You use operators to compare filtered objects.

The function of each operator depends on its context. Operators can perform mathematical operations and concave concatenate strings, as well as perform a wide variety of comparisons yielding Boolean results.
3.33.5.1 Equal to operator

Use the Equal to operator to obtain data equal to a value.

For example, to return data for the US only, create the filter "[Country] Equal to US".

3.33.5.2 Not Equal to operator

Use the Not Equal to operator to obtain data not equal to a value.

For example, to return data for all countries except the US create the filter "[Country] Not Equal to US".

**Note**
This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx queries.

3.33.5.3 Greater than operator

Use the Greater than operator to retrieve data greater than a value.

For example, to retrieve data for customers aged over 60, create the filter "[Customer Age] Greater than 60".

**Note**
This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx queries.

3.33.5.4 Greater than or Equal to operator

Use the Greater than or equal to operator to retrieve data greater than or equal to a value.

For example, to retrieve data for revenue starting from $1.5M, create the filter "[Revenue] Greater than or equal to 1500000".

**Note**
This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx hierarchies.
3.33.5.5  Less than operator

Use the Less than operator to retrieve data lower than a value.

For example, to retrieve data for exam grades lower than 40, create the filter "[Exam Grade] Less than 40".

i Note
This operator cannot be used for OLAP .unx universes, hierarchies in filters, or for hierarchies in BEx queries.

3.33.5.6  Less than or Equal to operator

Use the Less than or equal to operator to retrieve data less than or equal to a value.

For example, to retrieve data for customers whose age is 30 or less, create the filter "[Age] Less than or equal to 30".

i Note
This operator cannot be used for OLAP .unx universes, hierarchies in filters or for hierarchies in BEx queries.

3.33.5.7  Between operator

Use the Between operator to retrieve data between two boundary values including the two boundary values.

The first value declared must be lower than the second value.

For example, to retrieve data for weeks starting at week 25 and finishing at 36 (including week 25 and week 36), create the filter "[Week] Between 25 and 36".

i Note
This operator cannot be used for OLAP .unx universe or BEx hierarchies in filters.

3.33.5.8  Not between operator

Use the Not between operator to retrieve data outside the range of two values.

For example, to retrieve data for all the weeks of the year, except for and not including weeks 25 through 36, create the filter "[Week] Not between 25 and 36".
i Note
This operator cannot be used for OLAP .unx universes or for BEx hierachies in filters.

3.33.5.9 In list operator

Use the In list operator to retrieve data corresponding to values in a list of values.

For example, to retrieve data only for the US, UK and Japan, create the filter [Country] In list. when you can type values in the Type a value field, you enter US;UK;Japan.

When used in a query filter with a hierarchical list of values, either from a dimension associated with a hierarchical list of values or a hierarchy object, In list allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the In list operator allows the selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

When used in a report filter, In list produces a flat list of values.

3.33.5.10 Not In List operator

Use the Not in list operator to retrieve data that does not correspond to multiple values.

For example, if you do not want to retrieve data for the US, UK and Japan, create the filter "[Country] Not in list". In the Type a value field, you enter US;UK;Japan.

When used with a hierarchical list of values, either from a dimension associated with a hierarchical list of values, a hierarchy object or a level object, Not in list allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the Not in list operator allows selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

i Note
This operator can only be used in certain types of hierarchies, for example, it can be used in level-based hierarchies.

3.33.5.11 Matches Pattern operator

Use the Matches pattern operator to retrieve data that includes a specific string or part of a string.

For example, to retrieve customers whose date of birth is 1972, create the filter [DOB] Matches pattern "1972".

If you’re using a wildcard, use the "%" character for every data source, except for BEx data sources. For BEx data sources, use the "*" character.
3.33.5.12 Different From Pattern operator

Use the Different from pattern operator to return data that doesn’t include a specific string.

For example, to retrieve customers whose date of birth is not 1972, create the filter [DOB] Different from pattern ‘72’.

3.33.5.13 Both operator

Use the Both operator to retrieve data that corresponds to two values.

For example, to retrieve customers who have both fixed and mobile telephone numbers, create the filter [Account Type] Both ‘Fixed’ And ‘Mobile’.

3.33.5.14 Except operator

Use the Except operator to retrieve data that corresponds to one value and excludes another.

For example, to retrieve customers who have only a fixed telephone number and no mobile telephone number, create the filter [Account Type] ‘Fixed’ Except ‘Mobile’.

The Except operator is more restrictive than Different from or Not in list. For example, a report that returns customers and that includes the filter [Lines] Different From 'Accessories' excludes all sales records where the item sold is part of the 'Accessories' line. If the same customer has purchased Accessories and non-Accessories items, the customer still appears in the report, but their spending total includes only non-Accessories sales.

If the filter is [Lines] Except 'Accessories', only customers who have bought no accessories are included in the report.
iNote
This operator is not supported in universes based on OLAP data sources.

Related Information

Not In List operator [page 199]

3.33.5.15 Restrictions on filter operators

The following table lists the restrictions on prompt and filter operators based on the filtered object and query type.

<table>
<thead>
<tr>
<th>Object</th>
<th>Available filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level-based hierarchy</td>
<td>Equal to</td>
</tr>
<tr>
<td></td>
<td>Not equal to</td>
</tr>
<tr>
<td></td>
<td>In list</td>
</tr>
<tr>
<td></td>
<td>Not in list</td>
</tr>
<tr>
<td></td>
<td>Matches pattern</td>
</tr>
<tr>
<td></td>
<td>Different from pattern</td>
</tr>
<tr>
<td>Parent-child hierarchy</td>
<td>Equal to</td>
</tr>
<tr>
<td></td>
<td>In list</td>
</tr>
<tr>
<td></td>
<td>Matches pattern</td>
</tr>
<tr>
<td>Hierarchy in BEx query</td>
<td>Equal to</td>
</tr>
<tr>
<td></td>
<td>In list</td>
</tr>
</tbody>
</table>
3.33.6 To build a prompt

You build a query prompt in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Drag the object you want to filter with a prompt and drop it into the Query Filters pane. The query filter appears in outline in the Query Filters pane. The outline shows the filtered object, the operator and the type of filter applied to the object. By default the filter is a constant.
3. Select a filter operator from the list.

   i Note
   The list of available operators depends on the type of filtered object.

4. Click the arrow next to the outline query filter and select Prompt from the menu to filter the object using a prompt.

   i Note
   If the document contains multiple data providers, and there is already a prompt that includes objects with the same data type, operators of the same operator type, and that uses the same prompt text as the new prompt, a warning appears, telling you that the two prompts will be merged. This means that whenever all the data providers are refreshed, a single prompt message appears for the two prompts.

   The Prompts dialog box appears.
5. Select Prompt with list of values to allow the user to select from a list of values when answering the prompt.

   i Note
   ○ The option is selected by default if the filtered object has an associated list of values in the universe.
   ○ The option is selected by default and cannot be deselected if the filtered object is a hierarchy.
   ○ Do not select this option if the filtered object is a date and you want users to see a popup calendar to select the date.

   If you deselect the Prompt with list of Values option, type the prompt text (for example “Enter a City”) in the Prompt text box.
6. In the Parameter Properties dialog box, do any of the following:
   ○ Select Select only from list to restrict the user choice to values available in the list.

   i Note
   ○ The option is selected by default if the filtered object has an associated list of values in the universe, and cannot be deselected if the filtered object is a hierarchy.
   ○ Do not select this option if the filtered object is a date and you want users to see a popup calendar to select the date.
Select **Keep last values selected** to ensure that, by default, the prompt selects the values the user selected the last time they answered the prompt. The option is selected by default if the filtered object has an associated list of values in the universe, and cannot be deselected if the filtered object is a hierarchy.

Select **Set default values** if you want the prompt to select values by default when it appears, and type a value in the **Type a value** box, or click ... and select default values in the **List of Values** dialog box.

**Note**

This button is disabled if the filtered object has no associated list of values.

Select **Optional prompt** to make the prompt optional. If the user does not supply a value for an optional prompt, the prompt is ignored. Click the icon next to the text box and use the dialog box that appears to set the prompt properties.

**Results**

The prompt appears at each document refresh.

**Related Information**

- To open for edit the data provider of an existing query [page 178]
- Defining how prompts display [page 224]
- Merged prompts [page 215]
- Selecting prompt values in the Prompts dialog box [page 577]

### 3.33.7 To select an existing prompt

You can select from pre-existing prompts to add to a query. Only pre-existing prompts that are compatible with the object you are filtering are displayed.

**Procedure**

1. In a Web Intelligence document in **Design** or **Data** mode, open the Data Provider for edit. The **Query Panel** appears.
2. Drag the object on which you want to apply a prompt and drop it onto the **Query Filters** pane. The query filter appears in outline in the **Query Filters** pane.
3. Click the arrow next to the query filter and select **Prompt** from the menu.
4. Click **Select from universe**, select an existing prompt and click **OK**.
The list displays only those universe prompts that are compatible with the object you are filtering. For example, the filtered object and the universe prompt must have the same data type.

Related Information

To open for edit the data provider of an existing query [page 178]

3.33.8 To remove a prompt

You can delete query prompts in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Select the prompt in the Query Filters pane and click the Delete icon.

Related Information

To open for edit the data provider of an existing query [page 178]

3.33.9 Defining how prompts display

You can modify how prompts appear in the Prompts dialog box.

In the Prompts dialog box, users select values by either entering a value in the Type a value text box, if available, and adding it to the selected value list, or by selecting values from a list of values defined by the query prompt.

Options available in the Parameter Properties dialog box

<table>
<thead>
<tr>
<th>If you want the prompt to display...</th>
<th>(useful when you...)</th>
<th>then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>the list of values associated with the filtered dimension, measure, or detail</td>
<td>want to view all the values for the object and then select from those values</td>
<td>leave the option selected by default: Prompt with List of Values</td>
</tr>
<tr>
<td>the values specified the last time the prompt was answered (users can select a different values)</td>
<td>default to the same values when you refresh the document, but want the ability to select a different value when necessary, such as the name of the current month</td>
<td>select the option: Keep last values selected</td>
</tr>
</tbody>
</table>
If you want the prompt to display... (useful when you...) then...

<table>
<thead>
<tr>
<th>the values you specify as the default (users can select a different values)</th>
<th>almost always reselect the same values when you refresh the document, but want the ability to select a different value when necessary, such as the number for the current year</th>
<th>select the option: Set default value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a list of values from which users select a value</td>
<td>prevent users from typing a value that might not exist on the database or that you do not want them to view</td>
<td>select the option: Select only from List</td>
</tr>
</tbody>
</table>

To make the prompt optional, select Optional prompt. You are not obliged to specify a value for the prompt, in which case it is ignored.

**i Note**

If the prompt is for a date, the users will see the popup calendar and a list of values. If you want users to see the popup calendar in order to select the dates, deselect Prompt with List of Values.

### Related Information

Selecting prompt values in the Prompts dialog box [page 577]

### 3.33.10 Combining prompts

Combining multiple prompts on a single query enables you to filter the data returned to the document so that each person viewing the reports sees only the information relevant to their business need.

For example, you can combine the following three prompts on a Customer Accounts document:

- Which customer?
- Which account?
- Which calendar period: from? to?

This enables each accounts manager viewing the document to view report values for a specific customer account during a specific period.

You combine prompts in the same way that you combine query filters.

### 3.33.10.1 Combining prompts with query filters

Combining prompts and filters on a single query enables you decide the values for some of the selected objects on the query using filters and allow users to decide the values of other selected objects using prompts.

For example, if you combine the following filters and prompts on a Human Resources document:
Users viewing the document can choose which employee they view information for, but they can only view data for the current year and they can’t view data for senior executives.

3.33.11 To change the order of prompts

You change the order of query prompts in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Click the Query properties icon on the Query Panel toolbar.
3. Select the prompt you want to move up or down in the prompt order in the Prompt Order dialog box, then press the up or down arrow next to the box.

Related Information

To open for edit the data provider of an existing query [page 178]

3.34 Filtering data using subqueries

A subquery is a flexible query filter that allows you to restrict values in more sophisticated ways than is possible with an ordinary query filter.

Subqueries are more powerful than ordinary query filters for the following reasons:

- They allow you to compare the values of the object whose values are used to restrict the query with values from other objects.
- They allow you to restrict the values returned by the subquery with a WHERE clause.
- They allow you to pose complex questions that are difficult or impossible to formulate with simple query filters. For example: what is the list of customers and their associated revenue where the customer purchased a service that had previously been reserved (by any customer) in Q1 of 2003?

Subqueries work by modifying the SQL that is generated to retrieve the query data. The SQL contains a subquery that restricts the data returned by an outer query. SQL is the query language supported by all relational databases (RDBMS), although each database has its own syntax. For more information on SQL subqueries, see any book on SQL.
Subqueries are not supported in all databases. If they are not supported, the option to build subqueries does not appear in the Query Panel.

You can build subqueries using dimensions, attributes and measures. You cannot build subqueries using hierarchical objects.

Related Information

To build a subquery [page 227]
Subquery parameters [page 229]

3.34.1 To build a subquery

You can build subqueries in the Query Panel.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Add the objects that you want to appear in the query to the Result Objects pane.
3. Select the object in the Result Objects pane that you want to filter with a subquery and click the Add a subquery icon at the top of the Query Filters pane. The subquery outline appears in the Query Filters pane. By default the object you selected appears as the Filter object and Filter By object.
4. To add a WHERE condition to the subquery, drag a report object to the area of the subquery below the Drop an object here image. You can use an existing subquery or standard query filter as a WHERE condition in a subquery. To do so, drag and drop the existing filter or subquery to the area of the subquery below the Drop an object here boxes. In the HTML client, to copy rather than move the existing filter to the WHERE condition, hold down the Control key while dragging and dropping. In this case the existing filter remains in its initial place and becomes part of the WHERE condition of the subquery.
5. Select the operator and values used to filter the object in the WHERE condition.
6. Click Subquery to add an additional subquery to the query filter. In addition to linking subqueries in AND or OR relationships, you can nest them (create subqueries within subqueries) by dragging an existing subquery to the area beneath the Drop an object here boxes. In this case the inner subquery becomes part of the WHERE condition of the outer subquery. To copy rather than move the subquery to the WHERE condition, hold down the Control key while dragging and dropping.
this case the second subquery remains at the same level as the first, and becomes part of the WHERE clause of the first.

By default the two subqueries are linked in an AND relationship. Click the AND operator to toggle between AND and OR.

7. To nest a subquery (create a subquery within a subquery), drag an existing subquery to the area beneath the Drop an object here image.

To copy rather than move the subquery to the WHERE condition, hold down the Control key while dragging and dropping. In this case the second subquery remains at the same level as the first, and becomes part of the WHERE clause of the first.

The inner subquery becomes part of the WHERE condition of the outer subquery.

Related Information

To open for edit the data provider of an existing query [page 178]
Filtering data using subqueries [page 226]
Example: Customers bought a service reserved in Q1 of 2003, and how much revenue they generated [page 228]
Subquery parameters [page 229]
Nested combined queries [page 105]

3.34.2 Example: Customers bought a service reserved in Q1 of 2003, and how much revenue they generated

This example uses the Island Resorts Marketing sample universe in Web Intelligence to build a subquery.

Procedure

1. In a Web Intelligence document in Design or Data mode, open the Data Provider for edit. The Query Panel appears.
2. Drag the Customer and Revenue objects to the Result Objects pane in the Query Panel.
3. Select the Service object.
4. Click Subquery.

The subquery outline appears in the Query Filters pane.

Note

The selected object appears in both boxes in the subquery outline. You often use the same object in both boxes, although this is not required. If the objects do not return any common values, the subquery returns no values, and the query therefore returns no values.
5. Drag the Reservation Year object to the area of the subquery outline beneath the Service object, which adds a WHERE condition on the Reservation Year object.

6. Set the Reservation Year condition operator to Equal to.

7. Type FY2003 in the Type a constant box.

8. Drag the Reservation Quarter object to the area of the subquery outline beneath the Service object, which adds the Reservation Quarter object to the WHERE condition.

9. Set the Reservation Quarter condition operator to Equal to.

10. Type Q1 in the Type a constant box.

11. Click Run Query.

3.34.3 Subquery parameters

A subquery or set of subqueries contains several parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter objects</td>
<td>The object whose values are used to filter the result objects. You can include more than one filter object. If you do, the values of the objects you select are concatenated.</td>
</tr>
<tr>
<td>Filter by objects</td>
<td>The object that determines which Filter object values the subquery returns. You can include more than one Filter by object. If you do, the values of the objects you select are concatenated.</td>
</tr>
<tr>
<td>Operator</td>
<td>The operator that specifies the relationship between the Filter object and the Filter by object. Because of database restrictions you cannot use certain combinations of operators and Filter by objects together. For example, if you use the Equal to operator with a Filter by object that returns multiple values, the database rejects the SQL because this type of subquery requires the Filter by object to return one value only. In cases where the generated SQL is rejected by the database, you see an error message showing the error description returned by the database.</td>
</tr>
<tr>
<td>WHERE condition (optional)</td>
<td>An additional condition that constrains the list of values of the Filter by object. You can use ordinary report objects, predefined conditions or existing query filters, including subqueries, in the WHERE condition.</td>
</tr>
<tr>
<td>Relationship operator</td>
<td>If there is more than one subquery, this operator determines the relationship between the subqueries. AND - the conditions in all of the subqueries must be satisfied. OR - the conditions in any one of the subqueries must be satisfied.</td>
</tr>
</tbody>
</table>
4 Reporting data

4.1 Introduction to reporting

Now that you have built and run your query, you have to organize your data before you can start performing analysis operations.

Organizing your data helps you make your report understandable and avoid information overload. As a best practice, try to keep it simple and remove all irrelevant data that would get in the way of what you are trying to demonstrate.

Use the chart library and tables to design the report. Other tools are available so that you can perform formatting operations. You can for instance sort, rank, or merge data so that information is displayed according to your business requirements and questions.

The following sections provide you with information on how to choose the correct graphics according to your data, and how to format your report to make it look professional and easy to understand.

To know more about | Read
---|---
Organizing and formatting data | Tracking changes in data [page 272]
| Highlighting data using conditional formatting [page 282]
| Ranking report data [page 288]
| Merging data from dimensions and hierarchies [page 296]
| Enhancing reports with calculations, formulas and variables [page 314]
| Using sections to group data [page 350]
| Using breaks [page 357]
| Using sorts to organize data in reports [page 363]

Charts | Choosing the correct Web Intelligence chart for your data [page 368]
| Assigning data to a chart [page 384]
| Geo-qualifying an object for a geomap chart [page 386]

4.2 Working with reports

You can create and update ad hoc reports based on your business requirements.

In reports you can add charts, free-standing cells, formulas, and much more.
4.2.1 Web Intelligence features that are supported in reports for mobile devices

You can use several Web Intelligence query and report features in reports for mobile devices.

In the following table are the major features of Web Intelligence and if they are supported on mobile devices. This is not a complete list; the features listed below have been tested for viability on mobile devices. For more information on designing Web Intelligence reports for mobile devices, see the Mobile BI Report Designer’s Guide.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purpose and how it helps</th>
<th>Supported on Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hierarchies</td>
<td>You can use hierarchies to navigate through data that uses parent-child relationships.</td>
<td>Yes</td>
</tr>
<tr>
<td>Free-standing blank cells</td>
<td>You can use free-standing cells display text or formulas. For example, you can use these cells for report titles and images. You can put in them basic formulas, for example a conditional status indicator.</td>
<td>Yes</td>
</tr>
<tr>
<td>Pre-defined cells</td>
<td>You can use free-standing cells with defined formulas that show information like drill filters, the last refresh date, and the document name.</td>
<td>Yes</td>
</tr>
<tr>
<td>Tables</td>
<td>You can use tables to show data in a list format that is easy to scroll through.</td>
<td>Yes</td>
</tr>
<tr>
<td>Groups in tables</td>
<td>You can group dimension values. This feature can save space in a table. For example, if you have branches of stores in several states, you may prefer to group the stores into groups by region.</td>
<td>No</td>
</tr>
<tr>
<td>Table breaks</td>
<td>To save space by removing repetitive data in a table, you can use table breaks.</td>
<td>Yes</td>
</tr>
<tr>
<td>Sections</td>
<td>You can use sections to split information into smaller parts. For example, in a table with City, Quarter, and Sales Revenue, the city and quarter content can be repetitive. You can create section based on Quarter, which gives you quarterly tables on Sales Revenue by City.</td>
<td>Yes</td>
</tr>
<tr>
<td>Sorts</td>
<td>In tables, you can use sorts to organize the order in which values are displayed in a table. For example, you sort the revenue values in Descending order.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

! Restriction

There is a limit to the maximum number of rows and columns that can be displayed on the screens of mobile devices. For more information, see the Mobile BI Report Designer’s Guide.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Purpose and how it helps</th>
<th>Supported on Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranking</td>
<td>You can use ranking in a table to show only top or bottom items based on certain criteria. This helps readers to focus on the top or bottom items in a data set.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>! Restriction</strong></td>
<td></td>
</tr>
</tbody>
</table>
|                          | Supported only the following Mobile server versions:  
|                          | • BI 4.1 SP03 Patch 01 and higher  
|                          | • BI 4.0 SP09 Patch 01 and higher  
| Charts                   | You can use charts to show data in a visual way that adds impact to the results.                                                                                                                                                                                                                                                                   | Yes                 |
|                          | **! Restriction**                                                                                                                                                                                                                                                                                                                                      |                     |
|                          | There is a limit to the maximum number of rows and columns that can be displayed on the screens of mobile devices. For more information, see the Mobile BI Report Designer’s Guide.                                                                                                                               |                     |
| Prompts                  | You can use prompts in reports to allow users refine the data that is shown on the mobile device. You can also control the type or amount of data the user can access and that appears on the mobile device.                                                                                                                           | Yes                 |
| Query filters            | You can use query filters to limit the amount of data retrieved from the data source, reducing the data retrieval time.                                                                                                                                                                                                                               | Yes                 |
| Report filters           | You can use report filters to limit the retrieved data displayed in a report.                                                                                                                                                                                                             | Yes                 |
| Input controls           | You can use input controls as report element-specific filter controls.                                                                                                                                              | Yes                 |
| Folding and unfolding data | You can fold and unfold report data to see only the amount of data you want at a given time.                                                                                                                                                               | No                  |
| Drilling                 | You can use drilling to move through the data levels. For example, you can drill down from region to city to store.                                                                                                                                                                      | Yes                 |
| Conditional formatting   | You can use rules in reports to have table cell or section format change based on rules. You can highlight in a visual fashion important results by, for example, text, cell border and background display color and size changes, and even via images or web pages. | Yes                 |
| Data tracking            | You can display data changes in a report in a document, for when the changes in data is the focus of a report.                                                                                                                                                                              | No                  |
| Linking to other documents | You can link to other documents in the report, as in the case where you want to offer users access to related documents.                                                                                                                                                                     | Yes                 |
4.2.2 To rename a report

You can rename a report in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the Report tab of the report you want to rename.
2. Select Rename Report on the menu and type the new report name.
3. Click outside the report name tab and save the document.

4.2.3 To duplicate a report

You can duplicate a report in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the report tab of the report you want to duplicate.
2. Click Duplicate Report.
3. Rename the duplicated report, if required.
4. Save the document.

Related Information

To reuse an input control in another report within a Web Intelligence document [page 585]
4.2.4 To delete a report

You can delete a report from a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the report tab of the report you want to delete and select one of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you are using the Web Intelligence HTML interface:</td>
<td>Remove Report</td>
</tr>
<tr>
<td>If you are using the Web Intelligence Applet or Rich Client interface:</td>
<td>Delete Report</td>
</tr>
</tbody>
</table>

2. Click Yes to confirm the deletion.
3. Save the document.

4.2.5 To change the order of reports

You can change the order of reports in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the report tab of the report whose order you want to change in the document.

2. Click Move Report on the menu, then select one of the menu options.

Menu options in the Web Intelligence HTML interface

<table>
<thead>
<tr>
<th>Menu option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>The report becomes the first report in the document.</td>
</tr>
<tr>
<td>Previous</td>
<td>The report tab is moved to the left of another report tab in the report zone.</td>
</tr>
<tr>
<td>Next</td>
<td>The report tab is moved to the right of another report tab in the report zone.</td>
</tr>
<tr>
<td>Last</td>
<td>The report becomes the last report in the document.</td>
</tr>
</tbody>
</table>
### 4.2.6 To add a report

You can add a report to a Web Intelligence document in the Design mode.

**Procedure**

In a Web Intelligence document in Design mode, right-click the report tab of any existing report and click Add Report. A blank report is added to the document with the default name Report n.

### 4.2.7 Viewing document properties

You can view the document properties in the Document Summary pane in the Side Panel and edit them in the Document Summary dialog box.

The following table lists the document properties that you can view in the Document Summary pane in the Side Panel or edit in the Document Summary dialog box that is found at Properties > Document:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>The name of the document in the BI launch pad. This is displayed above the general properties and cannot be edited.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of document. This option is only available in the Web Intelligence HTML interface.</td>
</tr>
<tr>
<td>Author</td>
<td>The creator of the document.</td>
</tr>
<tr>
<td>Creation date</td>
<td>The date the document was created.</td>
</tr>
<tr>
<td>Locale</td>
<td>Tells you the formatting locale of the document.</td>
</tr>
<tr>
<td>Content Alignment</td>
<td>In the Side Panel, you can see the alignment in the document based on your locale settings in the Document Summary. The alignment of the application interface is from right to left (RTL) when you select Arabic or Hebrew. The alignment of the document content may be RTL, depending on the system settings selected by the BI administrator.</td>
</tr>
<tr>
<td>Description</td>
<td>Optional information that describes the document.</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Keywords</td>
<td>Optional keywords that can be used to search for the document in the BI launch pad.</td>
</tr>
<tr>
<td>Last refresh date</td>
<td>In the Side Panel, this field informs you of when the results were last refreshed with the latest data from the database.</td>
</tr>
<tr>
<td>Last modified</td>
<td>In the Side Panel, this field informs you when the document was last modified.</td>
</tr>
<tr>
<td>Last modified by</td>
<td>In the Side Panel, this field informs you who the last person was to modify the document.</td>
</tr>
<tr>
<td>Duration of the previous refresh</td>
<td>In the Side Panel, this field informs you how long it took to retrieve the data from the database the last time the results were refreshed.</td>
</tr>
<tr>
<td>Refresh on open</td>
<td>Automatically refreshes the results in reports with the latest data from the database each time the document is opened.</td>
</tr>
<tr>
<td></td>
<td>When <strong>Refresh on open</strong> is selected, data tracking does not display the difference between the data prior to the refresh and the data after the refresh. Data after the refresh is treated as new data because the refresh purges the document.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>The <strong>Refresh on open</strong> option is dependent on the following settings in the CMC configured by the BI administrator:</td>
</tr>
<tr>
<td></td>
<td>1. Select <strong>Applications</strong> &gt; <strong>Web Intelligence</strong>, and from the <strong>Manage</strong> list, select <strong>Properties</strong>. In the <strong>Automatic Document Refresh on Open Security Right Setting</strong> section, the property  <strong>Automatic Refresh</strong> security setting is enabled.</td>
</tr>
<tr>
<td></td>
<td>2. Select <strong>Applications</strong> &gt; <strong>Web Intelligence</strong>, and from the <strong>Manage</strong> list, select <strong>User Security</strong>. When you select a user profile and click <strong>View Security</strong>, verify that the <strong>Document - disable automatic refresh on open</strong> security right is disabled.</td>
</tr>
<tr>
<td>Apply security filtering on open</td>
<td>Automatically applies the security on data when opening the document, without any need to refresh the document.</td>
</tr>
<tr>
<td></td>
<td>This option is only available for a document created on a relational unx universe with Business Security Profiles.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>1. When the option <strong>Apply security filtering on open</strong> is selected, the option <strong>Refresh on open</strong> is greyed out.</td>
</tr>
<tr>
<td></td>
<td>2. When the option <strong>Refresh on open</strong> is selected, the option <strong>Apply security filtering on open</strong> is greyed out.</td>
</tr>
<tr>
<td>Permanent regional formatting</td>
<td>Formats the document according to the format locale with which it was saved.</td>
</tr>
<tr>
<td>Use query drill</td>
<td>Allows drilling in query drill mode.</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Enable query stripping</td>
<td>Generates queries that only use objects that contribute to the reports in which they are used. Each time a query is refreshed, non-contributing objects are ignored. Only relevant data is retrieved from the data provider. This feature enhances performance.</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong> \nQuery stripping is enabled by default for BEx queries.</td>
</tr>
<tr>
<td>Hide warning icons in chart</td>
<td>Hides General Warning icons in order to enhance readability.</td>
</tr>
<tr>
<td>Change Default Style</td>
<td>This button is only available in the Web Intelligence Applet interface and Web Intelligence Rich Client. In the Document Summary edit dialog box, you can change the default style for the document. You can import a new style or export the current style.</td>
</tr>
<tr>
<td>Data tracking reference mode</td>
<td>In the Side Panel, this field indicates whether data tracking is turned on or off.</td>
</tr>
<tr>
<td>Data tracking</td>
<td>Track the following kinds of data changes:</td>
</tr>
<tr>
<td></td>
<td>● Inserted data \n● Deleted data \n● Changed data \n● Increased values \n● Decreased values</td>
</tr>
<tr>
<td>Auto-merge dimensions</td>
<td>Automatically merges dimensions with the same name and from the same universe. You see the merged dimension in the list of available objects with the dimensions merged within it below. Merged dimensions are the mechanism for synchronizing data from different data providers.</td>
</tr>
<tr>
<td>Extend merged dimension values</td>
<td>When selected extends values of merged dimensions. Merged dimensions are the mechanism for synchronizing data from different data providers. This controls the results when a table contains synchronized data. If a table contains a dimension used in a merge, this dimension returns the value of its query plus the values of the other dimensions merged from other data providers for which there is an object in the table. When this option is not selected and a table contains a dimension used in a merge, this dimension returns the value of its query.</td>
</tr>
<tr>
<td></td>
<td><strong>Restriction</strong> \nYou should only activate the <em>Extend merged dimension values</em> option when you want to reproduce the merged dimension behavior of SAP BusinessObjects Desktop Intelligence.</td>
</tr>
</tbody>
</table>
Auto-refresh

This option, available in Document Summary panel, when activated causes the document to be automatically refreshed.

The Auto-refresh option applies to the use of delegated measures. Block elements that are affected by this include adding/deleting a column, inserting a break, including a footer, filter bar, input control. When this option is selected, and an object is added to or removed from the query, or when a different value is selected from a list in the Report Filter bar (all values, simple values), for example, the document is refreshed automatically. The #TOREFRESH message will not appear in the report because the refresh is automatic.

This option only applies to aggregated delegated measures. For example when you add a total to a table in a report.

Using this option can slow down the performance. If the drop in performance is a problem, consider deselecting this option. In this case #TOREFRESH will display when the report is modified.

**i Note**

This option can only be modified if the BI administrator has enabled it in the Web Intelligence application properties in the Central Management Console (CMC).

Default Style

You can change the default style that is used for the document. You can do the following:

- Import a different .css style sheet to replace the existing style sheet.
- Export the current style sheet to save or use elsewhere.
- Reset the document to use the original style sheet installed with the product. This option is only available when the current document style sheet is different from the original style sheet.

Merge prompts (BEx variables)

Select this option if you want to merge prompts that are created in Web Intelligence from BEx variables in the original BEx query. Only BEx variables that have the same technical name are merged. When this option is unselected, any previously merged BEx variables are unmerged and treated as separate prompts.

Prompts

In the Side Panel, this box indicates the prompts entered for the current view of the document.

KeyDates

In the Side Panel, this box indicates any keydates associated with the document.

**Related Information**

Merging data from dimensions and hierarchies [page 296]
Drilling with query drill [page 561]
Data tracking and Refresh on Open [page 281]
4.2.7.1 To configure document properties

You can configure the document properties in the Document Summary dialog box.

Procedure

1. In a Web Intelligence document in Design or Data mode, do one of the following:
   ○ Click Document on the Properties tab.
   ○ In the Side Panel, select the Document Summary pane, then click Edit.
2. In the Document Summary dialog box, edit the document properties.
3. Click OK to close the Document Summary dialog box.

Related Information

Viewing document properties [page 235]

4.2.7.2 To select default folders for local documents and universes

In Web Intelligence Rich Client, you can select a folder where local documents and universes are stored by default on your local machine.

Procedure

1. In a Web Intelligence document in Design mode, click Application in the Properties tab.
2. In the Web Intelligence Options dialog box, select the General tab.
3. Next to User documents, click Browse, and select a folder for documents.
4. Next to Universes, click Browse, and select a folder for universes.
5. Click OK to close the Web Intelligence Options dialog box.

4.2.7.3 Query stripping in documents

Query stripping is a reporting feature that can be used to optimize performance.

Query stripping is used only by Web Intelligence.
For relational universes, query stripping is only enabled if the following parameters are set:

- The **Allow query stripping** option is selected in the business layer properties in the information design tool (unselected by default).
- The **Enable query stripping** option is selected for the data provider in the **Query Properties** in Web Intelligence.
- The **Enable query stripping** option is selected in the **Document Properties** in Web Intelligence (selected by default if query stripping is enabled for the data provider).

For OLAP universes, query stripping is enabled by default.

When query stripping is enabled, the query is rewritten to reference only objects that are used in the report. Let’s take for example a query that contains three result objects: **Country**, **City**, and **Revenue**. A report based on this query may contain only **City** and **Revenue**. If query stripping is enabled, when the report is refreshed, in most cases the query will only retrieve the data for **City** and **Revenue**.

In relational universes, a report with query stripping enabled may return different data than when query stripping is disabled, depending on the schema of the data foundation. Let’s look again at the example of a query that contains **Country**, **City**, and **Sales Revenue**. In the data foundation, there is a self-restricting join on the **Country** table that restricts the country to the US. With query stripping disabled, the report on **City** and **Revenue** returns revenue for only cities in the US. With query stripping enabled, the report returns revenue for cities in all countries, because the **Country** table was stripped out of the query.

⚠️ **Caution**

Web Intelligence cannot strip every object if there is no report element in the document: the report must contain at least one object.

### Enhanced Query Stripping

The **USE_ENHANCED_QUERY_STRIPPING** parameter allows you to take advantage of enhancements to the query stripping method. Normal query stripping rewrites the query to contain only the objects referenced in the report and any joins concerned by those objects. Enhanced query stripping only optimizes the SELECT and GROUP BY clauses to avoid fetching unused data, but it doesn’t modify the other clauses or the joins. It is recommended to use enhanced query stripping in the following situations:

- The data foundation contains outer joins.
- The data foundation contains self-restricting joins (column filters).
- The data foundation contains shortcut joins.

If aggregate awareness is defined in the business layer (using the **@Aggregate_aware** function in the definition of business layer objects), enhanced query stripping is used in every case, even if the **USE_ENHANCED_QUERY_STRIPPING** parameter is not set.

The **USE_ENHANCED_QUERY_STRIPPING** parameter is not set by default. It can be set in the data foundation or business layer. For more information on query stripping, see the Information Design Tool user guide.
4.2.8 Applying security filtering when opening a document

When creating a document on a relational .unx universe, you can specify that security on data is applied when opening the document without any need to perform a refresh.

This saves time for all users of the document, especially for those who receive a document through the scheduling process.

Data security is also applied when you export the data of a document.

Applies to which universes?

This feature is available for documents created on relational .unx universes only, not for OLAP .unx universes.

Which security settings are applied?

When the option Apply security filtering on open is selected:

- The Business Security Profiles, which are defined by universe, are applied. Data Security Profiles are not applied.
- Within Business Security Profiles, Display Data and Filters are applied. Member Sets are not applied, as they are defined for OLAP .unx universes.

In which cases do errors appear in a document?

Even when the option Apply security filtering on open is selected, security on data is not applied in the following situations:

- If the universe can’t be accessed.
- If the Business Security Filters refer to objects that are not included in the query.
- If the Business Security Filters contain filter types not included in the following list:
  - Comparison filters with operators =, <>, >=, >, <=, <, INLIST, NOT_INLIST, BETWEEN, NOT_BETWEEN
  - Comparison filters based on @variable syntax on system variables such as BOUSER, UNVNAME, etc.
  - Comparison filters based on @variable syntax on CMS User Attributes.
- If Business Security Display Data is applied on queries containing delegated measures.
When there is an error in a document, the data of the document is automatically purged.

4.2.8.1 To apply security filtering when opening a document

Procedure

1. Make sure you are in Design mode.
2. Select the option Apply security filtering on open from the Document Summary dialog box. See To configure document properties [page 239].

i Note
- This option is not selected by default. When this option is selected, the option Refresh on open is greyed out. And when the option Refresh on open is selected, the option Apply security filtering on open is greyed out.
- If you deselect the option Apply security filtering on open, it means that the security on data will not be applied when a user opens the document. Then, as soon as the user refreshes the opened document, both data and security are applied. When you deselect the option, a message appears indicating that data will be purged.

Results

Data security is also applied when you export the data of a document.

4.2.9 Hierarchical and non-hierarchical data

Depending on the data source for your reports, they can contain non-hierarchical or hierarchical data.

Non-hierarchical data behaves differently from hierarchical data and you work with them in different ways.

4.2.9.1 Working with non-hierarchical data

Non-hierarchical data has no parent-child relationships. A dimension is an example of a non-hierarchical object.

For example, the [Country] and [City] dimensions displayed in a table, show the following values:
Although the data has a hierarchical relationship (for example, "New York" and "Atlanta" are child values of "US"), the data appears in non-hierarchical columns and the parent-child relationship is not expressed in the data structure.

You can analyze non-hierarchical data in many ways in your reports, for example by sorting or filtering it.

### 4.2.9.2 Working with hierarchical data

When your report includes hierarchical data, the measures are aggregated at each level in the hierarchy. You can navigate the hierarchical data to analyze the level of detail that interest you.

For example, in a [Geography] hierarchy, you can navigate to and analyze the [Revenue] measures for [USA] and for the more detailed levels of [California] and then, of [San Francisco] and [Los Angeles].

<table>
<thead>
<tr>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>$8,095,814</td>
</tr>
<tr>
<td>California</td>
<td>$1,704,221</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$982,637</td>
</tr>
<tr>
<td>San Francisco</td>
<td>$721,574</td>
</tr>
</tbody>
</table>

The appearance and behavior of hierarchical data depends on the report element where you place the data, the hierarchy order that you define, and how you organize the other data in the report element.

**Related Information**

- Working with non-hierarchical data [page 242]
- Restrictions concerning reporting with hierarchical data [page 244]
- Hierarchical data in tables [page 246]
- Hierarchical data in cross tables [page 247]
- Reversing the order of hierarchical data [page 248]
- Exploring hierarchies [page 251]
### Restrictions concerning reporting with hierarchical data

Some restrictions can apply when you are using hierarchical data.

These restrictions are repeated in the appropriate sections in this guide.

#### Restrictions when reporting with hierarchies

<table>
<thead>
<tr>
<th>The restriction concerns...</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEx query measures</td>
<td>Measures which aggregate with the SUM function in Web Intelligence, and not in the BEx query. The other types of measure aggregation are delegated.</td>
</tr>
<tr>
<td>Break on measure or detail</td>
<td>A break is always associated with the sort on the object where it is applied. For this reason, any hierarchy in the table where break applies, the hierarchy becomes flat. The user can remove the break on the underlying object to restore the hierarchy.</td>
</tr>
<tr>
<td>Delegated measure aggregation</td>
<td>This restriction applies whenever delegated measures are used, and is not specific to reporting on hierarchical data. Delegated measure aggregation returns #TOREFRESH, when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs, for example, when using the filter bar, and the user selects a value before “all value” and vice versa when selecting “all value” before a selected value. Delegated measure aggregation returns the #UNAVAILABLE message if the delegated measure is in a formula on a dimension, or if it is in a multi-valued filter (for example, an input control) on a dimension that is not in the context of the aggregation of the measure. This occurs for example when defining a URL on top of a dimension in a table where there is a delegated measure. In that case, we recommend that you create a variable on top of the URL formula as a detail of the original dimension and include, but hide, the original dimension in the block. In the formula: If ( condition) then [dimension1] else [dimension2]. any delegated measure that is given against this formula will still return #UNAVAILABLE.</td>
</tr>
<tr>
<td>Drilling</td>
<td>There is no drill-replace capability on objects from a BEx query (there is no navigation path). There is no query drill on OLAP . unx sources.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>The restriction concerns...</th>
<th>Description</th>
</tr>
</thead>
</table>
| Filtering on hierarchies  | A report/table filter where there is a hierarchy may remove rows without respecting the hierarchy structure. For this reason, a filter can remove a parent node currently expanded but keep leaves or nodes collapsed. To avoid returning an empty table, the system automatically expands the hierarchy in the block to show the resulting members.  
A filter can remove an intermediary node of a hierarchy. In that case, the user cannot access the next level of member from the parent node with a simple expand action. To see the descendant of the parent node, the user can do an expand all.  
It is not possible to filter on a merge object based on a hierarchy.  
Filter bar (drill bar): when filtering through the filter bar on a hierarchy, selecting a node that is not shown in the table because it is collapsed, the table is shown empty. The user can do an expand all to see all the value.  
To filter from the filter bar is to filter on the caption, even for OLAP business objects that have a key. |
| Report filters             | When the user changes any report filter, the system proceeds with an “expand all” on any hierarchy in the report. |
| Flattening hierarchies    | When a hierarchy becomes flat, the system shows all the members of the hierarchy at the same level, like for a dimension, without using + or - to navigate and without contextual menu “collapse/expand”. |
| Merged objects            | A merged object based on a hierarchy cannot be directly used in the report. This is because where the original hierarchy has a conflicting hierarchy structure (a member A is descendant of another member B, whereas in the other hierarchy the member A is ancestor of member B), the system cannot build a merge hierarchy. The system prevents you from dragging the merged object.  
If the user builds a formula using the merged object, the system returns #SYNTAX. The user can use directly the original hierarchy instead in the report.  
A merge on a key for a OLAP business object is a data synchronization of the same object from the same source (cube or BEx query), and is based on the internal key of the value of these objects. It can also be based on the caption.  
It is not possible to filter on a merged object based on a hierarchy. |
| OLAP                      | The order of an OLAP dimension member in a report LOV (filter bar, input control) is ascending in lexicographical order.  
Filtering on an OLAP object from the filter UI filter is based on the key of the given object.  
Filtering from an input control on an OLAP dimension is filtering on the caption. Filtering on a hierarchy is filtering on a key. |
| Query stripping           | Query stripping is only available for .unv, OLAP, and BEx query sources. |
The restriction concerns...

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refreshing documents</td>
</tr>
<tr>
<td>When you refresh a document, the system proceeds with a “collapse all” for any hierarchy whose root value has changed.</td>
</tr>
<tr>
<td>Refresh on open document property</td>
</tr>
<tr>
<td>When a document has the refresh on open property, all query objects are purged and Web Intelligence cannot check which hierarchies have had their root value changed. Consequently, all document hierarchies are collapsed.</td>
</tr>
<tr>
<td>Ranking on hierarchical data in a table</td>
</tr>
<tr>
<td>A ranking on a table where there is a hierarchy does not take into account the hierarchy structure of the data. For this reason, any hierarchy in a table where the user defines a ranking becomes flat.</td>
</tr>
<tr>
<td>Sorting</td>
</tr>
<tr>
<td>Sorting a hierarchy and, in the case of OLAP sources, a dimension is based on the order of the member in the underlying system. It is based on the source ordinal called natural order, but not lexicographical order like for other type of business object. The sort on a hierarchy respects the structure of the hierarchy; it is sorting sibling members at a given level. Sorting on a measure does not preserve the order of member within a hierarchy in the same table. For this reason the system is showing the hierarchy flat in a table, where the user applied a sort on measure.</td>
</tr>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Variable (formula) on hierarchy: a formula based on a hierarchy is always resulting in flat value list (no hierarchical data).</td>
</tr>
</tbody>
</table>

### 4.2.9.2.2 Hierarchical data in tables

Hierarchies appear in tables as hierarchical columns.

A hierarchical column displays the hierarchy levels. You can explore the hierarchy by expanding and collapsing its values.

#### ❗ Example

**A hierarchical column in a table**

The following table displays the [Product] hierarchy and the [Revenue] measure:

<table>
<thead>
<tr>
<th>Product</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td>203,124</td>
</tr>
<tr>
<td>Baking Goods</td>
<td>100,101</td>
</tr>
<tr>
<td>Beverages</td>
<td>54,345</td>
</tr>
<tr>
<td>Breads</td>
<td>48,678</td>
</tr>
</tbody>
</table>

The measure displays the total revenue for the corresponding value in the hierarchy. For example, the total revenue for Grocery products is 203,124.

You can find more information about Beverages by expanding the [Beverages] member:
When you expand the member, the Revenue column also displays the measure values associated with different kinds of beverage.

## Related Information

Hierarchical data in cross tables [page 247]

### 4.2.9.2.3 Hierarchical data in cross tables

Hierarchical data behaves similarly in cross tables to how it behaves in tables.

If an axis of the crosstab is based on a hierarchy, you can click a data item to expand it.

#### Example

**Hierarchical data in a cross table**

The following crosstab has the [Time] hierarchy on the vertical axis and the [Product] hierarchy on the horizontal axis.

<table>
<thead>
<tr>
<th>Time</th>
<th>Grocery</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>203,110</td>
</tr>
<tr>
<td>2009</td>
<td>321,400</td>
</tr>
<tr>
<td>2010</td>
<td>350,444</td>
</tr>
</tbody>
</table>

If you click the [Grocery] item, it expands to display its child items and displays the corresponding measure values.

<table>
<thead>
<tr>
<th>Time</th>
<th>Baking Goods</th>
<th>Beverages</th>
<th>Bread</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>54,570</td>
<td>67,000</td>
<td>81,540</td>
</tr>
</tbody>
</table>
Related Information

Hierarchical data in tables [page 246]

### 4.2.9.2.4 Reversing the order of hierarchical data

For hierarchical data in tables or sections, you can define the order in which the hierarchy levels display when the hierarchy is fully extended – either the top or the bottom level first.

Choose the hierarchy order that best meets your business needs:

- Use parents first to display the top level of the hierarchy first. This is the hierarchy order by default. For example, the [Geography] hierarchy, displays [Country], [Region], and finally, [City].
- Use children first to reverse the default order and display the bottom or most detailed level of the hierarchy first. For example, the [Geography] hierarchy displays [City], [Region], and finally, [Country].

When the hierarchical data is in a table column, the order displays from the top to the bottom of the table. When the hierarchical data is in a row, the order displays from left to right or right to left, as appropriate for the language settings.

The hierarchy order applies to all hierarchical data in the block.

When you turn a table into a chart, the chart does not retain the hierarchy order.

#### Example

For a sales report, use the default parents first order to show the sales revenue for the hierarchy levels [Country], [State], and [City].

<table>
<thead>
<tr>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>$36,397,203</td>
</tr>
<tr>
<td>California</td>
<td>$7,479,569</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$4,220,929</td>
</tr>
<tr>
<td>San Francisco</td>
<td>$3,258,641</td>
</tr>
</tbody>
</table>
### Geography

<table>
<thead>
<tr>
<th></th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>$2,060,275</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>$2,060,275</td>
</tr>
<tr>
<td>Florida</td>
<td>$2,961,950</td>
</tr>
</tbody>
</table>

For a profit and loss statement, use the children first order to show how the detailed [Sales Revenue], [Cost of Sales] and [Operating Expenses] contribute to the overall net profit. For example, show the detailed expenses, roll them up into total costs for each company area, and then, the total operating expenses.

#### Children first hierarchy order

<table>
<thead>
<tr>
<th>Operating Expenses</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Salaries</td>
<td>$4,200,000</td>
</tr>
<tr>
<td>Warranty Expenses</td>
<td>$730,000</td>
</tr>
<tr>
<td>Depreciation, Store Equipment</td>
<td>$120,000</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>$729,000</td>
</tr>
<tr>
<td>Total Sales</td>
<td>$5,779,000</td>
</tr>
<tr>
<td>Administration Salaries</td>
<td>$1,229,000</td>
</tr>
<tr>
<td>Rent and Utilities</td>
<td>$210,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>$379,000</td>
</tr>
<tr>
<td>Total General and Administraion</td>
<td>$1,818,000</td>
</tr>
<tr>
<td>Total Operating Costs</td>
<td>$7,597,000</td>
</tr>
</tbody>
</table>

### Related Information

To reverse the order of hierarchical data [page 250]
Applying sorts and hierarchy orders to hierarchical data [page 250]
4.2.9.2.5  To reverse the order of hierarchical data

Reverse the order of hierarchical data in reports: from aggregated values down to detailed values or from detailed values up to aggregated values.

Context

You can reverse the order of hierarchical data in tables and sections. The order you define applies to all hierarchies in the data block.

Procedure

1. Right-click the table or section that contains hierarchical data.
2. Select Sort > Advanced.
3. In Hierarchies, change the hierarchy order.

4.2.9.2.6  Applying sorts and hierarchy orders to hierarchical data

You can apply both a sort order and a hierarchy order to hierarchical data to make your reports easier to read.

Note

- The order of the data hierarchy and the sort order of the values at each level of the data hierarchy can be controlled independently.
- Using the Remove all sorts button has no impact on the hierarchy order.

Example

Columns one and two both show the parents first hierarchy order so the [Geography] hierarchy displays [WORLD], [Global Region], and finally, [Country Code]. However, each column uses a different sort order:

- Column one shows the ascending sort order so the text appears in alphabetical order and the numbers appear in ascending order.
- Column two shows the descending sort order so the text appears in reverse alphabetical order and the numbers appear in descending order.

Columns three and four show the children first hierarchy order so the [Geography] hierarchy displays [Country Code], [Global Region], and finally, [WORLD]. The [Country Code] values display before their [Global Region]. However, each column uses a different sort order:

- Column three shows the ascending sort order so the text appears in alphabetical order and the numbers appear in ascending order.
Column four shows the descending sort order so the text appears in reverse alphabetical order and the numbers appear in descending order.

Hierarchy order and sort order combinations

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hierarchy Order: Parents First</td>
<td>Hierarchy Order: Parents First</td>
<td>Hierarchy Order: Children First</td>
<td>Hierarchy Order: Children First</td>
</tr>
<tr>
<td>Sort Order: Ascending</td>
<td>Sort Order: Descending</td>
<td>Sort Order: Ascending</td>
<td>Sort Order: Descending</td>
</tr>
<tr>
<td>WORLD</td>
<td>WORLD</td>
<td>1</td>
<td>Middle East</td>
</tr>
<tr>
<td>Americas</td>
<td>Middle East</td>
<td>54</td>
<td>47</td>
</tr>
<tr>
<td>1</td>
<td>Europe</td>
<td>57</td>
<td>33</td>
</tr>
<tr>
<td>54</td>
<td>47</td>
<td>Americas</td>
<td>Europe</td>
</tr>
<tr>
<td>57</td>
<td>33</td>
<td>Asia Pacific</td>
<td>Asia Pacific</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>Asia Pacific</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Europe</td>
<td>Americas</td>
<td>33</td>
<td>54</td>
</tr>
<tr>
<td>33</td>
<td>57</td>
<td>Europe</td>
<td>1</td>
</tr>
<tr>
<td>47</td>
<td>54</td>
<td>Middle East</td>
<td>Americas</td>
</tr>
<tr>
<td>Middle East</td>
<td>1</td>
<td>WORLD</td>
<td>WORLD</td>
</tr>
</tbody>
</table>

4.2.9.2.7  Exploring hierarchies

The way you explore hierarchical data depends on how you organize the hierarchical and non-hierarchical data in your report.

When the hierarchical data is in a table, next to a non-hierarchical dimension, and you collapse or expand one of its members, your action is symmetric. It applies to all the values of the other dimensions for the selected hierarchy member and all those values collapse or display.

On the other hand, when two hierarchies are next to each other in a table, and you collapse or expand one member of one hierarchy, your action is asymmetric. It applies only to the current values of the other hierarchical data or dimensions for the selected member.

To perform a collapse or expand action symmetrically so that all the values of the other hierarchies or dimensions in the table collapse or expand, you specifically select a symmetric action.
4.2.9.2.8  To expand and collapse all the hierarchies in a table

In a table with hierarchical values, you can expand all the hierarchies to show all possible combinations of hierarchy members.

Procedure

1. To expand all the hierarchies in a table, right-click one of them and select Hierarchical Navigation All Expand All Hierarchies.
2. To collapse all the hierarchies in a table, right-click one of them and select Hierarchical Navigation All Collapse All Hierarchies.

4.2.9.2.9  Exploring a hierarchy asymmetrically

Asymmetric exploration is the way you explore a hierarchy by default when you select members to expand or contract them.

When you explore a hierarchy asymmetrically, your expand and collapse actions are applied only to the current value of the other dimensions that appear next to the explored hierarchy.

Example

Asymmetric exploration


<table>
<thead>
<tr>
<th>Product</th>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td>California</td>
<td>540,000</td>
</tr>
<tr>
<td>Beverages</td>
<td>California</td>
<td>453,300</td>
</tr>
</tbody>
</table>

If you expand the [California] member to display cities in California in the first row of the table, the expansion applies only to the current value (Grocery) of the [Product] dimension.
### Product

<table>
<thead>
<tr>
<th>Product</th>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td>California</td>
<td>540,000</td>
</tr>
<tr>
<td></td>
<td>Los Angeles</td>
<td>320,000</td>
</tr>
<tr>
<td></td>
<td>San Diego</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>San Francisco</td>
<td>120,000</td>
</tr>
<tr>
<td>Beverages</td>
<td>California</td>
<td>453,300</td>
</tr>
</tbody>
</table>

### Related Information

To explore a hierarchy asymmetrically [page 253]
To expand and collapse all the hierarchies in a table [page 252]

### 4.2.9.2.9.1 To explore a hierarchy asymmetrically

You can expand a hierarchy for only the current values of a dimension or hierarchy.

### Procedure

1. Open a Web Intelligence document based on a hierarchical data source in any mode.
2. To expand the child members of a member, click the member, or right-click and select Expand Children from the menu.
   The hierarchy expands only for the current value of the dimensions or hierarchies next to the expanded hierarchy in the table.
3. To expand all descendant members of a member, click the member, or right-click and select Expand Descendants.
   The hierarchy collapses only for the current value of the dimensions or hierarchies next to the expanded hierarchy in the table.
4. To collapse the child members of a member, click the expanded member, or right-click and select Collapse Children.
   The hierarchy collapses only for the current value of the dimensions or hierarchies next to the collapsed hierarchy in the table.
4.2.9.2.10 Exploring a hierarchy symmetrically

When you explore a hierarchy symmetrically, your expand and collapse actions are applied in relation to all values of the other hierarchies or dimensions that appear next to the explored hierarchy in the table.

Example

Symmetric exploration


<table>
<thead>
<tr>
<th>Product</th>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td>California</td>
<td>540,000</td>
</tr>
<tr>
<td>Beverages</td>
<td>California</td>
<td>453,300</td>
</tr>
</tbody>
</table>

If you expand the [California] member on the first row to display cities in California, the expansion applies to both values of the [Product] dimension.

<table>
<thead>
<tr>
<th>Product</th>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td>California</td>
<td>540,000</td>
</tr>
<tr>
<td></td>
<td>Los Angeles</td>
<td>320,000</td>
</tr>
<tr>
<td></td>
<td>San Diego</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>San Francisco</td>
<td>120,000</td>
</tr>
<tr>
<td>Beverages</td>
<td>California</td>
<td>453,300</td>
</tr>
<tr>
<td></td>
<td>Los Angeles</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>San Diego</td>
<td>200,000</td>
</tr>
<tr>
<td></td>
<td>San Francisco</td>
<td>133,300</td>
</tr>
</tbody>
</table>

Related Information

To expand and collapse all the hierarchies in a table [page 252]
To explore a hierarchy symmetrically [page 255]
4.2.9.2.10.1 To explore a hierarchy symmetrically

You can expand a hierarchy for all values of a dimension or hierarchy.

Procedure

1. Open a Web Intelligence document based on a hierarchical data source in any mode.
2. To expand the child items of a member, right-click the member and select Hierarchical Navigation Symmetric Expand Children. The hierarchy expands for all values of the dimensions or hierarchies next to the expanded hierarchy in the table.
3. To expand all descendant items of a member, right-click the member and select Hierarchical Navigation Symmetric Expand Descendants. The hierarchy expands for all values of the dimensions or hierarchies next to the expanded hierarchy in the table.
4. To collapse the child members of a member, right-click the member and select Hierarchical Navigation Symmetric Collapse Children. The hierarchy collapses for all values of the dimensions or hierarchies next to the collapsed hierarchy in the table.

4.2.9.2.11 Changing the drill focus of a hierarchy

You can change the drill focus when exploring hierarchies.

When you change the drill focus you filter out the parent member and all members at and above its level when expanding it.

Changing the drill focus is useful when creating charts on hierarchical data. Because measure values associated with parent members are more aggregated than their child members, it is difficult to display them on the same chart axis using the same scale. By removing the parent member, it is possible to display the values for the child members using the same scale.

Example

Drilling down on a hierarchy

You have the following data in a table:

<table>
<thead>
<tr>
<th>Time</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>29,358,677.22</td>
</tr>
<tr>
<td>2009</td>
<td>30,242,323</td>
</tr>
<tr>
<td>2010</td>
<td>45,320,243</td>
</tr>
</tbody>
</table>

When you drill down on the [2010] member, you see the following display:
### 4.2.9.2.11.1 To change the drill focus of a hierarchy

You can drill up and down in a table hierarchy.

**Procedure**

1. Open the Web Intelligence document in *Design* mode.
2. To drill down on a table hierarchy, do one of the following:
   - In the Web Intelligence HTML interface, right-click the member you want to expand and select *Start Drill ➔ Drill down to*.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client, right-click the member you want to expand and select *Start Drill ➔ Drill*.
3. To drill up on a table hierarchy, right-click any child member of a member you previously drilled down on and select *Drill Focus ➔ Drill Up*.

### 4.2.9.2.12 Aggregating hierarchical data

Hierarchical measure data is aggregated differently depending on whether the method of aggregation is default or explicit.

The aggregation logic is based on the following rules:

- **Data sets used for aggregation:**
  1. When there is a hierarchy in a measure context the measure values for the root members of the hierarchy are aggregated - this is by default (the *Aggregate()* mechanism is not explicitly declared).
  2. For explicit types (SUM, MAX, MIN), the hierarchical nature of the data is ignored. All the visible data is aggregated, including data that has already been aggregated (parent members already aggregated).
- **Sensitivity to the collapse/expand status:**
  1. Explicit aggregation only aggregates visible data, except when the set expression is used for a specific hierarchy, then an aggregation is performed on the objects defined in the set expression.
2. Default aggregation including the aggregate() function is not sensitive to the state of the collapse/expand.

### 4.2.9.2.12.1 Default aggregation

In a default aggregation, the collapsed or expanded state of a hierarchy's item is not taken into account. A measure in a report block is always aggregated with the context of that block. For example, if the block contains only one [Year] dimension, the measure will be aggregated for each value of the dimension: 2004, 2005, 2006 and so on. Also, if you aggregate every value of the measure for each quarter of each [Year] value using the Sum() function by default, Web Intelligence returns the sum of the measure for every quarter of each [Year] value.

This method of aggregation is called default aggregation, where it uses the default universe aggregation function specified by the universe designer at the universe creation. The default aggregation function is usually specified in the universe, although not always. For Excel data sources for instance, it is specified in the Query Panel. The aggregation is processed by Web Intelligence’s calculator. The calculator can run aggregations using functions such as Sum(), Average(), Count(), Min() or Max().

A default aggregation uses the rolled-up values returned by the database. In other words, it is compatible with the aggregated values returned by the database. Default values are calculated by applying the default aggregation function to all the root values in the hierarchy. This means that a default aggregation does not count values more than once except in situations where the same value appears beneath different root items in a hierarchy.

### Delegated aggregation

You can declare a function for a measure, which, by default, is delegated to the database. This means that when you use this measure in a report block, a query is sent to the database to retrieve the result of the aggregation depending on the context.

Delegated aggregations are mainly used for measures associated with hierarchical objects coming from SAP Business Explorer (BEx). That is because Web Intelligence cannot aggregate the values of a hierarchy that depends on the nodes and leaves retrieved by the query. Only the database knows the content of the hierarchical object in its entirety and is therefore able to aggregate a measure depending on that content.

### Related Information

Examples of default and explicit aggregation [page 258]
4.2.9.2.12.2 Explicit aggregation

In an explicit aggregation, you declare an aggregation function for the measure you want to aggregate.

In an explicit aggregation, Web Intelligence references the visual state of the hierarchy and uses the collapsed or expanded state of the members of the hierarchy to run calculations. As a result, values can be counted more than once, and the result of calculations can change depending on whether an item is collapsed or expanded.

For example, if an item is expanded and an explicit aggregation references both the item and one of its child items, depending on the rollup calculation, the value of the child may be counted twice: once for itself and once with the value of its parent. That is because Web Intelligence is adding the child and parent value.

Restriction concerning set-based explicit aggregation

When a measure is aggregated along hierarchies that are not part of the set expression declared in the aggregation function, the aggregation is not implicit.

For example, when hierarchies are present in a table and aggregation using set is in the table footer and the hierarchies in the table are not specified in the set expression, if there is a filter somewhere in the report which removes the initial roots of the hierarchy in the table, the system will not aggregate values for these roots, but along the original unfiltered roots (the original query result).

Related Information

Examples of default and explicit aggregation [page 258]

4.2.9.2.12.3 Examples of default and explicit aggregation

If you include a measure in a cell without specifying an aggregation function, or if you use the Aggregate function, the measure is calculated using the default aggregation function.

Example

Default and explicit aggregation

You have a hierarchy with the following data and the hierarchy appears fully expanded in a report:

<table>
<thead>
<tr>
<th>Product</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drink</td>
<td>24,597</td>
</tr>
<tr>
<td>Alcoholic Beverages</td>
<td>6,838</td>
</tr>
<tr>
<td>Beverages</td>
<td>13,573</td>
</tr>
<tr>
<td>Food</td>
<td>19,194</td>
</tr>
</tbody>
</table>
4.2.9.2.13 Setting default hierarchy levels in a report table

Using the Hierarchical Navigation option, you can set the default hierarchy member levels that are visible in a hierarchy table so that they will remain visible to the preferred level or fixed at the root level, even after refresh and data purge actions.

Note

If you set a default level, and then add a quick filter, all hierarchical levels are exposed for selection in the filter. If you select a level that is lower than the level set for hierarchy expansion, then you receive no values.

This option is available from the right-click contextual menu for a report table. If the filter is searching for hierarchy members that are on levels lower that those specified for the Hierarchical Navigation, then the table will appear empty.

Normally, the hierarchy in a table is automatically collapsed to the root hierarchy member in the following cases:

- You have just opened the document.
- You have changed the root members of the hierarchy.
You have purged or refreshed a document. If you do not use this option, then when a document is refreshed and the root members of the hierarchy are changed, or when the document has been purged and refreshed, the hierarchy in the table is automatically collapsed to the root hierarchy member.

**Impact of a document refresh on hierarchies**

Refreshing a document that contains hierarchies can impact the way they appear in a report. A collapsed hierarchy for example might expand after your refresh the document.

If the *Refresh on open* option is activated, the data is purged when you open the document. As a consequence, hierarchies are reset and collapsed to avoid having missing nodes after a refresh that could corrupt the document. However, if the document contains filters that apply to hierarchies, they are expanded to prevent the creation of empty blocks caused by a negative filter on the roots of a hierarchy that could potentially be filtered out.

This behavior does not apply when you do a standard refresh in a document because there is no data purge. Therefore, Web Intelligence has a reference to compare with and does not need to reset the hierarchies.

**4.2.9.2.13.1 Using the Default Level Expansion setting**

To avoid expanding all levels of a hierarchy, you can use the *Default Level Expansion* setting to specify which levels of the hierarchy should be expanded.

In Web Intelligence, hierarchies support up to 99 levels. If you set the *Default Level Expansion* to *None* in a hierarchy that has four levels for instance, the setting does not apply to the hierarchy. In this instance, all levels will be collapsed in the report after a refresh with data purge or a refresh on open. However, if a filter is applied to that hierarchy, the four levels will be expanded.

⚠️ **Caution**

Setting the *Default Level Expansion* setting to *None* in a hierarchy does not mean that it will be collapsed. It means that you do not apply any default expansion level.

**Related Information**

- Setting default hierarchy levels in a report table [page 259]
- To set the default hierarchy level in a report table [page 261]
4.2.9.2.13.2 To set the default hierarchy level in a report table

You can set the default number of hierarchy levels on a hierarchy member that are visible in a report table.

Procedure

1. From the BI launch pad, open a document in Web Intelligence.
2. In Design mode, select the report that contains the table you want to configure.
3. Right-click in the table the hierarchy whose level you want to set, and select Hierarchical Navigation Default Level Expansion.
4. In the Default Level Expansion contextual list, do one of the following:
   ○ Set the default level expansion from None to 4.
   ○ Select More to select or enter in the Default level expansion dialog box any level between 1 and 99.

4.2.10 Finding text in a report page

You can search for text in a report in a Web Intelligence document in Reading or Design mode.

Procedure

1. Open a Web Intelligence document.
2. Do one of the following:
   ○ If you are in Reading mode, click the Find icon on the toolbar.
   ○ If you are in Design mode, click the Find icon on the toolbar in the File tab toolbar.
   The Find or Search Bar appears at the bottom of the report panel.
3. Type text in the Find or Search Bar box and press Enter or click the Find icon.

   i Note
   To perform a case-sensitive search, click the arrow next to the box and select Match case.

4. If the text occurs more than once, click the Next or Previous icon to highlight other occurrences of the text.

   i Note
   If you are creating a report using the Web Intelligence Applet interface or Web Intelligence Rich Client, you can click Highlight all to highlight all occurrences of the text on the page. This option is not available once you have saved or closed the document.
**Results**

To close the Find or Search Bar box, click the X located at the far end of the Find or Search Bar.

### 4.2.11 Viewing modes

In the *Reading* and *Design* document modes, you can view reports in different modes depending on how you want to work with data and how you want the data to appear.

The viewing modes are controlled by buttons at the bottom of the Web Intelligence screen, on the status bar.

#### 4.2.11.1 Page view mode

In the *Reading* and *Design* document modes, the *Page* view mode displays the page layout of reports, including page margins, headers, and footers.

Use *Page* view mode when you want to fine-tune the formatting of tables and charts and the layout of report pages.

#### 4.2.11.1.1 Setting the report size in Page mode

You can set a report size to a specific percentage or to a specific number of pages in *Page* mode.

For example, if you set a report to be one page tall, all elements on the report are re-organized to fit on one horizontal page.

Setting the report size overrides all other settings that control the page layout of a report. For example, if you have a report with three sections and the report is set to start each section on a new page, the report still contains one page if the report is set to be one page tall.

The report size setting takes effect in *Page* mode only.

#### 4.2.11.1.1 To set the report size

You can set the width and height of the report, or even set the size as a percentage.

**Procedure**

1. In a Web Intelligence document in *Design* mode, select the *Page Setup* tab,
2. In the **Scale to Page** subtab, select the report width in the **Width** box and the height in the **Height** box, or set the report size as a percentage in the **Scale** box.

If you define a percentage, the width and height are calculated automatically.

### 4.2.11.2 Quick Display view mode

In the **Reading** and **Design** document modes, the **Quick Display** view mode is the default display mode.

It is a pagination mode that is based on the data, rather than the physical size of report pages. The **Quick Display** view mode displays just the tables, reports, and free standing cells in reports and displays a maximum number of records vertically and horizontally, depending on the **Quick Display** settings. The **Quick Display** view mode also specifies the minimum page width and height and the amount of padding around the edges of the report.

Because the **Quick Display** view mode restricts the number of horizontal and vertical rows, a report might not contain all possible data.

Use the **Quick Display** view mode when you want to focus on analyzing results, add calculations or formulas, or add breaks or sorts to tables to organize results.

The **Quick Display** view mode properties are configurable either by the BI administrator, or directly in the interface.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Property</th>
</tr>
</thead>
</table>
| BI administrator   | ● Maximum vertical records  
|                    | ● Maximum horizontal records  
|                    | ● Minimum page width  
|                    | ● Minimum page height  
|                    | ● Right padding  
|                    | ● Bottom padding  |

<table>
<thead>
<tr>
<th>Interface</th>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Vertical records per page</td>
</tr>
</tbody>
</table>

**i Note**
- This property impacts only horizontal tables and cross tables.
- Horizontal tables are never cut vertically.
- The number of rows in a horizontal table is ignored in vertical records calculations.

<table>
<thead>
<tr>
<th></th>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Horizontal records per page</td>
</tr>
</tbody>
</table>

**i Note**
- This property impacts only vertical tables, forms and cross tables.
- The number of rows in a vertical table is ignored in horizontal records calculations.

Other notes:
- Table headers and footers do not count as rows.
- Free standing cells and charts do not count as rows.
- Section cells do not count as rows when the section is not empty.
- Sections cells count as vertical rows when the section is empty.
- The Avoid Page Break in Block option has no effect in Quick Display view mode.

### 4.2.11.2.1 To change Quick Display mode settings

You can change the number of horizontal and vertical records per page in Quick Display mode.

**Procedure**

1. In a Web Intelligence document in Design mode, right-click the report and select Format Report to display the Format Report dialog box.
2. Select the General tab.
3. Select the number of horizontal and vertical records per page in the Page content (Quick Display mode only) section.
4. Click OK to return to the document.

### 4.2.11.3 To switch between viewing modes

You can switch between Quick Display and Page view modes.

**Procedure**

1. Open a Web Intelligence document, in the Reading or Design document mode.
2. In the status bar at the bottom of the document, select one of the following icons:
   - To display a report in Quick Display view mode, click the Quick Display icon.
   - To display a report in Page view mode, click the Page icon.

### 4.2.12 Folding and unfolding report data

You can hide and display report data by folding and unfolding the display of different report elements.

You can fold and unfold sections, breaks and tables. Data is concealed and displayed in different ways depending on the report element.
### 4.2.12.1 To fold and unfold report data

You can fold and unfold data in *Reading* and *Design* mode by activating the outline.

**Procedure**

1. Open a Web Intelligence document.
2. Select a cell in the table.
3. Do one of the following:
   - In the *Reading* mode, click *Outline*.
   - In the *Design* mode, in the *Analysis* tab, select the *Interact* subtab and click *Outline*.
4. Use the +/- or arrow icons on the bars, which correspond to and are aligned with individual report elements, to fold and unfold them.
5. Use the icons at the side or upper part of the bar to fold and unfold all instances of a type of report element.
4.2.12.2 To redisplay all hidden content in a report

You can hide tables, cells and sections in reports.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click the report containing hidden content and click Hide Show All Hidden Content.

4.2.13 Formatting the report layout

You can format your report and report elements in order to present the report with a company style.

You can format the report layout manually, or you can create a company stylesheet using a CSS file. You can add color background, corporate images, and so on. To change the report format, you must view the report in Design mode in order to access the report formatting options. You can format the following report elements:

<table>
<thead>
<tr>
<th>To set the...</th>
<th>Do this...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name the report</td>
<td>Right-click in the report, select Format Report General, then name the report.</td>
</tr>
<tr>
<td>Number of records per page</td>
<td>Right-click in the report, select Format Report General, then set the number of records per page.</td>
</tr>
<tr>
<td>Report border style</td>
<td>Right-click in the report, select Format Report Border, set the border style, thickness, and color.</td>
</tr>
<tr>
<td>Report background</td>
<td>Right-click in the report, select Format Report Appearance and set the background (color, pattern, image).</td>
</tr>
<tr>
<td>Page size</td>
<td>Right-click in the report, select Format Report Layout, select a page size.</td>
</tr>
<tr>
<td>Page orientation</td>
<td>Right-click in the report, select Format Report Layout, select landscape or portrait orientation.</td>
</tr>
<tr>
<td>Page scaling</td>
<td>Right-click in the report, select Format Report Layout, select the page scaling/</td>
</tr>
<tr>
<td>Page margins</td>
<td>Right-click in the report, select Format Report Layout, and set the different margin sizes, as required.</td>
</tr>
<tr>
<td>Show/hide header</td>
<td>Right-click in the report, select Format Report Layout, select or unselect Show header.</td>
</tr>
</tbody>
</table>
To set the... | Do this...
--- | ---

or
Right-click in the report header, select **Format Header**, select or unselect Show header.

| Header size | Right-click in the report, select **Format Report Layout** enter a size for the header.
| or
Right-click in the report header, select **Format Header**, enter a size for the header.

| Header border style | Right-click in the report header, select **Format Header**, select a style for the header border.

| Header background | Right-click in the report header, select **Format Header**, select a background color, a pattern or enter an address for an image.

| Show/hide footer | Right-click in the report, select **Format Report Layout** select or unselect Show footer
| or
Right-click in the report footer, select **Format Footer** and select or unselect **Show footer**.

| Footer size | Right-click in the report, select **Format Report Layout** enter a size for the footer.
| or
Right-click in the report footer, select **Format Footer**, enter a size for the footer.

| Footer border style | Right-click in the report footer, select **Format Footer**, select a style for the footer border.

| Footer background | Right-click in the report footer, select **Format Footer**, select a background color, pattern or enter an address for an image.

---

**Related Information**

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]
Formatting tables and table cells [page 447]
4.2.13.1 To format the appearance of reports and their headers, footers, sections, tables, and table cells

You can define the background color and pattern of a report, or its headers, footers, sections, tables, and even specific cells in tables. The pattern can be a skin, also known as a theme, an image from a URL address or a file.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the report, a header, footer, report section, table, or a selection of one or more cells in a table and select the applicable Format option from the contextual menu.
   For example, if you right-click on a selection of a group of cells, select *Format Cells* from the contextual menu.

2. In the format dialog box that appears, select the *Appearance* tab.
   The *Background* section in this tab shows the settings you can apply to your selected items.

3. To select a color for the background of the selected items:
   a. Click the radio button next to the color palette icon.
   b. Click the arrow next to the color palette icon to display the palette.
   c. Select a color from the palette.
   d. Click *OK* to return to the document.

   **Note**
   When the background color of cells are defined (even as white), they take precedence over the table background color. If you apply a background color to an entire table but one or more cells remain white, open the *Format Cells* dialog box for these cells and check their color background setting.

4. To format the pattern for the selected items, do one of the following:
   ○ To select a skin, select the *Skin* radio button, and select a skin from the dropdown list.

   **Note**
   If you are formatting the table appearance, you need to set the horizontal or vertical padding value to greater than 0 in the *Spacing and Padding* section of the *Appearance* tab, otherwise the skin will not appear.

   ○ To select an image at a URL location, select the *Image from address* radio button, and do one of the following:
      ○ Paste in the text box the URL address for an image. Click the *Validate* icon.
      ○ To create a dynamic image using a complex formula, click the *Formula Editor* icon next to the text box.
        Example: Table cell syntax
        “<URL>”+“<column header object>”+“.<image format>”
To access an image on the corporate server, type the image name. The application inserts boimg:// when you click Apply.

The dynamic image appears only if the column header object used to define the image is in the table. However, the object can be hidden. If the object is not in the table, then there is no context available to calculate the images address.

To select use an image from a file on your computer or a server, select the Image from file radio button, click Add or Browse, navigate to the image and click Open.

If you are using an image, you can select a display location from the Display dropdown list.

- If you select a Normal display, then you can set the position of the image from the Position dropdown lists.
- If you select Stretch, the image adjusts to fit the entire space, irrespective of the image height and width settings.
- If you select Tile, the image is repeated in the space.
- If you select a Horizontal Tile or Vertical Tile location, then you also have additional Position options.

To remove an image or pattern, select None for the pattern.

5. Click OK to return to the document.

Results

Restriction

Because there is no background image feature in Excel, when you save or export a report to the Excel format any background images are not exported to the output file.

Related Information

To build a formula in the Formula Editor [page 317]
Formatting the report layout [page 266]
Formatting tables and table cells [page 447]
4.2.14 Reusing report elements in other documents

You can reuse a report element in other applications. When you copy a report element, Web Intelligence automatically stores a copy in several formats:

- In an image format.
- In a text format so that it can be pasted in a text editing application.
- In a Web Intelligence format so that it can be pasted in the same document.
- In a shared object so that it can be pasted in a different Web Intelligence document.

In the Web Intelligence Applet interface, the creation of the shared object can take a while and affect performance as a result.

You can make the shared object creation optional and disable it to avoid performance drops.

Note

If you disable this option, you will not be able to paste report elements in other Web Intelligence documents.

Related Information

To enable or disable report elements reuse in other documents [page 270]

4.2.14.1 To enable or disable report elements reuse in other documents

If you do not plan on reusing report elements in other documents, you can disable the reuse option.

Procedure

1. Click Properties > Application.
   If you are using Web Intelligence Rich Client, click the Viewing tab.
2. Uncheck Reuse copied report elements in other Web Intelligence documents to disable the reuse option.
4.2.15 Printing reports

You can print one or multiple reports from a Web Intelligence document.

You print documents directly from Web Intelligence Applet interface and Web Intelligence Rich Client. However, when you print from the Web Intelligence HTML interface, you export the document to a PDF file that you can then print.

**i Note**

If a report is wider than the width of the paper size defined in the Report Page Layout, page breaks are inserted. The paper size and page orientation for printing can be different from the paper size and page orientation set for the reports when you view them in Web Intelligence Applet interface or Web Intelligence Rich Client.

4.2.15.1 To print reports in Web Intelligence

A variety of methods are available for printing reports in Web Intelligence.

**Procedure**

1. Open a Web Intelligence document.
2. Do one of the following:
   - In the Web Intelligence HTML interface:
     - If you are in **Reading** mode, click the arrow next to the **Print** icon on the toolbar.
     - If you are in **Design or Data** mode, click the arrow next to the **Print** icon in the **File** tab toolbar.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client interface:
     - If you are in **Reading** mode, click the **Print** icon on the toolbar.
     - If you are in **Design or Data** mode, click the **Print** icon in the **File** tab toolbar.
   
   The **Print** dialog box appears.
3. Do one of the following:
   - In the Web Intelligence HTML interface: choose your printing options and click **Print**.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client interface: choose your printing options and click **OK**.
   - In the Web Intelligence HTML interface: the **File Download** dialog box appears. Open the PDF file and print the report.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client interface: the report is sent to the printer.

**i Note**

In the Web Intelligence HTML interface, click the **Print** icon to print the report with current settings.
4.2.16 Tracking changes in data

To make informed and effective business intelligence decisions, you need to understand how the data on which you base those decisions changes over time.

You can track and display data changes to help you focus your analysis on key areas and avoid wasting time exploring irrelevant data.

When you track data changes, you select a particular data refresh as a reference point. This data is known as the reference data. When you activate data tracking, you see your data in relation to the reference data.

Here are some examples of data tracking:

- If an outlet no longer appears in a list of the top outlets by sales, it would be interpreted as deleted from the list. You can use this information to investigate why the outlet is no longer a top performer.
- If sales have decreased in a region, data tracking displays the decrease. You can then drill down into the data for the region to understand why revenue is falling.

In both these cases, data tracking makes the current data more meaningful by placing it in context with older data. Without this context it is much more difficult to identify trends.

**Note**

- The information in the Status Bar at the bottom of the report indicates the document level status. An asterisk on a report tab indicates that change tracking is activated on the report.
- Status “changes” of tracking data changes is only for a detail value when displayed with its associated dimension in the table. When the detail is given without it is associated dimension it is considered as a dimension and does not show the status changes (but only shows when the detail is inserted/deleted).

**Related Information**

Types of data change [page 273]
Automatic update tracking mode [page 273]
Absolute reference data tracking mode [page 273]
To activate data tracking [page 274]
To display changed data [page 275]
Configuring the appearance of changed data [page 274]
To configure the appearance of changed data [page 275]
How changed data is displayed in blocks [page 276]
How changed data is displayed in blocks with breaks [page 279]
How changed data is displayed in sections [page 278]
How changed data is displayed in reports with merged dimensions [page 277]
How changed data is displayed in charts [page 280]
4.2.16.1 Types of data change

You configure the display of data changes through the interface or formula language. You can track the following types of data change:

- Inserted data
- Deleted data
- Changed data
- Increased values
- Decreased values

The formula language provides advanced users with additional power and flexibility in displaying and formatting changed data.

4.2.16.2 Automatic update tracking mode

In the Auto-update data tracking mode, you always compare the current data with the data before the last refresh. This is achieved by automatically setting the current data as the reference data just before each refresh. The reference data is always one refresh behind the current data. Automatic data tracking is appropriate for scheduled documents when you want to compare the current data with the data before the last refresh.

Restriction

This applies only to documents scheduled to the Web Intelligence output format.

4.2.16.3 Absolute reference data tracking mode

In the Fixed data tracking mode, you manually select the reference data in the Data Tracking dialog box. You continue to use this data as a reference point until you update the reference point.
4.2.16.4 To activate data tracking

You can activate data tracking in the Data Tracking dialog box.

Context

i Note
If your user rights do not permit document tracking, then the options mentioned below are grayed out.

Procedure

1. Open a Web Intelligence document.
2. Do one of the following:
   ○ In any mode, click Track changes on the status bar at the bottom of the window.
   ○ In the Reading mode, click Track in the toolbar.
   ○ In the Design mode, in the Analysis tab, select the Data Tracking subtab and click Track.
3. In the Data Tracking dialog box, select the Data tab.
4. To compare the data with the last refresh, select Compare with last data refresh.
   When you select this option, the current data becomes the reference data after each data refresh. The report always shows the difference between the most recent data and the data before the last refresh.
   If this option is selected, the status bar displays Track changes: Auto-update.
5. To compare the data with a specific data refresh, select Compare with data refresh from and select the date of the data refresh from the list.
   When you select this option, the data refresh you choose becomes the reference data. The report always shows the difference between the most recent data and the data refresh you chose.
   If this option is selected, the status bar displays Track changes: Fixed data.
6. Select the reports that you want to display data tracking from the Reports with data tracking shown list.
7. Select Refresh data now to refresh the data when the dialog box closes.
8. Click OK to close the Data Tracking dialog box.

4.2.16.5 Configuring the appearance of changed data

You can configure the appearance (font style, size and color) of changed data in your document.

You can separately configure the appearance of the following changes:

- Inserted, deleted dimensions and changed detail values
• Increased or decreased measure values

Measure values can also adopt the formatting of inserted or deleted dimension values. For example, if a dimension value disappears from a list of values in a block, and the block also shows a measure value for the dimension, both the dimension and measure values appear as deleted data.

The BI administrator defines the default appearance of changed data in the Central Management Server (CMS). When you configure the appearance of changed data locally, you override the CMS defaults.

4.2.16.5.1 To configure the appearance of changed data

You can configure the appearance of changed data in the Data Tracking dialog box.

Procedure

1. Open a Web Intelligence document in Reading or Design mode.
2. Click Track Changes on the status bar at the bottom of the window to display the Data Tracking dialog box.
3. In the Options tab, select each type of changed data you wish to display and click Format to specify how you want the changes to appear.
4. Click OK to close the Data Tracking dialog box.

Related Information

Highlighting data using conditional formatting [page 282]

4.2.16.5.2 To display changed data

You can choose whether to display changed data when data tracking is activated.

Procedure

1. Open a Web Intelligence document in Reading or Design mode.
2. Activate data tracking.
3. Do one of the following:
   ○ If you are in Reading mode, select Track ➤ Show Changes ➤ Show Changes.
   ○ If you are in Design mode, in the Analysis tab, in the Data Tracking subtab, click Show Changes.
4. Select the option again to turn off the display of changed data.

Related Information

Configuring the appearance of changed data [page 274]
To activate data tracking [page 274]

4.2.16.5.3 How changed data is displayed in blocks

This example uses a document with a block showing [Country], [Year] and [Revenue].

- **Example**

  Changed data in a simple block

  The original data is as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2003</td>
<td>1000</td>
</tr>
<tr>
<td>France</td>
<td>2004</td>
<td>2000</td>
</tr>
<tr>
<td>Japan</td>
<td>2002</td>
<td>1000</td>
</tr>
<tr>
<td>Poland</td>
<td>2002</td>
<td>1200</td>
</tr>
</tbody>
</table>

  After a refresh, the data is as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2004</td>
<td>3000</td>
</tr>
<tr>
<td>Japan</td>
<td>2003</td>
<td>900</td>
</tr>
<tr>
<td>Poland</td>
<td>2002</td>
<td>800</td>
</tr>
<tr>
<td>UK</td>
<td>2004</td>
<td>900</td>
</tr>
</tbody>
</table>

  When data tracking is activated and data changes displayed, the block appears as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2003</td>
<td>1000</td>
<td>[deleted data formatting on all cells]</td>
</tr>
<tr>
<td>France</td>
<td>2004</td>
<td>3000</td>
<td>[increased data formatting on Revenue cell]</td>
</tr>
<tr>
<td>Japan</td>
<td>2002</td>
<td>1000</td>
<td>[deleted data formatting on all cells]</td>
</tr>
<tr>
<td>Country</td>
<td>Year</td>
<td>Revenue</td>
<td>Formatting</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>---------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Japan</td>
<td>2003</td>
<td>900</td>
<td>[inserted data formatting on all cells]</td>
</tr>
<tr>
<td>Poland</td>
<td>2002</td>
<td>800</td>
<td>[decreased data formatting on Revenue cell]</td>
</tr>
<tr>
<td>UK</td>
<td>2004</td>
<td>900</td>
<td>[inserted data formatting on all cells]</td>
</tr>
</tbody>
</table>

- The rows showing revenue for France in 2003 and Japan in 2002 represent data that no longer exist after the refresh.
- The revenue for France in 2004 has increased.
- The revenue for Poland in 2002 has decreased.
- The rows showing revenue for Japan in 2003 and the UK in 2004 appeared after the refresh.

4.2.16.5.4 How changed data is displayed in reports with merged dimensions

A dimension appears as changed only if all the dimensions that participate in the merge are changed.

**Example**

**Changed data and merged dimensions**

In this example, Country is a merged dimension containing the Country dimensions from two data providers. Before data refresh, the data is as follows:

<table>
<thead>
<tr>
<th>Country (DP1)</th>
<th>Revenue (DP1)</th>
<th>Country (DP2)</th>
<th>Sales (DP2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>10000</td>
<td>US</td>
<td>5000</td>
</tr>
<tr>
<td>France</td>
<td>4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>5000</td>
<td>UK</td>
<td>3000</td>
</tr>
<tr>
<td>Germany</td>
<td>1000</td>
<td>Germany</td>
<td>1000</td>
</tr>
</tbody>
</table>

After a data refresh, the data becomes:

<table>
<thead>
<tr>
<th>Country (DP1)</th>
<th>Revenue (DP1)</th>
<th>Country (DP2)</th>
<th>Sales (DP2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>10000</td>
<td>US</td>
<td>4000</td>
</tr>
<tr>
<td>France</td>
<td>4000</td>
<td>France</td>
<td>3000</td>
</tr>
<tr>
<td>UK</td>
<td>6000</td>
<td>UK</td>
<td>4000</td>
</tr>
<tr>
<td>Poland</td>
<td>2000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When displayed in a block with the merged Country dimension and data changes displayed, the data appears as follows:
<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
<th>Sales</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>10000</td>
<td>4000</td>
<td>[decreased data formatting on Sales cell]</td>
</tr>
<tr>
<td>France</td>
<td>4000</td>
<td>3000</td>
<td>[inserted data formatting on Revenue cell]</td>
</tr>
<tr>
<td>UK</td>
<td>6000</td>
<td>4000</td>
<td>[increased data formatting on Revenue and Sales cells]</td>
</tr>
<tr>
<td>Germany</td>
<td>1000</td>
<td>1000</td>
<td>[deleted data formatting on all cells]</td>
</tr>
<tr>
<td>Poland</td>
<td>2000</td>
<td></td>
<td>[inserted data formatting on Country and Revenue cells]</td>
</tr>
</tbody>
</table>

In the France row, France does not appear as inserted because a France row was not inserted in both data providers. Revenue appears as inserted because it is a new measure value after the data refresh.

In the Poland row, Poland appears as inserted because it is a new dimension value after the data refresh.

### 4.2.16.5.5 How changed data is displayed in sections

In this example you have a document with a block showing [Country], [Year] and [Revenue].

#### Example

**Changed data in a report with sections**

The original data is as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2003</td>
<td>1000</td>
</tr>
<tr>
<td>France</td>
<td>2004</td>
<td>2000</td>
</tr>
<tr>
<td>Japan</td>
<td>2002</td>
<td>1000</td>
</tr>
<tr>
<td>Poland</td>
<td>2002</td>
<td>1200</td>
</tr>
<tr>
<td>US</td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>2004</td>
<td></td>
</tr>
</tbody>
</table>

After a refresh, the data is as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2004</td>
<td>3000</td>
</tr>
<tr>
<td>Japan</td>
<td>2003</td>
<td>900</td>
</tr>
<tr>
<td>Poland</td>
<td>2002</td>
<td>800</td>
</tr>
<tr>
<td>UK</td>
<td>2004</td>
<td>900</td>
</tr>
</tbody>
</table>
If you create a section on [Country] and display data changes, the report appears as follows:

France [no formatting]

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1000</td>
<td>[deleted data formatting on all cells]</td>
</tr>
<tr>
<td>2004</td>
<td>3000</td>
<td>[increased data formatting on Revenue cell]</td>
</tr>
</tbody>
</table>

Japan [no formatting]

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1000</td>
<td>[deleted data formatting on all cells]</td>
</tr>
<tr>
<td>2003</td>
<td>900</td>
<td>[inserted data formatting on all cells]</td>
</tr>
</tbody>
</table>

Poland [no formatting]

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>800</td>
<td>[decreased data formatting on Revenue cell]</td>
</tr>
</tbody>
</table>

UK [inserted data formatting]

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>900</td>
<td>[inserted data formatting on all cells]</td>
</tr>
</tbody>
</table>

The data appears in the section header in either of two ways, depending on the changes in the data in the section:

- If all the rows in the block in the section have changed in the same way, the section header is displayed with the same formatting as the rows.
- If the rows have changed in different ways, or only some rows have changed, the section header retains its default format.

### 4.2.16.5.6 How changed data is displayed in blocks with breaks

When a block contains a break and the Merge block property is set, the display of the centered value follows rules similar to those for section headers.

- If all the rows in the break have changed in the same way, the centered value is displayed with the same formatting as the rows.
- If the rows have changed in different ways, or only some rows have changed, the centered value retains the default formatting.
4.2.16.5.7 How changed data is displayed in charts

When the data in a chart has changed, a changed data icon appears above the chart.
When you click the icon, the chart changes to a table to allow you to see the details of the changes.

4.2.16.6 Data tracking restrictions

If you change or purge a data provider, the report no longer displays changed data.
If the data provider is changed, the current version of the document is no longer compatible with the reference version. If the data is cleared, the old data no longer exists for comparison.
As a result, the following actions are incompatible with data tracking:

- Drill out of scope
- Query drill
- Deleting a query
- Any modification (including modifications to security rights) that changes the SQL generated by a data provider
- Purging the document

When you perform any of these actions, the data history of the document is cleared because the actions are incompatible with the display of changed data. For example, if you modify a query, the data in the document changes because of the modification. Any comparison between this data and old data generated from a different query is misleading.

Note

When you use query drill or drill out of scope, the data history is cleared because these actions change the data provider. This should not affect you because, when you start to drill, you have already identified the data that requires further analysis. Data tracking has served its purpose and you can now continue with your data analysis.

Related Information

To drill out of the scope of analysis [page 543]
Drilling with query drill [page 561]
To manage queries using the Data Manager [page 177]
4.2.16.6.1 Data tracking and Refresh on Open

When a document is set to refresh its data on opening (when the Refresh on open document property is selected), data tracking does not display the difference between the data prior to the refresh and the data after the refresh.

The data after the refresh is considered to be new data because the refresh purges the document.

**i Note**

When you enable the Refresh on open document property, the document displays the latest information each time you open the document. The Refresh on open option is dependent on the following settings in the CMC (configured by the BI administrator):

- In Applications ➤ Web Intelligence, from the Manage list, select Properties. In the Automatic Document Refresh on Open Security Right Setting section, the property Automatic Refresh security setting is enabled.
- In Applications ➤ Web Intelligence, from the Manage list, select User Security. When you select a user profile and click View Security, check that the Document - disable automatic refresh on open security right is disabled.

In the settings are set as listed above, then even if the document is not set as being Refresh on open, the data will still be refreshed when the document is opened.

Related Information

To save a document in the corporate repository [page 510]

4.2.16.7 Using formulas to track changed data

You can use formulas to create alerters that let you know when data has changed in a document.

These custom alerters do not appear in the list of standard alerters.

You use the RefValue, RefValueDate, and RefValueUserResponse functions in cell formulas to build these custom alerters. You can also use formulas with special calculations based on data changes. For example, you can include a calculation to show the difference between the previous value and the current value of a measure.

For more information on the functions, see the Using Functions, Formulas and Calculations in Web Intelligence guide or the related section in the Web Intelligence online help.
4.2.16.8 Changed data and the calculation context

When data tracking is activated, data only appears as changed when the calculation context remains the same. For example, if a measure value changes because you have changed the calculation context of a block, the new value is not flagged as changed.

Example

Changing the calculation context

In this example you have a block showing [City], [Customer] and [Revenue] as follows:

<table>
<thead>
<tr>
<th>City</th>
<th>Customer</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>Smith</td>
<td>1000</td>
</tr>
<tr>
<td>San Francisco</td>
<td>Jones</td>
<td>2000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>Wilson</td>
<td>3000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>Harris</td>
<td>4000</td>
</tr>
</tbody>
</table>

If you remove [Customer] from the block, revenue is aggregated by city:

<table>
<thead>
<tr>
<th>City</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>3000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>7000</td>
</tr>
</tbody>
</table>

The revenues do not appear as increased because the amount of revenue has not changed. Only the calculation context has changed. Revenues are now aggregated by city only, giving higher figures.

If, after a data refresh, Jones’ revenue falls to 1000 and Wilson’s revenue rises to 4000, the data appears as follows:

<table>
<thead>
<tr>
<th>City</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>2000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>8000</td>
</tr>
</tbody>
</table>

The data appears as changed because, independently of the change of calculation context, the total revenue for San Francisco has decreased and the total revenue for Los Angeles has increased.

4.2.17 Highlighting data using conditional formatting

Conditional formatting enables you to highlight results or change formatting based on data.

You can, for example, conditionally format results to highlight particularly high or low results with specific colors or with text comments, such as High Performer or Low Performer.

You can apply conditional formatting to the following elements:
You can apply up to 30 conditional formatting rules in a document. You can apply these rules to a maximum of 20 table columns or rows, free-standing cells, or section cells on the reports. You can apply up to 10 different rules on a single table column or row, free-standing cell, or section cell.

You can define conditional formatting rules to activate the following formatting changes:

- Text color, size and style
- Cell border colors and style
- Cell background display – specific colors, images, or hyperlinks to web pages

You can also define rules that display text or a formula, an image, or a hyperlink. In this case, the results that meet the condition defined in the rule will be replaced by the text or formula.

**i Note**

Hyperlinks display as active only when your system administrator has authorized them in Web Intelligence.

Conditional formatting is dynamic. When you refresh reports with the latest data from the database, the rules highlight the new results accordingly.

If you apply conditional formatting to a table row or column with a break, the rule is only activated when the value that meets the conditional rule appears on the first row of that break.

### 4.2.17.1 Conditions in conditional formatting

Conditional formatting rules contain multiple conditions, allowing you to apply multiple formats depending on the data.

A conditional formatting rule operates as follows:

```
If <Main Condition> is true, Apply <Main Format>
ElseIf <Second Condition> is true, Apply <Second Format>
ElseIf <Third Condition> is true, Apply <Third Format>
ElseIf...
Else Apply <Default Format>
```

In the above example, if `<Main Condition>` is `Sales Revenue > 100,000` and `<Main Format>` formats the text in blue, the conditional formatting displays the measure in blue whenever the Sales Revenue measure is greater than 100,000.

If `<Second Condition>` is `Sales Revenue < 10,000` and `<Second Format>` formats the text in red, the conditional formatting also displays the measure in red whenever its value is less than 10,000.

Each condition can contain multiple tests, and all tests must return True for the conditional formatting to be applied. For example, a condition can test the values of the `[Country]` and `[Resort]` objects. Both objects must return the value specified in the test for the formatting to be applied.
4.2.17.2 To build a conditional formatting rule

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, select the Conditional subtab.
3. Click New Rule to display the Formatting Rule Editor panel.
4. Enter a rule name and rule description.
5. Click ... next to the Filtered object or cell box and select objects.
   You cannot define a rule on a cell containing a date or numeric type data (for example, a date or a calculation) because the application considers any value you type into the Value text box as a character string.
6. Select an operator.
7. Enter the value that triggers the formatting rule in the Operands box.
   ○ To enter a value directly, type it in the box.
   ○ To select a value from the list of values, click ... next to the Operands box and select a value.
   ○ To change the object or variable as the value, click ... next to the Operands box, click Select an Object or Variable on the menu, then select a different object or variable.
   ○ To clear the Operands box, click ... next to the box, then select Empty.
8. To add an additional test within the condition, click + by the existing conditions, then choose the filtered cell or object, operator and value as described above.
9. To remove a condition, click x next to the Condition box.
10. To trigger the condition using a formula, click the arrow next to Condition and select Fx.
11. Click Fx next to the formula box to display the Formula Editor in which you can build formulas.
   ○ If you want your formula to return a text string, do not include quote marks before or after the text. For example, if you want the alerter to display OVERDUE, then type: OVERDUE.
   ○ The formula must return True or False. True triggers the condition; False does not. For example, if the formula is RowIndex() = 3, the conditional formatting appears on the fourth row of the table.
12. To add an additional condition to the rule, click Add at the top corner of the box to display an additional condition box, then define the conditions or build a formula as described above.
   You can add multiple conditions.
13. To set the format that appears when the rule is triggered, click Format in the If the above is true, then display panel.
   The Formatting Rules Display dialog box to set the format appears.
14. Click OK to save the IF/THEN formats, then OK to set the rule format in the report.
4.2.17.3 To set the format displayed by a conditional formatting rule

Context

To allow content to be read as HTML or a hyperlink, your system administrator must authorize HTML or hyperlinks in Web Intelligence.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, select the Conditional subtab.
3. Click Formatting Rules.
4. Select a rule from the list and click Edit.
5. In the Formatting Rule Editor dialog box, click Format to display the Formatting Rule Display dialog box.
6. To display text or a formula, select the Display tab and build the formula in the box.
   ○ To define the displayed text or formula as HTML, an image URL or a hyperlink, click Read content as, then select HTML, Image URL or Hyperlink from the list.
   
<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you select Read content as: HTML, the Autofit Width and Autofit Height properties do not work because the size of the HTML data in a cell cannot be decoded by the browser properly. The HTML content that is provided by the user is rendered by the browser directly. Web Intelligence does not modify the HTML code provided by the user to set the width and height.</td>
</tr>
</tbody>
</table>

   ○ To change the number format, select the format from the Format Number list or click Custom and select the format from the Format Number dialog box.
7. To change the font style, click the Text tab, and define the font using the controls in the tab.
8. To change the background style, select the Background tab then define the background using the controls in the tab.
9. To change the border style, select the Border tab and define the border using the controls in the tab.
10. Click OK, then OK again to return to the document.

Related Information

To build a conditional formatting rule [page 284]
4.2.17.4 To apply conditional formatting

You can apply previously-defined conditional formatting rules to report elements.

Context

You can format the following report elements:

- Columns in a vertical table
- Rows in a horizontal table
- Cells in forms and crosstables
- Section headers
- Free-standing cells

Procedure

1. In a Web Intelligence document in Design mode, select a report element on which you want to conditionally format.
2. In the Analysis tab, select the Conditional subtab.
3. Click the arrow next to Formatting Rules and select the rule you want to apply from the list.
4. Save the document.

4.2.17.5 To manage conditional formats

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, select the Conditional subtab.
3. From the Formatting Rules dropdown list, select Manage Rules to display the Conditional Formats dialog box.
4. To give a rule higher or lower priority in the list, select the rule and click the up or down arrow button to the side of the list.
5. To duplicate a rule, select the rule and click Duplicate.
6. To remove a rule, select the rule and click Remove.
7. Click OK to return to the document.
4.2.17.6 Using formulas to create advanced conditional formatting rules

You can build advanced conditional formatting rules using the formula language rather than using the Filtered object or cell, Operator and Value choices offered by in the Formatting Rules Editor.

Example

Highlighting three ranges of quarterly sales revenue results calculated as percentages of the average sales revenue

In this example, you build three rules to color-code sales revenues, depending on their relationship to the average sales revenue. The table includes results for three years, and this is the average to which you want to compare each sales revenue result calculated per quarter per product line.

Using the formula option in the Formatting Rules Editor, you build the following rule, which contains three conditions. The conditions are as follows:

Condition:

\[[Sales\ revenue] < (Average([Sales\ revenue]) In Block) \times 0.8\]

Else Condition:

\=\[Sales\ revenue] < (Average([Sales\ revenue]) In Block) \times 1.2\]

Else Condition:

\=\[Sales\ revenue] > (Average([Sales\ revenue]) In Block) \times 1.2\]

The formula you specify for each condition works as follows:

- The first condition applies when sales revenues are are < 0.8, or 80%, of the average.
- The second condition applies when sales revenues are < 1.2, or less than 120%, of the average.
- The third applies when sales revenue are > 1.2, or greater than 120%, of the average.

You then use the Formatting Rules Display dialog box to specify the conditional formatting you want displayed in report cells that meet one of the conditions. You choose the following formatting:

- Report cells containing sales revenue that is less than 80% of the average revenue (the first condition) display the revenue in red.
- Report cells containing sales revenue that is less than 20% above the average revenue (the second condition) display the revenue in blue.

Note

This condition covers values also covered by the first condition. For example, if the average is 100, 79 is less than 80% below the average and less than 20% above the average. In this case, the first condition takes precedence.

- Report cells containing sales revenue that is greater than 20% above the average revenue (the third condition) display the revenue in green.

This formatting enables you to see at a glance which product lines are generating above average, below average, or close to average sales revenue.
4.2.18 Ranking report data

Ranking allows you to isolate the top and bottom records in a set based on a variety of criteria.

For example, if you have a block showing countries and associated revenues, ranking allows you to rank the data in the block to show the top 3 countries only, based on the revenue they generate.

Ranking allows you to answer business questions such as:

- Which 3 regions generate the most revenue?
- Which are the bottom 10% of stores in terms of revenue generation?
- What is the group of the best-performing stores that generates a combined revenue of up to $10,000,000?

You can rank data in many ways to answer these kinds of business questions. You can:

- Rank the top and/or bottom n records by dimension (for example Country) based on the sum of a related measure (for example Revenue).
- Rank the top and/or bottom n% of the total number of records by dimension, based on the value of a related measure as a percentage of the total value of the measure.
- Rank the top and/or bottom n records by dimension based on the cumulative sum of a related measure.
- Rank the top and/or bottom n records by dimension based on the value of a related measure as a cumulative percentage of the total value of the measure.

4.2.18.1 Rankings and sorts

When you rank data, the data will be sorted according to the dimensions by which it is ranked.

For example, using the following table:

<table>
<thead>
<tr>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>B1</td>
<td>1</td>
</tr>
<tr>
<td>A1</td>
<td>B2</td>
<td>4</td>
</tr>
<tr>
<td>A2</td>
<td>B1</td>
<td>5</td>
</tr>
<tr>
<td>A2</td>
<td>B2</td>
<td>2</td>
</tr>
<tr>
<td>A3</td>
<td>B1</td>
<td>3</td>
</tr>
<tr>
<td>A3</td>
<td>B2</td>
<td>6</td>
</tr>
</tbody>
</table>

If you rank the top 2 measure values and no ranked-by dimension has been defined, then the data is sorted according to that measure, across all dimensions:

<table>
<thead>
<tr>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3</td>
<td>B2</td>
<td>6</td>
</tr>
<tr>
<td>A2</td>
<td>B1</td>
<td>5</td>
</tr>
</tbody>
</table>
If you rank the top 2 measure values by a specific dimension, for example [Dimension A], the data is sorted according to the aggregated value of that measure, in the chosen dimension [Dimension A]:

<table>
<thead>
<tr>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3</td>
<td>B1</td>
<td>3</td>
</tr>
<tr>
<td>A3</td>
<td>B2</td>
<td>6</td>
</tr>
<tr>
<td>A2</td>
<td>B1</td>
<td>5</td>
</tr>
<tr>
<td>A2</td>
<td>B2</td>
<td>2</td>
</tr>
</tbody>
</table>

Sorts applied to display rankings take precedence over sorts that you previously applied to data. For example, if you previously sorted the list of stores in alphabetical order, the ranking sort overrides the alphabetical sort. Sorts applied to display rankings can be managed like any other sort, using the dedicated Web Intelligence menus.

Removing the ranking on a measure will also remove the sort applied to the data.

**Note**
- If the dimension used to rank by is not present in the table, then the ranking cannot sort the data.
- Null measure values are not taken into account when a ranking is applied to that measure.

**Related Information**

Using sorts to organize data in reports [page 363]

### 4.2.18.2 Tied rankings

Tied rankings are assigned equal ranking values and subsequent ranking values are pushed back to compensate.

This means that a top or bottom n ranking can return more than n records.

**Example**

**Top and bottom tied rankings**

The following table shows a tied top 3 ranking and a tied bottom 3 ranking.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measure</th>
<th>Top 3 Ranking</th>
<th>Bottom 3 Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>30</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Each ranking includes records up to and including rank 3. This results in the following result for a top 3 ranking:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
</tr>
</tbody>
</table>

It results in the following for a bottom 3 ranking:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>30</td>
</tr>
</tbody>
</table>

Because the 2 largest measure values are identical, a top 1 or 2 ranking in the same table will result in the same table content.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>30</td>
</tr>
</tbody>
</table>

4.2.18.3 Ranking and data order

You cannot rank on an object whose values depend on the data order because the ranking changes the data order.

If the data order is changed, the object data is changed and results in a recalculation of the ranking. The result is a circular dependency between the ranking and the object that cannot be resolved.

If you create a rank on a measure whose values depend on the data order, for example a measure that uses the Previous function, the #RANK error code appears in all cells in the block.

For similar reasons, ranking on a measure using a running aggregation function such as RunningSum will not give any meaningful result, however no error code will be displayed in the block cells. The ranking cannot be meaningful because running calculations depend on the data context, which will be modified by the ranking operation.

For more information on the functions, see the Using Functions, Formulas and Calculations in Web Intelligence guide or the Web Intelligence online help.
4.2.18.4 Ranking in sections

You can apply ranking on blocks located within sections. However, ranking on a measure using a context modifier such as ForEach or ForAll is not supported. If you use a context modifier, you will encounter unexpected results, because of the interaction of the implicit filter defined by the section instance with the calculation context modifier that is used in the ranked measure.

For more information on the functions, see the Using Functions, Formulas and Calculations in Web Intelligence guide or the Web Intelligence online help.

4.2.18.5 Ranking parameters

The following parameters can be configured in the Ranking dialog box.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Top/Bottom         | When the calculation mode is Count, the ranking returns the top/bottom n records based on the measure specified as the Based on parameter. For example, the top 3 countries by revenue generated, the bottom 3 year/quarter combinations by revenue generated.  
                     | When the calculation mode is Percentage, the ranking returns the top/bottom n% of the total number of records based on the measure specified as the Based on parameter. For example, if there are 100 records and you rank the top 10%, the ranking returns the top 10 records.  
                     | When the calculation mode is Cumulative Sum, the ranking returns the top/bottom records, for which the cumulative sum of the measure specified as the Based on parameter does not exceed the value specified in the top/bottom.  
                     | When the calculation mode is Cumulative Percentage, the ranking returns the top/bottom records, for which the cumulative sum of the measure specified as the Based on parameter does not exceed n% of the total of the measure, specified in the top/bottom. |
| Based on           | The measure on which the ranking is based.                                                                                                    |
| Ranked By          | The ranking dimension. If you specify a ranking dimension, the aggregated values of the Based on parameter, calculated for the dimension, determine the ranking. If you do not specify this dimension, the values of the Based on parameter calculated for all dimensions in the block determine the ranking. In other words, the ranking returns the top/bottom X rows in the block based on the measure.  
                     | The ranked by dimension does not need to be part of the block where the ranking is applied. However, in this case, the ranked data cannot be sorted. |
| Calculation mode   | The type of calculation used to create the ranking. See the description of the Top/Bottom parameters in this table for more information. |
Related Information

To create a ranking [page 293]

4.2.18.5.1 Example of a ranking

If you rank the top 2 of each Quarter based on Revenue, the ranking filters out all the rows for Q1 and Q3 because Q4 and Q2 have the highest aggregated revenues.

A table contains the following data:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Q1</td>
<td>100</td>
</tr>
<tr>
<td>2006</td>
<td>Q2</td>
<td>200</td>
</tr>
<tr>
<td>2006</td>
<td>Q3</td>
<td>300</td>
</tr>
<tr>
<td>2006</td>
<td>Q4</td>
<td>500</td>
</tr>
<tr>
<td>2007</td>
<td>Q1</td>
<td>400</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>700</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>300</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>600</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>200</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>200</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>400</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>500</td>
</tr>
</tbody>
</table>

Total for Q1: 700
Total for Q2: 1100
Total for Q3: 1000
Total Q4: 1600

4.2.18.6 Ranking workflows

A ranking uses sorts and filters that are applied transparently according to the ranking you specify.

There are two ways of ranking data. You can:

- create a ranking by using the interface
- use the `Rank` function to return a ranking value
For example, if you rank the top 3 countries in a block by revenue, you implicitly sort the countries in descending order by revenue, then filter the block to remove all countries other than the 3 with the highest revenue.

**Note**
- When you create a ranking using the interface, the **Rank** function is used behind the scenes to assign ranking values.
- When the dimension used to rank by is not part of the block where the ranking is applied, then the ranked data cannot be sorted.

### 4.2.18.6.1 To create a ranking

You configure ranking filters in the **Ranking** dialog box.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Select the block that you want to rank.
3. Do one of the following:
   - In the **Analysis** tab, in the **Filters** subtab, click **Ranking**.
   - Right-click the measure you want to rank, and from the contextual menu, choose **Ranking** > **Add Ranking**.
4. In the **Ranking** dialog box, any one of the following:
   - To rank the highest records in the block, click **Top** and select the number of records you want to rank.
   - To rank the lowest records in the block, click **Bottom** and select the number of records you want to rank.
   - Select the measure on which the ranking is based in the **Based on** list.
   - To rank by a particular dimension rather than by all dimensions in the block, click **Ranked by** and select the dimension on which the ranking is based.
5. Click **OK** to close the **Ranking** dialog box.

**Related Information**

Ranking parameters [page 291]
## 4.2.18.7 Ranking examples

In the following examples, you have a dimension, Region, and a measure, Revenue.

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenue</th>
<th>% of Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East</td>
<td>1000000</td>
<td>7%</td>
</tr>
<tr>
<td>South West</td>
<td>2000000</td>
<td>13%</td>
</tr>
<tr>
<td>North East</td>
<td>3000000</td>
<td>20%</td>
</tr>
<tr>
<td>North West</td>
<td>4000000</td>
<td>24%</td>
</tr>
<tr>
<td>Central</td>
<td>5000000</td>
<td>33%</td>
</tr>
</tbody>
</table>

### Example

**Rank the top 3 regions by revenue generated**

To perform this ranking you set the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Ranked by</strong></td>
<td>Region (or unspecified because region is the only dimension in the block and therefore the default ranking dimension)</td>
</tr>
<tr>
<td><strong>Based on</strong></td>
<td>Revenue</td>
</tr>
<tr>
<td><strong>Calculation mode</strong></td>
<td>Count</td>
</tr>
</tbody>
</table>

This ranking gives the following result:

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>5000000</td>
</tr>
<tr>
<td>North West</td>
<td>4000000</td>
</tr>
<tr>
<td>North East</td>
<td>3000000</td>
</tr>
</tbody>
</table>

The implicit steps in calculating this ranking are:
- Sort the records in descending order.
- Display the top 3 records.

### Example

**Rank the bottom 40% of regions by revenue**

To perform this ranking you set the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bottom</strong></td>
<td>40%</td>
</tr>
</tbody>
</table>
**Example**

**Rank the top regions whose cumulative revenue is less than or equal to 10,000,000**

To perform this ranking you set the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>10000000</td>
</tr>
<tr>
<td>Ranked by</td>
<td>Region</td>
</tr>
<tr>
<td>Based on</td>
<td>Revenue</td>
</tr>
<tr>
<td>Calculation mode</td>
<td>Cumulative sum</td>
</tr>
</tbody>
</table>

This ranking gives the following result:

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>5000000</td>
</tr>
<tr>
<td>North West</td>
<td>4000000</td>
</tr>
</tbody>
</table>

The implicit steps in calculating this ranking are:

- Sort the records in descending order.
- Work through the records until the record that causes the cumulative total of the measure to pass 10,000,000.
- Include those records that do not cause the cumulative total to pass 10,000,000.

## Example

**Rank the bottom regions whose cumulative revenue is less than or equal to 30% of the total revenue**

To perform this ranking you set the following parameters:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>30%</td>
</tr>
<tr>
<td>Ranked by</td>
<td>Region</td>
</tr>
<tr>
<td>Based on</td>
<td>Revenue</td>
</tr>
<tr>
<td>Calculation mode</td>
<td>Cumulative percentage</td>
</tr>
</tbody>
</table>

This ranking gives the following result:

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East</td>
<td>1000000</td>
</tr>
<tr>
<td>South West</td>
<td>2000000</td>
</tr>
<tr>
<td>North East</td>
<td>3000000</td>
</tr>
</tbody>
</table>

The implicit steps in calculating this ranking are:

- Sort the records in ascending order.
- Work through the records until the record that causes the cumulative total of the measure, expressed as a percentage of the overall total of the measure, exceeds 30%.
- Display those records that do not cause the cumulative percentage to pass 30%.

4.2.19 Merging data from dimensions and hierarchies

You can synchronize the data returned by dimensions, hierarchies or attributes by creating merged objects which incorporate them.

You merge data from different data providers. For example, if you have one data provider that contains detailed customer information and another data provider that contains sales data, you can synchronize the two data providers around the customer.

When you merge data from the same data source (for example the same universe or BEx query), the merge is based on the internal ID of each data member. When you merge data from different data sources, the merge is based on the caption of each data member. For example, if you synchronize two [Geography] hierarchies, the data member [Los Angeles] is merged with [Los Angeles] through its internal ID when the hierarchies are based on the same data source. The members are merged on the caption "Los Angeles" when the hierarchies are in different data sources.

In cases where merging is based on the caption, and different members with the same caption have different parent members, it is not possible to merge the members and the #MULTIVALUE error occurs.

When merged objects are from different data providers

When two merged objects are from different data providers, note the following restriction concerning the dimension value for a merged object and object participating in a merge:
When merging variables, make sure they are not used with Set functions. Set functions are contextual and not supported when merging variables. Only scalar functions are supported.

When \([\text{DIM1}]\) coming from data provider 1, and \([\text{DIM2}]\) coming from data provider 2, are merged, the value for the \([\text{MERGE}]\) is the union of the values of \([\text{DIM1}]\) and \([\text{DIM2}]\).

When you use \([\text{DIM1}]\) (or \([\text{DIM2}]\)) in a table, the table shows only the value from \([\text{DIM1}]\) (or \([\text{DIM2}]\)). This behavior is as expected.

When you filter (using an input control, drill bar, or filter panel) on one of these dimensions, this shows the list of values of the \([\text{MERGE}]\) because it will result in a filter on the \([\text{MERGE}]\).

When \([\text{DIM1}]\) (or \([\text{DIM2}]\)) is used with a context modifier (in, foreach, forall), the calculation will be done based on the \([\text{MERGE}]\). For example, \(\text{count([measure]} \text{foreach ([DIM1])} \) counts all the measure items given against \([\text{MERGE}]\).

**Related Information**

Merging hierarchies [page 299]

**4.2.19.1 Merging data providers based on keys**

When you merge two data sources based on detail objects for a query based on BICS, the BEx query keys are mapped to details. In this way it is possible to merge data providers based on keys. Once merged, the attribute is used in the report in the same way as a dimension.

**4.2.19.2 Choosing which data to merge**

You merge data when your report draws data from different but related sources.

For example, you have a report showing revenue and sales targets. The report contains sections based on the year, and each section shows revenue and sales targets. If revenue and sales target data comes from two different data providers, it is not synchronized. You synchronize the data by merging the two data providers on the common dimension, Year.

The only technical restriction imposed on merged dimensions is that they must be of the same data type. You can, for example, merge two dimensions containing character data. But it does not make sense to merge unrelated dimensions even when their data types are the same. For example, it does not make sense to merge a dimension containing customer names with a dimension containing sales regions.

Merged dimensions often have the same name in both data sources, but this is not obligatory. It can make sense to merge dimensions with different names if they contain related data.

To merge dimensions correctly you need to be aware of the semantics of the data (what the data refers to) in the different data sources. The dimension data types and names are an approximate guide only to suitability of a dimension for merging.
4.2.19.3 Merged dimension example

In this topic, you can see an example of merged dimensions with two data providers.

Example

Merging City dimensions

Data Provider 1:

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>New York</td>
</tr>
<tr>
<td>US</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>France</td>
<td>Paris</td>
</tr>
<tr>
<td>France</td>
<td>Toulouse</td>
</tr>
</tbody>
</table>

Data Provider 2:

<table>
<thead>
<tr>
<th>City</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>100000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>75000</td>
</tr>
<tr>
<td>Paris</td>
<td>90000</td>
</tr>
<tr>
<td>Toulouse</td>
<td>60000</td>
</tr>
</tbody>
</table>

If you do not merge the City dimensions, you get the following result if you place the Country, City and Revenue objects in a table:

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>New York</td>
<td>325000</td>
</tr>
<tr>
<td>US</td>
<td>Los Angeles</td>
<td>325000</td>
</tr>
<tr>
<td>France</td>
<td>Paris</td>
<td>325000</td>
</tr>
<tr>
<td>France</td>
<td>Toulouse</td>
<td>325000</td>
</tr>
</tbody>
</table>

Because there is no link between the two data providers through a merged dimension, city revenues are not related to countries. The table shows the total revenue in data provider 2 against each Country/City pair.

If you merge the City dimensions, you get the following result:

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>New York</td>
<td>100000</td>
</tr>
<tr>
<td>US</td>
<td>Los Angeles</td>
<td>75000</td>
</tr>
<tr>
<td>France</td>
<td>Paris</td>
<td>90000</td>
</tr>
<tr>
<td>France</td>
<td>Toulouse</td>
<td>60000</td>
</tr>
</tbody>
</table>
4.2.19.4 Merging hierarchies

You can take advantage of data synchronization by using the original hierarchies that make up a merged hierarchy.

The data in the report takes the structure of the hierarchy you select.

Example

Merged hierarchies

You have two data sources, each using a hierarchy that you have merged into a merged object. Data provider 1 contains the following data:

<table>
<thead>
<tr>
<th>Product</th>
<th>Store Invoice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport</td>
<td>5401</td>
</tr>
<tr>
<td>Gym</td>
<td>4073</td>
</tr>
<tr>
<td>Bottoms</td>
<td>1236</td>
</tr>
<tr>
<td>Tops</td>
<td>1208</td>
</tr>
<tr>
<td>Weights</td>
<td>1629</td>
</tr>
<tr>
<td>Swimming</td>
<td>1328</td>
</tr>
<tr>
<td>Camping</td>
<td>16961</td>
</tr>
<tr>
<td>Tents</td>
<td>3534</td>
</tr>
<tr>
<td>Sleeping Bags</td>
<td>3423</td>
</tr>
<tr>
<td>Kitchen Equipment</td>
<td>5352</td>
</tr>
<tr>
<td>Electrical</td>
<td>4652</td>
</tr>
</tbody>
</table>

Data provider 2 contains the following data:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Ordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport</td>
<td>13348</td>
</tr>
<tr>
<td>Gym</td>
<td>8814</td>
</tr>
<tr>
<td>Bottoms</td>
<td>1231</td>
</tr>
<tr>
<td>Tops</td>
<td>3241</td>
</tr>
<tr>
<td>Weights</td>
<td>4342</td>
</tr>
<tr>
<td>Swimming</td>
<td>4534</td>
</tr>
<tr>
<td>Camping</td>
<td>34234</td>
</tr>
</tbody>
</table>

If you use the first hierarchy in a report, the merged data is structured as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Store Invoice</th>
<th>Units Ordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport</td>
<td>5401</td>
<td>13348</td>
</tr>
<tr>
<td>Product</td>
<td>Store Invoice</td>
<td>Units Ordered</td>
</tr>
<tr>
<td>----------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Gym</td>
<td>4073</td>
<td>8814</td>
</tr>
<tr>
<td>Bottoms</td>
<td>1236</td>
<td>1231</td>
</tr>
<tr>
<td>Tops</td>
<td>1208</td>
<td>3241</td>
</tr>
<tr>
<td>Weights</td>
<td>1629</td>
<td>4342</td>
</tr>
<tr>
<td>Swimming</td>
<td>1328</td>
<td>4534</td>
</tr>
<tr>
<td>Camping</td>
<td>16961</td>
<td>34234</td>
</tr>
<tr>
<td>Tents</td>
<td>3534</td>
<td></td>
</tr>
<tr>
<td>Sleeping Bags</td>
<td>3423</td>
<td></td>
</tr>
<tr>
<td>Kitchen Equipment</td>
<td>5352</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td>4652</td>
<td></td>
</tr>
</tbody>
</table>

The child members of [Camping] appear in the hierarchy because they appear in the hierarchy you selected. The [Units Ordered] measure does not display values for these members because they do not exist in the second data source.

If you select the second hierarchy, the merged data is structured as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Store Invoice</th>
<th>Units Ordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport</td>
<td>5401</td>
<td>13348</td>
</tr>
<tr>
<td>Gym</td>
<td>4073</td>
<td>8814</td>
</tr>
<tr>
<td>Tops</td>
<td>1236</td>
<td>1231</td>
</tr>
<tr>
<td>Bottoms</td>
<td>1208</td>
<td>3241</td>
</tr>
<tr>
<td>Weights</td>
<td>1629</td>
<td>4342</td>
</tr>
<tr>
<td>Swimming</td>
<td>1328</td>
<td>4534</td>
</tr>
<tr>
<td>Camping</td>
<td>16961</td>
<td>34234</td>
</tr>
</tbody>
</table>

The child members of [Camping] do not appear because they do not appear in the original hierarchy you selected.

### 4.2.19.5 Merging different types of objects

You can include dimensions, attributes and hierarchies in merged objects.

The structure of the data that appears in the report depends on which object you chose.

**Example**

**Merging a dimension and a hierarchy**

You have two data sources, one containing a dimension and the other a hierarchy. Data provider 1 contains the [Country] dimension as follows:
Data provider 2 contains the [Geography] hierarchy as follows:

<table>
<thead>
<tr>
<th>Geography</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>54342</td>
</tr>
<tr>
<td>California</td>
<td>6996</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>3423</td>
</tr>
<tr>
<td>San Francisco</td>
<td>2342</td>
</tr>
<tr>
<td>San Diego</td>
<td>1231</td>
</tr>
</tbody>
</table>

You merge the dimension and hierarchy in a merged object. If you include the [Country] dimension in a report, the data appears as follows:

<table>
<thead>
<tr>
<th>City</th>
<th>Stock Items</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>4545</td>
<td>3423</td>
</tr>
<tr>
<td>San Francisco</td>
<td>6465</td>
<td>2342</td>
</tr>
<tr>
<td>San Diego</td>
<td>4564</td>
<td>1231</td>
</tr>
</tbody>
</table>

If you place the [Geography] hierarchy in a report, the result is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Stock Items</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>54342</td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>6996</td>
<td></td>
</tr>
<tr>
<td>Los Angeles</td>
<td>4545</td>
<td>3423</td>
</tr>
<tr>
<td>San Francisco</td>
<td>6465</td>
<td>2342</td>
</tr>
<tr>
<td>San Diego</td>
<td>4564</td>
<td>1231</td>
</tr>
</tbody>
</table>
4.2.19.6 Forcing merged calculations with the ForceMerge function

By default, calculations do not account for merged dimensions if the merged dimensions do not explicitly appear in the calculation context.

Example
Calculating revenue with ForceMerge
This example has two data providers as follows:

Data Provider 1:

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>New York</td>
</tr>
<tr>
<td>US</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>France</td>
<td>Paris</td>
</tr>
<tr>
<td>France</td>
<td>Toulouse</td>
</tr>
</tbody>
</table>

Data Provider 2:

<table>
<thead>
<tr>
<th>City</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>100000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>75000</td>
</tr>
<tr>
<td>Paris</td>
<td>90000</td>
</tr>
<tr>
<td>Toulouse</td>
<td>60000</td>
</tr>
</tbody>
</table>

If you merge the City dimensions, then create a table with Country and Revenue, you get the following result:

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>325000</td>
</tr>
<tr>
<td>US</td>
<td>325000</td>
</tr>
<tr>
<td>France</td>
<td>325000</td>
</tr>
<tr>
<td>France</td>
<td>325000</td>
</tr>
</tbody>
</table>

Because City, the merged dimension, does not appear in the table, it does not influence the calculation of the revenue. The total revenue in the second data provider appears against each country.

To display the correct result, replace Revenue in the second column with the formula ForceMerge([Revenue]):

<table>
<thead>
<tr>
<th>City</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>175000</td>
</tr>
</tbody>
</table>
The relationship between countries and cities now influences the calculation of the revenue.

**Note**
If Revenue is a smart measure in the above example, ForceMerge([Revenue]) returns #MULTIVALE. This is because the grouping set (Country) does not exist for the Revenue measure. ForceMerge([smart_measure]) always returns #MULTIVALE, unless by chance no aggregation is required to calculate the measure.

### 4.2.19.7 To merge details, dimensions, or hierarchies

You can merge data objects in the *Available Objects* pane.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. In the *Data Access* tab, in the *Data Objects* subtab, click *Merge*.
3. Hold down the *Control* key and select the dimensions or hierarchies you want to merge.
4. Click *OK*.

You can view the merged object in the *Available Objects* pane of the Side Panel. The original hierarchies or dimensions that make up the merged object appear beneath it. You edit or remove the merged dimension or hierarchy in the *Available Objects* pane.

**Tip**
You can also select objects in the *Available Objects* pane, right-click the selected objects and click *Merge*.

5. To add additional objects to a group of merged objects:
   a. Select the *Available Objects* button in the *Side Panel*.
   b. Select the merged object.
   c. Hold down the *Control* key on your keyboard and select one or several object you want to add to the group.

**Note**
The objects you select must be of the same data type as the objects already merged.
d. Right-click the selection and select **Add to Merge** from the contextual menu.

### Related Information

- To unmerge objects [page 305]
- To edit merged objects [page 304]

### 4.2.19.8 To merge dimensions automatically

You can merge dimensions automatically if the dimensions have the same name and data type, and are in the same universe. The auto-merge happens only at the document level.

#### Procedure

1. Open a Web Intelligence document in **Design** mode.
2. In the **Properties** tab, click **Document**.
3. In the **Document Summary** dialog box, select **Auto-merge dimensions**.

    ⚠ **Restriction**
    
    If this option is activated, Web Intelligence searches for all dimensions sharing the same name and data type in a universe and merges them. In the case where you have the same object with different names, we recommend that you merge dimensions manually.

    ⚠ **Note**
    
    We recommend that you activate this option at the beginning so that all similar dimensions are merged, and then deactivate the option afterward.

4. Click **OK** to close the **Document Summary** dialog box.

### 4.2.19.9 To edit merged objects

You can edit merged objects in the **Edit Merged Dimension** dialog box.

#### Procedure

1. In a Web Intelligence document in **Design** mode, select the **Available Objects** button in the Side Panel.
2. Right-click a merged dimension, then select Edit Properties.
3. In the Edit Merged Dimension dialog box, type the merged dimension name in the Merged Dimension Name text box.
4. Type a description in the Description box.
5. Select a dimension that provides default properties for the merged dimension from the Source Dimension dropdown list.
6. Click OK to close the Edit Merged Dimension dialog box.

4.2.19.10 To unmerge objects

You can unmerge data objects in the Available Objects pane.

Procedure

1. In a Web Intelligence document in Design mode, select the Available Objects button in the Side Panel.
2. Do one of the following:
   - To unmerge a group of objects, right-click a merged dimension and click Unmerge from the contextual menu.
   - To remove an object from a merged group, right-click it in the group and select Remove from Merge from the contextual menu.
3. Click Yes to confirm.

4.2.19.11 Synchronizing data providers with different aggregation levels

You can synchronize data providers with different aggregation levels. This can have implications for the calculation of measures.

Example

Synchronizing data providers with different aggregation levels

In this example you have two data providers as follows:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones</td>
<td>2004</td>
<td>1500</td>
</tr>
<tr>
<td>Jones</td>
<td>2005</td>
<td>2000</td>
</tr>
<tr>
<td>Smith</td>
<td>2005</td>
<td>1200</td>
</tr>
</tbody>
</table>
If you merge the two data providers and the table properties *Avoid duplicate row aggregation* and *Show rows with empty dimension values* are unchecked, the result is as follows:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Year</th>
<th>Revenue</th>
<th>Number of sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones</td>
<td>2004</td>
<td>1500</td>
<td>12</td>
</tr>
<tr>
<td>Jones</td>
<td>2005</td>
<td>1200</td>
<td>12</td>
</tr>
<tr>
<td>Smith</td>
<td>2005</td>
<td>1200</td>
<td>10</td>
</tr>
</tbody>
</table>

It is not possible to determine the number of sales per year for customer Jones because the data provider that stores the number of sales does not break them down by year. Instead you see the total number of sales on each row.

**Note**

Although the Number of Sales values are duplicated, if you add a standard calculation to the bottom of the column (for example a Sum or Average calculation), the result is correct.

One way of addressing this issue is to add the dimensions to the second data provider that allow calculation to the appropriate level of data. If this is not possible, you must be aware of any situations where it is not possible to aggregate the data to the necessary level of detail.

**Related Information**

To show or hide tables [page 333]
To avoid duplicate row aggregation [page 337]

**4.2.19.12 Attributes and merged dimensions**

Attributes are associated with dimensions and provide additional information about the dimension.

There must be a one-to-one relationship between dimensions and attributes. An attribute can have one value only for each value of its associated dimension. Attribute objects are not taken into account when synchronizing data. The following example illustrates why this is necessary.

**Note**

Some previous versions of SAP BusinessObjects Web Intelligence (Web Intelligence, Desktop Intelligence and BusinessObjects), allowed a one-to-many relationship between dimensions and attributes. If you migrate a report created using any of these products and the attribute contains multiple values, you see the #MULTIVALUE error in the attribute cell.
### Example

**Synchronizing data providers with attributes**

In this example you have two data providers, and Address is an attribute of Customer:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Address</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>London</td>
<td>10000</td>
</tr>
<tr>
<td>Paul</td>
<td>Liverpool</td>
<td>15000</td>
</tr>
<tr>
<td>Paul</td>
<td>London</td>
<td>27000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>1234</td>
</tr>
<tr>
<td>Paul</td>
<td>5678</td>
</tr>
</tbody>
</table>

If you create a merged Customer dimension to synchronize the data providers, and Address can have more than one value for each customer, the result is ambiguous because there is no common value for data synchronization.

In the example, Paul has addresses in Liverpool and London, which means that there is no unique ‘Paul’ row for synchronization of Paul’s telephone number. Paul has a different telephone number for each address, and we do not know which address to associate with the telephone number:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Address</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>London</td>
<td>1234</td>
</tr>
<tr>
<td>Paul</td>
<td>Liverpool</td>
<td>#MULTIVALE 5678</td>
</tr>
</tbody>
</table>

If the relationship between Customer and Address is one-to-one, Address can be ignored in the synchronization. This removes the ambiguity:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Address</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>London</td>
<td>1234</td>
</tr>
<tr>
<td>Paul</td>
<td>Liverpool</td>
<td>5678</td>
</tr>
</tbody>
</table>

---

**Related Information**

Attributes [page 66]
4.2.19.13 Incompatible objects and merged dimensions

As a general rule, you cannot place dimensions from different data providers in the same table. This is to avoid Cartesian products (the display of all possible combinations of values from unrelated objects) or other ambiguous results, depending on the universe structure.

You can always place measures from different data providers in a table. The measure calculation depends on what dimensions are available. For example, if you place a measure in a table that contains no dimensions from the same data provider as the measure, the calculation displays its total value in the table.

You can place a merged dimension in a table as long as the table contains other dimensions from a data provider that participates in the merge. You can also place attributes from different data providers in a table, as long as the details are associated with dimensions that participate in a merged dimension.

In certain situations, it can be valid to place a dimension from another data provider in a table, even when this is not allowed by the software. This occurs when the incompatible dimension has a one-to-one or one-to-many relationship with a dimension already in the table. The important point is that there is only one value of the incompatible dimension associated with the dimension in the table (one-to-one). On the other hand, the same value of the incompatible dimension can be associated with multiple values of the dimension in the table (one-to-many).

In the table below, the relationship between Address and Name conforms to these rules: Address has a one-to-one or one-to-many association with Name. There is no one-to-many association in the other direction, between Name and Address (one name with more than one address):

<table>
<thead>
<tr>
<th>Dimension in table (Name)</th>
<th>Incompatible dimension (Address)</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>London</td>
</tr>
<tr>
<td>Paul</td>
<td>London</td>
</tr>
<tr>
<td>George</td>
<td>Liverpool</td>
</tr>
</tbody>
</table>

In this case the universe design is incorrect - the incompatible dimension (Address) should be defined as a detail of the dimension in the table (Name). If you encounter this situation, contact the BI administrator and ask for a redesign of the universe.

→ Tip

If it is not practical to change the universe:
1. Create a variable at the report level.
2. Define this variable as a detail.
3. Associate it with the dimension in the table.
4. Supply the name of the incompatible dimension as the variable definition.

The variable simply returns the same values as the incompatible dimension. Because it is defined as a detail of the dimension in the table, you can place it in the same table as the dimension.

Related Information

To create a variable [page 318]
4.2.19.14 Filtering and drilling on merged dimensions

Merging dimensions has implications for the application of filters.

**Note**

You cannot apply a filter on a merged object containing hierarchies.

**Block filters and merged dimensions**

When you apply a block filter to a dimension that is part of a merged dimension, the filter is applied to the block. It is not applied to other data providers synchronized through the merged dimension.

**Section filters and merged dimensions**

When a dimension that is part of a merged dimension is set as a section header, any filter applied to the section also applies to blocks from synchronized data providers within the section.

**Report filters and merged dimensions**

When you apply a report filter to a dimension that is part of a merged dimension, then the filter will impact all related blocks in the report that use the merged dimension (or any dimensions that participate in the merge).

**Example**

When you have two queries with a common dimension that you have merged, and you have two tables in a report, each table with data coming from a different query, when you filter on the merged dimension in one query, the filter will also impact the corresponding dimension in the second query and therefore in the second table.

**Drilling on merged dimensions**

When you merge dimensions, the new merged dimension belongs to the hierarchies of all dimensions involved in the merge.
4.2.19.15 Extending the values returned by merged dimensions

When you merge dimensions from different data providers, Web Intelligence creates a merged dimension. When you place the merged dimension in the report, only those dimension values that have corresponding values in the data providers synchronized through the merge are returned.

**Note**
Web Intelligence and Desktop Intelligence handle merged dimensions differently, you need to be aware of this when migrating reports from Desktop Intelligence and Web Intelligence. Desktop Intelligence does not create a dimension based on the merged dimension for the report. The following section describes how the differences affect your reports.

**Example**

**Web Intelligence and Desktop Intelligence behavior when dimensions are merged**
You have a report with the following data providers:

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>470</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>499</td>
</tr>
</tbody>
</table>

Web Intelligence returns the values of the Country of Origin dimension through the values returned by the Revenue measure.

If you include the Country of Origin dimension from Data Provider 1 and the Quantity measure from Data Provider 2 in the same block, in Web Intelligence, you get the following result:

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td></td>
</tr>
</tbody>
</table>

The same block in Desktop Intelligence returns the following result:

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>499</td>
</tr>
</tbody>
</table>

To get the same results table as above with Web Intelligence, you must extend the dimension values.
4.2.19.15.1 To extend dimension values

You can activate the dimension extension option in the Document Properties pane.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Properties tab, select Document.
3. In the Document Properties pane, select the Extend merged dimension values option.
   - Restriction
   You should only activate the Extend merged dimension values option when you want to reproduce the merged dimension behavior of SAP BusinessObjects Desktop Intelligence.
4. Click OK to close the Document Properties pane.

4.2.20 Using time dimensions

A time dimension is a hierarchy whose members reflect several units of time such as years, semesters, quarters, months, weeks, days and so on.

A time dimension provides various levels of granularity, time levels, and is practical for time-based analysis and reporting. It allows for calendar customization, which is very common in financial reporting for instance. You can set up a calendar that reflects the fiscal year of your company, specify the first day of the week according to your company’s calendar, or set the first and last months of the year. Your customized calendar can have ranges dates that you define to set limits, which allows for a better analysis of the fiscal period you are interested in.

In Web Intelligence, a time dimension defines the units of time for a data model and how these units aggregate. Its members are given in a chronological order in the hierarchy, making the analysis over time natural thanks to a logical navigation through the members within time levels.

You can create time dimensions using any DATE or DATETIME type object or variable. When creating a time dimension, time levels you select are automatically created so you can reuse them directly in reports. The time levels you select drive the analysis and how the data is reported.

You create time dimensions by generating a time hierarchy directly from a source dimension object. You can use the same dimension source object to create several time dimensions.

Time dimensions support filters, input controls, ranking, sorting, drill from one level to another and dynamic level change directly within a report block.

- Restriction
  - Time dimensions are not supported in SAP HANA Online mode.
  - Time dimensions do not support custom sorts.
Time dimensions do not support delegated measures.
Time dimensions do not support data tracking.
You cannot use a report element that contains a time dimension as a shared element.

Related Information

To create a time hierarchy

4.2.20.1 To create a time hierarchy

Context

You create time hierarchy by generating a time dimension from a DATE or DATETIME type object or variable.

Procedure

1. Right-click a dimension of type DATE or DATETIME.
2. Click Create Time Dimension.
3. Give a name and a description for the time dimension you want to create.
4. Select whether you want to display additional attributes for the time levels you have selected.
5. Select the time level(s) you want to add to the hierarchy and rename them if necessary.

i Note

- The Month time level is not compatible with the Week time level.
- The Week time level is not compatible with the Month, Quarter and Semester time levels.

6. Select the Fiscal Month and First day of the week to customize the calendar associated to your time dimension.
7. Optional: Set range dates to limit the size of the calendar.

i Note

In tables, data that is out of range is still aggregated, and displayed next to an empty cell in the time dimension column.
Next Steps

In the Available Objects pane, a new time dimension object has been created under the source dimension object.

Related Information

Using time dimensions [page 311]

4.2.20.2 To change the levels of a time hierarchy

You can change the levels of a table dynamically to refine the data you want to display.

Context

i Note

You can only choose the levels you have selected when you created the time dimension.

Procedure

1. Right-click a table.
2. Click Change Level.
3. Select the level you want to display.

Related Information

Using time dimensions [page 311]
To create a time hierarchy [page 312]
4.2.21 Enhancing reports with calculations, formulas and variables

You can use calculations, formulas and variables to manipulate data in reports.

Refer to the Using Functions, Formulas and Calculations in Web Intelligence guide for detailed information on the advanced calculation capabilities that you can use when you perform data analysis. This guide also provides a syntax reference to the available functions and operators.

4.2.21.1 Standard calculations

You can use standard calculation functions to make quick calculations on data.

The following standard calculations are available:

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum</td>
<td>Calculates the sum of the selected data.</td>
</tr>
<tr>
<td>Count</td>
<td>Counts all rows for a measure object or count distinct rows for a dimension or detail object.</td>
</tr>
<tr>
<td>Average</td>
<td>Calculates the average of the data.</td>
</tr>
<tr>
<td>Minimum</td>
<td>Displays the minimum value of the selected data.</td>
</tr>
<tr>
<td>Maximum</td>
<td>Displays the maximum value of the selected data.</td>
</tr>
<tr>
<td>Percentage</td>
<td>Displays the selected data as a percentage of the total. The results of the percentage are displayed in an additional column or row of the table.</td>
</tr>
</tbody>
</table>

**Note**

Percentages are calculated for the selected measure compared to the total results for that measure on the table or break. To calculate the percentage of one measure compared to another measure, you need to build a custom calculation.

| Default     | Applies the default aggregation function to a standard measure, or the database aggregation function to a smart measure. |

When you apply standard calculations to table columns, the calculation results appear in footers. One footer is added for each calculation.
4.2.21.1.1 To insert a standard calculation in a table or cross table

You can insert standard calculations in tables or cross tables to make quick calculations on table data.

Context

For more information on the standard calculations, see the Using Functions, Formulas and Calculations in Web Intelligence guide or in the online help.

You can insert multiple calculations in a table or cross table. When you apply two calculations to a table or crosstab, a footer is added for each calculation result. You insert multiple calculations in a table or cross table in the same way that you insert one calculation, but you repeat the procedure for as many calculations as you want to insert.

Procedure

1. In a Web Intelligence document in Design mode, click the table cell that contains the data you want to calculate.
2. In the Analysis tab, in the Functions subtab, select a calculation.
   You can repeat this step to add multiple calculations to the same column.

   → Tip
   Double-click a cell to launch the Formula Editor toolbar, in which you can edit the formula.
   A footer containing the result of the calculation is added below the column.

4.2.21.1.2 To remove a standard calculation

You can remove a standard calculation in Web Intelligence.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click that contains the calculation that you want to remove and select Delete.
4.2.21.2 Using formulas to build custom calculations

Custom calculations allow you to add additional calculations to your report beyond its base objects and standard calculations.

You add a custom calculation by writing a formula. A formula can consist of base report variables, functions, operators and calculation contexts.

A custom calculation is a formula that can consist of report objects, functions and operators. Formulas have a calculation context that you can specify explicitly if you choose.

Example

Showing average revenue per sale

If you have a report with Sales Revenue and Number Sold objects and you want to add revenue per sale to the report, the calculation \[ \frac{\text{Sales Revenue}}{\text{Number Sold}} \] gives this value by dividing the revenue by the number of items sold in order to give the revenue per item.

4.2.21.2.1 To enter a formula by typing

You can manually enter formulas in the Formula Editor in Web Intelligence.

Procedure

1. In a Web Intelligence document in Design mode, select the Properties tab.
2. From the View dropdown list, select Formula Bar to display the Formula Bar.
3. Select or insert a cell or text box in the report.
4. Type a formula in the Formula box.
5. To build a formula using the Formula Editor, click the Formula Editor icon on the Formula Bar.
6. Build the formula.
7. To confirm and apply the formula, click OK.
4.2.21.2.2 To build a formula in the Formula Editor

You can use the Formula Editor to define the formula for a table cell.

Context

In the Formula Editor, you can define a formula, include a list of values in the formula, and include a prompt in the formula.

**i Note**

For more information about operators and functions, refer to the Using functions, formulas and calculations in Web Intelligence guide or the Web Intelligence online help. You can also access this information by selecting an operator or function and clicking More on this function in the Description box.

Procedure

1. In a Web Intelligence document in Design mode, select the table cell where you want to insert the formula.
2. In the Properties tab, select Formula Bar from the View dropdown list to display the Formula Bar.
3. To build a formula using the Formula Editor, click the Formula Editor icon on the Formula bar.
4. Double-click to select an object for the formula from the Available Objects pane.
5. Double-click to select a function for the formula from the Available Functions or Functions pane.
6. Double-click to select an operator for your formula from the Available Operators or Operators pane.
   - If your formula requires you to select one or more values from a list of values, perform the following steps:
     a. Select an object in the Available Operators list.
     b. Double-click Prompts to open the prompt editor and define a prompt.
     c. Double-click the Values item to open the List of Values dialog box.
     d. Do one of the following:
        - To select one value, select the value and then click OK.
        - To select contiguous values, select the first value. While pressing the Shift key, click the last value and then click OK.
        - To select several (non-contiguous) values, select the first value. While pressing the Control key, click the other values you want to select and then click OK.
7. To confirm and apply the formula, click OK.
Related Information

Filtering data with prompts [page 575]

4.2.21.3 Using variables to simplify formulas

Variables are useful to break down formulas into manageable parts and make them easier to read. They also make building a formula less error-prone.

Variables are available in the Available Objects pane, under the Variables folder.

As of the 4.2 SP4 release, a new Description field is available so that you can provide context and details about a specific variable. The description that you enter is then displayed in the Query Panel when you hover over the variable. You can edit this description when creating, editing or renaming a variable.

4.2.21.3.1 To create a variable

You can create a variable in Web Intelligence.

Procedure

1. Open a Web Intelligence document in Design mode.
2. To display the Formula Bar, in the Properties tab, select Formula bar from the View dropdown list.
3. Click the Create Variable icon in the Formula Bar to display the Create New Variable or Create Variable panel.
4. Type the variable name in the Name box.
5. In the Formula box, build a formula for the variable, if one is not already displayed.

   i Note
   ○ If a cell is selected before you open the Formula Editor, the formula you create is assigned to the cell.
   ○ For detailed information on building formulas, including a syntax reference to the available functions and operators, refer to the Using functions, formulas and calculations in Web Intelligence guide or the Web Intelligence interface help.

6. Select a variable qualification.
7. Click OK to save the variable and return to the document.
4.2.21.3.2 To edit a variable

You can edit a variable in Web Intelligence.

Procedure

1. In a Web Intelligence document in Design mode, select the Available Objects tab on the Side Panel.
2. Right-click the variable you want to edit and select Edit. The Variable Editor or Edit Variable panel appears.
3. Edit the variable.

   i Note
   
   For detailed information on building formulas, including a syntax reference to the available functions and operators, refer to the Using functions, formulas and calculations in Web Intelligence guide or the Web Intelligence interface help.

4. Click OK to return to the document. The following warning message appears: Are you sure you want to modify this variable?
5. Click Yes to return to the document.

4.2.21.3.3 To delete a variable

You can delete a variable in Web Intelligence.

Procedure

1. In a Web Intelligence document in Design mode, select the Available Objects tab on the Side Panel.
2. Right-click in the list the variable that you want to delete and select Remove.
4.2.21.3.4 To rename a variable

You can rename a variable in the Web Intelligence Applet interface and Web Intelligence Rich Client.

Procedure

1. In a Web Intelligence document in Design mode, select the Available Objects tab on the Side Panel.
2. Right-click the variable that you want to rename and select Rename.

   i Note
   The Rename options is not available in the Web Intelligence HTML interface, however you can rename the variable in the Variable Editor or Edit Variable panel.

3. Rename the variable and click OK to save it.

Related Information

To edit a variable [page 319]

4.2.21.3.5 To duplicate a variable

You can duplicate a variable in Web Intelligence.

Procedure

1. In a Web Intelligence document in Design mode, select the Available Objects tab in the Side Panel.
2. Right-click the variable that you want to duplicate and select Copy.
3. Right-click the Variables folder icon and select Paste.
   The duplicated variable appears below the original variable, with a number in parenthesis in its name, for example (1) for the first duplicate, (2) for the second duplicate, and so on.
4.2.21.3.6 To merge variables

You can merge two variables, or merge a variable with another object.

Context

The variables must be dimension objects, and must come from different queries. You cannot merge objects coming from the same query.

Tip

To have a better visibility of the variables you can merge, switch to the Arranged by: Query view in the Available Objects pane. Using this view, you can see the variables coming from the different queries used in your document.

Procedure

1. In Design mode, select the Available Objects tab on the Side Panel.
2. Select two variables you want to merge by holding the Ctrl or Cmd key.
3. Right-click one of the variables you have selected.
4. Click Merge.

4.2.21.4 Using references to reuse data

A reference is a variable whose definition and content are based on another cell. It is useful whenever you want to leverage data of a cell that has been obtained using a complex formula.

You use a reference to point to another cell and reuse its value. Using a reference as a direct pointer to the content of a referenced cell is a direct shortcut to the value you are interested in. After you have created a reference in a document, it is replaced by the content of it referenced cell. In the 4.2 SP4 release, a new Description field is available so that you can provide context and details about a specific reference. The description that you enter is then displayed in the Query Panel when you hover over a reference. It gives information on how to use it, and you can edit this description when creating, editing or renaming a reference.

You can use references anywhere in a document, in any report or formula. As an example, you could use references to create a summary report that references figures from other reports.

A reference always inherits the type of the cell it references. If the referenced cell type is a string for instance, then the reference type is a string as well. If the referenced cell type changes, then the reference adapts so.

The definition of a reference is made of two elements:

- A name
The path of the cell it references

The following table lists the definitions related to references:

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>Variable whose definition and value references a target cell</td>
</tr>
<tr>
<td>Referenced cell</td>
<td>Target cell of the reference</td>
</tr>
<tr>
<td>Referenced cell content</td>
<td>Data contained in the reference, reused from the referenced cell</td>
</tr>
</tbody>
</table>

**Restriction**

- A reference doesn’t keep the format of its target cell. If a target cell has a specific color or font for instance, it is not reflected in the reference.
- When hiding a column table that contains a referenced cell or a commented cell, the reference is lost as well as the comment.
- When turning a table into a chart and then turning it back into a table, it is empty if the original table contained a reference. That is because references are constant strings and aren’t supported by charts.

References use the following icon: ![icon]

### 4.2.21.4.1 To assign a reference

**Context**

**Procedure**

1. Right-click a cell whose content you want to reuse.
2. Click Assign Reference.
3. Select whether you want to assign a new reference to the cell or an existing one.
4. Click OK.

**Results**

The reference now appears in the Available Objects pane, under the References folder. Note that if you copy and paste a cell using a reference, then the reference in the copied cell points to the same target cell.
4.2.21.4.2  To rename a reference

Context

Procedure

1. In the Available Objects pane, right-click the reference you want to rename.
2. Click Rename.
3. Enter a name in the New name text field.
4. Click OK.

Results

The reference has been updated with its new name in the Available Objects pane, under the References folder.

4.2.21.4.3  To delete a reference

Context

Procedure

1. In the Available Objects pane, right-click a reference you want to delete.
2. Click Delete.
3. Click OK.
Results

In the Available Objects pane, the reference you have deleted no longer appears under the References folder.

4.2.21.4.4 To display a referenced cell

Context

Procedure

1. In the Available Objects pane, right-click a reference whose referenced cell you want to display.
2. Click Show referenced cell.

Results

The cell is automatically selected on the report page.

4.2.22 Displaying data in tables

When you create a document and run the query the first time to display the results, the document contains a report that includes the query results in a vertical table.

You can do the following:

- Modify how the table is organized
- Remove or add data
- Insert other rows or columns
- Hide columns (see note below)
- Change the table type
- Turn the table into a chart
- Insert other tables
Tip

When you create a new name for a column, it becomes a custom header and it is no longer attached to the dimension. When you hide the column and show it again, it will revert to the original, default column name. If you want the custom header name to be permanent, you can create a variable.

Related Information

To create a variable [page 318]

4.2.22.1 Vertical tables

Vertical tables display header cells at the top of the table and the corresponding data in columns.

By default, the header cells display the names of the dimensions, details, and measures included in the table. The body cells display the corresponding values.

<table>
<thead>
<tr>
<th>Lines</th>
<th>Sales revenue</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories</td>
<td>$9,914,546</td>
<td>$3,809,135</td>
</tr>
<tr>
<td>City Skirts</td>
<td>$347,775</td>
<td>$132,302</td>
</tr>
<tr>
<td>City Trousers</td>
<td>$284,734</td>
<td>$104,346</td>
</tr>
<tr>
<td>Dresses</td>
<td>$2,915,620</td>
<td>$1,173,861</td>
</tr>
<tr>
<td>Jackets</td>
<td>$677,307</td>
<td>$288,130</td>
</tr>
<tr>
<td>Leather</td>
<td>$187,413</td>
<td>$70,599</td>
</tr>
<tr>
<td>Outerwear</td>
<td>$1,183,083</td>
<td>$474,302</td>
</tr>
<tr>
<td>Overcoats</td>
<td>$436,258</td>
<td>$185,522</td>
</tr>
<tr>
<td>Shirt Waist</td>
<td>$4,018,220</td>
<td>$1,616,210</td>
</tr>
<tr>
<td>Sweaters</td>
<td>$2,839,035</td>
<td>$1,000,673</td>
</tr>
<tr>
<td>Trousers</td>
<td>$903,320</td>
<td>$327,515</td>
</tr>
</tbody>
</table>

4.2.22.2 Horizontal tables

Horizontal tables display header cells on the side of the table and the corresponding data in rows.

By default, the header cells display the names of the dimensions, details, and measures included in the table. The body cells display the corresponding values.

<table>
<thead>
<tr>
<th>Fiscal Period</th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>$8,095,814</td>
<td>$13,232,246</td>
<td>$15,059,143</td>
</tr>
<tr>
<td>Margin</td>
<td>$3,731,971</td>
<td>$5,187,886</td>
<td>$5,667,084</td>
</tr>
</tbody>
</table>
4.2.22.3 Cross tables

Cross tables display values for dimensions across the top axis and on the side axis.

The body displays the values of a measure that correspond to the cross-section of the dimensions.

Values in cross tables

In the following example, the cross table displays values for [Quarter] across the top axis and displays values for [State] on the side axis. The body displays values that [Sales Revenue] for each quarter in each state.

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Califonia</strong></td>
<td>$1,899,680</td>
<td>$1,760,148</td>
<td>$1,930,517</td>
<td>$1,889,225</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td>$525,662</td>
<td>$500,076</td>
<td>$510,777</td>
<td>$523,740</td>
</tr>
<tr>
<td><strong>DC</strong></td>
<td>$766,022</td>
<td>$706,447</td>
<td>$692,258</td>
<td>$796,423</td>
</tr>
<tr>
<td><strong>Florida</strong></td>
<td>$515,688</td>
<td>$499,998</td>
<td>$387,811</td>
<td>$495,663</td>
</tr>
<tr>
<td><strong>Illinois</strong></td>
<td>$846,408</td>
<td>$850,905</td>
<td>$810,765</td>
<td>$714,890</td>
</tr>
<tr>
<td><strong>Massachusetts</strong></td>
<td>$312,896</td>
<td>$291,431</td>
<td>$249,329</td>
<td>$429,860</td>
</tr>
<tr>
<td><strong>New York</strong></td>
<td>$1,987,115</td>
<td>$2,028,091</td>
<td>$1,672,581</td>
<td>$1,894,435</td>
</tr>
<tr>
<td><strong>Texas</strong></td>
<td>$2,875,569</td>
<td>$2,499,277</td>
<td>$2,146,303</td>
<td>$2,596,518</td>
</tr>
</tbody>
</table>

Multiple dimensions in cross tables

You can include multiple dimensions in cross tables. In the following example, the cross table displays two dimensions. The values for the [Sales Revenue] measure are values each state by quarter for each line.

<table>
<thead>
<tr>
<th></th>
<th>Q1 City Skirts</th>
<th>Q1 City Trousers</th>
<th>Q2 City Skirts</th>
<th>Q2 City Trousers</th>
<th>Q3 City Skirts</th>
<th>Q3 City Trousers</th>
<th>Q4 City Skirts</th>
<th>Q4 City Trousers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>California</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>DC</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>Florida</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>Illinois</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>Massachusetts</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>New York</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
<tr>
<td><strong>Texas</strong></td>
<td>$7,795</td>
<td>$6,496</td>
<td>$9,075</td>
<td>$8,245</td>
<td>$8,375</td>
<td>$11,024</td>
<td>$10,685</td>
<td>$12,617</td>
</tr>
</tbody>
</table>

When you create cross tables that include dimensions in the body, the body cell values are calculated according to a multi-dimensional data model. In the following example, the values displayed in the body are
calculated according to all of the coordinates on the table axes, whether or not there is a row for the specific coordinate in the data.

<table>
<thead>
<tr>
<th>Year</th>
<th>California</th>
<th>Colorado</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>2001</td>
<td>San Francisco</td>
<td>San Francisco</td>
<td>San Francisco</td>
</tr>
<tr>
<td>2002</td>
<td>Colorado Springs</td>
<td>Colorado Springs</td>
<td>Colorado Springs</td>
</tr>
<tr>
<td>2002</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>2002</td>
<td>San Francisco</td>
<td>San Francisco</td>
<td>San Francisco</td>
</tr>
<tr>
<td>2003</td>
<td>Colorado Springs</td>
<td>Colorado Springs</td>
<td>Colorado Springs</td>
</tr>
<tr>
<td>2003</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>2003</td>
<td>San Francisco</td>
<td>San Francisco</td>
<td>San Francisco</td>
</tr>
</tbody>
</table>

### 4.2.22.4 Forms

You can use in your report to display detailed information per customer, product, or partner.

For example, you can use a form to display customer information such as the account, name, address, and so on.

Forms are also useful for formatting address labels for envelopes.

### 4.2.22.5 To create a table by dragging objects onto a report

You are working with a report and want to insert a table into the report. You use the available objects from the query.

**Procedure**

1. In a Web Intelligence document in Design mode, click the Available Objects icon to display the Available Objects list in the Side Panel.
2. Select an object or objects and drag and drop them with the mouse cursor to an empty part of the report. When you release the mouse button the objects appear as columns in a vertical table.
3. To add another object or objects to the table, drag them onto an existing table.

For example:
○ To add a column next to an existing column, drag and drop the object to the border of the column.
○ To replace an existing column, drag and drop the object to the middle of the column.

4.2.22.6 To create a table

Working in Structure mode allows you to define and preview a new table without data from the server.

Procedure

1. In a Web Intelligence document, from the Design mode dropdown list in the top corner of the toolbar, click Structure only to switch to Structure mode.
2. In the Report Elements tab, select the Tables subtab.
3. Select one of the following:
   ○ Define Vertical Table
   ○ Define Horizontal Table
   ○ Define Cross Table
   ○ Define Form
4. Click the report at the position where you want the table to appear.
5. Right-click the table border and select Assign Data from the contextual menu.
   The Assign Data dialog box appears.
6. Click the arrow in the Pick text box and from the dropdown list select the object to associate with the table column, row or body cell.

   **Note**
   You can associate a formula rather than a report object with the component by clicking the arrow next to the component, selecting Edit Formula and defining the formula in the Formula Editor.

7. To add another table element, click + next to the Pick text box.
8. To delete a table component, do one of the following:
   ○ Click the X icon.
   ○ Click the arrow next to an element text box and select Delete from the contextual menu.
9. When you have finished defining the table, click OK.
4.2.22.7 To change the format of a table

You can turn a table into a different format or into a chart using the *Turn Table Into* option.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the table you want to reformat, then select *Turn Table Into* to display the *Turn Into* options.
   - You can also select the table or chart style from the *Tools* section of the *Report Elements* tab.
2. Choose a table or chart type.

**Next Steps**

---

**Note**

When you turn a table with a unicode font into a chart, the font is not retained unless unicode is defined as your default font for charts. Contact the BI administrator for further information on setting unicode as your default font.

---

4.2.22.8 To add table rows or columns

You can add table rows and columns in Web Intelligence document in *Design* mode.

**Procedure**

1. In a Web Intelligence document in *Design* mode, select a cell in the column or row next to which you want to insert another column or row.
2. Do one of the following procedures:
   - Select the *Report Element* tab, and in the *Table Layout* subtab, from the *Insert* list, select one of the following:
     - *Insert Rows Above*
     - *Insert Rows Below*
     - *Insert Columns on Left*
     - *Insert Columns on Right*
   - Right-click the cell and select *Insert*, then one of the following:
     - *Row Above*
3. Drag an object from the Available Objects pane in the Side Panel to the empty column or row you inserted.

### 4.2.22.9 To remove table rows or columns

You can remove table rows or columns in a Web Intelligence document in Design mode.

**Procedure**

1. In a Web Intelligence document in Design mode, right-click the table column or row you want to remove and select Delete from the menu.
   By default, if you select Delete from the menu, it deletes the column in a vertical table or a row in a horizontal table.
2. Select Row or Column.
3. Click OK.

### 4.2.22.10 To move a row or column

You can move a row or column in a table in a Web Intelligence document in Design mode.

**Procedure**

In a Web Intelligence document in Design mode, drag the selected column or row and drop it before or after another column or row on the table.
When you drag a row or column, the column or row header displays next to your pointer.
4.2.22.11 To swap a row or column

You can swap rows and columns in tables in a Web Intelligence document in Design mode.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Drag the selected column or row onto the column or row that you want to swap.

→ Tip

The drag and drop is not available if you are using Chrome as a web browser. To work around the issue, move the mouse outside the table before you drop the column or row.

4.2.22.12 To clear cell contents from a table

You can clear different types of cells in a table.

Context

You can clear the following types of cell in a table:

- Header cells – you can clear each header cell separately
- Footer cells – you can clear each footer cell separately
- Related body cells – when you clear one body cell, you automatically clear all of the body cells in the same column or row of the table

Procedure

1. In a Web Intelligence document in Design mode, select the cell you want to clear. The cell borders are highlighted.
2. Right-click the selected cell and click Clear Contents.
4.2.22.13 To remove a table

You can remove a table in a Web Intelligence document in **Design** mode.

**Procedure**

1. In a Web Intelligence document in **Design** mode, click the top edge of the table you want to remove. A gray border appears around the table.
2. Press the **Delete** key on your keyboard.

4.2.22.14 To copy a table

You can copy and paste tables within a report or into external applications such as Microsoft Word and Excel.

**Procedure**

1. In a Web Intelligence document in **Design** mode, select and right-click the table you want to copy.
2. Select **Copy**.
3. To paste the table to another part of the report, right-click where you want the table to appear and select **Paste**.

   **Restriction**
   You cannot copy tables from one version of Web Intelligence to another.

4. To paste the table into another application, paste the contents in the other application.

4.2.22.15 Hiding tables, measures, and dimensions in tables

You can display or hide tables or table objects in a Web Intelligence document.

Sometimes tables or specific rows and columns display no values. For example, if a sales of a specific product are discontinued, table rows or columns that normally show results for that product appear empty. By default, these empty rows, columns, or tables are displayed.

You can also display and hide tables based on the result of a formula.
### 4.2.22.15.1 To show or hide tables

You can display or hide tables in a Web Intelligence document in *Design* mode.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. Hover the mouse over the table border until the cursor becomes a + sign, click the table and do one of the following:
   - In the *Document Structure and Filters* pane in the Side Panel, right-click the table and select one of the following options:
     - **Hide**: The table or dimension column is always hidden.
     - **Hide when Empty**: The table is hidden when there is no data.
     - **Hide When...**: The table is hidden when the formula you create is true.
     - **Show Hidden Dimensions**: The hidden dimension columns in the table appear in the table.
     - **Show**: The hidden table appears in the report.
   - While the table is selected, click the right mouse button and select one of the following from the contextual menu:
     1. Select **Hide**, and then one of the following options.
        - **Hide always**: The table is always hidden.
        - **Hide when Empty**: The table is hidden when there is no data.
        - **Hide When...**: The table is hidden when the formula you create is true. To hide the table when the formula is true, select and type a formula in the box.

   **Note**

   If you only want to hide a column containing a dimension in a vertical or cross table, or a row in a horizontal or cross table, right-click only the dimension in the table.

   - Select **Format Table**, and in the *General* tab configure the following options:
     - **Hide always**: The table is always hidden.
     - **Hide when empty**: The table is hidden when there is no data. The table is always visible, even if it contains no data.
When selected  
The table is hidden when the formula you create is true.

When deselected  
The table is never hidden based on any formula in the Formula text box.

### Note
For information on creating formulas, refer to the Web Intelligence online help or the *Using functions, formulas and calculations in Web Intelligence* guide.

3. Click **OK** to return to the document.

When a table or element is hidden, its name is italicized in grey in the *Document Structure and Filters* pane in the Side Panel.

### 4.22.15.2 To show or hide dimensions and measures in tables

Depending on the type of table you are using, you can hide or show dimensions and measures in columns or rows.

#### Procedure

1. In **Design** mode, select the table column containing the dimension or measure you want to show or hide.
2. Right-click a dimension or a measure and select **Hide Column** or **Hide Row**, and **Show Hidden Objects** to display hidden dimensions or measures.

### 4.22.15.3 To conditionally show or hide measures or dimensions values in tables

Depending on the type of table you are using, you can conditionally hide or show measures or dimensions values in columns or rows.

#### Procedure

1. Open a Web Intelligence document in **Design** mode.
2. Hover the mouse over the table border until the cursor becomes a + sign, click the right mouse button and select **Format Table** from the contextual menu.
3. In the General tab, configure the following options:

- For form, cross, and vertical tables:

<table>
<thead>
<tr>
<th>Option</th>
<th>When selected</th>
<th>When deselected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show rows with all empty measure values</td>
<td>Rows are displayed in the table, even if they do not contain values.</td>
<td>Rows are hidden if they do not contain values.</td>
</tr>
<tr>
<td>Show rows with empty dimension values</td>
<td>Rows are displayed in the table, even if they do not contain values.</td>
<td>Rows are hidden if they do not contain any values.</td>
</tr>
<tr>
<td>Shows rows for which all measure values = 0</td>
<td>Even if the measure value is 0 in all cells of the row, the row still appears in the table.</td>
<td>If the measure value is 0 in all cells, the row does not appear in the table.</td>
</tr>
<tr>
<td>Shows rows for which the sum of measure values = 0</td>
<td>Even if the sum of measure value is 0 in the row, the row still appears in the table.</td>
<td>If the sum of the measure value is 0 in all cells, the row does not appear in the table.</td>
</tr>
</tbody>
</table>

**Restriction**
You cannot conditionally hide or show column values in vertical tables and forms.

- For horizontal and cross tables:

<table>
<thead>
<tr>
<th>Option</th>
<th>When selected</th>
<th>When deselected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show columns with empty measure values</td>
<td>Columns are displayed in the table, even if they do not contain values.</td>
<td>Columns are hidden if they do not contain values.</td>
</tr>
<tr>
<td>Show columns with empty dimension values</td>
<td>Columns are displayed in the table, even if they do not contain values.</td>
<td>Columns are hidden if they do not contain any values.</td>
</tr>
<tr>
<td>Shows columns for which all measure values = 0</td>
<td>Even if the measure value is 0 in all cells of the column, the column still appears in the table.</td>
<td>If the measure value is 0 in all cells of the column, the column does not appear in the table.</td>
</tr>
<tr>
<td>Shows columns for which the sum of measure values = 0</td>
<td>Even if the sum of measure value is 0 in the column, the column still appears in the table.</td>
<td>If the sum of the measure value is 0 for the column, the column does not appear in the table.</td>
</tr>
</tbody>
</table>

**Restriction**
You cannot conditionally hide or show row values in horizontal tables.

4. Click **OK** to return to the document.
4.2.22.15.4 To redisplay hidden dimensions or measures

You can redisplay dimensions or measures that have been hidden in a report.

**Procedure**

1. In *Design* mode, select a table containing hidden dimensions or measures.
2. In the *Report Elements* tab, select the *Behaviors* subtab.
3. Click **Hide Show Hidden Dimensions** or **Show Hidden Measures** to redisplay the dimensions or measures.

→ **Tip**

If the hidden dimensions or measures were the only objects in the table, right-click the table in the *Document Structure and Filters* pane of the Side Panel and select **Hide Show Hidden Dimensions** or **Show Hidden Measures**.

4.2.22.15.5 To redisplay hidden tables, cells or sections

You can redisplay hidden objects in a Web Intelligence document in *Design* mode.

**Procedure**

1. In a Web Intelligence document in *Design* mode, select one of the following:
   - The hidden table, free-standing cell or section in the *Document Structure and Filters* tab in the Side Panel.
   - The hidden report object in the table in which it is displayed.
2. Right-click the object and select **Hide Show**.

→ **Tip**

To show all hidden elements in a report, right-click in the report and select **Show All Hidden Content**.
4.2.22.15.6 To avoid duplicate row aggregation

When rows contain duplicate data, measure values are aggregated by default. You can choose not to aggregate measure values in this situation.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select Format Table from the contextual menu.
3. In the General tab, select Avoid duplicate row aggregation.
   
   **Note**
   
   This option does not work in tables containing hierarchical data.

4. Click OK to return to the document.

4.2.22.16 To show or hide table headers and footers

You can show and hide table headers in a Web Intelligence document in Design mode.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select Format Table from the contextual menu.
3. In the Format Table dialog box, select the General tab.
4. For the table header, do one of the following:
   
   ○ To display the headers:
     ○ If you are using Web Intelligence HTML Interface, select Table headers or, in the case of a cross table, Top header or Left header or both.
     ○ If you are using Web Intelligence Applet interface or Web Intelligence Rich Client, select Show table headers or, in the case of a cross table, Show top header or Show left header or both.
   
   ○ To hide the headers, unselect the header options.

5. For the table footer, do one of the following:
   
   ○ To display the footers:
     ○ If you are using Web Intelligence HTML Interface, select Table footers or, in the case of a cross table, Bottom footer or Right footer.
     ○ If you are using Web Intelligence Applet interface or Web Intelligence Rich Client, select Show table footers or, in the case of a cross table, Show bottom footer or Show right footer.
To hide the footers, unselect the footer options.

6. Click OK to return to the document.

### 4.2.22.17 To start tables on a new report page

You can set a table to start on a new Web Intelligence report page in Design mode.

#### Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select Format Table from the contextual menu.
3. In the Layout tab, select Start on a new page in the Vertical or Horizontal panes.
   The Horizontal and Vertical panes refer to the table axes.
4. Click OK to return to the document.

### 4.2.22.18 To display object names in headers on cross tables

You can display object names in headers in cross tables in a Web Intelligence document in Design mode.

#### Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select Format Table from the contextual menu.
3. In the General tab, click Show object names to display the object names in additional headers on the cross table.
4. Click OK to return to the document.
4.2.22.19 To avoid page breaks in tables

You can stop page breaks from occurring in tables in a Web Intelligence report in Design mode.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select Format Table from the contextual menu.
3. In the Layout tab, select Avoid page breaks in table in the Vertical or Horizontal panes. The Horizontal and Vertical panes refer to the table axes.
4. Click OK to return to the document.

4.2.22.20 To repeat a table on every page

You can repeat a table horizontally, vertically or both a every page of a report.

Context

i Note

When using this parameter, a banner is inserted at the top of the first page on which the table is repeated. If a repeated table is placed in the middle of a page next to a table that spreads across multiple pages, then on the second page, the rest of the table is displayed only below the banner. We recommend using this parameter only if the table you want to repeat is placed at the top of the page or all the way to the left. Otherwise, the banner takes too much space on the page.

If the repeated element is contained within a section, then its container is the section instance and the banner is up at the top of the section instance rather than at the top of page. If there is not enough space to display the report block that comes after the repeated element, then the parameter is ignored.

Procedure

1. Right-click a table.
2. Click Format Table Layout.
3. In the Horizontal section, the Vertical section or both, check repeat on every page.
### 4.2.22.21 To repeat table headers or footers on report pages

You can set table headers and footers to be repeated in Web Intelligence report pages in Design mode.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. Hover the mouse over the table border until the cursor becomes a plus sign, click the right mouse button and select **Format Table** from the contextual menu.
3. In the Layout tab, select **Repeat header on every page** or **Repeat footer on every page** in the Vertical or Horizontal panes.
   The **Horizontal** and **Vertical** panes refer to the table axes.
4. Click **OK** in the document.

### 4.2.23 Displaying data in free-standing cells

Free-standing cells are single cells that stand alone in a report.

You can place any text or formula in a blank free-standing cell, or you can use pre-defined free standing cells that display specific information.

For more information on the functions used in free-standing cells, see the *Using Functions, Formulas and Calculations in Web Intelligence* guide, or see the Web Intelligence online help.

#### Formula and text cell functions in free-standing cells

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank Cell</td>
<td>Empty cell in which you can enter any text or formula.</td>
</tr>
<tr>
<td>Drill Filters</td>
<td>Uses the <strong>DrillFilters</strong> function to display details of the drill filters applied to the report.</td>
</tr>
<tr>
<td>Last Refresh Date</td>
<td>Uses the <strong>LastExecutionDate</strong> function to display the last date when the document was refreshed.</td>
</tr>
<tr>
<td>Document Name</td>
<td>Uses the <strong>DocumentName</strong> function to display the document name.</td>
</tr>
<tr>
<td>Query Summary</td>
<td>Uses the <strong>QuerySummary</strong> function to display details of the queries in the document.</td>
</tr>
</tbody>
</table>
Function | Description
---|---
Prompt | From the Prompt dropdown list, you can select one of the following cell options:
  * PromptSummary: This cell uses the PromptSummary function to display the complete details of the user prompt selections in the document.
  * `<name of query prompt>`: The name of each query prompt is listed in the Prompt list. A pre-defined cell based on a query prompt displays the user prompt selections at the last refresh or Run Query action.

Report Filter Summary | Uses the ReportFilterSummary function to display the report filters applied to the report.

**Page number cell functions in free-standing cells**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page Number</td>
<td>Uses the Page function to display the number of pages in the report.</td>
</tr>
<tr>
<td>Page Number/Total Pages</td>
<td>Uses the Page and NumberOfPages functions to display the current page number and the total number of pages in the report.</td>
</tr>
<tr>
<td>Total Number of Pages</td>
<td>Uses the NumberOfPages function to display the total number of pages in the report.</td>
</tr>
</tbody>
</table>

### 4.2.23.1 To insert a free-standing cell in a report

You can insert a free-standing cell in a report.

**Procedure**

1. In a Web Intelligence document in Design mode, select the Report Element tab.
2. In the Cell subtab, do one of the following:
   - Click Blank to insert a blank cell.
   - From the Pre-Defined dropdown list, select a pre-defined cell to insert.
3. Place your mouse over the part of the report where you want to insert the cell and click the left mouse button.
4. If you have inserted a blank cell, type the text or formula of the cell in the Formula Bar.

   **i Note**

   To activate the Formula Bar, click the Formula Bar icon in the Analysis tab.

5. To delete the cell, select it and press the Delete key on your keyboard.
4.2.23.2 To hide free-standing cells

You can hide free-standing cells unconditionally, when they are empty, or based on the result of a formula.

Procedure

1. In a Web Intelligence document in Design mode, right-click the free-standing cell and select Format Cell in the contextual menu.
2. In the Format Cell dialog box, in the General tab, select any of the following:
   ○ To hide the cell unconditionally, select Hide always.
   ○ To hide the cell when it is empty, select Hide when empty.
   ○ To hide the cell based on the result of a formula, click Hide when the following formula is true and type the formula in the box.
3. Click OK to return to the document.

Related Information

To redisplay hidden tables, cells or sections [page 336]

4.2.23.3 To copy a free-standing cell

You can copy and paste free-standing cells within a report or into external applications such as Microsoft Word and Excel.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click the free-standing cell and select Copy in the contextual menu.
3. To paste the free-standing cell to another part of the report, right-click where you want the free-standing cell to appear and click Paste on the menu.
4. To paste the free-standing cell into another application, paste the contents of the clipboard from within the application.
   You can also copy a free-standing cell into another application by dragging and dropping the free-standing cell directly into the open document in the target application. When you drag and drop a free-standing cell into a Microsoft Office application, the text in the cell is pasted into the application.
4.2.24 Formatting numbers and dates

You can change how values appear in specific cells or on chart axes using predefined formats available in the application, or by creating your own custom formats.

You can save your custom formats for reuse in more than one block and report in the same document.

4.2.24.1 Predefined formats

This topic describes the predefined formats available in Web Intelligence for table cells.

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>The format defined for the object on the universe.</td>
</tr>
<tr>
<td>Number</td>
<td>Formats for decimal or integer values.</td>
</tr>
<tr>
<td>Currency</td>
<td>Formats for currency values.</td>
</tr>
<tr>
<td>Date/Time</td>
<td>Date and time formats.</td>
</tr>
<tr>
<td>Boolean</td>
<td>Formats for true and false values.</td>
</tr>
</tbody>
</table>

Related Information

To apply a custom number format to a cell [page 348]
To define a custom format [page 348]
Setting Decimal type for big numbers to improve calculation and rounding accuracy [page 344]

4.2.24.1.1 To apply a predefined format to a cell

You can apply a predefined number format to data in a cell in a table.

Procedure

1. In a Web Intelligence document in Design mode, select a cell.
2. To select a predefined format:
   ○ In the Web Intelligence HTML interface, in the Formatting tab, select the Numbers subtab, and select a format from the Number Format dropdown list.
   ○ In the Web Intelligence Rich Client, in the Format tab, in the Numbers subtab, and select a format from the DEFAULT dropdown list.
3. Save the document.

### 4.2.24.1.2 Setting Decimal type for big numbers to improve calculation and rounding accuracy

The new Decimal number type implements the IEEE 754-2008 Decimal data format for big numbers which improves Web Intelligence calculation precision. The Decimal function `ToDecimal(value)` is supported where value can be a number or a string, and transforms its input into a Decimal type.

The Decimal number type offers the following advantages:

- Web Intelligence can now compute decimal numbers for any operation where a Number type is expected, for example, mathematical operators, conditional operators, or logical operators.
- Decimal values have a default precision of up to 40 digits with a maximum exponent value of 400 which correctly converts Double into Decimal.
- The new Decimal function `ToDecimal(value)` is supported in any function where a number is expected. For example, in the Character functions, you can use a Decimal value for `num_repeats` in the function `Fill(repeated_string ; num_repeats)` where `value` can be a number or a string that transforms its input into a Decimal. The string input type is particularly useful to extract large precision values from a data source without any loss in precision. For a numeric function, if the argument for a function is Decimal, then the function returns Decimal type to the extended precision. For example, `=Sin(1.0/3.0)` returns `0.3271946967961520` but `=Sin(ToDecimal("1")/ToDecimal("3"))` returns `0.3271946967961522441733440852676206061`.

In a Web Intelligence report, you apply Decimal for a measure as follows:

- Right click a measure in the **Available Objects** side panel.
- Select **Decimal** from the **Change Type** menu. You can also select **Number** for a measure that is already defined as Decimal.

⚠️ **Caution**

Changing certain measures to Decimal in your report may impact the performance of Web Intelligence. This applies particularly to documents with many measures returning high numbers of rows in the data provider.

**Related Information**

- *Predefined formats [page 343]*
### 4.2.24.2 Custom formats

In tables, you can use the Custom format type to define a customized format for any cell.

In Web Intelligence functions, the day/date, calendar and time of day character definitions below apply. The following table lists the strings you can use to create custom formats:

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>The corresponding digit. If the number has less digits than the number of # characters used to specify the format, no leading zeros are inserted.</td>
<td>‘12345’ with the format #, ##0 gives ‘12,345’ (if your locale defines the grouping separator as a comma) or ‘12 345’ (if your locale defines the grouping separator as a space)</td>
</tr>
<tr>
<td>0</td>
<td>The corresponding digit. If the number has less digits than the number of 0 characters used to specify the format, a leading zero(s) is inserted before the number.</td>
<td>‘123’ with the format #0, 000 gives ‘0.123’</td>
</tr>
<tr>
<td>,</td>
<td>The grouping separator as defined by your locale.</td>
<td>‘1234567’ with the format #, ##0 gives ‘1,234,567’ (if you locale defines the grouping separator as a comma) or ‘1 234 567’ (if your locale defines the grouping separator as a non-breaking space)</td>
</tr>
<tr>
<td>.</td>
<td>The decimal separator as defined by your locale.</td>
<td>‘12.34’ with the format #. #0 gives ‘12.34’ (if your locale defines the decimal separator as a period) or ‘12,34’ (if your locale defines the decimal separator as a comma)</td>
</tr>
<tr>
<td>[ ] %</td>
<td>Displays a percentage sign (%) after the result and multiplies the result by 100.</td>
<td>0.50 becomes 50%.</td>
</tr>
<tr>
<td>%</td>
<td>The % sign after the result, but does not multiply the result by 100.</td>
<td>0.50 becomes 0.50%</td>
</tr>
<tr>
<td>[ ]</td>
<td>A non-breaking space ( )</td>
<td>‘1234567’ with the format # #0 gives ‘1234 567’</td>
</tr>
<tr>
<td>1, 2, 3, a, b, c, $, €, ...</td>
<td>The alphanumeric character</td>
<td>‘705.15’ with the format $#. #0 gives ‘$705.15’ or with the format #,. #0 € gives ‘705,15 €’</td>
</tr>
</tbody>
</table>

**Note**

Alphanumeric characters should be delimited by single quotes, otherwise they can be interpreted as formatting characters. For example, ## will result in ‘123 4’ while ‘# #’ will result in ‘# 1234’
### Character(s)

- [Red], [Blue], [Green], [Yellow], [Gray], [White], [Dark Red], [Dark Blue], [Dark Green]

### Display(s)

- The value in the specified color.

### Example

- '150' with the format #,##0 [Red] gives '150' in red text. #,##0 [Blue] gives '150' in blue text.

### Day/Date Characters

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>(day, date)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>The number of the day in the month with no leading zeros. If the date for day is less than two characters, the date displays without a zero before it.</td>
<td>The first day of a month with the format d gives '1'</td>
</tr>
<tr>
<td>dd</td>
<td>The number of the day with leading zeros. If the date for day is less than two characters, the date displays with a zero before it.</td>
<td>The first day of a month with the format dd gives '01'</td>
</tr>
<tr>
<td>ddd</td>
<td>The name of the day abbreviated. The first letter is capitalized if the selected locale uses capitalized day names.</td>
<td>'Monday' with the format ddd gives 'Mon' in English, in French, lundi gives lun.</td>
</tr>
<tr>
<td>Dddd</td>
<td>Forced the capitalization of the day name, for any locale.</td>
<td>'Monday' with the format Dddd gives 'Mon' in English, in French, lundi gives Lun.</td>
</tr>
<tr>
<td>dddd</td>
<td>The name of the day in full. The first letter is capitalized if the selected locale uses capitalized day names.</td>
<td>'Monday' with the format dddd gives 'Monday' in English. In French, the day is lundi.</td>
</tr>
<tr>
<td>DDDD</td>
<td>The name of the day in full, in uppercase.</td>
<td>'Monday' with the format DDDD gives 'MONDAY' in English. In French, the day is LUNDI.</td>
</tr>
<tr>
<td>dddd dd</td>
<td>The day of the week followed by a space and the number of the day.</td>
<td>'Monday' with the format dddd dd gives 'Monday 01'</td>
</tr>
</tbody>
</table>

### Calendar Characters

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>(week, month, year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>The number of the month with no leading zeros. If the number for month is less than two characters, the number displays without a zero before it.</td>
<td>'January' with the format M gives '1'</td>
</tr>
<tr>
<td>MM</td>
<td>The number of the month with leading zeros. If the number for month is less than two characters, the number displays with a zero before it.</td>
<td>'January' with the format MM gives '01'</td>
</tr>
<tr>
<td>mmm</td>
<td>The name of the month abbreviated. The first letter is capitalized if the selected locale uses capitalization.</td>
<td>'January' with the format mmm gives Jan in English. In French, this is 'Jan'.</td>
</tr>
<tr>
<td>MMM</td>
<td>The name of the month abbreviated. The first letter is capitalized for all locales.</td>
<td>'January' with the format MMM gives Jan in English. In French, this is 'Jan'.</td>
</tr>
<tr>
<td>mmmm</td>
<td>The name of the month in full. The first letter is capitalized if the selected locale used capitalization.</td>
<td>'January' with the format mmmm gives January in English, janvier in French</td>
</tr>
<tr>
<td>Character(s)</td>
<td>Display(s)</td>
<td>Example</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>MMMM</td>
<td>The name of the month in full all in uppercase.</td>
<td>'January’ with the format MMMM gives JANUARY in English, JANVIER in French</td>
</tr>
<tr>
<td>ww</td>
<td>The week number of the year.</td>
<td>For the 9th of January 2015, the ww format gives ‘02’, because it is the seventh week of the year 2015.</td>
</tr>
<tr>
<td>w</td>
<td>The week number of the year without leading zero.</td>
<td>For the 9th of January 2015, the w format gives ‘2’, because it is the seventh week of the year 2015.</td>
</tr>
<tr>
<td>W</td>
<td>The week number of the month.</td>
<td>For the 9th of January 2015, the W format gives ‘2’, because it is the second week of January.</td>
</tr>
<tr>
<td>yy</td>
<td>The last two digits for year.</td>
<td>‘2003’ with the format yy gives ‘03’</td>
</tr>
<tr>
<td>yyyy</td>
<td>All four digits for year.</td>
<td>‘2003’ with the format yyyy gives ‘2003’</td>
</tr>
</tbody>
</table>

**Time of day characters**

(hours, minutes, seconds, am/pm)

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>hh:mm:ss a</td>
<td>The hour with no leading zeros and the minutes and seconds with leading zeros. The &quot;a&quot; character displays AM or PM after the time when available.</td>
<td>‘21:05:03’ with the format hh:mm:ss a gives ‘9:05:03 PM’ for English locale</td>
</tr>
<tr>
<td>H</td>
<td>The hour according to the 24-hour clock, starting at 0. No leading zero for single figure hours.</td>
<td>‘21:00’ with the format H gives ‘21’. Possible values are 0-23.</td>
</tr>
<tr>
<td>HH</td>
<td>The hour according to the 24-hour clock, starting at 0.</td>
<td>‘21:00’ with the format HH gives ‘21’. Possible values are 00-23.</td>
</tr>
<tr>
<td>k</td>
<td>The hour according to the 24-hour clock, starting at 1. No leading zero for single figure hours.</td>
<td>‘21:00’ with the format k gives ‘21’. Possible values are 1-24.</td>
</tr>
<tr>
<td>kk</td>
<td>The hour according to the 24-hour clock, starting at 01.</td>
<td>‘21:00’ with the format kk gives ‘21’. Possible values are 01-24.</td>
</tr>
<tr>
<td>hh</td>
<td>The hour according to the 12-hour clock.</td>
<td>‘21:00’ with the format hh gives ‘09’</td>
</tr>
<tr>
<td>HH:mm</td>
<td>The hour and minutes with a zero in front of a single-digit hour.</td>
<td>‘7:15 am’ with the format HH:mm gives ‘07:15’</td>
</tr>
<tr>
<td>HH:mm:ss</td>
<td>The hour, minutes, and seconds with a zero in front of a single-digit hour.</td>
<td>‘7:15 am’ with the format HH:mm:ss gives ‘07:15:00’</td>
</tr>
<tr>
<td>mm:ss</td>
<td>The minutes, and seconds with a zero in front of a single-digit hour.</td>
<td>‘07:15:03’ with the format mm:ss gives ‘15:03’</td>
</tr>
<tr>
<td>z</td>
<td>The time zone information on a date/time value as follows: GMT+/−HH:mm</td>
<td></td>
</tr>
</tbody>
</table>
4.2.24.2.1 To define a custom format

You can define custom number formats to use in cells in tables.

Procedure

1. In a Web Intelligence document in Design mode, select the Format tab, then the Numbers subtab.
2. Click Custom to display the Custom Format panel.
3. Select a format listed in the Samples pane, and then click Custom.
4. Edit the selected format by typing additional characters in one or more text boxes.
   For example, if you want to create a custom format for a number value, type the custom format you want in the Positive, Negative, and Equal to zero text boxes. If you want to create a custom format for Boolean values, type the custom format you want in the True and False boxes.
5. Click Add.
   You cannot delete or edit custom formats. To change a custom format, you need to create a new custom format and apply the new format to the selected cells. Any custom formats not applied to cells in a document are deleted automatically when you end your session.
   The custom format appears in the Custom tab of the Format Number panel.
6. Click OK to return to the document.

Related Information

Custom formats [page 345]
To apply a custom number format to a cell [page 348]

4.2.24.2.2 To apply a custom number format to a cell

You can apply an existing custom number format to data in a cell in a table.

Procedure

1. In a Web Intelligence document in Design mode, select the cells to which you want to apply a custom format.
2. Do one of the following:
   ○ In the Format tab, select the Numbers subtab. Select the custom formula from the dropdown list.
   ○ Right-click the selected cells, and select Format Number in the Format Number panel. In the Custom tab, select the custom format. Click OK to return to the document.
4.2.24.3 To format a number as a currency in a table cell

You can format the currency format in a cell in a table.

Procedure

1. In a Web Intelligence document in Design mode, select a cell.
2. In the Format or Formatting tab, select the Numbers subtab.
3. From the Currency icon dropdown list, select the currency symbol.
4. To select a number format, do one of the following:
   - Select a format from the Default dropdown list.
   - If you require a format that is not in the dropdown list, click Custom. Refer to the To define a custom format topic for more information.

Related Information

To define a custom format [page 348]

4.2.24.4 To apply a percentage format to a cell number

In a table in a Web Intelligence document, you can apply the percentage format in more than one way.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select one or more cells.
3. Do one of the following:
   - In the Format or Formatting tab:
     1. Select the Numbers subtab.
     2. Click the Percentage icon.
     3. From the Default dropdown list, select 123,456.70%.
   - Right-click the selection and choose one of the following:
     - If you are in the Web Intelligence Rich Client or Web Intelligence Applet interface, select Format Number. In the Format Number dialog box, select the Percentage tab, then 123,456.70%. Click OK.
     - If you are in the Web Intelligence HTML interface, select Format Cell. In the Format Cell dialog box, select the Number tab, then 123,456.70%. Click OK.
4.2.25 Using sections to group data

Sections allow you to split report information into smaller, more comprehensible parts.

Example

Grouping quarterly revenue results into sections on a report

You are the regional sales manager in Texas. You receive a report showing 2003 annual revenue for stores in your region, broken down by cities and quarters.

<table>
<thead>
<tr>
<th>City</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>Q1</td>
<td>314430</td>
</tr>
<tr>
<td>Austin</td>
<td>Q2</td>
<td>273608</td>
</tr>
<tr>
<td>Austin</td>
<td>Q3</td>
<td>294798</td>
</tr>
<tr>
<td>Austin</td>
<td>Q4</td>
<td>252644</td>
</tr>
<tr>
<td>Dallas</td>
<td>Q1</td>
<td>215874</td>
</tr>
<tr>
<td>Dallas</td>
<td>Q2</td>
<td>194689</td>
</tr>
<tr>
<td>Dallas</td>
<td>Q3</td>
<td>204066</td>
</tr>
<tr>
<td>Dallas</td>
<td>Q4</td>
<td>188791</td>
</tr>
<tr>
<td>Houston</td>
<td>Q1</td>
<td>572177</td>
</tr>
<tr>
<td>Houston</td>
<td>Q2</td>
<td>619924</td>
</tr>
<tr>
<td>Houston</td>
<td>Q3</td>
<td>533765</td>
</tr>
<tr>
<td>Houston</td>
<td>Q4</td>
<td>520332</td>
</tr>
</tbody>
</table>

To make a comparison of the results for each city per quarter, you set [Quarter] as a section value. The report is broken up into four separate sections by quarter.

Q1

<table>
<thead>
<tr>
<th>City</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>314430</td>
</tr>
<tr>
<td>Dallas</td>
<td>215874</td>
</tr>
<tr>
<td>Houston</td>
<td>572177</td>
</tr>
</tbody>
</table>

Q2
You can create a single section or include multiple sections with subsections in a report. You can also remove and reposition sections within a report.

You can create a section from one of two sources:
- on a dimension already displayed on a table or chart: right-click the dimension and select Set as section.
- on a dimension included in the document but not displayed on a table or chart

You cannot create a section with a measure object.

**Related Information**

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
4.2.25.1 To create a section from a column

You can create a section based on a table column in a Web Intelligence report in Design mode.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click the column you want to define as a section and click Set as Section.

4.2.25.2 To create a section from a dimension

You can create a section in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, select the Report Elements tab.
2. In the Section subtab, click Insert Section.
3. Click in the report at the position where you want to insert the section.
4. Select the dimension in the dialog box that appears and click OK to insert the section.

4.2.25.3 Using report filters in report sections

You can apply report filters to sections using values in the section header or that appear within the section.

Filters on a section header

If you have a report with section [Country], you can use in the filter syntax [Country] = "US" to filter out all sections on countries that are not "US".

Filters on section data

If you have a report with section [Region] and you use in the filter syntax [Product]="Drinks" in the section, the report contains all sections that contain the product "Drinks".
The filter is based on the data in the section, but applied indirectly to the data in the section header.

Related Information

To create, edit, and delete standard report filters [page 569]

4.2.25.4 Sections based on a hierarchy

Create a section on a hierarchy, to make each member of the hierarchy a section header. You can expand sections in the same way as you expand members in a column in a table. Depending on how the purpose of your report, you can maintain the default hierarchy order of parents first or reverse it to display children first.

You have a report that displays the following data:

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>Male</td>
<td>235,243</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>254,342</td>
</tr>
<tr>
<td>Australia</td>
<td>Male</td>
<td>34,342</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>45,464</td>
</tr>
<tr>
<td>Canada</td>
<td>Male</td>
<td>12,232</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>14,242</td>
</tr>
<tr>
<td>France</td>
<td>Male</td>
<td>17,343</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>18,001</td>
</tr>
</tbody>
</table>

If you create a section on [Customer Geography], the report initially appears as follows:

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>235,243</td>
</tr>
<tr>
<td>Female</td>
<td>254,342</td>
</tr>
</tbody>
</table>

If you expand the section header, the report appears as follows:

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>235,243</td>
</tr>
<tr>
<td>Gender</td>
<td>Internet Sales Amount</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Female</td>
<td>254,342</td>
</tr>
</tbody>
</table>

Australia

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>34,342</td>
</tr>
<tr>
<td>Female</td>
<td>45,464</td>
</tr>
</tbody>
</table>

Canada

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12,232</td>
</tr>
<tr>
<td>Female</td>
<td>14,242</td>
</tr>
</tbody>
</table>

France

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>17,343</td>
</tr>
<tr>
<td>Female</td>
<td>18,001</td>
</tr>
</tbody>
</table>

### 4.2.25.5  To remove a section cell or section

You can remove a section or section cell in a Web Intelligence report in Design mode.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. Right-click a section cell and do one of the following:
   - Select ![Delete Cell Only](#) to delete the section cell.
   - Select ![Delete Section and Cell](#) to delete the section and the cell.
4.2.25.6 To set the page layout of a section

You can set the page layout of a section in a Web Intelligence report in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click a section and select Format Section from the menu.
2. In the Layout tab, select any of the following:
   - Select Start on a new page to start each section on a new page.
   - Select Avoid page breaks to avoid page breaks in the section.
   - Select Repeat on every page to repeat the section header on every page.
3. Click OK to return to the document.

4.2.25.7 Hiding sections

In the Format Section dialog box, four different options are available to hide sections.

Depending on the option you select, you can either hide a whole section and all its instances, or only hide specific instances. The table below details the behavior of each option available.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hide section when the following are empty</td>
<td>Hides the instance of a section if the specified element is empty.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>This doesn’t mean that the instance will be hidden if the specified element no longer exists.</td>
</tr>
<tr>
<td></td>
<td>A table for instance has to be empty but still visible in a section for the condition to be true.</td>
</tr>
<tr>
<td>Hide always</td>
<td>Always hide a section and all its instances.</td>
</tr>
<tr>
<td>Hide when empty</td>
<td>Hides the instance of a section if it no longer contains any element.</td>
</tr>
</tbody>
</table>
### Option Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Hide when the following formula is true</em></td>
<td>Hides the section and all its instances depending on the boolean result of the formula being evaluated.</td>
</tr>
</tbody>
</table>

**Note**

This option doesn’t specifically hide instances of the section where the formula is true. The formula isn’t evaluated in each instance of the section, but at the section level.

---

The best way to hide an instance of a section is to use the *Hide when the following formula is true* option on each element of an instance, and use the *Hide when empty* option on the section itself.

---

### 4.2.25.8 To hide sections

You can hide sections in a Web Intelligence report in *Design* mode.

**Procedure**

1. In a Web Intelligence document in *Design* mode, select a section.
2. In the *Report Elements* tab, in the *Behaviors* subtab, click the arrow next to the *Hide* button and select one of the following:
   - To hide the section, select *Hide*.
   - To hide the section when it is empty, select *Hide When Empty*.
   - To hide the section when a specified formula is true, select *Hide When*, then select *Hide when the following formula is true*, and type a formula in the box. The formula must return a Boolean value (True or False).

**Related Information**

To redisplay hidden tables, cells or sections [page 336]
4.2.25.9 To define colors and images in a section

You can define section colors and images in a Web Intelligence report in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the section and select Format Section.
2. In the Appearance tab, define the colors and images.
3. Click OK to return to the document.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]

4.2.26 Using breaks

A break is a division within a block in which data is grouped according to a selected dimension, detail, or measure into self-contained sections.

Break sections are represented as smaller tables within the same block of data.

You use breaks to display all the data for each unique value of an object in separate parts.

Breaks offer the following advantages:

- You can more efficiently organize how your data is represented.
- You can display subtotals.
- You can display sub-aggregations.

When you insert a break, the break footer is automatically filled with the appropriate amounts. The default measure aggregation is used. If the measure has no aggregation, then it is not added in the footer.

4.2.26.1 Breaks compared to sections

Breaks and sections separate data differently in Web Intelligence.

A section distributes the data into multiple free-standing cells called section headers. Each section header contains one value for a dimension, with a block of data that corresponds to the dimension value.

A break divides the data up within one block. One column contains the values for a dimension, detail, or measure, which are repeated for each other row of values in the block.
4.2.26.2 Value based breaks

You can create breaks based on values that you have purposely selected.

When creating value based breaks, the headers and footers are only displayed for the values that you have selected.

Note
You cannot use value based breaks with measures or multiple objects.

What if the selected value is filtered out of the table?
The value isn’t displayed but still available in the list of values.

What if the selected value no longer exists in the query?
You can still use it in the break, but the value and the break associated to it are no longer displayed in the table.

Related Information

To insert a value based break [page 360]

4.2.26.3 Same level breaks

You can create breaks at the same level in the table using multiple objects.

When creating same level breaks, the objects in the break share the same footer, and are displayed on the same row in the table.

Note
You cannot use objects in same level breaks if you already use them in other breaks.

What if the break objects aren’t sorted?
The footer is displayed for each deepest object value.

What if the order of objects changes?
The break happens at the new deepest object level.

What if an object is added or removed?
The break happens at the new deepest object level.
4.2.26.4 Applying breaks to hierarchies

When you apply a break to a hierarchy, the break occurs on all hierarchy members at all levels.

Example

A break applied to a hierarchy

You have a report displaying the following data:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Gender</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>F</td>
<td>131,587</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>138,215</td>
</tr>
<tr>
<td>USA</td>
<td>F</td>
<td>131,587</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>138,215</td>
</tr>
<tr>
<td>CA</td>
<td>F</td>
<td>36,759</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>37,989</td>
</tr>
</tbody>
</table>

If you apply a break to the [Customer] hierarchy, the display appears as follows. The break is applied on each member of [Customer].

<table>
<thead>
<tr>
<th>Customer</th>
<th>Gender</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>F</td>
<td>131,587</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>138,215</td>
</tr>
<tr>
<td>USA</td>
<td>F</td>
<td>131,587</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>138,215</td>
</tr>
<tr>
<td>CA</td>
<td>F</td>
<td>36,759</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>37,989</td>
</tr>
</tbody>
</table>
4.2.26.5 Default sort order in breaks

When you apply a break in a report, a default sort order is applied.

When you insert a break on an object, the values for the object are automatically sorted in ascending order as follows:

- If the values are numeric, the lowest value appears in the first row of the table, the highest in the last row.
- If the values are alphabetical characters, then the values are sorted in alphabetical order from A to Z.

You can set multiple breaks across several dimensions details or measures and set a sort priority on each break.

4.2.26.6 To insert a break

You can insert a break in any table in a Web Intelligence report, except for in form tables.

Procedure

1. In a Web Intelligence document in Design mode, in a table, select a column on which you want to apply a break.
2. In the Analysis tab, in the Display subtab, select Add Break from the Break dropdown list.
   The table is divided into as many mini tables as there are unique values in the column. Each mini table has a footer.

Related Information

To manage breaks [page 362]

4.2.26.7 To insert a value based break

Context

Create value based breaks if you want your table to break on values that are the most relevant to you.
Procedure

1. Right-click the column to which you want to apply a break.
2. Click **Break** > **Add Break**.
3. In the **Manage Breaks** dialog box, check **Value based break** and click **Values**.
4. Select the value(s) to which you want the break to apply and click **OK**.
5. Back in the **Manage Breaks** dialog box, click **OK**.

Results

The break footer and header are displayed only for the value(s) you have selected.

**4.2.26.8 To insert a same level break**

Context

Create same level breaks to have multiple objects break at the same level in a table.

Procedure

1. Right-click one of the column to which you want to apply a break.
2. Click **Break** > **Manage Break**.
3. In the **Manage Breaks** dialog box, click **Add**.
4. Select two or more objects and click **OK**

   - **Note**
   
   You can’t select objects that are already used in other breaks.

5. Back in the **Manage Breaks** dialog box, click **OK**.

Results

The header and footer are displayed only for the deepest object level, that is the object that you have selected last in the **Manage Breaks** dialog box.
4.2.26.9 To remove a break

You can remove the break in a table in the Manage Breaks dialog box.

Procedure

1. In a Web Intelligence document in Design mode, select the table column on which the break is defined.
2. In the Analysis tab, in the Display subtab, select Remove Break from the Break dropdown list.
   
   **i Note**
   
   If the column does not have a break defined, the Remove Break menu item is not available.

3. To remove all breaks, select any column in the table and select Remove All Breaks from the Break dropdown list. The Remove All Breaks menu item is not available if the table has no breaks defined.

4.2.26.10 To manage breaks

You can manage table column breaks in the Manage Breaks dialog box.

Procedure

1. In a Web Intelligence document in Design mode, select any column in a table.
2. In the Analysis tab, in the Display subtab, select Manage Breaks from the Break dropdown list. The Manage Breaks dialog box shows the breaks defined in the table. If the table is a crosstab, the dialog box shows the breaks on both the horizontal and vertical axes. Each break is represented by the dimension on which it is defined. The order in which the dimensions appear indicates the order in which the breaks are applied.
3. To change the priority of a break, select the dimension and click the Up or Down arrow to move the dimension in the break priority.
4. To add a break, click Add and select the dimension on which you want to apply the break.
5. To remove a break, select the dimension and click Remove.
6. To set the properties of a break, select the dimension and select the properties in the opposite section in the dialog box. See the link at the bottom of this topic for more information on the break properties you can set.
7. Click OK.
4.2.26.11 Break properties

A table break has several customizable properties.

You can set the following properties of a break:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break header</td>
<td>Displays a header for each part of the table, crosstab, or form when you insert a break.</td>
</tr>
<tr>
<td>Break footer</td>
<td>This displays a footer for each break in a section, including a footer after the last row for a table or column for a crosstab when you insert a break. When you apply a calculation to the data, the result is shown in the footer.</td>
</tr>
<tr>
<td>Apply Sort</td>
<td>Applies the default sort order to the values in the break.</td>
</tr>
<tr>
<td>Duplicate values: Display all</td>
<td>Displays all values in the break, even when they are duplicated.</td>
</tr>
<tr>
<td>Duplicate values: Display first</td>
<td>Displays the first value only when values are duplicated.</td>
</tr>
<tr>
<td>Duplicate values: Merge</td>
<td>Merges cells containing duplicate values and displays a single value over the merged cells.</td>
</tr>
<tr>
<td>Duplicate values: Repeat first on new page</td>
<td>Displays the first value in a group of duplicate values at the beginning of the break and on each new page.</td>
</tr>
<tr>
<td>Start on a new page</td>
<td>Displays each part of the table or form created by a break on a new page.</td>
</tr>
<tr>
<td>Avoid page breaks in block</td>
<td>Where possible, keeps each break section on the same page. This option is not taken into account when a block is larger than one page.</td>
</tr>
<tr>
<td>Repeat header on every page</td>
<td>Repeats the header at the top of the table on every new page when a table goes over onto a new page.</td>
</tr>
<tr>
<td>Repeat footer on every page</td>
<td>Repeats the footer at the bottom of the table on every new page when a table goes over onto a new page.</td>
</tr>
</tbody>
</table>

4.2.27 Using sorts to organize data in reports

You can apply sorts to the values displayed in tables, sections and charts to organize the order in which values are displayed in a report.

By default, the sort starts from the first column.

- By default, each individual dimension is sorted ascending, in alphabetic order, when displayed in the report. If you do not set the order explicitly, then the priority is given to the dimensions going from left to right.
A dimension or hierarchy from an OLAP source (.unx) is ordered according to the underlying source order, if this source provides an order.

- When the Preferred viewing locale is different from and incompatible with the Document locale (different character sets), sorting in document tables may not work. In order to sort in documents that use a different locale to your Preferred viewing locale, contact your administrator and request a change to the registry key for Windows, or to the boconfig.cfg file for UNIX in the following way:
  - In Windows, on the server machines and client machines, change or create the following registry key declaration:
    ```
    HKEY_LOCAL_MACHINE\SOFTWARE\SAP BusinessObjects\Suite XI 4.0\...
    \WebIntelligence\Calculator : SortLocale = PVL
    ```
    then close and reopen any Web Intelligence documents that are open.
  - In UNIX, on the server machines, open the boconfig.cfg file (in $installdir/setup/boconfig.cfg), and add the registry key declaration:
    ```
    HKEY_LOCAL_MACHINE\SOFTWARE\SAP BusinessObjects\Suite XI 4.0\...
    \WebIntelligence\Calculator : SortLocale = PVL
    ```
    then close and reopen any Web Intelligence documents that are open.

When you perform sorts, the following sort orders are available:

<table>
<thead>
<tr>
<th>Sort order</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Depending on the type of data in the column or row, the results are sorted as follows:</td>
</tr>
<tr>
<td></td>
<td>- ascending numeric order for numeric data</td>
</tr>
<tr>
<td></td>
<td>- ascending chronological order for date</td>
</tr>
<tr>
<td></td>
<td>- alphabetical order for alphanumeric data</td>
</tr>
<tr>
<td>Ascending</td>
<td>When selected, results are arranged in ascending order, starting with the smallest value at the top of the column. For example: 100, 200, 300 or California, Colorado, Florida.</td>
</tr>
<tr>
<td>Descending</td>
<td>When selected, results are arranged in descending order, starting with the highest value at the top of the column. For example: 300, 200, 100 or Florida, Colorado, California.</td>
</tr>
<tr>
<td>Custom Order</td>
<td>You define your own sort order. Custom Order is available on dimensions and attributes.</td>
</tr>
</tbody>
</table>

**iNote**

- Custom Order is not available on hierarchies, levels, and measures. It is not possible to manually add values to the Custom Order list if the dimension detail contains an internal key (in data sources like OLAP and BEx).
- By default, the maximum number of values for dimensions are set to different values on the client and server. To avoid conflicts, we recommend that you set both to the same value.
- You cannot manually add values for a Custom Order if the dimension has an internal key.

Server default value: 100 items (MaximumCustomSortSize parameter in the WebIntelligenceProcessingServer properties in the Central Management Console)

Client default value: 1000 items (WebiParamCustomSortMaxSize parameter in WebIContainer_ClientDescriptor.xml)
4.2.27.1 Sorting hierarchical data

Sorts apply on hierarchical data within each parent item in the hierarchy. Sorts do not break links between parent and child items.

The sort order impacts the data display independently of the hierarchy order. Optimize the way you present the data by defining the appropriate sort and hierarchy orders in the same data block and managing them separately.

Example
Sorting hierarchical data
The following table contains the [Product] hierarchy in an unsorted state:

<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baking Goods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beverages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft Drinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breads</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After a descending sort is applied, the hierarchy appears as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beverages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft Drinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baking Goods</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The sort places grocery types in descending order and beverages in descending order in their parent item. The sorted beverages retain their hierarchical link with their parent item.
4.2.27.2 To insert a sort

You can insert a table sort in a Web Intelligence document in Design mode.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select the column you want to sort.
3. In the Analysis tab, in the Display subtab, select Ascending or Descending from the Sort list to sort the column in ascending or descending order.

4.2.27.3 To remove a sort

You can remove a column sort in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, select a sorted column.
2. In the Analysis tab, in the Display subtab, select None from the Sort list.
   - To remove all sorts from the table, select a column and select Remove All Sorts.
   - Removing all sorts has no impact on the hierarchy order defined for the same data.

4.2.27.4 To manage sorts

The Manage Sorts dialog box displays the sorts applied to the table or chart.

Context

In a cross table, the sorts on both the horizontal and vertical axes are displayed. Each sort is represented by the name of the sorted dimension, and an arrow indicates the sort direction (ascending or descending). The order in which the sorted dimensions appear indicates the order in which the sorts are applied.
**Procedure**

1. In a Web Intelligence document in Design mode, select the table or chart in which you want to manage sorts.
2. In the Analysis tab, in the Display subtab, select Advanced from the Sort dropdown list.
3. In the Manage Sorts dialog box, do any of the following:
   - To change the priority of a sort, select the dimension and click the Up or Down arrow to move the dimension in the sort priority.
     
     **Note**
     
     You cannot change the priority of a sort if a sorted break is defined on the dimension.
   - To change the direction of a sort, double-click the dimension, or select it and select Ascending or Descending from the Order list.
   - To add a sort, click Add and select the dimension you want to sort from the list.
   - To remove a sort, select the dimension and click Remove.
   - To customize a sort by choosing your own sort order or adding values to the list of values to sort, click Values beneath Custom Order and define your custom sort.

     **Note**

     - The Values button is disabled if the custom sort is not applicable.
     - The custom order is applied to the dimension in the entire document and not just in the selected block.

     To reset a custom sort order to the standard sort order, select the dimension and click Reset.

     **Note**

     - The Reset button is disabled if the sort on the selected dimension is not customized.
     - Refer to the table in the topic Sorting the results displayed on reports for the restrictions of the Custom Order option.

4. Click OK to save your changes and close the Manage Sorts dialog box.

**Related Information**

Using sorts to organize data in reports [page 363]

**4.3 Working with charts in reports**

Charts allows you to visualize the data.

You can include one or multiple charts in a Web Intelligence report.
When you export a document that contains a chart to Excel format, the chart is converted into an image.

Related Information

To add a chart to a report [page 383]

4.3.1 Chart types

Web Intelligence offers many types of charts that you can use to display your data.

3D line, 3D area, and 3D surface charts, available in XI 3.1, are not available in BI 4.x. When Web Intelligence documents are migrated to BI 4.x, any of these charts in the XI 3.1 version of the document are transformed into 3D bar charts.

4.3.1.1 Choosing the correct Web Intelligence chart for your data

Web Intelligence offers various charts for viewing and analyzing data.

<table>
<thead>
<tr>
<th>Analysis type</th>
<th>Description</th>
<th>Available charts</th>
</tr>
</thead>
</table>
| Comparison    | Use to view the differences between values. It provides the simple comparison of categorical divisions of measures. It is the default analysis type. For example, you could use a bar chart to compare the differences in your sales revenue between different countries. | If you have only a few categories:  
- 3D column chart  
- Bar chart, vertical or horizontal  
- Column chart  
- Heat map  
- Pie with variable slice depth chart  
- Tag cloud chart  
For statistical analysis:  
- Box plot chart |

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Reporting data
<table>
<thead>
<tr>
<th>Analysis type</th>
<th>Description</th>
<th>Available charts</th>
</tr>
</thead>
</table>
| Distribution | Use one of these charts to show a summarized group of unorganized data. You can also use these charts for qualitative and quantitative data. | For single variables:  
  - 3D column chart  
  - Area chart  
  - Bar chart  
  - Column chart  
  - Line chart  
If you have more than one variable:  
  - Polar scatter chart  
  - Scatter chart |
| Correlation  | Use for viewing the relationship between values. It is useful for comparing multiple measure values.  
For example, you can view the correlation of two measures, and understand the impact of the first measure on the second measure. | For two variables:  
  - Polar bubble chart  
  - Polar scatter chart  
  - Scatter plot chart  
For three variables:  
  - Bubble chart (The size of bubbles within the chart is determined by a third measure) |
| Trend        | Use to show a trend in the data values. This analysis type is particularly useful for dimensions that are time based such as Year. It is useful for seeing progression of your data and possible patterns.  
For example, you can use a line chart to view sales revenue trends of a product throughout a range of years. | If you have several periods to compare over time:  
  - Line chart  
  - Radar chart  
If you only have a few periods to compare over time:  
  - 3D column chart  
  - Column chart  
  - Column or line chart with dual axes  
  - Combined column and line chart  
  - Combined column and line chart with dual axes  
  - Waterfall chart |
| Composite    | Use these charts to show cumulative differences in data over time or to show the effect of a measure on values.  
For example, use a pie chart to see who had the highest sales as part of a total sales value directly:  
Total sales = $200. Paul had 10% ($20), David had 65% ($130), and Susan had 25% ($50). | For data changing over time:  
  - Area chart  
  - 100% stacked bar or column chart  
  - Stacked bar or column chart  
For static data:  
  - Pie with variable slice depth chart  
  - Pie or donut chart  
  - Tree map  
  - Waterfall chart |
### Analysis type

<table>
<thead>
<tr>
<th>Description</th>
<th>Available charts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geography</strong></td>
<td><strong>Geo analysis</strong></td>
</tr>
</tbody>
</table>

**Use** to show a map of the country object on a mobile device. The data for dimensions sorted by country are shown on the map. This is useful to see the geographical spread of data.

**Note**
The Geo map is actually a data table in reports that is configured for use only on mobile devices. For more information on this chart, refer to the *Mobile BI Report Designer’s Guide*.

### Related Information

- To add a chart to a report [page 383]
- To assign data to a chart [page 385]
- To change the chart type by using Turn Into [page 432]

### 4.3.1.2 Bar charts

Bar charts display data in rectangular form horizontally.

Bar charts are useful if you want to compare similar groups of data; for example, revenue from one time period to another.

**Types of bar charts**

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bar Chart</strong></td>
<td>A chart constructed of horizontally-oriented rectangles. The lengths of rectangles are proportional to the values associated to different category items.</td>
</tr>
<tr>
<td><strong>Stacked Bar Chart</strong></td>
<td>A chart constructed of horizontally-oriented stacked colored rectangles. The heights of the rectangles are proportional to the values associated to different category items. Rectangles are colored according to legend entries.</td>
</tr>
</tbody>
</table>
### 4.3.1.3 Box plot charts

A Box Plot Chart (also called a stock chart) displays a five-number summary based on the distribution of a dataset: the maximum, the minimum, the first quartile, the third quartile, and the median.

A Box Plot Chart can also show abnormal values called outliers.

### 4.3.1.4 Column charts

Column charts display a series as a set of vertical bars that are grouped by category.

Column charts are useful for showing data changes over a period of time or for illustrating comparisons among items.

Web Intelligence offers the following column charts.

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Column Chart</strong></td>
<td>A chart constructed of vertically-oriented rectangles. The heights of the rectangles are proportional to the values associated to different category items.</td>
</tr>
<tr>
<td><strong>Column Chart with Dual Value Axes</strong></td>
<td>A chart with two value axes. It allows a part of a data series to be plotted against one axis and a part of the data series to be plotted against the other axis.</td>
</tr>
<tr>
<td>Chart type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Combined Column and Line Chart</strong></td>
<td>A chart displaying a combination of a column chart and a line chart. The chart types share the same value axis.</td>
</tr>
<tr>
<td><strong>Combined Column and Line Chart with Dual Value Axes</strong></td>
<td>A chart displaying a combination of a column chart and a line chart. The chart types each have their own value axis.</td>
</tr>
<tr>
<td><strong>Stacked Column Chart</strong></td>
<td>A chart constructed of vertically-oriented stacked colored rectangles. The heights of rectangles are proportional to the values associated to different category items. Rectangles are colored according to legend entries.</td>
</tr>
<tr>
<td><strong>100% Stacked Column</strong></td>
<td>A chart with data displayed as parts of a whole (as percentages) with a whole being a column and a series being a subdivision of the column. If there is only one series in your chart, all the column bars will fit to 100% of the chart area.</td>
</tr>
<tr>
<td><strong>3D Column Chart</strong></td>
<td>A chart similar to a column chart with an added 3D dimension.</td>
</tr>
</tbody>
</table>
4.3.1.5 Funnel and Pyramid charts

Funnel charts display progressive decrease of data as it goes from one stage of a process to another, or hierarchical structure.

<table>
<thead>
<tr>
<th>Chart Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| Funnel     | ![Funnel Chart](image)  
It is mostly used in sales reporting to present the different stages of a sale process, but also to identify potential areas of improvement for that sales process. Each section represents a volume of transactions for a specific stage of the process. The height of each section is proportional to the value it represents. |
| Pyramid    | ![Pyramid Chart](image)  
Pyramids are reversed funnels with no neck. You can use pyramids when you need your data to reflect a specific hierarchy. The height of each section is visually representative of a quantity. Sections are arranged from bottom to top, or top to bottom, according to the related topics they depict. |

4.3.1.6 Gauge charts

Gauges are charts that indicate the location of data points across a particular range.

You can use gauge charts as value indicators in reports to display key performance indicators, progress indicators or quantity indicators.
<table>
<thead>
<tr>
<th>Chart Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angular Gauge</td>
<td>An angular gauge indicates where a specific data point, the actual value, is located on a radial scale. It features a primary measure that is compared to other measures representing a mandatory maximum value and optional target and minimum values. The colored area represents the actual value, while the gray area represents the gap between the actual value and the maximum value. The optional black line, when present, corresponds to the target value.</td>
</tr>
<tr>
<td>Linear Gauge</td>
<td>A linear gauge indicates where a specific data point, the actual value, is located on a linear scale. It features a primary measure that is compared to other measures representing a mandatory maximum value and optional target and minimum values. The colored area represents the actual value, while the gray area represents the gap between the actual value and the maximum value. The optional black line, when present, corresponds to the target value.</td>
</tr>
<tr>
<td>Speedometer</td>
<td>A speedometer is a gauge that uses a needle to represent data on a radial scale between a lower and an upper limit.</td>
</tr>
</tbody>
</table>

### 4.3.1.7 Geomap charts

Geomap charts display data on a geographic map.

Geomap charts are useful if you want to compare your data geographically. They use a geographical database embedded in Web Intelligence and a matching algorithm to automatically match values of dimensions, merged
objects or a dimension variables with a location. When you match values with specific locations, you geo-qualify the values and their parent object so they can be rendered on a map. The geo-qualification can be done using either a location’s name, or its latitude and longitude coordinates.

**Note**
The database contains location names in multiple languages, called exonyms. When you geo-qualify an object, Web Intelligence selects the exonym according to your preferred viewing locale (PVL). If you decide later on to modify your PVL, you will need to geo-qualify the object again so that the new PVL is taken into account.

<table>
<thead>
<tr>
<th>Chart Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choropleth</td>
<td>Choropleth charts display values that are represented by colors on a geographic map. The colors of the geographic zones are determined by a measure value.</td>
</tr>
<tr>
<td>Geo Bubble</td>
<td>Geo Bubble charts display values that are represented by bubbles on a geographic map. The size of the bubbles on each geographic zone is determined by a measure value.</td>
</tr>
<tr>
<td>Geo Pie</td>
<td>Geo Pie charts display values that are represented by pies on a geographic map. The size of the pies on each geographic zone is determined by a measure value.</td>
</tr>
</tbody>
</table>

Once you have geo-qualified an object, an icon appears next to it. Click the + button to see the geographical details of the location it has been matched with, such as its name, its latitude and its longitude.

**Available settings**

The table below lists the settings available according to each type of Geomap chart.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Available for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display invisible area as point</td>
<td>Display choropleth areas as points when they are too small. This is typically the case for City level areas</td>
<td>Choropleth</td>
</tr>
<tr>
<td>Symbol Size</td>
<td>Sets the choropleth symbol size when choropleth is represented as colored points</td>
<td>Choropleth</td>
</tr>
<tr>
<td>Draws unrelated geographic boundaries as background</td>
<td>Draws the country borders as background</td>
<td>All Geomaps</td>
</tr>
<tr>
<td>Geographic context color</td>
<td>Sets the color of the background geographic context</td>
<td>All Geomaps</td>
</tr>
<tr>
<td>Geographic context of the zones with data</td>
<td>Draws the borders of the areas with data. Possible values are: none, neighbors (that is, areas at the same level) or parents (that is, areas at the upper level)</td>
<td>Choropleth</td>
</tr>
<tr>
<td>Precision</td>
<td>Drawing precision of the borders (0 - highest to 10 - lowest)</td>
<td>All Geomaps</td>
</tr>
<tr>
<td>The color of the sea in the geographic map</td>
<td>Sets the color of the sea</td>
<td>All Geomaps</td>
</tr>
<tr>
<td>Shapes with NULL or empty values</td>
<td>Sets the color of areas with NULL or empty values</td>
<td>Choropleth</td>
</tr>
<tr>
<td>Shapes with values out of range</td>
<td>Sets the color of out-of-range areas</td>
<td>Choropleth</td>
</tr>
<tr>
<td>Bubble scale</td>
<td>Sets the ratio between the smallest and the largest bubbles and pies (2 to 10)</td>
<td>Geo Bubble, Geo Pie</td>
</tr>
<tr>
<td>Bubble scaling mode</td>
<td>Allows you to choose between a proportional and a perceptual bubbles and pies scaling mode</td>
<td>Geo Bubble, Geo Pie</td>
</tr>
<tr>
<td>Edge color</td>
<td>Sets the color of the areas borders</td>
<td>All Geomaps</td>
</tr>
<tr>
<td>Pie title</td>
<td>Allows you to display the Geopie titles</td>
<td>Geo Pie</td>
</tr>
<tr>
<td>Use Manual Range</td>
<td>Allows you to define the latitude / longitude range of the map</td>
<td>All Geomaps</td>
</tr>
</tbody>
</table>

**Related Information**

Geo-qualifying an object for a geomap chart [page 386]
To match values of an object with a location [page 387]
To manually match values of an object with a location [page 388]
To modify the location of a value [page 391]
To reset the location of a value [page 391]
4.3.1.8 Line charts

Line charts connect specific data values with lines, either horizontally or vertically. Line charts are useful if you want to show trends or changes in data over time.

Types of line charts

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Chart</td>
<td>An XY chart that displays lines connecting plots. Value axis plot positions are expressed by analysis category items. The secondary value axis plot positions represent the associated values.</td>
</tr>
<tr>
<td>Line Chart with Dual Axes</td>
<td>An XY chart with two axes displaying lines connecting plots. Category axis plot positions signify analysis category items. The value axis plot positions, on both axes, represent the associated values.</td>
</tr>
<tr>
<td>Area Chart</td>
<td>An area chart is an XY chart that displays a surface made up of a collection of plots.</td>
</tr>
</tbody>
</table>
4.3.1.9 Map charts

Web Intelligence offers two types of Map chart.

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Map</td>
<td>Charts that display values within nested rectangles that can be colored. The levels of nesting correspond to the level of hierarchical breakdown. The size of the rectangles and their color both express a set of values.</td>
</tr>
<tr>
<td>Heat Map</td>
<td>Charts that display values that are represented by colors in a map using a category axis and optionally a second category axis. The colors of the rectangles are determined by a measure value.</td>
</tr>
</tbody>
</table>

4.3.1.10 Pie charts

Pie charts display data as segments of a whole.

Pie charts are useful if you want to show how each part of your report data contributes to the total.

You can only include one measure object in a simple pie chart or two in a pie chart with depth. If you have several measures in your report, you should choose another chart type.

Data labels on pie charts can be wrapped for a better layout. In the Data Values pane of the Format Chart tab, the Text Policy option Wrap can be used.
Types of pie charts available

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pie Chart</td>
<td>A circular chart made up of sectors. The area of the circle represents a whole, and the sectors of the circle represent the parts of a whole. Additionally, a Donut Chart can be displayed from a pie chart. It is similar to a pie chart, but with an empty center; it is ring shaped.</td>
</tr>
<tr>
<td>Pie Chart with Variable Slice Depth</td>
<td>A circular chart made up of sectors. The area of the circle represents a whole, and the sectors of the circle represent the parts of a whole. The sectors may have some depth expressing a third value.</td>
</tr>
</tbody>
</table>

4.3.1.11 Point charts

The Point chart category includes scatter, polar and bubble charts.

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scatter Plot Chart</td>
<td>An XY chart displaying plots. Plots are positioned with coordinates given by a pair of values. Each plot may have colored symbols representing the analysis category item associated with the values. Scatter Charts are similar to line graphs, except that the data points are plotted without a line connecting them. Scatter Charts are useful if you want to make a comparison between specific data points.</td>
</tr>
<tr>
<td>Bubble Chart</td>
<td>A two-dimensional chart of points representing a collection of data. Extra variables are represented by the size of the points.</td>
</tr>
<tr>
<td>Chart type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Polar Scatter Plot</td>
<td>An XY chart displaying plots. Plots are positioned with coordinates given by a pair of values. Each plot may be sized according to extra values. A chart with one radial axis and one angular axis, where each data point is represented with a symbol. Similar to a Bubble Chart, but without the sizing of points.</td>
</tr>
<tr>
<td>Polar Bubble Chart</td>
<td>An XY chart displaying plots. Plots are positioned with coordinates given by a pair of values. Each plot may be sized according to extra values. A two-dimensional chart with one radial axis and one angular axis of points representing a collection of data. Extra variables are represented by the size of the points.</td>
</tr>
</tbody>
</table>

4.3.12 Radar charts

The Radar Chart (also known as a Spider chart) displays several axes starting from a unique origin and with a common scale.

Each axis represents an analysis category item. Plots are directly placed on an axis according to the associated values. Plots can be linked by lines.

Radar charts are useful if you want to look at several different factors related to one item. For example, you could use a radar chart to display revenue data for different services within a hotel. On one axis, you could display revenue for the rooms. On another you could display revenue for the restaurant, and so on.

4.3.13 Tag cloud charts

A Tag Cloud Chart is a mono-dimensional visualization representing data as words where the word font size represents its relative weight in the dataset.
4.3.1.14 Waterfall charts

A Waterfall Chart (also known as a Bridge chart) displays vertical bars.

Each one of these bars starts at the level where the preceding bar ends, making the bars look as if they are floating. This type of chart is useful for showing how a measure increases or decreases, for representing positive or negative changes or for illustrating up and down effects.

Types of waterfall charts

- A chart generated from a flat dimension gives a simple waterfall chart.
- A chart generated from hierarchical data gives a complex waterfall chart.

Subtotal management

- Intermediate totals are only generated from hierarchical tree nodes. To generate intermediate totals from a flat dimension, you have to use grouping.
- Intermediate totals (tree nodes) are displayed as a waterfall.

Feeding restrictions

- The category axis is limited to one dimension (or hierarchy).
- The value axis is limited to one measure.

Color management

You can assign specific colors to initial values, totals, subtotals or positive/negative variations.

Related Information

To configure the value colors in a waterfall chart [page 410]
4.3.2 Custom Elements

Custom Elements are visualizations whose rendering is delegated to external rendering services outside of Web Intelligence.

In Web Intelligence documents, Custom Elements are integrated and displayed similarly to any other report elements like charts or tables. The feeding model is provided by the selected Custom Elements service, with a default number of axis. You can work with Custom Elements using the contextual menu when you right-click them. They are located at the bottom of the list of regular charts when you insert a report element.

To be able to use Custom Elements in Web Intelligence, you have to add a Custom Elements service in the CMC first. To know how to add a Custom Elements service, refer to the Business Intelligence Platform Administrator Guide.

⚠️ Caution

The Custom Elements service you deploy adds code to Web Intelligence, and can generate potential security issues such as cross-site scripting. Cross-site scripting allows attackers to run code and execute scripts on other users’ computers. A security warning asks for your explicit consent before you deploy your Custom Elements service. Your consent is mandatory to deploy your Custom Elements service.

โปรดซื้อได้ค่าใช้จ่ายเพิ่มเติมในกรณีที่คุณไม่สามารถถูกปรับแต่งได้

 nota

You cannot drill on a custom element.

Using Custom Elements with the Rich Client

If a document that contains Custom Elements is saved locally on a computer, you can view and modify its full content in Web Intelligence Rich Client only if Rich Client is connected to the BI Platform where the document was created.

Related Information

To add a custom element to a report [page 383]

4.3.3 Opening charts created with XI Web Intelligence 3.x

This version of the software supports backward compatibility with Web Intelligence XI 3.x.

Existing charts are converted automatically when you open them; however if you open an existing 3D chart, other than a 3D bar chart, it will be converted into a 3D bar chart.
4.3.4 To add a chart to a report

You can add a chart to a Web Intelligence report.

Procedure

1. Open a Web Intelligence document in Design mode.

   i Note
   If you are in Structure Only Design mode, all the charts will appear grayed out.

2. Do one of the following:
   - In the Reports Elements tab, in the Chart subtab, click a chart icon, then click in your report. Drag and drop the dimensions and measures you want into it from the Available Objects pane.
   - Right-click in the report and select Insert and do one of the following:
     - Select a column, line, pie or scatter plot chart.
     - To insert a different sort of chart from those listed above, click Insert a Report Element. The chart appears empty in light gray. This is sometimes called a ghost chart.
     - Select a table you want to turn into a chart and do one of the following:
       - Select Turn Into from the Tools subtab.
       - Right-click the table and select Turn Into, then select a chart type.

Related Information

To assign data to a chart [page 385]

4.3.5 To add a custom element to a report

You can add a custom element to a Web Intelligence report.

Context

The Custom Element subtab is available only if at least one Custom Elements service has been configured and enabled in the CMC. To know how to add a Custom Elements service, refer to Business Intelligence Platform Administrator Guide.
Procedure

1. Open a Web Intelligence document in Design mode.
2. Under the Custom Elements subtab in the toolbar, click Insert Custom Elements.
3. Place the Custom Element anywhere on the report page.
4. Select a Custom Elements service at the bottom of the list of regular charts.
5. Select a Custom Element.
6. Assign data to the Custom Element like you assign data to regular charts.
7. Click OK.

⚠️ Caution

In Web Intelligence DHTML client, you will lose the mouse focus if you move a Custom Element in the report page and the pointer hovers over a Custom Element in the process. That is because the focus is taken away by the interactions with the Custom Element content. To avoid this issue, do not hover over a Custom Element when you move the pointer. Also, if you want to move a Custom Element for instance, you can drag it by the bottom if you want to move it down, or by the top if you want to move it up.

Related Information

To assign data to a chart [page 385]

4.3.6 Assigning data to a chart

Depending on the chart, you assign objects, also called feeding, to different drivers.

Some dimensions and measures generate axis labels or values and some drive the series color.

The table explains the different elements for assigning data a chart.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Feeds</th>
<th>Object type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binding object to axes</td>
<td>Value axes</td>
<td>Measures</td>
</tr>
<tr>
<td></td>
<td>Category axes</td>
<td>Dimensions, Details or Measure Names</td>
</tr>
<tr>
<td>Defining series (*)</td>
<td>• Region Color</td>
<td>Dimensions, Details or Measure Names</td>
</tr>
<tr>
<td></td>
<td>• Region Shape (Radar &amp; Point charts)</td>
<td></td>
</tr>
</tbody>
</table>
4.3.6.1 To assign data to a chart

You can assign data to a chart via the Side Panel or from an option in the contextual menu.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Do one of the following:
   - In the Side Panel, select Available Objects. From the Available Objects pane, drag and drop the measures, dimensions, and/or details into the chart. They will automatically be dispatched to the relevant area.
   - Right-click in the chart and select Assign Data from the contextual menu. The Assign Data dialog box appears displaying the dimensions that require data. You can add, delete, reorder (move up, down, to the top, or to the bottom), or hide the values plus edit or create a formula.

   **Note**

   If you are assigning data to a Geomap chart, make sure that every object you want to use is matched with a location. An object that has not been matched with a location cannot be displayed on the Geomap chart.

Related Information

- Geo-qualifying an object for a geomap chart [page 386]
- To match values of an object with a location [page 387]
- To manually match values of an object with a location [page 388]
- To modify the location of a value [page 391]
- To reset the location of a value [page 391]
- To format a chart [page 396]
4.3.7 Geo-qualifying an object for a geomap chart

Geomaps rely on a geographical database to render your data.

Before you start using geomaps in your reports, you need to set up your data and go through the geo-qualification process so that they can be bound to the geographical database. Geo-qualifying your data means that you match each value of an object with a specific location. Geomaps then use these locations to render your data on a map. The geo-qualification can be done using either a location’s name, or its latitude and longitude coordinates.

Geo-qualifying an object using a location’s name

Web Intelligence uses an algorithm to match each value of the object with a geographic location. The search engine uses fuzzy logic to create three categories of values and automatically match them with locations:

- **Resolved**: only one location matches at 100%, and is automatically bound to the value.
- **Unresolved**: several locations match at 100% or higher than 85% but below 100%. There is no obvious match, and you have to select the most appropriate one.
- **Missing**: no location found, or locations match at lower than 85%. Search for the location you want to bind in the geographical database.

**Note**

In order to be geo-qualified by its name, every value of a dimension must belong to the same geographical level. Hierarchical dimension objects cannot be edited as geography because they contain several geographical levels (for example, Country, Region, Sub-Region and City).

You may select a different location in the dropdown list from the one selected by the automatic matching mechanism. To select a location manually, refer to To manually match values of a dimension with a location.

Geo-qualifying an object using a location’s latitude and longitude coordinates (4.2 SP3)

Latitude and longitude coordinates are two objects that must be available as dimensions, dimensions’ attributes or variables. They can be any object that can be added to a dimension as a detail, and do not necessarily have to be the same type of object. You can have latitude coordinates as a dimension and longitude coordinates as a variable for instance.

**Restriction**

Latitude and longitude objects cannot be geo-qualified objects, measures, measures’ attributes or hierarchies.
Coordinates must range from:

- -90.0° (South) to 90.0° (North) for latitude coordinates, 0° being the equator
- -180.0° (West) to 180.0° (East) for longitude coordinates, 0° being the Greenwich meridian

It is possible to edit an object that has been geo-qualified using latitude and longitude coordinates, but only by latitude and longitude, not by name.

**Related Information**

- Geomap charts [page 374]
- To match values of an object with a location [page 387]
- To manually match values of an object with a location [page 388]
- To match values of an object using latitude and longitude coordinates [page 390]

### 4.3.7.1 To match values of an object with a location

You can bind a geographic location to a value. Geomap charts for instance use locations to render data on a map.

**Context**

The geo-qualification will automatically match values to a geographic database of name-latitude-longitude data using name lookup. If there is more than one matching location, all matches will be presented, allowing you to select the most appropriate location. It is possible to select a different location in the dropdown list from the one selected by the automatic matching mechanism. To do so, refer to To manually match values of an object with a location.

**Procedure**

1. Go to the **Available Objects** pane.
2. Right-click an object you want to geo-qualify.
3. Click **Edit as a Geography By Name**.
4. Select a level.
   - There are four possible levels: **Country**, **Region**, **Sub-Region** and **City**. In the United States for example, California is a region, Southern California is a sub-region, and Los Angeles is a city.
5. **Optional:** Click the **Show** combo box to filter the list on matching category.
6. Click the dropdown list next to the value you want to edit.
7. Select one of the locations available.
8. Click Apply.
9. Click OK.

**i Note**

An error icon ▼ is displayed on the geomap and next to the geo-qualified object if a value has not been geo-qualified. This may occur when you refresh the document or add new locations. To fix this issue, make sure all objects values are geo-qualified by repeating the above procedure.

**Related Information**

To manually match values of an object with a location [page 388]

### 4.3.7.2 To manually match values of an object with a location

You can manually match values of an object to a location. This is useful when the location you expect does not appear in the dropdown list for example, or when a value is assigned to an incorrect location.

**Context**

**i Note**

The geographical database might not recognize a specific location you are looking for. If this is the case, try to select a substitute location, create a custom location or select an alternative location.

**Procedure**

1. Go to the **Available Objects** pane.
2. Right-click an object you want to geo-qualify.
3. Click ▶ **Edit as a geography ▶ By Name ▶**
4. Select a **level**.
   - There are four possible levels: Country, Region, Sub-Region and City. In the United States for example, California is a region, Southern California is a sub-region, and Los Angeles is a city.
5. Click the dropdown list next to the value that you want to edit.
   - If several locations appear in the dropdown list, select the one that is closest to the location you were originally looking for.
6. **Optional:** If you do not find the location you are looking for, Click *Select location...*.

7. Do one of the following:
   - Type in the name of the location, select the one you are looking for and click **OK**.
   - Click **Add Location**, enter the coordinates of the location you are looking for and click **OK**.

   **Note**
   The search applies to the level you have defined when you edited the dimension as geography: *Country*, *Region*, *Sub-Region* or *City*. Make sure you are using the correct level when doing a search.

8. Click **OK**.

### 4.3.7.3 Matching values of a merged object with a location

Members of a geo-qualified merged object share a common list of values.

If you merge an object that is geo-qualified with another one that is not, it inherits the geo-qualification method, that is by name or latitude and longitude, of the member that was originally geo-qualified.

In the *Available Objects* pane, the following icon is displayed next to merged objects that are geo-qualified: 🌍.

Depending on the geo-qualification scenario, you might have conflicts or unresolved and missing values. In that case, an icon is displayed next to the merged object with unresolved or missing values: 🌍. Another icon is also displayed next to the member whose geo-qualification needs is incomplete: 🌍. Conflicts, unresolved or missing values can happen in the following cases:

- **You are merging two geo-qualified objects to create a geo-qualified merged object**
  - Each member object comes with in its own list of values resulting from a previous geo-qualification. If the lists of values conflict with one another or if there are unresolved and missing values, repeat the geo-qualification process.

- **You are adding a new object to a merged object that is already geo-qualified**
  - The member you are adding to the merged object is automatically geo-qualified. However, it can bring new and unresolved values. Repeat the geo-qualification process either for the merged object or one of its members to solve the issue.

**Restriction**
You cannot merge objects that have been geo-qualified using the latitude/longitude geo-qualification method. However, it is possible to merge an object that has been geo-qualified using the latitude/longitude geo-qualification method with an object that is not geo-qualified.

### Impact of an unmerge command on geo-qualification

Unmerging a geo-qualified object by name does not cancel the geo-qualification of its members. Unmerging a geo-qualified object by latitude and longitude returns all of its members to their original state.
Caution

Resetting the geo-qualification of a merged object, a merged object member or an object that is part of a merge will reset the geo-qualification of the merged object, its members and all its participating objects.

Related Information

To match values of an object with a location [page 387]
To manually match values of an object with a location [page 388]
To match values of an object using latitude and longitude coordinates [page 390]

4.3.7.4 To match values of an object using latitude and longitude coordinates

Context

Restriction

You cannot use an object as latitude or longitude if it is already geo-qualified.

Procedure

1. Go to the Available Objects pane.
2. Right-click an object you want to geo-qualify.
3. Click Edit as a Geography By Latitude / Longitude.
4. Select the latitude and longitude objects.
5. Click OK.
4.3.7.5 To modify the location of a value

You can modify the geo-qualification of an object.

Context

After a geo-qualified object has been modified, refresh the document for the new locations to be displayed on the map.

Procedure

1. Go to the Available Objects pane.
2. Right-click on a geo-qualified object you want to edit.
3. Click Edit as a Geography.
4. Optional: Filter the results in the Show dropdown list.
5. Click the dropdown list next to the value that you want to edit.
6. Select one of the locations available.
7. Repeat the process for every value you want to edit.
8. Click Apply.
9. Click OK.

4.3.7.6 To reset the location of a value

Context

Reset the geo-qualification to remove the geography associated with an object.

⚠️ Caution

If you reset a merged object, every member is reset and loses the geo-qualification. This behavior also applies if you reset a geo-qualified object participating to a merge.

Procedure

1. Go to the Available Objects pane.
2. Right-click on a geo-qualified object you want to reset.
3. Click Reset.

4.3.8 To remove a chart

The following task describes how to remove a chart from a report.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Do one of the following:
   - Right-click the chart frame and click **Delete**.
   - Select the **Document Structure and Filters** tab in the **Side Panel**. Right-click the chart name and select **Delete**.
   - Select the chart, and in the **Side Panel** toolbar, click the **Delete** icon.

**Results**

The chart has been deleted.

**Related Information**

To format a chart [page 396]

4.3.9 To copy a chart

You can copy a chart dynamically to another report or as a picture in other applications.

**Procedure**

1. In a Web Intelligence document in **Design** mode, right-click the chart frame and select **Copy**.
   The chart is copied to the clipboard.
2. To paste the chart to another part of the report, right-click where you want the chart to appear then select **Paste**.
3. To paste the chart into another application, paste the contents of the clipboard from within the other application.
   You can also copy a chart into another application by dragging and dropping it directly into the open document in the target application.
   Within the same application, your copied chart will be dynamic. However, if the chart is pasted into another application, the chart appears as a picture.

Related Information

To format a chart [page 396]

4.3.10 Turning hierarchical queries into charts

You can turn a hierarchical query into a chart.

→ Tip
   Displaying the totals may generate scale distortions, especially if the measure is an aggregate. Hierarchical totals should not be displayed in Pie charts or a Tag Cloud. To hide hierarchical totals, use levels for feeding or navigate within the table with the Drill Focus option or uncheck the option Show parent nodes in the Format Chart dialog box (Global General).

i Note
   Use only one hierarchy to feed a Tree Map.

Related Information

Hierarchical queries [page 71]
To change the chart type by using Turn Into [page 432]
4.3.11 To set the position of a table or chart on the report page

You can set the position of a table or chart in a report.

Procedure

1. In a Web Intelligence document in Design mode, right-click the border of the table or chart, and select Format Table or Format Chart.

2. In the Global Layout section of the table or chart format panel, use the controls in the Relative Position section to set the position of the table or chart in relation to other report elements.

   → Tip

   You can also reach the Layout tab in the table or chart format panel by one of the following ways:
   ○ In the Report Elements tab, in the Position subtab, click Align, then an alignment option.
   ○ Right-click the table or chart and select Align, then an alignment option.

3. Click OK.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format table or cell borders [page 450]
To format text in table cells [page 451]
To set cell height and width [page 452]
To copy formatting using the Format Painter tool [page 454]
To layer tables and cells [page 456]
To merge table cells [page 458]
Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]
4.3.12 To position a chart in relation to another chart or table

If you have more than one block (table, chart, or form) in your report, you can use relative positioning.

Context

Relative positioning allows you to position a selected block (for example, a chart) in relation to other blocks in the report.

If new data on the database modifies the size of the tables or charts, relative positioning ensures that the different tables and charts display correctly without overlapping each other.

i Note

If you position a chart in relation to another block (that is, a chart, table, or form), the position of the chart changes automatically, if you reposition the reference block.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart and click Format Chart.
2. Select the Global chart area, then the Layout tab.
3. In the Relative Position area, configure the left and right edge position of the chart in proximity of a report object you specify.
   For example, to align with the left edge of the report title, select Left edge, then Report title.

Results

Tip

You can also reach the Layout dialog box by doing one of the following:

- In the Report Elements tab, in the Position subtab, click Align Relative Position.
- Right-click the table or chart and selecting Align Relative Position.

4.3.13 Formulas in chart elements

You can use the Formula Editor (the fx icon) to define and edit formulas in chart elements.

The following chart elements can use a formula:
4.3.14 Formatting charts

You can format a chart area or a selected chart area (title, legend, axes, plot area, area title) in Web Intelligence.
You can find chart format options in the Format or Formatting toolbar in the Design mode.

4.3.14.1 To format a chart

You can format a chart in a report using options in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Format Chart dialog box, select the chart area that you want to format.
   
   → Tip
   
   If you have preselected a chart area before calling the dialog box, this area is displayed automatically without you having to navigate.

3. Do one of the following:
   
   ○ In Web Intelligence Rich Client, select the functional tab that you want to change in the Side Panel.
   ○ In the Web Intelligence HTML interface, expand the tab of the chart area you want to format, then select the functional tab.

4. When you have made your changes, click Apply if you want to see the changes before you close the dialog box or if you want to make some other changes before you close the dialog box. Otherwise, click OK to save the changes and close the dialog box.

Results

Another way to access the Format Chart dialog box is to select the chart. In the Formatting tab, in the Chart Style subtab, click Format Chart.

For more information on the functions used in free-standing cells, see the Using Functions, Formulas and Calculations in Web Intelligence guide or the online help.
4.3.14.2 Data intervals in Tree Maps, Heat Maps and Tag Cloud charts

Data intervals are based on colors in Tree Map, Heat Map, and Tag Cloud charts that use intervals. You can use one of the following shape coloring methods:

<table>
<thead>
<tr>
<th>Coloring method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom Range Coloring</td>
<td>The Custom Range Coloring method uses ranges that you set based on an increment or percentage, and you select the color that applies to each range.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring</td>
<td>The Gradient-based Palette Coloring method uses a 2 or 3 color gradient definition, and you select the color that applies to each gradient.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring Using Measure Polarity</td>
<td>The Gradient-based Palette Coloring Using Measure Polarity method not only uses a 2 or 3 color gradient definition, it also uses a 2 or 3 color neutral polarity definition.</td>
</tr>
<tr>
<td>Palette Coloring</td>
<td>The Palette Coloring method applies a different color from the selected palette to each legend interval.</td>
</tr>
</tbody>
</table>

**Note:** You should not use these charts with hierarchical nodes for aggregate measures because the color scale can be distorted. To deactivate these nodes, deactivate the Show Parent Node option in the Global General section of the Format Chart dialog box.

**Palette coloring methods**

In all of the palette coloring methods, the data range is defined in the Range Definition setting. This range defines the set of data that is distributed in the intervals.

You can define the number of intervals which will be created within the data range, using the Number of Intervals setting.

You can set the way data is distributed in chart intervals using the Data Distribution Mode setting.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution by Values</td>
<td>The range of attribute values is divided into equal-sized ranges. This method emphasizes the amount of an attribute value relative to other values.</td>
</tr>
</tbody>
</table>

**Note:** If the data values are clustered instead of being evenly distributed, then most of the data can exist in one or two ranges and some ranges can have no data.
Distribution by Quartiles

The quartile distribution works well with linearly-distributed data. Because data is grouped by the number in each range, the resulting chart can be misleading. Similar data can be placed in adjacent ranges, or data with widely different values can be put in the same range. This distortion can be minimized by increasing the number of ranges.

**Note**
Data with close values may end up in different ranges, thus exaggerating the differences between them.

Shapes with values out of range

By default, coloring applies to all values, but you can restrict coloring to a range of values. This is done by default with the *Custom Range Coloring*. You can specify a color to values out of range.

Shapes with null or empty values

You can specify a color for shapes with null or empty values to, for example, define the color of states without any point of sales.

Data Interval Syntax

In *Measure-based Coloring*, the chart legend displays a range of data using bracket. You select the preferred syntax in the *Data Interval Syntax*.

To declare an interval, you can use the *ISO31-11* syntax setting, which uses an inverse bracket to exclude a value:

-2..-1[
[-1..3[
[3..5]

However, in the United States, you use the *US Syntax* setting to replace that bracket by a parenthesis when excluding values:

-2..1
[-1..3)
[3..5]

If you prefer syntax less mathematical, then you use the *Basic Syntax* setting:

-2..1
Measure polarity

Measure-based coloring charts are driven by measure values. The *Gradient-based Palette Coloring Using Measure Polarity* coloring method is based on the polarity associated to the measure driving the color and determines if high values are good, bad or neutral.

The following palettes exist:

<table>
<thead>
<tr>
<th>Palettes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ascending polarity</strong></td>
<td>The colors indicate that low is bad and high is good, with the first palette from the <em>Start Color</em> to the <em>End Color</em>, which is red to green by default.</td>
</tr>
<tr>
<td><strong>Descending polarity</strong></td>
<td>The colors indicate that low is good and high is bad, with the first palette from the <em>End Color</em> to the <em>Start Color</em>, which is green to red by default.</td>
</tr>
<tr>
<td><strong>Neutral polarity</strong></td>
<td>With this palette, neither low nor high is bad or good. The second palette is from <em>Start Color</em> to <em>End Color</em>, which are blue to yellow by default.</td>
</tr>
</tbody>
</table>

The default setting, found in the *Measure Properties* section of the Global chart area settings, for measure polarity is *Automatic*, which applies descending polarity.

Related Information

Tag cloud charts [page 380]
Waterfall charts [page 381]

4.3.14.2.1 To configure the measure polarity for Tree Map, Heat Map, and Tag Cloud charts

You can configure the measure polarity for data interval charts in the *Format Chart* dialog box.

Procedure

1. In a Web Intelligence document in "Design" mode, right-click the chart and select *Format Chart*.
2. In the *Global* section, select *Measure Properties*.
3. Select a polarity palette for your chart type:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart Type</td>
<td>Measures to configure</td>
</tr>
<tr>
<td>Tree Map</td>
<td>Rectangle Weight</td>
</tr>
<tr>
<td></td>
<td>Rectangle Color</td>
</tr>
<tr>
<td>Heat Map</td>
<td>Rectangle Color</td>
</tr>
<tr>
<td>Tag Cloud</td>
<td>Tags Weight</td>
</tr>
<tr>
<td></td>
<td>Tags Family</td>
</tr>
</tbody>
</table>

4. Click **OK** to close the *Format Chart* dialog box.

**i Note**

You can configure other aspects of the Tree Map, Tree Map or Tag Cloud chart in the *Palette and Style* tab of the *Global* section.

**Related Information**

To manage measure-based coloring in Tree maps, Heat maps and Tag Cloud charts [page 428]

To configure the data interval for Tree Map, Heat Map, and Tag Cloud charts [page 400]

### 4.3.14.2.2 To configure the data interval for Tree Map, Heat Map, and Tag Cloud charts

You can configure the data interval for Tree Map, Heat Map, and Tag Cloud charts in the Format Chart dialog box.

**Procedure**

1. In a Web Intelligence document in "Design" mode, right-click the chart and select *Format Chart*.
2. In the *Global* section, select *Palette and Style*.
3. Select a *Color Palette*.
4. If you wish the plot area to have a color, select *Use Internal Palette*.
5. Select a method from the *Coloring Method for Shapes* dropdown list.
6. If you are using the either of the gradient-based palette coloring methods, configure the *Gradient Definition*.
   a. Select one of the following:
Gradient | Description
--- | ---
3 Colors | Allows you to have a starting color, a midpoint color and an ending color.
2 Colors | Allows you to have a starting color and an ending color.

b. Select the colors and their gradient.

7. To define the number of intervals within the defined data range, specify a **Number of Ranges**.

> **Tip**
The best number of ranges is typically 4 or 5. This amount can reveal data patterns without being confusing. If you have more than 7 colors, data with similar values can be hard to distinguish, and fewer than four ranges will not reveal much variation and therefore may reveal no clear pattern.

> **i Note**
This setting does not apply to the **Custom Range Coloring** method.

8. To define a specific range of data to appear in the chart, select the **Range Definition** checkbox, then enter the **From** and **To** numbers.

> **i Note**
This setting does not apply to the **Custom Range Coloring** method.

9. To set the way data is distributed in chart intervals, select a **Data Distribution Mode**.

> **i Note**
This setting does not apply to the **Custom Range Coloring** method.

10. To set colors for out-of-range value shapes, for the **Shapes with Values Out of Range** option configure the following settings:
   a. Select either **RGBA Color** or **Gradient**.
   b. Select a color from the color picker dropdown list and set the opacity.

11. To set colors for null and empty value shapes, for the “Shapes with NULL or Empty Value” option, configure the following settings:
   a. Select either **RGBA Color** or **Gradient**.
   b. Select a color from the color picker dropdown list and set the opacity.

12. Select a **Data Interval Syntax**.

13. If you are using the **Gradient-based Palette Coloring Using Measure Polarity** method, then you need to configure the **Gradient Definitions for Measures with Neutral Polarity** option.
   a. Select one of the following:

<table>
<thead>
<tr>
<th>Gradient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Colors</td>
<td>Allows you to have starting color, a midpoint color and an ending color.</td>
</tr>
</tbody>
</table>
Gradient Description

2 Colors Allows you to have starting color and an ending color.

b. Select the colors and their gradient.

14. If you are using the Custom Range Coloring method, configure the Color zones option.
b. To have the ranges colored by percent instead of increments, select Percent.
a. To have the ranges colored by percent instead of increments, select Percent.
c. Enter the minimum and maximum zone parameters.

c. Select a color from the color picker dropdown list and set the opacity.

→ Tip
In Heat Maps, if you are using the Emboss Effect, you should disable the Light and Shadow Effects in the Palette and Style subsection.

Related Information

To configure the measure polarity for Tree Map, Heat Map, and Tag Cloud charts [page 399]
Map charts [page 378]
Tag cloud charts [page 380]

4.3.14.3 Warning icons in charts

Warning icons in charts can alert you when there are chart and data object errors.

The warning icons available are:

- General Warnings, icons displayed on the top left corner of the chart.
  Red X in a white background: impossible to generate the chart. (This could be due to a cache problem - try clearing temporary objects from cache.
  White X in a red circle: cannot find the image, the BI administrator should check load balancing settings and enable service monitoring as described in the Business Intelligence Platform Administrator Guide.
  Yellow warning: for example dataset too large (technical limit of the server), need to refresh the dataset, other cube errors.
  Blue alert: limit for optimal rendering

The display of the General Warning icons is controlled by the Hide warning icons in chart setting in the Web Intelligence document properties. If this setting is activated, then no General Warning icons appear in the charts.

- An incompatible chart data warning, small yellow warning icon displayed on the data point.
  These occur if Show alert when the data is incompatible with the chart is activated in the chart format options and the dataset is inconsistent with the chart parameters. For example, a warning can appear in a Pie chart with negative values, negative values for a logarithmic scale, or inconsistent hierarchical values for a Tree Map.
### Technical limits of the data received from the Visualization Service, which is responsible for displaying data in the chart

**Max number of rows = 50,000**

*Restriction*

This is a non-configurable parameter. It is hard-coded into the product and cannot be changed by properties of the APS server in CMC or by manually changing an XML file.

Only part of the dataset is rendered and a warning icon appears, as well as an informational tooltip.

### Data restricted for optimal rendering

The data is restricted by the chart type and size for optimal appearance.

An alert icon appears, as well as a tooltip showing optimization guidelines.

---

**Related Information**

Viewing document properties [page 235]

### 4.3.14.3.1 To display warning icons in charts

You can allow warning icons to appear in charts and on data points.

**Procedure**

1. In a Web Intelligence document in Design mode, right-click the chart frame and select **Format Chart**.
2. In the Global chart area, select the **General** tab.
3. Select **Show alert when the data is incompatible with the chart**.
4. Click **OK** to return to the document.
4.3.14.4 To edit and format a chart title

You can activate and set titles in charts in the Format Chart dialog box.

Context

By default, titles are generated automatically.

Procedure

1. In Design mode, right-click the chart frame and select Format Chart.
2. In the Format Chart dialog box, select one of the following:
   - Global Area Display
   - Title Design
3. Click Custom Title and enter a new title.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.5 To display a chart with a 3D look

You can apply a 3D look to a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Select 3D look or 3D.

i Note

Some types of bar charts using bar display effects do not look very attractive if they also use the 3D look or 3D setting.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.6 Assigning colors to charts

You can personalize the appearance of charts in Web Intelligence reports by assigning colors to dimension objects manually or by using built-in or customized color palettes. You can retain this color assignment to keep a color assigned to a dimension object.

When you create a chart in a Web Intelligence report, colors from the default color palette are automatically assigned to dimension objects in a top-to-bottom order. This order remains the same across sections and pages. However, the colors you assign using color palettes are not retained when the report is refreshed when opened, or when you change the number of objects displayed in a chart by filtering or using drill snapshots.

If you want to consistently display a specific object, such as a [Product Line] or [Sales Region], in a specific color, you can either assign a specific color to the object manually, or assign an in-built or custom color palette and set the color assignment as default.

When you set the color assignment as default, colors assigned to dimension objects do not change when you use filters or drill snapshots, or when the report is refreshed when opened. You can reset all colors by applying a new palette to the chart or by using a dedicated option.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you turn a chart into another type of chart, the color mapping is maintained only if the following conditions are respected:</td>
</tr>
<tr>
<td>• The legend color for the primary dimension (assigned to Region Type color or Pie color) must be the same.</td>
</tr>
<tr>
<td>• The legend items must be the same (no adding or removing a primary dimension for the Region Shape).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>You cannot assign colors to dual value axis charts or to charts using Measured-Based Coloring (like Heat Map, Tree Map and Tag Cloud).</td>
</tr>
</tbody>
</table>

Related Information

To create a custom palette style for charts [page 407]
To assign a color to an object in chart [page 409]
To assign colors to objects in charts using color palettes [page 409]
4.3.14.6.1 To select a palette for a chart

You can select a palette for a chart in the Format chart dialog box.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select or insert a chart.
3. Do one of the following:
   ○ Right-click the chart area and select Format Chart from the contextual menu. The Format chart dialog box appears. Select the Palette and Style tab. From the Color Palette dropdown list, select a palette style.
   ○ In the Format tab, in the Chart Style subtab, from the Palette Style dropdown list, select a palette style.

The chart is displayed with the colors from the selected palette. If the colors are not as you prefer, you can either select another palette style from the dropdown list, or you can create a custom palette.

i Note

In waterfall charts, settings other than Automatic in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to Automatic.

Related Information

To edit a custom palette chart style [page 408]
To create a custom palette style for charts [page 407]
To configure the value colors in a waterfall chart [page 410]
4.3.14.6.2 To create a custom palette style for charts

You can create a custom palette style based on an existing palette style.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select or insert a chart.
3. Do one of the following:
   ○ Right-click the chart area and select Format Chart from the contextual menu. The Format chart dialog box appears. Select the Palette and Style tab. From the Color Palette dropdown list, select Custom.
   ○ In the Format tab, in the Chart Style subtab, from the Palette Style dropdown list, select Custom.

   The Manage Palettes dialog box appears, with either the default palette or the last palette applied to the chart selected.
4. Do one of the following:
   ○ If the currently selected palette is the one from which you want to create a custom palette, click New.
   ○ If you want to create a palette based on another built-in palette, select that palette and click New.

   The Create palette dialog box appears.
5. Enter a palette name.
6. Click a cell in the Color settings area and then select a different color from the Color dropdown palette.
7. Set the opacity if necessary.
8. When you have customized the cells, click OK.

   The custom palette appears in the Custom section of the Manage Palettes dialog box.

   The custom palette you have created will appear in the following places when it is selected for a chart:
   ○ From the Color Palette dropdown list in the Format chart dialog box.
   ○ From the Palette Style dropdown list in the Chart Style subtab.

   When it is not selected for a chart, you can access it in the Manage Palettes dialog box.

   i Note

   In waterfall charts, settings other than Automatic in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to Automatic.
Related Information

To edit a custom palette chart style [page 408]
To select a palette for a chart [page 406]
To configure the value colors in a waterfall chart [page 410]

4.3.14.6.3 To edit a custom palette chart style

You can edit custom chart styles.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select or insert a chart.
3. Do one of the following:
   ○ Right-click the chart area and select Format Chart from the contextual menu. The Format chart dialog box appears. Select the Palette and Style tab. From the Color Palette dropdown list, select Custom.
   ○ In the Format tab, in the Chart Style subtab, from the Palette Style dropdown list, select Custom.

The Manage Palettes dialog box appears, with either the default palette or the last palette applied to the chart selected.

4. Select the custom palette style that you want to edit and click Edit.

i Note

Built-in chart styles cannot be changed, however you can create a palette chart style from a built-in chart style.

The Create palette dialog box appears.

5. Edit the palette settings as necessary.
6. When you have completed your changes, click OK.

i Note

In waterfall charts, settings other than Automatic in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to Automatic.
**Related Information**

- To create a custom palette style for charts [page 407]
- To select a palette for a chart [page 406]
- To configure the value colors in a waterfall chart [page 410]

### 4.3.14.6.4 To assign a color to an object in chart

You can assign custom colors to dimension objects in charts in Web Intelligence reports.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. Select a dimension object or a legend item on a chart.
3. In the *Formatting* tab, in the *Style* subtab, click the *arrow* next to the *Background Color* icon.
4. From the *Background Color* dropdown list, do one of the following:
   - To assign a pre-defined color, select a color.
   - To assign a custom color, click *More Colors*, set a color and click *OK*.

**Results**

The color is assigned to the dimension object.

### 4.3.14.6.5 To assign colors to objects in charts using color palettes

You can assign default or custom color palettes to dimension objects in charts in Web Intelligence reports. You can retain this color assignment when the report is refreshed when opened, and when you use filters, input controls, or drill snapshots.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. Select a chart.
3. In the **Formatting** tab, in the **Chart Style** subtab, from the **Palette Style** dropdown list, select a palette or click **Custom** to create a custom palette. Colors from the palette are assigned to the dimension objects.

4. If you want to retain this color assignment, right-click the chart.

5. Select **Series Colors** ➤ **Set as Default Colors** ➤

**Results**

If you want to clear the color assignment, right-click the chart and select **Series Colors** ➤ **Clear Color Assignment**.

**Related Information**

To create a custom palette style for charts [page 407]

**4.3.14.6.6 To configure the value colors in a waterfall chart**

You can configure the start, total, negative and positive values in a waterfall chart.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Select or insert a waterfall chart.
3. Right-click the chart area and select **Format Chart** from the contextual menu.
4. In the **Format chart** dialog box, select the **Palette and Style** tab.
5. In the **Custom Format** section, configure the **Fixed Value** for any of the following on the waterfall chart:
   - The **Start Value Color** affects the starting value bar.
   - The **Total Value Color** affects the final value bar.
   - The **Negative Value Color** affects any bars that reflect negative values.
   - The **Positive Value Color** affects any bars that reflect positive values.

   **Note**

   Settings other than **Automatic** in the **Custom Format** section can override the **Color Palette** settings. To return to the **Color Palette** settings, change all of the **Custom Format** settings to **Automatic**.

6. When you have completed your changes, click **OK**.
4.3.14.6.7 Creating a corporate palette for charts

You can define a corporate palette for charts so that your reports have the corporate style. The palette colors are defined in the configuration file called VisualizationConfig.xml. You can only define one corporate palette, and the palette ID must not be changed.

The default palette contains 32 defined colors. You can define more colors, but you must define at least two colors. You define a color by defining the strengths of red (R), green (G), blue (B), and the transparency (A).

Example

```xml
<Color R="200" G="0" B="0" A="255" />
```

4.3.14.6.7.1 Corporate palette configuration file syntax

You can define a default corporate chart palette.

The corporate chart palette configuration file VisualizationConfig.xml is by default located in the following location:

C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\images

This file contains the following elements:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<CONFIG>
   <!-- Rename this file to VisualizationConfig.xml which will activate a custom default palette. -->
   <!-- TOMCAT must be restarted after each modification of this file -->
   <PALETTES>
      <PALETTE ID="corporate">
```

Related Information

Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Formatting tables and table cells [page 447]
Related Information

To define a corporate palette for charts [page 413]
4.3.14.6.7.2 To define a corporate palette for charts

The BI administrator can use the following steps to define a corporate palette using the VisualizationConfig.xml configuration file. This corporate palette will then be used as default for all new charts.

Procedure

1. In the following directory open the template file: VisualizationConfig.template.xml:
   
   C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\images

2. Define at least two colors or edit the ones present in the template file.

3. Rename the file: VisualizationConfig.xml and save it in the same directory.

4. Restart Tomcat.

Results

This corporate palette will be used as default for all new charts. Make sure there are no errors in the configuration file, otherwise the standard palette will be applied.

Next Steps

→ Tip

Restart Tomcat each time you modify this file.

4.3.14.7 To modify chart borders

You can modify the borders of a chart in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart and select Format Chart.

2. In the Global chart area, select the Border tab.
3. Use the settings to format the borders.
4. Click OK to return to the document.

**Related Information**

To format a chart [page 396]

**4.3.14.8 To format the chart background**

You can format the background colors, grid colors, opacity, line type and transparency of charts.

**Context**

**i Note**

The Tree Map, Tag Cloud, and Heat Map charts do not have background configuration options.

The options available vary depending on the type of chart.

**Procedure**

1. In a Web Intelligence document in **Design** mode, right-click the plot area and select **Format Chart Plot Area** or **Format Chart**.
2. In the **Plot Area** chart area, select the **Background** tab.
3. In a 3D chart, you can show or hide the grid floor and edges.
4. Select a **Grid and Background** style:
   - **Plain background**
     - **Background Color** (refers to the background of the plot area)
     - **Category Axis Grid Color** (refers to the lines that are parallel to the category axis)
     - **Value Axis Grid Color** (refers to the lines that are parallel to the value axis)
     - **Depth Grid Color** (in a 3D chart, it refers to the lines parallel to the **Value Axis Grid Color**.
   - **Striped Background** (it shows alternate colors, instead a grid. The striped background option may not be available depending on the chart type, as in the case of Pie and 3D charts.
   - If you want the plot area lines to be dashed, select **Dashed Lines**.

**i Note**

Grid options slightly differ depending on the chart type.
5. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.9 To modify plot area settings in Waterfall charts

You can activate or deactivate a reference line and set the spacing between objects in the Waterfall chart plot area.

Procedure

1. Right-click in the Waterfall chart.
2. Select Format Chart.
3. In the Format Chart dialog box, select the Plot Area chart area.
4. In the Design tab, select Reference Line.
5. To set the spacing between plot area items, enter or select a number for the Relative Spacing between Items.
6. Click OK or Apply.

Related Information

To format the chart background [page 414]

4.3.14.10 To show and format chart legend

You can format the chart legend in a report.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart legend and select Format Legend.
2. In the Format Chart dialog box, for the Legend chart area, select the Design tab.
3. You can make the legend visible or not, adjust the symbol size, position and layout, group by dimension, adjust the text settings and border and background settings.

4. In the Title tab, you set the legend title settings, such as: Automatic Title or Custom Title. Custom Title allows you to define a formula to be used for the Legend title.

5. Click OK to return to the document.

Results

→ Tip
In the Global chart area, in the Area Display tab, you can display or hide the legend and legend title.

Related Information

To format a chart [page 396]
Formulas in chart elements [page 395]

4.3.14.11 To reverse the legend order of a chart

You can reverse the legend order of a chart.

Context

The legend is reversed by default for bar and stacked charts. It is available for all XY charts as well as Pie charts and derived charts (if the Clockwise setting is disabled).

Procedure

1. In Design mode, right-click the chart legend you want to edit.
2. Click Format Chart Legend.
3. Check Reverse legend order.
Results

The legend order has been reversed.

4.3.14.12 To avoid page breaks in charts

You can restrict page breaks in charts.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Layout tab.
3. Select Avoid page breaks in chart or Avoid page break. These options can be selected for both horizontal and vertical breaks.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.13 To repeat a chart on every page

You can repeat a chart horizontally, vertically or both on every page of a report.

Context

i Note

When using this parameter, a banner is inserted at the top of the first page on which the chart is repeated. If a repeated chart is placed in the middle of a page next to a table that spreads across multiple pages, then on the second page, the rest of the table is displayed only below the banner. We recommend using this parameter only if the chart you want to repeat is placed at the top of the page or all the way to the left. Otherwise, the banner takes too much space on the page.

If the repeated element is contained within a section, then its container is the section instance and the banner is up at the top of the section instance rather than at the top of page. If there is not enough space to display the report block that comes after the repeated element, then the parameter is ignored.
Procedure

1. Right-click a chart.
2. Click Format Chart > Layout.
3. In the Horizontal section, Vertical section or both, check repeat on every page.

4.3.14.14 To configure a stacked bar or column chart

In a stacked chart, the measure data is stacked in bars or columns. Stacking is done axis by axis and you can choose which data to stack. In a 100% stacked chart, the data is displayed as percentage parts of a whole, or 100%, of a bar or column.

Context

Note

Only charts with value axes can be stacked.

Procedure

1. In a Web Intelligence document in Design mode, add a stacked bar or column chart.
2. Right-click the chart and select Format Chart from the contextual menu.
3. In the Value Axis chart area:
   ○ Select the Design tab. Under Stacking, select one of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstacked</td>
<td>Select this option to unstack all dimensions and measures in the chart.</td>
</tr>
<tr>
<td>Stacked Chart</td>
<td>Select this option if you only want to slice one dimension by another. For example, in a chart containing revenue per state and year. Measures are not stacked.</td>
</tr>
<tr>
<td>Globally Stacked Chart</td>
<td>Select this option stacks the dimensions and measures in one stack per bar or column.</td>
</tr>
</tbody>
</table>

○ Select 100% Stacked Chart if you want to measure multiple series as a proportion vs. time, or if you have three or more data series and want to compare distributions within categories, and at the same time display the differences between categories. Each bar represents 100% of the amounts for that category.
4. In the Plot Area chart area, if you are configuring a 100% stacked chart, and want bars or columns with zero values to be flat against the value axis, select Flatten zero values.

5. Click OK to close the Format Chart dialog box.

Related Information

To format the category or value axis title [page 420]
To format the chart background [page 414]
To format axis grid values, numbers and text [page 423]
To show a specific range of axis values [page 420]
To display the Value Axis logarithmically [page 421]
Linear and logarithmic axis scales [page 421]
To show and format chart legend [page 415]

4.3.14.15 To manage overlap in bar charts

You can set the overlap between bars in a bar chart.

Context

Procedure

1. Right-click a bar chart.
2. Click Format Chart.
3. In the Plot Area of the chart area.
4. Enter a value in Spacing between Groups, Spacing within Groups or both.
   - Spacing between Groups corresponds to a percentage of the total axis space dedicated to separate bars of category axis values, and defines the space allocated to each bar group.
   - Spacing within Groups corresponds to the space allocated to each bar within a group. A negative value defines a percentage of the total group space dedicated to bar overlap. We recommend setting the Bar Width to Unlimited when using negative values.
5. Click OK.
4.3.14.16 To format the category or value axis title

You can format the title of a category or value axis in a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Category Axis or Value Axis chart area, select the Title tab.
3. Edit the title settings, which include:
   ○ Title label and visibility
   ○ Layout spacing
   ○ Text formatting
   ○ Borders and the background
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.17 To show a specific range of axis values

You can specify a range of values in a chart axis.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis chart area, select the Design tab.
3. Under Scaling, to set the Minimum Value and the Maximum Value, select Fixed Value, then enter a value.
   
   i Note
   Overscaling is a specific display that indicates that a bar is incomplete. Its value is out of the axis Max/Min values.
4. Click OK to return to the document.
Related Information

To format a chart [page 396]

4.3.14.18 Linear and logarithmic axis scales

Linear scales are based on addition. Logarithmic scales allow you to examine values that span many orders of magnitude without losing information on the smaller scales.

By default, the application displays the Value axis on charts as a linear scale. In a linear scale, the axis markers are evenly spaced. Consider, for example, the linear sequence: 1, 3, 5, 7, 9. To get the next number in the sequence, you add 2 to the previous number.

You can set the axis to a logarithmic scale. Logarithmic scales are based on multiplication rather than addition. In a logarithmic scale, the steps increase or decrease in size. Logarithmic scales are based on multiplication (or division). Consider, for example, the logarithmic sequence: 2, 4, 8, 16, 32.

To get the next number in the sequence, you multiply the previous number by 2. We can say that this sequence represents "base 2."

Consider the following sequence: 1, 10, 100, 1000, 10000.

This sequence represents "base 10," because you get the next term in the sequence by multiplying the previous term by 10.

4.3.14.18.1 To display the Value Axis logarithmically

You can change the Value Axis to appear logarithmically in a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis chart area, select the Design tab.
   A logarithmic scale uniformly presents percent changes rather than point changes. In other words, the distance from 1 to 2 (100% increase) is the same as the distance from 2 to 4 (another 100% increase).
4. Click OK to return to the document.
Results

Note
You cannot represent negative values on a logarithmic scale. If you have selected Show alert when the data is incompatible with the chart option in the chart format options, a small yellow warning icon will appear on the data point if there is negative data.

Related Information

To format a chart [page 396]
Linear and logarithmic axis scales [page 421]
To display warning icons in charts [page 403]

4.3.14.19 To assign axis labels to data values

You can assign labels to an axis in charts.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Data Values tab.
3. Select Data label displaying mode.
4. Select the appropriate Data Type.
5. You can also change the other data value settings on this page, like Automatic Hiding Mode and font, border, line and background settings as necessary.
6. Click OK to return to the document.

Related Information

To format a chart [page 396]
To show or hide data values [page 430]
4.3.14.20 To format axis grid values, numbers and text

You can format the value and category axis settings.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Category Axis or Value Axis chart area, select the Design tab and format settings in the following sections:
   - Under General, you can select that the axis is visible.
   - Under Layout, you can display the axis, show labels, change the orientation, adjust the legend layout, automatically reduce the font size of labels displayed in grid, reverse order on the category axis, set the axis label delete mode and show continuous axis layout.

   **i Note**
   
   By default the Value axis is the Y axis and the Category axis is the X axis. If you reverse the order of the chart, the X,Y relationship is broken. The horizontal line remains the X axis and the vertical axis remains the Y axis.

To set the legend layout, select Adjust Layout and configure the following options for the layout width and height:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic</td>
<td>Select Automatic so that the legend width or height is automatically adjusted to the size of the legend contents.</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>The width adjusts as much as possible, however if the legend items are long, they can disappear from the legend cell.</td>
</tr>
<tr>
<td>Fixed</td>
<td>Select Fixed to manually set the height or width of the legend cell.</td>
</tr>
<tr>
<td>Proportional</td>
<td>Select Proportional to have the legend cell height or width appears relative to the size of the chart. You express this size as a 0.x value, where 0.2 means that the legend cell height will appear as 20% of the actual chart.</td>
</tr>
</tbody>
</table>

   - Under Color Options, you can set the Axis Color (the category axis line), Grid Color (the grid around the category axis labels) and Grid Background Color (which refers to the category axis labels).
   - Under Text, you can choose the font settings, text alignment, and the text policy (Wrap, No Wrap or Truncate).
i Note

- To force the display of a long chart title when No wrap has been selected and the title is longer than the chart width, activate Force to Display.
- The legend size, controlled by the Adjust Layout option, can be determined manually or automatically adjusted depending on the chart size and legend items length for optimal readability. If you select the No Wrap option while the Layout Width is Automatic, the legend width will be adjusted to the legend item length as much as possible when the chart size is small; however long items will be hidden.
- Under Number, select the pattern you want for chart numbers.

3. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.3.14.21 To unlock a value axis in a dual axis chart

In a chart that uses dual axes, the chart normally has axes that are locked and synchronized to the same origin.

Context

In some data series where one axis has positive values and another data series has both negative and positive values, the chart results can appear flat. In this case, you can unlock the axes so that each has its own grid and origin, and the minimum and maximum values share one axis, each according to its data context.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis 2 chart area, select the Design tab.
3. Under Scaling, select Unlock the Axis.

Results

When the axes are unlocked, the second value axis is freed from the grid.
In a XI 3.1 document migrated to BI 4.1 SP 4 or greater, value axes are automatically unlocked.

Related Information

Linear and logarithmic axis scales [page 421]
To format axis grid values, numbers and text [page 423]
To assign axis labels to data values [page 422]
To show a specific range of axis values [page 420]

4.3.14.22 To hide an empty chart

Sometimes charts display no values. For example, if sales of a specific product are discontinued, a chart that normally displays results for that product will appear empty. By default, the application displays such empty charts on reports. If wished, you set the application to hide charts whenever they are empty.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the General tab.
3. In the Display section, select one of the following:
   - Select Hide always to hide the chart.
   - Select Hide when empty to hide the chart when it is empty.
   - Select Hide when following formula is true and type a formula in the box to hide the chart when the formula is true.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]
4.3.14.23 To exclude zero values in charts and tables

In charts and tables, you can exclude zero values from the displayed data.

**Context**

If a chart or table has zero values, you can choose to remove them from the visible output. You can also have hidden items that have zero values.

If you deactivate either of the zero value options:
- In a chart, there are no items.
- In a table, if the values in a column or row for an item equal zero, the column or row does not appear.

**Procedure**

1. In a Web Intelligence document in Design mode, right-click the chart or table frame and select Format Chart or Format Table.
2. Do one of the following:
   - For a chart, in the Global chart area, select the General tab.
   - For a table, select the General tab.
3. Select the following Display options as required:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show rows for which all measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show rows for which the sum of measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show columns for which all measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show columns for the sum of measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show measure values where values = 0</td>
<td>In charts, to suppress a chart item if its measure values are equal to zero.</td>
</tr>
<tr>
<td>Show measure values for which the sum of values = 0</td>
<td>In charts, to suppress a chart item where the sum of its measure values is equal to zero.</td>
</tr>
</tbody>
</table>

**Note**

In charts and tables, empty values are considered the same as zero values, and therefore are also affected by these Display options.

4. Click OK to close the dialog box.
To specify styles, shadow effects and data markers for the chart data

You can specify palette and style effects in line, bar, column, line, point, and radar charts.

Context

Note

By default, dual axis charts use two color palettes.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Configure the following as necessary:
   ○ In Chart Series Style, select an effect.
   ○ Select the Color Palette and the percent of transparency.
   ○ Under Marker, choose symbols, symbol size, symbol palettes, border, border color.
   ○ Under Light and Shadow Effects, select many light and shadow effects: offset, color, shadow, and 1-sided shadow.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]
4.3.14.25  To manage measure-based coloring in Tree maps, Heat maps and Tag Cloud charts

The coloring method determines the color of rectangles or tags based on the value of a reference measure.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Select a coloring method from the Coloring Method for Shapes dropdown list:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palette Coloring</td>
<td>You can define the number of ranges and the colors are associated automatically based on the selected palette. You can also define range definition and the color for null or empty values.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring</td>
<td>You can define a 2- or 3-color gradient associated to the ranges.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring using Measure Polarity</td>
<td>You can define a 2- or 3-color gradient associated to Measure with Neutral Polarity.</td>
</tr>
<tr>
<td>Custom Range Coloring</td>
<td>You can define the ranges manually and associate the colors by either percentage or absolute value.</td>
</tr>
</tbody>
</table>

4. If needed, define a range for the measure values and associate a color to out of range values.
5. Select a color for null or empty values.
6. Define the gradient for gradient methods or associate a color to each range for the custom method. For custom range coloring, define the Maximum and Minimum values of the color ranges. (It is automatic for other methods)
7. Click OK to return to the document.

4.3.14.26  To format a series of data in a chart

You can adjust the color, color opacity and data label position of pieces or points in Bar, Column, Line, Pie, Scatter, Bubble, and Point charts.

Procedure

1. Right-click the piece, point, or legend item in a chart that you want to configure and select Format Data Series from the contextual menu.

i Note
This feature is not available for Box plot, Map, Tag cloud or Waterfall charts.
2. In the Format Data Series dialog box, select Custom.

   i Note
   At any time you can reset the settings in this dialog box to the application default by selecting Automatic.

3. Select a color for the data piece or point from the color picker dropdown panel and adjust the opacity setting as necessary.

4. If you are formatting a Line chart and want to have a thicker line, select a Line Width number.

5. To have a data label appear, in the case where a data label was hidden, or to customize the data label position, select Show Data Labels.

   i Note
   Unselect this option if you want the data label hidden in the chart.

6. Select one of the following data position options:
   
   For all charts:
   ○ Select Outside if you want the label outside of the selected chart piece.
   ○ Select Inside if you want the label inside the selected chart piece.

   i Note
   Data label positioning is not available for Polar, stacked Bar or Column charts.

   For all charts except the Pie chart the following options are also available:
   ○ Select Inside First, Outside Otherwise if you prefer the label inside the selected chart item, but can allow it to be outside the chart piece if there is not enough room for the label in the item.
   ○ Select Outside First, Inside Otherwise if you prefer the label outside the selected chart piece, but can allow it to be inside the chart piece if there is not enough room for the label in the item.

7. Depending on your chart type, you can set the data label alignment when the data position is set to Outside:
   ○ If you are working with a Donut or Pie chart, select one of the following data label alignments:
     ○ Select Side Layout for the data label to appear at the side of the chart block.
     ○ Select Circular Layout for the data label to appear right next to the chart piece.
   ○ If you are working with a Line or Point chart, select one of the following data label alignments: Top, Below, Left, Right.

8. Click Apply to apply your changes and continue to modify the data label changes.

9. Click OK to apply your changes and close the panel.
**4.3.14.27 To show or hide data values**

You can show and hide data values in a chart.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the chart frame and select *Format Chart*.
2. In the *Global* chart area, select the *Data Values* tab.
3. Select *Data label displaying mode* to show the data.
4. You can adjust the settings for various parameters, depending on the chart type. For instance for a pie chart, select the data type, the data position, border size, background color, etc.
5. Click *OK* to return to the document.

**Related Information**

To format a chart [page 396]

**4.3.14.28 To resize a chart**

You can resize the chart using the mouse or in the *Format Chart* dialog box.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the chart frame and click *Format Chart*.
2. In the *Global* chart area, select the *General* tab.
3. Enter or set the chart width and height in the *Width* and *Height* boxes.
4. Click *OK* to return to the document.

**Related Information**

To format a chart [page 396]
4.3.14.29 To apply a chart style

A chart style is a group of settings stored within a source file.

Context

The chart style is used to manipulate a chart (at several levels - graphic, region, and property) before it is rendered. Chart styles allow charts to assembled using a set of predefined settings which include modern chart styles (such as anti-alias, gloss, and emboss). Adapted chart styles offer straightforward chart output customization with pre-settings and themes. They contain the group of settings for a chart including:

- layout - the settings that determine how each chart is displayed
- chart items (such as the title, the legend, the axes)
- chart location (for example, where chart items are placed, if they are visible)
- theme - the settings that determine how the chart looks
- color palettes, etc.
- textures (such as the texture of the background)
- shadows
- fonts

Note

You can choose among pre-defined color palettes.

When creating a chart, we recommend that you feed it with all needed dimensions; apply the style, then change the settings to refine the chart format. If you modify a setting before applying a template, you may alter your modifications if these settings are included in the template definition. If that happens, the only way to get them back is to do an Undo action.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select an existing chart or create one.
3. With the chart selected, in the Formatting tab, in the Chart Style subtab, select a style from the Format Chart Style icon dropdown list:
   - Belize (Default)
   - Flashy Style
   - Normal Style
   - High Contrast
Related Information

To format a chart [page 396]

4.3.14.30 To change the chart type by using Turn Into

You can change the chart type using Turn Into in the chart contextual menu.

Procedure

1. In a Web Intelligence document in Design mode, right-click the table or chart.
2. Select Turn Into from the contextual menu, then More Transformations.
   The Turn Into dialog box appears.
3. Click the chart category you want, then click a chart icon.
   Edit the chart values as necessary.
4. Click OK.
   The selected template is applied to the block and displays the data in the chart type you chose.

Related Information

To format a chart [page 396]
Line charts [page 377]
Bar charts [page 370]
Box plot charts [page 371]
Column charts [page 371]
Geomap charts [page 374]
Map charts [page 378]
Pie charts [page 378]
Point charts [page 379]
Radar charts [page 380]
Tag cloud charts [page 380]
Waterfall charts [page 381]
4.4 Formatting reports and report elements

You can format your report and report elements in order to present the report with a company style.

Once your report is setup with the report elements you want to put on display, you can format them so that the data is represented exactly like you want it to be.

4.4.1 Formatting the report layout

You can format your report and report elements in order to present the report with a company style.

You can format the report layout manually, or you can create a company stylesheet using a CSS file. You can add color background, corporate images, and so on. To change the report format, you must view the report in Design mode in order to access the report formatting options. You can format the following report elements:

<table>
<thead>
<tr>
<th>To set the...</th>
<th>Do this...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name the report</td>
<td>Right-click in the report, select Format Report General, then name the report.</td>
</tr>
<tr>
<td>Number of records per page</td>
<td>Right-click in the report, select Format Report General, then set the number of records per page.</td>
</tr>
<tr>
<td>Report border style</td>
<td>Right-click in the report, select Format Report Border, set the border style, thickness, and color.</td>
</tr>
<tr>
<td>Report background</td>
<td>Right-click in the report, select Format Report Appearance and set the background (color, pattern, image).</td>
</tr>
<tr>
<td>Page size</td>
<td>Right-click in the report, select Format Report Layout, select a page size.</td>
</tr>
<tr>
<td>Page orientation</td>
<td>Right-click in the report, select Format Report Layout, select landscape or portrait orientation.</td>
</tr>
<tr>
<td>Page scaling</td>
<td>Right-click in the report, select Format Report Layout, select the page scaling.</td>
</tr>
<tr>
<td>Page margins</td>
<td>Right-click in the report, select Format Report Layout, and set the different margin sizes, as required.</td>
</tr>
<tr>
<td>Show/hide header</td>
<td>Right-click in the report, select Format Report Layout, select or unselect Show header. or Right-click in the report header, select Format Header, select or unselect Show header.</td>
</tr>
<tr>
<td>To set the...</td>
<td>Do this...</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| Header size  | Right-click in the report, select Format Report > Layout, enter a size for the header.  
or Right-click in the report header, select Format Header, enter a size for the header. |
| Header border style | Right-click in the report header, select Format Header, select a style for the header border. |
| Header background | Right-click in the report header, select Format Header, select a background color, a pattern or enter an address for an image. |
| Show/hide footer | Right-click in the report, select Format Report > Layout, select or unselect Show footer  
or Right-click in the report footer, select Format Footer and select or unselect Show footer. |
| Footer size | Right-click in the report, select Format Report > Layout, enter a size for the footer.  
or Right-click in the report footer, select Format Footer, enter a size for the footer. |
| Footer border style | Right-click in the report footer, select Format Footer, select a style for the footer border. |
| Footer background | Right-click in the report footer, select Format Footer, select a background color, pattern or enter an address for an image. |

**Related Information**

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]  
Formatting your reports using Cascading Style Sheets [page 437]  
Creating a corporate palette for charts [page 411]  
Formatting tables and table cells [page 447]
4.4.1.1 To format the appearance of reports and their headers, footers, sections, tables, and table cells

You can define the background color and pattern of a report, or its headers, footers, sections, tables, and even specific cells in tables. The pattern can be a skin, also known as a theme, an image from a URL address or a file.

Procedure

1. In a Web Intelligence document in Design mode, right-click the report, a header, footer, report section, table, or a selection of one or more cells in a table and select the applicable Format option from the contextual menu.
   For example, if you right-click on a selection of a group of cells, select Format Cells from the contextual menu.

2. In the format dialog box that appears, select the Appearance tab.
   The Background section in this tab shows the settings you can apply to your selected items.

3. To select a color for the background of the selected items:
   a. Click the radio button next to the color palette icon.
   b. Click the arrow next to the color palette icon to display the palette.
   c. Select a color from the palette.
   d. Click OK to return to the document.

   **Note**
   When the background color of cells are defined (even as white), they take precedence over the table background color. If you apply a background color to an entire table but one or more cells remain white, open the Format Cells dialog box for these cells and check their color background setting.

4. To format the pattern for the selected items, do one of the following:
   ○ To select a skin, select the Skin radio button, and select a skin from the dropdown list.

   **i Note**
   If you are formatting the table appearance, you need to set the horizontal or vertical padding value to greater than 0 in the Spacing and Padding section of the Appearance tab, otherwise the skin will not appear.

   ○ To select an image at a URL location, select the Image from address radio button, and do one of the following:
     ○ Paste in the text box the URL address for an image. Click the Validate icon.
     ○ To create a dynamic image using a complex formula, click the Formula Editor icon next to the text box.
       Example: Table cell syntax
       "<URL>"+"<column header object>"+"<image format>"
To access an image on the corporate server, type the image name. The application inserts `boimg://` when you click **Apply**.

The dynamic image appears only if the column header object used to define the image is in the table. However, the object can be hidden. If the object is not in the table, then there is no context available to calculate the images address.

To select use an image from a file on your computer or a server, select the **Image from file** radio button, click **Add** or **Browse**, navigate to the image and click **Open**.

If you are using an image, you can select a display location from the **Display** dropdown list.

- If you select a **Normal** display, then you can set the position of the image from the **Position** dropdown lists.
- If you select **Stretch**, the image adjusts to fit the entire space, irrespective of the image height and width settings.
- If you select **Tile**, the image is repeated in the space.
- If you select a **Horizontal Tile** or **Vertical Tile** location, then you also have additional **Position** options.

To remove an image or pattern, select **None** for the pattern.

5. Click **OK** to return to the document.

### Results

**Restriction**

Because there is no background image feature in Excel, when you save or export a report to the Excel format any background images are not exported to the output file.

### Related Information

To build a formula in the Formula Editor [page 317]
Formatting the report layout [page 266]
Formatting tables and table cells [page 447]
4.4.2 Formatting your reports using Cascading Style Sheets

Web Intelligence Cascading Style Sheets (CSS) define how to display your reports and determine the presentation of documents.

You can edit the CSS to apply a specific style to the presentation of documents. You can export the file, modify the styles according to your needs and then import the file back. You can also distribute the style sheet to other users as a standard style.

The Web Intelligence CSS conforms to the W3C CSS core syntax. However, the core syntax does not imply anything about property names, types, and semantic. Web Intelligence CSS supports locale-specific style sheets.

As of 4.2 SP6, a new CSS is deployed by default. It is used by default only in every new document you create after installing the 4.2 SP6 version. If you want to use the new CSS in older documents, or keep your corporate CSS you previously saved in new documents, make sure to import the correct CSS file. To do so, refer to the Modifying the document default style section.

**i Note**
The CSS style sheet does not control the color of charts. There is a separate file for defining corporate palettes for charts. For more information on how to assign colors to charts, see Assigning colors to charts [page 405].

**i Note**
The Cascading Style Sheets are derived from the W3C CSS. To modify the CSS of your documents, you must be familiar with the CSS core syntax of the W3C. For more information, see http://www.w3.org.

Using a CSS allows you to:

- Define a company-wide style sheet in order to define standard settings (such as a company logo).
- Define different styles to present a specific type of information. For example, you can use one color for products sold, another color for expenses and another color for revenues.
- Create a style sheet in order to encode personal preferences.
- Personalize the presentation of the documents you create.

Related Information

- Formatting the report layout [page 266]
- Creating a corporate palette for charts [page 411]
- Formatting tables and table cells [page 447]
- Modifying the document default style [page 438]
4.4.2.1 Using a Cascading Style Sheet in documents

When you create a report or a report element in a Web Intelligence document, the formatting is entirely based on the default style.

If specific formatting is done on these elements by the user from the Right-click context menu (Format option), the modified properties overwrite locally the values taken from the default style.

To remove this specific formatting, right-click the report and select Format Clear Format.

4.4.2.2 Modifying the document default style

The document default style is stored in a Cascading Style Sheet (CSS) file that is embedded into the document itself.

- To modify the default style, you can export the CSS file. To export a CSS file, in the Properties tab, click Document Change Default Style Export Style.
- You can use any text editor to edit a CSS file. Once you have edited the file, save and import it to apply the changes.

> i Note
You have to import the CSS file every time you edit it.

To import a CSS file, in the Properties tab, click Document Change Default Style Import Style. The CSS file you import is applied to the report.

> i Note
If the properties of an element have been set through the user interface (toolbox, context menu, dialog box), these properties are not affected by the CSS you import.

- To apply a CSS to an element that has already been formatted through the user interface, you have to clear its format. To clear the format of an element, right-click the element and select Format Clear Format.
- To clear the format of all the elements in a page, right-click the report body and select Format Clear Format.

> i Note
You have to clear the format of the header and footer manually because they are not a part of the report body.

- You can undo changes at any time by clicking the Undo button.
- To restore the default CSS, in the Properties tab, click Document Reset standard Default Style.
4.4.2.3 Modifying and using the standard default style

The standard CSS file is named WebIDefaultStyleSheet.css.

This standard CSS file is located by default at:

C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\images

When you create a 4.X document, or when you edit a Web Intelligence 3.1 document for the first time, the standard CSS is embedded into the Web Intelligence document to become the document style. This default style document diverges from the standard and can be locally modified.

To reset the document default style to the standard style, in the Properties tab, click Document > Reset standard Default Style. The standard CSS will replace the previous CSS in the document.

To publish a standard default file, you must have access to the ../images/ folder of your servers and Web Intelligence Rich Client installations to put a new version of WebIDefaultStyleSheet.css.

4.4.2.4 Web Intelligence CSS syntax

The Web Intelligence CSS conforms to the W3C CSS core syntax.

However, the core syntax does not imply anything about property names, types and semantic.

Web Intelligence CSS supports locale-specific style sheets.

Related Information

http://www.w3.org/TR/CSS21/syndata.html

4.4.2.4.1 Cascading Style Sheet elements

In order to modify the way your document is displayed, you have to modify the Web Intelligence CSS elements of the document.

To modify an element, you have to modify its properties.

This table shows the elements you can edit in the CSS file:

<table>
<thead>
<tr>
<th>Element</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>REPORT</td>
<td>Tag that contains the report</td>
</tr>
<tr>
<td>PAGE_BODY</td>
<td>Tag that contains the page</td>
</tr>
</tbody>
</table>
### 4.4.2.4.2 Cascading Style Sheet properties

For many properties, Web Intelligence CSS uses the same names as the W3C CSS. Some property names change and some are ignored.

<table>
<thead>
<tr>
<th>Element</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE_HEADER</td>
<td>Tag that contains the area on top of the PAGE_BODY</td>
</tr>
<tr>
<td>PAGE_FOOTER</td>
<td>Tag that contains the area in the bottom of the PAGE_BODY</td>
</tr>
<tr>
<td>SECTION</td>
<td>Tag that contains an area inside the PAGE_BODY</td>
</tr>
<tr>
<td>TABLE</td>
<td>Tag that contains a table</td>
</tr>
<tr>
<td>VTABLE</td>
<td>Tag that modifies a table vertically</td>
</tr>
<tr>
<td>HTABLE</td>
<td>Tag that modifies the table horizontally</td>
</tr>
<tr>
<td>COLINFO</td>
<td>Tag that contains the columns of a table</td>
</tr>
<tr>
<td>ROWINFO</td>
<td>Tag that contains the rows of a table</td>
</tr>
<tr>
<td>CELL</td>
<td>Tag that contains the cells of a table</td>
</tr>
<tr>
<td>AXIS</td>
<td>Tag that defines the relationship between the columns and rows of a table</td>
</tr>
<tr>
<td>FORM</td>
<td>Tag that contains a form</td>
</tr>
<tr>
<td>XELEMENT</td>
<td>Tag that contains a graphic</td>
</tr>
<tr>
<td>BAG</td>
<td>Tag that contains elements and places them relatively using X and Y</td>
</tr>
<tr>
<td>WOB</td>
<td>Tag that contains elements and places them automatically</td>
</tr>
</tbody>
</table>

**Example**

Web Intelligence CSS uses the property `min-width` and the W3C CSS uses the property `width`. Both properties have the same use.

**Related Information**

- For CSS 2.1
- For CSS 3
### 4.4.2.4.2.1 Report page properties

For cascading style sheets, you can edit the following report page properties.

This table shows the properties that can be applied to the element `<REPORT>`:

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>page-format-dimension-height</code></td>
<td>Height of page</td>
<td>42094</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-dimension-width</code></td>
<td>Width of page</td>
<td>29764</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-margin-bottom</code></td>
<td>Size of the bottom margin of the page</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-margin-left</code></td>
<td>Size of the left margin of the page</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-margin-right</code></td>
<td>Size of the right margin of the page</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-margin-top</code></td>
<td>Size of the top margin of the page</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-format-orientation</code></td>
<td>Orientation of page</td>
<td>portrait</td>
<td>landscape, portrait</td>
</tr>
<tr>
<td><code>page-records-horizontal</code></td>
<td>In Quick Display mode, specifies how many data records can be horizontally displayed before triggering a page break</td>
<td>150</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-records-vertical</code></td>
<td>In Quick Display mode, specifies how many data records can be vertically displayed before triggering a page break</td>
<td>50</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-scaling-factor</code></td>
<td>Zoom percentage</td>
<td>100</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-scaling-tall</code></td>
<td>When this property is defined, the report will be scaled so that it fits in the given height</td>
<td>100</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-scaling-wide</code></td>
<td>When this property is defined, the report will be scaled so that it fits in the given width</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td><code>page-target-mode</code></td>
<td>Pagination mode: quick display or not</td>
<td>undefined</td>
<td>undefined, quick, all</td>
</tr>
</tbody>
</table>
### 4.4.2.4.2.2 Report element properties

For cascading style sheets, you can edit the properties in report elements.

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>autofit-height</td>
<td>Specifies whether the height of the element can be adjusted to fit its content</td>
<td>yes</td>
<td>yes/no</td>
</tr>
<tr>
<td>autofit-width</td>
<td>Specifies whether the width of the element can be adjusted to fit its content</td>
<td>yes</td>
<td>yes/no</td>
</tr>
<tr>
<td>bookmark</td>
<td>Specifies whether the element will be bookmarked</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>h-align</td>
<td>Horizontal positioning of the element</td>
<td>none</td>
<td>none, top, center, bottom</td>
</tr>
<tr>
<td>hide</td>
<td>Specifies whether the element is hidden</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>min-height</td>
<td>Minimal height of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>min-width</td>
<td>Minimal width of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>never-alternate</td>
<td>This property can be used to avoid the application of the alternate style on the element</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>padding-bottom</td>
<td>How much space to put between the bottom border and the content of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>padding-left</td>
<td>How much space to put between the left border and the content of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>padding-right</td>
<td>How much space to put between the right border and the content of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>padding-top</td>
<td>How much space to put between the top border and the content of the element</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>struct-min-height</td>
<td>Minimal height of the element when displayed in structure mode</td>
<td>900</td>
<td>Numeric value</td>
</tr>
<tr>
<td>struct-min-width</td>
<td>Minimal width of the element when displayed in structure mode</td>
<td>4050</td>
<td>Numeric value</td>
</tr>
<tr>
<td>v-align</td>
<td>Vertical positioning of the element</td>
<td>none</td>
<td>none, top, center, bottom</td>
</tr>
</tbody>
</table>

These properties can be applied to the following elements:
### 4.4.2.4.2.3 Formatting properties

For cascading style sheets, you can edit the Formatting elements.

This table shows the properties that you can edit to modify the Formatting elements:

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>background-color</td>
<td>Color to be displayed in background</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>background-fill</td>
<td>Describes what will be displayed in background</td>
<td>none</td>
<td>color, bitmap, bitmapAndColor, skin, none</td>
</tr>
<tr>
<td>background-h-align</td>
<td>Horizontal position of the background image</td>
<td>center</td>
<td>left, center, right</td>
</tr>
<tr>
<td>background-image</td>
<td>Image to be displayed in background</td>
<td>None</td>
<td>Any image you want</td>
</tr>
<tr>
<td>background-inner-height</td>
<td>Inner height of background</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>background-inner-width</td>
<td>Inner width of background</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>background-type</td>
<td>Determines how the background image will be laid out or repeated</td>
<td>box</td>
<td>box, tile, vtile, htile, stretch</td>
</tr>
<tr>
<td>background-v-align</td>
<td>Vertical position of the background image</td>
<td>center</td>
<td>top, center, bottom</td>
</tr>
<tr>
<td>border-bottom-color</td>
<td>Color of an element's bottom border</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>border-bottom-style</td>
<td>Style of an element's bottom border</td>
<td>none</td>
<td>none, dashed, dotted, double, plain</td>
</tr>
<tr>
<td>border-bottom-width</td>
<td>Width of an element's bottom border</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>Property name</td>
<td>Description</td>
<td>Default value</td>
<td>Value range</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------</td>
<td>---------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>border-left-color</td>
<td>Color of an element's left border</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>border-left-style</td>
<td>Style of an element's left border</td>
<td>none</td>
<td>none, dashed, dotted, double, plain</td>
</tr>
<tr>
<td>border-left-width</td>
<td>Width of an element's left border</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>border-right-color</td>
<td>Color of an element's right border</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>border-right-style</td>
<td>Style of an element's right border</td>
<td>none</td>
<td>none, dashed, dotted, double, plain</td>
</tr>
<tr>
<td>border-right-width</td>
<td>Width of an element's right border</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>border-top-color</td>
<td>Color of an element's top border</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>border-top-style</td>
<td>Style of an element's top border</td>
<td>none</td>
<td>none, dashed, dotted, double, plain</td>
</tr>
<tr>
<td>border-top-width</td>
<td>Width of an element's top border</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>color</td>
<td>Foreground color</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>default-date-h-align</td>
<td>Default horizontal alignment when a date is being displayed</td>
<td>right</td>
<td>left, center, right, auto</td>
</tr>
<tr>
<td>default-numeric-h-align</td>
<td>Default horizontal alignment when a numeric value is being displayed</td>
<td>right</td>
<td>left, center, right, auto</td>
</tr>
<tr>
<td>default-text-h-align</td>
<td>Default horizontal alignment when a text is being displayed</td>
<td>left</td>
<td>left, center, right, auto</td>
</tr>
<tr>
<td>font-family</td>
<td>Name of font family</td>
<td>default</td>
<td>Web Intelligence-supported fonts</td>
</tr>
<tr>
<td>font-orientation</td>
<td>Describes the orientation of the displayed text</td>
<td>normal</td>
<td>normal, hotel, 45D, 90D, 180D, 270D, 315D</td>
</tr>
<tr>
<td>font-size</td>
<td>Size of the displayed font</td>
<td>0</td>
<td>Numeric value in points (pt.)</td>
</tr>
<tr>
<td>font-style-italic</td>
<td>Activates the italic font style</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>font-weight-bold</td>
<td>Activates the bold font style</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>text-align</td>
<td>Horizontal alignment of the text</td>
<td>left</td>
<td>left, center, right, auto</td>
</tr>
</tbody>
</table>
These properties can be applied to the following elements:

- BAG
- WOB
- CELL
- VTABLE
- HTABLE
- XTABLE
- TABLE
- XELEMENT
- SECTION

### 4.4.2.4.2.4 Spacing properties

For cascading style sheets, you can edit the spacing element properties.

This table shows the properties that you can edit to modify the spacing elements:

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>h-spacing</td>
<td>Horizontal spacing of children</td>
<td>0</td>
<td>Numeric value</td>
</tr>
<tr>
<td>v-spacing</td>
<td>Vertical spacing of children</td>
<td>0</td>
<td>Numeric value</td>
</tr>
</tbody>
</table>

These properties can be applied to the following elements:

- BAG
- WOB

### 4.4.2.4.2.5 Hyperlink properties

For cascading style sheets, you can edit the hyperlink elements.

This table shows the properties that you can edit to modify the hyperlink elements:
<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>active-color</td>
<td>Color of hyperlinks when they are being activated</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>hover-color</td>
<td>Color of hyperlinks when the user designates it (by a pointing device)</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>link-color</td>
<td>Color of hyperlinks</td>
<td>#0000ff</td>
<td>Any hexadecimal color</td>
</tr>
<tr>
<td>visited-color</td>
<td>Color of visited hyperlinks</td>
<td>#000000</td>
<td>Any hexadecimal color</td>
</tr>
</tbody>
</table>

These properties can be applied to the following elements:

- REPORT

### 4.4.2.4.2.6 Break properties

For cascading style sheets, you can edit the break element properties.

This table shows the properties that can be applied to the BREAK element:

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
<th>Default value</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>break-newpage</td>
<td>Reports always start on a new page</td>
<td>false</td>
<td>true/false</td>
</tr>
<tr>
<td>break-onepage</td>
<td>Reports start on a new page only if they do not fit in the current page</td>
<td>true</td>
<td>true/false</td>
</tr>
</tbody>
</table>

### 4.4.2.4.3 Cascading Style Sheet units

Numeric values can be very important in Cascading Style Sheet units.

#### Numeric values in fonts

When you assign a numeric value to the property `font-size`, you can only use the unit "points" (pt).

For example: `font-size : 14pt;`

#### Numeric values in dimension properties

When you assign a numeric value to any other dimension property, you can use centimeters (cm), inches (in) or "metric" (without any unit).
4.4.2.5 Style and 3.x documents

When you open a Web Intelligence 4.x document with a Web Intelligence 3.x format, the style of the document does not change, regardless of the style defined in the standard CSS.

However, the style used while creating report elements or during Turn into operations will come from the CSS.

The Web Intelligence CSS replaces the old way of personalizing your documents.

To set the default style defined by the report elements in the document, select the report elements and go to Format Clear Format. The formatting of the selected objects will be cleared and the default style will be applied.

The DefaultConfig.xml file used in the previous versions is obsolete.

Here are some correspondences between the entries of Web Intelligence CSS and the obsolete entries of the DefaultConfig.xml file used in previous versions.

<table>
<thead>
<tr>
<th>WebI selector</th>
<th>Corresponding entry in defaultConfig.xml</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE</td>
<td>table*Table</td>
</tr>
<tr>
<td>FORM</td>
<td>table*Form</td>
</tr>
<tr>
<td>SECTION</td>
<td>Section*background</td>
</tr>
<tr>
<td>CELL</td>
<td>freeCell*default</td>
</tr>
</tbody>
</table>

4.4.3 Formatting tables and table cells

In Web Intelligence, you can define several visual aspects of tables and cells in reports.

- Select a background color for the table
- Insert an image or skin in a table or one or more of its cells
- Format table cells or borders
- Format text in table cells
- Set cell height and width
- Copy and paste formatting
- Set the position of the table in the report page
- Layer tables and cells
- Merge table cells

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells

You can set the background color for a table or its cells. When the background color of cells are defined (even as white), they take precedence over the table background color.

**Procedure**

1. In a Web Intelligence document in **Design** mode, right-click the table or cell and select **Format Table** or **Format Cell** from the contextual menu.
2. In the **Appearance** tab, click the radio button next to the color palette icon.
3. Click the arrow next to the color palette icon to display the palette.
4. Select a color from the palette.
5. Click **OK** to return to the document.

> **Tip**

If you try to apply a background color to all of a table, and the cells remain white, make sure that the cells are not set with a white background.

**Related Information**

- To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
- To define alternate row and column colors for a table [page 449]
- To format table or cell borders [page 450]
- To format text in table cells [page 451]
- To set cell height and width [page 452]
- To copy formatting using the Format Painter tool [page 454]
- To set the position of a table or chart on the report page [page 394]
- To layer tables and cells [page 456]
- To merge table cells [page 458]
- Formatting the report layout [page 266]
- Formatting your reports using Cascading Style Sheets [page 437]
- Creating a corporate palette for charts [page 411]
4.4.3.2 To define alternate row and column colors for a table

You can define row colors in a table in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the table and select Format Table from the contextual menu.
2. In the Appearance tab, in the Alternate Color section, set the frequency with which you want the alternate color to appear for the alternate row color in the combo box next to Frequency.
3. Click the arrow next to Color and select the color using the color palette.
4. Click OK to return to the document.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To format table or cell borders [page 450]
To format text in table cells [page 451]
To set cell height and width [page 452]
To copy formatting using the Format Painter tool [page 454]
To set the position of a table or chart on the report page [page 394]
To layer tables and cells [page 456]
To merge table cells [page 458]
Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]
4.4.3.3 To format table or cell borders

You can format the border of a table or cell in a table in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, right-click the table or cell and select Format Table or Format Cell from the contextual menu.
2. In the Border tab, use the controls in the tab to configure the border styles and colors.

   Each time you change a style setting, you need to click the square or one of the line buttons so that it is applied to the Preview section, or it will not be applied to the cell or table.

   When borders are defined between two adjacent cells, priority is given to lines in the order Double Dashed Dotted Plain none. In case of equivalent priorities between the two cells, the right border of the left cell or the bottom border of the top cell will be shown.
3. Click OK to return to the document.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format text in table cells [page 451]
To set cell height and width [page 452]
To copy formatting using the Format Painter tool [page 454]
To set the position of a table or chart on the report page [page 394]
To layer tables and cells [page 456]
To merge table cells [page 458]
Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]
4.4.3.4 To format text in table cells

You can format text in tables in a Web Intelligence document in Design mode.

Procedure

1. In a Web Intelligence document in Design mode, select the cells whose text you want to format.

   **i Note**

   If you select one cell in the column, depending on the type of table, the following cells are also selected:

<table>
<thead>
<tr>
<th>Table type</th>
<th>Resulting cells are selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>Row</td>
</tr>
<tr>
<td>Vertical</td>
<td>Column</td>
</tr>
<tr>
<td>Cross</td>
<td>Entire table body</td>
</tr>
</tbody>
</table>

   **Tip**

   You can select multiple cells in one of the following ways:
   - Select the first cell, hold down the `Control` key, and then click additional cells.
   - To select a contiguous group of columns or rows, select the beginning row or column, hold down the `Shift` key, and then click the end location of the group of rows or columns.

2. Right-click on the cell selection and click *Format Cell*.
3. In the *Font* tab, select the font, style, size and effects, as needed.
4. Click *OK* to return to the document.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format table or cell borders [page 450]
To set cell height and width [page 452]
To copy formatting using the Format Painter tool [page 454]
To set the position of a table or chart on the report page [page 394]
To layer tables and cells [page 456]
To merge table cells [page 458]
Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
4.4.3.5  To activate text wrapping in a table cell

You can activate the text wrapping in a cell in a table.

Procedure

1. Open a Web Intelligence document in *Design* mode.
2. Select a cell in the table and do one of the following:
   ○ In the *Format* or *Formatting* tab and in the *Alignment* subtab, click the *Wrap Text* icon.
   ○ Right-click the cell and do one of the following:
     ○ Select *Text*, then *Wrap Text*.
     ○ Select *Format Cell*. In the *Format Cell* dialog box, select Alignment in the Side Pane and activate *Wrap Text*. Click OK to close the dialog box.

Next Steps

To deactivate text wrapping in a cell, select it and do one of the following techniques offered above and unselect *Wrap Text*.

4.4.3.6  To set cell height and width

You can define the height and width of cells by using drag and drop or specifying the size of cells in the *Format Cell* dialog box.

Context

→ Tip

If you want to hide the contents of a cell, right-click the cell and select *Hide* → *Hide dimension*.
Procedure

1. Open a Web Intelligence document in Design mode.
2. To set a fixed cell height and width, do one of the following:
   - Drag the cell borders until the cell is the height and width you want.
   - Select the cells you want to change, then right-click the cells and select Format Cell. In the General tab, set the cell height and width.
3. To set the cell to automatically fit to its text contents, do one of the following:
   - Select Autofit width to content or Autofit height to content or both, and set the minimum width and height.
     Autofit retains the current cell size as the minimum size and enlarges the cell size if the string that the cell contains is larger than the minimum size specified.
     Some functions are incompatible with autofitted cells. If you place any of these functions in an autofitted cell, the function returns the #RECURSIVE error message.
   - To set an autofit cell width, double-click either sides of the cell.
   - To set an autofit cell height, double-click the bottom border of the cell.

Restriction

- Documents that contain tables with the cell size set to autofit take longer to display than documents where tables contain cells with a fixed cell width and height.
- Autofit height to content and Autofit width to content properties do not work as well when the Read content as option is set to HTML.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format table or cell borders [page 450]
To format text in table cells [page 451]
To copy formatting using the Format Painter tool [page 454]
To set the position of a table or chart on the report page [page 394]
To layer tables and cells [page 456]
To merge table cells [page 458]
Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]
4.4.3.6.1 Effects of autofit and text wrapping in table cells

This topic lists the effects of the autofit and wrap text features when used separately and in combination.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrap text</td>
<td>Text is wrapped at the end of the cell.</td>
</tr>
<tr>
<td>Autofit width to content</td>
<td>Cell width is adjusted to display all the text.</td>
</tr>
<tr>
<td>Autofit height to content</td>
<td>Cell height is adjusted to display all the text.</td>
</tr>
<tr>
<td>Autofit width to content + Autofit height to content</td>
<td>Cell width and height is adjusted to display all the text</td>
</tr>
<tr>
<td>Wrap text + Autofit width to content</td>
<td>Cell width is adjusted to accomodate the longest word. Because the cell height is not adjusted to the number of lines of text, text might be truncated vertically.</td>
</tr>
<tr>
<td>Wrap text + Autofit height to content</td>
<td>Cell height is adjusted to accommodate the number of lines of text created by the wrap text. Because the cell width is not adjusted to the longest word, text might be truncated horizontally.</td>
</tr>
<tr>
<td>Wrap text + Autofit height to content + Autofit width to content</td>
<td>Cell height and width is adjusted to the text and there is no horizontal or vertical truncation.</td>
</tr>
</tbody>
</table>

Related Information

To activate text wrapping in a table cell [page 452]
To set cell height and width [page 452]

4.4.3.7 To copy formatting using the Format Painter tool

You use the Format Painter tool to quickly apply the formatting from a report, table or cell to other reports, tables or cells.

Context

The formatting options applied depend on the objects you choose as the source and target. In general, only properties that affect the visual formatting, for example font style, background color, are applied. Properties that affect the display of data, for example table properties such as Avoid duplicate row aggregation, are not applied.
**Procedure**

1. In a Web Intelligence document in *Design* mode, select the report, table or cell whose formatting you want to apply.
2. In the *Tools* subtab under the *Formatting* tab, click the *Format Painter* icon to apply the formatting once, or double-click to apply the formatting multiple times.
3. Click the report, table or cell to which you want to apply the formatting.

   If you single-clicked the *Format Painter* icon, it is deactivated.

   If you double-clicked the *Format Painter*, it remains activated. To deactivate it, click the *Format Painter* icon again or press `Esc` to cancel the formatting operation.

**Related Information**

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format table or cell borders [page 450]
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To set the position of a table or chart on the report page [page 394]
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Formatting your reports using Cascading Style Sheets [page 437]
Creating a corporate palette for charts [page 411]

**4.4.3.8 To set the position of a table or chart on the report page**

You can set the position of a table or chart in a report.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the border of the table or chart, and select *Format Table* or *Format Chart*.
2. In the *Layout* section of the table or chart format panel, use the controls in the *Relative Position* section to set the position of the table or chart in relation to other report elements.
You can also reach the Layout tab in the table or chart format panel by one of the following ways:
○ In the Report Elements tab, in the Position subtab, click Align, then an alignment option.
○ Right-click the table or chart and select Align, then an alignment option.

3. Click OK.

Related Information

To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
To select a background color for the table or cells [page 448]
To define alternate row and column colors for a table [page 449]
To format table or cell borders [page 450]
To format text in table cells [page 451]
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To copy formatting using the Format Painter tool [page 454]
To layer tables and cells [page 456]
Formatting the report layout [page 266]
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4.4.3.9 To layer tables and cells

Layering determines how tables and cells appear when they occupy the same space in a report. An object further forward in the layering order appears over an object further backward in the layering order.

Procedure

1. In a Web Intelligence document in Design mode, select the table or cell whose layer you want to set.
2. Right-click the selection, click Order and select the layering option.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bring to Front</td>
<td>Make the table or cell the first object in the layering order.</td>
</tr>
<tr>
<td>Send to Back</td>
<td>Make the table or cell the last object in the layering order.</td>
</tr>
<tr>
<td>Bring Forward</td>
<td>Bring the table or cell one layer forward in the layering order.</td>
</tr>
<tr>
<td>Send Backward</td>
<td>Send the table or cell one layer backward in the layering order.</td>
</tr>
</tbody>
</table>
4.4.3.10 To exclude zero values in charts and tables

In charts and tables, you can exclude zero values from the displayed data.

Context

If a chart or table has zero values, you can choose to remove them from the visible output. You can also have hidden items that have zero values.

If you deactivate either of the zero value options:
- In a chart, there are no items.
- In a table, if the values in a column or row for an item equal zero, the column or row does not appear.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart or table frame and select Format Chart or Format Table.
2. Do one of the following:
   - For a chart, in the Global chart area, select the General tab.
   - For a table, select the General tab.
3. Select the following Display options as required:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show rows for which all measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show rows for which the sum of measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show columns for which all measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show columns for which the sum of measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show measure values where values = 0</td>
<td>In charts, to suppress a chart item if its measure values are equal to zero.</td>
</tr>
<tr>
<td>Show measure values for which the sum of values = 0</td>
<td>In charts, to suppress a chart item where the sum of its measure values is equal to zero.</td>
</tr>
</tbody>
</table>

*Note*

In charts and tables, empty values are considered the same as zero values, and therefore are also affected by these *Display* options.

4. Click **OK** to close the dialog box.

### 4.4.3.11 To merge table cells

You can merge table cells in a Web Intelligence document in *Design* mode.

**Procedure**

1. In a Web Intelligence document in *Design* mode, to select the cells you want to merge, hold down the **Control** key and click the cells.
2. Keep the **Control** key pressed, right-click the selected cells, and select **Merge**.

*Caution*

When you merge cells, the resulting merged cell contains the data only from the first cell you selected only. Data from all the other cells is lost.

**Related Information**

- To format the appearance of reports and their headers, footers, sections, tables, and table cells [page 268]
- To select a background color for the table or cells [page 448]
- To define alternate row and column colors for a table [page 449]
- To format table or cell borders [page 450]
4.4.4 Formatting charts

You can format a chart area or a selected chart area (title, legend, axes, plot area, area title) in Web Intelligence.

You can find chart format options in the Format or Formatting toolbar in the Design mode.

4.4.4.1 To format a chart

You can format a chart in a report using options in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Format Chart dialog box, select the chart area that you want to format.
3. Do one of the following:
   - In Web Intelligence Rich Client, select the functional tab that you want to change in the Side Panel.
   - In the Web Intelligence HTML interface, expand the tab of the chart area you want to format, then select the functional tab.
4. When you have made your changes, click Apply if you want to see the changes before you close the dialog box or if you want to make some other changes before you close the dialog box. Otherwise, click OK to save the changes and close the dialog box.
Results

Another way to access the Format Chart dialog box is to select the chart. In the Formatting tab, in the Chart Style subtab, click Format Chart.

4.4.4.2 Data intervals in Tree Maps, Heat Maps and Tag Cloud charts

Data intervals are based on colors in Tree Map, Heat Map, and Tag Cloud charts that use intervals.

You can use one of the following shape coloring methods:

<table>
<thead>
<tr>
<th>Coloring method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom Range Coloring</td>
<td>The Custom Range Coloring method uses ranges that you set based on an increment or percentage, and you select the color that applies to each range.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring</td>
<td>The Gradient-based Palette Coloring method uses a 2 or 3 color gradient definition, and you select the color that applies to each gradient.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring Using Measure Polarity</td>
<td>The Gradient-based Palette Coloring Using Measure Polarity method not only uses a 2 or 3 color gradient definition, it also uses a 2 or 3 color neutral polarity definition.</td>
</tr>
<tr>
<td>Palette Coloring</td>
<td>The Palette Coloring method applies a different color from the selected palette to each legend interval.</td>
</tr>
</tbody>
</table>

**i Note**

You should not use these charts with hierarchical nodes for aggregate measures because the color scale can be distorted. To deactivate these nodes, deactivate the Show Parent Node option in the Global General section of the Format Chart dialog box.

Palette coloring methods

In all of the palette coloring methods, the data range is defined in the Range Definition setting. This range defines the set of data that is distributed in the intervals.

You can define the number of intervals which will be created within the data range, using the Number of Intervals setting.

You can set the way data is distributed in chart intervals using the Data Distribution Mode setting.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
</table>
**Distribution by Values**

The range of attribute values is divided into equal-sized ranges. This method emphasizes the amount of an attribute value relative to other values.

**Note**

If the data values are clustered instead of being evenly distributed, then most of the data can exist in one or two ranges and some ranges can have no data.

---

**Distribution by Quartiles**

The quartile distribution works well with linearly-distributed data. Because data is grouped by the number in each range, the resulting chart can be misleading. Similar data can be placed in adjacent ranges, or data with widely different values can be put in the same range. This distortion can be minimized by increasing the number of ranges.

**Note**

Data with close values may end up in different ranges, thus exaggerating the differences between them.

---

**Shapes with values out of range**

By default, coloring applies to all values, but you can restrict coloring to a range of values. This is done by default with the **Custom Range Coloring**. You can specify a color to values out of range.

---

**Shapes with null or empty values**

You can specify a color for shapes with null or empty values to, for example, define the color of states without any point of sales.

---

**Data Interval Syntax**

In **Measure-based Coloring**, the chart legend displays a range of data using bracket. You select the preferred syntax in the **Data Interval Syntax**.

To declare an interval, you can use the **ISO31-11** syntax setting, which uses an inverse bracket to exclude a value:

[-2..-1[
[-1..3[
[3..5[  

---
However, in the United States, you use the \textit{US Syntax} setting to replace that bracket by a parenthesis when excluding values:

\[-2..-1)\]
\[-1..3)\]
\[3..5]\]

If you prefer syntax less mathematical, then you use the \textit{Basic Syntax} setting:

\[-2..1\]
\[1..3\]
\[3..5\]

\section*{Measure polarity}

Measure-based coloring charts are driven by measure values. The \textit{Gradient-based Palette Coloring Using Measure Polarity} coloring method is based on the polarity associated to the measure driving the color and determines if high values are good, bad or neutral.

The following palettes exist:

<table>
<thead>
<tr>
<th>Palettes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{Ascending polarity}</td>
<td>The colors indicate that low is bad and high is good, with the first palette from the \textit{Start Color} to the \textit{End Color}, which is red to green by default.</td>
</tr>
<tr>
<td>\textit{Descending polarity}</td>
<td>The colors indicate that low is good and high is bad, with the first palette from the \textit{End Color} to the \textit{Start Color}, which is green to red by default.</td>
</tr>
<tr>
<td>\textit{Neutral polarity}</td>
<td>With this palette, neither low nor high is bad or good. The second palette is from \textit{Start Color} to \textit{End Color}, which are blue to yellow by default.</td>
</tr>
</tbody>
</table>

The default setting, found in the \textit{Measure Properties} section of the Global chart area settings, for measure polarity is \textit{Automatic}, which applies descending polarity.

\section*{Related Information}

Tag cloud charts [page 380]
Waterfall charts [page 381]
4.4.4.2.1 To configure the measure polarity for Tree Map, Heat Map, and Tag Cloud charts

You can configure the measure polarity for data interval charts in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in "Design" mode, right-click the chart and select Format Chart.
2. In the Global section, select Measure Properties.
3. Select a polarity palette for your chart type:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart Type</td>
<td>Measures to configure</td>
</tr>
<tr>
<td>Tree Map</td>
<td>Rectangle Weight</td>
</tr>
<tr>
<td></td>
<td>Rectangle Color</td>
</tr>
<tr>
<td>Heat Map</td>
<td>Rectangle Color</td>
</tr>
<tr>
<td>Tag Cloud</td>
<td>Tags Weight</td>
</tr>
<tr>
<td></td>
<td>Tags Family</td>
</tr>
</tbody>
</table>

4. Click OK to close the Format Chart dialog box.

i Note
You can configure other aspects of the Tree Map, Tree Map or Tag Cloud chart in the Palette and Style tab of the Global section.

Related Information

To manage measure-based coloring in Tree maps, Heat maps and Tag Cloud charts [page 428]
To configure the data interval for Tree Map, Heat Map, and Tag Cloud charts [page 400]
4.4.4.2.2 To configure the data interval for Tree Map, Heat Map, and Tag Cloud charts

You can configure the data interval for Tree Map, Heat Map, and Tag Cloud charts in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in "Design" mode, right-click the chart and select Format Chart.
2. In the Global section, select Palette and Style.
3. Select a Color Palette.
4. If you wish the plot area to have a color, select Use Internal Palette.
5. Select a method from the Coloring Method for Shapes dropdown list.
6. If you are using the either of the gradient-based palette coloring methods, configure the Gradient Definition.
   a. Select one of the following:

<table>
<thead>
<tr>
<th>Gradient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Colors</td>
<td>Allows you to have starting color, a midpoint color and an ending color.</td>
</tr>
<tr>
<td>2 Colors</td>
<td>Allows you to have starting color and an ending color.</td>
</tr>
</tbody>
</table>

   b. Select the colors and their gradient.
7. To define the number of intervals within the defined data range, specify a Number of Ranges.

   ➔ Tip
   The best number of ranges is typically 4 or 5. This amount can reveal data patterns without being confusing. If you have more than 7 colors, data with similar values can be hard to distinguish, and fewer than four ranges will not reveal much variation and therefore may reveal no clear pattern.

   ➔ Note
   This setting does not apply to the Custom Range Coloring method.
8. To define a specific range of data to appear in the chart, select the Range Definition checkbox, then enter the From and To numbers.

   ➔ Note
   This setting does not apply to the Custom Range Coloring method.
9. To set the way data is distributed in chart intervals, select a Data Distribution Mode.

   ➔ Note
   This setting does not apply to the Custom Range Coloring method.
10. To set colors for out-of-range value shapes, for the *Shapes with Values Out of Range* option configure the following settings:
   a. Select either *RGBA Color* or *Gradient*.
   b. Select a color from the color picker dropdown list and set the opacity.

11. To set colors for null and empty value shapes, for the “Shapes with NULL or Empty Value” option, configure the following settings:
   a. Select either *RGBA Color* or *Gradient*.
   b. Select a color from the color picker dropdown list and set the opacity.

12. Select a *Data Interval Syntax*.

13. If you are using the *Gradient-based Palette Coloring Using Measure Polarity* method, then you need to configure the *Gradient Definitions for Measures with Neutral Polarity* option.
   a. Select one of the following:

<table>
<thead>
<tr>
<th>Gradient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Colors</td>
<td>Allows you to have starting color, a midpoint color and an ending color.</td>
</tr>
<tr>
<td>2 Colors</td>
<td>Allows you to have starting color and an ending color.</td>
</tr>
</tbody>
</table>

   b. Select the colors and their gradient.

14. If you are using the *Custom Range Coloring* method, configure the *Color zones* option.
   a. To have the ranges colored by percent instead of increments, select *Percent*.
   b. Enter the minimum and maximum zone parameters.
   c. Select a color from the color picker dropdown list and set the opacity.

   ➔ **Tip**

   In Heat Maps, if you are using the *Emboss Effect*, you should disable the *Light and Shadow Effect* in the *Palette and Style* subsection.

### Related Information

To configure the measure polarity for Tree Map, Heat Map, and Tag Cloud charts [page 399]
Map charts [page 378]
Tag cloud charts [page 380]

### 4.4.4.3 Warning icons in charts

Warning icons in charts can alert you when there are chart and data object errors.

The warning icons available are:

- General Warnings, icons displayed on the top left corner of the chart.
Red X in a white background: impossible to generate the chart. (This could be due to a cache problem - try clearing temporary objects from cache.

White X in a red circle: cannot find the image, the BI administrator should check load balancing settings and enable service monitoring as described in the Business Intelligence Platform Administrator Guide.

Yellow warning: for example dataset too large (technical limit of the server), need to refresh the dataset, other cube errors.

Blue alert: limit for optimal rendering

The display of the General Warning icons is controlled by the *Hide warning icons in chart* setting in the Web Intelligence document properties. If this setting is activated, then no General Warning icons appear in the charts.

- An incompatible chart data warning, small yellow warning icon displayed on the data point. These occur if *Show alert when the data is incompatible with the chart* is activated in the chart format options and the dataset is inconsistent with the chart parameters. For example, a warning can appear in a Pie chart with negative values, negative values for a logarithmic scale, or inconsistent hierarchical values for a Tree Map.

<table>
<thead>
<tr>
<th>Restriction</th>
<th>Definition</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical limits of the data received from the Visualization Service, which is responsible for displaying data in the chart</td>
<td>Max number of rows = 50,000</td>
<td>Only part of the dataset is rendered and a warning icon appears, as well as an informational tooltip.</td>
</tr>
<tr>
<td>! Restriction</td>
<td>This is a non-configurable parameter. It is hard-coded into the product and cannot be changed by properties of the APS server in CMC or by manually changing an XML file.</td>
<td></td>
</tr>
<tr>
<td>Data restricted for optimal rendering</td>
<td>The data is restricted by the chart type and size for optimal appearance.</td>
<td>An alert icon appears, as well as a tooltip showing optimization guidelines.</td>
</tr>
</tbody>
</table>

**Related Information**

*Viewing document properties [page 235]*
4.4.4.3.1 To display warning icons in charts

You can allow warning icons to appear in charts and on data points.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the General tab.
3. Select Show alert when the data is incompatible with the chart.
4. Click OK to return to the document.

4.4.4.4 To edit and format a chart title

You can activate and set titles in charts in the Format Chart dialog box.

Context

By default, titles are generated automatically.

Procedure

1. In Design mode, right-click the chart frame and select Format Chart.
2. In the Format Chart dialog box, select one of the following:
   ○ Global > Area Display
   ○ Title > Design
3. Click Custom Title and enter a new title.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]
4.4.4.5  To display a chart with a 3D look

You can apply a 3D look to a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Select 3D look or 3D.

   Note
   Some types of bar charts using bar display effects do not look very attractive if they also use the 3D look or 3D setting.

4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.6  Assigning colors to charts

You can personalize the appearance of charts in Web Intelligence reports by assigning colors to dimension objects manually or by using built-in or customized color palettes. You can retain this color assignment to keep a color assigned to a dimension object.

When you create a chart in a Web Intelligence report, colors from the default color palette are automatically assigned to dimension objects in a top-to-bottom order. This order remains the same across sections and pages. However, the colors you assign using color palettes are not retained when the report is refreshed when opened, or when you change the number of objects displayed in a chart by filtering or using drill snapshots.

If you want to consistently display a specific object, such as a [Product Line] or [Sales Region], in a specific color, you can either assign a specific color to the object manually, or assign an in-built or custom color palette and set the color assignment as default.

When you set the color assignment as default, colors assigned to dimension objects do not change when you use filters or drill snapshots, or when the report is refreshed when opened. You can reset all colors by applying a new palette to the chart or by using a dedicated option.

   Note
   When you turn a chart into another type of chart, the color mapping is maintained only if the following conditions are respected:
The legend color for the primary dimension (assigned to Region Type color or Pie color) must be the same.

The legend items must be the same (no adding or removing a primary dimension for the Region Shape).

**i Note**

You cannot assign colors to dual value axis charts or to charts using Measured-Based Coloring (like Heat Map, Tree Map and Tag Cloud).

Related Information

To create a custom palette style for charts [page 407]
To assign a color to an object in chart [page 409]
To assign colors to objects in charts using color palettes [page 409]

### 4.4.4.6.1 To select a palette for a chart

You can select a palette for a chart in the Format chart dialog box.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Select or insert a chart.
3. Do one of the following:
   - Right-click the chart area and select **Format Chart** from the contextual menu. The **Format chart** dialog box appears. Select the **Palette and Style** tab. From the **Color Palette** dropdown list, select a palette style.
   - In the **Format** tab, in the **Chart Style** subtab, from the **Palette Style** dropdown list, select a palette style.

The chart is displayed with the colors from the selected palette. If the colors are not as you prefer, you can either select another palette style from the dropdown list, or you can create a custom palette.

**i Note**

In waterfall charts, settings other than **Automatic** in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to **Automatic**.
4.4.4.6.2 To create a custom palette style for charts

You can create a custom palette style based on an existing palette style.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select or insert a chart.
3. Do one of the following:
   ○ Right-click the chart area and select Format Chart from the contextual menu. The Format chart dialog box appears. Select the Palette and Style tab. From the Color Palette dropdown list, select Custom.
   ○ In the Format tab, in the Chart Style subtab, from the Palette Style dropdown list, select Custom.

The Manage Palettes dialog box appears, with either the default palette or the last palette applied to the chart selected.
4. Do one of the following:
   ○ If the currently selected palette is the one from which you want to create a custom palette, click New.
   ○ If you want to create a palette based on another built-in palette, select that palette and click New.

The Create palette dialog box appears.
5. Enter a palette name.
6. Click a cell in the Color settings area and then select a different color from the Color dropdown palette.
7. Set the opacity if necessary.
8. When you have customized the cells, click OK.

The custom palette appears in the Custom section of the Manage Palettes dialog box.

The custom palette you have created will appear in the following places when it is selected for a chart:
   ○ From the Color Palette dropdown list in the Format chart dialog box.
   ○ From the Palette Style dropdown list in the Chart Style subtab.

When it is not selected for a chart, you can access it in the Manage Palettes dialog box.
In waterfall charts, settings other than Automatic in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to Automatic.

Related Information

To edit a custom palette chart style [page 408]
To select a palette for a chart [page 406]
To configure the value colors in a waterfall chart [page 410]

4.4.4.6.3 To edit a custom palette chart style

You can edit custom chart styles.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select or insert a chart.
3. Do one of the following:
   ○ Right-click the chart area and select Format Chart from the contextual menu. The Format chart dialog box appears. Select the Palette and Style tab. From the Color Palette dropdown list, select Custom.
   ○ In the Format tab, in the Chart Style subtab, from the Palette Style dropdown list, select Custom.

The Manage Palettes dialog box appears, with either the default palette or the last palette applied to the chart selected.
4. Select the custom palette style that you want to edit and click Edit.

i Note

Built-in chart styles cannot be changed, however you can create a palette chart style from a built-in chart style.

The Create palette dialog box appears.
5. Edit the palette settings as necessary.
6. When you have completed your changes, click OK.
Note
In waterfall charts, settings other than Automatic in the Custom Format section of the Format chart dialog box can override any custom Color Palette settings. To use the Color Palette settings in the waterfall chart, change all Custom Format settings to Automatic.

Related Information
To create a custom palette style for charts [page 407]
To select a palette for a chart [page 406]
To configure the value colors in a waterfall chart [page 410]

4.4.4.6.4 To assign a color to an object in chart

You can assign custom colors to dimension objects in charts in Web Intelligence reports.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select a dimension object or a legend item on a chart.
3. In the Formatting tab, in the Style subtab, click the arrow next to the Background Color icon.
4. From the Background Color dropdown list, do one of the following:
   ○ To assign a pre-defined color, select a color.
   ○ To assign a custom color, click More Colors, set a color and click OK.

Results

The color is assigned to the dimension object.
4.4.4.6.5 To assign colors to objects in charts using color palettes

You can assign default or custom color palettes to dimension objects in charts in Web Intelligence reports. You can retain this color assignment when the report is refreshed when opened, and when you use filters, input controls, or drill snapshots.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. Select a chart.
3. In the Formatting tab, in the Chart Style subtab, from the Palette Style dropdown list, select a palette or click Custom to create a custom palette.
   Colors from the palette are assigned to the dimension objects.
4. If you want to retain this color assignment, right-click the chart.
5. Select Series Colors Set as Default Colors.

**Results**

If you want to clear the color assignment, right-click the chart and select Series Colors Clear Color Assignment.

**Related Information**

To create a custom palette style for charts [page 407]

4.4.4.6.6 To configure the value colors in a waterfall chart

You can configure the start, total, negative and positive values in a waterfall chart.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. Select or insert a waterfall chart.
3. Right-click the chart area and select Format Chart from the contextual menu.
4. In the Format chart dialog box, select the Palette and Style tab.
5. In the Custom Format section, configure the Fixed Value for any of the following on the waterfall chart:
   - The Start Value Color affects the starting value bar.
   - The Total Value Color affects the final value bar.
   - The Negative Value Color affects any bars that reflect negative values.
   - The Positive Value Color affects any bars that reflect positive values.

   **Note**
   Settings other than Automatic in the Custom Format section can override the Color Palette settings. To return to the Color Palette settings, change all of the Custom Format settings to Automatic.

6. When you have completed your changes, click OK.

**Related Information**

To edit a custom palette chart style [page 408]

### 4.4.4.6.7 Creating a corporate palette for charts

You can define a corporate palette for charts so that your reports have the corporate style. The palette colors are defined in the configuration file called VisualizationConfig.xml. You can only define one corporate palette, and the palette ID must not be changed.

The default palette contains 32 defined colors. You can define more colors, but you must define at least two colors. You define a color by defining the strengths of red (R), green (G), blue (B), and the transparency (A).

**Example**

```xml
<COLOR R="200" G="0" B="0" A="255" />
```

**Related Information**

Formatting the report layout [page 266]
Formatting your reports using Cascading Style Sheets [page 437]
Formatting tables and table cells [page 447]
You can define a default corporate chart palette.

The corporate chart palette configuration file VisualizationConfig.xml is by default located in the following location:

C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\images

This file contains the following elements:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<CONFIG>
  <!-- Rename this file to VisualizationConfig.xml which will activate a custom default palette. -->
  <!-- The following section allows to define a corporate palette which will be used by default in all new visualization. -->
  <!-- TOMCAT must be restarted after each modification of this file -->
  <PALETTES>
    <PALETTE ID="corporate">
      <!-- Add a list of colors so as to define your palette (default palettes contains 32 colors): R for Red, G for Green, B for Blue and A for managing the transparency-->
      <!-- Each attributes must take an integer value from 0 to 255 -->
      <!-- The palette ID should not be changed. -->
      <COLOR R="200" G="0" B="0" A="255" />
      <COLOR R="0" G="200" B="0" A="255" />
      <COLOR R="0" G="0" B="200" A="255" />
      <COLOR R="200" G="200" B="200" A="255" />
      <COLOR R="125" G="125" B="0" A="255" />
      <COLOR R="0" G="125" B="125" A="255" />
      <COLOR R="125" G="0" B="125" A="255" />
      <COLOR R="200" G="0" B="0" A="255" />
      <COLOR R="0" G="200" B="0" A="255" />
      <COLOR R="0" G="0" B="200" A="255" />
      <COLOR R="0" G="0" B="0" A="255" />
      <COLOR R="200" G="200" B="200" A="255" />
      <COLOR R="125" G="125" B="0" A="255" />
      <COLOR R="0" G="125" B="125" A="255" />
      <COLOR R="125" G="0" B="125" A="255" />
      <COLOR R="200" G="0" B="0" A="255" />
      <COLOR R="0" G="200" B="0" A="255" />
      <COLOR R="0" G="0" B="200" A="255" />
      <COLOR R="0" G="0" B="0" A="255" />
      <COLOR R="200" G="200" B="200" A="255" />
      <COLOR R="125" G="125" B="0" A="255" />
      <COLOR R="0" G="125" B="125" A="255" />
      <COLOR R="125" G="0" B="125" A="255" />
    </PALETTE>
  </PALETTES>
</CONFIG>
```
4.4.4.6.7.2 To define a corporate palette for charts

The BI administrator can use the following steps to define a corporate palette using the VisualizationConfig.xml configuration file. This corporate palette will then be used as default for all new charts.

**Procedure**

1. In the following directory open the template file: VisualizationConfig.template.xml:
   
   C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\images

2. Define at least two colors or edit the ones present in the template file.
3. Rename the file: VisualizationConfig.xml and save it in the same directory.
4. Restart Tomcat.

**Results**

This corporate palette will be used as default for all new charts. Make sure there are no errors in the configuration file, otherwise the standard palette will be applied.

**Next Steps**

→ Tip

Restart Tomcat each time you modify this file.
4.4.4.7 To modify chart borders

You can modify the borders of a chart in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart and select Format Chart.
2. In the Global chart area, select the Border tab.
3. Use the settings to format the borders.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.8 To format the chart background

You can format the background colors, grid colors, opacity, line type and transparency of charts.

Context

i Note
The Tree Map, Tag Cloud, and Heat Map charts do not have background configuration options.

The options available vary depending on the type of chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the plot area and select Format Chart Plot Area or Format Chart.
2. In the Plot Area chart area, select the Background tab.
3. In a 3D chart, you can show or hide the grid floor and edges.
4. Select a Grid and Background style:
   ○ Plain background
○ **Background Color** (refers to the background of the plot area)
○ **Category Axis Grid Color** (refers to the lines that are parallel to the category axis)
○ **Value Axis Grid Color** (refers to the lines that are parallel to the value axis)
○ **Depth Grid Color** (in a 3D chart, it refers to the lines parallel to the **Value Axis Grid Color**.
○ **Striped Background** (it shows alternate colors, instead a grid. The striped background option may not be available depending on the chart type, as in the case of Pie and 3D charts.
○ If you want the plot area lines to be dashed, select **Dashed Lines**.

### i Note

Grid options slightly differ depending on the chart type.

5. Click **OK** to return to the document.

### Related Information

To format a chart [page 396]

### 4.4.4.9 To modify plot area settings in Waterfall charts

You can activate or deactivate a reference line and set the spacing between objects in the Waterfall chart plot area.

### Procedure

1. Right-click in the Waterfall chart.
2. Select **Format Chart**.
3. In the **Format Chart** dialog box, select the **Plot Area** chart area.
4. In the **Design** tab, select **Reference Line**.
5. To set the spacing between plot area items, enter or select a number for the **Relative Spacing between Items**.
6. Click **OK** or **Apply**.

### Related Information

To format the chart background [page 414]
4.4.4.10 To show and format chart legend

You can format the chart legend in a report.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart legend and select Format Legend.
2. In the Format Chart dialog box, for the Legend chart area, select the Design tab.
3. You can make the legend visible or not, adjust the symbol size, position and layout, group by dimension, adjust the text settings and border and background settings.
4. In the Title tab, you set the legend title settings, such as: Automatic Title or Custom Title. Custom Title allows you to define a formula to be used for the Legend title.
5. Click OK to return to the document.

Results

→ Tip

In the Global chart area, in the Area Display tab, you can display or hide the legend and legend title.

Related Information

To format a chart [page 396]
Formulas in chart elements [page 395]

4.4.4.11 To reverse the legend order of a chart

You can reverse the legend order of a chart.

Context

The legend is reversed by default for bar and stacked charts. It is available for all XY charts as well as Pie charts and derived charts (if the Clockwise setting is disabled).
Procedure

1. In Design mode, right-click the chart legend you want to edit.
2. Click Format Chart Legend.
3. Check Reverse legend order.

Results

The legend order has been reversed.

4.4.4.12 To avoid page breaks in charts

You can restrict page breaks in charts.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Layout tab.
3. Select Avoid page breaks in chart or Avoid page break. These options can be selected for both horizontal and vertical breaks.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]
4.4.4.13 To configure a stacked bar or column chart

In a stacked chart, the measure data is stacked in bars or columns. Stacking is done axis by axis and you can choose which data to stack. In a 100% stacked chart, the data is displayed as percentage parts of a whole, or 100%, of a bar or column.

Context

*Note
Only charts with value axes can be stacked.

Procedure

1. In a Web Intelligence document in Design mode, add a stacked bar or column chart.
2. Right-click the chart and select Format Chart from the contextual menu.
3. In the Value Axis chart area:
   - Select the Design tab. Under Stacking, select one of the following:
     - **Unstacked**: Select this option to unstack all dimensions and measures in the chart.
     - **Stacked Chart**: Select this option if you only want to slice one dimension by another. For example, in a chart containing revenue per state and year. Measures are not stacked.
     - **Globally Stacked Chart**: Select this option stacks the dimensions and measures in one stack per bar or column.
   - Select **100% Stacked Chart** if you want to measure multiple series as a proportion vs. time, or if you have three or more data series and want to compare distributions within categories, and at the same time display the differences between categories. Each bar represents 100% of the amounts for that category.
4. In the Plot Area chart area, if you are configuring a 100% stacked chart, and want bars or columns with zero values to be flat against the value axis, select Flatten zero values.
5. Click OK to close the Format Chart dialog box.

Related Information

To format the category or value axis title [page 420]
To format the chart background [page 414]
To format axis grid values, numbers and text [page 423]
To show a specific range of axis values [page 420]
To display the Value Axis logarithmically [page 421]
Linear and logarithmic axis scales [page 421]
To show and format chart legend [page 415]

4.4.4.14 To manage overlap in bar charts

You can set the overlap between bars in a bar chart.

Context

Procedure

1. Right-click a bar chart.
2. Click Format Chart.
3. In the Plot Area of the chart area.
4. Enter a value in Spacing between Groups, Spacing within Groups or both.
   ○ Spacing between Groups corresponds to a percentage of the total axis space dedicated to separate bars of category axis values, and defines the space allocated to each bar group.
   ○ Spacing within Groups corresponds to the space allocated to each bar within a group. A negative value defines a percentage of the total group space dedicated to bar overlap. We recommend setting the Bar Width to Unlimited when using negative values.
5. Click OK.

4.4.4.15 To format the category or value axis title

You can format the title of a category or value axis in a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Category Axis or Value Axis chart area, select the Title tab.
3. Edit the title settings, which include:
   - Title label and visibility
   - Layout spacing
   - Text formatting
   - Borders and the background
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.16 To show a specific range of axis values

You can specify a range of values in a chart axis.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis chart area, select the Design tab.
3. Under Scaling, to set the Minimum Value and the Maximum Value, select Fixed Value, then enter a value.

   i Note
   Overscaling is a specific display that indicates that a bar is incomplete. Its value is out of the axis Max/Min values.

4. Click OK to return to the document.

Related Information

To format a chart [page 396]
4.4.4.17 Linear and logarithmic axis scales

Linear scales are based on addition. Logarithmic scales allow you to examine values that span many orders of magnitude without losing information on the smaller scales.

By default, the application displays the Value axis on charts as a linear scale. In a linear scale, the axis markers are evenly spaced. Consider, for example, the linear sequence: 1, 3, 5, 7, 9. To get the next number in the sequence, you add 2 to the previous number.

You can set the axis to a logarithmic scale. Logarithmic scales are based on multiplication rather than addition. In a logarithmic scale, the steps increase or decrease in size. Logarithmic scales are based on multiplication (or division). Consider, for example, the logarithmic sequence: 2, 4, 8, 16, 32.

To get the next number in the sequence, you multiply the previous number by 2. We can say that this sequence represents ```base 2.''

Consider the following sequence: 1, 10, 100, 1000, 10000.

This sequence represents ```base 10,'' because you get the next term in the sequence by multiplying the previous term by 10.

4.4.4.17.1 To display the Value Axis logarithmically

You can change the Value Axis to appear logarithmically in a chart.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis chart area, select the Design tab.
   
   A logarithmic scale uniformly presents percent changes rather than point changes. In other words, the distance from 1 to 2 (100% increase) is the same as the distance from 2 to 4 (another 100% increase).
4. Click OK to return to the document.

Results

i Note

You cannot represent negative values on a logarithmic scale. If you have selected Show alert when the data is incompatible with the chart option in the chart format options, a small yellow warning icon will appear on the data point if there is negative data.
Related Information

To format a chart [page 396]
Linear and logarithmic axis scales [page 421]
To display warning icons in charts [page 403]

4.4.4.18 To assign axis labels to data values

You can assign labels to an axis in charts.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Data Values tab.
3. Select Data label displaying mode.
4. Select the appropriate Data Type.
5. You can also change the other data value settings on this page, like Automatic Hiding Mode and font, border, line and background settings as necessary.
6. Click OK to return to the document.

Related Information

To format a chart [page 396]
To show or hide data values [page 430]

4.4.4.19 To format axis grid values, numbers and text

You can format the value and category axis settings.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Category Axis or Value Axis chart area, select the Design tab and format settings in the following sections:
○ Under **General**, you can select that the axis is visible.
○ Under **Layout**, you can display the axis, show labels, change the orientation, adjust the legend layout, automatically reduce the font size of labels displayed in grid, reverse order on the category axis, set the axis label delete mode and show continuous axis layout.

**i Note**

By default the Value axis is the Y axis and the Category axis is the X axis. If you reverse the order of the chart, the X,Y relationship is broken. The horizontal line remains the X axis and the vertical axis remains the Y axis.

To set the legend layout, select **Adjust Layout** and configure the following options for the layout width and height:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automatic</strong></td>
<td>Select <strong>Automatic</strong> so that the legend width or height is automatically adjusted to the size of the legend contents.</td>
</tr>
<tr>
<td><strong>i Note</strong></td>
<td>The width adjusts as much as possible, however if the legend items are long, they can disappear from the legend cell.</td>
</tr>
<tr>
<td><strong>Fixed</strong></td>
<td>Select <strong>Fixed</strong> to manually set the height or width of the legend cell.</td>
</tr>
<tr>
<td><strong>Proportional</strong></td>
<td>Select <strong>Proportional</strong> to have the legend cell height or width appears relative to the size of the chart. You express this size as a 0.x value, where 0.2 means that the legend cell height will appear as 20% of the actual chart.</td>
</tr>
</tbody>
</table>

○ Under **Color Options**, you can set the **Axis Color** (the category axis line), **Grid Color** (the grid around the category axis labels) and **Grid Background Color** (which refers to the category axis labels).

○ Under **Text**, you can choose the font settings, text alignment, and the text policy (**Wrap**, **No Wrap** or **Truncate**).

**i Note**

○ To force the display of a long chart title when **No wrap** has been selected and the title is longer than the chart width, activate **Force to Display**.

○ The legend size, controlled by the **Adjust Layout** option, can be determined manually or automatically adjusted depending on the chart size and legend items length for optimal readability. If you select the **No Wrap** option while the **Layout Width** is **Automatic**, the legend width will be adjusted to the legend item length as much as possible when the chart size is small; however long items will be hidden.

○ Under **Number**, select the pattern you want for chart numbers.

3. Click **OK** to return to the document.
4.4.4.20 To unlock a value axis in a dual axis chart

In a chart that uses dual axes, the chart normally has axes that are locked and synchronized to the same origin.

Context

In some data series where one axis has positive values and another data series has both negative and positive values, the chart results can appear flat. In this case, you can unlock the axes so that each has its own grid and origin, and the minimum and maximum values share one axis, each according to its data context.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Value Axis 2 chart area, select the Design tab.
3. Under Scaling, select Unlock the Axis.

Results

When the axes are unlocked, the second value axis is freed from the grid.

i Note

In a XI 3.1 document migrated to BI 4.1 SP 4 or greater, value axes are automatically unlocked.

Related Information

Linear and logarithmic axis scales [page 421]
To format axis grid values, numbers and text [page 423]
To assign axis labels to data values [page 422]
To show a specific range of axis values [page 420]
4.4.4.21 To hide an empty chart

Sometimes charts display no values. For example, if sales of a specific product are discontinued, a chart that normally displays results for that product will appear empty. By default, the application displays such empty charts on reports. If wished, you set the application to hide charts whenever they are empty.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the General tab.
3. In the Display section, select one of the following:
   - Select Hide always to hide the chart.
   - Select Hide when empty to hide the chart when it is empty.
   - Select Hide when following formula is true and type a formula in the box to hide the chart when the formula is true.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.22 To exclude zero values in charts and tables

In charts and tables, you can exclude zero values from the displayed data.

Context

If a chart or table has zero values, you can choose to remove them from the visible output. You can also have hidden items that have zero values.

If you deactivate either of the zero value options:
- In a chart, there are no items.
- In a table, if the values in a column or row for an item equal zero, the column or row does not appear.
Procedure

1. In a Web Intelligence document in Design mode, right-click the chart or table frame and select Format Chart or Format Table.

2. Do one of the following:
   ○ For a chart, in the Global chart area, select the General tab.
   ○ For a table, select the General tab.

3. Select the following Display options as required:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show rows for which all measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show rows for which the sum of measure values = 0</td>
<td>In vertical and cross tables, to suppress rows where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show columns for which all measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where all measure values are equal to zero.</td>
</tr>
<tr>
<td>Show columns for the sum of measure values = 0</td>
<td>In horizontal and cross tables, to suppress columns where the sum of the measure values is equal to zero.</td>
</tr>
<tr>
<td>Show measure values where values = 0</td>
<td>In charts, to suppress a chart item if its measure values are equal to zero.</td>
</tr>
<tr>
<td>Show measure values for which the sum of values = 0</td>
<td>In charts, to suppress a chart item where the sum of its measure values is equal to zero.</td>
</tr>
</tbody>
</table>

   i Note
   In charts and tables, empty values are considered the same as zero values, and therefore are also affected by these Display options.

4. Click OK to close the dialog box.

4.4.4.23 To specify styles, shadow effects and data markers for the chart data

You can specify palette and style effects in line, bar, column, line, point, and radar charts.

Context

i Note
By default, dual axis charts use two color palettes.
Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Configure the following as necessary:
   - In Chart Series Style, select an effect.
   - Select the Color Palette and the percent of transparency.
   - Under Marker, choose symbols, symbol size, symbol palettes, border, border color.
   - Under Light and Shadow Effects, select many light and shadow effects: offset, color, shadow, and 1-sided shadow.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.24 To manage measure-based coloring in Tree maps, Heat maps and Tag Cloud charts

The coloring method determines the color of rectangles or tags based on the value of a reference measure.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and select Format Chart.
2. In the Global chart area, select the Palette and Style tab.
3. Select a coloring method from the Coloring Method for Shapes dropdown list:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palette Coloring</td>
<td>You can define the number of ranges and the colors are associated automatically based on the selected palette. You can also define range definition and the color for null or empty values.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring</td>
<td>You can define a 2- or 3-color gradient associated to the ranges.</td>
</tr>
<tr>
<td>Gradient-based Palette Coloring using Measure Polarity</td>
<td>You can define a 2- or 3-color gradient associated to Measure with Neutral Polarity.</td>
</tr>
<tr>
<td>Custom Range Coloring</td>
<td>You can define the ranges manually and associate the colors by either percentage or absolute value.</td>
</tr>
</tbody>
</table>

4. If needed, define a range for the measure values and associate a color to out of range values.
5. Select a color for null or empty values.

6. Define the gradient for gradient methods or associate a color to each range for the custom method. For custom range coloring, define the Maximum and Minimum values of the color ranges. (It is automatic for other methods)

7. Click OK to return to the document.

4.4.4.25 To format a series of data in a chart

You can adjust the color, color opacity and data label position of pieces or points in Bar, Column, Line, Pie, Scatter, Bubble, and Point charts.

Procedure

1. Right-click the piece, point, or legend item in a chart that you want to configure and select Format Data Series from the contextual menu.

   i Note
   This feature is not available for Box plot, Map, Tag cloud or Waterfall charts.

2. In the Format Data Series dialog box, select Custom.

   i Note
   At any time you can reset the settings in this dialog box to the application default by selecting Automatic.

3. Select a color for the data piece or point from the color picker dropdown panel and adjust the opacity setting as necessary.

4. If you are formatting a Line chart and want to have a thicker line, select a Line Width number.

5. To have a data label appear, in the case where a data label was hidden, or to customize the data label position, select Show Data Labels.

   i Note
   Unselect this option if you want the data label hidden in the chart.

6. Select one of the following data position options:

   For all charts:
   o Select Outside if you want the label outside of the selected chart piece.
   o Select Inside if you want the label inside the selected chart piece.

   i Note
   Data label positioning is not available for Polar, stacked Bar or Column charts.

   For all charts except the Pie chart the following options are also available:
Select *Inside First, Outside Otherwise* if you prefer the label inside the selected chart item, but can allow it to be outside the chart piece if there is not enough room for the label in the item.

Select *Outside First, Inside Otherwise* if you prefer the label outside the selected chart piece, but can allow it to be inside the chart piece if there is not enough room for the label in the item.

7. Depending on your chart type, you can set the data label alignment when the data position is set to *Outside*:
   - If you are working with a Donut or Pie chart, select one of the following data label alignments:
     - Select *Side Layout* for the data label to appear at the side of the chart block.
     - Select *Circular Layout* for the data label to appear right next to the chart piece.
   - If you are working with a Line or Point chart, select one of the following data label alignments: *Top*, *Below*, *Left*, *Right*.

8. Click *Apply* to apply your changes and continue to modify the data label changes.
9. Click *OK* to apply your changes and close the panel.

### 4.4.4.26 To show or hide data values

You can show and hide data values in a chart.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the chart frame and select *Format Chart*.
2. In the *Global* chart area, select the *Data Values* tab.
3. Select *Data label displaying mode* to show the data.
4. You can adjust the settings for various parameters, depending on the chart type. For instance for a pie chart, select the data type, the data position, border size, background color, etc.
5. Click *OK* to return to the document.

**Related Information**

To format a chart [page 396]
4.4.4.27 To resize a chart

You can resize the chart using the mouse or in the Format Chart dialog box.

Procedure

1. In a Web Intelligence document in Design mode, right-click the chart frame and click Format Chart.
2. In the Global chart area, select the General tab.
3. Enter or set the chart width and height in the Width and Height boxes.
4. Click OK to return to the document.

Related Information

To format a chart [page 396]

4.4.4.28 To apply a chart style

A chart style is a group of settings stored within a source file.

Context

The chart style is used to manipulate a chart (at several levels - graphic, region, and property) before it is rendered. Chart styles allow charts to assembled using a set of predefined settings which include modern chart styles (such as anti-alias, gloss, and emboss). Adapted chart styles offer straightforward chart output customization with pre-settings and themes. They contain the group of settings for a chart including:

- layout - the settings that determine how each chart is displayed
- chart items (such as the title, the legend, the axes)
- chart location (for example, where chart items are placed, if they are visible)
- theme - the settings that determine how the chart looks
- color palettes, etc.
- textures (such as the texture of the background)
- shadows
- fonts

i Note

You can choose among pre-defined color palettes.
When creating a chart, we recommend that you feed it with all needed dimensions; apply the style, then change the settings to refine the chart format. If you modify a setting before applying a template, you may alter your modifications if these settings are included in the template definition. If that happens, the only way to get them back is to do an *Undo* action.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. Select an existing chart or create one.
3. With the chart selected, in the *Formatting* tab, in the *Chart Style* subtab, select a style from the *Format Chart Style* icon dropdown list:
   
   - *Belize* (Default)
   - *Flashy Style*
   - *Normal Style*
   - *High Contrast*

**Related Information**

To format a chart [page 396]

**4.4.4.29  To change the chart type by using Turn Into**

You can change the chart type using *Turn Into* in the chart contextual menu.

**Procedure**

1. In a Web Intelligence document in *Design* mode, right-click the table or chart.
2. Select *Turn Into* from the contextual menu, then *More Transformations*.
   
   The *Turn Into* dialog box appears.
3. Click the chart category you want, then click a chart icon.
   
   Edit the chart values as necessary.
4. Click *OK*.
   
   The selected template is applied to the block and displays the data in the chart type you chose.
4.4.5 Formatting multiple report elements simultaneously

The HTML client allows you to format several report elements at the same time. Resizing, aligning, defining borders, background colors, or relative positions are examples of what is possible when formatting multiple report elements simultaneously. The formatting options available depend on the report elements you select. There are three possible selections:

- selection of report elements of the same type, such as two vertical tables.
- selection of report elements of different type, such as a vertical table and a horizontal table.
- selection of report elements of heterogenous type, such as a pie chart and a free cell.

You can use the table below as a reference point to know the available formatting options in the Format dialog box, depending on the report elements you select.

<table>
<thead>
<tr>
<th>Chart</th>
<th>Table</th>
<th>Free cell</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>General</td>
<td>General</td>
<td>N/A</td>
</tr>
<tr>
<td>Palette</td>
<td>Background</td>
<td>Palette</td>
<td></td>
</tr>
<tr>
<td>Background</td>
<td>Border</td>
<td>Background</td>
<td></td>
</tr>
<tr>
<td>Border</td>
<td>Layout</td>
<td>Border</td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td></td>
<td>Layout</td>
<td></td>
</tr>
<tr>
<td>Table</td>
<td>General</td>
<td>General</td>
<td>N/A</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Background</td>
<td>Border</td>
<td>Border</td>
<td></td>
</tr>
<tr>
<td>Border</td>
<td>Appearance</td>
<td>Appearance</td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td>Layout</td>
<td>Layout</td>
<td></td>
</tr>
<tr>
<td>Free cell</td>
<td>General</td>
<td>General</td>
<td>General</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Border</td>
<td>Border</td>
<td>Alignment</td>
</tr>
<tr>
<td></td>
<td>Background</td>
<td>Appearance</td>
<td>Font</td>
</tr>
<tr>
<td></td>
<td>Layout</td>
<td>Layout</td>
<td>Appearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Layout</td>
</tr>
<tr>
<td>Section</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**i Note**

If a custom element is part of your multi-selection, the **Background** and **Palette** tabs are not available.

Options available within these tabs depend on the type of selection you make and the settings the report elements you select have in common. Also, some of these settings may appear as undetermined when the report elements have different values for the same setting. These settings are reset to make sure that the new value you enter applies to all the report elements you select.

The options in the **Format** tab in the toolbar also changes depending on your selection. Many of these options are an alternative way of accessing the options of the **Format** dialog box. You can also access some of these options, such as alignment or hiding options, using the contextual menu.

### 4.5 Linking to other documents

To give immediate access to information related to a report from that report, define document cells as hyperlinks.

The user who consults the report can click the active hyperlink and open a web page with additional, related information.

**! Restriction**

- When the hyperlink refers to a web site that cannot be opened in other websites, you can encounter browser errors.
- To avoid having **#ERROR** displayed instead of hyperlinks you have created, we recommend avoiding hard coded date formats. It causes **#ERROR** when changing the preferred viewing locale of the BI Launch Pad.

When you click a cell that contains a hyperlink, the target document specified in the link opens. The target document can be another Web Intelligence document, a site on the world wide web, a PDF, Excel or Word document, or any resource accessible through a hyperlink.
Hyperlinks can be either static or dynamic. A static hyperlink always links to the same document in the same way. A dynamic hyperlink can link differently depending on the data in the document containing the hyperlink.

You can create different types of hyperlink:
- A cell where the cell text is the hyperlink text.
- A cell with an associated hyperlink.
- A link to another document in the CMS. Use the Web Intelligence HTML interface for this action. For target documents that refer to BEx queries or .unx or .unv universes that contain prompts that use Index Awareness, there are additional parameters to set.

When you create a link using the Web Intelligence HTML interface, the link is defined using the OpenDocument syntax. If you wish, you can build links manually using OpenDocument. For detailed information on OpenDocument syntax, see the Viewing Documents using OpenDocument guide.

As well as linking between documents, you can also link report elements in the same report by defining elements as input controls that filter the values in other report elements.

**i Note**

Hyperlinks only display as active when your system administrator has authorized them in Web Intelligence.

### 4.5.1 Cells defined as a hyperlink

When you define a cell as a hyperlink, the cell text becomes an active hyperlink.

For example, if you define a free-standing cell containing the text `http://www.sap.com` as a hyperlink, clicking the cell takes you to the SAP web page.

This method is best suited for static hyperlinks, where the text in the cell always remains the same and links to the same resource in the same way.

**i Note**

You can make this type of hyperlink dynamic by using a cell formula to change the cell text based on report data.

### 4.5.1.1 To define a cell as a hyperlink

You define a cell as a hyperlink in a document in Web Intelligence.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Select or type hyperlink text in a cell.
3. Right-click the cell and select Linking Read Contents as Hyperlink.

4.5.2 A hyperlink associated with a cell

When you associate a hyperlink with a cell, you define a hyperlink that links to the source document when the cell is clicked. The cell text itself is not the hyperlink.

This is the recommended method for creating dynamic hyperlinks, for the following reasons:

- It is specially tailored for working with the parameters in dynamic hyperlinks.
- It shields you from the complexity of hyperlink syntax. You define your hyperlink using a graphical interface and the hyperlink syntax is generated and managed behind the scenes.
- It allows you to define hyperlink text that is different from the cell text.

4.5.2.1 To add a hyperlink to a cell

You configure a cell hyperlink in the Create Hyperlink or Hyperlinks dialog box.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click a cell and select Linking Add Hyperlink to display the Create Hyperlink or Hyperlinks dialog box.
3. If you are in the Web Intelligence HTML interface, select the Link to web page tab.
4. Type or paste the hyperlink text into the box.
5. Click Parse.

Any hyperlink parameters appear in the Customize URL parameters area.

Dynamic hyperlinks contain parameters whose values can change. Parameters appear as name=value parts at the end of the hyperlink after the question mark. For example, the following URL contains one parameter, `reportname`, whose value is “products”:

```
http://salesandproductreport/default.asp?reportname=products
```

Each parameter appears on a separate line with the parameter name on the left and the parameter value on the right. The static part of the hyperlink, the part without the parameters, appears in the Main section.
6. To supply data from formulas or variables as parameter values, click the arrow next to each parameter value and select an option.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build formula</td>
<td>You build a formula in the <em>Formula Editor</em> to supply the formula output as the parameter value.</td>
</tr>
<tr>
<td>Select object</td>
<td>You choose the object from the list in the <em>Available Objects</em> dialog box to supply its value as the parameter value.</td>
</tr>
</tbody>
</table>

**i Note**

When you modify a parameter, the full hyperlink syntax changes to reflect the modification in the box at the top of the screen.

7. To add or remove a parameter, modify the hyperlink syntax, then click *Parse*.

**i Note**

You cannot add or remove parameters directly in the parameter list in the *Customize URL parameters* area. You must modify the URL syntax directly.

8. Type the tooltip text in the *Tooltip* box or build a dynamic tooltip by using the *Build formula* or *Select variable* options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build formula</td>
<td>You build a formula in the <em>Formula Editor</em> to supply the formula output as the tooltip.</td>
</tr>
<tr>
<td>Select object</td>
<td>You choose the object from the list in the <em>Available Objects</em> dialog box to supply its value as the tooltip.</td>
</tr>
</tbody>
</table>

The tooltip appears when you hover your mouse pointer over the cell containing the hyperlink.

9. Click the arrow next to *Target window* to define how the target URL appears.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current window</td>
<td>The target URL replaces the document containing the hyperlink in the current window.</td>
</tr>
<tr>
<td>New window</td>
<td>The target URL opens in a new browser window.</td>
</tr>
</tbody>
</table>

10. Click *OK* to close the *Create Hyperlink* or *Hyperlinks* dialog box.

### 4.5.3 Linking to another document in the CMS

In the Web Intelligence HTML interface, you can link to another document in the CMS using the *Create Hyperlink* dialog box.

The link uses the `OpenDocument` function. The parameters passed to the function are determined by the choices you make in the dialog box.

You can also work with the `OpenDocument` function directly by typing the syntax into a cell.

**Document instances and values passed to prompts**

Hyperlinks supply values to prompts in the target document in two ways:
• Passing values directly to prompts.
• Opening a document instance based on passed values.

In the first case, the hyperlink feeds values directly to the prompts in the target document. In the second case, the link opens the document instance whose stored prompt values correspond to the values passed by the hyperlink. When you click on the url, the target document is automatically refreshed, even if the Refresh on open option is deactivated.

It is more efficient to choose a document instance based on passed parameters if the target document is large.

**Linking to large documents**

When the target document contains a large amount of data, it is more efficient to link to an instance than to open and retrieve the document with a passed parameter value. You can schedule and pre-retrieve multiple instances with different parameter values. This allows the document to be scheduled and pre-retrieved in advance with different parameter values.

When you click the hyperlink, the link opens the appropriate pre-retrieved instance rather than using the passed value to open the document and retrieve the data.

---

**Example**

**Linking to a large sales report**

In this example you link to a large sales report that retrieves sales by region. The report has a parameter that allows the user to select the region. There are four regions - North, South, East, and West.

Your source document has a [Region] dimension. You do the following:

• Configure the hyperlink to pass the value of [Region] as a parameter.
• Create four instances of the sales report, one for each value of [Region].
• Schedule these instances for pre-retrieval.
• Configure the hyperlink to open the latest instance whose parameter value matches the value passed by the hyperlink.

Assuming that the document has a [Region] dimension, the settings are as follows:

<table>
<thead>
<tr>
<th>Link to document instance setting</th>
<th>Latest value match</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most recent - matching prompt values</td>
<td>[Region]</td>
</tr>
</tbody>
</table>
4.5.3.1 To link to another document in the CMS

You can set in a document one or more links to other documents in the same CMS.

Context

**Note**
When the target document refers to a .unx or .unv universe containing an Index Awareness Prompt, or to a BEx query, there are additional objects to select.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Do one of the following:
   - Right-click the cell where you want to create the link and select Linking Add Document Link.
   - In the Report Elements tab, in the Linking subtab, select Add Document Link from the Document dropdown list.
3. In the Create Hyperlink dialog box, Select the Link to a document tab.
4. Click Browse and in the Choose a document dialog box, select the target document, and click Open.
   - If there are prompts on the document to which you are linking, the Select Prompts panel appears.
5. In the Select Prompts panel, select the prompts that you want to appear and click OK, or if you have no selections to make, click Cancel.
6. In the Hyperlink Properties section:
   - To ensure that the link uses the full URL path rather than a relative path from the current document, select Use complete URL path to create hyperlink.
   - To refresh the data of the target document when the hyperlink is selected, select Refresh on open.
   - To link to an instance of the selected document, select Link to document instance, then select an option from the dropdown list.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most recent</strong></td>
<td>The hyperlink opens the most recent instance.</td>
</tr>
<tr>
<td><strong>i Note</strong></td>
<td>You cannot specify parameter values in the hyperlink when you choose this option. The hyperlink does not pass parameter values. All parameters are set to Use document default and cannot be modified.</td>
</tr>
<tr>
<td><strong>Most recent - current user</strong></td>
<td>The hyperlink opens the most recent instance owned by the current user.</td>
</tr>
<tr>
<td><strong>i Note</strong></td>
<td>You cannot specify parameter values in the hyperlink when you choose this option. The hyperlink does not pass parameter values. All parameters are set to Use document default and cannot be modified.</td>
</tr>
<tr>
<td><strong>Most recent - matching prompt values</strong></td>
<td>The hyperlink opens the most recent instance whose prompt values correspond to the values passed by the hyperlink.</td>
</tr>
<tr>
<td></td>
<td>This option is useful when you want to link to a large document that contains prompts.</td>
</tr>
<tr>
<td></td>
<td>You must specify at least one parameter value. Without at least one specified value, the hyperlink returns an error when clicked. The error occurs because the hyperlink is designed to retrieve an instance based on parameter values, but no value is provided for comparison against the instance.</td>
</tr>
</tbody>
</table>

- If you are linking to a Web Intelligence document, select Target area within the document and then the name of the report.
- To link to a specific part of a report:
  1. Select Target area within the document and Report part.
  2. Click Select.
  3. Right-click the report part (for example a table) and select Select this report part.
  4. To display only the report part, select Display report part only.
  5. To focus on the report part but display the whole report in the target document, select Position at report part (full document available).

**i Note**

You can create links between report elements by defining a report element as an input control that filters the values in other report elements. For example, if you have a report containing two tables, you can filter the values in one table depending on the values selected in the other.

7. In the Customize the look and behavior of the hyperlink section, do one of the following:
Select the format of the target document from the **Document format** dropdown list. The format of the document determines which options are available when defining the link. For example, you cannot link to a report part in a PDF document. For a document referring to a BEx query or a `.unx` or `.unv` universe with a prompt that uses index awareness:

1. Select the **key**.
2. Click the key dropdown box and select **Build formula** and type `=<objectname>.key()`. The object must not be a variable and the object must have a key.
3. Test that the `<objectname>.key()` returns the expected results. If the result does not return the key, ask the universe designer to provide help on how to obtain the key.

To define how the target document opens, select **New window** or **Current window** from the **Target window** dropdown list.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New window</strong></td>
<td>The document opens in a new browser window.</td>
</tr>
<tr>
<td><strong>Current window</strong></td>
<td>The document opens in the current browser window and replaces the document containing the hyperlink.</td>
</tr>
</tbody>
</table>

Type text in the **Tooltip** box, or build a dynamic tooltip by using the **Build formula** or **Select object** options. The tooltip will appear when you hover your mouse pointer over the cell containing the hyperlink.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build formula</strong></td>
<td>You build a formula in the <strong>Formula Editor</strong> to supply the formula output as the tooltip.</td>
</tr>
<tr>
<td><strong>Select object</strong></td>
<td>You choose the variable from the list in the <strong>Available Objects</strong> dialog box to supply its value as the tooltip.</td>
</tr>
</tbody>
</table>

8. In the **Document prompts** section, for each prompt existing in the document, select one of the following options from the dropdown list:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build formula</strong></td>
<td>You use the <strong>Formula Editor</strong> to build a formula to pass a value to the prompt.</td>
</tr>
<tr>
<td><strong>Select object</strong></td>
<td>You select an object whose value is passed to the prompt.</td>
</tr>
<tr>
<td><strong>Prompt user at runtime</strong></td>
<td>The user specifies a value for the prompt when they click the hyperlink.</td>
</tr>
<tr>
<td><strong>Use document default</strong></td>
<td>You configure the hyperlink to not pass a parameter to the target document, and the target document opens with the default value for the prompt. The default value is either the last value specified for the prompt, or the default specified in the document.</td>
</tr>
<tr>
<td><strong>Enter a constant</strong></td>
<td>You enter a constant alphanumeric string that is entered for the prompt.</td>
</tr>
</tbody>
</table>
4.5.4 OpenDocument links

OpenDocument is a web application that processes incoming URL requests for documents and any other viewable object type in the Central Management Server (CMS), and delivers the correct document to the end user in the appropriate viewer.

You can either open OpenDocument links or create them following a specific syntax, depending on the client you want to the OpenDocument link to point, the report you want to open and so on.

For more information on the syntax of an OpenDocument link and the parameters you should include when creating one, refer to the Viewing Documents Using OpenDocument Guide.

4.5.4.1 To open a document from a hyperlink

You can set hyperlinks between documents in the Web Intelligence HTML interface.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Hover your mouse pointer over a cell with a hyperlink to display the tooltip, if a tooltip is defined.

   i Note
   
   The generated syntax of the hyperlink appears in the Formula Bar. Do not modify this syntax directly. Use the Create Hyperlink dialog box if you need to update it.

3. Click the hyperlink to open the target document.
   Depending on how the hyperlink is configured, the target document opens in a new browser window, or it replaces the current document in the current browser window.

4.5.5 To edit a hyperlink in a cell

You can set hyperlinks in table cells in the Web Intelligence HTML interface.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click the cell containing the hyperlink and select Hyperlink Edit.
3. In the Create Hyperlink dialog box, edit the hyperlink.
4. Click OK to close the Create Hyperlink dialog box.
4.5.6 To delete a hyperlink

You can delete hyperlinks in documents in the Web Intelligence.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select the cell containing the hyperlink and select Linking Remove.

4.5.7 Formatting hyperlink colors

You can define the colors used to display hyperlinks that have already been clicked (visited hyperlinks). You can also define the colors for hyperlinks that have not been clicked (unvisited hyperlinks).

4.5.7.1 To set hyperlink colors

You can set the colors of hyperlinks in documents in Web Intelligence.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Right-click a blank area on the report that contains hyperlinks and select Format Report.
3. In the Format Report dialog box, click the Appearance tab.
4. In the Hyperlink color section, click the arrows next to Visited and Unvisited, then either select a predefined color or click More colors to define a custom color.
5. Click OK to close the Format Report dialog box.

4.6 Linking to other reports within the same document

You can define hyperlinks, called intra-document links, to give users immediate access to other reports within the same document.

You can create an intra-document link:

- In a free cell,
In a table cell (on any cell of the table and on any type of table).

**Note**
You create intra-document links only in Web Intelligence HTML interface. The links can then be used in: Web Intelligence Applet, Web Intelligence Rich Client, Web Intelligence Interactive Viewer and Web Intelligence HTML.

**Caution**
When you select a link, its formula is displayed in the formula bar. You should not change it or the link may break. Also, note that all the parameters are case-sensitive.

### 4.6.1 To link to another report within the same document

You can add one or multiple links in a document to other reports within the same document.

**Context**

**Note**
The *Add Intra-Document Link* option is only available when you edit a report in the HTML interface.

**Procedure**

1. Open a Web Intelligence document in *Design* mode.
2. Do one of the following:
   - Right-click the cell (free cell or in a table) where you want to create the link and select *Linking > Add Intra-Document Link*.
   - From the *Report Elements* tab, click the *Linking* subtab, then select *Add Document Link* from the *Document* dropdown list.
3. In the Create Hyperlink dialog box, Select the *Intra-Document Link* tab.
4. Select the report you want to link to from the *Report name* dropdown list.
5. Enter text in the *Tooltip* box, or build a dynamic tooltip by using the *Build formula* or *Select object* options. The tooltip will appear when you hover your mouse pointer over the cell containing the hyperlink.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build formula</strong></td>
<td>You build a formula in the <em>Formula Editor</em> to supply the formula output as the tooltip.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Select object</td>
<td>You choose the variable from the list in the Available Objects dialog box to supply its value as the tooltip.</td>
</tr>
</tbody>
</table>

6. Click **OK**.

**Next Steps**

You may want to edit or delete the link afterwards. To do so, see To edit a hyperlink in a cell [page 504] and To delete a hyperlink [page 505].

**4.7 Saving and exporting documents, reports and data in Web Intelligence**

Web Intelligence allows you to save or export your documents in a variety of formats.

You can perform the following save and export actions, depending on the version of Web Intelligence you are using.

<table>
<thead>
<tr>
<th>Application</th>
<th>Export as</th>
<th>Save as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Intelligence HTML interface</td>
<td>CSV</td>
<td>Web Intelligence</td>
</tr>
<tr>
<td></td>
<td>CSV archive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excel 2007</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>Web Intelligence Applet interface</td>
<td>CSV</td>
<td>CSV archive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excel 2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PDF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Web Intelligence</td>
</tr>
</tbody>
</table>
Refer to the appropriate topics in this document for instructions on how to save the different formats in the interface you are using.

**Related Information**

- Saving data in a document in a CSV archive zip file [page 513]
- To save a document as a text file [page 512]
- To save document data in a CSV file [page 513]
- To save a document in the corporate repository [page 510]
- To save a document as a PDF file [page 510]
- To save a document as an Excel spreadsheet [page 508]
- Exporting documents, reports or data [page 514]

**4.7.1 To save a document as an Excel spreadsheet**

You can use the Web Intelligence Applet or HTML interface to save a document as an Excel spreadsheet.

**Prerequisites**

You must modify the Windows registry before you can export images as background or content to an Excel spreadsheet. See Exporting HTML Code, URLs, and Images to Excel Spreadsheets and PDF Files [page 516].
Context

i Note

- When you export a report with charts to an Excel .xls format, the charts are converted into embedded images in the Excel file and use only 56 colors. This can have an effect on the final color and shading of the images. There are no restrictions on color or shading when you export to an Excel .xlsx format.
- In the BI launch pad preferences for Web Intelligence, you can configure the appearance of data in Web Intelligence documents exported or saved as Microsoft Excel files. For more information, refer to the Selecting an Excel format for Web Intelligence documents topic in the Business Intelligence Launch Pad User Guide.

i Restriction

- An Excel .xlsx worksheet can contain up to 1 million rows of exported data. If you save or export a report to a version of Excel prior to Excel .xlsx, then a new worksheet is started for each 65,000 rows of exported data.
- Web Intelligence cannot export or save to Excel report tables that exceed 2 million rows.

To save a document as an Excel spreadsheet:

Procedure

1. Open a Web Intelligence document.
2. Do one of the following:
   - If you are in Reading mode, select Save As from the Save icon dropdown list.
   - If you are in Design or Data mode, click the arrow next to Save on the toolbar in the File tab toolbar and select Save As.
3. Select My Computer, My Desktop, or My Documents in the dialog box and navigate to the folder where you want to save the document.
4. From the Files of Type list, select Excel (.xls) or Excel (.xlsx).
5. Select the reports you want to save as Excel or select Select All to save all reports.
   - If you save the entire document to Excel, each report within the document is saved as separate worksheet within the Excel file.
6. To have the layout and formatting of the document matched as closely as possible in the Excel file, select Prioritize the formatting of the documents.
7. Tip
   - This option does not exploit the data processing features of Excel to the same extent.
8. To avoid merging multiple cells into Excel cells as much as possible to exploit the data processing features of Excel, select Prioritize easy data processing in Excel.
9. Click Save.
   - In Web Intelligence, all charts are automatically converted to images in Excel.
4.7.2 To save a document as a PDF file

You can use the Web Intelligence Applet interface to save a document as a PDF file.

**Context**

**i Note**

The table cell formatting `Read content as HTML` is not supported when you export a document or report as PDF. Any table cells with this setting are empty in the generated PDF. To keep the cell contents in a PDF, you need to unselect this property. To do this, right-click in the table cell, select `Format Cell`, and in the `Display` section of the `General` tab, change the `Read contents as` to some other value than `HTML`. The setting is applied to the entire column.

**Procedure**

1. Open a Web Intelligence document.
2. Do one of the following:
   - If you are in `Reading` mode, select `Save As` from the `Save` icon dropdown list.
   - If you are in `Design` or `Data` mode, click the arrow next to `Save` on the toolbar in the `File` tab toolbar and select `Save As`.
3. Select `My Computer`, `My Desktop`, or `My Documents` in the dialog box and navigate to the folder where you want to save the document.
4. In the `Files of Type` field, select `PDF`.
5. Do one of the following:
   - To select specific reports to save, select `Select reports`, then select the reports from the list.
   - To save the current report and select the pages you want to save, select `Current report`.
6. Click `Save`.

4.7.3 To save a document in the corporate repository

You can save a document in the corporate repository.

**Context**
Procedure

1. Do one of the following:
   ○ If you are in Reading mode, select Save As from the Save icon dropdown list.
     In Rich Client, from the Save Menu icon dropdown list, select Save to Enterprise.
   ○ If you are in Design or Data mode, click the arrow next to Save on the toolbar in the File tab toolbar and select Save As.
     In Rich Client, select Save to Enterprise from the Save Menu icon dropdown list.

2. Browse the folder in which you want to save the document.

3. Enter a name, a description, and key words.
   Click the Advanced button or toggle button to display the Description and Keywords entry fields.

   → Tip
   Use keywords so that you or other users can reuse them and find documents quicker when doing a search.

4. If you are using the HTML interface, select the categories you want to associate with the documents in the Assign Category box.

5. Optional: Check Refresh on open to refresh the document each time it is opened.

   i Note
   When you enable the Refresh on open document property, the document displays the latest information each time you open the document. The Refresh on open option is dependent on the following settings in the CMC (configured by the BI administrator):
   ○ In Applications ➤ Web Intelligence ➤ from the Manage list, select Properties. In the Automatic Document Refresh on Open Security Right Setting section, the property Automatic Refresh security setting is enabled.
   ○ In Applications ➤ Web Intelligence ➤ from the Manage list, select User Security. When you select a user profile and click View Security, check that the Document - disable automatic refresh on open security right is disabled.
   The Refresh on open property here is different from the Refresh on open option mentioned in the To link to another document in the CMS section. In this case, the document is purged from its data when you open it. This means that the document is empty when you open it, and is then refreshed to reflect the latest data available. There is no record of your data.

6. Optional: Check Permanent regional formatting to preserve the document regional formatting with the document.

7. In Web Intelligence Rich Client:
   ○ To remove all document security and make the document available in Standalone mode, check Remove document security.
   ○ To ensure that the document is not locked by the current user, select Save for all users.

8. Click Save.
Results

The document is saved in the corporate repository.

4.7.4 To save a document as a text file

You can use the Web Intelligence Applet interface to save a document as a text file.

Procedure

1. Open a Web Intelligence document.
2. Do one of the following:
   ○ If you are in Reading mode, select Save As from the Save icon dropdown list.
   ○ If you are in Design or Data mode, click the arrow next to Save on the toolbar in the File tab toolbar and select Save As.
3. Select My Computer, My Desktop, or My Documents in the dialog box and navigate to the folder where you want to save the document.
4. In the Files of Type field, select TXT File.
5. Select the reports to save from the Select reports list or select Select All to export all reports.

   The export of the report elements depends on the Preferred Viewing Locale you have selected in the BI launch pad preferences. Some locales, like the English locale, use the left-to-right (LTR) interface positioning, whereas others, like the Arabic locale, use the right-to-left (RTL) interface positioning.

   In an LTR locale, report elements are exported in the following order:
   1. Report element position, starting from the upper left corner
   2. Left to right, then top to bottom.

   In an RTL locale, report elements are exported in the following order:
   1. Report element position, starting from the upper right corner
   2. Right to left, then top to bottom.

   Note
   ○ In page mode, report elements are exported page by page.
   ○ The exported file in page mode can be different from the result in draft mode.
   ○ The separator used is a tab space.
   ○ Charts and images are not exported.
   ○ Export size limit for text file is defined in the Central Management Console. The default value is 5 MB. An error message appears if the size limit is exceeded.
   ○ If several reports are selected, they are appended one after another in the same text file.

6. Click Save.
Related Information

Interface and document locales [page 51]

4.7.5 To save document data in a CSV file

You can use the Web Intelligence Applet interface or Web Intelligence Rich Client to save document data in a CSV file.

Context

If you save to a CSV archive file, only the data in the current document is saved into a ZIP file, with each report in a separate CSV file.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. If you are in Data mode, select the query whose data you want to save as a CSV or CSV archive file.
3. In the menu above the Side Panel, select Save as from the Save dropdown list. Select the CSV archive format.
4. Enter a file name.
5. Choose the text qualifier, column delimiter and character set.

   → Tip
   
   To make the options you chose the default options when saving to CSV, select Set as default values.

6. If you are creating a CSV archive file, select the reports you want exported.
7. Click Save.

4.7.6 Saving data in a document in a CSV archive zip file

In Web Intelligence Rich Client and the Web Intelligence Applet interface, you can save document data to the CSV archive format which generates an archive file (.zip) that contains one CSV file per report.

Each CSV file contains the report data without any headers, footers or charts.

You can configure the following objects:

- Text qualifier
You can also have all or only some of the reports saved in the CSV archive file.

**Example**

*Contents of a* `<Document_Name>.zip archive file`

- `<Report1_name>.csv`
- `<Report2_name>.csv`
- `<ReportN_name>.csv`

### 4.7.7 Exporting documents, reports or data

You can export a complete document or one or more reports to a text file, a PDF, an Excel spreadsheet, a CSV file, or a CSV archive.

If you want to export raw data, only the CSV format is available. You can select whether you want to export all data or just the data for specific queries.

Except for the text file format, each file type has several settings available when you're in the Export dialog box. They are detailed in the sections below.

**PDF file**

When exporting to a PDF file, you can decide whether you want to export all reports if you have several reports in your document, or only the report you are currently viewing. If you decide to export only the report you are viewing, then it is possible to select whether you want to export:

- All pages
- The current page
- Specific pages, for example pages 10 to 15 only

You can also fine-tune the DPI for images using the *Images DPI* dropdown list.

The *Display Bookmarks* option enables Adobe Acrobat Reader to display the bookmarks tab by default when opening the file to make the navigation through the document easier. This option is disabled by default.

**Excel spreadsheet**

For both XLS and XLSX files, you can select between two options:

- *Prioritize the formatting of the document*
- *Prioritize ease data processing in Excel*

You can also fine-tune the DPI for images using the *Images DPI* dropdown list.
CSV file and CSV archive

You can configure the following objects:

- Text qualifier
- Column delimiter
- Charset

If you want these options to be the default options when you export to a CSV archive, select Set as default values.

As of 4.2 SP5, the class name is added to objects with identical names when exporting query data to a CSV file. If the class names are also identical, then the parent class name is also attached, as shown in the example.

Example

<table>
<thead>
<tr>
<th>Class</th>
<th>Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resort</td>
<td>Country</td>
</tr>
<tr>
<td></td>
<td>Resort</td>
</tr>
<tr>
<td>Customer</td>
<td>Country</td>
</tr>
<tr>
<td></td>
<td>City</td>
</tr>
<tr>
<td>Measure</td>
<td>Revenue</td>
</tr>
</tbody>
</table>

When exporting the query data to a CSV file, the names of [Country] and [Customer.Country] are modified to [Resort.Country] and [Customer.Country].

**i Note**

To prevent malicious command injections from being triggered when you open the CSV file in Microsoft Excel, Web Intelligence adds a space before the following characters during the export process:

- = (Equal)
- + (Plus)
- - (Minus)
- @ (At)

The additional space prevents values with these characters from being executed as commands, which could cause a security issue on your system.

If you want to disable this behavior, ask your administrator to create or change the registry key in Windows or in the boconfig.cfg in UNIX, as follows:

- In Windows, on the server machines and client machines, set the following registry key to false: `HKEY_LOCAL_MACHINE\SOFTWARE\SAP BusinessObjects\Suite XI 4.0\default\WebIntelligence\EscapeCharactersForCSVExport`.
- In UNIX, on the server machines, open the boconfig.cfg file (in `$installdir/setup/boconfig.cfg`), set the following registry declaration key to false `HKEY_LOCAL_MACHINE\SOFTWARE\SAP BusinessObjects\Suite XI 4.0\default\WebIntelligence\EscapeCharactersForCSVExport`.

After the change and before you perform the export, close and open Web Intelligence.
4.7.8 To export a document

You can export a document to a specific location.

Context

Depending on the interface you are using, available formats may vary.

Procedure

1. Click the export icon.
2. Optional: In the HTML interface, select whether you want to export specific reports or data only.
3. Select a format.
   
   Caution
   .PDF, .TXT, .XLS, and .XLSX formats are only available in the HTML interface.

4. In the HTML interface, set the different options available for the format you have elected and click OK.
   To know more about the options available, read Exporting documents, reports or data [page 514].
5. Browse the location where you want to export the file.
6. Give a name to the file you want to export.
7. Click Save.

4.7.9 Exporting HTML Code, URLs, and Images to Excel Spreadsheets and PDF Files

HTML code, URLs and images contained in Web Intelligence documents can be exported to Excel spreadsheets and to PDF files.

Exporting HTML Code to Excel Spreadsheets and PDF Files

HTML code contained in Web Intelligence tables and free cells will be exported as text in Excel spreadsheets and will not be interpreted. In PDF files, HTML code contained in Web Intelligence tables and free cells will not be exported, if these cells have been formatted to be read as HTML. Else, they will be exported as text without any interpretation.
Exporting URLs to Excel Spreadsheets and PDF Files

URLs contained in Web Intelligence tables and free cells will be exported as URLs in Excel spreadsheets and PDF files, if these cells have been formatted to be read as hyperlinks. Else, they will be exported as text.

Exporting Images to Excel Spreadsheets and PDF Files

Images as background or content, that is, cells formatted to be read as image hyperlinks, of Web Intelligence tables and free cells will be exported as images in Excel spreadsheets and PDF files.

However, you must define the proxy server used by Web Intelligence to export these images.

On Windows

In the Windows registry HKEY_LOCAL_MACHINE\SOFTWARE\SAP BusinessObjects\Suite XI 4.0\default\WebIntelligence\BlobManager subkey, do the following:

1. Create or modify the ResolveHTTPUrl value to yes to have the following line:

   "<ResolveHTTPUrl>"=string:"<yes>"

2. Create or modify the PROXY value to <customer-proxy>:<port>, where <customer-proxy> is your proxy server and <port> is the port of that server, to have the following line:

   "<PROXY>"=string:"<customer-proxy>:<port>"

In the case of the Web Intelligence Rich Client, the BlobManager subkey is to be found in HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\SAP BusinessObjects\Suite XI 4.0\default\WebIntelligence.

On UNIX

You need to modify the boconfig.cfg file found in the $installdir/setup folder.

In the boconfig.cfg file, locate the Software\SAP BusinessObjects\Suite XI 4.0\default\WebIntelligence\BlobManager section and do the following:

1. Create or modify the ResolveHTTPUrl value to yes to have the following line:

   "<ResolveHTTPUrl>"=string:"<yes>".

2. Create or modify the PROXY value to <proxy>:<port>, where <proxy> is your client proxy server and <port> is the port of that server, to have the following line:

   "<PROXY>"=string:"<proxy>:<port>"
4.7.10 Autosaved documents

If autosave has been activated by the BI administrator in the Central Management Console (CMC) and if you have the appropriate security rights, then your documents are saved automatically in the `My Favorites/~WebIntelligence` folder as you work.

Autosaved document names consist of the document name prefixed by the document ID and followed by the autosaved document ID. If the document ID is -1, the document was not saved before being autosaved.

Note

Web Intelligence Rich Client does not save documents automatically.

When the autosave feature is enabled, Web Intelligence saves a version of the document you are working on in the `My Favorites/~WebIntelligence` folder. This version however is partial and contains references to the source document. It corresponds to a state of the document at a specific point in time when the document was autosaved. Do not delete the source file, as opening an autosaved document in the `My Favorites/~WebIntelligence` will generate an error if the source document is missing. An autosaved version still needs the original document in order to be opened, as it contains references to the source document.

Caution

- We do not recommend migrating the `My Favorites/~WebIntelligence` folder as it will not be reusable after the migration.
- The content of the files located in the `My Favorites/~WebIntelligence` is partial. These files aren’t Web Intelligence document, and should only be used by the Web Intelligence processing server. Using, opening, copying, cutting or moving these files are unsupported workflows.

The interval at which documents are autosaved is also defined in the CMC. This interval is reset each time you save a document manually, and each time a document is saved automatically. The autosaved document is also deleted when you close a document manually.

In addition to regular autosaving, documents are saved when your session times out.

Note

If you lose a document before you can save it, check the folder immediately to see if there is an autosaved version. The `My Favorites/` folder retains autosaved documents until you end the BI launch pad session.

For more information on the settings and security rights that impact automatic saving, refer to the Business Intelligence Platform Administrator Guide.

Related Information

- Management of autosaved documents [page 519]
- Recovering autosaved documents [page 519]
4.7.10.1 Recovering autosaved documents

Check the My Favorites/~WebIntelligence folder immediately after restoring the connection for your autosaved document.

If your session times out while you are working on a document, your document is saved in the My Favorites/~WebIntelligence folder and displays a dialog box explaining that the session has ended.

In this dialog box:

- Select **Restore** to launch a new session and reopen the autosaved document. The next time you save the document manually, it is saved in its original folder.
- Select **Close** to be redirected to the home page of the BI launch pad. The autosaved document is available in the My Favorites/~WebIntelligence folder.

It is not always possible to link to the autosaved document after a server timeout or connection loss. When this happens, you do not have the option to restore the autosaved document. Documents are regularly deleted from this folder based on the autosave settings.

Related Information

Autosaved documents [page 518]
Management of autosaved documents [page 519]

4.7.10.2 Management of autosaved documents

Documents are autosaved in the My Favorites/~WebIntelligence folder.

As a general rule, autosaving is transparent and you do not access autosaved documents directly.

**iNote**

The My Favorites/~WebIntelligence is not a permanent storage location for autosaved documents, but it usually lists autosaved documents for a short time. All documents are also deleted from the folder at an interval defined in the Central Management Console (CMC).

The My Favorites/~WebIntelligence folder has a maximum size limit, which is set in the CMC. When the total size of the documents in the folder exceeds this limit, the application deletes as many of the oldest documents in the folder as necessary to make way for the latest document.

If you navigate away from a document in the browser without saving the document, the document is lost and the contents of the My Favorites/~WebIntelligence folder are cleared.
Related Information

Autosaved documents [page 518]
Recovering autosaved documents [page 519]
5  Collaborating and sharing data

5.1  Commenting on report data

You can add one or several comments to your data and manage them via the Side Panel.

There is a variety of elements you can comment on. The table below details the different report elements you can comment on and provides links about how to do it.

<table>
<thead>
<tr>
<th>Report element</th>
<th>Definition</th>
<th>How to</th>
<th>Icon displayed in the top-right hand corner of the cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report</td>
<td>A general comment on a report or a report section</td>
<td>Make a global comment with a free cell [page 525]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>Section</td>
<td>A contextual comment linked to a specific section of the report</td>
<td>Comment on a report section [page 525]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>Table cell</td>
<td>A comment specific to a cell contained in a table</td>
<td>Comment on a cell [page 526]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>Report cell</td>
<td>A comment specific to a cell located in the header, body or footer of the report</td>
<td>Comment on a cell [page 526]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>A report block</td>
<td>A comment specific to a chart or a table</td>
<td>Comment on a block [page 527]</td>
<td>![Icon]</td>
</tr>
</tbody>
</table>

Every comment entered for a report or report element can be seen in the Comments pane of the Side Panel. For comments entered for a report cell, a table cell or a report block, a tooltip shows either the first or last comment entered according to the parameter set in the Document Properties when you hover over the icon in the top-right hand corner of the cell. However, you can see the whole thread in the Comments pane when you right-click on a report element and select Comments in the contextual menu.

A document that has not been saved cannot contain comments, so make sure to save it first before you try to add comments to it. If you save a document using the Save As method, it is possible to save the comments as well with the Save document with comments option. It is unchecked by default and greyed out if you do not have the necessary rights to use it.

⚠️ Caution

- You cannot add comments to a document’s instance. To do so, either use the original document or save the instance as a new document.
- The comments of a document you copy are not persisted in the instance that you paste.
- When sending a document, the comments are lost and not persisted in the recipient’s version of the document.
- When entering a comment, the text field is limited to 600 characters (2000 UTF-8 bytes).
5.1.1 Comments restrictions and limitations

Depending on how you interact with the report, you might run into limitations regarding the commenting possibilities.

Commenting in Design mode

The commentary service is only available in Reading mode or Design with Data mode.

⚠️ Caution
To be able to create a comment cell in Design mode, you must be granted the Reporting - Enable Formatting security right. If you don’t have this right, contact your system administrator.

Commenting in a report header, body, or footer

You cannot comment on a report header, body, or footer. As a workaround, create an empty cell, comment it and then place it in the header, body, or header of the report.

Database and report desynchronization

To make sure that you are viewing the latest comments entered in the report, refresh the document.

Changing the context on cells that contain comments

If you change the context of a table by changing a column using the Assign Data method or by editing a measure using the formula editor, comments that were entered for a cell are still displayed in the Comments pane even though the data have changed.
As a workaround, delete the column and create a new one with the new measure.

**Filters and prompts**

When you add a comment to a table cell and apply filters or prompts to the table, the comment cell can sometimes disappear. That is because the comment is not linked to the filtered result, but to the table cell itself. If you remove the filters or prompts you have applied, then the comment cell is displayed again.

**Hierarchies**

If you comment on a cell within a hierarchy, the comment is displayed as long as the hierarchy is expanded. If you collapse the hierarchy, then the comment disappears.

**Drilling**

If you comment on a table cell and drill down on the table, the comment disappears. Drill back up to see the comment again.

**Shared elements**

When you create a shared element from a report element, comment attached to it is not saved with the shared element.

**Non-aggregated data in tables**

You cannot comment on non-aggregated data.

**Scheduling documents that contain comments**

If you schedule a document several times and modify or delete comments between two scheduling jobs, the previous instances will reflect these modifications or deletions. Note that if you add new comments between two instances, previous instances will only contain the comments that were in the document at the time of the scheduling job.
### 5.1.2 Security rights

You need to be granted specific rights by your administrator to manage comments.

You can access the security rights in the Central Management Console in the *Folders* section.

**Note**

These rights are not Web Intelligence specific, they apply to the whole Business Intelligence platform. For more information, refer the *Business Intelligence Platform Administrator Guide*.

The table below lists the different rights.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Comments</td>
<td>Enter or reply to a comment</td>
</tr>
<tr>
<td>Read Comments</td>
<td>Display all the comments in the <em>Comments</em> pane</td>
</tr>
<tr>
<td>Read Comments You Own</td>
<td>Display only the comments you own in the <em>Comments</em> pane</td>
</tr>
<tr>
<td>Edit All Comments</td>
<td>Edit comments you have not entered yourself</td>
</tr>
<tr>
<td>Edit Comments You Own</td>
<td>Edit your comments</td>
</tr>
<tr>
<td>Delete All Comments</td>
<td>Delete comments you have not entered yourself</td>
</tr>
</tbody>
</table>

⚠️ **Caution**

The *Delete* button (Trash Bin) does not actually delete comments, it only hides them in the interface. The comments you delete aren’t erased, and still exist in the database.

| Delete Comments You Own | Delete your comments.                                  |

⚠️ **Caution**

The *Delete* button (Trash Bin) does not actually delete comments, it only hides them in the interface. The comments you delete aren’t erased, and still exist in the database.
5.1.3 To make a global comment with a free cell

You use a free cell to make a global comment on a report.

**Context**

A free cell is a cell that can be displayed anywhere on the report page. It is not linked to a report element.

**i Note**

To create a comment using a free cell, you must be in Connected mode.

**Procedure**

1. Do one of the following.
   - Right-click anywhere on the report and click Insert Comment.
   - In the Report Elements tab, click Cell Pre-defined Comment.
   - In the Report Elements tab, click Comment Insert Comment Cell.
2. Click on the report page where you want the comment to be displayed.
3. Type a comment in the Comments pane that just opened in the Side Panel.
4. Click OK.

**Results**

The free cell containing your comment is now displayed on the report page.

5.1.4 To comment on a report section

You can create comments that are related to a specific context of data using section comments.

**Context**

Sections support contextual comments, meaning that if you create a comment in a section, the comment will only be displayed in that specific section of the report.
Procedure

1. Do one of the following:
   - Right-click anywhere in the section and click **Insert Comment**.
   - In the **Report Elements** tab, click **Cell Pre-defined Comment**.
   - In the **Report Elements** tab, click **Comment Insert Comment Cell**.
2. Click anywhere in the section where you want to insert the comment.
3. Type a comment.
4. Click **OK**.

5.1.5 To comment on a cell

As opposed to the free cell that contains general comments on a report or a report section, comments on a cell are related to a specific cell of your report.

Context

A cell can be a table cell or a report cell, that is in the header, body or footer of the report but not part of table.

> Tip

You cannot comment directly on the header, body or footer of a report. As a workaround, create an empty cell, comment it and then place it in the header, body or header of the report.

Procedure

1. Right-click a cell you want to comment on.
2. Click **Comment**.
   - The **Comments** pane opens up in the **Side Panel**.
3. Click **Add**.
4. Click **OK**.

Results

A yellow ribbon is now displayed in the top-right hand corner of the cell you have just commented on. Hover over the ribbon to see the comment.
5.1.6 To comment on a block

As opposed to the free cell that contains general comments on a report or report section, comments on a block are related to a specific block of your report.

**Context**

A block can be a chart or a table.

**Procedure**

1. Click the block you want to comment on.
2. In the Comments pane of the Side Panel, click Add.
3. Enter your comment.
4. Click OK.

**Results**

An icon is now displayed in the top-right hand corner of the block you have just commented on. Hover over the icon to see the comment.

5.1.7 To reply to a comment

**Context**

You can reply to a comment in both Design mode and Reading mode.

**Procedure**

1. In the Comments pane, click Add Comment.
2. Enter your text.
3. Click **OK**.

### 5.1.8 To delete a comment

**Context**

The delete action does not actually delete comments, it only hides them in the interface. The comments you delete still exist in the database.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make sure that you are granted the necessary rights to delete comments.</td>
</tr>
</tbody>
</table>

**Procedure**

1. Go to the **Comments** pane in the **Side Panel**.

2. Click the bin icon (🗑️) next to the comment you want to delete.

**Related Information**

- Security rights [page 524]
- To clean up comments in the database [page 529]

### 5.1.9 To copy a comment thread

**Context**
Procedure

1. In the Side Panel, click the Comments pane.
2. Click Copy Comments.
3. Press Ctrl + C or Cmd + C.

Results

The comment has been copied to the clipboard.

5.1.10 Cleaning up comments from the database

You can delete comments from the database using the CMC.

An option, called Delete all comments older than X days, allows you to schedule a recurrent cleaning operation in the database. When enabled, comments older than the specific number of days you have entered are automatically deleted from the database. By default, the option is disabled.

⚠️ Caution

If you have hidden comments in the interface, a desynchronization can happen between the database and the Web Intelligence client. In such a case, Web Intelligence displays the cache rather than the updated content of the database. To make sure that you are viewing the latest comments entered, refresh the document.

5.1.11 To clean up comments in the database

Context

Procedure

1. On the CMC home screen, click Applications.
2. Click BI Commentary Application.
3. Check Delete comments older than X days.
4. Enter a number of days after which comments should be deleted.

5.1.12 Displaying a specific comment

You can add parameters to the Comment() function to display a specific comment whenever a cell contains several comments.

The Comment() function is useful whenever you are in a validation workflow and need to display comments that have been validated. The function only works with empty cells that do not contain data, and you can use it either with free comment cells or with empty table cells. As a best practice, we recommend creating an extra column with empty cells in your table dedicated to comments if you intend to use the function with table cells.

After comments have been entered in a cell, all you need to do is pass parameters to the function and assign them values that are then registered in the database to display the comment that has been validated.

Here’s how it works: Web Intelligence drills down the database and retrieves every comment that matches a given value. If several comments match a value given to a parameter, Web Intelligence displays only the first or last matching comment according to the preference you have defined in the Document Properties.

The comments database is managed by the administrator, and has four columns that can contain values assigned to a comment:

- OptionKey1
- OptionKey2
- OptionKey3
- OptionKey4

Make sure that the value you give to comments in the database is in keeping with your validation workflow. If you want to display a comment that has to be reviewed, give it a “Review” or “Check” value for instance.

After you have set the function to retrieve a specific comment, an icon is displayed at the top-right hand corner of the cell or report block. When you hover over the icon, an icon shows the comment entered for the cell. The only time this tooltip is not displayed is when you decide to display two comments in a free comment cell and one of these comments is called via the parameters of the Comment() formula.

⚠️ Caution

There might be a desynchronization issue between the database and the user interface in cells that contain several comments and in which you have used the Comment() function. In such cases, the tooltip is disabled to avoid displaying comments that are not up to date or validated. As a workaround, refresh the document to make sure that you are viewing the most up to date content.

❄️ Example

The table below is an extract of the Comments database and details the content and lifecycle of a specific comment cell.

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Owner</th>
<th>Comment Time Stamp</th>
<th>OptionKey1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CommentCell 1</td>
<td>Administrator</td>
<td>07/20/2015 14:50:23</td>
<td></td>
</tr>
<tr>
<td>CommentCell 1</td>
<td>Spokesman</td>
<td>07/20/2015 16:00:00</td>
<td>Validated</td>
</tr>
</tbody>
</table>
The content of the cell has been modified several times with different comments, but only one of the comments has been validated by the report owner.

As the document reaches its final version, you might want to only display comments that have been validated. Edit the function as follows:

```
Comment("OptionKey1","Validated")
```

Web Intelligence will only display the comment that matches the value declared in the function.

To know more about the Comments database and BI Commentary, refer to the *Business Intelligence Platform Administrator Guide*.

### 5.1.13 Saving a document with its comments

A document that has not been saved cannot contain comments, so make sure to save it first before you try to add comments to it. If you save a document using the *Save As* method, it is possible to save the comments as well with the *Save document with comments* option, available in the *Save* dialog box under *Advanced options*.

### 5.2 Using shared elements to share report parts

Shared elements are report elements, for example, tables, charts, headers or footers, that you store in the CMS repository when you save them. By doing so, you can make them available to you and other report designers so they can be reused multiple times in other documents.

When you insert a shared element in a document, you copy an instance of the report element that you have saved as a shared element. Therefore, the shared element inherits the properties and dependencies of the report element it stems from.

You can manage shared elements from the *Side Panel* in the *Shared Elements* pane. Make sure you are connected to the CMS repository and have the necessary security rights granted.

**Restriction**

- Shared elements are not supported in SAP HANA Online mode.
- When you create a shared element from a report element, comment attached to it is not saved with the shared element.
Example

Every report of your company displays a header with the name of the company. You recreated that same header for every new report you designed.

What if you could avoid creating the same header every time? If you save that specific report element as a shared element, you can then insert it in on the fly in every new report you design. This header is now shared, and your colleagues can use it whenever they design their own reports.

Related Information

To create a shared element [page 533]
To insert a shared element using the toolbar [page 534]
To insert a shared element using the Side Panel [page 535]
Document and shared element synchronization [page 535]
Updating a shared element [page 536]
To update a shared element manually [page 537]

5.2.1 Shared elements restrictions

To work with shared elements, you must be connected to the CMS repository. Depending on the mode you are in, several tasks can be disabled.

Shared elements in Connected mode

In Connected mode, Web Intelligence is connected to the CMS repository. There are no restrictions.

Standalone mode

In Standalone mode, Web Intelligence is not connected to the CMS repository, and every action regarding shared elements is disabled.

i Note

You can open a document that is linked to a shared element if it has been saved without security on a local folder.
Offline mode

In **Offline** mode, the content accessed in **Online** mode is still available via a cache. The table below details the list of restrictions.

<table>
<thead>
<tr>
<th>Action</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating a shared element</td>
<td>Not available</td>
</tr>
<tr>
<td>Inserting a shared element in a document</td>
<td>Not available</td>
</tr>
<tr>
<td>Editing shared element properties</td>
<td>Not available</td>
</tr>
</tbody>
</table>
| Modifying inserted shared elements content in the document | Available  
This does not break the link between the shared element and the document, except if you delete the report element linked to the shared element. |
| Editing shared element content in the CMS        | Not available                                     |
| Updating a shared element in the CMS             | Not available                                     |
| Removing/Unlinking a linked shared element       | Available  
This breaks the link between the shared element and the document. |
| Searching shared elements in the CMS             | Not available                                     |

**5.2.2 To create a shared element**

Create a shared element whenever you want to share content with other users. When you save a shared element, it is stored in the CMS repository.

**Context**

**i Note**

It is not possible to create a shared element based on a custom element, a geomap chart, a comment, a web service or a text file. Also, we do not recommend that you create a shared element from a cell containing a comment.

**Procedure**

1. **In Design** mode, right-click a report element and click **Linking** > **Save as Shared element** or in the toolbar, click **Shared Element** > **Save as**
2. Enter a name and a description for the shared element.
3. Browse the location where you want to save the shared element.
4. **Optional**: If you do not want to keep the format attached to the report element, check *Remove format*.
5. Assign categories to the shared element.
6. Click *Save*.

**Note**

When a report element is created from a document, no link between this document and the shared element is created. They both remain independent.

### 5.2.3 To insert a shared element using the toolbar

#### Context

When you insert a shared element in a document, a link to the source shared element is created so that Web Intelligence can check for shared element updates. Removing this link unlinks the document from the shared element, but the shared element content remains in the document.

#### Procedure

1. Click **Report Element > Linking > Shared element > Insert shared element**.
2. Click on the report page where you want the shared element to be displayed.
3. Browse the folder where the shared element is located.
4. Select the shared element.
5. Click *Open*.
6. **Optional**: If you are prompted to update the shared element, click *OK*. 

---

This text is from the **SAP BusinessObjects Web Intelligence User's Guide**, focusing on collaborating and sharing data.
5.2.4 To insert a shared element using the Side Panel

You can use the Side Panel to insert a shared element.

Context

**i Note**

This is only possible in the Web Intelligence Applet interface or HTML interface.

Procedure

1. In the Shared Elements pane in the Side Panel, click Browse to navigate to the location of the shared element you want to insert and select it.
   You can also use the search functionality to type the name of the shared element you are looking for and access it directly. To do so, click the magnifying glass icon and enter the name of the shared element.
2. Drag it on the report page and drop it where you want it to be displayed.
   In the HTML interface, if you use the search functionality to select a shared element, you cannot use the drag and drop to place the shared element on the report page. To insert it, right-click it and click Insert.

5.2.5 Document and shared element synchronization

When you insert a shared element in a document, Web Intelligence creates a link between the shared element and the document. The content of the shared element however is not automatically updated if a new version is available.

Whenever the shared element is updated in the CMS repository, the document in which the shared element has been copied is no longer up to date. To make sure that you always use the latest version of a shared element in your document, update the shared element content in the document.

**i Note**

Only one version of a shared element can be linked to a document.

If you do not want to keep the modifications between the latest version of a shared element in the CMS repository and its copy in a document, to track changes for instance, unlink the shared element from the document.
5.2.6 Updating a shared element

Shared elements can have a different life cycle than the documents they are linked to. This can happen in the following cases:

- A shared element has been modified and a new version, more recent than the one used in the document, has been published in the CMS repository.
- An older version of a shared element has been restored in the CMS repository and is available.

If an update modifies the query, a new query is created to avoid the modification of the variables or report elements that you use in the document. If you update several shared elements, the document may contain several unused queries. Web Intelligence deletes the unused query to avoid renaming the updated query and its possible variables if it is not used in the document.

A different version of the shared element exists in the CMS repository

When you open a document that contains one or multiple shared elements, Web Intelligence runs a background check to know whether the version of the shared element in the document corresponds to the one stored in the CMS repository.

**i Note**

Make sure that you have enabled the *Check for shared element updates on open* option in the *Document Properties*.

The shared element has been deleted from the CMS repository

An error icon is displayed if a shared element has been removed from the CMS repository or if you do not have the rights to see it. This icon means that the shared element can no longer be accessed. However, the references to the shared element in the document are kept.
The version of the shared element in the CMS repository is unknown

If you are not connected to the CMS repository or if the check for new versions has not been performed, an icon 🔄 is displayed next to the shared element used in the document.

5.2.7 To update a shared element manually

You can check for new versions of the shared elements contained in your document in order to update them.

Context

Tip

In the Properties tab, enable the option Check for shared object update(s) on open to avoid checking for updates manually.

Procedure

1. Select a shared element.
2. In the Shared Elements pane, click Check New Revisions.
   An icon 🔄 is displayed if a new version of the shared element used in the document is available
3. In the Shared Elements pane of the Side Panel, in the Currently Used menu, check the box(es) of the shared element(s) you want to update.
4. Click Update in the toolbar to update the shared element(s) you have selected.

Results

If an error icon 🔄 appears after the update process, it means that the shared element(s) you have selected cannot be found in the CMS repository.
5.2.8 To update a shared element automatically

You can automatically update shared elements each time you open the document by enabling the option Update shared element(s) on open. As a result, the update icon in the Shared Elements pane is not displayed since the document already contains the latest revisions of the shared elements.

Procedure

1. In the Properties tab, click Document.
2. Enable the option Update shared element(s) on open.

5.2.9 To unlink a shared element from a document

Unlinking a shared element from a document removes the link between the shared element and the document.

Context

You will not be notified if new version of the shared element is available in the CMS repository.

i Note

Unlinking a shared element does not delete its content from the document it was linked to.

Procedure

1. In the Shared Elements pane in the Side Panel, click Currently Used to display the shared elements linked to the document.
2. Select a shared element.
3. Click Unlink.

i Note

You can also unlink a specific instance of the shared element in the document by clicking Report Element > Linking > Shared element > Unlink shared element in the toolbar. If there are no instances of the shared element left in the document or if they have all been unlinked from the document, Web Intelligence deletes the link between the document and the shared element.
5.2.10  To unlink a specific instance of a shared element from a document

You can unlink a specific instance of a shared element in a document if it has been copied several times. It does not remove the link of other instances copied in the document.

**Context**

This is useful when you have inserted a shared element several times in different reports of a same document, for instance.

---

**Note**

Do not use the Side Panel to unlink a specific instance of a shared element. It will unlink all the instances that the document contains.

---

**Procedure**

1. On the report page, right-click the shared element you want to unlink.
2. Click Linking Unlink Shared Element.

5.2.11  To search for shared elements

You can search for shared elements in the CMS repository.

**Context**

**Procedure**

1. In the Shared Elements pane in the Side Panel, click the Browse button.
2. Select a folder.
3. Click the magnifying glass icon.
4. Click the drop-down list and select whether you want to search by name (default), keyword or description.
5. Enter your text.
6. Click the magnifying glass to start searching.

### 5.2.12 To edit the properties of a shared element

You can edit the properties of a shared element in Design mode in the Side Panel.

**Context**

Make sure you are connected to the CMS repository.

**Procedure**

1. In the Shared Elements pane in the Side Panel, click Browse.
2. Select the shared element you want to edit.
3. In the toolbar, click Edit.
4. Edit the name, description or keywords of the shared element.
5. Click Save.

**Note**

The name and the description are saved in the document when you insert the shared element. They are updated only when there is a shared element update in the document.

### 5.2.13 Modifying the content of a shared element linked to a document

You can modify the content of any linked shared element added in a document without breaking the link with the given element in the CMS repository, even if these modifications introduce differences between the content in the document and the shared element.

However, if you update the shared element, its content is replaced by the content of the shared element in the CMS repository and all your modifications are lost.
5.2.14 Editing the content of a shared element in the CMS repository

To edit the content of a shared element, you must modify its content in a Web Intelligence document in which it has been copied and then republish it under the same name. The content is then replaced if a shared element with the same name already exists in the CMS repository. The last modification date of the shared element is automatically updated.

The description of the shared element is not updated automatically. However, you can modify the content of the description.

Related Information

To create a shared element [page 533]
6 Analyzing data

6.1 Introduction to data analysis

Data analysis is a crucial process that consists of inspecting your data to find useful information and take decisions.

To analyze your data, you have to break each component apart to get an understanding of why they give such results when put together. The underlying structure and variables of your data set provide you with an investigation plan and valuable insights.

Depending on the insight you are trying to gain from your data, you can use several methods of analysis such as drilling or filtering. These methods enable you to dig into your data and extract key messages that back up the decision you are going to take and help you decide what the next step is.

The following sections provide you with information on the several methods of data analysis, as well as how to use functions and calculations.

6.2 Drilling on report data

Drilling on reports lets you look deeper into your data to discover the details behind a good or bad summary result displayed in tables, charts, or sections.

Restrictions

<table>
<thead>
<tr>
<th>Restriction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queries on BEx queries</td>
<td>You cannot use a Navigation path on BEx queries. Navigation path (previously called the drillpath) has been replaced by the collapse/expand workflow on the real hierarchy.</td>
</tr>
<tr>
<td>Queries on .unv and .unx universes</td>
<td>You can only drill on a .unv or .unx universe if the drill paths are previously defined in the universe.</td>
</tr>
</tbody>
</table>

Example

**Why did sales of accessories, outwear, and overcoats rise in Q3?**

You work for a US national fashion retail chain, and are in charge of sales of accessories, outerwear and overcoat clothing lines in western states. You see that revenue is much higher for Q3 than the other quarters. To understand why, you drill down to look at the factors behind the result and you see that jewelry sales were much higher in July.
6.2.1 Retrieving more levels of data to the report

When you are drilling a report, you may want to drill up or down to a dimension that lies outside the scope of analysis defined for the document.

Returning the additional data requires running a new query that includes the additional dimensions you specify. This is called extending the scope of analysis.

You can extend the scope of analysis during your drill sessions only if your security profile allows you to do so. Your security profile is controlled by the BI administrator.

If your drill options are not set to display the Extend the Scope of Analysis prompt message during drill, you will not be given the option to select filters if you drill beyond the data already available in the document. In this case, the new query runs automatically and returns data for all the values on the dimensions you are drilling.

**Note**
If you plan on drilling out of scope on a Geomap chart, make sure that every additional dimension you specify is matched with a location. If no location is indicated, the additional dimensions will not show on the map.

### 6.2.1.1 To drill out of the scope of analysis

You can create an additional query for a document that returns additional data to the document and adds to the table data for the dimension on which you drilled.

**Procedure**

1. Open a Web Intelligence document in **Reading** or **Design** mode.
2. In the **Analysis** tab, in the **Interact** subtab, select **Start Drill** from the **Drill** dropdown list.
3. Hold your mouse cursor over a dimension value that is at the end of the scope of analysis. A ToolTip informs you that a new query is necessary to return the additional data to the document.
4. Drill on the dimension.
   
   If your drill options are set to prompt you when a drill action requires a new query, the Extend the Scope of Analysis dialog box appears.
   
   The dialog box lists the dimensions in the hierarchy above and below the drilled value. The dimensions already included in the document are checked. The dialog box also displays the filters that you can select to filter the new query.
5. Select the check boxes next to the dimensions you want to drill.
6. Select the check boxes next to the filters you want to use to filter the query.
7. Click **OK**.
6.2.2 Drill paths and hierarchies

When you analyze data in drill mode, you move along a drill path. These paths are based on the dimension hierarchies set by the designer of the universe. Universe designers organize objects in classes in a hierarchy with the summary objects at the top and the most detailed at the bottom. So if you want to see a high-level report, you know that your query should include objects at the top of the list. If you want to see more detailed information, you can then switch to Drill Mode and drill down on each dimension value displayed in the reports.

For example, if the data from [Quarter] did not sufficiently explain a result, you could drill down to [Month] or [Week], depending on how the universe designer set up the hierarchy. When you drill to a different level, measures, such as a [Revenue] or [Margin], are recalculated accordingly.

Drill paths usually follow the same hierarchy order as the classes on a universe. For example, a class called Time typically includes the [Year] dimension at the top of the class, followed by the [Quarter], [Month], and [Week] dimensions. The hierarchies for drill within the Time hierarchy typically follow the same order, because users want to drill annual results to analyze details for quarter, month, and so on. However, the universe designer can also define custom hierarchies.

i Note
A dimension can belong to several hierarchies. When you drill a result on a dimension that belongs to more than one hierarchy, you must answer a prompt to select the drill path.

6.2.2.1 To view drill hierarchies

You can view drill hierarchies in a data provider.

Procedure

1. Open a Web Intelligence document in Data or Design mode.
2. In the Data Access tab, in the Data Providers subtab, click Edit.
3. In the Query Panel, underneath Universe Outline, select Display by Navigation Paths from the Master Perspective dropdown list.

6.2.3 Prompt when drill requires additional data option

When you drill the results displayed on a report, you may want to drill to higher- or lower-level information that isn’t included in the scope of analysis for the document. A new query is required to retrieve this data.

Since queries on large selections of data may take a long time to be completed, you can choose to be prompted with a message every time a new query is necessary. The prompt message asks you whether you want to run the additional query or not. In addition, the prompt lets you apply filters to the extra dimensions.
You include in the new query. This means you can restrict the size of the query to only the data necessary for your analysis.

You need permission from the BI administrator to drill out of the scope of analysis.

Related Information

Setting the scope of analysis [page 93]
Retrieving more levels of data to the report [page 543]

6.2.4 Setting drill options

Before you begin a drill session, you can set your drill options to specify how reports will change each time you drill.

How you set the drill options depends on the interface you are using:

- BI launch pad, if you are using the Web Intelligence HTML or Web Intelligence Applet interface.
- Your computer, if you are using Web Intelligence Rich Client from the BI platform deployment on your computer.

Related Information

To set drill options in the BI launch pad [page 545]
To set drill options in Web Intelligence Rich Client [page 546]
Synchronize drill on report blocks option [page 546]
Hide Drill toolbar on startup option [page 547]
Start drill session on existing report option [page 547]
Start drill session on a duplicate report option [page 547]

6.2.4.1 To set drill options in the BI launch pad

You can configure drill options for Web Intelligence in the BI launch pad preferences.

Procedure

1. In the BI launch pad, click *Preferences*. 
2. In *Web Intelligence* section, select the drill options under *Drill options* and *Start drill session*.

### 6.2.4.2 To set drill options in Web Intelligence Rich Client

You can configure drill options in a document.

**Procedure**

1. With a document open in the Web Intelligence Rich Client, click *Properties ➤ Application*.
2. If no document is open in the Web Intelligence Rich Client, click *Tools*, and select *Options* from the menu in the top corner next to the help menu to display the *Options* dialog box.
3. Select the *Drill* tab.
4. Select the drill options.

### 6.2.4.3 Synchronize drill on report blocks option

When you select the *Synchronize drill on report blocks* option for Web Intelligence in the BI launch pad preferences, the display of all blocks changes to correspond with your drill actions.

For example, if you drill down on a block from year to quarter, and your report also contains a chart showing data by year, the chart display also changes to display data by quarter.

If you do not select the option, only the structure of the drilled block changes. Drill filters are applied to the whole report.

**Synchronizing drill across multiple tables and charts**

A report can contain several tables or charts. The generic term used to refer to tables and charts in this guide is a block. There are two ways to drill on a report with multiple blocks:

- Drill simultaneously on each block in the report the contains the drilled dimension
- Drill on only the current block of data

You set how drill is performed on reports with the *Synchronize drill on report blocks* option.

If synchronize drilling across all blocks in a report, you drill on each block in the report containing that drilled dimension. The next dimension in the drill path replaces the previous dimension in all blocks in the report.

If you do not synchronize drilling across all blocks in a report, the next dimension in the drill path replaces the previous dimension only in the current block in the report.
6.2.4.4  Hide Drill toolbar on startup option

When you drill on a value displayed on a report, the Drill toolbar appears and displays the value on which you drilled.

The value displayed on the toolbar filters the results displayed on the drilled report.

For example, if you drill on year 2010, the results displayed on the drilled table are Q1, Q2, Q3, and Q4 for year 2010. This means that the quarterly values you drilled to are filtered by 2001.

The Drill toolbar allows you to select alternative values on the same level, in order to filter the results differently. For example, if you use the Drill toolbar illustrated above to select “2002,” the results displayed on the drilled table would be Q1, Q2, Q3, and Q4 for year 2002.

In the Web Intelligence section of the BI launch pad Preferences, you can select Hide Drill toolbar on startup to hide the Drill toolbar when you start the drill mode. The Drill toolbar is only useful if you want to select filters during your drill session.

6.2.4.5  Start drill session on existing report option

You can activate the ability to drill in Web Intelligence documents via the BI launch pad preferences.

In the Web Intelligence section of the BI launch pad Preferences, select Start drill session On existing report so that the current report becomes drillable when you start drill mode. When you end drill mode, the report displays the drilled values.

6.2.4.6  Start drill session on a duplicate report option

You can activate the ability to drill in duplicate reports in Web Intelligence documents via the BI launch pad preferences.

In the Web Intelligence section of the BI launch pad Preferences, select Start drill session On duplicate report to drill on a duplicate of the current report when working in drill mode. This allows you to compare the results of the original report with the results you discover during your drill analysis.
6.2.5  To switch to drill mode

To start drilling on a report, you either switch to Drill mode or, if the report is saved in Drill mode, drill directly.

Procedure

1. In a Web Intelligence document in Design mode, select the report you want to drill.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.

   i Note
   When you open a document that was saved in Drill mode, the document opens in Drill mode if you have the right to drill on documents.

By default, a drill icon appears on the tab of the drillable report. Depending on the drill options you selected in the BI launch pad Preferences page, either the selected report becomes drillable or a drillable duplicate of the selected report is created.

Related Information

Start drill session on a duplicate report option [page 547]

6.2.6  To choose a drill path when more than one is available

A dimension can belong to multiple hierarchies. When you drill down on such a dimension value, it is not clear which drill path to follow. You must define the drill path.

Context

   i Note
   If the dimension value you choose to drill on is the result of a previous drill, the drill path is already known. Therefore you do not need to select a drill path.
Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. Drill on the dimension. The Select Drill Path dialog box appears. The dialog box lists the dimensions in the hierarchy above and below the drilled value. A check box appears next to each dimensions below the current dimension you are drilling, so that you can select which of these dimensions you want to retrieve from the database. The dialog box also displays the filters that you can select to filter the new query.
4. Select the path you want to drill.
5. Click OK.

6.2.7 To take a snapshot of report drill results

You can create a report in the existing document that contains the results of a drill action.

Procedure

1. Open a Web Intelligence document in Reading or Design mode.
2. Activate the Drill mode:
   - If you are in Reading mode, select Start Drill Mode from the Drill dropdown list.
   - If you are in Design mode, go to the Analysis tab, and in the Interact subtab, select Start Drill Mode from the Drill dropdown list.
3. Do one of the following:
   - If you are in Reading mode, select Snapshot from the Drill dropdown list.
   - If you are in Design mode, go to the Analysis tab, and in the Interact subtab, select Snapshot from the Drill dropdown list.

6.2.8 Drilling on measures in tables and sections

When you drill on a measure value, you drill one level down for each related dimension in the block, and you see the measure calculated for the displayed dimensions.

Example

Drill on annual sales revenue results to see the breakdown by city and quarter

For example, you drill down on the year 2003 sales revenue value for California, which is displayed on a crosstab that shows sales revenue by year and by state.

The drilled report displays sales revenue by quarter (one level below Year) and by city (one level below State) for California.
6.2.9 Drilling on dimensions in tables and sections

When you drill on a dimension to see the more data behind the displayed result, it is calculated according to the values to which you drill.

Dimensions typically represent character data, such as customer or business names, and dates. Calculations are based around the dimensions in a report. For example, a report calculates a region’s total sales revenue for a given year where a Sales Revenue measure is calculated based on the State and Year dimensions.

If you drill on Year, you display sales revenue by state and quarter, because Quarter is the next dimension in the time hierarchy below Year.

Note
Detail objects cannot be drilled on in reports.

6.2.9.1 Drilling down on report data

You can drill down to see the lower-level data that makes up the summary results displayed on reports. This helps explain why high or low results occurred.

Example
Using drill analysis to find out why sales decreased dramatically in 2006

In this example, you receive a report that shows sales revenue results for the accessories line at the eFashion retail store. The following crosstab shows that the Accessories line decreased in 2006.

To analyze more precisely when the decrease occurred, you drill down on the cell value 2006, to view the detailed data for each quarter. When you drill down on the cell value 2006, a filter appears in the Drill toolbar to show that the quarterly values you have drilled to are filtered for the year 2006. The drilled chart clearly shows that the problem arose in Q4 of 2006.

To find out which of the categories within the Accessories line was responsible for the drop in revenue, you drill down again on the cell value Accessories.
The drilled crosstab shows which categories were responsible for low revenue in Q4.

**Note**

If you try to drill to a dimension that is already displayed in another column or row of the same table, the next available dimension in the drill path is displayed.

### 6.2.9.1.1 To drill down on a value in a table or section cell

You can drill down on a measure value in a table or section in a report.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. In the **Analysis** tab, in the **Interact** subtab, select **Start Drill** from the **Drill** dropdown list.
3. On a table or section cell, place your pointer over the dimension value on which you want to drill.
   A ToolTip appears, showing the next dimension in the drill path. If the drilled report includes dimensions from multiple data providers, the ToolTip displays the name of the query and the dimension for the value.
4. Right-click the cell and select **Drill**, then the drill direction.
   The drilled table or section displays data one dimension level down. The Drill toolbar, at the top of the report, displays the values from which you drilled. These values filter the values displayed on the drilled table.

**Related Information**

To take a snapshot of report drill results [page 549]
6.2.9.2 Drilling up on report data

You can drill up on a dimension value to see how the more detailed data aggregates to a higher-level result. For example, you may have drilled down on Year to examine data for each quarter. If you want to see how this data aggregates to yearly results, you can drill up.

When you drill up on a dimension value, you move along the drill path from lower to higher-level data. For example, you may have drilled down on [Year] to [Quarter]. If you drill up on [Quarter], you return to [Year].

You can only drill up on a dimension value if you have previously drilled down to that dimension, or you have defined the appropriate drill path in the scope of analysis.

Related Information

- Setting the scope of analysis [page 93]
- Retrieving more levels of data to the report [page 543]

6.2.9.2.1 To drill up on a dimension or measure value

You can drill up on a dimension or measure value in a table in a document.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. On a table or section cell, do one of the following:
   - Right-click the cell and select Drill > Drill up.
   - Click the Drill Up icon next to the dimension value you want to drill up.

   If the table is a crosstab without headers that display the names of the dimensions on the table, then the Drill Up icon appears next to each value from which you can drill up.

Related Information

- To take a snapshot of report drill results [page 549]
6.2.9.3  Drilling by other dimensions in a report

When you drill down or up, you move through a hierarchy one dimension at a time. However, you can get another view of the data by slicing it in a different way, and then look at the data in other hierarchies. To do this, you drill by the other dimensions that interest you.

Note
You can only use Drill by with a dimension that is included in the scope of analysis of the document.

Example
Drilling by the Products hierarchy to slice sales revenue results by product
You work as regional manager for California in a retail clothing store, and have been sent the following report that shows quarterly sales revenue by state:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>State</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>California</td>
<td>$1,890,680</td>
</tr>
<tr>
<td>Q1</td>
<td>Colorado</td>
<td>$525,682</td>
</tr>
<tr>
<td>Q1</td>
<td>DC</td>
<td>$766,822</td>
</tr>
<tr>
<td>Q1</td>
<td>Florida</td>
<td>$515,688</td>
</tr>
<tr>
<td>Q1</td>
<td>Illinois</td>
<td>$846,408</td>
</tr>
<tr>
<td>Q1</td>
<td>Massachusetts</td>
<td>$312,896</td>
</tr>
<tr>
<td>Q1</td>
<td>New York</td>
<td>$1,887,115</td>
</tr>
<tr>
<td>Q1</td>
<td>Texas</td>
<td>$2,875,569</td>
</tr>
<tr>
<td></td>
<td>Sum:</td>
<td>$9,720,861</td>
</tr>
<tr>
<td></td>
<td>Average:</td>
<td>$1,216,233</td>
</tr>
</tbody>
</table>

You are only interested in analyzing the results in the state of California. In addition, you want to analyze the sales revenue broken down by each product line you sell. To drill on California data, you place your pointer on the table cell that says California.

If you drilled down now, however, you would drill to results for each city within California, because [City] is the dimension below [State]. Instead, you select Drill by from the drill menu and then you navigate through the dimensions on the Products hierarchy by selecting the sub-menus until you reach the [Lines] dimension.
The drilled report displays the detailed sales revenue results for each product line sold in California.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Lines</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Accessories</td>
<td>$801,858</td>
</tr>
<tr>
<td>Q1</td>
<td>City Skirts</td>
<td>$7,796</td>
</tr>
<tr>
<td>Q1</td>
<td>City Trousers</td>
<td>$8,496</td>
</tr>
<tr>
<td>Q1</td>
<td>Dresses</td>
<td>$80,291</td>
</tr>
<tr>
<td>Q1</td>
<td>Jackets</td>
<td>$47,930</td>
</tr>
<tr>
<td>Q1</td>
<td>Leather</td>
<td>$6,263</td>
</tr>
<tr>
<td>Q1</td>
<td>Outerwear</td>
<td>$28,431</td>
</tr>
<tr>
<td>Q1</td>
<td>Overcoats</td>
<td>$11,541</td>
</tr>
<tr>
<td>Q1</td>
<td>Shirt Waist</td>
<td>$149,421</td>
</tr>
<tr>
<td>Q1</td>
<td>Sweaters</td>
<td>$151,986</td>
</tr>
<tr>
<td>Q1</td>
<td>Sweat-T-T-Shirts</td>
<td>$576,284</td>
</tr>
<tr>
<td>Q1</td>
<td>Trousers</td>
<td>$29,325</td>
</tr>
</tbody>
</table>

Sum: $1,899,680  
Average: $158,307
6.2.9.3.1 To drill by a dimension value

You can drill by a measure value in a report table.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. Right-click a dimension value in a table or section cell.
   The contextual menu appears, displaying the available drill paths.
4. Click Drill by.
   
   Note
   If this option does not appear in the contextual menu, then the cell does not have lower levels of data.
5. Select the class to which you want to drill and then the dimension to which you want to drill.
   The report now displays data for the dimension to which you drilled.

Related Information

To take a snapshot of report drill results [page 549]

6.2.10 Drilling on charts

Drilling down, up, or by on a chart, provides you with a graphical explanation for why summary results are particularly high or low.

You can drill on:

- dimensions – by drilling on chart axes or the chart legend
- measures – by drilling on the data bars or markers in the body of the chart

You cannot drill by dimensions on chart axes. However, you can drill by dimensions on chart legends.
6.2.10.1 Drilling on dimensions via chart axes

On 2D charts, you can drill on dimensions via the X Axis. On 3D charts, you can drill on dimensions via the X Axis and the Z Axis.

Charts can contain one or multiple dimensions on a single axis. When an axis contains multiple dimensions, each possible combination of the dimension values appear on the axis (this is sometimes referred to as a cartesian product).

When you drill on an axis value with multiple dimensions, the drilled results are filtered by both dimensions.

6.2.10.1.1 To drill on a chart axis

You can drill down or up on a dimension value in a chart axis.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. Do one of the following:
   ○ To drill down on the dimension value, click the value.
   ○ To drill up on the dimension value, right-click the value then select Drill Up.
   ○ To drill down on the dimension value, right-click the value then select Drill Down.
   ○ To drill by the dimension value, right-click the value then select Drill By.

i Note

Drill By is not available if the axis has multiple dimensions.
6.2.10.2 Drilling on measures in charts

When you drill on measures, the drill occurs on each dimension displayed on the chart axes.

You can drill on the measures displayed on the following types of chart:

- bar charts – by drilling on the bars
- line and radar line charts – by drilling on the data markers
- pie chart – by drilling on the segments

The new measure calculations displayed on the bars or data markers on the drilled chart, correspond to the lower or higher-level dimensions to which you drilled. The chart axis labels display the names of the drilled dimensions.

Example

Analyze detailed information for the sales revenue measure on a chart

For example, this 3D bar chart displays values for the [State] dimension on the X Axis and displays values for the [Lines] dimension on the Z Axis. This means that the chart bars display values for sales revenue per state per line.

As the example below shows, when you drill down on the bar for “Accessories” in “California”, you also drill down from [State] to [City] on the X Axis and from [Lines] to [Category] on the Y Axis.
The drilled chart displays sales revenue per city per category for accessories.

6.2.10.2.1 To drill on a measure in a chart

You can drill down or up on a measure value in a chart.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. In the **Analysis** tab, in the **Interact** subtab, select **Start Drill** from the **Drill** dropdown list.
3. Do one of the following:
   - To drill down on the measure value, click the bar or data marker.
   - To drill up on the measure value, right-click the bar or data marker, and then click **Drill up**.

On charts, each measure is represented by a bar (on bar charts) or by a data marker (on a line charts and radar line charts).
6.2.10.2.2 Restrictions when drilling measures on charts

When you drill on charts that are not bar charts, the drill action might be performed only on certain dimensions instead of on all of the dimensions on the chart axes.

When you drill on measures in the following chart types, the drill action is performed only on the values in the axis legend:

- area charts – 2D, 3D, and stacked
- radar and scatter charts – all types

**i Note**
You cannot drill on measures in 3D area charts.

6.2.10.3 Drilling on axis legends

You can drill on charts via the chart legend whenever the legend lists the dimensions displayed on the chart.

However, when the chart legend lists the measures displayed on the chart, drilling on the legend is not possible.

Drilling on a legend is useful if you are working with a pie chart, because the axis labels, which display the names of the dimensions represented by each pie segment, are not often displayed.

**i Note**
You can only use Drill By on a chart legend if there is a single dimension on the axis.

6.2.10.3.1 To drill on an axis legend

You can drill down on a dimension value, or drill up or by a dimension value.

**Procedure**

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. Do one of the following:
   - To drill down the dimension value, click the color associated with the value.
   - To drill up the dimension value, right-click the color associated with the value, then click Drill up.
   - To drill by the dimension value, right-click the color associated with the value, then click Drill by.
6.2.11 Using filters when you drill

When you drill on a dimension or measure value in a table or chart, the drilled results are filtered by the dimension or measure you drilled on.

The filter is applied to all of the results displayed on the drilled report.

Filters appear as list boxes in the Drill toolbar. Each list box contains the values associated with that filter. You select the data displayed in a table or chart by choosing the appropriate values from the list boxes.

Tip
You can also use the Drill toolbar outside drill mode to quickly add simple report filters to reports. In this context the toolbar is known as the Report Filter toolbar.

Example
Filtering drilled reports by different US states
For example, if you drill down on a table cell displaying "California" to view results for cities in California, you filter the values in the entire report for California and display results for California only in the report.

By changing the value of each filter, you can then see data for other values on the drilled dimension. For example, you can select Colorado in the filter on State.

Note
If the drilled report includes dimensions from multiple data providers, a ToolTip appears when you rest your cursor on the value displayed on the filter. The ToolTip displays the name of the query and the dimension for the value.

Related Information
To create simple report filters [page 573]

6.2.11.1 To add or remove a drill filter

You can add or remove a drill filter in a document.

Procedure

1. Open a Web Intelligence document in Design mode.
2. In the Analysis tab, in the Interact subtab, select Start Drill from the Drill dropdown list.
3. From the Available Objects list, drag the dimension containing the values around which you want to filter your report and drop it onto the Drill toolbar.

4. A list box for the new filter appears on the Drill toolbar. You can select a value from the list of values to filter the results displayed on the drilled table, chart, or report.

5. To remove a drill filter, drag the dimension away from the Drill toolbar.

### 6.2.12 Saving reports with drill filters

When you save a document with reports in Drill mode, filters generated during drill are saved with the document.

When you open a document saved in Drill mode, the Drill toolbar appears on the drilled reports and shows the filters generated during the last drill session.

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documents saved in Drill mode take longer to open.</td>
</tr>
</tbody>
</table>

### 6.2.13 Refreshing data in a drilled report with prompts

When you refresh a document, a prompt can appear that requires you to specify the values you want to retrieve from the database and return to the reports in the document.

For example, a prompt can require you to specify a year for which you want to retrieve data. This drilled report shows values for Year 2003, the year selected for the prompt.

If the drilled report is filtered for Year 2003, and you then refresh the document and select year 2002 to answer the prompt, the report displays results for 2002 instead of 2003.

### 6.2.14 Drilling with query drill

When you activate query drill, you drill by modifying the underlying query (adding and removing dimensions and query filters) in addition to applying drill filters.

You use query drill when your report contains aggregate measures calculated at the database level. It is designed in particular to provide a drill mode adapted to databases such as Oracle 9i OLAP, which contain aggregate functions which are not supported in Web Intelligence, or which cannot be accurately calculated in the report during a drill session.

Query drill is also useful for reducing the amount of data stored locally during a drill session. Because query drill reduces the scope of analysis when you drill up, it purges unnecessary data.

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>In query drill mode, new objects created when drilling out of scope are deleted when they are no longer needed. As a result, dimensions used in Geomap charts lose the location they have been matched with.</td>
</tr>
</tbody>
</table>
Example

Drilling down from month to week

In this example, Month is the lowest dimension currently available in the query from a time hierarchy, and Week is the dimension immediately below it in the hierarchy.

If you drill down on Month = January, three things happen:

- Week is added to the scope of analysis.
- A query filter restricts Month to "January".
- A drill filter is added to restrict Month to "January".

If you drill up from Week to Month, the process is reversed:

- Week is removed from the scope of analysis.
- The query filter is removed.
- The drill filter is removed.

Note

Drill filters are not strictly necessary in query drill mode. They are applied for consistency with standard drill mode. For example, the DrillFilters function returns the correct value in query drill mode because a query drill applies drill filters to match the query filters.

Related Information

Setting the scope of analysis [page 93]
Levels of scope of analysis [page 93]
To drill out of the scope of analysis [page 543]

6.2.14.1 Drilling down with query drill

When you drill down, query drill behaves similarly to standard drill at the point where the data moves outside the scope of analysis.

A drilled dimension is filtered in query drill mode by adding a query filter in addition to a drill filter. For example, if you drill on Year=2001, you add a query filter to restrict the Year dimension to 2001. For this reason, the only value that appears in the drill toolbar for the drilled dimension is the value on which you drilled (in this case 2001). This is different from standard drill mode, in which all values of the dimension are visible in the toolbar. As a result, you cannot change filter values in query drill mode (for example, drill on Year=2001 then switch to Year=2003) as you can in standard drill mode.

Because query drill automatically extends the scope of analysis, you can use it only if you have the right to drill outside the scope. Contact the BI administrator for more details.
6.2.14.2 Drilling up with query drill

When you drill up, query drill removes dimensions from the query.

For example, if you drill up from Month to Quarter, you remove Month from the query. This has two consequences:

- Query drill is incompatible with drill snapshots.
- You cannot drill up beyond any dimension that appears as one of the report objects. For example, if your report displays Year, Quarter and Revenue, you cannot drill up from Quarter to Year because this would remove quarter from the list of report objects.

6.2.14.3 Query drill and drill snapshots

In query drill mode, snapshots change when you drill up beyond a dimension that you included in a snapshot.

Do not use drill snapshots when working in query drill mode, because query drill means that snapshots cannot be guaranteed to stay the same.

Because the drill up removes the dimension from the underlying query, it also removes the dimension from the snapshot.
6.2.14.4 Query drill and other reports based on the same data provider

If your document contains other reports that contain dimensions on which you drill in query drill mode, these reports are affected because the query drill modifies the dimensions they contain.

You can avoid this (at the cost of retrieving duplicate data) by creating a new data provider and rebuilding the other report against it. Now when you drill in query drill mode, the other report remains unaffected.

Example

Drilling on a dimension that appears in another report

If you have two reports based on a query that contains Year, Quarter and Sales Revenue, and you use query drill to drill down to Year = 2001 on the first report, you also filter the data for Year in the second report to include 2001 only.

6.2.14.5 To activate query drill

If your report already has a scope of analysis defined, you see an error message telling you to clear the scope of analysis before activating query drill.

Procedure

1. Open a Web Intelligence document in Design or Data mode.
2. In the Properties tab, click Document to display the Document Properties dialog box.
3. Select Use query drill.
   
   i Note

   The Use query drill option is unavailable if there is a scope of analysis activated in the Query Panel.

4. Click OK to close the Document Properties dialog box.

Related Information

To set the scope of analysis [page 94]
6.3 Filtering report data

You can filter reports to limit the displayed results.

For example, you can limit the displayed results to information for a specific customer or a sales period. The data you filter out remains in the document; it is simply not displayed in the report tables or charts. This means you can change or remove report filters in order to view the hidden values, without modifying the query behind the document.

You can apply different filters to different parts of a report. For example, you can limit the results in the entire report to a specific product line and then limit results in a table or chart further to focus on results for a specific region or customer profile.

To create a report filter, you need to specify the following elements:

- a filtered object
- an operator
- filter values
- the report element to be filtered (the whole report, sections, or blocks)

In the Side Panel, click the "Document Structure and Filters" tab, to see the structure of the document and the report elements that are filtered by operator and value.

Related Information

Using report filters in report sections [page 352]

6.3.1 Query filters and report filters compared

You can define the following types of filter in a document.

<table>
<thead>
<tr>
<th>Type of document filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query filter</td>
<td>Defined on the query to limit the data retrieved from the data source and returned to the document.</td>
</tr>
<tr>
<td>Report filter</td>
<td>Defined within the report to limit values displayed in tables, charts, and sections within the document. Unlike the query filter, a report filter doesn’t modify the data that is retrieved from the data source; it simply hides values at the report level.</td>
</tr>
</tbody>
</table>

⚠️ Caution

Users with document edit rights on a document have the right to modify any of your document report filter and can also access the document data.
Empty and null values in LOVs

The List of Values option \[EMPTY\_VALUE\] for a filter appears in your filter list of values (LOV) when empty string values are present in your query. You can use \[EMPTY\_VALUE\] only when filtering on empty strings, not when filtering on NULL values.

The \[NULL\_VALUE\] option in a LOV allows you to select any null or empty string value in the list. This option always appears in a report filter LOV, and can appear in a Combo box, Radio buttons, List box, or Check boxes input control if the input control is set to allow selection of null values.

Related Information

To create, edit, and delete standard report filters [page 569]
Filtering data using query filters [page 195]

6.3.2 Report filter operators

You use operators to compare filtered objects.
Operators can perform mathematical operations.

6.3.2.1 Not Equal to operator

Use the Not Equal to operator to obtain data not equal to a value.
For example, to return data for all countries except the US create the filter “County Not Equal to US”.

\[i\] Note
This operator cannot be used for OLAP universe parent-child hierarchies or for BEx queries.

6.3.2.2 Greater than operator

Use the Greater than operator to retrieve data greater than a value.
For example, to retrieve data for customers aged over 60, create the filter “[Customer Age] Greater than 60”.

\[i\] Note
This operator cannot be used for OLAP universe parent-child hierarchies or for BEx queries.
6.3.2.3 Greater than or Equal to operator

Use the Greater than or equal to operator to retrieve data greater than or equal to a value.

For example, to retrieve data for revenue starting from $1.5M, create the filter "[Revenue] Greater than or equal to 1500000".

**i Note**

This operator cannot be used for OLAP .unx universe parent-child hierarchies or for BEx hierarchies.

6.3.2.4 Less than operator

Use the Less than operator to retrieve data lower than a value.

For example, to retrieve data for exam grades lower than 40, create the filter "[Exam Grade] Less than 40".

**i Note**

This operator cannot be used for OLAP .unx universes, hierarchies in filters, or for hierarchies in BEx queries.

6.3.2.5 Less than or Equal to operator

Use the Less than or equal to operator to retrieve data less than or equal to a value.

For example, to retrieve data for customers whose age is 30 or less, create the filter "[Age] Less than or equal to 30".

**i Note**

This operator cannot be used for OLAP .unx universes, hierarchies in filters or for hierarchies in BEx queries.

6.3.2.6 Between operator

Use the Between operator to retrieve data between two boundary values including the two boundary values.

The first value declared must be lower than the second value.

For example, to retrieve data for weeks starting at week 25 and finishing at 36 (including week 25 and week 36), create the filter "[Week] Between 25 and 36".

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6.3.2.7 Not between operator

Use the *Not between* operator to retrieve data outside the range of two values.

For example, to retrieve data for all the weeks of the year, except for and not including weeks 25 through 36, create the filter "[Week] Not between 25 and 36".

---

6.3.2.8 In list operator

Use the *In list* operator to retrieve data corresponding to values in a list of values.

For example, to retrieve data only for the US, UK and Japan, create the filter *[Country] In list*, when you can type values in the *Type a value* field, you enter `US;UK;Japan`.

When used in a query filter with a hierarchical list of values, either from a dimension associated with a hierarchical list of values or a hierarchy object, *In list* allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the *In list* operator allows selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

When used in a report filter, *In list* produces a flat list of values.

---

6.3.2.9 Not In List operator

Use the *Not in list* operator to retrieve data that does not correspond to multiple values.

For example, if you do not want to retrieve data for the US, UK and Japan, create the filter "[Country] Not in list". In the *Type a value* field, you enter `US;UK;Japan`.

When used with a hierarchical list of values, either from a dimension associated with a hierarchical list of values, a hierarchy object or a level object, *Not in list* allows the selection of multiple members from any levels of the hierarchy. For example, a prompt on the [Geography] hierarchy using the *Not in list* operator allows selection of [Paris] at the City level and [Canada] at the Country level in the prompt.

---

This operator can only be used in certain types of hierarchies, for example, it can be used in level-based hierarchies.
6.3.2.10 IsNull operator

Use the IsNull operator to retrieve data for which there are no values in the database.

For example, to retrieve customers without children (the children column in the database has no value), create the filter [Children] IsNull.

6.3.2.11 Is not Null operator

Use the Is not Null operator to return data for which there is a value in the database.

For example, to return customers with children, create the filter [Children] Is not Null.

6.3.2.12 Equal to operator

Use the Equal to operator to obtain data equal to a value.

For example, to return data for the US only, create the filter 

6.3.3 Types of report filter

Report filters are filters that can be applied on different report elements: report, section, table, graph.

There are two types of report filter:

- Standard report filters.
  Standard report filters are the most flexible type of report filter. They can use any filter operator and can filter on single values or lists of values.
- Simple report filters.
  Simple report filters provide an easy way to create filters using the Equal to operator. They can filter on single values only, and are applied to a whole report (not an entire document or report element).

6.3.4 To create, edit, and delete standard report filters

You can work with report filters in the Report Filter dialog box.

Procedure

1. In a Web Intelligence document in Design mode, select the report element you want to filter.
2. In the **Analysis** tab, select the **Filters** subtab.

3. From the **Filter** dropdown list, select **Add filter**.
   
   If you selected a cell in a table, by default, the **Filter On** box displays the object for that cell.

4. If you wish to filter on an object besides the default object, click **Add filter** in the **Report Filter** dialog box to display the objects you can filter.

5. In the **Available objects** panel, select the objects you want to filter and click **OK**.
   
   If you selected more than one object, the filtered objects appear in an AND relationship. Double-click the AND operator to change it to OR.

6. For each filter object, select a filter operator from the object’s dropdown list.
   
   By default, the **In List** filter operator is selected.

7. To add values for the filter to the list of filtered values, do one of the following:
   - Type values directly in the box above the list of values of the object.
   - Double-click the item to add it to the list of selected values.
   - Select values from the list and click > to add it to the list of selected values.

   The values you can type or select depend on the operator. For example, if you select the **Equal to** operator, you can type or select only one value.

   To obtain data for rows or columns that contains no data, add `[NULL_VALUE]` to the object. For example, if you want to see customers who have not paid, then if you select `[NULL_VALUE]` for object “Invoice Date”, the resulting list shows only those customers without an invoice date.

   If the filtered object is a hierarchy, the values are displayed hierarchically. All members of the hierarchy are visible even if they are collapsed in the report. You must select hierarchy members from the hierarchy; you cannot type them manually. All member values that have been selected in the **Query Panel** are displayed in gray and can’t be selected if they are not in the final report because they are not linked to any measures. To help you select the right values, you can also click the key icon to see both the text and key ID value for the members.

   If the filtered object is a level, the values are displayed in a list. It is not possible to type the values.

8. Click **OK** to apply the report filter to the element.

9. To edit a report filter, select the report element and select **Edit Filter** from the **Filter** dropdown list and edit the filter using the dialog box. Click **OK** to return to the document.

10. To delete a report filter, select the report element and select **Remove Filter** from the **Filter** dropdown list.

    You use this to remove all filters for the selected report element. To remove only one filter, click **Edit Filter** and in the **Report Filter** dialog box, select the filter and click the **Remove** icon.
6.3.4.1 To select values from a list of values

When selecting from a list of values in a query, items in the list can appear either as a single or multi-column list or a hierarchy, depending on the object.

Context

In a multi-column list, additional columns provide related values to the main value. In a hierarchical list, values appear in a hierarchical relationship.

When you refresh a document with prompts, lists of values for the prompts appear in a flat list without multiple columns.

Procedure

1. In a list of values, select items that you want to appear.
   - If the list of values does not appear when a dialog box opens, refresh the list, or search the list to retrieve values. Some list of values require an initial search to display values because the list is too large to be loaded in full.
   - If the list of values is divided into ranges, use the control above the list to navigate through the ranges. Some large lists of values are divided into ranges to reduce the amount of data retrieved from the database. When you select a range, the list displays the values in that range.
   - If the list of values depends on other lists of values, specify the dependent values in the prompt dialog box that appears. A list of values can be dependent on other lists of values, for example when it is part of a hierarchical list of values. For example, if the list of values contains cities, and the City object is part of the hierarchy Country > Region > City, you need to specify values for country and region first to filter the list of cities.

   **Note**
   Dependent lists of values appear in queries only. They do not appear when you are selecting from a list of values in a report.

   When you first display the list of values, you see the Prompts dialog box in which you specify the dependent values. Once you have specified the dependent values, you can select the values from the filtered list.

   - To display the value keys in OLAP or BEx queries, click Show/hide key values.
     Key values are not indicated in the list of Selected Values, only in the list of available values. Some lists of values contain key values, which are unique values that can be used to identify values with the same display value. If the list of values contains multiple columns, only the key of the filtering column is displayed.
   - To search for values in the list, type the search text in the box below the list and select one of the following options from the Search icon dropdown list.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Match case</strong></td>
<td>The search is case-sensitive.</td>
</tr>
<tr>
<td></td>
<td>This option is not available when the <strong>Search in keys</strong> or <strong>Search on database</strong> options are selected.</td>
</tr>
<tr>
<td><strong>Search in keys</strong></td>
<td>The search uses unique value keys rather than display values.</td>
</tr>
<tr>
<td></td>
<td>This option is available only in lists of values that support key values.</td>
</tr>
<tr>
<td><strong>Search on database</strong></td>
<td>The search includes all values stored in the database rather than being restricted to the values loaded into the list. It improves search accuracy but reduces search speed.</td>
</tr>
<tr>
<td></td>
<td>This option is available only in lists of values that support database searches.</td>
</tr>
<tr>
<td></td>
<td>Database searching improves search accuracy at the cost of performance. It is useful when not all values in the list of values were retrieved. This can happen when the total number of values in the list exceeds the <strong>Max rows retrieved</strong> query property.</td>
</tr>
<tr>
<td></td>
<td>Database searching is particularly useful when the list of values is hierarchical because values are loaded from the database only in response to their parent value being expanded in the hierarchy. For example, in a geographical hierarchy, the child values of the California value (cities in California) are not loaded from the database until the value is expanded. If the option is selected, the search includes these items even when the California value has not been expanded.</td>
</tr>
<tr>
<td></td>
<td>The search includes all ranges if the list of values is divided into ranges.</td>
</tr>
<tr>
<td></td>
<td>In search patterns, the &quot;<em>&quot; wildcard represents any string of characters and the '?' wildcard represents any single character. For example, the value &quot;March&quot; can be returned by the search patterns &quot;M</em>&quot; or &quot;Mar?h&quot;. To include the &quot;*&quot; and '?' characters literally rather than as wildcards, precede them with &quot;&quot; in the search pattern.</td>
</tr>
<tr>
<td></td>
<td>○ Type values from the list directly if the list supports direct data entry or select values from the list.</td>
</tr>
</tbody>
</table>

2. Click **OK** or **Run Query**, as applicable.

**Related Information**

- Max rows retrieved query property [page 97]
- Selecting prompt values in the Prompts dialog box [page 577]
6.3.5 Using simple report filters

Simple report filters filter information in an open Web Intelligence report, not in the document or in specific objects in the report.

The Report Filter toolbar provides a quick method for adding simple report filters to reports.

You can filter on the following objects in a report:

- Dimension or detail objects
- Hierarchies, characteristics or attributes for OLAP universes or BEx queries (but not at the hierarchy level or on measures)

Simple report filters can only use the Equal to operator and can only filter on a single value. They can use the All values operator.

**Restriction**

In 4.2 SP3, available filter operators on attributes for queries based on OLAP sources are limited to “Equal to”, “In List” and “Matches pattern”. This only applies to attributes directly associated to hierarchies.

Related Information

To create simple report filters [page 573]

6.3.5.1 To create simple report filters

You can filter a report on the object value you select. For example, if you select “US” from the list of values of the Country object, the report is filtered to exclude all rows where Country does not have the value “US”.

Procedure

1. Open a Web Intelligence document.
2. Do one of the following:
   - In the Reading mode, click Filter Bar.
   - In Design mode, in the Analysis tab, select the Interact subtab and click Filter Bar.

The Report Filter toolbar appears.

**Note**

When opening the filter bar, filters are automatically inserted when their report scopes are:

- Single value (Equal to operator)
- With the All Values operator
Those filters are no longer displayed in the Filter box.

Note

When collapsing the Report Filter toolbar, all "simple filters" are put back as Equal to or All values report filters that filter on the entire report. To avoid creating All values filters, remove the object from the filter bar before you collapse it.

3. Click the add simple report filter icon on the toolbar and select the object on which you want to filter from the menu.

You can add multiple objects to the toolbar to create multiple filters.

Note

Depending on the data sources and selected objects, the values or objects available in a filter may depend on the values set in another filter object.

4. Select the value on which you want to filter from the dropdown list of values.

Note

For non-hierarchical objects, the list contains all values contained in the report for this object after applying all other report scope filters. For example if you have an In List filter reducing this object values, you will have this list of values for the filter bar Equal to filter.

For hierarchical objects, the list contains the flat list of all member values at any level. This list is in tree view order, not alphabetical order.

Tip

In the Web Intelligence Applet interface, or in Web Intelligence Rich Client, you can drag objects from the tree view to the Report Filter toolbar.

Results

To remove a filter:

- In the Web Intelligence HTML interface in Reading or Design mode, from the dropdown list for the operator in the Report Filter toolbar, select (Remove).
- In the Web Intelligence Applet interface or Web Intelligence Rich Client in Design mode, select the filter and drag and drop it into the report.

Related Information

To create, edit, and delete standard report filters [page 569]
6.3.6 To create nested filters in a report

A nested report filter contains more than one filter that use AND and OR clauses.

Procedure

1. Open a Web Intelligence document in Design mode.
2. To add a filter to the existing filter list, in the Analysis tab, select the Filters subtab.
3. From the Filter dropdown list, click Add Filter.
4. In Report Filter panel, click Add filter, select one or more object for the filter, and click OK.
5. Select an operator and values for the filter.
6. Click the operator to change the type from AND to OR and vice versa.
7. When you have finished adding filters, click OK to return to the document.

6.3.7 Filtering data with prompts

You can filter report data by supplying values for prompts.

When you refresh a document with prompts, the Prompts dialog box displays a summary of all the defined prompts in the Prompt Summary pane. You select the prompt you want to answer, and supply values in the Enter values for prompt pane of the dialog box.

Depending on the prompt you select, you type values directly or select values from a list. A list of values can contain display only values, or the values and their corresponding database key values. Database key values are unique values used to identify the display within the database.

Lists of values can be organized hierarchically if the list was defined as a hierarchy by the universe designer, or the prompt is based on a hierarchy or level object.

Lists of values can be split into ranges to improve performance.

You can search or filter lists of values for easier access to the values you are interested in.

Prompts can be optional or mandatory. If you do not supply a value for an optional prompt, the prompt is ignored. You must supply values for all mandatory prompts before you can filter the data by running the prompts.

Prompts can depend on other prompts. For example, a prompt on a City object can be dependent on a prompt on a Region object. By supplying values to the Region prompt, you restrict the number of possible values of the City prompt.

You can supply values for dependent prompts only when you have supplied values for all the prompts on which they depend. If you wish to supply values to dependent prompts of an optional prompt, you must supply values for the optional prompt.
Related Information

To select values from a list of values [page 206]
Selecting prompt values in the Prompts dialog box [page 577]

6.3.7.1 To supply values for prompts

You can filter report data based on the prompt values you use.

Procedure

1. Open a Web Intelligence document containing a query-level prompt in Design mode.
2. Click the Refresh button.
3. Select the prompt in the Prompts Summary pane.
4. If the prompt has a list of values and the values are not displayed, click the Refresh button to display them. In this case, the list displays the text To see the contents of the list, click Refresh.
   
   If the prompt is dependent on other prompts, the list of values displays links to the dependent prompts. You must supply values for the dependent prompts before you can supply a value for the current prompt. Groups of dependent prompts appear in separate groups in the Prompt Summary pane.

   The values can appear as single values, in multiple columns (where the additional columns supply further information about the main filtering column), or hierarchically, depending on the prompt.

   If the list of values is too large to display all at once, the list is split into ranges and a box above the list of values displays the current range. You can scroll through the ranges to see all the values in the list.

5. Select values and click > to add values to the selected values list, or type values directly if the prompt allows you to do so.

   You cannot type values directly if the list of values is hierarchical.

   If the prompt requires a date, you can select it from the calendar that appears in the box in which you select the value.

   Note
   
   SAP Key Dates appear as date prompts, with other prompts in the same data provider appearing as dependent prompts.

6. Repeat the previous step if the prompt allows you to select multiple values.

   If a prompt allows you to make multiple selections from a hierarchical list of values, you can select values at different levels of the hierarchy. If the prompt allows single values only, you can select values only from the bottom level of the hierarchy.

   If a prompt allows you to type values directly and allows multiple values, you can specify multiple values separated by ";", for example California;Nevada;Iowa. After you have typed or pasted the separated list, click the tooltip that says Click here to interpret as multiple values. If you click >, the list is interpreted as a single value.
7. Run the query:
   a. In the Web Intelligence HTML interface, click Run Query to run the query.
   b. In the Web Intelligence Applet interface or Web Intelligence Rich Client, click OK to run the query.

Related Information

To select values from a list of values [page 206]
To build a prompt [page 222]

6.3.7.2 Selecting prompt values in the Prompts dialog box

When you open or refresh a document with prompts, the Prompts dialog box appears.

The actions you can take in the Prompts dialog box depend on the type of data source the document is accessing or the settings selected by the data source or document query designer.

Features of the Prompts dialog box in the Applet and Rich Client interfaces

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Actions you can take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available prompt variants text box</td>
<td>This feature is available after you have created, run, and saved to the CMS the Web Intelligence query for the first time. This feature lists any prompt variants you have saved.</td>
<td>You enter the name of the prompt variant in this text box when you are creating it for the first time. Once you have named and saved a prompt variant, you can select it from the dropdown list.</td>
</tr>
</tbody>
</table>
| Delete prompt variant button         | This feature is available after you have created, run, and saved to the CMS the Web Intelligence query for the first time. A button that allows you to delete an existing prompt variant. | To delete the prompt variant:  
1. Select the prompt variant from the Available prompt variants dropdown list.  
2. Click Delete prompt variant. |
| Create prompt variant button         | This feature is available after you have created, run, and saved to the CMS the Web Intelligence query for the first time. A button that allows you to create a prompt variant. | To create a prompt variant:  
1. Select values from each prompt in the prompt summary.  
2. Enter a name in the Available prompt variants text box.  
3. Click Create prompt variant.  
   It appears in the Available prompt variants dropdown list. |
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Actions you can take</th>
</tr>
</thead>
</table>
| **Save prompt variant** button  | This feature is available after you have created, run, and saved to the CMS the Web Intelligence query for the first time. A button that allows you to save changes to an existing prompt variant. | To save prompt variant changes:  
1. Select your prompt variant from the *Available prompt variants* drop-down list.  
2. Update the value selection for each prompt in the prompt summary.  
3. Click *Save prompt variant*. |
| **Prompts Summary** list box    | A list of the prompts and your previous selections.                          | To change the selections for a specific prompt, you can select it from the list, and supply different values. |
| **Type a value** text box       | A text box in which you can manually enter values, including wildcard text patterns (for example 9* for all accounts starting with 9), to add to the *Selected Value(s)* list box. | To manually add a value, or use wildcard text patterns, you enter the text string in this box and click the right angle bracket (>) icon to add it to the *Selected Value(s)*, *Start Value*, or *End Value* list box. |
| **List of values box**          | The list box that shows the available data values.                          | To add an item in this list box to a *Selected Value(s)*, *Start Value*, or *End Value* list box:  
1. Select the item in the List of values box (to select additional items, press *Control* and click other items).  
2. Click the right angle bracket (>) icon. |
| **Refresh values** button       | When you click this icon, the List of values box shows the values that can be selected for the prompt.  
Some lists of values require an initial search to display values because the list is too large to be loaded in full.  
See To select values from a list of values [page 206] for more information on lists of values. | To refresh the list of values box, click the **Refresh values** button. |
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Actions you can take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search text box</td>
<td>A text box in which you can enter a search pattern. Next to this text box is a</td>
<td>To search the list of values, enter text in the search text box and press Enter or</td>
</tr>
<tr>
<td></td>
<td>Search button that offers three search options: Match case, Search in keys,</td>
<td>click the Search button.</td>
</tr>
<tr>
<td></td>
<td>and Search on database. See To select values from a list of values [page 206]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for more information on lists of values.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected Value(s) list</td>
<td>In a prompt that allows multivalue variable selection, the list box that</td>
<td>To delete an item from this list box, select it and click the &lt; button.</td>
</tr>
<tr>
<td>box</td>
<td>shows the values that you have entered for a prompt.</td>
<td></td>
</tr>
<tr>
<td>Start Value text box</td>
<td>In a prompt that requires an interval selection, this shows the start value</td>
<td></td>
</tr>
<tr>
<td>End Value text box</td>
<td>In a prompt that requires an interval selection, this shows the end value</td>
<td></td>
</tr>
<tr>
<td>Right angle bracket (&gt; ) icon</td>
<td>A button that allows you to add items to the Selected Value(s), Start Value,</td>
<td>When you have manually entered a value in the Type a value text box or selected one</td>
</tr>
<tr>
<td></td>
<td>or End Value list box.</td>
<td>or more values in the list of values box, click &gt; to add the values to the Selected</td>
</tr>
<tr>
<td>Left angle bracket (&lt; ) icon</td>
<td>A button that allows you to remove items to the Selected Value(s), Start</td>
<td>Value(s), Start Value, or End Value list box.</td>
</tr>
<tr>
<td></td>
<td>Value, or End Value list box.</td>
<td>To remove an item from a Selected Value(s) list box, select the item and click &lt;.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To remove an item from a Start Value or End Value list box, click &lt; next to the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>applicable list box.</td>
</tr>
</tbody>
</table>

**Related Information**

Prompt variant sets in the Prompts dialog box [page 580]
To select members based on relative depth from a selected node [page 128]
To add a second BEx query data provider to a document [page 134]
To edit a document based on a BEx query [page 136]
About previewing data when a BEx query has variables [page 137]
To select values from a list of values [page 206]
Filtering data with query prompts [page 214]
To build a prompt [page 222]
Defining how prompts display [page 224]

6.3.7.3 Prompt variant sets in the Prompts dialog box

You can save a group of often-used variable value sets as a prompt variant in the Prompts dialog box. After the Web Intelligence document query is created, run, and saved for the first time, when you refresh or open the document, you can see the Available prompt variants options in the Prompts dialog box. Once you’ve selected the values for each prompt in the Prompts Summary, you name and save the variable value set as a prompt variant. It is subsequently available in the Prompts dialog box from the Available prompt variants dropdown list.

For example, if you are a regional manager and prefer to have a prompt variant for each branch in your region, then when you refresh a report and select a prompt variant for branch A, the document displays only the data for branch A.

When Web Intelligence applies a prompt variant, each variant value is applied to prompt if, and only if, the following match exactly:

- data type (as in string, date, and so on)
- selection type (single, multiple, or interval)
- structure (hierarchy, flat)

Unmatched prompts are ignored.

Restriction

- You must create, run, and then save the document to the CMS to see the prompt variant options.
- Only the user who created the prompt variants can view them and they only apply to the document in which they have been created on.
- When you delete a prompt variant, it is completely removed from the document. It cannot be recovered.
- Prompt variants do not work in Web Intelligence Rich Client in offline or standalone mode.

Related Information

Selecting prompt values in the Prompts dialog box [page 577]

6.4 Filtering data using input controls

Input controls provide a convenient, easily accessible way to filter and analyze report data.

When you create an input control, it appears in the Input Controls tab on the Side Panel.

You can define input controls using standard windows controls such as text boxes and radio buttons and associate these input controls with one or more elements such as tables, sections, and charts in a report, or for
all of the elements in a document. When you select values in the input control, you filter the values in the associated report elements by the values you have selected.

You can use input controls to analyze different scenarios by changing the value of variables. For example, you can assign a slider input control to a variable with a constant value. If the variable is part of a formula, you use the slider control to examine different formula results based on the variable value.

i Note
Input controls apply directly to the variables. You cannot define dependencies on reports, report parts or documents.

Filtering with element links

Report element links are another kind of input control, also displayed in the Input Controls tab. You can define tables and charts as input controls using element links. When you create an element link between a parent and child elements, you can select values in the parent table or chart to filter the child report elements.

When you select a table or chart-based control in the Input Controls tab, the table or chart used as an input control is highlighted.

! Restriction
When a report is in drill mode, table and chart-based input controls are disabled. They are re-enabled when drill mode is deactivated.

6.4.1 Using input controls with hierarchical data

You can use input controls on hierarchical data.

When you select a node of a hierarchy, you can select a single value and use the Equal to operator, or you can select multiple values from a hierarchical tree list.

When you select a hierarchical tree list, right-click and select the member, its children, or its descendants in the hierarchy. The elements of the hierarchies that you select display in the report pane.
## 6.4.2 Available input controls

You can choose from several input controls to help users filter data in your reports.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry field</td>
<td>For any type of object, you can use the entry field input control on a report object where you want to be able to directly type a value name into a text box. This is useful for objects with simple names, for example if you are using a Year universe object. In an input control based on year, you simply type the year and click <strong>OK</strong>. To clear the input control, you delete the text box contents and click <strong>OK</strong>.</td>
</tr>
<tr>
<td>Combo box</td>
<td>For a dimension object, you can use the combo box to select a value from a list of possible values. The combo box is compact and only expands when you select it, otherwise only the current selection is displayed.</td>
</tr>
<tr>
<td>Radio buttons</td>
<td>For a dimension object, you can use ever visible radio buttons to select one value from a list of possible values.</td>
</tr>
<tr>
<td>List box</td>
<td>For a dimension object, you can use a list box that displays all available values. For single value selections: You can select one value from a list of possible values. The selected value is highlighted. For multiple value selections: You can select several values from a list of possible values, using the <strong>Control</strong> and click method, and then click <strong>OK</strong> to update the display of those report elements affected by the input control.</td>
</tr>
<tr>
<td>Calendar</td>
<td>For a (dimension) date object, you can pick a value that appears in with a manual entry text box or a calendar icon. If you click the calendar icon, you can then select a date from a popup calendar.</td>
</tr>
<tr>
<td>Spinner</td>
<td>For a measure object, you can have an arrow-activated, spinning list of values.</td>
</tr>
<tr>
<td>Simple slider</td>
<td>For a measure object, you can have a slider bar to navigate to a specific value. You must set interval bounds and a default value.</td>
</tr>
<tr>
<td>Tree list</td>
<td>For a dimension object, you can have a list of hierarchy values. For single value selections: You can select a node or node subset. By default, the control shows the currently selected value, and can be toggled to tree selection. For multiple value selections: You can select more than one value from a list of possible values in a hierarchy, using the <strong>Control</strong> and click method. By default, control displays the list of currently selected values, and can be toggled to tree selection.</td>
</tr>
<tr>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Check box</td>
<td>For a dimension object, you can have a list of alternatives from which you can select more than one value.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>The availability of the OK button is controlled in the input control create or edit mode.</td>
</tr>
<tr>
<td>Double slider</td>
<td>For a measure object, you can have a slider list based on a measure object from which you can select two values from an interval. You must set interval bounds and default values.</td>
</tr>
</tbody>
</table>

### 6.4.3 To add an input control

You can add an input control to a Web Intelligence document.

#### Prerequisites

You must have sufficient document modification rights to add input controls.

#### Procedure

1. In a Web Intelligence document in *Design* mode, do one of the following:
   - In the *Input Controls* tab in the Side Panel, click *New*.
   - In the *Analysis* tab, select the *Filters* subtab, and then from the *Input Controls* dropdown list, select *Define Control*.

   If you selected an entire table or chart before clicking *Define Control* or *New*, you can select *Include objects from selected block only* or *Filter objects to current selection* to restrict the list of objects to the objects in the table or chart you selected.

   You can also select the type of input control directly from the list of controls under *Analysis > Filters > Controls* instead of selecting *Define Control*. Those controls not compatible with the data from the report element you selected are disabled. The control is automatically associated with the report object that supplies data to the selected report element and uses its default properties, and you move directly to selecting the report elements you want the input control to filter.

2. In the *Select Report Object* panel, select the report object to supply values for the input control, then click *Next*.
3. Select the input control type.
The list of control types is determined by the data type of the report object. For more information on input control types, see Available input controls [page 582].

4. Set the input control properties.

If you are in Web Intelligence Rich Client, click the empty field next to the input control property. The available properties are determined by the control type.

<table>
<thead>
<tr>
<th>Rich Client interface</th>
<th>HTML or Applet Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>Name</td>
<td>The name of the input control</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>The description of the input control</td>
</tr>
<tr>
<td>List of values</td>
<td></td>
<td>The list of values available in the input control. You can use all values of the report object on which the input control is based (the default) or define your own custom list of values.</td>
</tr>
</tbody>
</table>

**Use restricted List of Values**

If you define a custom list of values for the report object, this setting filters the data in the report element you assign to the input control based on this list of values. Even when no values are selected in the input control, any values not in the restricted list are excluded from the report element filtered by the input control.

For example, if an input control based on the Country dimension is restricted to the values “US” and “France”, a table filtered by the input control shows data for US and France only, even when no value is selected in the input control.

If you deselect Use restricted List of Values, all values of Country appear in the table when no value is selected in the input control.

**Allow selection of all values**

This property allows you to show or hide the All Values option in an input control. For example, you may want to hide the All values option when the aggregation of the values makes no sense.

**Operator**

**Filter Operators**

The operator that the input control uses to filter the associated report elements.

**Default values**

The default values that the input control uses to filter the associated report element.

**Allow selection of null values**

For the Combo box, Radio buttons, List box, and Check boxes input controls, you can allow users to select null values.

When you select this option, [NULL_VALUE] is available in the input control LOV. When a user selects [NULL_VALUE] in the list, the report shows rows or columns without data. For example, if a user wants to see customers who have not paid, then selecting [NULL_VALUE] for object “Invoice Date” results in a list showing only customers without an invoice date.

For more information about how the NULL_VALUE LOV option compares to the [EMPTY_VALUE] LOV option, refer to Query filters and report filters compared [page 565].
Rich Client interface | HTML or Applet Interface | Description
---|---|---
Number of lines | | The number of lines that the input control displays in the Input Control pane. For example a list of five radio buttons with Number of lines set to 3 displays only three radio buttons by default. You access the other two radio buttons by using the scroll bar.

Minimum value | Min Value | The minimum numerical value you can select in the input control.

Maximum value | Max Value | The maximum numerical value you can select in the input control.

Increment | | The amount by which the input control increases/decreases a numerical value when you are choosing a value.

5. Click Next.

6. In the Assign Report Elements panel:
   - To assign the input control to all tables and charts in the document, select Entire document.
   - To assign the input control to all elements in a report, select Current report.

   **Note**
   Each time you save a document, any input controls that have no associated report elements are removed.

7. Click Finish.
   The input control appears on the Input Controls pane, which organizes input controls in the following categories:
   - Document Input controls
   - Report Input controls

Related Information

To edit an input control [page 586]

6.4.4 To reuse an input control in another report within a Web Intelligence document

You can reuse the input controls from an existing report in a new report.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Go to the report with the input controls you want to reuse.
3. Right-click the report tab and click *Duplicate Report*.

**Results**

The report and its input controls are duplicated.

### 6.4.5 To edit an input control

You can edit an input control in the *Edit Input Control* dialog box.

**Procedure**

1. In a Web Intelligence document in *Design* mode, select the *Input Controls* tab in the Side Panel.
2. Select the input control, then click the *Edit* icon on the input control toolbar to display the *Edit Input Control* dialog box.
3. To edit the input control properties:
   - In the Web Intelligence HTML interface, edit the input control properties in the *Properties* tab.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client, edit the input control properties in the *Control* tab.
4. Edit the report elements associated with the input control on the *Dependencies* tab:
   - To reassign an input control to all tables and charts in the document, select *Entire document*.
   - To reassign an input control to all elements in a report, select *Current report*.
5. Click *OK* to return to the document.

### 6.4.6 To view input control dependencies

You can view input control dependencies in a document.

**Procedure**

1. In a Web Intelligence document in *Design* mode, click the *Input Controls* tab in the Side Panel.
2. Do the following:
   - In the Web Intelligence HTML interface, select the input control in the list, then click the *Highlight dependencies* icon on the input control toolbar.
   - In the Web Intelligence Applet interface or Web Intelligence Rich Client, click the *Show dependencies* icon on the input control toolbar.
6.4.7 To organize input controls

You can change the order of input controls in the Input Controls pane.

Procedure

1. In a Web Intelligence document in Design mode, select the Input Controls tab in the Side Panel.
2. Drag and drop input controls to move them up or down on the Input Controls pane.
3. Select an input control, then click the Remove icon on the input control toolbar to remove it from the Input Controls pane.
4. Click Yes to confirm the action.

6.4.8 To define a table or chart as an input control

You can use a table or a chart as an input control in a Web Intelligence document.

Procedure

1. In a Web Intelligence document in Design mode, right-click the table or chart and select Linking Add Element Link.
2. Do one of the following:
   ○ To define all the objects in the table or chart as the filtering objects, select All objects.
   ○ To define a single object in the table or chart as the filtering object, select Single object and then select an object.

   **Note**
   You can select dimensions only as filtering objects when you define a table or chart as an input control.

3. Click Next.
4. Type a name and a description for the input control, then click Next.
5. Select the report elements to be filtered by the input control.
6. Click *Finish*. The table or chart input control appears in the **Input Controls** pane. When you click *Show Dependencies*, the table or chart defined as the input control is highlighted.

7. To modify the way a table or chart filters other report elements, right-click the table or chart and select **Linking > Edit Element Link**.

8. To remove a link between a table or chart and other report elements, disable the element link, then right-click the table or chart and select **Linking > Remove**.

**Related Information**

To edit an input control [page 586]

### 6.4.9 To filter data using input controls

You can filter data in a document using input control.

**Procedure**

1. In a Web Intelligence document in **Design** mode, select the **Input Controls** tab in the Side Panel.

   **i Note**

   The input control displays the following message if the report elements filtered by the input control are no longer in the report: *There are no dependent report elements in the report.*

2. Select values in the input control.

   The associated report elements are filtered based on the values you select. For example, if you select the "US" value of the [Country] dimension, the filter operator is Equal To, and there is a table associated with the input control, the table is filtered on the condition [Country] = "US".

   Select [NULL VALUE] to show rows or columns without data. For example, if you want to see customers who have not paid, [NULL VALUE] for object “Invoice Date” results in a list showing only customers without an invoice date.

3. To filter using a table or chart defined as an input control, select dimension values in the table (rows, columns or cells) or chart (clickable data areas).
Tables or charts defined as input controls can only filter using dimension values.

In the Web Intelligence Applet interface, a warning message appears when you delete objects used by an input control.

The input control shows the following message if the table or chart is no longer in the report: *The table or chart is not in the report.*

The input control shows the following message if the filtering dimensions are no longer in the table or chart: *Filtering dimensions not available.* The input control becomes usable again if you add the dimensions to the table or chart.

The input control shows the following message if the report is in drill mode: *Control not usable while the report is in drill mode.* Drill mode must be turned off to make the input control usable.

Table and chart-based input controls are indicated by an icon in the top corner of the table or chart. Right-clicking the icon displays the following menu options:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Edit</em></td>
<td>Edits the input control</td>
</tr>
<tr>
<td><em>Highlight dependencies</em></td>
<td>Highlights the report elements filtered by the input control</td>
</tr>
<tr>
<td><em>Show dependencies</em></td>
<td>Highlights the report elements filtered by the input control</td>
</tr>
<tr>
<td><em>Reset</em></td>
<td>Removes the filters applied by the input control</td>
</tr>
<tr>
<td><em>Disable/Enable</em></td>
<td>Disables or enables the input control</td>
</tr>
</tbody>
</table>

To remove all filters applied by input controls, click *Reset* at the top of the *Input Controls* pane.

### 6.5 Filtering data dynamically with groups of input controls

You can use a filter path to help you refine your data in a report.

A filter path is a visual representation of values you have successively selected for several input controls that you have purposely grouped beforehand.

You create a filter path by grouping several input controls together in a report, and then select each one in the order that you would like your values to be filtered. The filter path allows you to control the progressive refinement of your data.

#### △ Caution

Restricting lists of values dependent on other input controls’ selections can decrease performance.

#### ★ Example

Instead of selecting a city from a large list of values, it is easier to:
1. Select a value for the **Country** input control to narrow down the possible regions.
2. Select a value from the restricted list of regions for the **Region** input control to further limit the number of potential cities.
3. Select a value from the restricted list of cities for the **City** input control.

Your filter path would then look like this: ![filter path](Country > Region > Cities).

**Tip**
You can also group input controls to improve the layout of a report.

### Related Information

To create a group of input controls [page 591]
Input controls eligible to groups and dynamic filtering [page 590]
Example: Creating a filter path [page 595]

### 6.5.1 Input controls eligible to groups and dynamic filtering

Depending on the input control and the properties you selected when you created it, it might not be eligible for grouping, or eligible with restrictions regarding dynamic filtering.

Web Intelligence notifies you whenever there are incompatibilities between the properties of an input control and grouping or dynamic filtering when you create a group of input controls.

### Input controls not eligible for grouping

Input controls can be ineligible for one of the reasons listed below:

- **Restricted list of values**
  You have defined a list of values that might be incompatible with the restricted list of values resulting from dynamic filtering.

- **Default value**
  The default value of the input control might be incompatible with the restricted list of values resulting from dynamic filtering.

- **Excluding <All values>**
  The default value you have selected instead of <All values> might be incompatible with the restricted list of values resulting from dynamic filtering.

Input controls that cannot be added to a group are grayed out and cannot be selected. An information icon and a tooltip appear when you move the cursor over. When attempting to select them, a message is also displayed at the bottom of the dialog box. Elements links and tree lists for example aren’t eligible to grouping.
Input controls eligible for grouping with restrictions regarding dynamic filtering

Several input controls are not associated to a list of values and therefore cannot be filtered dynamically:

- Calendar
- Direct input
- Spinner
- Slider

If you select an input control from the list above to add it to a group, the incompatibility is explained in a tooltip when you move the cursor over the warning icon. A message is also displayed at the bottom of the dialog box.

6.5.2 To create a group of input controls

Context

Before creating a filter path, you need to create a group of input controls in which you can apply a filter path.

Procedure

1. In the Side Panel, click the Input Controls pane.
2. Click Group.
3. Enter a name for the new group.
4. Click Document or Report to select from a list of either document input controls or report input controls.
   A group cannot contain both report and document input controls. Make sure that the input controls you add to a group are of the same type.
5. Select at least two input controls.

   i Note
   You cannot have the same input control in two different groups. If you select an input control that already belongs to another group, the other group will be reset without the selected input control, and its filter path will be modified. Also, if you add an existing input control to a group, its value is reset to "All values".

6. Click OK.

   The group is now created and displayed in the Input Controls pane.
6.5.3 To create a filter path

Context

Once you have a group of input controls, you can create a filter path. Make sure the first input control you select returns the most general values, followed by input controls with increasing specificity so the filter path narrows down your data selection in successive steps. During the creation of a filter path, input controls within the group change position to reflect the successive selections you make.

Procedure

1. Click the group for which you want to create a filter path.
2. Select one or more values for the first input control of the group.
   The report dynamically changes to display a restricted list of values filtered accordingly to the value of the first input control. The filter path is displayed on top of the first input control of the group.

   Note
   You can modify the selected values at any time by clearing current values or selecting new ones. The filter path will adapt accordingly.

3. Select a second input control and select one or more values. These are the values that have been restricted by the previous input control.
   The report adjusts to the new values.
4. Repeat the previous step for each of the following input controls.

Related Information

Filtering data dynamically with groups of input controls [page 589]
Input controls eligible to groups and dynamic filtering [page 590]
6.5.4 To reset a filter path

Context

Resetting a filter path has the following effects in the group:

- Every value of each input control is reset to all values
- The order of the input controls specified in the removed filter path is reset to its original order in the group.

Procedure

1. Right-click the header of the group whose filter path you want to reset.
2. Click Reset.

Tip

You can also click the Clear filter path icon (✗) next to the name of the group.

6.5.5 To add an input control to a group

Context

Procedure

1. Right-click the input control you want to add to a group.
2. Click Add to Group.
3. Select the group to which you want to add the input control.

Results

The new input control is displayed at the bottom of the group.
6.5.6 To remove an input control from a group

Context

⚠️ Caution
If you remove an input control from a group that has only two input controls, the group is deleted. Also, if the input control you remove belongs to a filter path, the filter path is modified.

Procedure

1. Right-click the input control you want to remove from the group.
2. In the contextual menu, click Ungroup.

Results

The input control you have just removed is now displayed underneath the group it belonged to.

6.5.7 To move an input control to another group

Context

⚠️ Caution
If the input control you move belongs to a group that has only two input controls, the group will be deleted. Also, if the input control is part of the filter path of its previous group, moving it to another group will remove it from the filter path and will reset the values of its previous group.

Procedure

1. Right-click the input control you want to move to another group.
2. In the context menu, select *Move to group*.
3. Select the new group.

### 6.5.8 To delete a group

**Context**

**Procedure**

1. Click the *X* icon next to name of the group you want to delete.
2. Click *Yes*.

### 6.5.9 Example: Creating a filter path

You create a filter path by successively selecting different input controls, so that you can narrow down the amount values you want to analyze in your report.

**Checking the revenue generated by swimming suits in Kingston in 2014**

As a regional marketing director for America, you want to check the revenue generated by the city of Kingston in 2014, for the swimming suits product line. You have the following information:

- Two input controls, `<Year 2014>` and `<Sales Revenue>` have already been created in the report you are working on.
- There is also a group of three input controls, named `<Business>`, with the following input controls inside: `<Country>`, `<City>` and `<Product>`.

So, you would like to create a filter path to display the information you are interested in and filter your data.

1. Select the value of the first input control of the group, `<Country>`: Jamaica.
   
   You can see that the list of possible values for `<City>` decreased and displays only the value for Jamaica.
   
   Let’s say that you want to take a closer look at Kingston, to see if the results are better than last year.
2. Select Kingston as the value for the second input control, `<City>`.
   
   Again, the values of the last input controls are filtered to show only the remaining possible values.
3. Select the swimming suits in the third input control, `<Product>`, to get a quick view of the result you wanted to get originally.
You can now see in the table the revenue generated by swimming suits in Kingston in 2014.

Notice how the three input controls of the group now have a shape and a color associated to them in the input control pane. They indicate that these input control belong to the filter path.

You can see the filter path as you go along in the Input Controls pane on the left. It should look like this:

Jamaica ➤ Kingston ➤ Swimming Suits

If you want to drill up and get a look a broader results, for the whole country for instance, reset the second input control to <all values> to see the revenue generated by the other cities of the country.

6.6 Using functions, formulas and calculations for data analysis

6.6.1 Document History: Web Intelligence Functions, Formulas and Calculations

The following table provides an overview of the most important document changes.

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2 Support Package 6</td>
<td>July 2018</td>
<td>The following sections of the guide have been added to the guide or updated:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● New PageInSection() function added PageInSection [page 816]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● New Refreshable status in available in the QuerySummary() function QuerySummary [page 738]</td>
</tr>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2 Support Package 5</td>
<td>December 2017</td>
<td>The following sections of the guide have been added to the guide or updated:</td>
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<tr>
<td></td>
<td></td>
<td>● New dp parameter available to the PromptSummary() function PromptSummary [page 737]</td>
</tr>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2 Support Package 4</td>
<td>April 2017</td>
<td>The following sections have been added to the guide or updated:</td>
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<tr>
<td></td>
<td></td>
<td>● Building custom functions Overview of calculation extensions [page 851]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● New DatesBetween function added DatesBetween [page 695]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● New TimeBetween function added TimeBetween [page 707]</td>
</tr>
<tr>
<td>Version</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2 Support Package 3</td>
<td>August 2016</td>
<td>• New sorting_order and show_definitive_prompts parameters available to the PromptSummary function PromptSummary [page 737]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The following sections have been added to the guide or updated:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New MemberAtDepth function added MemberAtDepth [page 792]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated QuerySummary function with new StatusOfData parameter for BW data sources QuerySummary [page 738]</td>
</tr>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2 Support Package 2</td>
<td>March 2016</td>
<td>The following section has been added to the guide:</td>
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<tr>
<td></td>
<td></td>
<td>• Description of Comment function Comment [page 803]</td>
</tr>
<tr>
<td>SAP BusinessObjects Web Intelligence 4.2</td>
<td>November 2015</td>
<td>The following sections have been added to the guide:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Description of Automatic Formula Rewrite mechanism Automatic rewrite formula mechanism [page 863]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAP HANA Online mode formulas, functions and operators restrictions Function and formula operators [page 605]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Strings to create custom formats for weeks Custom formats [page 345]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Time zone can be displayed on a date/time value Custom formats [page 345]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New ToDecimal function added ToDecimal [page 774]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated Concatenation function behavior Concatenation [page 673]</td>
</tr>
</tbody>
</table>

### 6.6.2 About this guide

The Using Functions, Formulas and Calculations in Web Intelligence guide provides detailed information on the advanced calculation capabilities that you can use when you perform data analysis.

This guide also provides a syntax reference to the available functions and operators.
6.6.3 Using standard and custom calculations

6.6.3.1 Using standard and custom calculations

You can use standard calculation functions to make quick calculations on data.

If standard calculations are not sufficient for your needs, you can use the formula language to build custom calculations.

6.6.3.1.1 Standard calculations

You can use standard calculation functions to make quick calculations on data.

The following standard calculations are available:

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum</td>
<td>Calculates the sum of the selected data.</td>
</tr>
<tr>
<td>Count</td>
<td>Counts all rows for a measure object or count distinct rows for a dimension or detail object.</td>
</tr>
<tr>
<td>Average</td>
<td>Calculates the average of the data.</td>
</tr>
<tr>
<td>Minimum</td>
<td>Displays the minimum value of the selected data.</td>
</tr>
<tr>
<td>Maximum</td>
<td>Displays the maximum value of the selected data.</td>
</tr>
<tr>
<td>Percentage</td>
<td>Displays the selected data as a percentage of the total. The results of the percentage are displayed in an additional column or row of the table.</td>
</tr>
</tbody>
</table>

**Note**

Percentages are calculated for the selected measure compared to the total results for that measure on the table or break. To calculate the percentage of one measure compared to another measure, you need to build a custom calculation.

| Default     | Applies the default aggregation function to a standard measure, or the database aggregation function to a smart measure. |

When you apply standard calculations to table columns, the calculation results appear in footers. One footer is added for each calculation.

6.6.3.1.2 Using formulas to build custom calculations

Custom calculations allow you to add additional calculations to your report beyond its base objects and standard calculations.

You add a custom calculation by writing a formula. A formula can consist of base report variables, functions, operators and calculation contexts.
A custom calculation is a formula that can consist of report objects, functions and operators. Formulas have a calculation context that you can specify explicitly if you choose.

**Example**

**Showing average revenue per sale**

If you have a report with Sales Revenue and Number Sold objects and you want to add revenue per sale to the report, the calculation \[
\frac{\text{Sales Revenue}}{\text{Number Sold}}
\] gives this value by dividing the revenue by the number of items sold in order to give the revenue per item.

### 6.6.3.1.2.1 Using variables to simplify formulas

Variables are useful to break down formulas into manageable parts and make them easier to read. They also make building a formula less error-prone.

Variables are available in the *Available Objects* pane, under the *Variables* folder.

As of the 4.2 SP4 release, a new *Description* field is available so that you can provide context and details about a specific variable. The description that you enter is then displayed in the *Query Panel* when you hover over the variable. You can edit this description when creating, editing or renaming a variable.

### 6.6.3.1.3 Working with functions

A custom calculation sometimes contains only report objects, for example \[
\frac{\text{Sales Revenue}}{\text{Number of Sales}}
\]. Calculations can also include functions in addition to report objects.

A function receives zero or more values as input and returns output based on those values. For example, the *Sum* function totals all the values in a measure and outputs the result. The formula \[
\text{Sum}(\text{Sales Revenue})
\] outputs a total of sales revenues. In this case, the function input is the Sales Revenue measure and the output is the total of all Sales Measures.

### Related Information

- Function and formula operators [page 605]
- Functions [page 627]
6.6.3.1.3.1 Including functions in cells

The text in report cells always begins with ‘=’.

Literal text appears in quotation marks, while formulas appear without quotation marks. For example, the formula `Average([Revenue])` appears in a cell as `=Average([Revenue]). The text “Average Revenue?” appears as “Average Revenue?”.

You can use text alone in a cell, or mix formulas and text by using the ‘+’ operator. If you want a cell to display the average revenue preceded by the text “Average Revenue:”, the cell text is as follows: `="Average Revenue: " + Average([Revenue])`.

Note the space at the end of the text string so that the text and the value are not placed directly side-by-side in the cell.

6.6.3.1.3.2 Function syntax

The Formula Editor displays the function syntax when you select the function.

To use a function you need to know its name, how many input values it requires and the data types of these input values. You also need to know the type of data that the function outputs.

For example, the `Sum` function takes a numerical object as input (for example a measure showing sales revenue) and outputs numeric data (the sum of all the values of the measure object).

Here is the syntax of the `Abs` function:

```
num Abs(number)
```

This syntax tells you that the `Abs` function takes a single number as input and returns a number as output.

6.6.3.1.3.3 Examples of functions

This topic offers examples of functions used in formulas.

**Example**

Showing prompt input with the `UserResponse` function

You have a report showing Year, Quarter and Sales revenue. The State object also appears in the report data, although it is not displayed. When the user runs the report they are presented with a prompt and they must choose a state. You want to show the state that they have chosen in the report title. If your data provider is called “eFashion” and the text in the prompt is “Choose a State”, the formula for the title is:

```
"Quarterly Revenues for " + UserResponse([Query 1];"Enter values for State:"))
```

The report is as follows when the user has chosen Illinois as the state when refreshing the data provider:
Example

Calculating a percentage using the Percentage function

The Percentage function calculates percentages. This function calculates the percentage of a number in relation to its surrounding context. For example, the following table shows revenues by year and quarter. The percentage column contains the formula `Percentage ([Sales revenue])`. 

### Quarterly Revenues for Illinois

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Q1</td>
<td>$256,454</td>
</tr>
<tr>
<td>2004</td>
<td>Q2</td>
<td>$241,149</td>
</tr>
<tr>
<td>2004</td>
<td>Q3</td>
<td>$107,006</td>
</tr>
<tr>
<td>2004</td>
<td>Q4</td>
<td>$133,306</td>
</tr>
<tr>
<td>2004</td>
<td>Total</td>
<td>$737,914</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>Q1</td>
<td>$334,297</td>
</tr>
<tr>
<td>2005</td>
<td>Q2</td>
<td>$264,722</td>
</tr>
<tr>
<td>2005</td>
<td>Q3</td>
<td>$230,573</td>
</tr>
<tr>
<td>2005</td>
<td>Q4</td>
<td>$331,067</td>
</tr>
<tr>
<td>2005</td>
<td>Total</td>
<td>$1,150,659</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Q1</td>
<td>$255,658</td>
</tr>
<tr>
<td>2006</td>
<td>Q2</td>
<td>$354,724</td>
</tr>
<tr>
<td>2006</td>
<td>Q3</td>
<td>$273,186</td>
</tr>
<tr>
<td>2006</td>
<td>Q4</td>
<td>$250,517</td>
</tr>
<tr>
<td>2006</td>
<td>Total</td>
<td>$1,134,085</td>
</tr>
</tbody>
</table>
In this case the function calculates each revenue as a percentage of the total revenue. The surrounding context is the total revenue; this is the only revenue figure that is relevant outside the breakdown by year and quarter in the table.

If the report is split into sections by year, the surrounding context outside the table becomes the total revenue in the section.

If the Percentage cell is placed outside the table but still inside the section, the surrounding context becomes the total revenue. In this case the Percentage function calculates the total revenue for the section as a percentage of the total overall revenue.
Example

Calculating a percentage using the Sum function

You can gain more control over the context in which a percentage is calculated by using the Sum function rather than the Percentage function. If you divide one figure in a set of figures by the total of those figures, you get its percentage of the total; for example, the formula \([\text{Sales revenue}] / \text{Sum}([\text{Sales revenue}])\) gives the sales revenue as a percentage of the total revenue.

In the following table the Percentage of Total column has the formula:

\[
\frac{\text{Sales revenue}}{\text{Sum}(\text{Sales revenue} \text{ In Report})}
\]

and the Percentage of Year column has the formula:

\[
\frac{\text{Sales revenue}}{\text{Sum}(\text{Sales revenue} \text{ In Section})}
\]
These formulas take advantage of the extended syntax keywords Report and Section to instruct the Sum function to calculate the overall total revenue and yearly revenue respectively.

### Related Information

Modifying the default calculation context with extended syntax [page 615]

#### 6.6.3.1.3.3.1 Simplifying a variance formula with variables

Variance is a statistical term. The variance of a set of values measures the spread of those values around their average.

The \( \text{Var} \) function calculates the variance in one step, but manual calculation of variance provides a good example of how to simplify a complex formula using variables. To calculate the variance manually you need to:

- calculate the average number of items sold
- calculate the difference between each number of items sold and the average, then square this value
- add up all these squared differences
- divide this total by the number of values - 1

You have a report showing numbers of items sold by quarter and you want to include the variance. Without the use of variables to simplify it, this complex formula is as follows:

\[
\text{Sum}((\{\text{Quantity sold}\} - \text{Average}(\{\text{Quantity sold}\} \text{ ForEach } \{\text{Quarter}\}) \text{ In Report})\times(\{\text{Quantity sold}\} - \text{Average}(\{\text{Quantity sold}\} \text{ ForEach } \{\text{Quarter}\}) \text{ In Report})) \text{ In } \{\text{Quarter}\}/\text{Count}(\{\text{Quantity sold}\} \text{ ForEach } \{\text{Quarter}\} - 1)
\]

### Creating the variance formula

There are several steps involved in creating a variance formula. You encapsulate each of these steps in a variable. The variables you create are:
• average number of items sold
• number of observations (that is, the number of separate values of the number of items sold)
• difference between an observation and the average, squared
• sum of these differences divided by the number of observations - 1

The variable formulas are as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Sold</td>
<td>Average([Quantity sold] in ([Quarter])) in Report</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>Count([Quantity sold] in ([Quarter])) in Report</td>
</tr>
<tr>
<td>Difference Squared</td>
<td>Power(([Quantity sold] - [Average sold])**2)</td>
</tr>
<tr>
<td>Variance</td>
<td>Sum([Difference squared] in ([Quarter]))/([Number of Observations] - 1)</td>
</tr>
</tbody>
</table>

The final formula becomes the following:

\[
\text{Sum } ([\text{Difference Squared}]/[\text{Number of Observations}] - 1)
\]

This formula is much easier to understand. This simplified version of the formula gives you a high-level view of what the formula is doing, rather than plunging you into the confusing details. You can then examine the formulas of the variables referenced in the high-level formula to understand its component parts.

For example, the formula references the variable Difference squared, which itself references the variable Average sold. By examining the formulas of Difference squared and Average sold, you can drill down into the formula to understand the details of what it is doing.

### 6.6.3.1.3.4 Function and formula operators

Operators link the various components in a formula. Formulas can contain mathematical, conditional, logical, function-specific or extended syntax operators.

### SAP HANA Online mode operators restrictions

The table below lists the operators that are not supported in SAP HANA Online mode.

<table>
<thead>
<tr>
<th>Operator Type</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function-specific operators</td>
<td>Drill</td>
</tr>
<tr>
<td></td>
<td>Index</td>
</tr>
<tr>
<td></td>
<td>Where</td>
</tr>
<tr>
<td>Extended syntax operators</td>
<td>In</td>
</tr>
<tr>
<td></td>
<td>ForEach</td>
</tr>
</tbody>
</table>
6.6.3.1.3.4.1 Mathematical operators

Mathematical operators are familiar from everyday arithmetic.

There are addition (+), subtraction (-), multiplication (*), division (/) operators that allow you to perform mathematical operations in a formula. The formula \([Sales Revenue] - [Cost of Sales]\) contains a mathematical operator, in this case subtraction.

**Note**

When used with character strings, the ‘+’ operator becomes a string concatenation operator. That is, it joins character strings. For example, the formula "John" + " Smith" returns "John Smith".

6.6.3.1.3.4.2 Conditional operators

Conditional operators determine the type of comparison to be made between values.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>Equal to</td>
</tr>
<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>&lt;&gt;</td>
<td>Not equal to</td>
</tr>
</tbody>
</table>

You use conditional operators with the **If** function, as in:

```plaintext
If [Revenue]>10000 Then "High" Else "Low"
```

which returns “High” for all rows where the revenue is greater than or equal to 10000 and “Low” for all other rows.

6.6.3.1.3.4.3 Logical operators

The logical operators are **And**, **Or**, **Not**, **Between** and **InList**.

Logical operators are used in boolean expressions, which return **True** or **False**.
6.6.3.1.3.4.4 Context operators

Context operators form part of extended calculation syntax.

Extended syntax allows you to define which dimensions a measure or formula takes into account in a calculation.

6.6.3.1.3.4.5 Function-specific operators

Some functions can take specific operators as arguments.

For example, the Previous function can take the Self operator.

All functions use ) and ( to enclose function arguments. Functions that accept multiple parameters use ; to separate the parameters.

6.6.4 Understanding calculation contexts

6.6.4.1 Understanding calculation contexts

The calculation context is the data that a calculation takes into account to generate a result.

This means that the value given by a measure is determined by the dimensions used to calculate the measure.

A report contains two kinds of objects:

- Dimensions represent business data that generate figures. Store outlets, years or regions are examples of dimension data. For example, a store outlet, a year or a region can generate revenue: we can talk about revenue by store, revenue by year or revenue by region.
- Measures are numerical data generated by dimension data. Examples of measure are revenue and number of sales. For example, we can talk about the number of sales made in a particular store.

Measures can also be generated by combinations of dimension data. For example, we can talk about the revenue generated by a particular store in 2005.

The calculation context of a measure has two components:

- the dimension or list of dimensions that determine the measure value
- the part of the dimension data that determines the measure value

The calculation context has two components:

- The input context
- The output context
6.6.4.1.1 The input context

The input context of a measure or formula is the list of dimensions that feed into the calculation. The list of dimensions in an input context appears inside the parentheses of the function that outputs the value. The list of dimensions must also be enclosed in parentheses (even if it contains only one dimension) and the dimensions must be separated by semicolons.

Example

Specifying an input context

In a report with Year sections and a block in each section with Customer and Revenue columns, the input contexts are:

<table>
<thead>
<tr>
<th>Report part</th>
<th>Input context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section header and block footers</td>
<td>Year</td>
</tr>
<tr>
<td>Rows in the block</td>
<td>Year, Customer</td>
</tr>
</tbody>
</table>

In other words, the section headers and block footers show aggregated revenue by Year, and each row in the block shows revenue aggregated by Year and Customer (the revenue generated by that customer in the year in question).

When specified explicitly in a formula, these input contexts are:

- \( \text{Sum ([Revenue] In ([Year])}) \)
- \( \text{Sum ([Revenue] In ([Year];[Customer])}) \)

That is, the dimensions in the input context appear inside the parentheses of the function (in this case, Sum) whose input context is specified.
6.6.4.1.2 The output context

The output context causes the formula to output a value if it is placed in the footer of a block containing a break.

Example

Specifying an output context

The following report shows revenue by year and quarter, with a break on year, and the minimum revenue calculated by year:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Q1</td>
<td>$2,860,700</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>$2,278,093</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>$1,367,841</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>$1,788,580</td>
</tr>
<tr>
<td>2004</td>
<td>Min:</td>
<td>$1,367,841</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>Q1</td>
<td>$3,326,172</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>$2,840,651</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>$2,879,303</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>$4,166,120</td>
</tr>
<tr>
<td>2005</td>
<td>Min:</td>
<td>$2,840,651</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Q1</td>
<td>$3,742,989</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>$4,006,718</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>$3,953,395</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>$3,356,041</td>
</tr>
<tr>
<td>2006</td>
<td>Min:</td>
<td>$3,356,041</td>
</tr>
</tbody>
</table>
What if you want to show the minimum revenue by year in a block with no break? You can do this by specifying the output context in a formula. In this case, the formula looks like this:

\[ \text{Min ([Sales revenue]) In ([Year])} \]

That is, the output context appears after the parentheses of the function whose output context you are specifying. In this case, the output context calculates the minimum revenue by year.

If you add an additional column containing this formula to the block, the result is as follows:

You can see that the Min By Year column contains the minimum revenues that appear in the break footers in the previous report.

Notice that in this example, the input context is not specified because it is the default context (Year, Quarter) for the block. In other words, the output context determines which revenue by year and quarter to output. In full, with both input and output formulas explicitly specified, the formula looks like this:

\[ \text{Min ([Sales revenue] In([Year];[Quarter])) In ([Year])} \]

This formula calculates revenues by year by quarter, then outputs the smallest of these revenues that occurs in each year.

What would happen if you did not specify the output context in the Min by Year column? In this case, these figures would be identical to the figures in the Sales revenue column. Why? Remember that the default context in a block includes the dimensions in that block. The minimum revenue by year by quarter is the same as the revenue by year by quarter simply because there is only one revenue for each year/quarter combination.
6.6.4.1.3  Default calculation contexts

A measure has a default calculation context depending on its place in the report.

The figures returned by a measure depend on the dimensions with which it is associated. This combination of dimensions represents the calculation context.

You can change the default context with extended syntax. In other words, you can determine the set of dimensions used to generate a measure. This is what is meant by defining the calculation context.

Example

Default contexts in a report

This example describes the default calculation context of the measures in a simple report. The report shows revenue generated by customers and is split into sections by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total: 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Revenue</td>
</tr>
<tr>
<td>Harris</td>
<td>1000</td>
</tr>
<tr>
<td>Jones</td>
<td>3000</td>
</tr>
<tr>
<td>Walsh</td>
<td>4000</td>
</tr>
<tr>
<td>Total:</td>
<td>8000</td>
</tr>
</tbody>
</table>

Report total: 8000

The table below lists the calculation context of the measures in this report:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
<th>Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report total</td>
<td>20000</td>
<td>Total of all revenues in the report</td>
</tr>
<tr>
<td>Section header total</td>
<td>8000</td>
<td>Year</td>
</tr>
<tr>
<td>Customer total</td>
<td>1000, 3000, 4000</td>
<td>Year;Customer</td>
</tr>
<tr>
<td>Block footer total</td>
<td>8000</td>
<td>Year</td>
</tr>
</tbody>
</table>

Related Information

Understanding calculation contexts [page 607]
Modifying the default calculation context with extended syntax [page 615]
6.6.4.1.3.1 Default contexts in a vertical table

A vertical table is a standard report table with headers at the top, data going from top to bottom and footers at the bottom.

The default contexts in a down table are:

<table>
<thead>
<tr>
<th>When the calculation is in the...</th>
<th>The input context is</th>
<th>The output context is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Header</td>
<td>The dimensions and measures used to generate the body of the block</td>
<td>All the data is aggregated then the calculation function returns a single value</td>
</tr>
<tr>
<td>Body of the block</td>
<td>The dimensions and measures used to generate the current row</td>
<td>The same as the input context</td>
</tr>
<tr>
<td>Footer</td>
<td>The dimensions and measures used to generate the body of the block</td>
<td>All the data is aggregated then the calculation function returns a single value</td>
</tr>
</tbody>
</table>

6.6.4.1.3.2 Default contexts in a horizontal table

The default contexts for a horizontal table are the same as those for a vertical table.

A horizontal table is like a vertical table turned on its side.

The appearance of the horizontal table depends on the Preferred Viewing Locale you have selected in the BI launch pad preferences. Some locales, like the English locale, use the left-to-right (LTR) interface positioning, whereas others, like the Arabic locale, use the right-to-left (RTL) interface positioning.

In an LTR locale, headers appear at the left, data goes left to right and footers appear at the right. In an RTL locale, headers appear at the right, data goes right to left and footers appear at the left.

6.6.4.1.3.3 Default contexts in a crosstab table

A crosstab displays data in a matrix with measures appearing at the intersections of dimensions.

The default contexts in a crosstab are:

<table>
<thead>
<tr>
<th>The calculation is in the...</th>
<th>The input context is</th>
<th>The output context is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Header</td>
<td>The dimensions and measures used to generate the body of the block</td>
<td>All the data is aggregated, then the calculation function returns a single value</td>
</tr>
<tr>
<td>Body of the block</td>
<td>The dimensions and measures used to generate the body of the block</td>
<td>The same as the input context</td>
</tr>
<tr>
<td>Footer</td>
<td>The dimensions and measures used to generate the body of the block</td>
<td>All the data is aggregated, then the calculation function returns a single value</td>
</tr>
</tbody>
</table>
The calculation is in the... | The input context is... | The output context is...
---|---|---
VBody footer | The dimensions and measures used to generate the current column. | All the data is aggregated, then the calculation function returns a single value.
HBody Footer | The dimensions and measures used to generate the current row. | All the data is aggregated, then the calculation function returns a single value.
VFooter | Same as footer. | All the data is aggregated, then the calculation function returns a single value.
HFooter | Same as footer. | All the data is aggregated, then the calculation function returns a single value.

Example

Default contexts in a crosstab

The following report shows the default contexts in a crosstab:

<table>
<thead>
<tr>
<th></th>
<th>FY2000 Q1</th>
<th>FY2000 Q2</th>
<th>FY2000 Q3</th>
<th>FY2000 Q4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>259,170</td>
<td>81,895</td>
<td>76,566</td>
<td>70,080</td>
<td>1,115,730</td>
</tr>
<tr>
<td>US</td>
<td>856,560</td>
<td>195,831</td>
<td>189,330</td>
<td>234,674</td>
<td>856,560</td>
</tr>
<tr>
<td>Sum</td>
<td>1,115,730</td>
<td>250,726</td>
<td>266,441</td>
<td>304,654</td>
<td>1,115,730</td>
</tr>
</tbody>
</table>

6.6.4.1.3.4 Default contexts in a section

A section consists of a header, body and footer.

The default contexts in a section are:

<table>
<thead>
<tr>
<th>The calculation is in the...</th>
<th>The input context is...</th>
<th>The output context is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>The dimensions and measures in the report, filtered to restrict the data to the section data.</td>
<td>All the data is aggregated, then the calculation function returns a single value.</td>
</tr>
</tbody>
</table>

Example

Default contexts in a section

The following report shows the default contexts in a section:
6.6.4.1.3.5 Default contexts in a break

A break consists of a header, body and footer.

The default contexts in a break are:

<table>
<thead>
<tr>
<th>The calculation is in the...</th>
<th>The input context is...</th>
<th>The output context is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Header</td>
<td>Current instance of the break.</td>
<td>All the data is aggregated, then the calculation function returns a single value.</td>
</tr>
<tr>
<td>Footer</td>
<td>Current instance of the break.</td>
<td>All the data is aggregated, then the calculation function returns a single value.</td>
</tr>
</tbody>
</table>

### 2001

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$2,660,700</td>
<td>8,096,123.6</td>
</tr>
<tr>
<td>Q2</td>
<td>$2,279,003</td>
<td>8,096,123.6</td>
</tr>
<tr>
<td>Q3</td>
<td>$1,367,841</td>
<td>8,096,123.6</td>
</tr>
<tr>
<td>Q4</td>
<td>$1,788,500</td>
<td>8,096,123.6</td>
</tr>
<tr>
<td><strong>Sum:</strong></td>
<td><strong>8,096,123.6</strong></td>
<td><strong>8,096,123.6</strong></td>
</tr>
</tbody>
</table>

### 2002

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$3,326,172</td>
<td>13,232,246</td>
</tr>
<tr>
<td>Q2</td>
<td>$2,840,651</td>
<td>13,232,246</td>
</tr>
<tr>
<td>Q3</td>
<td>$2,879,303</td>
<td>13,232,246</td>
</tr>
<tr>
<td>Q4</td>
<td>$4,186,120</td>
<td>13,232,246</td>
</tr>
<tr>
<td><strong>Sum:</strong></td>
<td><strong>13,232,246</strong></td>
<td><strong>13,232,246</strong></td>
</tr>
</tbody>
</table>

### 2003

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$3,742,980</td>
<td>15,059,142.8</td>
</tr>
<tr>
<td>Q2</td>
<td>$4,006,718</td>
<td>15,059,142.8</td>
</tr>
<tr>
<td>Q3</td>
<td>$3,963,395</td>
<td>15,059,142.8</td>
</tr>
<tr>
<td>Q4</td>
<td>$3,366,041</td>
<td>15,059,142.8</td>
</tr>
<tr>
<td><strong>Sum:</strong></td>
<td><strong>15,059,142.8</strong></td>
<td><strong>15,059,142.8</strong></td>
</tr>
</tbody>
</table>
Example

Default contexts in a break

The following report shows the default contexts in a break:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$8096123</td>
</tr>
<tr>
<td>C1</td>
<td></td>
<td>$2660790</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>$2279003</td>
</tr>
<tr>
<td>C3</td>
<td></td>
<td>$1367841</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>$1768580</td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td>$8096124</td>
</tr>
<tr>
<td></td>
<td>Sum:</td>
<td>$8096124</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$13232246</td>
</tr>
<tr>
<td>C1</td>
<td></td>
<td>$3325672</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>$2640651</td>
</tr>
<tr>
<td>C3</td>
<td></td>
<td>$2679303</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>$4188120</td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td>$13232246</td>
</tr>
<tr>
<td></td>
<td>Sum:</td>
<td>$13232246</td>
</tr>
</tbody>
</table>

6.6.4.1.4 Modifying the default calculation context with extended syntax

Extended syntax uses context operators that you add to a formula or measure to specify its calculation context.

A measure or formula context consists of its input context and output context.

Related Information

- Extended syntax keywords [page 844]
- Extended syntax operators [page 615]

6.6.4.1.4.1 Extended syntax operators

You specify input and output contexts explicitly with context operators.

The following table lists the context operators:
Operator | Description
--- | ---
In | Specifies an explicit list of dimensions to use in the context.
ForEach | Adds dimensions to the default context
ForAll | Removes dimensions from the default context

The ForAll and ForEach operators are useful when you have a default context with many dimensions. It is often easier to add or subtract from the context using ForAll and ForEach than it is to specify the list explicitly using In.

### 6.6.4.1.4.1.1 In context operator

The In context operator specifies dimensions explicitly in a context.

#### Example

**Using In to specify the dimensions in a context**

In this example you have a report showing Year and Sales revenue. Your data provider also contains the Quarter object but you do not include this dimension in the block. Instead, you want to include an additional column to show the maximum revenue by quarter in each year. Your report looks like this:

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales revenue</th>
<th>Max Quarterly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>$8,096,123.60</td>
<td>$2,660,699.50</td>
</tr>
<tr>
<td>2002</td>
<td>$13,232,246.00</td>
<td>$4,186,120.00</td>
</tr>
<tr>
<td>2003</td>
<td>$15,059,142.80</td>
<td>$4,006,717.50</td>
</tr>
</tbody>
</table>

You can see where the values in the Max Quarterly Revenue column come from by examining this block in conjunction with a block that includes the Quarter dimension:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Q1</td>
<td>$2,660,699.50</td>
</tr>
<tr>
<td>2001</td>
<td>Q2</td>
<td>$2,279,003.00</td>
</tr>
<tr>
<td>2001</td>
<td>Q3</td>
<td>$1,367,841.00</td>
</tr>
<tr>
<td>2001</td>
<td>Q4</td>
<td>$1,788,580.00</td>
</tr>
<tr>
<td></td>
<td>Max:</td>
<td>$2,660,699.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td>$3,326,172.00</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
<td>$2,840,651.00</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td>$2,879,303.00</td>
</tr>
<tr>
<td>Q4</td>
<td></td>
<td>$4,186,120.00</td>
</tr>
<tr>
<td></td>
<td>Max:</td>
<td>$4,186,120.00</td>
</tr>
</tbody>
</table>
The Max Quarterly Revenue column shows the highest quarterly revenue in each year. For example, Q4 has the highest revenue in 2002, so the Max Quarterly Revenue shows Q4 revenue on the row showing 2002.

Using the In operator, the formula for Max Quarterly Revenue is

\[
\text{Max ([Sales revenue] In ([Year];[Quarter])) In ([Year])}
\]

This formula calculates the maximum sales revenue for each (Year,Quarter) combination, then outputs this figure by year.

**Note**

Because the default output context of the block is Year, you do not need to specify the output context explicitly in this formula.

### 6.6.4.1.4.1.2 ForEach context operator

The ForEach operator adds dimensions to a context.

**Example**

**Using ForEach to add dimensions to a context**

The following table shows the maximum revenue for each Quarter in a report which contains the Quarter dimension but does not include it in the block:

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales revenue</th>
<th>Max Quarterly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>8096123.60</td>
<td>2660699.50</td>
</tr>
<tr>
<td>2002</td>
<td>13232246.00</td>
<td>4186120.00</td>
</tr>
<tr>
<td>2003</td>
<td>15059142.80</td>
<td>4006717.50</td>
</tr>
</tbody>
</table>

It is possible to create a formula for the Max Quarterly Revenue column that does not include the ForEach operator:

\[
\text{Max ([Sales revenue] In ([Year];[Quarter])) In ([Year])}
\]

Using the ForEach context operator, you can achieve the same result with the following formula:

\[
\text{Max ([Sales revenue] ForEach ([Quarter])) In ([Year])}
\]
Why? Because the Year dimension is the default input context in the block. By using the ForEach operator, you add the Quarter dimension to the context, giving an input context of ([Year],[Quarter]).

6.6.4.1.4.1.3 ForAll context operator

The ForAll context operator removes dimensions from a context.

Example

Using ForAll to remove dimensions from a context

You have a report showing Year, Quarter and Sales revenue and you want to add a column that shows the total revenue in each year, as shown in the following block:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Yearly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Q1</td>
<td>$2,660,700</td>
<td>$8,096,124</td>
</tr>
<tr>
<td>2004</td>
<td>Q2</td>
<td>$2,279,003</td>
<td>$8,096,124</td>
</tr>
<tr>
<td>2004</td>
<td>Q3</td>
<td>$1,367,841</td>
<td>$8,096,124</td>
</tr>
<tr>
<td>2004</td>
<td>Q4</td>
<td>$1,788,580</td>
<td>$8,096,124</td>
</tr>
<tr>
<td>2005</td>
<td>Q1</td>
<td>$3,326,172</td>
<td>$13,232,246</td>
</tr>
<tr>
<td>2005</td>
<td>Q2</td>
<td>$2,840,651</td>
<td>$13,232,246</td>
</tr>
<tr>
<td>2005</td>
<td>Q3</td>
<td>$2,879,303</td>
<td>$13,232,246</td>
</tr>
<tr>
<td>2005</td>
<td>Q4</td>
<td>$4,166,120</td>
<td>$13,232,246</td>
</tr>
<tr>
<td>2006</td>
<td>Q1</td>
<td>$3,742,969</td>
<td>$15,059,143</td>
</tr>
<tr>
<td>2006</td>
<td>Q2</td>
<td>$4,006,718</td>
<td>$15,059,143</td>
</tr>
<tr>
<td>2006</td>
<td>Q3</td>
<td>$3,953,395</td>
<td>$15,059,143</td>
</tr>
<tr>
<td>2006</td>
<td>Q4</td>
<td>$3,356,041</td>
<td>$15,059,143</td>
</tr>
</tbody>
</table>

To total revenues by year the input context needs to be (Year); by default it is (Year; Quarter). Therefore, you can remove Quarter from the input context by specifying ForAll ([Quarter]) in the formula, which looks like this:

\[ \text{Sum}([\text{Sales revenue}] \text{ ForAll} ([\text{Quarter}])) \]

Note that you can use the In operator to achieve the same thing; in this case the formula is:

\[ \text{Sum}([\text{Sales revenue}] \text{ In} ([\text{Year}])) \]

This version of the formula explicitly specifies Year as the context, rather than removing Quarter to leave Year.
6.6.5 Calculating values with smart measures

6.6.5.1 Calculating values with smart measures

Smart measures are measures whose values are calculated by the database (relational or OLAP) on which a universe is based.

They differ from classic measures, which are calculated from the detailed values returned by the database. The data returned by smart measures is aggregated in ways not supported natively by the Web Intelligence component of the SAP BusinessObjects Business Intelligence platform.

Queries that contain smart measures calculate the measures in all the calculation contexts required in a report. These contexts can change as the report changes. As a result, the query changes at each data refresh after the required contexts have changed.

When you edit such a report, automatically the #TOREFRESH message is inserted in the report reminding you that the report should be refreshed in order to reflect the changes. You can choose to update the report automatically by selecting the Auto-refresh document option in the Document properties dialog.

i Note
The measure delegation is static and defined based on the report definition at design time. In some cases (formula based on "if [choice]=1 then [dimension 1] else [dimension 2]"") the dimensional context is variable at run time. In this case the system cannot delegate the measure calculation and returns an empty value.

Smart measures behave differently from classic measures, which support a basic set of aggregation functions (Max, Min, Count, Sum, Average) that can be calculated in all contexts without help from the database. For example, if you build a query containing the [Country] and [Region] dimensions and the [Revenue] measure (which calculates the sum of the revenue), the initial display shows Country, Region and Revenue in a block. If you remove Region from the block, the total revenue for each country can still be calculated without a data refresh by summing the revenues for all the regions in the country. A smart measure requires a data refresh in this situation.

Calculation contexts are represented by grouping sets in the generated query.

6.6.5.1.1 Grouping sets and smart measures

A grouping set is a set of dimensions that generates a result for a measure.

The generated SQL that returns the data in a smart measure includes grouping sets for all the aggregations of that measure that are included in the report.

Example

Grouping sets in a query

A query contains the [Country], [Region], [City] dimensions and the [Revenue] smart measure. These objects imply the following grouping sets to calculate revenue in all possible contexts:

- Total smart measure value
If the database supports `UNION`, each grouping set is represented in a `UNION` clause in the generated SQL.

The grouping sets are updated according to the calculation contexts required by the report, which can change in response to changes in the report structure.

### 6.6.5.1.1 Management of grouping sets

When you first build and run a query including smart measures, the generated SQL includes the grouping set necessary to calculate the smart measures at the most detailed level implied by the query objects.

For example, if you build a query containing the `[Country]`, `[Region]` and `[City]` dimensions and the `[Revenue]` smart measure, the `(Country, Region, City)` grouping set appears in the generated SQL. The most detailed grouping set always appears in the SQL. Other grouping sets are added and removed in response to changes in the report.

If you remove the `[City]` dimension from the block, the `(Country, Region)` grouping set is required to return the revenue values. This grouping set is not yet available in the query SQL, so `#TOREFRESH` appears in the `[Revenue]` cells. When you refresh the data, `#TOREFRESH` is replaced with the revenue values.

If you then replace the `[City]` dimension in the block, the `(Country, Region)` grouping set is no longer needed. It is removed from the query SQL and its values discarded the next time you refresh the data.

Each time you refresh the report data, grouping sets are included or discarded according to the calculation contexts required by the report.

In certain situations, it is not possible to display the value of a smart measure. In this case, `#UNAVAILABLE` appears in the measure cells.

### 6.6.5.1.2 Smart measures and the scope of analysis

When you build a query with a scope of analysis, the initial grouping set contains the result objects, but not the scope objects.

The query does not generate all the possible grouping sets from the combination of the result objects and the scope objects.
A query with a scope of analysis and a smart measure

A query has the result objects [Country] and [Revenue]. The scope of analysis contains the [Region] and [City] dimensions. When you run the query, its SQL contains the (Country) grouping set and it displays [Country] and [Revenue] in a block.

6.6.5.1.3 Smart measures and SQL

6.6.5.1.3.1 Grouping sets and the UNION operator

Some databases support grouping sets explicitly with the `GROUPING SETS` operator.

When you build a query containing smart measures, the generated SQL uses multiple result sets and the `UNION` operator to simulate the effect of `GROUPING SETS`.

Example

Grouping sets retrieved with the UNION operator

This example describes a query containing [Country], [Region], [City] dimensions and the [Revenue] smart measure.

Note

For simplicity, the smart measure calculates a sum. In practice, a smart measure is not needed for this aggregation because sums are supported natively in Web Intelligence.

When the query is first run, the grouping set is (Country, Region, City). The entire SQL query returns this grouping set and there is no need for the `UNION` operator in the SQL.

If you remove the [City] dimension from the table, the (Country, Region) grouping set is required to display the revenue (which appears initially as #TOREFRESH). After data refresh, the SQL is as follows:

```sql
SELECT 0 AS GID, country.country_name, region.region_name, NULL, sum(city.revenue) FROM country, region, city WHERE (country.country_id=region.country_id) AND (region.region_id=city.region_id) GROUP BY country.country_name, region.region_name UNION SELECT 1 AS GID, country.country_name, region.region_name
```
region.region_name,
city.city_name,
sum(city.revenue)
FROM
country,
region,
city
WHERE
  ( country.country_id=region.country_id  )
AND  ( region.region_id=city.region_id  )
GROUP BY
country.country_name,
region.region_name,
city.city_name

Each grouping set is represented by a SELECT statement, and each has its own ID (the GID column). Grouping sets that do not contain the full set of dimensions include empty columns (SELECT '') because each SELECT statement in a query including UNION must have the same number of columns.

If you add a new block containing [Country] and [Revenue] to the report, the (Country) grouping set is required. The generated SQL now includes three grouping sets as follows:

SELECT
  0 AS GID,
country.country_name,
region.region_name,
NULL,
sum(city.revenue)
FROM
country,
region,
city
WHERE
  ( country.country_id=region.country_id  )
AND  ( region.region_id=city.region_id  )
GROUP BY
country.country_name,
region.region_name
UNION
SELECT
  1 AS GID,
country.country_name,
NULL,
NULL,
sum(city.revenue)
FROM
country,
city,
region
WHERE
  ( country.country_id=region.country_id  )
AND  ( region.region_id=city.region_id  )
GROUP BY
country.country_name
UNION
SELECT
  2 AS GID,
country.country_name,
region.region_name,
city.city_name,
sum(city.revenue)
FROM
country,
region,
city
WHERE
6.6.5.1.4 Smart measures and formulas

6.6.5.1.4.1 Smart measures and dimensions containing formulas

If a formula or variable appears as a dimension in the calculation context of a smart measure, and the formula determines the grouping set required by the measure, the values of the smart measure can be displayed.

For example, smart measures and dimensions now return values for:

- A URL created with hyperlink wizard.
- Simple concatenation on a dimension (or blank removal).
- When FormatDate is used on [date]

**Note**

The message #UNAVAILABLE is still returned for the following functions: ForEach, ForAll, In, Where, Rank, Previous, RelativeValue, RelativeDate, TimeDim, and in the Aggregation function when Min, Max, Last, or First are used in the formula: if ([selection] =1) then [dim1] else [dim2]

6.6.5.1.4.2 Smart measures in formulas

Smart measures can return values when included in formulas, even when the formula requires a different calculation context from the context implied by the position of the formula.

For example, a report contains a block as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>North</td>
<td>10000</td>
</tr>
<tr>
<td>US</td>
<td>South</td>
<td>15000</td>
</tr>
<tr>
<td>US</td>
<td>East</td>
<td>14000</td>
</tr>
<tr>
<td>US</td>
<td>West</td>
<td>12000</td>
</tr>
</tbody>
</table>

If you include an additional column in this table with the formula

\[\text{[Revenue] ForAll ([Region])}\]
the initial value of the column is #TOREFRESH because the formula, which excludes regions from the calculation, requires the grouping set (Country). Refreshing the data adds the (Country) grouping set to the query and displays the values of the measure.

Related Information

ForAll context operator [page 618]

6.6.5.1.5 Smart measures and filters

6.6.5.1.5.1 Restrictions concerning smart measures and filters

A smart measure can be evaluated in the body of a table when there is no filter in the table or in the parent context (a report filter).

The following table describes how smart measures are evaluated when filters are present.

<table>
<thead>
<tr>
<th>When the filter is on a ...</th>
<th>The smart measure is evaluated this way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>The smart measure will be correctly evaluated, but some rows will be removed from the table.</td>
</tr>
<tr>
<td>Dimension that is already part of the table axis</td>
<td>The smart measure will be correctly evaluated, but some rows will be removed from the table. The smart measure can be evaluated, because there is no aggregation after the filtering.</td>
</tr>
<tr>
<td>Dimension that is not part of the axis of the table, and when the filter operand is mono-value (the filter will return one value/row).</td>
<td>The smart measure will be correctly evaluated. The smart measure can be evaluated because there is no aggregation after the filtering.</td>
</tr>
<tr>
<td>Dimension that is not part of the axis of the table, and if the filter operand is multivalue (the filter can return many values/rows).</td>
<td>The smart measure can't be evaluated (#UNAVAILABLE is displayed) because in this case, filtering is done before aggregation, and for one row of the table, aggregation is required.</td>
</tr>
</tbody>
</table>

6.6.5.1.5.2 Smart measures and filters on dimensions

If you apply a multi-valued filter to a dimension on which the value of a smart value depends, but the dimension does not appear explicitly in the calculation context of the measure, the smart measure cannot return a value, and the cell displays #UNAVAILABLE.

This also applies when a report filter comes from an input control.
#UNAVAILABLE appears because the measure must be filtered in the report and then aggregated, but a smart measure cannot be aggregated after a report-level filter is applied. Calculating the measure would be possible by adding a query filter to the generated SQL, but this solution carries the risk of impacting other reports based on the same query.

**Note**

A multi-valued filter filters on multiple values using operators such as Greater Than, In List or Less Than. You can apply single-valued filters such as Equal To without generating the #UNAVAILABLE error.

**Note**

There is a workaround for cases which do not require aggregation: Define the formula as variable whose qualification is a measure and be sure that the used dimension is included in the block with the variable (you can hide that column for a better display).

**Example**

**A smart measure and a filter on a dimension**

A query contains the Country and Product dimensions and the Revenue smart measure. Country and Revenue are displayed in a block. If you apply a report filter restricting the values of Product to "Dresses" or "Jackets", #UNAVAILABLE appears in the Revenue cells.

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>#UNAVAILABLE</td>
</tr>
<tr>
<td>US</td>
<td>#UNAVAILABLE</td>
</tr>
<tr>
<td>Sum:</td>
<td>#UNAVAILABLE</td>
</tr>
</tbody>
</table>

If you restrict Product to "Jackets" only, the values are displayed.

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>971,444</td>
</tr>
<tr>
<td>Sum:</td>
<td>971,444</td>
</tr>
</tbody>
</table>

**Note**

A multivalue filter on Country will return results because the filter is in the table.

### 6.6.5.1.5.3 Filtering smart measures

The value in the table footer must be the aggregation of what the user sees in the table.

If what user sees in the table is filtered locally, then the system cannot return delegated aggregation of what is locally filtered.
### Example

**Filtering a smart measure**

<table>
<thead>
<tr>
<th>Country</th>
<th>OrderAmountDel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>28,833.36</td>
</tr>
<tr>
<td>China</td>
<td>51,384.33</td>
</tr>
<tr>
<td>France</td>
<td>68,630.22</td>
</tr>
<tr>
<td>USA</td>
<td>3,529,511.14</td>
</tr>
<tr>
<td>Total</td>
<td>3,678,359.05</td>
</tr>
<tr>
<td>Sum</td>
<td>3,678,359.05</td>
</tr>
</tbody>
</table>

When the data in the following table is filtered by OrderAmountDel > 60,000

The table shows the rows for which the OrderAmountDel in the context of table (per country) is greater than 60,000:

Sum in footer calculates the sum of the visible rows;

Total returns #UNAVAILABLE because the calculation is pushing the aggregation to the back end, but because Web Intelligence has performed local filtering, the aggregation cannot be delegated.

<table>
<thead>
<tr>
<th>Country</th>
<th>OrderAmountDel</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>68,630.22</td>
</tr>
<tr>
<td>USA</td>
<td>3,529,511.14</td>
</tr>
<tr>
<td>Total</td>
<td>#UNAVAILABLE</td>
</tr>
<tr>
<td>Sum</td>
<td>3,598,141.36</td>
</tr>
</tbody>
</table>

### 6.6.5.1.5.4 Smart measures and drill filters

A drill filter is a single valued filter.

You can drill using the drill bar directly.

### 6.6.5.1.5.5 Smart measures and nested OR filters

Nested OR filters in which at least one of the filtered dimensions does not appear in a block generate the #UNAVAILABLE error for a smart measure in the block.

This is because the smart measure has to be aggregated locally after some local processing (for example, filtering; some specific Web Intelligence formula) and this is not delegated.
6.6.6 Functions, operators and keywords

6.6.6.1 Functions

Formula functions are divided into several categories.

**i Note**

In the following languages, the functions are not translated: Chinese, Japanese, Hungarian, Polish, Turkish, Thai, and Russian. They appear in the interface in English.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>Aggregates data (for example by summing or averaging a set of values)</td>
</tr>
<tr>
<td>Character</td>
<td>Manipulates character strings</td>
</tr>
<tr>
<td>Date and Time</td>
<td>Returns date or time data</td>
</tr>
<tr>
<td>Document</td>
<td>Returns data about a document</td>
</tr>
<tr>
<td>Data Provider</td>
<td>Returns data about a document's data provider</td>
</tr>
<tr>
<td>Logical</td>
<td>Returns TRUE or FALSE</td>
</tr>
<tr>
<td>Numeric</td>
<td>Returns numeric data</td>
</tr>
<tr>
<td>Misc</td>
<td>Functions that do not fit into the above categories</td>
</tr>
<tr>
<td>Set</td>
<td>Returns sets of members from hierarchies</td>
</tr>
</tbody>
</table>

**SAP HANA Online Mode functions restrictions**

The functions listed in the table below are not supported in SAP HANA Online mode.

<table>
<thead>
<tr>
<th>Function Category</th>
<th>Function Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Provider</td>
<td>Connection</td>
</tr>
<tr>
<td></td>
<td>DataProvider</td>
</tr>
<tr>
<td></td>
<td>DataProviderKeyDate</td>
</tr>
<tr>
<td></td>
<td>DataProviderKeyDateCaption</td>
</tr>
<tr>
<td></td>
<td>DataProviderSQL</td>
</tr>
<tr>
<td></td>
<td>DataProviderType</td>
</tr>
<tr>
<td></td>
<td>IsPromptAnswered</td>
</tr>
<tr>
<td></td>
<td>LastExecutionDate</td>
</tr>
<tr>
<td></td>
<td>LastExecutionDuration</td>
</tr>
<tr>
<td></td>
<td>LastExecutionTime</td>
</tr>
</tbody>
</table>
6.6.6.1.1 Custom formats

In tables, you can use the Custom format type to define a customized format for any cell.

In Web Intelligence functions, the day/date, calendar and time of day character definitions below apply. The following table lists the strings you can use to create custom formats:

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>The correspoinding digit. If the number has less digits than the number of # characters used to specify the format, no leading zeros are inserted.</td>
<td>‘12345’ with the format #,###0 gives ‘12,345’ (if your locale defines the grouping separator as a comma) or ‘12 345’ (if your locale defines the grouping separator as a space).</td>
</tr>
<tr>
<td>Character(s)</td>
<td>Display(s)</td>
<td>Example</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>0</td>
<td>The corresponing digit. If the number has less digits than the number of 0 characters used to specify the format, a leading zero(s) is inserted before the number.</td>
<td>'123' with the format #0,000 gives '0123'</td>
</tr>
<tr>
<td>,</td>
<td>The grouping separator as defined by your locale.</td>
<td>'1234567' with the format #,##0 gives '1,234,567' (if you locale defines the grouping separator as a comma) or '1 234 567' (if your locale defines the grouping separator as a non-breaking space)</td>
</tr>
<tr>
<td>.</td>
<td>The decimal separator as defined by your locale.</td>
<td>'12.34' with the format #.#0 gives '12.34' (if your locale defines the decimal separator as a period) or '12,34' (if your locale defines the decimal separator as a comma)</td>
</tr>
<tr>
<td>[%]%</td>
<td>Displays a percentage sign (%) after the result and multiplies the result by 100.</td>
<td>0.50 becomes 50%</td>
</tr>
<tr>
<td>%</td>
<td>The % sign after the result, but does not multiply the result by 100.</td>
<td>0.50 becomes 0.50%</td>
</tr>
<tr>
<td>()</td>
<td>A non-breaking space ()</td>
<td>'1234567' with the format # #0 gives '1234 567'</td>
</tr>
<tr>
<td>1, 2, 3, a, b, c, $, £, € (and so on)</td>
<td>The alphanumeric character.</td>
<td>'705.15' with the format $#.#0 gives '705.15 €' or with the format #,#0 € gives '705,15 €'</td>
</tr>
<tr>
<td>[Red], [Blue], [Green], [White], [Gray], [Dark Red], [Dark Blue], [Dark Green]</td>
<td>The value in the specified color.</td>
<td>'150' with the format #,#0[Red] gives '150' in red text. #,#0[Blue] gives '150' in blue text.</td>
</tr>
</tbody>
</table>

**Note**

Alphanumeric characters should be delimited by single quotes, otherwise they can be interpreted as formatting characters. For example, # # will result in '123 4' while '1# # will result in '# 1234'.
<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>ddd</td>
<td>The name of the day abbreviated. The first letter is capitalized if the selected locale uses capitalized day names.</td>
<td>'Monday' with the format ddd gives 'Mon' in English, in French, lundi gives lundi.</td>
</tr>
<tr>
<td>Dddd</td>
<td>Forced the capitalization of the day name, for any locale.</td>
<td>'Monday' with the format Dddd gives 'Mon' in English, in French, lundi gives Lundi.</td>
</tr>
<tr>
<td>dddd</td>
<td>The name of the day in full. The first letter is capitalized if the selected locale uses capitalized day names.</td>
<td>'Monday' with the format dddd gives 'Monday' in English. In French, the day is lundi.</td>
</tr>
<tr>
<td>DDDD</td>
<td>The name of the day in full, in uppercase.</td>
<td>'Monday' with the format DDDD gives 'MONDAY' in English. In French, the day is LUNDI.</td>
</tr>
<tr>
<td>dddd dd</td>
<td>The day of the week followed by a space and the number of the day.</td>
<td>'Monday' with the format dddd dd gives 'Monday 01'</td>
</tr>
</tbody>
</table>

**Calendar characters**

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Display(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>The number of the month with no leading zeros. If the number for month is less than two characters, the number displays without a zero before it.</td>
<td>'January' with the format M gives '1'</td>
</tr>
<tr>
<td>MM</td>
<td>The number of the month with leading zeros. If the number for month is less than two characters, the number displays with a zero before it.</td>
<td>'January' with the format MM gives '01'</td>
</tr>
<tr>
<td>mmm</td>
<td>The name of the month abbreviated. The first letter is capitalized if the selected locale uses capitalization.</td>
<td>'January' with the format mmm gives Jan in English. In French, this is 'jan'.</td>
</tr>
<tr>
<td>Mmmm</td>
<td>The name of the month abbreviated. The first letter is capitalized for all locales.</td>
<td>'January' with the format Mmmm gives Jan in English. In French, this is 'Jan'.</td>
</tr>
<tr>
<td>mmmmm</td>
<td>The name of the month in full. The first letter is capitalized if the selected locale used capitalization.</td>
<td>'January' with the format mmmmm gives January in English, janvier in French</td>
</tr>
<tr>
<td>MMMM</td>
<td>The name of the month in full all in uppercase.</td>
<td>'January' with the format MMMM gives JANUARY in English, JANVIER in French</td>
</tr>
<tr>
<td>ww</td>
<td>The week number of the year.</td>
<td>For the 9th of January 2015, the ww format gives '02', because it is the seventh week of the year 2015.</td>
</tr>
<tr>
<td>w</td>
<td>The week number of the year without leading zero.</td>
<td>For the 9th of January 2015, the w format gives '2', because it is the seventh week of the year 2015.</td>
</tr>
<tr>
<td>W</td>
<td>The week number of the month.</td>
<td>For the 9th of January 2015, the W format gives '2', because it is the second week of January.</td>
</tr>
<tr>
<td>yy</td>
<td>The last two digits for year.</td>
<td>'2003' with the format yy gives '03'</td>
</tr>
<tr>
<td>yyyy</td>
<td>All four digits for year.</td>
<td>'2003' with the format yyyy gives '2003'</td>
</tr>
<tr>
<td>Character(s)</td>
<td>Display(s)</td>
<td>Example</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Time of day characters</strong></td>
<td>(hours, minutes, seconds, am/pm)</td>
<td>'21:00' with the format <em>hh:mm:ss a</em> gives '9:05:03 PM' for English locale</td>
</tr>
<tr>
<td>hh:mm:ss a</td>
<td></td>
<td>'21:00:03' with the format <em>hh:mm:ss a</em></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>'21:00' with the format <em>H</em> gives '21:00' Possible values are 0-23.</td>
</tr>
<tr>
<td>HH</td>
<td></td>
<td>'21:00' with the format <em>HH</em> gives '21:00' Possible values are 00-23.</td>
</tr>
<tr>
<td>k</td>
<td></td>
<td>'21:00' with the format <em>k</em> gives '21:00' Possible values are 1-24.</td>
</tr>
<tr>
<td>kk</td>
<td></td>
<td>'21:00' with the format <em>kk</em> gives '21:00' Possible values are 01-24.</td>
</tr>
<tr>
<td>hh</td>
<td></td>
<td>'21:00' with the format <em>hh</em> gives '09'</td>
</tr>
<tr>
<td>HH:mm</td>
<td></td>
<td>'7:15 am' with the format <em>HH:mm</em> gives '07:15'</td>
</tr>
<tr>
<td>HH:mm:ss</td>
<td></td>
<td>'7:15 am' with the format <em>HH:mm:ss</em> gives '07:15:00'</td>
</tr>
<tr>
<td>mm:ss</td>
<td></td>
<td>'07:15:03' with the format <em>mm:ss</em> gives '15:03'</td>
</tr>
<tr>
<td>z</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.6.6.1.2 Aggregate functions

#### 6.6.6.1.2.1 Aggregate

**Description**

Returns the default aggregation of a measure for a given member set.

**Function Group**

Aggregate
Syntax

```
num Aggregate(measure[,member_set])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>The member set used to calculate the aggregation</td>
<td>Member set</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- You can use extended syntax context operators with `Aggregate`.
- If you include `member_set`, `Aggregate` returns the aggregate value of the measure for all members in the member set.
- `member_set` can include multiple sets separated by semicolons (;
- The list of member sets must be enclosed in {}.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table. Then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message #MULTIVALUE.
- Delegated measure aggregation returns #TOREFRESH when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs for example when using the filter bar when the user selects a value before “all values” and vice versa when selecting “all values” before a selected value.

Examples

If the default aggregation of the [Sales Revenue] measure is Sum, and [California] is a member in the [Geography] hierarchy (Country > State > City), `Aggregate([Sales Revenue]; {Descendants([Geography]&[US],[California];1)}` returns the total sales revenue of all cities in California.

Related Information

Referring to members and member sets in hierarchies [page 850]
6.6.6.1.2.2 Member selection in aggregate functions

Description

For certain aggregate functions you can define a member selection to define the aggregation context when the block contains a hierarchy.

Function Group

Aggregate

Syntax

=AggregationFunction([my object];{memberselection})

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
</table>
| AggregationFunction | Must be one of the following:  
- Aggregate  
- Average  
- Count  
- Max  
- Min  
- Sum  | Aggregate function           | Yes                |          |
| my object       | Dimension or a measure                                              | Dimension or Measure        | Yes      |
| memberselection | A defined member, or a calculated set of member using set functions. The memberselection must be enclosed in curly brackets. Each part of the member set is separated with semicolon  
{[member one];[member two];CalculatedMemberSet()} | Member or a calculated set of members using Set functions. | Yes      |

Where CalculatedMemberSet uses one of the set functions:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancestor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descendant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siblings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description**

The set functions use Object, Level, or Member as parameters. If you specify only Object and the object is a hierarchical object present in the block, then it will use the current member. You can also define a specific member using the following syntax:

```
[HierarchicalObject][RootMember].[ChildMember].[ChildMember]
```

For Microsoft and Essbase .UNX sources you can select a Level:

```
[HierarchicalObject].[LevelName]
```

**Examples**

The following examples are all taken from an English language data source.

**Example**

In the following sample, you want to get the internet sales difference between Year 2002 and Year 2001:

```
=Sum([Internet Sales].[Internet Sales Amount]; {[Calendar].[Date.Calendar]&[All Periods].[CY 2002]}) + Sum([Internet Sales].[Internet Sales Amount]; {[Calendar].[Date.Calendar]&[All Periods].[CY 2001]})
```

Or either select two members in the member selection:

```
=Sum([Internet Sales].[Internet Sales Amount]; {[Calendar].[Date.Calendar]&[All Periods].[CY 2002]}; [Calendar].[Date.Calendar]&[All Periods].[CY 2001]})
```
Example

In the following sample, you have a product hierarchy, and you want to know the internet sales for all products related to bikes. But two of them are in a different branch:

```plaintext
=Sum([Query 3].[Internet Sales].[Internet Sales Amount];[[Product Model Categories]&[All Products].[Accessories].[Bike Racks];[Product Model Categories]&[All Products].[Accessories].[Bike Stands];[Product Model Categories]&[All Products].[Bikes]])
```
In the following sample, you want to compare Internet Sales Amount between North America Area countries, comparing first of all Canada and USA, and then with other countries worldwide:

<table>
<thead>
<tr>
<th>Bikes Amount</th>
<th>28,397,095.65</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Products</td>
<td>29,358,677.22</td>
</tr>
<tr>
<td>Accessories</td>
<td>700,759.96</td>
</tr>
<tr>
<td>Bike Racks</td>
<td>39,360</td>
</tr>
<tr>
<td>Bike Stands</td>
<td>39,591</td>
</tr>
<tr>
<td>Bottles and Cages</td>
<td>56,798.19</td>
</tr>
<tr>
<td>Cleaners</td>
<td>7,218.6</td>
</tr>
<tr>
<td>Fenders</td>
<td>46,619.58</td>
</tr>
<tr>
<td>Helmets</td>
<td>225,335.6</td>
</tr>
<tr>
<td>Hydration Packs</td>
<td>40,307.67</td>
</tr>
<tr>
<td>Tires and Tubes</td>
<td>245,529.32</td>
</tr>
<tr>
<td>Bikes</td>
<td>28,318,144.65</td>
</tr>
<tr>
<td>Mountain Bikes</td>
<td>9,952,759.56</td>
</tr>
<tr>
<td>Road Bikes</td>
<td>14,520,584.04</td>
</tr>
<tr>
<td>Touring Bikes</td>
<td>3,844,801.05</td>
</tr>
<tr>
<td>Clothing</td>
<td>339,772.61</td>
</tr>
<tr>
<td>Caps</td>
<td>19,688.1</td>
</tr>
<tr>
<td>Gloves</td>
<td>35,020.7</td>
</tr>
<tr>
<td>Jerseys</td>
<td>172,950.68</td>
</tr>
<tr>
<td>Shorts</td>
<td>71,319.81</td>
</tr>
<tr>
<td>Socks</td>
<td>5,106.32</td>
</tr>
<tr>
<td>Vests</td>
<td>35,687</td>
</tr>
</tbody>
</table>

Example

In the following sample, you want to compare Internet Sales Amount between North America Area countries, comparing first of all Canada and USA, and then with other countries worldwide:
Firstly, get the total for the North American countries, for this sample, you are only interested in Canada and USA:

\[
=\text{Sum}([\text{Query 2}].[\text{Internet Sales}].[\text{Internet Sales Amount}];\{(\text{Customer Geography}&[\text{All Customers}].[\text{Canada}];\text{Customer Geography}&[\text{All Customers}].[\text{United States}])\})
\]

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>Australia</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>Canada</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>France</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>Germany</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>11,367,634.37</td>
</tr>
<tr>
<td>United States</td>
<td>11,367,634.37</td>
</tr>
</tbody>
</table>

Then you want to compare all countries with North America:

\[
=\text{[Query 2}].[\text{Internet Sales}].[\text{Internet Sales Amount}] / \text{Sum([Query 2}].[\text{Internet Sales}].[\text{Internet Sales Amount}];\{(\text{Customer Geography}&[\text{All Customers}].[\text{Canada}];\text{Customer Geography}&[\text{All Customers}].[\text{United States}])\})
\]

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>258.27%</td>
</tr>
<tr>
<td>Australia</td>
<td>79.71%</td>
</tr>
<tr>
<td>Canada</td>
<td>17.40%</td>
</tr>
<tr>
<td>France</td>
<td>23.26%</td>
</tr>
<tr>
<td>Germany</td>
<td>25.46%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>29.94%</td>
</tr>
<tr>
<td>United States</td>
<td>82.60%</td>
</tr>
</tbody>
</table>

We can see that the global world total of customers is two and a half times that of North America, and that Australia is 80% compared to North America.

**Related Information**

Aggregate [page 631]
6.6.6.1.2.3 Average

Description

Returns the average value of a measure

Function Group

Aggregate

Syntax

```
num Average(measure[,member_set][;IncludeEmpty])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>A set of members</td>
<td>Member set</td>
<td>No</td>
</tr>
<tr>
<td>IncludeEmpty</td>
<td>Includes empty rows in the calculation</td>
<td>Keyword</td>
<td>No</td>
</tr>
</tbody>
</table>

(Empty rows excluded by default)

Notes

- You can use extended syntax context operators with Average.
- If you include member_set, Average returns the average value of the measure for all members in the member set.
- member_set can include multiple sets separated by semicolons (;).
- The list of member sets must be enclosed in {}.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table, then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message #MULTIVALUE.
- Delegated measure aggregation returns #TOREFRESH when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs for
example when using the filter bar when the user selects a value before “all values” and vice versa when selecting “all values” before a selected value.

- A delegated measure given against a group returns #UNAVAILABLE as it requires local aggregation (aggregation of the measure value of the grouped values). Even when you force local aggregation on a delegated measure against an "if then else" formula or group value it will still return the #MULTIVALUE message.

Examples

If the [Sales Revenue] measure has the values 41569, 30500, 40000 and 50138, \( \text{Average}([\text{Sales Revenue}]) \) returns 40552.

If [California] is a member in the [Geography] hierarchy (Country > State > City), \( \text{Average}([\text{Sales Revenue}];[[\text{Geography}]\&[\text{US}].[\text{California}].children]) \) returns the average sales revenue of all cities in California.

Related Information

Referring to members and member sets in hierarchies [page 850]
IncludeEmpty operator [page 834]

6.6.6.1.2.4 Count

Description

Returns the number of values in a set of values

Function Group

Aggregate

Syntax

\[
\text{integer Count}(\text{aggregated_data}[:\text{member_set}][:\text{IncludeEmpty}][:\text{Distinct}])
\]
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>aggregated_data</td>
<td>Any dimension, measure, hierarchy, level or member set</td>
<td>Dimension, measure, hierarchy, member set</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>The member set used to calculate the count</td>
<td>Member set</td>
<td>No</td>
</tr>
<tr>
<td>IncludeEmpty</td>
<td>Includes empty values in the calculation</td>
<td>Keyword</td>
<td>No</td>
</tr>
<tr>
<td>Distinct</td>
<td>All</td>
<td>Includes distinct values only (default for dimensions) or all values (default for measures) in the calculation</td>
<td>Keyword</td>
</tr>
</tbody>
</table>

### Notes

- You can use extended syntax context operators with `Count`.
- If you specify `IncludeEmpty` as the second argument, the function takes empty (null) values into consideration in the calculation.
- If you do not specify the `Distinct|All` parameter, the default values are `Distinct` for dimensions and `All` for measures.
- If you include `member_set`, `Count` restricts the count to the number of values in `member_set`.
- `member_set` can include multiple sets separated by semicolons (;).
- The list of member sets must be enclosed in `{}`.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table, then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message `#MULTIVALE`.
- Delegated measure aggregation returns `#TOREFRESH` when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs for example when using the filter bar when the user selects a value before `All values` and vice versa when selecting `All values` before a selected value.
- A delegated measure given against a group returns `#UNAVAILABLE` as it requires local aggregation (aggregation of the measure value of the grouped values). Even when you force local aggregation on a delegated measure against an "if then else" formula or group value it will still return the `#MULTIVALE` message.

### Examples

```
Count("Test") returns 1

Count([City]; Distinct) returns 5 if there are 5 different cities in a list of cities, even if there are more than 5 rows in the list due to duplication.
```
Count([City];All) returns 10 if there are 10 cities in a list of cities, even though some are duplicated.
Count([City];IncludeEmpty) returns 6 if there are 5 cities and one blank row in a list of cities.
Count([Product];{[Geography]&[State]}) returns the total number of products at the [State] level in the [Geography] hierarchy.

**Related Information**

IncludeEmpty operator [page 834]
Distinct/All operators [page 834]

### 6.6.6.1.2.5 First

**Description**

Returns the first value in a data set

**Function Group**

Aggregate

**Syntax**

```
input_type First(dimension|measure)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Any dimension or measure</td>
<td>Dimension or measure</td>
</tr>
</tbody>
</table>
Notes

- When placed in a break footer, First returns the first value in the break.
- When placed in a table footer, First returns the first value in the table.
- When placed in a table body, the result of First is unpredictable and depends on the order of the data set in the data source.

Examples

When placed in a table footer, First([Revenue]) returns the first value of [Revenue] in the table.

6.6.1.2.6 Interpolation

Description

Calculates empty measure values by interpolation

Function Group

Aggregate

Syntax

```
num Interpolation(measure[,PointToPoint|Linear][;NotOnBreak|(reset_dims)][;Row|Col])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>PointToPoint</td>
<td>Linear</td>
<td>The interpolation method:</td>
<td>Keyword</td>
</tr>
</tbody>
</table>

(PointToPoint is default)
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>PointToPoint</td>
<td>- point-to-point interpolation</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>- linear regression with least squares interpolation</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>NotOnBreak</td>
<td>- prevents the function from resetting the calculation on block and section breaks</td>
<td>Keyword</td>
<td>dimension list</td>
</tr>
<tr>
<td>reset_dims</td>
<td>- the list of dimensions used to reset the interpolation</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
</tbody>
</table>

### Notes

- **Interpolation** is particularly useful when you create a line graph on a measure that contains missing values. By using the function you ensure that the graph plots a continuous line rather than disconnected lines and points.
- Linear regression with least squares interpolation calculates missing values by calculating a line equation in the form \( f(x) = ax + b \) that passes as closely as possible through all the available values of the measure.
- Point-to point interpolation calculates missing values by calculating a line equation in the form \( f(x) = ax + b \) that passes through the two adjacent values of the missing value.
- The sort order of the measure impacts the values returned by **Interpolation**.
- You cannot apply a sort or a ranking to a formula containing **Interpolation**.
- If there is only one value in the list of values, **Interpolation** uses this value to supply all the missing values.
- Filters applied to an interpolated measure can change the values returned by **Interpolation** depending on which values the filter impacts.

### Examples

**Interpolation([Value])** supplies the following missing values using the default point-to-point interpolation method:

<table>
<thead>
<tr>
<th>Day</th>
<th>Value</th>
<th>Interpolation([Value])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
## Related Information

- Linear operator [page 835]
- PointToPoint operator [page 837]

### 6.6.6.1.2.7 Last

#### Description

Returns the last value in a data set

#### Function Group

Aggregate

#### Syntax

```plaintext
input_type Last(dimension|measure)
```

#### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Any dimension or measure</td>
<td>Dimension or measure</td>
</tr>
</tbody>
</table>
Notes

- When placed in a table footer, `Last` returns the last value in the in the break.
- When placed in a table footer, `Last` returns the last value in the table.
- When placed in a table body, the result of `Last` is unpredictable and depends on the order of the data set in the data source.
- For technical reasons, `Last` can return a null value when the input parameter is a merged object.

Examples

When placed in a table footer, `Last([Revenue])` returns the last value of [Revenue] in the table.

6.6.6.1.2.8 Max

Description

Returns the largest value in a set of values

Function Group

Aggregate

Syntax

```
input_type Max(aggregated_data[,member_set])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>aggregated_data</td>
<td>Any dimension, measure, hierarchy, level or member set</td>
<td>Dimension, measure, hierarchy, level or member set</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>A set of members</td>
<td>Member set</td>
<td>No</td>
</tr>
</tbody>
</table>
Notes

- You can use extended syntax context operators with \texttt{Max}.
- If you include \texttt{member\_set}, \texttt{Max} returns the maximum value of the aggregated data for all members in the member set.
- \texttt{member\_set} can include multiple sets separated by semicolons (;).
- The list of member sets must be enclosed in {}.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table, then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message \texttt{#MULTIVALUE}.
- Delegated measure aggregation returns \texttt{#TOREFRESH} when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs for example when using the filter bar when the user selects a value before “all values” and vice versa when selecting “all values” before a selected value.
- A delegated measure given against a group returns \texttt{#UNAVAILABLE} as it requires local aggregation (aggregation of the measure value of the grouped values).
  Even when you force local aggregation on a delegated measure against an "if then else" formula or group value it will still return the \texttt{#MULTIVALUE} message.

Examples

If the \texttt{[Sales Revenue]} measure has the values 3000, 60034 and 901234, \texttt{Max([Sales Revenue])} returns 901234.

If the \texttt{[City]} dimension has the values “Aberdeen” and “London”, \texttt{Max ([City])} returns “London”.

If \texttt{[US]} is a member in the \texttt{[Geography]} hierarchy (Country $>$ State $>$ City), \texttt{Max([Sales Revenue]; ([Geography].[US].Children}) returns the highest sales revenue for a US state.

6.6.6.1.2.9 Median

Description

Returns the median (middle value) of a measure

Function Group

Aggregate
Syntax

```
num Median(measure)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

If the set of numbers has an even number of values, `Median` takes the average of the middle two values.

Examples

```
Median([Revenue]) returns 971,444 if [Revenue] has the values 835420, 971444, and 1479660.
```

6.6.6.1.2.10 Min

Description

Returns the smallest value in a set of values

Function Group

Aggregate

Syntax

```
input_type Min(aggregated_data[,member_set])
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>aggregated_data</td>
<td>Any dimension, measure, hierarchy, level or member set</td>
<td>Dimension, measure, hierarchy, level or member set</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>A set of members</td>
<td>Member set</td>
<td>No</td>
</tr>
</tbody>
</table>

### Notes

- You can use extended syntax context operators with `Min`.
- If you include `member_set`, `Min` returns the minimum value of the aggregated data for all members in the member set.
- `member_set` can include multiple sets separated by semicolons (;
- The list of member sets must be enclosed in {}.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table, then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message #MULTIVALUE.
- Delegated measure aggregation returns #TOREFRESH when the required aggregation is not available in the query. The user has to refresh the document to get the new level of aggregation. This occurs for example when using the filter bar when the user selects a value before “all values” and vice versa when selecting “all values” before a selected value.
- A delegated measure given against a group returns #UNAVAILABLE as it requires local aggregation (aggregation of the measure value of the grouped values). Even when you force local aggregation on a delegated measure against an “if then else” formula or group value it will still return the #MULTIVALUE message.

### Examples

If the [Sales revenue] measure has the values 3000, 60034 and 901234, `Min([Sales Revenue])` returns 3000.
If the [City] dimension has the values Aberdeen and London, `Min([City])` returns “Aberdeen”.
`Min([Sales Revenue];([Geography]&[US].children))` returns the lowest sales revenue for a US state if [US] is a member in the [Geography] hierarchy with levels [Country] > [State] > [City].
6.6.1.2.11 Mode

Description

Returns the most frequently-occurring value in a data set

Function Group

Aggregate

Syntax

\[ \text{input\_type \ Mode(dimension|measure)} \]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Any dimension or measure</td>
<td>Measure</td>
</tr>
</tbody>
</table>

Notes

- Mode returns null if the data set does not contain one value that occurs more frequently than all the others.

Examples

Mode([Revenue]) returns 200 if [Revenue] has the values 100, 200, 300, 200.
Mode([Country]) returns the most frequently-occurring value of [Country].
6.6.6.1.2.12 Percentage

Description

Expresses a measure value as a percentage of its embedding context

Function Group

Aggregate

Syntax

```
num Percentage(measure[,Break][;Row|Col])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>Break</td>
<td>Accounts for table breaks</td>
<td>Keyword</td>
<td>No</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
</tbody>
</table>

Examples

In the following table, the Percentage column has the formula `Percentage([[Sales Revenue]])`

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Revenue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>5000</td>
<td>50</td>
</tr>
<tr>
<td>2003</td>
<td>4000</td>
<td>40</td>
</tr>
<tr>
<td><strong>Sum:</strong></td>
<td><strong>10000</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

By default the embedding context is the measure total in the table. You can make the function take account of a break in a table by using the optional `Break` argument. In this case the default embedding context becomes the table section.

In the following table, the Percentage column has the formula `Percentage([[Sales Revenue]];Break)`
<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Revenue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Q1</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>5000</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td>2001</td>
<td>Sum</td>
<td>10000</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Revenue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Q1</td>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>5000</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>Sum</td>
<td>10000</td>
<td>100</td>
</tr>
</tbody>
</table>

You can use the `Percentage` function across columns or rows; you can specify this explicitly using the optional `Row|Col` argument. For example, in the following crosstab, the % column has the formula `Percentage([Sales Revenue]; Row)`

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>%</th>
<th>Q2</th>
<th>%</th>
<th>Q3</th>
<th>%</th>
<th>Q4</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1000</td>
<td>10</td>
<td>2000</td>
<td>20</td>
<td>5000</td>
<td>50</td>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td>2002</td>
<td>2000</td>
<td>20</td>
<td>2000</td>
<td>20</td>
<td>5000</td>
<td>50</td>
<td>1000</td>
<td>10</td>
</tr>
</tbody>
</table>

### 6.6.6.1.2.13 Percentile

#### Description

Returns the nth percentile of a measure

#### Function Group

Numeric

#### Syntax

```
num Percentile(measure;percentile)
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>percentile</td>
<td>A percentage expressed as a decimal</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Notes

The nth percentile is a number that is greater than or equal to n% of the numbers in a set. You express n% in the form 0.n.

## Examples

If `[measure]` has the set of numbers (10;20;30;40;50), `Percentile([measure];0.3)` returns 22, which is greater than or equal to 30% of the numbers in the set.

## 6.6.6.1.2.14 Product

### Description

Multiplies the values of a measure

### Function Group

Aggregate

### Syntax

```plaintext
num Product(measure)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Examples

```
Product([Measure]) returns 30 if [Measure] has the values 2, 3, 5.
```

### 6.6.6.1.2.15 RunningAverage

#### Description

Returns the running average of a measure

#### Function Group

Aggregate

#### Syntax

```
num RunningAverage(measure[;Row|Col][;IncludeEmpty][;{reset_dims}])
```

To reset at each section the RunningAverage, we recommend the following syntax:

```
num RunningAverage(measure;section)
```

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
</tbody>
</table>
### Notes

- You can use extended syntax context operators with `RunningAverage`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by `RunningAverage`, the running average is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningAverage` does not automatically reset the average after a block break or new section.

### Examples

- **RunningAverage(Revenue)** returns the following results:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1,479,660</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>1,225,552</td>
</tr>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
</tbody>
</table>

- **RunningAverage(Revenue);(Country)** returns the following results:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1,479,660</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>1,225,552</td>
</tr>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
</tbody>
</table>

In an example where you are using `RunningAverage` in a section on `[Quarter]`, using the formula `RunningAverage([Sales revenue];([Quarter]))`, you receive the following results:

Q1
<table>
<thead>
<tr>
<th>City</th>
<th>Sales revenue</th>
<th>Running Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$1,987,114.70</td>
<td>$1,987,114.70</td>
</tr>
<tr>
<td>Houston</td>
<td>$1,544,627.80</td>
<td>$1,765,871.25</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$1,129,177.60</td>
<td>$1,553,640.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>Sales revenue</th>
<th>Running Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$2,028,090.70</td>
<td>$2,028,090.70</td>
</tr>
<tr>
<td>Houston</td>
<td>$1,380,838.20</td>
<td>$1,704,464.45</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$980,405.30</td>
<td>$1,463,111.40</td>
</tr>
</tbody>
</table>

**Related Information**

- IncludeEmpty operator [page 834]
- Row/Col operators [page 837]

### 6.6.6.1.2.16 RunningCount

**Description**

Returns the running count of a number set

**Function Group**

Aggregate

**Syntax**

```
num RunningCount(dimension|measure[;Row|Col][;IncludeEmpty][;(reset_dims)])
```

To reset at each section the RunningCount, we recommend the following syntax:

```
num RunningCount(dimention|measure;section)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Any dimension or measure</td>
<td>Dimension or measure</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
<tr>
<td>IncludeEmpty</td>
<td>Includes empty values in the calculation</td>
<td>Keyword</td>
<td>No</td>
</tr>
<tr>
<td>reset_dims</td>
<td>Resets the calculation on the specified dimensions</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td>section</td>
<td>Dimension on which the section is set</td>
<td>Keyword</td>
<td>Yes in the case of a section reset</td>
</tr>
</tbody>
</table>

### Notes

- You can use extended syntax context operators with `RunningCount`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by `RunningCount`, the running count is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningCount` does not automatically reset the count after a block break or new section.

### Examples

`RunningCount([Sales revenue])` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Sales revenue</th>
<th>Running Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>3</td>
</tr>
</tbody>
</table>

`RunningCount([Revenue];([Country]))` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>1</td>
</tr>
</tbody>
</table>
In an example where you are using `RunningCount` in a section on `[Week]`, using the formula `RunningCount([Lines];([Week]));` and with an input control on `[Sales revenue]` limiting the list to revenues over $30,000, returns the following results:

**Week 1**

<table>
<thead>
<tr>
<th>Lines</th>
<th>Sales revenue</th>
<th>Running Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweat-T-Shirts</td>
<td>$186,191</td>
<td>1</td>
</tr>
<tr>
<td>Shirt Waist</td>
<td>$139,082</td>
<td>2</td>
</tr>
<tr>
<td>Dresses</td>
<td>$70,931</td>
<td>3</td>
</tr>
</tbody>
</table>

**Week 2**

<table>
<thead>
<tr>
<th>Lines</th>
<th>Sales revenue</th>
<th>Running Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories</td>
<td>$344,617</td>
<td>1</td>
</tr>
<tr>
<td>Sweat-T-Shirts</td>
<td>$196,976</td>
<td>2</td>
</tr>
<tr>
<td>Shirt Waist</td>
<td>$105,597</td>
<td>3</td>
</tr>
<tr>
<td>Dresses</td>
<td>$76,290</td>
<td>4</td>
</tr>
<tr>
<td>Sweaters</td>
<td>$68,364</td>
<td>5</td>
</tr>
</tbody>
</table>

Notice that in Week 1 there are three lines with revenue that exceeded $30,000, while in Week 2, there are five product lines that exceeded $30,000.

**Related Information**

- IncludeEmpty operator [page 834]
- Row/Col operators [page 837]
- IncludeEmpty operator [page 834]
- IncludeEmpty operator [page 834]

**6.6.6.1.2.17 RunningMax**

**Description**

Returns the running maximum of a dimension or measure

**Function Group**

Aggregate
Syntax

```
input_type RunningMax{dimension|measure;.Row;Col}>({reset_dims})
```

To reset at each section the RunningMax, we recommend the following syntax:

```
num RunningMax(measure;section)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Any dimension or measure</td>
<td>Dimension or measure</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
<tr>
<td>reset_dims</td>
<td>Resets the calculation on the specified dimensions</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td>section</td>
<td>Dimension on which the section is set</td>
<td>Keyword</td>
<td>Yes in the case of a section reset</td>
</tr>
</tbody>
</table>

Notes

- You can use extended syntax context operators with `RunningMax`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by `RunningMax`, the running maximum is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningMax` does not automatically reset the max after a block break or new section.

Examples

`RunningMax([Revenue])` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>971,444</td>
</tr>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1,479,660</td>
</tr>
</tbody>
</table>
In an example where you are using `RunningMax` in a section on `City`, using the formula `RunningMax([Sales revenue]; ([City]));`, you receive the following results:

**Austin**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Running Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$775,482.70</td>
<td>$775,482.70</td>
</tr>
<tr>
<td>Q2</td>
<td>$667,850.30</td>
<td>$775,482.70</td>
</tr>
<tr>
<td>Q3</td>
<td>$581,470.40</td>
<td>$775,482.70</td>
</tr>
<tr>
<td>Q4</td>
<td>$674,869.80</td>
<td>$775,482.70</td>
</tr>
</tbody>
</table>

**Boston**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Running Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$312,896.40</td>
<td>$312,896.40</td>
</tr>
<tr>
<td>Q2</td>
<td>$291,431.00</td>
<td>$312,896.40</td>
</tr>
<tr>
<td>Q3</td>
<td>$249,529.00</td>
<td>$312,896.40</td>
</tr>
<tr>
<td>Q4</td>
<td>$429,850.20</td>
<td>$429,850.20</td>
</tr>
</tbody>
</table>

**Related Information**

IncludeEmpty operator [page 834]
Row/Col operators [page 837]

### 6.6.6.1.2.18 RunningMin

**Description**

Returns the running minimum of a dimension or measure

**Function Group**

Aggregate

**Syntax**

```plaintext
input_type RunningMin(dimension|measure; [Row|Col]; [reset_dims])
```
To reset at each section the RunningMin, we recommend the following syntax:

```
num RunningMin(measure;section)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>Any dimension or measure</td>
<td>Dimension or measure</td>
<td>Yes</td>
</tr>
<tr>
<td>detail</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
<td>No</td>
</tr>
<tr>
<td>measure</td>
<td>Resets the calculation on the specified dimensions</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td>section</td>
<td>Dimension on which the section is set</td>
<td>Keyword</td>
<td>Yes in the case of a section reset</td>
</tr>
</tbody>
</table>

**Notes**

- You can use extended syntax context operators with `RunningMin`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by `RunningMin`, the running minimum is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningMin` does not automatically reset the minimum after a block break or new section.

**Examples**

`RunningMin([Sales revenue])` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Sales revenue</th>
<th>Running Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>835,420</td>
</tr>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>835,420</td>
</tr>
</tbody>
</table>

In an example where you are using `RunningMin` in a section on `[City]`, using the formula `RunningMin([Sales revenue];([City]))`, you receive the following results:

```
Austin
```

```
### Quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Running Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$775,482.70</td>
<td>$775,482.70</td>
</tr>
<tr>
<td>Q2</td>
<td>$667,850.30</td>
<td>$667,850.30</td>
</tr>
<tr>
<td>Q3</td>
<td>$581,470.40</td>
<td>$581,470.40</td>
</tr>
<tr>
<td>Q4</td>
<td>$674,869.80</td>
<td>$581,470.40</td>
</tr>
</tbody>
</table>

### Boston

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Running Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$312,896.40</td>
<td>$312,896.40</td>
</tr>
<tr>
<td>Q2</td>
<td>$291,431.00</td>
<td>$291,431.00</td>
</tr>
<tr>
<td>Q3</td>
<td>$249,529.00</td>
<td>$249,529.00</td>
</tr>
<tr>
<td>Q4</td>
<td>$429,850.20</td>
<td>$249,529.00</td>
</tr>
</tbody>
</table>

---

**Related Information**

IncludeEmpty operator [page 834]
Row/Col operators [page 837]

---

**6.6.6.1.2.19 RunningProduct**

**Description**

Returns the running product of a measure

**Function Group**

Aggregate

**Syntax**

```plaintext
num RunningProduct(measure[,Row|Col][;(reset_dims)])
```
**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
<tr>
<td>resetDims</td>
<td>Resets the calculation on the specified dimensions</td>
<td>Dimension list</td>
<td>No</td>
</tr>
</tbody>
</table>

**Notes**

- You can use extended syntax context operators with `RunningProduct`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by `RunningProduct`, the running product is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningProduct` does not automatically reset the product after a block break or new section.

**Examples**

`RunningProduct([Number of guests])` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>City</th>
<th>Number of guests</th>
<th>Running Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Kobe</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Japan</td>
<td>Osaka</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>US</td>
<td>Chicago</td>
<td>241</td>
<td>5784</td>
</tr>
</tbody>
</table>

`RunningProduct([Number of guests];([Country of origin]))` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country of origin</th>
<th>City</th>
<th>Number of guests</th>
<th>Running Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Kobe</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Japan</td>
<td>Osaka</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>US</td>
<td>Chicago</td>
<td>241</td>
<td>5784</td>
</tr>
</tbody>
</table>
Related Information

IncludeEmpty operator [page 834]
Row/Col operators [page 837]

6.6.6.1.2.20 RunningSum

Description

Returns the running sum of a measure

Function Group

Aggregate

Syntax

```
num RunningSum(measure[,Row|Col][;{reset_dims}])
```

To reset at each section the RunningSum, we recommend the following syntax:

```
num RunningSum(measure;section)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>Row</td>
<td>Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
</tr>
<tr>
<td>reset_dims</td>
<td>Resets the calculation on the</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>specified dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>section</td>
<td>Dimension on which the section is</td>
<td>Keyword</td>
<td>Yes in the case of a section reset</td>
</tr>
<tr>
<td></td>
<td>set</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notes

- You can use extended syntax context operators with the `RunningSum`.
- You can set the calculation direction with the `Row` and `Col` operators.
- If you apply a sort on the measure referenced by the `RunningSum` function, the running sum is calculated after the measure is sorted.
- You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.
- When you specify a set of reset dimensions you must separate them with semi-colons.
- `RunningSum` does not automatically reset the sum after a block break or new section.

Example

`RunningSum([Revenue])` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>1,806,864</td>
</tr>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>3,286,524</td>
</tr>
</tbody>
</table>

`RunningSum([Revenue];([Country]))` returns these results in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Running Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>835,420</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>971,444</td>
</tr>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>2,451,104</td>
</tr>
</tbody>
</table>

In an example where you are using `RunningSum` in a section on `[Quarter]`, using the formula `RunningSum([Sales revenue];([Quarter]))`, you receive the following results:

Q1

<table>
<thead>
<tr>
<th>City</th>
<th>Sales revenue</th>
<th>Running Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$1,987,114.70</td>
<td>$1,987,114.70</td>
</tr>
<tr>
<td>Houston</td>
<td>$1,544,627.80</td>
<td>$3,531,742.50</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$1,129,177.60</td>
<td>$4,660,920.10</td>
</tr>
</tbody>
</table>

Q2

<table>
<thead>
<tr>
<th>City</th>
<th>Sales revenue</th>
<th>Running Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$2,028,090.70</td>
<td>$2,028,090.70</td>
</tr>
<tr>
<td>Houston</td>
<td>$1,380,838.20</td>
<td>$3,408,928.90</td>
</tr>
</tbody>
</table>
Related Information

IncludeEmpty operator [page 834]
Row/Col operators [page 837]

6.6.6.1.2.21 StdDev

Description

Returns the standard deviation of a measure

Function Group

Aggregate

Syntax

num StdDev(measure)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

The standard deviation is a measure of the statistical dispersion in a set of numbers. It is calculated by:

- finding the average of the set of numbers
- subtracting the average from each number in the set and squaring the difference
- summing all these squared differences
- dividing this sum by \((\text{number of numbers in the set}) - 1\)
- finding the square root of the result

Examples

If \text{measure} has the set of values \((2, 4, 6, 8)\) \(\text{StdDev([measure])}\) returns 2.58.

Related Information

Var [page 669]

6.6.6.1.2.22 StdDevP

Description

Returns the population standard deviation of a measure

Function Group

Aggregate

Syntax

\[
\text{num StdDevP(measure)}
\]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

The population standard deviation is a measure of the statistical dispersion in a set of numbers. It is calculated by:

- finding the average of the set of numbers;
- subtracting the average from each number in the set and squaring the difference;
- summing all these squared differences;
- dividing this sum by (number of numbers in the set);
- finding the square root of the result.

You can use extended syntax context operators with StdDevP.

Examples

If measure has the set of values (2, 4, 6, 8) StdDevP([measure]) returns 2.24.

6.6.6.1.2.23 Sum

Description

Returns the sum of a measure

Function Group

Aggregate

Syntax

\[ \text{num Sum(measure[,member_set])} \]
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>member_set</td>
<td>A set of members</td>
<td>Member set</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- You can use extended syntax context operators with `Sum`.
- If you include `member_set`, `Sum` returns the sum of the measure for all members in the member set.
- `member_set` can include multiple sets separated by semicolons (;).
- The list of member sets must be enclosed in {}.
- If the member set expression does not specify a precise member or node, the hierarchy referenced must be present in the table, then the member set expression references the current member in the hierarchy in the table. If the hierarchy is not in the table, the function returns the message #MULTIVALUE.
- Delegated measure aggregation returns #TOREFRESH when the required aggregation is not available in the query. This occurs for example when using the filter bar when the user selects a value before “all values” and vice versa when selecting “all values” before a selected value.
- When migrating from XIR2 to XIR3, aggregation functions containing IN and WHERE clauses in XI2 queries should be included into `Sum` function definitely by using parenthesis as follows:
  - In XIR2, the formula: `=Sum([Measure] In ([Dim 1];[Dim 2])) In ([Dim 1]) Where ([Dim 3]="Constant")`
  - From XIR3 onwards, modify the declaration: `=Sum(([Measure] In ([Dim 1];[Dim 2])) In ([Dim 1]) Where ([Dim 3]="Constant"))`
- A delegated measure given against a group returns #UNAVAILABLE as it requires local aggregation (aggregation of the measure value of the grouped values). Even when you force local aggregation on a delegated measure against an “if then else” formula or group value it will still return the #MULTIVALUE message.

Examples

If the Sales Revenue measure has the values 2000, 3000, 4000, and 1000, `Sum([Sales Revenue])` returns 10000.

If `[California]` is a member in the [Geography] hierarchy (Country > State > City), `Sum([Sales Revenue]; {Descendants([Geography]&[US].[California];1)})` returns the total sales revenue of all cities in California.
6.6.6.1.2.24 Var

Description

Returns the variance of a measure

Function Group

Aggregate

Syntax

num Var(measure)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

The variance is a measure of the statistical dispersion in a set of numbers. It is calculated by:

- finding the average of the set of numbers
- subtracting the average from each number in the set and squaring the difference
- summing all these squared differences
- dividing this sum by \((<\text{number of numbers in the set}> - 1)\)

The variance is the square of the standard deviation.

You can use extended syntax context operators with Var.

Examples

If measure has the set of values (2, 4, 6, 8) \(\text{Var}([\text{measure}])\) returns 6.67.
Related Information

StdDev [page 665]

6.6.6.1.2.25  VarP

Description

Returns the population variance of a measure

Function Group

Aggregate

Syntax

num VarP(measure)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

The population variance is a measure of the statistical dispersion in a set of numbers. It is calculated by:

- finding the average of the set of numbers
- subtracting the average from each number in the set and squaring the difference
- summing all these squared differences
- dividing this sum by (<number of numbers in the set>)

The population variance is the square of the population standard deviation.

You can use extended syntax context operators with VarP.
Examples

If measure has the set of values (2, 4, 6, 8) VarP([measure]) returns 5.

Related Information

StdDevP [page 666]

6.6.6.1.3 Character functions

6.6.6.1.3.1 Asc

Description

Returns the ASCII value of a character

Function Group

Character

Syntax

int Asc(string)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>Any string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

If string contains more than one character, the function returns the ASCII value of the first character in the string.

Examples

Asc("A") returns 65.
Asc("ab") returns 97.
Asc([Country]) returns 85 when the value of [Country] is "US".

6.6.6.1.3.2 Char

Description

Returns the character associated with an ASCII code

Function Group

Character

Syntax

string Char(ascii_code)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>ascii_code</td>
<td>An ASCII code</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

If `number` is a decimal, the function ignores the decimal part.

Example

`s
Char(123) returns "{".

6.6.6.1.3.3 Concatenation

Description

Concatenates (joins) two character strings. With numbers, the function will sum up the values rather than concatenate them.

i Note

If at least one of the input parameters is a string, then all other input parameters are converted into strings.

Function Group

Character

Syntax

```
string Concatenation(first_string;second_string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_string</td>
<td>The first string</td>
<td>String or number</td>
<td>Yes</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Type</td>
<td>Required</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>second_string</td>
<td>The string added to the first string</td>
<td>String or number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

You can also use the '+' operator to concatenate strings.

"First " + "Second" returns "First Second".

"First " + "Second" + " Third" returns "First Second Third".

You can use concatenation to include multiple dimensions in an aggregation function. For example, Count([Sales Person]+[Quarter]+[Resort]) is equivalent to the syntax Count([Sales Person], [Quarter], [Resort]) that is allowed by Desktop Intelligence.

**Examples**

Concatenation("First ";"Second") returns "First Second".

Concatenation("First ";Concatenation("Second ";"Third")) returns "First Second Third".

If [A] is a number and [A] = 1, Concatenation([A];[A]) returns "2".

If [A] is a string and [A] = 1, Concatenation([A];[A]) returns "11".

If [A] is a string, [B] is a number, [A] = 1 and [B] = 2, Concatenation([A];[B]) returns "12".

### 6.6.6.1.3.4 Fill

**Description**

Builds a string by repeating a string n times

**Function Group**

Character
Syntax

```plaintext
string Fill(repeating_string;num_repeats)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>repeating_string</td>
<td>The repeating string</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>num_repeats</td>
<td>The number of repeats</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Fill ("New York ";2) returns "New York New York ".

6.6.6.1.3.5 FormatDate

Description

Formats a date according to a specified format

Function Group

Character

Syntax

```plaintext
string FormatDate(date;format_string)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The date to format</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>format_string</td>
<td>The format to apply</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- The format of the output is dependent on the date format applied to the cell.
- The color formatting strings (for example: [Red], [Blue] and so on) cannot be applied to `FormatDate`.

Examples

`FormatDate(CurrentDate();"dd/MM/yyyy")` returns "15/12/2005" if the current date is 15 December 2005.

Related Information

Custom formats [page 345]

6.6.1.3.5.1 Format_string examples for the FormatDate function

In the `FormatDate` syntax for `format_string`, you can use the examples in the following table.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, September 21, 2004</td>
<td><code>dddd', 'mmmm d', 'yyyy</code></td>
</tr>
<tr>
<td>September 21, 2004</td>
<td><code>mmmm d', 'yyyy</code></td>
</tr>
<tr>
<td>Sep 21, 2004</td>
<td><code>mmm d', 'yyy</code></td>
</tr>
</tbody>
</table>

Note

You can find these samples in the `Format Number` dialog box in the Web Intelligence Rich Client or Applet interfaces; however, what samples appear depend on your selected Product Locale in the BI launch pad preferences. For example, if you select English, then “September 21, 2004” will be an available sample.
### Sample Syntax

<table>
<thead>
<tr>
<th>Sample</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/21/04</td>
<td>M'/'d'/'yy</td>
</tr>
<tr>
<td>Sep 21, 2004 8:45:30 PM</td>
<td>mmm d', 'yyyy h':'mm:'ss a</td>
</tr>
<tr>
<td>9/21/04 8:45 PM</td>
<td>M'/'d'/'yy h':'mm a</td>
</tr>
<tr>
<td>9/21/2004</td>
<td>M'/'d'/'yyyy</td>
</tr>
<tr>
<td>09/21/2004</td>
<td>MM'/'d'/'yyyy</td>
</tr>
<tr>
<td>9/21/04 8:45:30 PM</td>
<td>M'/'d'/'yy h':'mm a</td>
</tr>
<tr>
<td>8:45:30 PM</td>
<td>h':'mm:'ss a</td>
</tr>
<tr>
<td>8:45 PM</td>
<td>h':'mm a</td>
</tr>
<tr>
<td>20:45:30</td>
<td>HH':'mm:'ss</td>
</tr>
<tr>
<td>20h45</td>
<td>HH'h'mm</td>
</tr>
</tbody>
</table>

→ **Tip**

We recommend that you represent actual text in the syntax surrounded by apostrophes so that the text is not confused as pattern symbols. For example, as in the last sample in the table above, ‘h’ in “HH’h’mm”.

### Related Information

- [FormatDate](page 675)
- [Custom formats](page 345)

### 6.6.6.1.3.6 FormatNumber

#### Description

Formats a number according to a specified format

#### Function Group

Character

#### Syntax

```plaintext
string FormatNumber(number;format_string)
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number to format</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>format_string</td>
<td>The format to apply</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Notes

- The format of the output is dependent on the number format applied to the cell.
- The color formatting strings (for example: [Red], [Blue] and so on) cannot be applied to `FormatNumber`.

## Examples

```
FormatNumber([Revenue];"#,##.00") returns 835,420.00 if [Revenue] is 835,420.
```

## Related Information

- Custom formats [page 345]

## 6.6.6.1.3.7 HTMLEncode

### Description

Applies HTML encoding rules to a string

### Function Group

Character

### Syntax

```
string HTMLEncode(html)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>html</td>
<td>An HTML string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

`HTMLEncode("<Hello World!>")` returns "<Hello World!>", because the browser interprets the character. Internally, it returns "&lt;Hello World!&gt;".

6.6.6.1.3.8 InitCap

Description

Capitalizes the first letter of a string

Function Group

Character

Syntax

```plaintext
string InitCap(string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to capitalize</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Examples

InitCap("we hold these truths to be self-evident") returns "We hold these truths to be self-evident".

6.6.6.1.3.9 Left

Description

Returns the leftmost characters of a string.

i Note

When the selected interface locale is Arabic (Right-To-Left display/reading) this function returns the first characters from the logical start of the string.

Function Group

Character

Syntax

string Left(string;num_chars)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The input string</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>num_chars</td>
<td>The number of characters to return from the start of the string</td>
<td>number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

Left([Country];2) returns "Fr" if [Country] is "France".
6.6.6.1.3.10  LeftPad

Description

Pads a string on its left with another string.

i Note

When the selected interface locale is Arabic (Right-To-Left display/reading) this function pads the string before its logical start with characters of another string.

Function Group

Character

Syntax

```
string LeftPad(padded_string;length;left_string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>padded_string</td>
<td>The original string</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>length</td>
<td>The length of the output string</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>left_string</td>
<td>The string to be added to the start of padded_string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- If `length` is less than the length of `left_string` and `padded_string` combined, `left_string` is truncated.
- If `length` is less than or equal to the length of `padded_string`, the function returns `padded_string`.
- If `length` is greater than the lengths of `padded_string` and `left_string` combined, `left_string` is repeated or partially repeated enough times to fill out the length.
Examples

LeftPad("York";8;"New ") returns "New York"

LeftPad("York";6;"New ") returns "NeY ork"

LeftPad("York";11;"New ") returns "New NewY ork"

LeftPad("New ";2;"York") returns "New".

6.6.6.1.3.11 LeftTrim

Description

Trims the leading spaces from a string.

i Note
When the selected interface locale is Arabic (Right-To-Left display/reading) this function removes the first space characters from the logical start of the string.

Function Group

Character

Syntax

string LeftTrim(trimmed_string)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>trimmed_string</td>
<td>The string to be trimmed</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

LeftTrim([Country]) returns "France" if [Country] is " France".
6.6.1.3.12 Length

Description

Returns the number of characters in a string

Function Group

Character

Syntax

```plaintext
int Length(string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The input string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

`Length([Last Name])` returns 5 if [Last Name] is “Smith”.

6.6.1.3.13 Lower

Description

Converts a string to lower case

Function Group

Character
Syntax

```plaintext
string Lower(string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to be converted to lower case</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Lower("New York") returns "new york".

6.6.6.1.3.14 Match

Description

Determines whether a string matches a pattern

Function Group

Character

Syntax

```plaintext
bool Match(test_string;pattern)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>test_string</td>
<td>The string to be tested against the text pattern</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>pattern</td>
<td>The text pattern</td>
<td>string</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

- The pattern can contain the wildcards "*" (replaces any set of characters) or "?" (replaces any single character).

### Examples

- `Match([Country];"F*")` returns True if `[Country]` is "France".
- `Match([Country];"?S?")` returns True if `[Country]` is "USA".
- `Match("New York";"P*")` returns False.

### 6.6.6.1.3.15 Pos

#### Description

Returns the starting position of a text pattern in a string

#### Function Group

Character

#### Syntax

```plaintext
int Pos(test_string;pattern)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>test_string</td>
<td>The string to be tested for the text pattern</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>pattern</td>
<td>The text pattern</td>
<td>string</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- If the pattern occurs more than once, Pos returns the position of the first occurrence.

Examples

Pos("New York";"Ne") returns 1.
Pos("New York, New York";"Ne") returns 1.
Pos("New York"; "York") returns 5.

6.6.6.1.3.16 Replace

Description

Replaces part of a string with another string

Function Group

Character

Syntax

```
string Replace(replace_in;replaced_string;replace_with)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace_in</td>
<td>The string in which the text is replaced</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>replaced_string</td>
<td>The text to be replaced</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>replace_with</td>
<td>The text that replaces replaced_string</td>
<td>string</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Examples

Replace("New YORK";"ORK";"ork") returns "New York".

### 6.6.6.1.3.17 Right

#### Description

Returns the rightmost characters of a string (the characters at the end of the string).

**i Note**

When the selected interface locale is Arabic (Right-To-Left display/reading) this function returns the first characters from the logical start of the string.

#### Function Group

Character

#### Syntax

```
string Right(string;num_chars)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>Any string</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>num_chars</td>
<td>The number of characters to return from the right</td>
<td>number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Examples

Right([[Country];2]) returns "ce" if [Country] is "France".

#### 6.6.6.1.3.18 RightPad

**Description**

Pads a string on its right with another string (adds a string to the start of the original string).

**Note**

When the selected interface locale is Arabic (Right-To-Left display/reading) this function adds a string to the first characters from the logical start of the string.

**Function Group**

Character

**Syntax**

```plaintext
string RightPad(padded_string;length;right_string)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>padded_string</td>
<td>The original string</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>length</td>
<td>The length of the output string</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>right_string</td>
<td>The string to be added to the end of padded_string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

- If `length` is less than the length of `right_string` and `padded_string` combined, `right_string` is truncated.
- If `length` is less than or equal to the length of `padded_string`, the function returns `padded_string`.
- If `length` is greater than the lengths of `padded_string` and `right_string` combined, `right_string` is repeated or partially repeated enough times to fill out the length.

### Examples

RightPad("New ";8;'York") returns "New York"
RightPad("New ";6;'York") returns "New Yo"
RightPad("New ";11;'York") returns "New YorkYor"
RightPad("New ";2;'York") returns "New".

### 6.6.6.1.3.19 RightTrim

**Description**

Trims the trailing spaces from a string.

**Note**

When the selected interface locale is Arabic (Right-To-Left display/reading) this function trims the trailing space from the logical end of the string.
**Function Group**

Character

**Syntax**

```plaintext
string RightTrim(trimmed_string)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>trimmed_string</td>
<td>The string to be trimmed</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Examples**

RightTrim([Country]) returns "France" if [Country] is "France ".

**6.6.6.1.3.20 Substr**

**Description**

Returns part of a string

**Function Group**

Character

**Syntax**

```plaintext
string SubStr(string;start;length)
```
Table 1: Input Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>Any string</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>start</td>
<td>The start position of the extracted string</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>length</td>
<td>The length of the extracted string</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

SubStr("Great Britain";1;5) returns "Great".
SubStr("Great Britain";7;7) returns "Britain".

6.6.6.1.3.21 Trim

Description

Trims the leading and trailing spaces from a string

Function Group

Character

Syntax

```plaintext
string Trim(trimmed_string)
```

Table 2: Input Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to be trimmed</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Examples

Trim(" Great Britain ") returns "Great Britain".

6.6.6.1.3.22 Upper

Description

Converts a string to upper case

Function Group

Character

Syntax

\[
\text{string Upper(string)}
\]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to be converted</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Upper("New York") returns "NEW YORK".

6.6.6.1.3.23 UrlEncode

Description

Applies URL encoding rules to a string
Function Group

Character

Syntax

```plaintext
string UrlEncode(html)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>html</td>
<td>The URL to be encoded</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples


6.6.6.1.3.24 WordCap

Description

Capitalizes the first letter of all the words in a string

Function Group

Character

Syntax

```plaintext
string WordCap(string)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to be capitalized</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Examples

`WordCap("Sales revenue for March")` returns "Sales Revenue For March".

---

### 6.6.6.1.4 Date and Time functions

#### 6.6.6.1.4.1 CurrentDate

**Description**

Returns the current date formatted according to the regional settings

**Function Group**

Date and Time

**Syntax**

```
date CurrentDate()
```

**Examples**

`CurrentDate()` returns 10 September 2002 if the date is 10 September 2002.
6.6.6.1.4.2 CurrentTime

Description

Returns the current time formatted according to the regional settings

Function Group

Date and Time

Syntax

```
time CurrentTime()
```

Examples

```
CurrentTime returns 11:15 if the current time is 11:15.
```

6.6.6.1.4.3 DatesBetween

Description

Returns the number of periods between two dates, irrespective of the time.

Function Group

Date and Time

Syntax

```
int DatesBetween(first_date;last_date;period)
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_date</td>
<td>The first date of the time range</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>last_date</td>
<td>The last date of the time range</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>period</td>
<td>The type of period to be counted in the time range</td>
<td>Pre-defined</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Note

- Possible values for the **period** parameter are: DayPeriod, WeekPeriod, MonthPeriod, QuarterPeriod, SemesterPeriod, YearPeriod.
- If the return value is out of range for int, an #OVERFLOW error is returned.

### Examples

- `DatesBetween([Begin Date];[End Date];MonthPeriod)` returns 2 when `[Begin Date]` is 30 June 2016 and `[End Date]` is 3 August 2016.
- `DatesBetween([Begin Date];[End Date];DayPeriod)` returns -10 when `[Begin Date]` is 30 June 2016 and `[End Date]` is 20 June 2016.
- `DatesBetween([Begin Date];[End Date];QuarterPeriod)` returns 6 when `[Begin Date]` is 30 June 2016 and `[End Date]` is 17 November 2017.
- `DatesBetween([Begin Date];[End Date];MonthPeriod)` returns 1 when `[Begin Date]` is 31 December 2015 and `[End Date]` is 1 January 2016.
- `DatesBetween([Begin Date];[End Date];DayPeriod)` returns 1 when `[Begin Date]` is 31 December 2015 and `[End Date]` is 1 January 2016.
- `DatesBetween([Begin Date];[End Date];WeekPeriod)` returns 0 when `[Begin Date]` is 31 December 2015 and `[End Date]` is 1 January 2016, because both days belong to the same week.

## 6.6.6.1.4.4 DayName

### Description

Returns the day name in a date
Function Group

Date and Time

Syntax

```plaintext
string DayName(date)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

`DayName([Reservation Date])` returns "Saturday" when the date in [Reservation Date] is 15 December 2001 (which is a Saturday).

Note

The input date must be a variable. You cannot specify the date directly, as in `DayName("07/15/2001")`.

6.6.6.1.4.5 DayNumberOfMonth

Description

Returns the day number in a month
Syntax

```c
int DayNumberOfMonth(date)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

```
DayNumberOfMonth([Reservation Date]) returns 15 when the date in [Reservation Date] is 15 December 2001.
```

6.6.6.1.4.6 DayNumberOfWeek

Description

Returns the day number in a week

Function Group

Date and Time

Syntax

```c
int DayNumberOfWeek(date)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

The function treats Monday as the first day of the week.

Examples

\[
\text{DayNumberOfWeek(}[\text{Reservation Date}]\) \text{ returns 1 when the date in } [\text{Reservation Date}] \text{ is 2 May 2005 (which is a Monday).}
\]

6.6.6.1.4.7 DayNumberOfYear

Description

Returns the day number in a year

Function Group

Date and Time

Syntax

\[
\text{int DayNumberOfYear(date)}
\]
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

DayNumberOfYear([Reservation Date]) returns 349 when the date in [Reservation Date] is 15 December 2001.

6.6.6.1.4.8 DaysBetween

Description

Returns the number of days between two dates

Function Group

Date and Time

Syntax

int DaysBetween(first_date;last_date)

i Note

You must ensure that the dates given in the arguments are in the same timezone. This applies to all date operations: comparison and calculation.

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_date</td>
<td>The first date</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Type</td>
<td>Required</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>last_date</td>
<td>The last date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Examples**

DaysBetween([Sale Date];[Invoice Date]) returns 2 if [Sale Date] is 15 December 2001 and [Invoice Date] is 17 December 2001.

6.6.6.1.4.9 LastDayOfMonth

**Description**

Returns the date of the last day in a month

**Function Group**

Date and Time

**Syntax**

```plaintext
date LastDayOfMonth(date)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>Any date in the month</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Examples**

LastDayOfMonth([Sale Date]) returns 31 December 2005 if [Sale Date] is 11 December 2005.
6.6.6.1.4.10 LastDayOfWeek

Description

Returns the date of the last day in a week

Function Group

Date and Time

Syntax

```plaintext
date LastDayOfWeek(date)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>Any date in the week</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

The function treats Monday as the first day of the week.

Examples

`LastDayOfWeek([Sale Date])` returns 15 May 2005 (a Sunday) if [Sale Date] is 11 May 2005.

6.6.6.1.4.11 Month

Description

Returns the month name in a date
Function Group

Date and Time

Syntax

```
string Month(date)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

`Month([Reservation Date])` returns “December” when the date in [Reservation Date] is 15 December 2005.

**6.6.6.1.4.12 MonthNumberOfYear**

Description

Returns the month number in a date

Function Group

Date and Time

Syntax

```
int MonthNumberOfYear(date)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>Any date in the year</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Example

```
MonthNumberOfYear([Reservation Date]) returns 12 when the date in [Reservation Date] is 15 December 2005.
```

### 6.6.6.1.4.13 MonthsBetween

#### Description

Returns the number of months between two dates

#### Function Group

Date and Time

#### Syntax

```
int MonthsBetween(first_date;last_date)
```

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_date</td>
<td>The first date</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>last_date</td>
<td>The last date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Examples

MonthsBetween([Sale Date];[Invoice Date]) returns 1 if [Sale Date] is 2 December 2005 and [Invoice Date] is 2 January 2006.

MonthsBetween([Sale Date];[Invoice Date]) returns 1 if [Sale Date] is 31/03/2008 and [Invoice Date] is 30/04/2008.

MonthsBetween([Sale Date];[Invoice Date]) returns 118 if [Sale Date] is 07/01/1993 and [Invoice Date] is 06/11/2002.

6.6.6.1.4.14 Quarter

Description

Returns the quarter number in a date

Function Group

Date and Time

Syntax

int Quarter(date)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>Any date in the quarter</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Quarter([Reservation Date]) returns 4 when the date in [Reservation Date] is 15 December 2005.
6.6.6.1.4.15 RelativeDate

Description

Returns a date relative to another date.

Function Group

Date and Time

Syntax

```
date RelativeDate(start_date;num;period)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>start_date</td>
<td>The start date</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>num</td>
<td>The number of period units added to the start date</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>period</td>
<td>The type of period added to the start date</td>
<td>Pre-defined</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Notes

- The `num` parameter can be a constant, the numerical result of a function, a measure value or a numerical dimension value, and has to be an integer.
- The `num` parameter can be negative to return a date earlier than `start_date`.
- If omitted, the `period` parameter works with days (DayPeriod).
- When adding or subtracting months (for SemesterPeriod, QuarterPeriod and MonthPeriod), if the day does not exist in the returned month, then the last day of the returned month must be used.
- Possible values for the `period` parameter are: MillisecondPeriod, SecondPeriod, MinutePeriod, HourPeriod, DayPeriod, WeekPeriod, MonthPeriod, QuarterPeriod, SemesterPeriod, YearPeriod.
Examples

RelativeDate([Reservation Date];2) returns 17 December 2005 when [Reservation Date] is 15 December 2005.

RelativeDate([Reservation Date];-3) returns 9 January 2007 when [Reservation Date] is 12 January 2007.

RelativeDate([Reservation Date];1;MonthPeriod) returns 12 February 2007 when [Reservation date] is 12 January 2007.

6.6.6.1.4.16 TimeBetween

Description

Returns the number of periods between two dates, taking the time into account.

Function Group

Date and Time

Syntax

\[
\text{int TimeBetween(first_date;last_date;period)}
\]

i Note

Make sure that the dates given in the arguments are in the same time zone, since no time zone offset is used in calculating the return value.

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_date</td>
<td>The first date of the time</td>
<td>Time</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>last_date</td>
<td>The last date of the time</td>
<td>Time</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Type</td>
<td>Required</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>period</td>
<td>The type of period to be counted in the time range</td>
<td>Pre-defined</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

- Possible values for the period parameter are: DayPeriod, WeekPeriod, MonthPeriod, QuarterPeriod, SemesterPeriod, YearPeriod, HourPeriod, MinutePeriod, SecondPeriod, MillisecondPeriod.
- If the return value is out of range for int, an #OVERFLOW error is returned.

**Examples**

- `TimeBetween([Begin Date];[End Date];HourPeriod)` returns 2 when [Begin Date] is 30 June 2016, 8:45 and [End Date] is 30 June 2016, 10:05.
- `TimeBetween([Begin Date];[End Date];MinutePeriod)` returns -10 when [Begin Date] is 30 June 2016 8:45 and [End Date] is 30 June 2016 8:35.
- `TimeBetween([Begin Date];[End Date];SecondPeriod)` returns 120 when [Begin Date] is 30 June 2016 8:45 and [End Date] is 30 June 2016 8:47.
- `TimeBetween([Begin Date];[End Date];MonthPeriod)` returns 1 when [Begin Date] is 31 December 2015 11:45 and [End Date] is 1 January 2016 8:47.
- `TimeBetween([Begin Date];[End Date];DayPeriod)` returns 1 when [Begin Date] is 31 December 2015 11:45 and [End Date] is 1 January 2016 8:47.
- `TimeBetween([Begin Date];[End Date];WeekPeriod)` returns 0 when [Begin Date] is 31 December 2015 11:45 and [End Date] is 1 January 2016 8:47, because both days belong to the same week.

**6.6.6.1.4.17 TimeDim**

**Description**

The `TimeDim` time dimension allows you to build a time axis from a date type universe object. `TimeDim` returns the data for the dates given as the first parameter over the time periods given as the second parameter. When there are periods that have no data, the first day of each empty period is returned. This ensures a full axis for the given period. This guarantees:

- That the axis retains the natural time order (oldest objects first, the most recent objects last).
- The axis contains all the periods between the minimum and maximum dates in the current context.
You cannot use the TimeDim function to filter on formulas (for example in a filter, input-control, element-link, filter/drill bar). Instead you should directly filter on the underlying date dimension.

**Function Group**

Date and Time

**Syntax**

```
TimeDim([Date Type]; Period Type)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Type</td>
<td>The date object for the report, for example, InvoiceDate.</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>Period Type</td>
<td>The period for the results, from the following values:</td>
<td>Pre-defined</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>- DayPeriod</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MonthPeriod</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- QuarterPeriod</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- YearPeriod</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When no value is selected, the DayPeriod is used by default. This object</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>should be a data provider object, it must be available from report</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>objects, and cannot be a variable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the above function in conjunction with the following functions:

- DayName
- DayNumberOfMonth
- DayNumberOfWeek
- DayNumberOfYear
- Month
Example

The first table below contains data that concerns only certain dates. The query examples that follow show how the results are interpreted.

<table>
<thead>
<tr>
<th>Invoice Date</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3/00</td>
<td>31,607</td>
</tr>
<tr>
<td>1/8/00</td>
<td>31,244</td>
</tr>
<tr>
<td>7/3/00</td>
<td>38,154</td>
</tr>
</tbody>
</table>

The following formula `DayName(TimeDim([Invoice Date] ; QuarterPeriod)` returns daily values from the above table.

<table>
<thead>
<tr>
<th>Invoice Date</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3/00</td>
<td>31,607</td>
</tr>
<tr>
<td>1/8/00</td>
<td>31,244</td>
</tr>
<tr>
<td>4/1/00</td>
<td></td>
</tr>
<tr>
<td>7/3/00</td>
<td>38,154</td>
</tr>
</tbody>
</table>

You should format the results of the TimeDim function with the Quarter function to return the results by Quarter (Q1, Q2...) to give you the following result table:

<table>
<thead>
<tr>
<th>Invoice Date</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>62,851</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>38,154</td>
</tr>
</tbody>
</table>

6.6.6.1.4.18 ToDate

Description

Turns a character string into a date. Give the date format as the parameter to indicate to Web Intelligence how to convert the string into a date. The date format you provide must match the format of the date in the original string. Refer to the link below for the possible date formats.
Function Group

Date and Time

Syntax

```plaintext
date ToDate(date_string;format)
```

or

```plaintext
date ToDate(date_string;"INPUT_DATE_TIME")
```

i Note

In scenarios where the Preferred viewing locale can be different depending on the user, a fixed format (for a particular locale) is not appropriate. In this case use INPUT_DATE_TIME as shown in the second example above.

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date_string</td>
<td>The string to be interpreted as a date.</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>format</td>
<td>The date format used by the string. Use &quot;INPUT_DATE_TIME&quot; to use the format of the Preferred viewing locale.</td>
<td>string</td>
<td>Yes*</td>
</tr>
</tbody>
</table>

* See the note above. Use the format or INPUT_DATE_TIME depending on your needs.

Examples

```
ToDate("12/15/2002";"MM/dd/yyyy") interprets “12” as a month number, “15” as a day number and “2002” as a year.
```

```
ToDate("Dec/02";"Mmm/yy") interprets “Dec” as an abbreviated month name and “02” as the two last digits of a year.
```

```
ToDate("15-December-02";"dd-Mmmm-yy") interprets “15” as a day number, “December” as a month and “02” as the last two digits of a year.
```
ToDate("12/15/02 11:00:00";"INPUT_DATE_TIME") interprets “12/15/02 11:00:00” in the format used by the Preferred viewing locale on the user’s machine.

**i Note**

- With INPUT_DATE_TIME, both the date and time must be specified in the date_string input string.
- If date_string cannot be interpreted as a valid date with the specified format, the ToDate() formula returns #ERROR.
- The way a date is displayed in a cell depends on the chosen date format in that cell. For instance, if the chosen date format is "MM/dd/yyyy", then ToDate("Dec/15/02";"MMM/dd/yy") will be displayed as 12/15/2002.

### Related Information

Custom formats [page 345]

### 6.6.6.1.4.19 Week

#### Description

Returns the week number in the year

#### Function Group

Date and Time

#### Syntax

```
int Week(date)
```

#### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Examples

\(\text{Week([Reservation Date])}\) returns 1 when the date in [Reservation Date] is 4 January 2004 (which occurs in the first week of the year 2004).

6.6.6.1.4.20 Year

Description

Returns the year in a date

Function Group

Date and Time

Syntax

\[
\text{int Year(date)}
\]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>The input date</td>
<td>Date</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

\(\text{Year([Reservation Date])}\) returns 2005 when the date in [Reservation Date] is 15 December 2005.
6.6.6.1.5 Data Provider functions

6.6.6.1.5.1 Connection

Description

Returns the parameters of the database connection used by a data provider

Function Group

Data Provider

Syntax

```plaintext
string Connection(dp)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- You must enclose the name of the data provider in square brackets.
- For security reasons, the output of the function does not include the database host name, user name and user password.

6.6.6.1.5.2 DataProvider

Description

Returns the name of the data provider containing a report object
Function Group

Data Provider

Syntax

```
stringDataProvider(obj)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>A report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

```
DataProvider([Total Revenue]) returns "Sales" if the [Total Revenue] measure is in a data provider called "Sales".
```

**Note**

DataProvider requires an object name to return its data provider name. If you use another function as a parameter of DataProvider, for example a dimension variable, that does not give an object name, the DataProvider function will return an error.

6.6.6.1.5.3 DataProviderKeyDate

Description

Returns the keydate of a data provider

Function Group

Data Provider
Syntax

date DataProviderKeyDate(dp)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- You must enclose the name of the data provider in square brackets.
- The returned keydate is formatted according to the document locale.

Examples

DataProviderKeyDate([Sales]) returns 3 August 2007 if the keydate for the Sales data provider is 3 August 2007.

6.6.6.1.5.4 DataProviderKeyDateCaption

Description

Returns the keydate caption of a data provider

Function Group

Data Provider

Syntax

string DataProviderKeyDateCaption(dp)
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

You must enclose the name of the data provider in square brackets.

Examples

`DataProviderKeyDateCaption([Sales])` returns "Current calendar date" if the keydate caption in the Sales data provider is "Current calendar date".

6.6.6.1.5.5 `DataProviderSQL`

Description

Returns the SQL generated by a data provider

Function Group

Data Provider

Syntax

```plaintext
string DataProviderSQL(dp)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

You must enclose the name of the data provider in square brackets.

### Examples

```
DataProviderSQL([Query 1]) returns SELECT country.country_name FROM country if the data provider SQL is SELECT country.country_name FROM country.
```

### 6.6.6.1.5.6 DataProviderType

#### Description

Returns the type of a data provider

#### Function Group

Data Provider

#### Syntax

```
string DataProviderType(dp)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- `DataProviderType` returns "Universe" for universe data providers or "Personal Data" for personal data providers.
- You must enclose the name of the data provider in square brackets.

Examples

`DataProviderType([Sales])` returns "Universe" if the "Sales" data provider is based on a universe.

6.6.6.1.5.7 IsPromptAnswered

Description

Determines whether a prompt has been answered

Function Group

Data Provider

Syntax

```csharp
bool IsPromptAnswered([dp]prompt_string)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider containing the prompt</td>
<td>Data provider</td>
<td>No</td>
</tr>
<tr>
<td>prompt_string</td>
<td>The prompt text</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

- You must enclose the name of the data provider in square brackets.
- IsPromptAnswered returns a Boolean value that you can use with the If function.
- If you place IsPromptAnswered directly into a column, it returns an integer (1=true, 0=false). You can format this integer using a Boolean number format.

### Examples

IsPromptAnswered("Choose a city") returns true if the prompt identified by the text "Choose a city" has been answered.

IsPromptAnswered([Sales];"Choose a city") returns true if the prompt identified by the text "Choose a city" in the [Sales] data provider has been answered.

### 6.6.6.1.5.8 LastExecutionDate

#### Description

Returns the date on which a data provider was last refreshed

#### Function Group

Data Provider

#### Syntax

```java
date LastExecutionDate(dp)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- If your report has one data provider only you can omit the dp parameter.
- You must enclose the name of the data provider in square brackets.
- You can use theDataProvider function to provide a reference to a data provider.

Examples

`LastExecutionDate([Sales Query])` returns "3/4/2002" if the Sales Query data provider was last refreshed on 4 March 2002.

Related Information

DataProvider [page 714]

6.6.6.1.5.9 LastExecutionDuration

Description

Returns the time in seconds taken by the last refresh of a data provider

Function Group

Data Provider
### Syntax

```plaintext
num LastExecutionDuration(dp)
```

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

You must enclose the name of the data provider in square brackets.

### Examples

`LastExecutionDuration([Sales])` returns 3 if the “Sales” data provider took 3 second to return its data the last time it was run.

### 6.6.6.1.5.10 LastExecutionTime

#### Description

Returns the time at which a data provider was last refreshed

#### Function Group

Data Provider

#### Syntax

```plaintext
time LastExecutionTime(dp)
```
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- If your report has one data provider only you can omit the dp parameter.
- You can use the `DataProvider` function to provide a reference to a data provider.
- You must enclose the name of the data provider in square brackets.

Examples

```
LastExecutionTime([Sales Query]) returns "2:48:00 PM" if the Sales Query data provider was last refreshed at 2:48:00 PM.
```

Related Information

`DataProvider [page 714]`

### 6.6.6.1.5.11 NumberOfDataProviders

**Description**

Returns the number of data providers in a report

**Function Group**

Data Provider
Syntax

```c
int NumberOfDataProviders()
```

Examples

`NumberOfDataProviders()` returns 2 if the report has two data providers.

6.6.6.1.5.12 `NumberOfRows`

Description

Returns the number of rows in a data provider

Function Group

Data Provider

Syntax

```c
int NumberOfRows(dp)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- You must enclose the name of the data provider in square brackets.
- You can use the `DataProvider` function to provide a reference to a data provider.
Examples

`NumberOfRows([Query 1])` returns 10 if the “Query 1” data provider has 10 rows.

Related Information

`DataProvider [page 714]`

6.6.6.1.5.13 RefValueDate

Description

Returns the date of the reference data used for data tracking

Function Group

Data Provider

Syntax

```plaintext
date RefValueDate()
```

Examples

`RefValueDate()` returns 15 December 2008 if the reference date is 15 December 2008.

6.6.6.1.5.14 RefValueUserReponse

Description

Returns the response to a prompt when the reference data was the current data
Function Group

Data Provider

Syntax

```
string RefValueUserResponse([dp;p]prompt_string[Index])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>No</td>
</tr>
<tr>
<td>prompt_string</td>
<td>The prompt text</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>Index</td>
<td>Tells the function to return the database primary keys of the prompt values</td>
<td>Keyword</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- The function returns an empty string if data tracking is not activated.
- You must enclose the name of the data provider in square brackets.
- You can use the `DataProvider` function to provide a reference to a data provider.
- If you selected more than one value in answer to a prompt, the function returns a string consisting of a list of values (or primary keys if the `Index` operator is specified) separated by semi-colons.

Examples

`RefValueUserResponse( "Which city?" )` returns "Los Angeles" if you entered "Los Angeles" in the "Which City?" prompt at the time when the reference data was the current data.

`RefValueUserResponse([Sales Query];"Which city?")` returns "Los Angeles," if you entered "Los Angeles" in the "Which City?" prompt in the "Sales Query" data provider at the time when the reference data was the current data.
6.6.6.1.5.15 ServerValue

Description

Returns the database value of a measure

Function Group

Data Provider

Syntax

```
neg ServerValue([measure])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- ServerValue ignores all local filters applied to dimensions or hierarchies used to calculate the measure

Example

```
ServerValue([Internet Sales Amount]) returns the database value of the measure [Internet Sales Amount]
```
6.6.6.1.5.16 UniverseName

Description

Returns the name of the universe on which a data provider is based

Function Group

Data Provider

Syntax

string UniverseName(dp)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- The value of `dp` in the formula is automatically updated if the name of the data provider changes. If the data provider is renamed to "Q1", the formula becomes `UniverseName([Q1])`.
- You must enclose the name of the data provider in square brackets.
- You can use the `DataProvider` function to provide a reference to a data provider.

Examples

`UniverseName([Query 1])` returns "eFashion" if the [Query 1] data provider is based on the eFashion universe.
Related Information

DataProvider [page 714]

6.6.6.1.5.17 UserResponse

Description

Returns the response to a prompt

Function Group

Data Provider

Syntax

```
string UserResponse([dp;]prompt_string[;Index])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>The data provider</td>
<td>Data provider</td>
<td>No</td>
</tr>
<tr>
<td>prompt_string</td>
<td>The prompt text</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>Index</td>
<td>Tells the function to return the database primary keys of the prompt values</td>
<td>Keyword</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- You must enclose the name of the data provider in square brackets.
- You can use the DataProvider function to provide a reference to a data provider.
- If you select more than one value in answer to a prompt, the function returns a string consisting of a list of values (or primary keys if the Index operator is specified) separated by semi-colons.
The output of the function depends on the prompt type.

**Examples**

UserResponse("Which city?") returns "Los Angeles" if you entered "Los Angeles" in the "Which City?" prompt.

UserResponse([Sales Query];"Which city?") returns "Los Angeles", if you entered "Los Angeles" in the "Which City?" prompt in the "Sales Query" data provider.

UserResponse([Sales Query];"Which city?";Index) returns 23 if you entered "Los Angeles" in the "Which City?" prompt in the "Sales Query" data provider, and the database primary key of Los Angeles is 23.

UserResponse("Which country?") returns "France" if it is a mono-value prompt.

UserResponse("Which country?") returns "France;Holland;USA" if it is a multi-value prompt.

UserResponse("Which country?") returns "France - USA" if it is an interval type prompt with a single entry.

UserResponse("Which country?") returns "France - Holland;Japan - USA" if it is an interval type prompt with multiple entries.

UserResponse("Which country?") returns "France" if it is a complex prompt used with the Equal To operator.

UserResponse("Which country?") returns “>France” if it is a complex prompt used with the Greater Than operator.

UserResponse("Which country?") returns “>=France” if it is a complex prompt used with the Greater Than or Equal To operator.

UserResponse("Which country?") returns “<France” if it is a complex prompt used with the Less Than operator.

UserResponse("Which country?") returns “<=France” if it is a complex prompt used with the Less Than or Equal To operator.

UserResponse("Which country?") returns "France - USA" if it is a complex prompt used with the Between operator.

UserResponse("Which country?") returns "France - Holland;>Japan" if it is a complex prompt used with the Not Equal To operator.

UserResponse("Which country?") returns "Austria;France - Holland;>Japan" if it is a complex prompt with multiple entries.
6.6.6.1.6 Document functions

6.6.6.1.6.1 DocumentAuthor

Description

Returns the InfoView logon of the document creator

Function Group

Document

Syntax

```java
string DocumentAuthor()
```

Examples

`DocumentAuthor()` returns "gkn" if the document author's login is "gkn".

6.6.6.1.6.2 DocumentCreationDate

Description

Returns the date on which a document was created

Function Group

Document
Syntax

\[ \text{date DocumentCreationDate}() \]

Examples

DocumentCreationDate() returns 15 December 2008 if the document was created on 15 December 2008.

6.6.6.1.6.3 DocumentCreationTime

Description

Returns the time when a document was created

Function Group

Document

Syntax

\[ \text{time DocumentCreationTime}() \]

Examples

DocumentCreationTime() returns 11:15 if the document was created at 11:15.

6.6.6.1.6.4 DocumentDate

Description

Returns the date on which a document was last saved
Function Group

Document

Syntax

date DocumentDate()

Examples

DocumentDate() returns 8 August 2005 if the document was last saved on 8 August 2005.

6.6.6.1.6.5 DocumentName

Description

Returns the document name

Function Group

Document

Syntax

string DocumentName()

Examples

DocumentName() returns "Sales Report" if the document is called "Sales Report".
### 6.6.6.1.6.6 DocumentOwner

**Description**

Returns the BI launch pad logon/user name of the owner of the document (the last person who saved the document). (To return the original author/creator of the document, use the DocumentAuthor function.)

**Function Group**

Document

**Syntax**

```csharp
string DocumentOwner()
```

**Examples**

```
DocumentOwner() returns "gkn" if the last person who saved the document has the user name or login "gkn".
```

### 6.6.1.6.7 DocumentPartiallyRefreshed

**Description**

Determines whether a document is partially refreshed

**Function Group**

Document

**Syntax**

```csharp
bool DocumentPartiallyRefreshed()
```
Notes

DocumentPartiallyRefreshed returns a boolean value that you can use in the If function.

Examples

DocumentPartiallyRefreshed() returns True if the document is partially refreshed.

6.6.6.1.6.8 DocumentTime

Description

Returns the time when a document was last saved

Function Group

Document

Syntax

```plaintext
time DocumentTime()
```

Notes

The format of the returned time varies depending on the cell format.

Example

DocumentTime() returns 15:45 if the document was last saved at 15:45.
6.6.1.6.9 DrillFilters

Description

Returns the results of drill filters applied to a document or object in an declared report in drill mode. You can declare a different report within the document. If you do not declare a report, the current active report is used.

Function Group

Document

Syntax

```plaintext
string DrillFilters([obj|separator[;report]])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>A report object</td>
<td>Report object</td>
<td>Either obj or separator required</td>
</tr>
<tr>
<td>separator</td>
<td>The drill filter separator</td>
<td>String</td>
<td>Either obj or separator required</td>
</tr>
<tr>
<td>report</td>
<td>Optional. The name of the report you want to use. It must be in the document. If no report is declared, then the current report is used.</td>
<td>String</td>
<td>Either obj or separator required</td>
</tr>
</tbody>
</table>

Notes

- You can insert `DrillFilters` directly without the need to enter the formula manually by inserting a `DrillFilters` cell.
- If you do not specify an object, the function returns all drill filters applied to the document.
Examples

DrillFilters() returns "US" if the document has a drill filter restricting the [Country] object to US.


DrillFilters ([Quarter]) returns "Q3" if the document has a drill filter restricting [Quarter] to "Q3".

6.6.6.1.6.10 PromptSummary

Description

Returns the prompt text and user response of all prompts in a document

Function Group

Document

Syntax

string PromptSummary([dp];[sorting_order];[show_definitive_prompts])

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>Data Provider</td>
<td>A data provider</td>
<td>No</td>
</tr>
<tr>
<td>sorting_order</td>
<td>Pre-Defined</td>
<td>Sorting order of the function output</td>
<td>No (default value = ascending)</td>
</tr>
<tr>
<td>show_definitive_prompts</td>
<td>Boolean</td>
<td>Show BW definitive prompts in the function output</td>
<td>No (default value = false)</td>
</tr>
</tbody>
</table>
Notes

- The optional use of `dp` allows to filter the output of `PromptSummary()` to the specified query.
- Possible values for the `sorting_order` parameter are: default, ascending or descending.
- If the `sorting_order` is not used in the function, then the data source order is used.
- If the `show_definitive_prompts` parameter is not used, the BW Definitive prompts are hidden in the function output.

Example

Example output of the `PromptSummary` function appears as follows:

```
Enter Quantity Sold: 5000
Enter value(s) for State (optional): California, Texas, Utah
Enter Customer (optional):
```

6.6.6.1.6.11 QuerySummary

Description

Returns information about the queries in a document

Function Group

Document

Syntax

```
string QuerySummary([dp])

string QuerySummary([dp];[StatusOfData])
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dp</td>
<td>A data provider</td>
<td>Data provider</td>
<td>No</td>
</tr>
<tr>
<td>StatusOfData</td>
<td>BW Status of data</td>
<td>Boolean</td>
<td>No</td>
</tr>
</tbody>
</table>

### Notes

- You must enclose the name of the data provider in square brackets.
- The BW status of data indicates the last refresh date of the BW info provider, and appears as the last line returned by the function.
- The Refreshable status indicates whether the refreshable option has been enabled for the query.

### Examples

- `QuerySummary()` returns information about all the queries in a document.
- `QuerySummary([Query 1])` returns information about the queries based on the [Query 1] data provider.

### Output example:

**Query 1:**
- Universe: eFashion
- Last execution time: 1s
- NB of rows: 34500
- Result objects: State, Year, Sales Revenue
- Scope of analysis: State, City, Year, Quarter, Month
- Refreshable: ON
- Filters:
  - (State inlist:"US";"France";)
  - And (Sales Revenue Greater Than 1000000
  - Or Sales Revenue Less Than 10000)

**Query 2:**
- Source file: D:\Data\datacar.xls
- Result objects: State, Year, Sales Revenue
- Refreshable: OFF

## 6.6.6.1.6.12 ReportFilter

### Description

Returns the report filters applied to an object
Function Group

Document

Syntax

```plaintext
string ReportFilter(obj)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>A report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

```plaintext
ReportFilter([Country]) returns "US" if there is a report filter on the Country object that restricts it to "US".
```

6.6.6.1.6.13  ReportFilterSummary

Description

Returns a summary of the report filters in a document or report

Function Group

Document

Syntax

```plaintext
string ReportFilterSummary(report_name)
```
**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>report_name</td>
<td>The name of the report</td>
<td>String</td>
<td>No</td>
</tr>
</tbody>
</table>

**Notes**

If `report_name` is omitted, `ReportFilterSummary` returns a summary of all the report filters in all the reports in the document.

**Examples**

`ReportFilterSummary()` returns information about all the report filters in a document.


Example output of the `ReportFilterSummary` function appears as follows:

```
Filters on Report1:
    (Sales Revenue Greater Than 1000000
     Or (Sales Revenue Less Than 3000))
Filters on Section on City:
    (City InList{"Los Angeles";"San Diego";})
Ranking Filter:
    (Top 10 & Bottom 10 [Customer] Based on [Sales Revenue] (Count))
```

**Logical functions**

**6.6.6.1.7 Even**

**Description**

Determines whether a number is even

**Function Group**

Logical
Syntax

```
bool Even(number)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- `Even` returns a boolean value that you can use in the `If` function.
- If you place `Even` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.
- `Even` returns True for every even integer, and False for every decimal number.

Examples

```
Even(4) returns True.
Even(3) returns False.
Even(23.2) returns False.
Even(-4) returns True.
Even(-2.2) returns False.
```

6.6.6.1.7.2 IsDate

Description

Determines whether a value is a date
**Function Group**

Logical

**Syntax**

```plaintext
bool IsDate(obj)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

- `IsDate` returns a boolean value that you can use in the `If` function.
- If you place `IsDate` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

**Examples**

```plaintext
IsDate([Reservation Date]) returns True if [Reservation Date] is a date.
```

Or one of the following to return "Date" if [Reservation Date] is a date:

- If(IsDate([Reservation Date])) Then "Date" Else "Not a date"
- If IsDate([Reservation Date]) Then "Date" Else "Not a date"

**Related Information**

`If...Then...Else [page 809]`
6.6.6.1.7.3 IsError

Description

Determines whether an object returns an error

Function Group

Logical

Syntax

```plaintext
bool IsError(obj)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- `IsError` returns a boolean value that you can use in the `If` function.
- If you place `IsError` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

Examples

`IsError([Revenue])` returns `False` if the `[Revenue]` variable does not return an error.

`IsError([Average Guests])` returns `True` if the `[Average Guests]` variable returns a division by zero (`#DIV/0`) error.

If `IsError([Average Guests])` Then "Error" Else "No error" returns "Error" if the `[Average Guests]` variable returns a division by zero (`#DIV/0`) error.
Related Information

If...Then...Else [page 809]

6.6.6.1.7.4 IsLogical

Description

Determines whether a value is boolean

Function Group

Logical

Syntax

```python
bool IsLogical(obj)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- IsLogical returns a boolean value that you can use in the If function.
- If you place IsLogical directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

Examples

IsLogical(IsString([Country])) returns True.
IsLogical([Country]) returns False if country returns any data type other than boolean.

If IsLogical(IsDate([Country])) Then "Boolean" Else "Not boolean" returns "Boolean".

**Related Information**

If...Then...Else [page 809]

### 6.6.6.1.7.5 IsNull

**Description**

Determines whether a value is null

**Function Group**

Logical

**Syntax**

```plaintext
bool IsNull(obj)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

- IsNull returns a boolean value that you can use in the If function.
- If you place IsNull directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.
**Examples**

IsNull([Revenue]) returns False if the [Revenue] variable is not null.

IsNull([Average Guests]) returns True if the [Average Guests] variable is null.

**Related Information**

If...Then...Else [page 809]

### 6.6.6.1.7.6 IsNumber

**Description**

Determines whether a value is a number

**Function Group**

Logical

**Syntax**

```plaintext
bool IsNumber(obj)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

- `IsNumber` returns a boolean value that you can use in the `If` function.
If you place IsNumber directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

**Examples**

IsNumber([Revenue]) returns True if the [Revenue] variable is a number.

IsNumber([Customer Name]) returns False if the [Customer Name] variable is not a number.

If IsNumber([Customer Name]) Then "Number" Else "Not a number" returns "Not a number" if the [Customer Name] variable is not a number.

**Related Information**

If...Then...Else [page 809]

### 6.6.6.1.7.7 IsString

**Description**

Determines whether a value is a string

**Function Group**

Logical

**Syntax**

```
bool IsString(obj)
```
### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Notes

- `IsString` returns a boolean value that you can use in the `If` function.
- If you place `IsString` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

### Examples

`IsString([Revenue])` returns false if the `[Revenue]` variable is not a string.

`IsString([Customer Name])` returns true if the `[Customer Name]` variable is a string.

`If IsString([Customer Name]) Then "String" Else "Not a string"` returns "String" if the `[Customer Name]` variable is a string.

### Related Information

- `If...Then...Else [page 809]`

### 6.6.6.1.78 IsTime

#### Description

Determines whether a variable is a time variable.

#### Function Group

- Logical
Syntax

```c
bool IsTime(obj)
```

## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Notes

- `IsTime` returns a boolean value that you can use in the `If` function.
- If you place `IsTime` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.

## Examples

- `IsTime([Reservation Time])` returns true if the `[Reservation Time]` variable is a time variable.
- `IsTime([Average Guests])` returns false if the `[Average Guests]` variable is not a time variable.
- `If IsTime([Average Guests]) Then "Time" Else "Not time"` returns "Not time" if the `[Average Guests]` variable is not a time variable.

## Related Information

- [If...Then...Else](page 809)
**Function Group**

Logical

**Syntax**

```plaintext
bool Odd(number)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

- `Odd` returns a boolean value that you can use in the `If` function.
- If you place `Odd` directly into a column, it returns an integer (1=true; 0=false). You can format this integer using a Boolean number format.
- `Odd` returns True for every decimal number, and False for every even integer.

**Examples**

- `Odd(5)` returns True.
- `Odd(4)` returns False.
- `Odd(23.2)` returns True.
- `Odd(24.2)` returns True.
- `Odd(-23.2)` returns True.
- `Odd(-24.2)` returns True.

**Related Information**

`If...Then...Else` [page 809]
6.6.6.1.8 Numeric functions

6.6.6.1.8.1 Abs

Description

Returns the absolute value of a number

Function Group

Numeric

Syntax

num Abs(number)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Abs(25) returns 25.
Abs(-11) returns 11.

6.6.6.1.8.2 Ceil

Description

Returns a number rounded up to the nearest integer
Function Group

Numeric

Syntax

```
num Ceil(number)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Ceil(2.4) returns 3.
Ceil(3.1) returns 4.
Ceil(-3.1) returns -3.

6.6.6.1.8.3 Cos

Description

Returns the cosine of an angle

Function Group

Numeric
## Syntax

```
num Cos(angle)
```

## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>angle</td>
<td>An angle in radians</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Example

```
Cos(180) returns -0.6.
```

## 6.6.6.1.8.4 EuroConvertFrom

### Description

Converts a Euro amount to another currency

### Function Group

Numeric

### Syntax

```
num EuroConvertFrom(euro_amount;curr_code;round_level)
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>euro_amount</td>
<td>The amount in Euros</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>curr_code</td>
<td>The ISO code of the target currency</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>round_level</td>
<td>The number of decimal places to which the result is rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Notes

The currency code must be the code of one of the 12 EU currencies whose values were fixed in relation to the Euro prior to their abolition in January 2002. If it is not, the function returns #ERROR. The currencies are:

- BEF  Belgian franc
- DEM  German mark
- GRD  Greek drachma
- ESP  Spanish peseta
- FRF  French franc
- IEP  Irish punt
- ITL  Italian lira
- LUF  Luxembourg franc
- NLG  Dutch guilder
- ATS  Austrian schilling
- PTS  Portuguese escudo
- FIM  Finnish mark

## Examples

- `EuroConvertFrom(1000;"FRF";2)` returns 6559.57.
- `EuroConvertFrom(1000;"FRF";1)` returns 6559.60.
- `EuroConvertFrom(1000.04;"DEM";2)` returns 1955.83.
- `EuroConvertFrom(1000.04;"DEM";1)` returns 1955.80.
Related Information

Rounding and truncating numbers [page 849]

6.6.6.1.8.5 EuroConvertTo

Description

Converts an amount to Euros

Function Group

Numeric

Syntax

```plaintext
num EuroConvertTo(noneuro_amount;curr_code;round_level)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>euro_amount</td>
<td>The amount in the non-euro currency</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>curr_code</td>
<td>The ISO code of the non-euro currency</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>round_level</td>
<td>The number of decimal places to which the result is rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

```plaintext
EuroConvertTo(6559;"FRF";2) returns 999.91.
EuroConvertTo(6559;"FRF";1) returns 999.90.
EuroConvertTo(1955;"DEM";2) returns 999.58.
```
EuroConvertTo(1955;"DEM";1) returns 999.60.

Note

The currency code must be the code of one of the 12 EU currencies whose values were fixed in relation to the Euro prior to their abolition in January 2002. If it is not, the function returns #ERROR. The currencies are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEF</td>
<td>Belgian franc</td>
</tr>
<tr>
<td>DEM</td>
<td>German mark</td>
</tr>
<tr>
<td>GRD</td>
<td>Greek drachma</td>
</tr>
<tr>
<td>ESP</td>
<td>Spanish peseta</td>
</tr>
<tr>
<td>FRF</td>
<td>French franc</td>
</tr>
<tr>
<td>IEP</td>
<td>Irish punt</td>
</tr>
<tr>
<td>ITL</td>
<td>Italian lira</td>
</tr>
<tr>
<td>LUF</td>
<td>Luxembourg franc</td>
</tr>
<tr>
<td>NLG</td>
<td>Dutch guilder</td>
</tr>
<tr>
<td>ATS</td>
<td>Austrian schilling</td>
</tr>
<tr>
<td>PTS</td>
<td>Portuguese escudo</td>
</tr>
<tr>
<td>FIM</td>
<td>Finnish mark</td>
</tr>
</tbody>
</table>

Related Information

Rounding and truncating numbers [page 849]

6.6.6.1.8.6 EuroFromRoundError

Description

Returns the rounding error in a conversion from Euros

Function Group

Numeric
Syntax

\[ \text{num EuroFromRoundError(euro\_amount;curr\_code;round\_level)} \]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>euro_amount</td>
<td>The amount in Euros</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>curr_code</td>
<td>The ISO code of the target currency</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>round_level</td>
<td>The number of decimal places to which the result is rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Output

The rounding error in the calculation

Examples

\[ \text{EuroFromRoundError(1000;"FRF";2)} \] returns 0. (There is no difference between the unrounded conversion and the conversion rounded to 2 decimal places.)

\[ \text{EuroFromRoundError(1000;"FRF";1)} \] returns 0.03. (The unrounded conversion is 6559.57. The conversion rounded to 1 decimal place is 6559.60. The rounding error is 0.03.)

\[ \text{EuroFromRoundError(1000;"DEM";2)} \] returns 0. (There is no difference between the unrounded conversion and the conversion rounded to 2 decimal places.)

\[ \text{EuroFromRoundError(1000;"DEM";1)} \] returns -0.01. (The unrounded conversion is 1955.83. The conversion rounded to 1 decimal place is 1995.80. The rounding error is -0.03.)

Note

The currency code must be the code of one of the 12 EU currencies whose values were fixed in relation to the Euro prior to their abolition in January 2002. If it is not, the function returns #ERROR. The currencies are:

BEF  Belgian franc
Related Information

Rounding and truncating numbers [page 849]

6.6.6.1.8.7  EuroToRoundError

Description

Returns the rounding error in a conversion to Euros

Function Group

Numeric

Syntax

```
num EuroToRoundError(noneuro_amount;curr_code;round_level)
```
# Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>euro_amount</td>
<td>The amount in the non-euro currency</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>curr_code</td>
<td>The ISO code of the non-euro currency</td>
<td>String</td>
<td>Yes</td>
</tr>
<tr>
<td>round_level</td>
<td>The number of decimal places to which the result is rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Examples

EuroToRoundError(6559;"FRF";2) returns 0. (There is no difference between the unrounded conversion and the conversion rounded to 2 decimal places.)

EuroToRoundError(6559;"FRF";1) returns -0.01. (The unrounded conversion is 999.91. The conversion rounded to 1 decimal place is 999.90. The rounding error is -0.01.)

EuroToRoundError(1955;"DEM";2) returns 0. (There is no difference between the unrounded conversion and the conversion rounded to 2 decimal places.)

EuroToRoundError(1955;"DEM";1) returns 0.02. (The unrounded conversion is 999.58. The conversion rounded to 1 decimal place is 999.60. The rounding error is 0.02.)

## Note

The currency code must be the code of one of the 12 EU currencies whose values were fixed in relation to the Euro prior to their abolition in January 2002. If it is not, the function returns #ERROR. The currencies are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Currency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEF</td>
<td>Belgian franc</td>
</tr>
<tr>
<td>DEM</td>
<td>German mark</td>
</tr>
<tr>
<td>GRD</td>
<td>Greek drachma</td>
</tr>
<tr>
<td>ESP</td>
<td>Spanish peseta</td>
</tr>
<tr>
<td>FRF</td>
<td>French franc</td>
</tr>
<tr>
<td>IEP</td>
<td>Irish punt</td>
</tr>
<tr>
<td>ITL</td>
<td>Italian lira</td>
</tr>
<tr>
<td>LUF</td>
<td>Luxembourg franc</td>
</tr>
<tr>
<td>NLG</td>
<td>Dutch guilder</td>
</tr>
<tr>
<td>ATS</td>
<td>Austrian schilling</td>
</tr>
</tbody>
</table>
Related Information

Rounding and truncating numbers [page 849]

6.6.6.1.8.8 Exp

Description

Returns an exponential (e raised to a power)

Function Group

Numeric

Syntax

```
um Exp(power)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>power</td>
<td>The power</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

An exponential is the constant e (2.718...) raised to a power.
Exp(2.2) returns 9.03.

### 6.6.6.1.8.9 Fact

**Description**

Returns the factorial of a number

**Function Group**

Numeric

**Syntax**

```
int Fact(number)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

The factorial of `number` is the product of all the integers from 1 to `number`.

**Examples**

- `Fact(4)` returns 24.
- `Fact(5.9)` returns 120.
6.6.6.1.8.10  Floor

Description

Returns a number rounded down to the nearest integer

Function Group

Numeric

Syntax

```
int Floor(number)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

```
Floor(24.4) returns 24.
```

6.6.6.1.8.11  Ln

Description

Returns the natural logarithm of a number

Function Group

Numeric
Syntax

num Ln(number)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Ln(10) returns 2.3

6.6.6.1.8.12 Log

Description

Returns the logarithm of a number in a specified base

Function Group

Numeric

Syntax

num Log(number;base)
Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>base</td>
<td>The base of the logarithm</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

\[ \log(125; 5) \] returns 3.

6.6.6.1.8.13 Log10

Description

Returns the base 10 logarithm of a number

Function Group

Numeric

Syntax

\[ \text{num Log10(number)} \]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Examples

Log10(100) returns 2.

6.6.6.1.8.14 Mod

Description

Returns the remainder from the division of two numbers.

Function Group

Numeric

Syntax

num Mod(dividend;divisor)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dividend</td>
<td>The dividend</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>divisor</td>
<td>The divisor</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

Mod(10;4) returns 2.
Mod(10.2;4.2) returns 1.8.
6.6.6.1.8.15 Power

Description

Returns a number raised to a power

Function Group

Numeric

Syntax

\[ \text{num \ Power(number;power)} \]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number to raise to a power</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>power</td>
<td>The power</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

Power(10;2) returns 100.

6.6.6.1.8.16 Rank

Description

Ranks a measure by dimensions
Function Group

Numeric

Syntax

\[
\text{int Rank}(\text{measure}; [\text{ranking_dims}]; [\text{Top|Bottom}]; [\text{reset_dims}])
\]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>The measure to be ranked</td>
<td>Measure</td>
<td>Yes</td>
</tr>
<tr>
<td>ranking_dims</td>
<td>The dimensions used to rank the measure</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td>Top</td>
<td>Bottom</td>
<td>Sets the ranking order:</td>
<td>Keyword</td>
</tr>
<tr>
<td></td>
<td>● Top - descending</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Bottom - ascending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>reset_dims</td>
<td>The dimensions that reset the ranking</td>
<td>Dimension list</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- The function uses the default calculation context to calculate the ranking if you do not specify ranking dimensions.
- You must always place dimensions in parentheses even if there is only one dimension in the list of ranking or reset dimensions.
- When you specify a set of ranking or reset dimensions you must separate them with semi-colons.
- By default the ranking is reset over a section or block break.

Examples

In the following table the rank is given by \( \text{Rank}([\text{Revenue}]; ([\text{Country}])) \):

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>835,420</td>
<td>2</td>
</tr>
</tbody>
</table>
In the following table the rank is given by \( \text{Rank}([\text{Revenue}] ; ([\text{Country}]; \text{Bottom})) \). The Bottom argument means that the measures are ranked in descending order.

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>835,420</td>
<td>1</td>
</tr>
<tr>
<td>US</td>
<td>2,451,104</td>
<td>2</td>
</tr>
</tbody>
</table>

In the following table the rank is given by \( \text{Rank}([\text{Revenue}] ; ([\text{Country}]; [\text{Resort}])) \):

<table>
<thead>
<tr>
<th>Country</th>
<th>Resort</th>
<th>Revenue</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>French Riviera</td>
<td>835,420</td>
<td>3</td>
</tr>
<tr>
<td>US</td>
<td>Bahamas Beach</td>
<td>971,444</td>
<td>2</td>
</tr>
<tr>
<td>US</td>
<td>Hawaiian Club</td>
<td>1,479,660</td>
<td>1</td>
</tr>
</tbody>
</table>

In the following table the rank is given by \( \text{Rank}([\text{Revenue}] ; ([\text{Country}]; [\text{Year}]); ([\text{Country}])) \). The rank is reset on the Country dimension.

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Revenue</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>FY1998</td>
<td>295,940</td>
<td>1</td>
</tr>
<tr>
<td>France</td>
<td>FY1999</td>
<td>280,310</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>FY2000</td>
<td>259,170</td>
<td>3</td>
</tr>
<tr>
<td>US</td>
<td>FY1998</td>
<td>767,614</td>
<td>3</td>
</tr>
<tr>
<td>US</td>
<td>FY1999</td>
<td>826,930</td>
<td>2</td>
</tr>
<tr>
<td>US</td>
<td>FY2000</td>
<td>856,560</td>
<td>1</td>
</tr>
</tbody>
</table>

**Related Information**

Bottom/Top operators [page 832]

**6.6.6.1.8.17 Round**

**Description**

Rounds a number
**Function Group**

Numeric

**Syntax**

num Round (number;round_level)

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number to be rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>round_level</td>
<td>The number of decimal places to which the number is rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Examples**

Round(9.44;1) returns 9.4.
Round(9.45;1) returns 9.5.
Round(9.45;0) returns 9.
Round(9.45;-1) returns 10.
Round(4.45;-1) returns 0.

**Related Information**

Rounding and truncating numbers [page 849]

**6.6.6.1.8.18  Sign**

**Description**

Returns the sign of a number
Function Group

Numeric

Syntax

```c
int Sign(number)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>Any number</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

`Sign` returns -1 if `number` is negative, 0 if `number` is zero and 1 if `number` is positive.

Examples

`Sign(3)` returns 1.

`Sign(-27.5)` returns -1.

6.6.6.1.8.19 Sin

Description

Returns the sine of an angle.

Function Group

Numeric
Syntax

num Sin(angle)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>angle</td>
<td>An angle in radians</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

Sin(234542) can return, depending on the decimal point setting, -0.116992 or -0.12.

6.6.6.1.8.20 Sqrt

Description

Returns the square root of a number

Function Group

Numeric

Syntax

num Sqrt(number)
## Example

\[ \sqrt{25} \text{ returns } 5. \]

### 6.6.6.1.8.21 Tan

#### Description

Returns the tangent of an angle

#### Function Group

Numeric

#### Syntax

\[ \text{num } \text{Tan}(\text{angle}) \]

#### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>angle</td>
<td>An angle in radians</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Examples

\[ \text{Tan } (90) \text{ returns } -2. \]
6.6.6.1.8.22 ToDecimal

Description

Returns a decimal.

Function Group

Numeric

Syntax

```
num ToDecimal(number|string)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>string</td>
<td>A number or a string that can be interpreted as a number</td>
<td>Number or string</td>
</tr>
</tbody>
</table>

Notes

If string is not a number, ToDecimal returns #ERROR.

Examples

ToDecimal("1234567890.1234567890") returns 1234567890.1234567890.

ToDecimal("1234567890.12345") returns 1234567890.12345.

ToDecimal("abcdefijk") returns #ERROR.
**6.6.1.8.23 ToNumber**

**Description**

Returns a string as a number.

**Function Group**

Numeric

**Syntax**

```plaintext
num ToNumber(string)
```

or

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>A number as a string</td>
<td>String</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

If `string` is not a number or a datetime, `ToNumber` returns #ERROR.

**Examples**

`ToNumber("45")` returns 45.
6.6.6.1.8.24 Truncate

Description

Truncates a number

Function Group

Numeric

Syntax

```
num Truncate(number;truncate_level)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>number</td>
<td>The number to be rounded</td>
<td>Number</td>
<td>Yes</td>
</tr>
<tr>
<td>truncate_level</td>
<td>The number of decimal places to which the number is truncated</td>
<td>Number</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

Example

```
Truncate(3.423;2) returns 3.42.
```

Related Information

Rounding and truncating numbers [page 849]
6.6.6.1.9 Set functions

6.6.6.1.9.1 Ancestor

Description

Returns an ancestor member of a member

Function Group

Set

Syntax

member Ancestor(member; level|distance)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
<tr>
<td>level</td>
<td>The level of the ancestor</td>
<td>level</td>
<td>Either level or distance is required</td>
</tr>
<tr>
<td>distance</td>
<td>The distance of the ancestor level from the current level</td>
<td>int</td>
<td>Either level or distance is required</td>
</tr>
</tbody>
</table>

Notes

- **Ancestor** is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- **member** is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.
- **distance** must be positive.
Examples

The following examples are all taken from an English language data source.

Based on the following geography hierarchy, you want to know the Internet Sales Amount impact of each customer independent of the customer’s city.

Firstly, for each City, you want the Internet Sales Amount value for its Country:

\[ \text{=Sum([Query 2].[Internet Sales].[Internet Sales Amount];\{Ancestor([Customer Geography];[Customer Geography].[City])\})} \]

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>29,358,677.22</td>
</tr>
<tr>
<td>Australia</td>
<td>9,061,000.58</td>
</tr>
<tr>
<td>New South Wales</td>
<td>3,934,485.73</td>
</tr>
<tr>
<td>Coffs Harbour</td>
<td>235,454.97</td>
</tr>
<tr>
<td>2450</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Adriana Smith</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Aimee Guo</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Allison R. Young</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Ann A. Sara</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Antonio O. Paterson</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Ariana Stewari</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Arthur Kapoor</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Barbara W. Lal</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Bobby D. Saunders</td>
<td>235,454.97</td>
</tr>
<tr>
<td>Brianna J. Johnson</td>
<td>235,454.97</td>
</tr>
<tr>
<td></td>
<td>5,333.25</td>
</tr>
<tr>
<td></td>
<td>77.27</td>
</tr>
<tr>
<td></td>
<td>39.98</td>
</tr>
<tr>
<td></td>
<td>39.98</td>
</tr>
<tr>
<td></td>
<td>8,008.03</td>
</tr>
<tr>
<td></td>
<td>6,070.59</td>
</tr>
<tr>
<td></td>
<td>23.97</td>
</tr>
<tr>
<td></td>
<td>2,795.01</td>
</tr>
<tr>
<td></td>
<td>120.48</td>
</tr>
<tr>
<td></td>
<td>38.99</td>
</tr>
</tbody>
</table>
Then you calculate the contribution of each City in the country’s global Internet Sales amount:

\[
=\frac{\text{[Query 2].[Internet Sales].[Internet Sales Amount]}}{\text{Sum([Query 2].[Internet Sales].[Internet Sales Amount];\{Ancestor([Customer Geography];[Customer Geography].[City])\})}}
\]

<table>
<thead>
<tr>
<th>Customer Geography</th>
<th>Internet Sales Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Customers</td>
<td>29,358,677.22</td>
</tr>
<tr>
<td>Australia</td>
<td>9,061,000.58</td>
</tr>
<tr>
<td>New South Wales</td>
<td>3,934,465.73</td>
</tr>
<tr>
<td>Coffs Harbour</td>
<td>235,454.97</td>
</tr>
<tr>
<td>2450</td>
<td>100.00%</td>
</tr>
<tr>
<td>Adriana Smith</td>
<td>2.27%</td>
</tr>
<tr>
<td>Aimee Guo</td>
<td>0.03%</td>
</tr>
<tr>
<td>Allison R. Young</td>
<td>0.02%</td>
</tr>
<tr>
<td>Ann A. Sara</td>
<td>0.02%</td>
</tr>
<tr>
<td>Antonio G. Patterson</td>
<td>3.43%</td>
</tr>
<tr>
<td>Ariana Stewart</td>
<td>2.58%</td>
</tr>
<tr>
<td>Arthur Kapoor</td>
<td>0.01%</td>
</tr>
<tr>
<td>Barbara W. Lal</td>
<td>1.19%</td>
</tr>
<tr>
<td>Bobby D. Saunders</td>
<td>0.05%</td>
</tr>
<tr>
<td>Brianna J. Johnson</td>
<td>0.02%</td>
</tr>
<tr>
<td>Bruce G. Madan</td>
<td>0.03%</td>
</tr>
</tbody>
</table>

**Note**

When using BICS connections to SAPBW providers, you need to specify an offset level instead of naming the level:

\[
=\frac{\text{[Query 2].[Internet Sales].[Internet Sales Amount]}}{\text{Sum([Query 2].[Internet Sales].[Internet Sales Amount];\{Ancestor([Customer Geography];2)\})}}
\]

In this case you will have results also for State Province and Country.

**Related Information**

- Aggregate [page 631]
- Average [page 638]
- Count [page 639]
- Max [page 645]
6.6.6.1.9.2 Children

Description

Returns the child members of a hierarchy member within an aggregate function.

Function Group

Set

Syntax

```
member_set member.Children
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- Children is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- member is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.

Examples

```
[Geography].[US].[California].Children returns [Los Angeles], [San Francisco], [San Diego].
```
[Geography].Children returns [Los Angeles], [San Francisco], [San Diego] if [California] is the current member in the [Geography] hierarchy.

Related Information

Aggregate [page 631]
Average [page 638]
Count [page 639]
Max [page 645]
Min [page 647]
Sum [page 667]

6.6.6.1.9.3 Depth

Description

Returns the depth of a member in a hierarchy

Function Group

Set

Syntax

int member.Depth

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

- The depth is the distance of the member from top level of the hierarchy.
- The top level of the hierarchy is level 0.
- member is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.

Examples

You want to know the depth of hierarchy members:

```
=([Calendar].[Date.Calendar].Depth
```

<table>
<thead>
<tr>
<th>Date.Calendar</th>
<th>=([Calendar].[Date.Calendar].Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Periods</td>
<td>0</td>
</tr>
<tr>
<td>CY 2001</td>
<td>1</td>
</tr>
<tr>
<td>H2 CY 2001</td>
<td>2</td>
</tr>
<tr>
<td>Q3 CY 2001</td>
<td>3</td>
</tr>
<tr>
<td>July 2001</td>
<td>4</td>
</tr>
<tr>
<td>July 1, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 2, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 3, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 4, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 5, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 6, 2001</td>
<td>5</td>
</tr>
<tr>
<td>July 7, 2001</td>
<td>5</td>
</tr>
</tbody>
</table>

Now combine with the Children functions to check if you have all days listed every month:

```
=If ([Calendar].[Date.Calendar].Depth = 4 Then Count([Internet Sales].[Internet Sales Amount] ; ([Calendar].[Date.Calendar].Children()))
```
6.6.6.1.9.4 Descendants

Description

Returns descendants of a hierarchy member within an aggregation function.

Function Group

Set

Syntax

```
member_set Descendants(member[, level|distance][,desc_flag])
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Type</td>
<td>Required</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>level</td>
<td>The level of the descendants</td>
<td>level</td>
<td>No (the level of member is the default)</td>
</tr>
<tr>
<td>distance</td>
<td>The distance of the descendant level from the current level</td>
<td>int</td>
<td>No (the level of member is the default)</td>
</tr>
<tr>
<td>desc_flag</td>
<td>Determines which descendant members are returned</td>
<td>keyword</td>
<td>No (default is Self)</td>
</tr>
</tbody>
</table>

### Notes

- **Descendants** is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- **member** is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.
- **Self in desc_flag** refers to the level specified by the `level|distance` parameter.
- **Before in desc_flag** refers to all levels above the level specified by the `level|distance` parameter.
- **After in desc_flag** refers to all levels below the level specified by the `level|distance` parameter.
- The values of desc_flag are as follows:

<table>
<thead>
<tr>
<th>desc_flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>Returns the descendants at the level specified by the `level</td>
</tr>
<tr>
<td>Before</td>
<td>Returns the current member and all descendants above the level specified by the `level</td>
</tr>
<tr>
<td>After</td>
<td>Returns the descendants below the level specified by the `level</td>
</tr>
<tr>
<td>Self_Before</td>
<td>Returns the current member and all descendants above and including the level specified by the `level</td>
</tr>
<tr>
<td>Self_After</td>
<td>Returns the current member and all descendants at and below the level specified by the `level</td>
</tr>
<tr>
<td>Before_After</td>
<td>Returns the current member and all descendants except those at the level specified by the `level</td>
</tr>
<tr>
<td>Self_Before_After</td>
<td>Returns the current member and all descendants.</td>
</tr>
<tr>
<td>Leaves</td>
<td>Returns all members between the current member and the level specified by the `level</td>
</tr>
</tbody>
</table>

- **distance** must be positive.
**Example**

You have a financial hierarchy, some of the nodes are not always cumulative ones, but you want to sum their descendants. In this example, you will get the sum of descendants of each Balance Sheet member, only 1 level below:

\[
\text{=Sum([Query 3 (1)].[Financial Reporting].[Amount];
{Descendants([Accounts]&[Balance Sheet];1)})}
\]

### Accounts

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance Sheet</td>
<td>0</td>
<td>27,481,462</td>
</tr>
<tr>
<td>Assets</td>
<td>13,740,731</td>
<td></td>
</tr>
<tr>
<td>Liabilities and Owners Equity</td>
<td>13,740,731</td>
<td></td>
</tr>
<tr>
<td>Net Income</td>
<td>12,609,503</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{=Sum([Query 3 (1)].[Financial Reporting].[Amount];
{Descendants([Accounts]&[Balance Sheet].[Assets].[Current Assets];1;Leaves)})}
\]

### Balance Sheet

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>13,740,731</td>
<td></td>
</tr>
<tr>
<td>CurrentAssets</td>
<td>12,445,026</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>3,236,799</td>
<td></td>
</tr>
<tr>
<td>Receivables</td>
<td>3,475,923</td>
<td></td>
</tr>
<tr>
<td>Trade Receivables</td>
<td>3,371,580</td>
<td></td>
</tr>
<tr>
<td>Other Receivables</td>
<td>104,343</td>
<td></td>
</tr>
<tr>
<td>Allowance for Bad Debt</td>
<td>67,429</td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td>4,143,396</td>
<td></td>
</tr>
<tr>
<td>Raw Materials</td>
<td>2,007,586</td>
<td></td>
</tr>
<tr>
<td>Work in Process</td>
<td>1,393,582</td>
<td></td>
</tr>
<tr>
<td>Finished Goods</td>
<td>742,230</td>
<td></td>
</tr>
<tr>
<td>Deferred Taxes</td>
<td>505,424</td>
<td></td>
</tr>
<tr>
<td>Prepaid Expenses</td>
<td>341,992</td>
<td></td>
</tr>
<tr>
<td>Intercompany Receivable</td>
<td>674,663</td>
<td></td>
</tr>
</tbody>
</table>

Now you want to sum all members below Current Assets:

\[
\text{=Sum([Query 3 (1)].[Financial Reporting].[Amount];
{Descendants([Accounts]&[Balance Sheet].[Assets].[Current Assets];0;After)})}
\]
Now add Current Assets itself:

```
=Sum([Query 3 (1)].[Financial Reporting].[Amount];
{Descendants([Accounts]&[Balance Sheet].[Assets].[Current Assets];0;Self_After)})
```
Related Information

Aggregate [page 631]
Average [page 638]
Count [page 639]
Max [page 645]
Min [page 647]
Sum [page 667]

6.6.6.1.9.5 IsLeaf

Description

Determines whether a member is a leaf member

Function Group

Misc

Syntax

bool member.IsLeaf

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- A leaf member is a member that does not have any child members.
- member is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.
Examples

You want to know if the line is a day:

```
=[Calendar].[Date.Calendar].IsLeaf()
```

<table>
<thead>
<tr>
<th>Date.Calendar</th>
<th>'=[Query 1].[Calendar].[Date.Calendar].IsLeaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Periods</td>
<td>0</td>
</tr>
<tr>
<td>CY 2001</td>
<td>0</td>
</tr>
<tr>
<td>H2 CY 2001</td>
<td>0</td>
</tr>
<tr>
<td>Q3 CY 2001</td>
<td>0</td>
</tr>
<tr>
<td>July 2001</td>
<td>0</td>
</tr>
<tr>
<td>July 1, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 2, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 3, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 4, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 5, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 6, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 7, 2001</td>
<td>1</td>
</tr>
<tr>
<td>July 8, 2001</td>
<td>1</td>
</tr>
</tbody>
</table>

6.6.6.1.9.6 Key

Description

Returns the key of a member

Syntax

```
string member.Key
```
Function Group

Set

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- The key is the internal identifier of a member.
- member is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.

Example

[Geography].[US].Key returns "XYZ" if the key of the [US] member is "XYZ".

6.6.6.1.9.7 Lag

Description

Returns a member at the same level as the current member and a given distance after it, within an aggregate function.

Syntax

```
member member.Lag(distance)
```
Function Group

Set

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
<tr>
<td>distance</td>
<td>The distance of the member from the current member</td>
<td>int</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- Lag is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- If distance is positive, Lag returns the member distance places after member. If distance is negative, Lag returns the member distance places before member.
- member is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.
- Lag uses the member order in the hierarchy and query to return the related member.

Examples

You want to get the differences in internet sales from week to week.

```excel
=Max([Internet Sales].[Internet Sales Amount];{[Calendar].[Date.Calendar].Lag(7)})
```

<table>
<thead>
<tr>
<th>Date.Calendar</th>
<th>Internet Sales Amount</th>
<th>=Max([Query 1].[Internet Sales].[Internet Sales Amount];[Query 1].[Calendar].[Date.Calendar].Lag(7))</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Periods</td>
<td>29,359,677.22</td>
<td></td>
</tr>
<tr>
<td>Q1 CY 2001</td>
<td>3,266,373.66</td>
<td>3,266,373.66</td>
</tr>
<tr>
<td>Q2 CY 2001</td>
<td>3,266,373.66</td>
<td>3,266,373.66</td>
</tr>
<tr>
<td>Q3 CY 2001</td>
<td>1,453,522.89</td>
<td>1,623,971.86</td>
</tr>
<tr>
<td>July 2001</td>
<td>473,388.16</td>
<td>550,816.99</td>
</tr>
<tr>
<td>July 1, 2001</td>
<td>14,477.34</td>
<td>7,855.64</td>
</tr>
<tr>
<td>July 2, 2001</td>
<td>13,901.52</td>
<td>23,999.79</td>
</tr>
<tr>
<td>July 3, 2001</td>
<td>15,012.18</td>
<td>13,556.53</td>
</tr>
<tr>
<td>July 4, 2001</td>
<td>7,156.54</td>
<td>11,313.60</td>
</tr>
<tr>
<td>July 5, 2001</td>
<td>15,012.18</td>
<td>11,313.60</td>
</tr>
<tr>
<td>July 6, 2001</td>
<td>14,313.08</td>
<td>7,156.54</td>
</tr>
<tr>
<td>July 7, 2001</td>
<td>7,855.54</td>
<td>25,047.89</td>
</tr>
<tr>
<td>July 8, 2001</td>
<td>7,855.54</td>
<td>11,230.63</td>
</tr>
<tr>
<td>July 9, 2001</td>
<td>20,099.70</td>
<td>14,313.08</td>
</tr>
<tr>
<td>July 10, 2001</td>
<td>10,556.53</td>
<td>14,313.08</td>
</tr>
</tbody>
</table>
Or you want to compare a specific year to another year two years previously:

<table>
<thead>
<tr>
<th>Date.Calendar</th>
<th>Internet Sales Amount</th>
<th>VARIANCE</th>
<th>WITHIN</th>
<th>BETWEEN</th>
<th>OVER</th>
<th>PERIODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Periods</td>
<td>29,358,677.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CY 2001</td>
<td>3,266,373.66</td>
<td>11.13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CY 2002</td>
<td>6,530,343.53</td>
<td>22.24%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 CY 2002</td>
<td>3,805,710.59</td>
<td>58.28%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2 CY 2002</td>
<td>2,724,632.94</td>
<td>41.72%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CY 2003</td>
<td>9,791,060.3</td>
<td>33.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 CY 2003</td>
<td>3,037,501.36</td>
<td>31.02%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2 CY 2003</td>
<td>6,753,558.94</td>
<td>68.98%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CY 2004</td>
<td>9,770,899.74</td>
<td>33.28%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Now you want to combine Lag and IsLeaf to know over a one week period the difference for the amount sold. The formula set in the last column will be:

```excel
=If [Calendar].[Date.Calendar].IsLeaf() Then [Internet Sales].[Internet Sales Amount] - Max([Internet Sales].[Internet Sales Amount];([Calendar].[Date.Calendar].Lag(7)))
```
### Related Information

- **Aggregate** [page 631]
- **Average** [page 638]
- **Count** [page 639]
- **Max** [page 645]
- **Min** [page 647]
- **Sum** [page 667]

### 6.6.6.1.9.8 MemberAtDepth

#### Description

Returns the members of a hierarchy, at a chosen depth.

#### Function Group

Set
## Syntax

```c
string MemberAtDepth(hierarchy;depth)
```

## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>hierarchy</td>
<td>Hierarchical object</td>
<td>dimension</td>
<td>Yes</td>
</tr>
<tr>
<td>depth</td>
<td>The level of the member set in the chosen hierarchy</td>
<td>int</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Notes

- depth must be positive or zero, else the function will return an error
- When there is no member at the given depth, then `MemberAtDepth()` returns `Null`
- When the input object is not a hierarchy, then `MemberAtDepth()` returns `Null` for any depth greater than zero

## Examples

The following `[Country]` hierarchy has been filtered to keep only two children of the EUROPE node.

<table>
<thead>
<tr>
<th>Country</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>282,481</td>
</tr>
<tr>
<td>EUROPE</td>
<td>31,009</td>
</tr>
<tr>
<td>France</td>
<td>6,905</td>
</tr>
<tr>
<td>Germany</td>
<td>6,331</td>
</tr>
<tr>
<td>NORTH_AMERICA</td>
<td>219,944</td>
</tr>
<tr>
<td>Canada</td>
<td>17,754</td>
</tr>
<tr>
<td>USA</td>
<td>202,190</td>
</tr>
<tr>
<td>ASIA_PAC</td>
<td>9,065</td>
</tr>
</tbody>
</table>

`MemberAtDepth([Country];0)` returns:

<table>
<thead>
<tr>
<th>Order</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>755,719</td>
</tr>
</tbody>
</table>
“WORLD” is the root and the only value at level 0.

If the *Avoid duplicate row aggregation* option is disabled, then the function aggregates all the members’ values since they all stem from the "WORLD" root. If you want to check all the aggregated values, enable the *Avoid duplicate row aggregation* option. The hierarchy would then look like this:

<table>
<thead>
<tr>
<th>Order Quantity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>262,461</td>
</tr>
<tr>
<td>WORLD</td>
<td>31,009</td>
</tr>
<tr>
<td>WORLD</td>
<td>6,965</td>
</tr>
<tr>
<td>WORLD</td>
<td>6,331</td>
</tr>
<tr>
<td>WORLD</td>
<td>219,944</td>
</tr>
<tr>
<td>WORLD</td>
<td>17,754</td>
</tr>
<tr>
<td>WORLD</td>
<td>202,190</td>
</tr>
<tr>
<td>WORLD</td>
<td>9,065</td>
</tr>
</tbody>
</table>

**Sum:** 755,719

*MemberAtDepth([Country];1)* returns:

<table>
<thead>
<tr>
<th>Order Quantity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>262,461</td>
<td></td>
</tr>
<tr>
<td>ASIA_PAC</td>
<td>9,065</td>
</tr>
<tr>
<td>EUROPE</td>
<td>44,305</td>
</tr>
<tr>
<td>NORTH_AME</td>
<td>439,888</td>
</tr>
</tbody>
</table>

The first row contains a NULL value because the root has no values at level 1.
On other rows, the function aggregates all the members’ values of the [Country] hierarchy at level 1: “ASIA_PAC”, “EUROPE” and “NORTH_AMERICA”. If you want to check all the aggregated values, enable the 
Avoid duplicate row aggregation option. The hierarchy would then look like this:

<table>
<thead>
<tr>
<th>Order Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>262,461</td>
</tr>
<tr>
<td>ASIA_PAC</td>
</tr>
<tr>
<td>EUROPE</td>
</tr>
<tr>
<td>EUROPE</td>
</tr>
<tr>
<td>EUROPE</td>
</tr>
<tr>
<td>NORTH_AME</td>
</tr>
<tr>
<td>NORTH_AME</td>
</tr>
<tr>
<td>NORTH_AME</td>
</tr>
<tr>
<td>Sum:</td>
</tr>
</tbody>
</table>

MemberAtDepth([Country];2) returns:

<table>
<thead>
<tr>
<th>Order Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>522,479</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>France</td>
</tr>
<tr>
<td>Germany</td>
</tr>
<tr>
<td>USA</td>
</tr>
</tbody>
</table>

Again, the first row aggregates all the members that have no values at level 2, that is, the root and each node. On other rows, all the members’ values of the [Country] hierarchy at level 2 are aggregated.

MemberAtDepth([Country];3) returns:

<table>
<thead>
<tr>
<th>Order Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>755,719</td>
</tr>
</tbody>
</table>

There is only one row left, with a NULL value, since the hierarchy has no third level. Therefore, all nodes and leaves’ values of the hierarchy are aggregated.
If you want to visualize the whole hierarchy, add columns containing the levels of the hierarchy in the existing table, then use the function and give it different level values. It would then look like this:

<table>
<thead>
<tr>
<th>Level 0</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Order Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td></td>
<td></td>
<td>282,481</td>
</tr>
<tr>
<td>WORLD</td>
<td>ASIA_PAC</td>
<td></td>
<td>9,065</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>France</td>
<td>6,965</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>Germany</td>
<td>6,331</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td></td>
<td>219,944</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>Canada</td>
<td>17,754</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>USA</td>
<td>202,190</td>
</tr>
</tbody>
</table>

You can use the `IsLeaf` formula to filter the hierarchy leaves in the above table: For more information on the `IsLeaf` formula, see [IsLeaf](page 787)

<table>
<thead>
<tr>
<th>Level 0</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Order Quantity</th>
<th>IsLeaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td></td>
<td></td>
<td>282,481</td>
<td>false</td>
</tr>
<tr>
<td>WORLD</td>
<td>ASIA_PAC</td>
<td></td>
<td>9,065</td>
<td>true</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td></td>
<td>31,009</td>
<td>true</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>France</td>
<td>6,965</td>
<td>true</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>Germany</td>
<td>6,331</td>
<td>true</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td></td>
<td>219,944</td>
<td>false</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>Canada</td>
<td>17,754</td>
<td>true</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>USA</td>
<td>202,190</td>
<td>true</td>
</tr>
</tbody>
</table>

Once it’s done, you can hide the `IsLeaf` column to get the equivalent of a flattened hierarchy table:

<table>
<thead>
<tr>
<th>Level 0</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Order Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>ASIA_PAC</td>
<td></td>
<td>9,065</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>France</td>
<td>6,965</td>
</tr>
<tr>
<td>WORLD</td>
<td>EUROPE</td>
<td>Germany</td>
<td>6,331</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>Canada</td>
<td>17,754</td>
</tr>
<tr>
<td>WORLD</td>
<td>NORTH_AMERICA</td>
<td>USA</td>
<td>202,190</td>
</tr>
</tbody>
</table>
6.6.6.1.9.9 Parent

Description

Returns the parent member of a hierarchy member within an aggregate function.

Function Group

Set

Syntax

```
member member.Parent
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- **Parent** is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- **member** is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.

Examples

The second column contains the formula that allow yous to obtain the Parent of each hierarchy member:

```
=Max([Customer Geography];([Customer Geography].Parent))
```
### Related Information

- [Aggregate](#) [page 631]
- [Average](#) [page 638]
- [Count](#) [page 639]
- [Max](#) [page 645]
- [Min](#) [page 647]
- [Sum](#) [page 667]

### 6.6.6.1.9.10 Siblings

#### Description

Returns the member and sibling members of the hierarchy member within an aggregate function.

#### Function Group

Set
Syntax

member_set member.Siblings

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>member</td>
<td>Any member</td>
<td>member</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes

- *siblings* is not used as a standalone function. It is used in the input parameter in aggregate functions that specifies the member set for aggregation.
- *member* is the current member of a hierarchy. When the hierarchy is not in the context of the block, the formula returns an empty value.
- Sibling members are members from the same level and with the same parent as *member*.

Examples

You have a time hierarchy and want to know the percentage of each Quarter within a year or the percentage of each year within the period.

```plaintext
=[Query 1].[Internet Sales].[Internet Sales Amount] / Sum([Query 1].[Internet Sales].[Internet Sales Amount];([Query 1].[Calendar].[Date.Calendar].siblings()));
```
In a free form cell you want to know the contribution of Year 2004 in the overall period:

```plaintext
=Sum([Query 1].[Internet Sales].[Internet Sales Amount];[[Query 1].[Calendar].[Date.Calendar]&[All Periods].[CY 2004]])) / Sum([Query 1].[Internet Sales].[Internet Sales Amount];[[Query 1].[Calendar].[Date.Calendar]&[All Periods].[CY 2004]].Siblings()))
```
Related Information

Aggregate [page 631]
Average [page 638]
Count [page 639]
Max [page 645]
Min [page 647]
Sum [page 667]
6.6.6.10 Misc functions

6.6.6.10.1 BlockName

Description

Returns the block name

Function Group

Misc

Syntax

```c
string BlockName()
```

Examples

`BlockName()` returns "Block1" if it is placed in a block called "Block1".

6.6.6.10.2 ColumnNumber

Description

Returns the column number

Function Group

Misc
Syntax

```
int ColumnNumber()
```

Examples

`ColumnNumber()` returns 2 if the formula is placed in the second column of a table.

6.6.6.1.10.3 Comment

Description

Returns the comment of a cell

Function Group

Misc

Syntax

```
string Comment()
```

Note

The comment returned by the function is either the first or last comment entered in the cell, depending on how you have set the parameter in the Document Properties.

Example

`Comment()` returns "Increase the gross margin in Q3" if the comment in the cell is "Increase the gross margin in Q3".
6.6.6.10.4 CurrentUser

Description

Returns the BI launch pad login of the current user

Function Group

Misc

Syntax

```plaintext
string CurrentUser()
```

Examples

```
CurrentUser() returns "gkn" if the current user's login is "gkn".
```

6.6.6.10.5 ForceMerge

Description

Includes synchronized dimensions in measure calculations when the dimensions are not in the measure's calculation context

Function Group

Misc

Syntax

```plaintext
num ForceMerge(measure)
```
## Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>Any measure</td>
<td>Measure</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Output

The result of the calculation with the synchronized dimensions taken into account

## Notes

- ForceMerge returns #MULTIVALE if applied to a smart measure because the grouping set necessary to calculate the smart measure does not exist.
- ForceMerge is the equivalent of the BusinessObjects/Desktop Intelligence Multicube function.

## Examples

ForceMerge([Revenue]) returns the value of [Revenue], taking into account any synchronized dimensions that do not appear in the same block as the [Revenue] measure.

### 6.6.6.11.0.6 GetContentLocale

#### Description

Returns the locale of the data contained in the document (the Document Locale)

#### Function Group

Misc

#### Syntax

```
string GetContentLocale()
```
Notes

The Document Locale is used to format the data in a document.

Examples

GetContentLocale() returns "fr_FR" if the Document Locale is "French (France)".

6.6.6.10.7 GetDominantPreferredViewingLocale

Description

Returns the dominant locale in the user's Preferred Viewing Locale group.

Function Group

Misc

Syntax

string GetDominantPreferredViewingLocale()

Notes

- Each group of related locales has a dominant locale, used as a base for all the other locales in the group. For example, US English ("en_US") is the dominant locale in the English locales group. New Zealand English ("en_NZ") is also a member of this group.
- The Translation Manager Guide lists all the Dominant Preferred Viewing Locales.

Examples

GetDominantPreferredViewingLocale returns "en_US" when the Preferred Viewing Locale is "English (New Zealand)".
Related Information

GetPreferredViewingLocale [page 809]

6.6.6.10.8 GetLocale

Description

Returns the user’s locale used to format the user interface (the Product Locale)

Function Group

Misc

Syntax

```
string GetLocale()
```

Notes

The Product Locale is the locale of the user interface (for example, menu items and button text).

Examples

GetLocale() returns "en_US" if the user’s Product Locale is "English (US)".

6.6.6.10.9 GetLocalized

Description

Returns a string localized according to the user’s Preferred Viewing Locale
**Syntax**

```
string GetLocalized(string[,comment])
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>The string to be translated</td>
<td>string</td>
<td>Yes</td>
</tr>
<tr>
<td>comment</td>
<td>A comment to aid translators</td>
<td>string</td>
<td>No</td>
</tr>
</tbody>
</table>

**Notes**

- The `string` parameter can be a string in any formula (for example, in a cell, an alerter message or a variable definition).
- When designing a report, you can use the `comment` parameter to provide further information to help translators translate the string. The comment appears with the string in the Translation Manager tool which translators use to translate reports.
- Each `string + comment` pair generates a separate string to be translated in the Translation Manager tool. As a result, `GetLocalized("Product Total";"Max 20 characters")` and `GetLocalized("Product Total";"Use no more than 20 characters")` might return different translations.

**Examples**

`GetLocalized("Total for all products")` returns the French translation of "Total for all products" if the Preferred Viewing Locale is "fr_FR".

`GetLocalized("Total for all products";"Try not to use more than 20 characters")` returns the German translation of "Total for all products" if the Preferred Viewing Locale is "de_DE". The function also tells the translator of the report not to use more than 20 characters if possible when translating the string.

**Related Information**

GetPreferredViewingLocale [page 809]
6.6.6.10.10 GetPreferredViewingLocale

Description

Returns the user’s preferred locale for viewing document data (the Preferred Viewing Locale)

Function Group

Misc

Syntax

```c
string GetPreferredViewingLocale()
```

Examples

GetPreferredViewingLocale returns "en_US" if the Preferred Viewing Locale is "English (US)".

Related Information

GetLocalized [page 807]
GetDominantPreferredViewingLocale [page 806]

6.6.6.10.11 If...Then...Else

Description

Returns a value based on whether an expression is true or false

Function Group

Misc
Syntax

If bool_value Then true_value [Else false_value]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>bool_value</td>
<td>A boolean value</td>
<td>Boolean</td>
<td>Yes</td>
</tr>
<tr>
<td>true_value</td>
<td>The value to return if bool_value is true</td>
<td>Any</td>
<td>Yes</td>
</tr>
<tr>
<td>false_value</td>
<td>The value to return if bool_value is false</td>
<td>Any</td>
<td>Yes if Else is included</td>
</tr>
</tbody>
</table>

Notes

- true_value and false_value can mix datatypes.
- You can use the boolean operators And, Between, InList, Or and Not with If.
- You can nest If conditions by replacing any Else clause with an ElseIf clause. The following syntax describes one level of nesting:

  If bool_value Then true_value [ElseIf bool_value Then true_value Else false_value...]

- The original syntax of the If function, If(bool_value;true_value;false_value), is also supported.

Examples

If [Sales Revenue] > 1000000 Then "High Revenue" returns "High Revenue" for all rows whose revenue is larger than 1,000,000 and nothing for all other rows.

If [Sales Revenue] > 1000000 Then "High Revenue" Else [Revenue] returns "High Revenue" for all rows whose revenue is larger than 1,000,000 and the revenue value for all other rows.

If [Sales Revenue] > 1000000 Then "High Revenue" Else "Low Revenue" returns "High Revenue" for all rows whose revenue is larger than 1,000,000 and "Low Revenue" for all rows whose revenue is less than 1,000,000.

If [Sales Revenue] > 1000000 Then "High Revenue" ElseIf [Sales Revenue] > 800000 Then "Medium Revenue" Else "Low Revenue" returns "High Revenue" for all rows whose revenue is larger than 1000000. "Medium Revenue" for all rows whose revenue is between 800000 and 1000000, and "Low Revenue" for all other rows.
Related Information

If [page 811]
And operator [page 827]
Between operator [page 829]
InList operator [page 829]
Or operator [page 828]
Not operator [page 828]

6.6.6.1.10.12 If

Description

Returns a value based on whether an expression is true or false

Function Group

Misc

Syntax

If(bool_value;true_value;false_value)

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>bool_value</td>
<td>A boolean value</td>
<td>Boolean</td>
<td>Yes</td>
</tr>
<tr>
<td>true_value</td>
<td>The value to return if bool_value is true</td>
<td>Any</td>
<td>Yes</td>
</tr>
<tr>
<td>false_value</td>
<td>The value to return if bool_value is false</td>
<td>Any</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

- `true_value` and `false_value` can mix datatypes.
- You can nest `If` conditions by replacing `false_value` with additional `If` conditions. This syntax shows one level of nesting:

  ```
  If(bool_value;true_value;If(bool_value;true_value;false_value);false_value)
  ```

- The `If...Then...Else` syntax is also supported.

Examples

If([Sales Revenue]>1000000;"High Revenue";"Low Revenue") returns "High Revenue" for all rows whose revenue is larger than 1,000,000 and "Low Revenue" for all rows whose revenue is less than 1,000,000.

If([Sales Revenue]>1000000;"High Revenue";[Revenue]) returns "High Revenue" for all rows whose revenue is larger than 1,000,000 and the revenue value for all other rows.

Related Information

If...Then...Else [page 809]

6.6.6.1.10.13 LineNumber

Description

Returns the line number in a table

Function Group

Misc

Syntax

```
int LineNumber()
```
Notes

Numbering of the lines in a table starts with the header, which is line 1.

Examples

`LineNumber()` returns 2 when the function appears at the second line in a table.

### 6.6.6.10.14 NameOf

**Description**

Returns the name of an object

**Function Group**

Misc

**Syntax**

```
string NameOf(obj)
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

The `NameOf` function appears in column and row headers in reports.
Examples

NameOf([Reservation Date]) returns "Reservation Date".

6.6.6.10.15 NoFilter

Description

Ignores filters when calculating a value. NoFilter is used with measure objects. It does not apply to dimensions.

Function Group

Misc

Syntax

input_type NoFilter(obj[,All|Drill])

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>
| All|Drill     | • No keyword specified - ignore report and block filters  
| | • All - ignore all filters  
| | • Drill - ignore report and drill filters | Keyword | No       |

Notes

- NoFilter(obj;Drill) does not work in query drill mode because the drill filters are added to the query rather than applied to the report data.
- If you end drill mode with drill filters applied, the drill filters become report filters and can change the value of any objects to which NoFilter(obj;Drill) is applied.
Examples

When placed in a block footer, NoFilter(Sum([Sales Revenue])) returns the total sales revenue of all possible rows in the block, even when rows are filtered out of the block.

NoFilter(Sum([Sales Revenue]);All) returns the sum of the sales revenue for all countries including France, even though there is a filter that excludes France from the report.

NoFilter(Sum([Sales Revenue]);Drill) returns the sum of the sales revenue for all countries, even when there is a drill filter on the [Country] dimension.

6.6.6.1.10.16 NumberOfPages

Description

Returns the number of pages in a report

Function Group

Misc

Syntax

integer NumberOfPages()

Notes

If you place the NumberOfPages function in a cell whose Autofit Height or Autofit Width properties are set, the cell returns #RECURSIVE because the placing of this formula in an Autofit cell creates a circular dependency. This function needs the exact size of the report to return a value, but the size of the cell, which affects the size of the report, is determined by the cell content.

Examples

NumberOfDataPages() returns 2 if the report has two pages.
**6.6.6.10.17 Page**

**Description**

Returns the current page number in a report

**Function Group**

Misc

**Syntax**

```
integer Page()
```

**Notes**

If you place the \texttt{Page} function in a cell whose Autofit Height or Autofit Width properties are set, the cell returns \#RECURSIVE because the placing of this formula in an Autofit cell creates a circular dependency. This function needs the exact size of the report to return a value, but the size of the cell, which affects the size of the report, is determined by the cell content.

**Example**

\texttt{Page()} returns 2 if it appears in the second page of the report.

**6.6.6.10.18 PageInSection**

**Description**

Returns the page number within the current section instance in a specified section
**Function Group**

Misc

**Syntax**

```plaintext
integer PageInSection([section_level])
```

**Input**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>section_level</td>
<td>Hierarchical level of the section</td>
<td>integer</td>
<td>No</td>
</tr>
</tbody>
</table>

**Notes**

- If you place the `PageInSection` function in a cell whose Autofit Height or Autofit Width properties are set, the cell returns #RECURSIVE because the placing of this formula in an Autofit cell creates a circular dependency. This function needs the exact size of the report to return a value, but the size of the cell, which affects the size of the report, is determined by the cell content.
- `PageInSection()` must be within a section instance. Otherwise, it returns 0.
- The section hierarchical levels start at 1 (top level).
- If `section_level` is not specified, the function returns the number in the current section level.
- If you specify a section level that does not exist, the function returns 0.
- Variables created with the function must be measures.

**Examples**

In a document with a section on Year (= 2010, 2011, 2012) and a sub-section on State (= California, Florida, Texas):

- `PageInSection(1)` repeated in the Year section returns 2 on the second page of 2010, 2011 and 2012.
- `PageInSection(2)` repeated in the State sub-section returns 1 on the first page of California, Florida and Texas.
6.6.10.19 Previous

Description

Returns a previous value of an object

Function Group

Misc

Syntax

\[
\text{input_type Previous(dimension|measure|Self [;Row|col][;(reset dims)][;offset] [;NoNull])}
\]

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimension</td>
<td>measure</td>
<td>Self</td>
<td>The dimension or measure whose previous value the function returns, or the Self keyword</td>
</tr>
<tr>
<td>Row/Col</td>
<td>Sets the calculation direction</td>
<td>Keyword</td>
<td>No</td>
</tr>
<tr>
<td>reset_dims</td>
<td>The list of dimensions used to reset the calculation</td>
<td>Dimension list</td>
<td>No</td>
</tr>
<tr>
<td>offset</td>
<td>Specifies the value of dimension or measure that is offset rows previous to the current row</td>
<td>Integer</td>
<td>No (default is 1)</td>
</tr>
<tr>
<td>NoNull</td>
<td>Tells the function to return the first non-null value starting from the offset</td>
<td>Keyword</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes

- The default value of `offset is 1`. `Previous([Revenue];1)` and `Previous([Revenue])` are functionally the same.
When you include the NoNull argument, the function returns the first non-null value of the object beginning from the cell offset rows before the current row and counting backwards.

You can use extended syntax context operators with Previous.

The Self operator allows you to refer to the previous value of a cell when it contains content other than one report object.

You must always place dimensions in parentheses even if there is only one dimension in the list of reset dimensions.

When you specify a set of reset dimensions you must separate them with semi-colons.

Previous is applied after all report, section and block filters, and all sorts, are applied.

You cannot apply sorts or filters on formulas that use Previous.

If Previous is applied on a measure and the measure returns an undefined value, Previous returns an undefined value even if the previous line returned a value.

Previous ignores breaks when placed outside a break header or footer.

Previous returns the value in the previous instance of the footer when placed in a break footer.

Previous is reset in each report section.

When used in a crosstab, Previous does not treat the last value in a row as the previous value of the first value of the next row.

Examples

Previous([Country];1) returns the following values in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>2,000,000</td>
<td>US</td>
</tr>
<tr>
<td>France</td>
<td>2,100,000</td>
<td>UK</td>
</tr>
</tbody>
</table>

Previous([Revenue]) returns the following values in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Revenue</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>2,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>France</td>
<td>2,100,000</td>
<td>2,000,000</td>
</tr>
</tbody>
</table>

Previous([Revenue];([Country])) returns the following values in the following table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Revenue</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>North</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>7,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>UK</td>
<td>North</td>
<td>3,000,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>4,000,000</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>
Previous([Revenue]) returns the following values in the following crosstab:

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>Previous</th>
<th>2005</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>5,000,000</td>
<td></td>
<td>6,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>UK</td>
<td>2,000,000</td>
<td></td>
<td>2,500,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>France</td>
<td>3,000,000</td>
<td></td>
<td>2,000,000</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

Previous([Revenue]) returns the following values in the following table with a break on [Country]:

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Revenue</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>North</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>7,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>US</td>
<td></td>
<td>12,000,000</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>North</td>
<td>3,000,000</td>
<td>7,000,000</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>4,000,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td>7,000,000</td>
<td>12,000,000</td>
</tr>
</tbody>
</table>

Previous([Revenue]);2;NoNull) returns the following values in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Revenue</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Q1</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>700</td>
<td>500</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>

2*Previous(Self) returns the sequence 2, 4, 6, 8, 10...

**Related Information**

Comparing values using the Previous function [page 870]
Self operator [page 839]
6.6.10.20 RefValue

Description

Returns the reference value of a report object when data tracking is activated

Function Group

Misc

Syntax

input_type RefValue(obj)

Examples

RefValue([Top Performing Region]) returns "South West" if the value of the [Top Performing Region] variable is "South West" in the reference data.

RefValue([Revenue]) returns 1000 if the value of the [Revenue] measure is 1000 in the reference data.

Notes

- The RefValue() function can be used with either a measure or a dimension object. However, when used in a variable qualified as a dimension or a detail, the RefValue() function will return the current values of that object, rather than its reference values. In order to get the reference values, the variable must be qualified as a measure.
- When created directly in a section, table, form, or chart, a formula will always be qualified as a measure, so if the formula uses the RefValue() function, it will return the expected reference values.

Example of RefValue function with a variable

We have the list of values for the [State] dimension: California, Florida, Texas and New York. After a data refresh, this list becomes: Arizona, California, Florida, Texas and New York. A variable such as

Example: Variable=RefValue([State]) will either return:
Variable is qualified as | List of values returned is
---|---
Dimension or detail | Arizona, California, Florida, Texas and New York
Measure | (null value), California, Florida, Texas and New York

6.6.6.10.21 RelativeValue

Description

Returns previous or subsequent values of an object

Function Group

Misc

Syntax

```
input_type RelativeValue(measure|detail;slicing_dims;offset)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>measure</td>
<td>detail</td>
<td>Any measure or a detail of a dimension in the block</td>
<td>Measure or detail</td>
</tr>
<tr>
<td>slicing_dims</td>
<td>The dimensions that provide the calculation context</td>
<td>Dimension list</td>
<td>Yes</td>
</tr>
<tr>
<td>offset</td>
<td>Specifies the value of measure or detail that is offset rows removed from the current row</td>
<td>Integer</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes

- The object must be a measure or a detail of a dimension available in the block.
- The sort order of the list of values of the slicing dimensions is used to determine the output of the function. The sort order is determined by two factors: sorts applied to the slicing dimensions, and the order in which the slicing dimensions are listed in the function.
- A dimension used as a section master can be specified as a slicing dimension.
- All the slicing dimensions must be present in the block or section header of the block in which the function is placed. If a slicing dimension is later removed from the block, the function returns the #COMPUTATION error.
- If the offset exceeds the number of rows in the list of values of the slicing dimension, the function returns null.
- RelativeValue cannot be used recursively.
- You must always place dimensions in parentheses even if there is only one dimension in the list of slicing dimensions.

Examples

The RelativeValue column in the table below contains the following formula:

```
RelativeValue([Revenue];([Year]);-1)
```

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Wilson</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Harris</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>4000</td>
<td>1000</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td>2000</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Wilson</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Harris</td>
<td>1700</td>
<td>3000</td>
</tr>
</tbody>
</table>

Related Information

#COMPUTATION [page 865]
Comparing values using the RelativeValue function [page 870]
6.6.110.22 ReportName

Description

Returns the name of a report

Function Group

Misc

Syntax

string ReportName()

Examples

ReportName() returns "Sales Report" if it is placed in a report called "Sales Report".

6.6.110.23 RowIndex

Description

Returns the number of a row

Function Group

Misc

Syntax

integer RowIndex()
Notes

- Row numbering starts at 0.
- `RowIndex` returns `#MULTIVALUE` when placed in a table header or footer.

Examples

`RowIndex` returns 0 when it appears on the first row of a table.

6.6.6.1.10.24  `UniqueNameOf`

Description

Returns the unique name of an object

Function Group

Misc

Syntax

```plaintext
string UniqueNameOf(obj)
```

Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>obj</td>
<td>Any report object</td>
<td>Report object</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples

`UniqueNameOf([Reservation Date])` returns "Reservation Date".
6.6.6.2  Function and formula operators

Operators link the various components in a formula.

Formulas can contain mathematical, conditional, logical, function-specific or extended syntax operators.

SAP HANA Online mode operators restrictions

The table below lists the operators that are not supported in SAP HANA Online mode.

<table>
<thead>
<tr>
<th>Operator Type</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function-specific operators</td>
<td>Drill</td>
</tr>
<tr>
<td></td>
<td>Index</td>
</tr>
<tr>
<td></td>
<td>Where</td>
</tr>
<tr>
<td>Extended syntax operators</td>
<td>In</td>
</tr>
<tr>
<td></td>
<td>ForEach</td>
</tr>
<tr>
<td></td>
<td>ForAll</td>
</tr>
</tbody>
</table>

6.6.6.2.1  Mathematical operators

Mathematical operators are familiar from everyday arithmetic.

There are addition (+), subtraction (-), multiplication (*), division (/) operators that allow you to perform mathematical operations in a formula. The formula \(\text{[Sales Revenue]} - \text{[Cost of Sales]}\) contains a mathematical operator, in this case subtraction.

**i Note**

When used with character strings, the ‘+’ operator becomes a string concatenation operator. That is, it joins character strings. For example, the formula “John” + “Smith” returns “John Smith”.

6.6.6.2.2  Conditional operators

Conditional operators determine the type of comparison to be made between values.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>Equal to</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater than</td>
</tr>
</tbody>
</table>
You use conditional operators with the If function, as in:

```
If [Revenue]>10000 Then "High" Else "Low"
```

which returns “High” for all rows where the revenue is greater than or equal to 10000 and “Low” for all other rows.

### 6.6.6.2.3 Logical operators

The logical operators are **And**, **Or**, **Not**, **Between** and **InList**.

Logical operators are used in boolean expressions, which return **True** or **False**.

### 6.6.6.2.3.1 And operator

The **And** operator links boolean values.

**Description**

If all the boolean values linked by **And** return true, the combination of all the values also returns true.

**Syntax**

```
bool_value And bool_value [And bool_value...]
```

**Examples**

```
If [Resort] = "Bahamas Beach" And [Revenue]>100000 Then "High Bahamas Revenue" returns "High Bahamas Revenue" if [Resort] = "Bahamas Beach" And [Revenue]>100000.
```
6.6.6.2.3.2 Or operator

The or operator links boolean values.

Description

If any one boolean value linked by or returns true, the combination of all the values also returns true.

Syntax

```
bool_value Or bool_value [Or bool_value...]
```

Examples

If [Resort] = "Bahamas Beach" Or [Resort]="Hawaiian Club" Then "US" Else "France"
returns "US" if [Resort]="Bahamas Beach" or "Hawaiian Club", or "France" otherwise.

6.6.6.2.3.3 Not operator

Description

The Not operator returns the opposite of a boolean value.

Syntax

```
bool Not(bool_value)
```

Examples

If Not([Country] = "US") Then "Not US" returns "Not US" if [Country] has any value other than "US".
6.6.6.2.3.4 Between operator

Description

The Between operator determines if a variable is between two values.

Syntax

```plaintext
bool Between(first_value;second_value)
```

Notes

- You use Between with the If function and the Where operator.
- Changing the document locale can impact the result returned by the Between operator.

Examples

If [Sales revenue] Between(800000;900000) Then "Medium revenue" returns "Medium revenue" if [Sales revenue] is between 800000 and 900000.

[Sales revenue] Between (10000;20000) returns true if the Sales revenue is between 10000 and 20000.

If ([Sales revenue] Between (200000;500000);"Medium revenue";"Low/High revenue") returns "Medium revenue" if [Sales revenue] is 300000.

Related Information

If...Then...Else [page 809]
Where operator [page 839]

6.6.6.2.3.5 InList operator

Description

The InList operator determines if a value is in a list of values.
Syntax

```cpp
bool test_value InList(value_list)
```

Notes

It is the combination of `test_value` + `InList` that returns a boolean value, not `InList` alone.

Examples

If Not ([Country] InList("England";"Scotland";"Wales");) Then "Not Britain" Else "Britain" returns "Not Britain" if [Country] is not equal to "England", "Scotland" or "Wales", or "Britain" otherwise.

If [Resort] InList("Bahamas Beach";"Hawaiian Club") Then "US Resort" returns "US Resort" if [Resort] is equal to "Bahamas Beach" or "Hawaiian Club".

Related Information

If...Then...Else [page 809]
Where operator [page 839]

6.6.6.2.4 Function-specific operators

Some functions can take specific operators as arguments.

For example, the `Previous` function can take the `Self` operator.

All functions use `)` and `(` to enclose function arguments. Functions that accept multiple parameters use `;` to separate the parameters.

6.6.6.2.4.1 All operator

The `All` operator tells the `NoFilter` function to ignore all filters.

The `All` operator can also tell the `Count` function to count all values, including duplicates.
6.6.6.2.4.2 All/Drill operators

The All/Drill operators work with the NoFilter function.

Description

The All/Drill operators determine which filters the NoFilter function ignores.

- Not specified - NoFilter ignores report and block filters
- All - NoFilter ignores all filters
- Drill - NoFilter ignores report filters and drill filters

6.6.6.2.4.3 Ascending

The Ascending operator is an argument of the PromptSummary function.

Description

When set, the PromptSummary function sorts the prompts in the ascending order.

Related Information

PromptSummary [page 737]
6.6.2.4.4 Bottom/Top operators

The Bottom/Top operators work with the Rank function.

Description

The Bottom/Top operators tell the Rank function to rank in descending or ascending order.

- Top - ranks in descending order
- Bottom - ranks in ascending order

Examples

\[ \text{Rank}([\text{Revenue}] ; ([\text{Country}] ) ; Top) \] ranks countries by revenue from highest to lowest.

Related Information

Rank [page 767]

6.6.2.4.5 Break operator

The Break operator works with the Percentage function.

Description

The Break operator tells Percentage function to account for table breaks.

Examples

The formula \[ \text{Percentage} ([\text{Revenue}]) \] gives the following result in the following table (percentages are calculated on the total revenue in the block):

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Revenue</th>
<th>Percentage</th>
</tr>
</thead>
</table>
The formula `Percentage([Revenue]; Break)` gives the following result in the following table (percentages are calculated on the total revenue in each part of the block):

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Revenue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>Q1</td>
<td>10000</td>
<td>33.3%</td>
</tr>
<tr>
<td>2005</td>
<td>Q2</td>
<td>20000</td>
<td>66.6%</td>
</tr>
<tr>
<td>2006</td>
<td>Q1</td>
<td>30000</td>
<td>42.9%</td>
</tr>
<tr>
<td>2006</td>
<td>Q2</td>
<td>40000</td>
<td>57.1%</td>
</tr>
</tbody>
</table>

**Related Information**

**Percentage [page 650]**

**6.6.6.2.4.6 Descending**

The Descending operator is an argument of the `PromptSummary` function.

**Description**

When set, the `PromptSummary` function sorts the prompts in the descending order.

**Related Information**

`PromptSummary [page 737]`
6.6.6.2.4.7 Distinct/All operators

The Distinct/All operators work with the Count function. The Distinct/All operators tell the Count function to count distinct values only, or all values.

Examples

Count([Revenue]; Distinct) returns 3 if [Revenue] has the values (5;5;6;4).
Count([Revenue]; All) returns 4 if [Revenue] has the values (5;5;6;4).

Related Information

Count [page 639]

6.6.6.2.4.8 IncludeEmpty operator

The IncludeEmpty operator works with aggregate functions.

Description

The IncludeEmpty operator tells some aggregate functions (Average, Count, RunningAverage, RunningCount) to include empty values in calculations.

Examples

Average([Revenue]; IncludeEmpty) returns 3 if [Revenue] has the values (5;3;<empty>;4).

Related Information

Average [page 638]
Count [page 639]
RunningAverage [page 653]
RunningCount [page 655]
6.6.6.2.4.9 Index operator

The Index operator works with the UserResponse and RefValueUserResponse functions.

Description

The Index operator tells the UserResponse and RefValueUserResponse functions to return the database primary key of the prompt response.

Related Information

UserResponse [page 729]
RefValueUserResponse [page 725]

6.6.6.2.4.10 Linear operator

The Linear operator works with the Interpolation function.

Description

The Linear operator tells the Interpolation function to use linear regression with least squares interpolation to supply missing measure values.

Linear regression with least squares interpolation calculates missing values by calculating a line equation in the form $f(x) = ax + b$ that passes as closely as possible through all the available values of the measure.

Related Information

Interpolation [page 642]
6.6.6.2.4.11 NoNull operator

The NoNull operator works with the Previous function.

Description

The NoNull operator tells the Previous function to ignore null values.
When used with NoNull, Previous returns the first non-null value of the object, beginning from the cell offset rows before the current row and counting backwards.

Related Information

Previous [page 818]

6.6.6.2.4.12 NotOnBreak operator

The NotOnBreak operator works with the Interpolation function.

Description

The NotOnBreak operator tells the Interpolation function to ignore section and block breaks.

Related Information

Interpolation [page 642]
6.6.2.4.13 PointToPoint operator

The PointToPoint operator tells the Interpolation function to use point-to-point interpolation to supply missing measure values.

**Description**

Point-to-point interpolation calculates missing values by calculating a line equation in the form \( f(x) = ax + b \) that passes through the two adjacent values of the missing value.

**Related Information**

Interpolation [page 642]

6.6.2.4.14 Row/Col operators

The Row operator calculates each value in the row as a percentage of the total value of all the rows in the embedding context. The Col operator calculates each value in the column as a percentage of the total value of all the columns in the embedding context.

**Description**

The Row/Col operators set the calculation direction of the following functions: Percentage, Previous, RunningAverage, RunningCount, RunningMax, RunningMin, RunningProduct, RunningSum.

**Notes**

In a crosstab, the value in each cell is calculated by default as a percentage of the total value in the crosstab. The Row operator calculates the values in the rows as percentages of the total value for the row. The Col operator calculates the values in the columns as percentages of the total value in the column.

**Examples**

In a crosstab, `Percentage([Measure])` gives the following result:
<table>
<thead>
<tr>
<th>Measure</th>
<th>Percentage</th>
<th>Measure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>10%</td>
<td>500</td>
<td>50%</td>
</tr>
<tr>
<td>200</td>
<td>20%</td>
<td>200</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Percentage([Measure];Row)** gives the following result:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Percentage</th>
<th>Measure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>16.7%</td>
<td>500</td>
<td>83.3%</td>
</tr>
<tr>
<td>200</td>
<td>50%</td>
<td>200</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Percentage([Measure];Col)** gives the following result:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Percentage</th>
<th>Measure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>33.3%</td>
<td>500</td>
<td>83.3%</td>
</tr>
<tr>
<td>200</td>
<td>66.6%</td>
<td>200</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

The Row operator calculates the running aggregate by row. The Col operator calculates the running aggregate by column.

**In a crosstab,** **RunningSum([Measure])** or **RunningSum([Measure];Row)** gives the following result:

<table>
<thead>
<tr>
<th>Measure</th>
<th>RunningSum</th>
<th>Measure</th>
<th>RunningSum</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>400</td>
<td>700</td>
<td>250</td>
<td>950</td>
</tr>
</tbody>
</table>

**In a crosstab,** **RunningSum([Measure];Col)** gives the following result:

<table>
<thead>
<tr>
<th>Measure</th>
<th>RunningSum</th>
<th>Measure</th>
<th>RunningSum</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>200</td>
<td>700</td>
</tr>
<tr>
<td>400</td>
<td>500</td>
<td>250</td>
<td>950</td>
</tr>
</tbody>
</table>

**Related Information**

- Percentage [page 650]
- RunningAverage [page 653]
- RunningCount [page 655]
- RunningMax [page 657]
- RunningMin [page 659]
- RunningProduct [page 661]
- RunningSum [page 663]
6.6.6.2.4.15  Self operator

The Self operator works with the Previous function.

Description

Refers the Previous function to the previous cell when it does not contain a report object.

Examples

5 + Previous(Self) returns the sequence 5, 10, 15, 20, 25, 30...
1 + 0.5 * Previous(Self) returns the sequence 1, 1.5, 1.75, 1.88...

Related Information

Previous [page 818]

6.6.6.2.4.16  Where operator

Description

The Where operator restricts the data used to calculate a measure.

Examples

The formula Average ([Sales Revenue]) Where ([Country] = "US") calculates the average sales where the country is "US".

The formula Average ([Sales Revenue]) Where ([Country] = "US" Or [Country] = "France") calculates the average sales where the country is "US" or "France".

The formula [Revenue] Where (Not ([Country] Inlist ("US"; "France"))) calculates the revenue for the countries other than US and France.

The variable [High Revenue] has the formula [Revenue] Where [Revenue > 500000]. When placed in a block, [High Revenue] displays either the revenue when its value is greater than 500000, or nothing. When
placed in a footer at the bottom of the [High Revenue] column, the formula $\text{Average ([High Revenue])}$ returns the average of all the revenues greater than 500000.

**Related Information**

And operator [page 827]
Between operator [page 829]
InList operator [page 829]
Or operator [page 828]
Not operator [page 828]

### 6.6.6.2.5 Extended syntax operators

You specify input and output contexts explicitly with context operators.

The following table lists the context operators:

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>Specifies an explicit list of dimensions to use in the context.</td>
</tr>
<tr>
<td>ForEach</td>
<td>Adds dimensions to the default context</td>
</tr>
<tr>
<td>ForAll</td>
<td>Removes dimensions from the default context</td>
</tr>
</tbody>
</table>

The ForAll and ForEach operators are useful when you have a default context with many dimensions. It is often easier to add or subtract from the context using ForAll and ForEach than it is to specify the list explicitly using In.

### 6.6.6.2.5.1 In context operator

The **In context** operator specifies dimensions explicitly in a context.

**Example**

**Using In to specify the dimensions in a context**

In this example you have a report showing Year and Sales revenue. Your data provider also contains the Quarter object but you do not include this dimension in the block. Instead, you want to include an additional column to show the maximum revenue by quarter in each year. Your report looks like this:

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales revenue</th>
<th>Max Quarterly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>$8,096,123.60</td>
<td>$2,660,699.50</td>
</tr>
<tr>
<td>2002</td>
<td>$13,232,246.00</td>
<td>$4,186,120.00</td>
</tr>
</tbody>
</table>
You can see where the values in the Max Quarterly Revenue column come from by examining this block in conjunction with a block that includes the Quarter dimension:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Q1</td>
<td>$2,660,699.50</td>
</tr>
<tr>
<td>2001</td>
<td>Q2</td>
<td>$2,279,003.00</td>
</tr>
<tr>
<td>2001</td>
<td>Q3</td>
<td>$1,367,841.00</td>
</tr>
<tr>
<td>2001</td>
<td>Q4</td>
<td>$1,788,580.00</td>
</tr>
<tr>
<td></td>
<td>Max:</td>
<td>$2,660,699.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td>$3,326,172.00</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
<td>$2,840,651.00</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td>$2,879,303.00</td>
</tr>
<tr>
<td>Q4</td>
<td></td>
<td>$4,186,120.00</td>
</tr>
<tr>
<td></td>
<td>Max:</td>
<td>$4,186,120.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td>$3,742,989.00</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
<td>$4,006,717.50</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td>$3,953,395.00</td>
</tr>
<tr>
<td>Q4</td>
<td></td>
<td>$3,356,041.00</td>
</tr>
<tr>
<td></td>
<td>Max:</td>
<td>$4,006,717.50</td>
</tr>
</tbody>
</table>

The Max Quarterly Revenue column shows the highest quarterly revenue in each year. For example, Q4 has the highest revenue in 2002, so the Max Quarterly Revenue shows Q4 revenue on the row showing 2002.

Using the In operator, the formula for Max Quarterly Revenue is

```
Max ([Sales revenue] In ([Year];[Quarter])) In ([Year])
```

This formula calculates the maximum sales revenue for each (Year,Quarter) combination, then outputs this figure by year.

**i Note**

Because the default output context of the block is Year, you do not need to specify the output context explicitly in this formula.
6.6.2.5.2 ForEach context operator

The ForEach operator adds dimensions to a context.

**Example**

**Using ForEach to add dimensions to a context**

The following table shows the maximum revenue for each Quarter in a report which contains the Quarter dimension but does not include it in the block:

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales revenue</th>
<th>Max Quarterly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>8096123.60</td>
<td>2660699.50</td>
</tr>
<tr>
<td>2002</td>
<td>13232246.00</td>
<td>4186120.00</td>
</tr>
<tr>
<td>2003</td>
<td>15059142.80</td>
<td>4006717.50</td>
</tr>
</tbody>
</table>

It is possible to create a formula for the Max Quarterly Revenue column that does not include the ForEach operator:

\[
\text{Max ([Sales revenue] In ([Year];[Quarter])) In ([Year])}
\]

Using the ForEach context operator, you can achieve the same result with the following formula:

\[
\text{Max ([Sales revenue] ForEach ([Quarter])) In ([Year])}
\]

Why? Because the Year dimension is the default input context in the block. By using the ForEach operator, you add the Quarter dimension to the context, giving an input context of ([Year];[Quarter]).

6.6.2.5.3 ForAll context operator

The ForAll context operator removes dimensions from a context.

**Example**

**Using ForAll to remove dimensions from a context**

You have a report showing Year, Quarter and Sales revenue and you want to add a column that shows the total revenue in each year, as shown in the following block:
To total revenues by year the input context needs to be (Year); by default it is (Year; Quarter). Therefore, you can remove Quarter from the input context by specifying `ForAll ([Quarter])` in the formula, which looks like this:

```
Sum([Sales revenue] ForAll ([Quarter]))
```

Note that you can use the `In` operator to achieve the same thing; in this case the formula is:

```
Sum([Sales revenue] In ([Year]))
```

This version of the formula explicitly specifies Year as the context, rather than removing Quarter to leave Year.

### 6.6.6.2.6 Set operators

Set operators work on members in hierarchical data.

#### 6.6.6.2.6.1 Range operator

**Description**

The range operator (:) returns a set of members between and including two members at the same level.
Syntax

first_member:last_member

Examples

[Geography]&[US].[California].[Los Angeles]:[Geography]&[US].[California].[San Francisco] returns [Los Angeles], [San Diego], [San Francisco] if the members at the level are in the order ...
[Los Angeles]. [San Diego]. San Francisco]...

Sum([Revenue];{{Geography}&[US].[California].[Los Angeles]:[Geography]&[US].
[California].[San Francisco]}) returns the total revenue for Los Angeles, San Diego and San Francisco.

6.6.6.3 Extended syntax keywords

Extended syntax keywords are a form of shorthand that allows you to refer to dimensions in extended syntax without specifying those dimensions explicitly.

These keywords help future-proof reports. If formulas do not contain hard-coded references to dimensions, they will continue to work even if dimensions are added to or removed from a report.

There are five extended syntax keywords: Report, Section, Break, Block and Body.

**Note**

Extended syntax keywords are not supported in SAP HANA Online mode.

6.6.6.3.1 The Block keyword

This topic describes the dimensions referenced by the Block keyword, depending on where it is placed in a report. The Block keyword often encompasses the same data as the Section keyword.

The difference is that Block accounts for filters on a block whereas Section ignores them.

<table>
<thead>
<tr>
<th>When placed in...</th>
<th>References this data...</th>
</tr>
</thead>
<tbody>
<tr>
<td>A block</td>
<td>Data in the whole block, ignoring breaks, respecting filters</td>
</tr>
<tr>
<td>A block break (header or footer)</td>
<td>Data in the whole block, ignoring breaks, respecting filters</td>
</tr>
<tr>
<td>A section (header, footer, or outside a block)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Outside any blocks or sections</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Example

The Block keyword

You have a report showing Year, Quarter and Sales revenue. The report has a section based on Year. The block is filtered to exclude the third and fourth quarters.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales revenue</th>
<th>First Half Average</th>
<th>Yearly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>$2,660,700</td>
<td>$2,469,851.25</td>
<td>$8,096,123.60</td>
</tr>
<tr>
<td>G2</td>
<td>$2,279,003</td>
<td>$2,469,851.25</td>
<td>$8,036,123.60</td>
</tr>
<tr>
<td>Sum</td>
<td>4,939,702.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>$3,326,172</td>
<td>$3,063,411.50</td>
<td>$13,232,246.00</td>
</tr>
<tr>
<td>G2</td>
<td>$2,840,651</td>
<td>$3,063,411.50</td>
<td>$13,232,246.00</td>
</tr>
<tr>
<td>Sum</td>
<td>6,166,823</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>$3,742,969</td>
<td>$3,874,853.20</td>
<td>$15,059,142.80</td>
</tr>
<tr>
<td>G2</td>
<td>$4,006,718</td>
<td>$3,874,853.20</td>
<td>$15,059,142.80</td>
</tr>
<tr>
<td>Sum</td>
<td>7,749,706.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Yearly Average column uses the following formula:

\[
\text{Average([Sales revenue] In Section)}
\]

The First Half Average column uses the following formula:

\[
\text{Average ([Sales revenue]) In Block}
\]

You can see how the Block keyword takes account of the filter on the block.
6.6.6.3.2 The Body keyword

This topic describes the dimensions referenced by the keyword in a block Body, depending on where it is placed in a report.

<table>
<thead>
<tr>
<th>When placed in...</th>
<th>References this data...</th>
</tr>
</thead>
<tbody>
<tr>
<td>A block</td>
<td>Data in the block</td>
</tr>
<tr>
<td>A block break (header or footer)</td>
<td>Data in the block</td>
</tr>
<tr>
<td>A section (header, footer, or outside a block)</td>
<td>Data in the section</td>
</tr>
<tr>
<td>Outside any blocks or sections</td>
<td>Data in the report</td>
</tr>
</tbody>
</table>

Example

The Body keyword

You have a report showing Year, Quarter and Sales revenue, with a break on Year. The report has a section based on Year and a break on Quarter.

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Q1</td>
<td>2,660,700</td>
<td>2,660,699.5</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>2,279,003</td>
<td>2,279,003</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>1,367,841</td>
<td>1,367,840.7</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>1,788,580</td>
<td>1,788,580.4</td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td>8,096,123.6</td>
<td></td>
</tr>
</tbody>
</table>

The Body column has the formula

\[
\text{Sum ([Sales revenue]) In Body}
\]

The totals in the Body column are the same as those in the Sales revenue column because the Body keyword refers to the data in the block. If you were to remove the Month object, the figures in the Block column would change to correspond with the changed figures in the Sales revenue column. If you were to place the formula in the report footer it would return the total revenue for the body.

6.6.6.3.3 The Break keyword

The following table describes the dimensions referenced by the Break keyword depending on where it is placed in a report.

<table>
<thead>
<tr>
<th>When placed in...</th>
<th>References this data...</th>
</tr>
</thead>
<tbody>
<tr>
<td>A block</td>
<td>Data in the part of a block delimited by a break</td>
</tr>
<tr>
<td>A block break (header or footer)</td>
<td>Data in the part of a block delimited by a break</td>
</tr>
</tbody>
</table>
When placed in... | References this data...
---|---
A section (header, footer, or outside a block) | Not applicable
Outside any blocks or sections | Not applicable

![Example]

The Break keyword

You have a report showing Year, Quarter and Sales revenue:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales revenue</th>
<th>Break Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Q1</td>
<td>$2,660,700</td>
<td>$8,096,124</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>$2,279,003</td>
<td>$8,096,124</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>$1,367,841</td>
<td>$8,096,124</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>$1,788,580</td>
<td>$8,096,124</td>
</tr>
</tbody>
</table>

The report has break on Year. The Break Total column has the formula:

\[ \text{Sum ([Sales revenue]) In Break} \]

Without the Break keyword this column would duplicate the figures in the Sales revenue column, because it would use the default output context ([Year];[Quarter]).

6.6.6.3.4 The Report keyword

This topic describes the data referenced by the Report keyword, depending on where it is placed in a report:

When placed in... | References this data...
---|---
A block | All data in the report
A block break (header or footer) | All data in the report
A section (header, footer, or outside a block) | All data in the report
Outside any blocks or sections | All data in the report

![Example]

The Report keyword

You have a report showing Year, Quarter and Sales revenue. The report has a column, Report Total, that shows the total of all revenue in the report.
The formula for the Report Total column is as follows:

$$\text{Sum}([\text{Sales revenue}]) \text{ In Report}$$

Without the Report keyword, this column would duplicate the figures in the Sales Revenue column because it would use the default output context $([\text{Year}],[\text{Quarter}])$.

### 6.6.6.3.5 The Section keyword

This topic describes the data referenced by the keyword for a Section, depending on where it is placed in a report.

<table>
<thead>
<tr>
<th>When placed in...</th>
<th>References this data...</th>
</tr>
</thead>
<tbody>
<tr>
<td>A block</td>
<td>All data in the section</td>
</tr>
<tr>
<td>A block break (header or footer)</td>
<td>All data in the section</td>
</tr>
<tr>
<td>A section (header, footer, or outside a block)</td>
<td>All data in the section</td>
</tr>
<tr>
<td>Outside any blocks or sections</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

#### Example

**The Section keyword**

You have a report showing Year, Quarter, and Sales revenue.
The report has a section based on Year. The Section Total column has the formula:

\[ \text{Sum ([Sales revenue]) In Section} \]

The figure in the Section Total column is the total revenue for 2001, because the section break occurs on the Year object. Without the Section keyword this column would duplicate the figures in the Sales revenue column, because it would use the default output context ([Year];[Quarter]).

### 6.6.6.4 Rounding and truncating numbers

Several functions contain a parameter that determines to what level the function rounds or truncates the value it returns.

This parameter accepts an integer that is either greater than 0, 0, or less than 0. The following table explains how numbers are rounded and truncated in these cases:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| > 0       | The function rounds/truncates to <parameter> decimal places.  
                        Examples:  
                        \[ \text{Round}(3.13;1) \text{ returns 3.1} \]  
                        \[ \text{Round}(3.157;2) \text{ returns 3.16} \] |
| 0         | The function rounds/truncates to the nearest integer.  
                        Examples:  
                        \[ \text{Truncate}(3.7;0) \text{ returns 3} \]  
                        \[ \text{Truncate}(4.164;0) \text{ returns 4} \] |
| < 0       | The function rounds/truncates to the nearest 10  
                        (parameter = -1), 100 (parameter = -2), 1000 (parameter = -3) and so on.  
                        Examples:  
                        \[ \text{Round}(123.76;-1) \text{ returns 120} \] |
### Parameter Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round(459.9;-2)</td>
<td>returns 500</td>
</tr>
<tr>
<td>Truncate(1600;-3)</td>
<td>returns 1000</td>
</tr>
</tbody>
</table>

**Note**

Numbers are represented internally using double-precision floating-point formats and have 15 to 17 digits of precision.

---

### Related Information

- **Round** [page 769]
- **Truncate** [page 776]
- **EuroConvertTo** [page 756]
- **EuroConvertFrom** [page 754]
- **EuroFromRoundError** [page 757]
- **EuroToRoundError** [page 759]

---

### 6.6.6.5 Referring to members and member sets in hierarchies

You refer to members and member sets in functions using the syntax `\[hierarchy\]&path.function`. The path and function parts are optional. In path, you refer to each member in square brackets, with members separated by full stops. The names of members and levels are case-sensitive.

**Note**

You use member sets to override the default calculation context for a hierarchy. In functions that accept member sets, you enclose the member set in `{}`.

You refer to ranges of members using a colon `:` between the start and end member, and with the full path specified for each member. A range includes all members at the same level as the specified members.

An example of range syntax is: `\[Sales Hierarchy\]&\[Customer_Type\].\[ENTERPRISE\];\[Large\].\[Nancy Davolio\]: \[Sales Hierarchy\]&\[Customer_Type\].\[ENTERPRISE\];\[Large\].\[Andrew Smith\].`

**Example**

**Referring to members and member sets**

You have the following hierarchy:
<table>
<thead>
<tr>
<th>Sales Hierarchy</th>
<th>Order Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer_Type</td>
<td>277,290,434</td>
</tr>
<tr>
<td>ENTERPRISE</td>
<td>180,063,361</td>
</tr>
<tr>
<td>Large</td>
<td>113,905,997</td>
</tr>
<tr>
<td>Nancy Davolio</td>
<td>44,855,689</td>
</tr>
<tr>
<td>Janet Leverling</td>
<td>44,050,308</td>
</tr>
<tr>
<td>Andrew Smith</td>
<td>30,000,000</td>
</tr>
<tr>
<td>GLOBAL</td>
<td>91,157,363</td>
</tr>
</tbody>
</table>

- `[Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].Children` refers to the [Nancy Davolio], [Janet Leverling] and [Andrew Smith] members.
- `Sum([Order Amount]; [Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].children)` returns 113,905,997 (the sum of the measure for the three child members).
- `[Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Janet Leverling]` refers to the [Janet Leverling] member.
- `Sum([Order Amount]; [Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Janet Leverling]; [Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Nancy Davolio])` returns 88,905,997 (the sum of the measure for the two members).
- `[Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Nancy Davolio];[Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Andrew Smith]` refers to the [Nancy Davolio], [Janet Leverling] and [Andrew Smith] members.
- `Sum([Order Amount]; [Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Nancy Davolio];[Sales Hierarchy] & [Customer_Type].[ENTERPRISE].[Large].[Andrew Smith])` returns 113,905,997 (the sum of the measure for the three members in the range).
- `[Sales Hierarchy].children` refers to all members in the [Sales Hierarchy] hierarchy.
- `Sum([Order Amount]; [Sales Hierarchy].children)` returns 277,290,434.

### 6.6.7 Building custom functions

#### 6.6.7.1 Overview of calculation extensions

Calculation extensions are custom Web Intelligence reporting calculations that enhance the list of existing Web Intelligence functions.

To use the Calculation Extension Library, create a C++ external library following a specific API.
6.6.7.1  External functions

External functions are visible and usable like the other Web Intelligence standard functions. You can build a formula with functions that implement your own logic.

**Note**
You can define as many functions as you need. Only functions that use single value parameters are supported. You can have a maximum of five single value parameters.

To define a function:
1. Declare in an XML file the description of the external function using a given XML structure.
2. Implement the function in a C++ library using a given API.
3. Copy the XML file and library to the appropriate folder in your Business Objects Enterprise installation directory folder for the server and the desktop client.
4. Restart the system to automatically add the external function to the list of the functions available for creating formulas.

The external function is based on a unique identifier so that when it is used in a report, it cannot be misinterpreted in case of using a different external library.

If the system cannot load a library or is missing information for an external function, has an inconsistent XML declaration, missing library, or duplicated function, an error message appears. The system also writes errors in the trace log.

**Related Information**

#EXTERNAL error message [page 862]

6.6.7.2  Deploying the custom functions

Deployment of custom functions requires a few manual steps. The BusinessObjects administrator must place the XML file and related library DLL file in the library folder for the server, as well as on every machine where desktop rich-client is installed.

**Caution**
Replacing or adding a library in the custom library folder can represent a threat to the system. Since the library is automatically loaded, an external library can access internal critical data or processes, putting the system in danger.

Make sure that the site administrator implements the appropriate security access to the related folder, so that only authorized people access the custom library folder.
6.6.7.1.3	The library declaration

The library file extensions are different depending on the operating system:

- DLL for Windows
- SO for Linux or UNIX

The file types are:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XML catalogs declaration</td>
<td>There is only one file of this type, and it should be named externalcatalogs.xml. This file contains the list of all XML function definition files.</td>
</tr>
<tr>
<td>XML functions declaration</td>
<td>This file defines a list of functions and their associated library and is listed in the XML catalogs declaration file.</td>
</tr>
<tr>
<td>library file</td>
<td>This file contains the code in C++ for the user functions. The library file contains the user function implementation as defined in the XML function declaration.</td>
</tr>
</tbody>
</table>

6.6.7.1.4	Using the Web Intelligence sample files

Prerequisites

Make sure to have the following applications installed:

- Visual Studio C++ VS2015 or higher
- Web Intelligence 4.1 or higher

Context

The examples in this document use the sample files in the Samples.zip file located in [Install directory]\userlibs\WebI\Samples\.
Procedure

1. Unzip Samples.zip.
2. To open the samples, launch OpenSolution.bat.

   The OpenSolution.bat sets the temporary `<WEBICALCPLUGINAPI>` variable environment that is used by the solution to find Web Intelligence specific headers files.

   △ Caution

   If the required version of Web Intelligence is not installed, you cannot use the OpenSolution.bat. If that is the case, manually set the `<WEBICALCPLUGINAPI>` variable environment to the path of the folder that contains the Web Intelligence header files and open Samples\WebICalcPlugIn.

Related Information

Examples [page 861]

6.6.7.2 Defining a custom calculation

To customize a function within Web Intelligence:

1. Define the XML function declaration
2. Define the XML catalog declaration.
3. Implement the library in C++ using the specific API for external function.
4. Compile the source file.
5. Copy the XML definition and the library into the dedicated WebiCalcPlugin folder (server side and any rich client).
6. Restart the Web Intelligence server.

   i Note

   The chapter’s examples use the sample files delivered with Web Intelligence.

The system automatically adds the function to the function list in the formula editor and formula bar contextual help.

If a formula is using a function for which no external library is available, the #EXTERNAL error message appears.

   i Note

   Only functions that use single value parameters are supported. Table parameters for instance aren’t supported.
### 6.6.7.2.1 XML function objects

The XML definition contains objects which define the custom function. XML custom functions extend the function list of the formula language so that a formula using this function can be parsed according its XML signature and turn into a tokenized form. You assign the external function a global unique ID (GUID) so that it cannot be reused or confused with other custom libraries.

The XML definition contains the following objects:

<table>
<thead>
<tr>
<th>Tag</th>
<th>XML attribute</th>
<th>XML definition object</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;CATALOG&gt;</code></td>
<td></td>
<td>The XML root</td>
</tr>
<tr>
<td><code>&lt;LIBRARY&gt;</code></td>
<td>file</td>
<td>The name of the library file that contains the C++ implementation code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The library file can contain several functions. The library extension should not be specified.</td>
</tr>
<tr>
<td><code>&lt;FUNCTION&gt;</code></td>
<td>guid</td>
<td>The unique function GUID</td>
</tr>
<tr>
<td></td>
<td>name</td>
<td>The function name that appears in the formula editor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The function name must:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• be a simple, unique name for the function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• start with a letter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• use lower and upper case letters, number characters, or the _ character</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• not already exist in the Web Intelligence library</td>
</tr>
<tr>
<td></td>
<td>i Note</td>
<td>The name will not be translated to another language.</td>
</tr>
<tr>
<td><code>&lt;ARGLIST&gt;</code></td>
<td></td>
<td>The list of parameters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The number of parameters should be lower than or equal to five.</td>
</tr>
</tbody>
</table>
### Defining the XML function declaration

#### Context

The XML for the signature uses the following structure:

```
Function_list
```
The XML for the signature uses the following structure:

```xml
Function_list := [Function*]
Function := [name, GUID, data_type = Numeric|Boolean|Date|String, category = character|Date|Document|DP|Misc|Logical|Num, parameter_list, (online_help_signature?), (online_help_description?),library_name])
parameter_list := [parameter*]
parameter := [name, data_type = Numeric|Boolean|Date|String]
```

**Procedure**

1. Set the XML root tag to `CATALOG`.
2. To the `CATALOG` add `LIBRARY` tags.
3. To the `LIBRARY` add the name of the library file without the DLL or SO file extension. This is the `file` attribute.
4. To the `LIBRARY` add `FUNCTION` tags.

   A `FUNCTION` tag should have a unique `GUID` and an additional, unique attribute name which defines the name of the function.
   
   The `FUNCTION` tag should contain:
   
   - a `ARGLIST` tag with `ARG` tags. The `ARG` tags should have a first attribute type that defines the type of this parameter, and a second attribute that defines the name of this parameter.
     
     The `ARG` type can be Boolean, Numeric, Date, or String. The `ARG` name contains only alphanumeric characters.

   - a `RETURN` tag which defines a type attribute.
     
     The `RETURN` type can be Boolean, Numeric, Date, or String.
   - a `CATEGORY` tag which defines a type attribute.
     
     The `CATEGORY` type can be Character, Date, Document, DP, Misc, Logical, or Num.
   - a `HINT` tag which defines a value attribute.

5. Place the XML definition into the dedicated folder (server side and any rich client).

**Example**

`SampleMath.xml`

```xml
<CATALOG>
  <LIBRARY file="SampleMath">
    <FUNCTION guid="CC3E9742-67A7-4844-9DBF-2CCD4F6ECABE" name="MySquareFct">
      <ARG type="Numeric" name="input_number"/>
      <RETURN type="Numeric"/>
      <CATEGORY type="Num"/>
      <HINT value="My square function."/>
    </FUNCTION>
  </LIBRARY>
</CATALOG>
```
### Defining the XML catalog declaration

#### Context

You can create the XML catalog declaration or add it to an existing catalogs declaration. `<CATALOG>` references an XML function declaration file or directly define the `<CATALOG>` as is shown in the section which defines an XML functions declaration format.

To create a catalog declaration:

#### Procedure

1. Name the declaration `externalcatalogs.xml`.
2. Set the XML root tag to `CATALOGS`.
3. To the `CATALOGS` add `CATALOG` tags.

   This action defines the file name value of the XML functions declarations.

4. Place the XML library into the dedicated folder (server side and any rich client).

#### Example

```
externalcatalogs.xml

<CATALOGS>
  <CATALOG file="SampleMath.xml"/>
</CATALOGS>
```

---

**Related Information**

Using the Web Intelligence sample files [page 853]
6.6.7.2.4 Implementing the C++ file

Procedure

1. In the file, add the `ibovariant.h` header.
2. For each method, start the declaration with the `BO_DECLARE_USER_FCT` macro.

   The macro includes:
   - the function name as it appears in the XML functions declaration file.
   - the return value object name
   - the parameter object name

   **Note**
   The function returns a `BONOERROR` if everything is okay, otherwise the `#EXTERNAL` error message appears into the report.

   **Example**

   Square.cpp

   ```cpp
   // Headers file include of the WebI hearders
   #include <ibovariant.h>
   // To not repeat BOExtFunct::
   using namespace BOExtFunct;
   BO_DECLARE_USER_FCT (// Name of function as it was defined in the XML.
   MySquareFct,
   // Name of the return value object.
   retVal,
   // Name of the parameters object.
   parameters
   )
   {
   try // Always used a try{}catch(...) to be sure no
   // exception was thrown outside this Web
   // Intelligence user function.
   {
   // Get the first parameter.
   const iBOValue&param0 = parameters[0];
   // Transform the parameter to the correct type.
   double valPar0(param0);
   // Assign value to the return value.
   retVal = valPar0 * valPar0;
   }
   catch(...) { return BONOERROR; // Unknown exception so notify WebI
   return BONOERROR; // It's OK
   }
   ```

Related Information

Using the Web Intelligence sample files [page 853]
6.6.7.2.5 Compiling the source file in Microsoft Visual Studio 2015

Procedure

1. To create a project, go to File > New > Project.
3. In Templates, select Empty Project.
4. Specify the name of the project.
5. Specify the destination folder for the project.
6. Click OK.
7. Right-click the project and select Properties.
8. In Configuration, select All configurations.
10. Click OK.
11. Right-click the project and select Add > New Item.
13. In Template, select C++ File (.CPP).
14. Specify the name of the CPP file.
15. Click Add.
16. Right-click the project and select Properties.
17. In Configuration, select All configurations.
18. In Configuration Properties > C/C++ > Additional Include Directories, add the folder which contains the Business Objects file headers.
19. Click Apply.
20. In Configuration, select Debug.

**Note**

If you are running a machine where Microsoft Visual Studio is installed, you can use Multi-threaded Debug DLL (/MDd) instead of Multi-threaded DLL (/MD) to benefit from its debug environment.

22. Click Apply.

**Note**

If you are running a machine where Microsoft Visual Studio is installed, you can use Multi-threaded Debug DLL (/MDd) instead of Multi-threaded DLL (/MD) to benefit from its debug environment.
25. Click **OK**.
26. Add the code to the CPP file.
27. Compile.

### 6.6.7.2.6 Copying files into WebiCalcPlugin

**Procedure**

Copy the XML functions declaration, the XML catalogs declaration, and the DLL/SO file into the `WebiCalcPlugIn` folder.

The folder is available in:

```
[installation directory]\[BusinessObjects Version]\[OS]_[PLATFORM]\WebiCalcPlugIn
```

Where: [BusinessObjects Version] is the version of the product, for example BusinessObjects Enterprise XI 4.0, and [OS] is the operating system, for example `win32` for Windows Operating System or `linux` for Linux Operating System, and [PLATFORM] is the platform, for example `x86` on an Intel 32-bit CPU.

### 6.6.7.3 Examples

The examples use the sample files in the `Samples.zip` file, which is located in `[Install directory]\userlibs\WebI\Samples\`.

#### Example

**XML catalog declaration for the externalcatalogs.xml**

```
<CATALOGS>
  <CATALOG file="SampleString.xml"/>
</CATALOGS>
```

#### Example

**XML function declaration in SampleString.xml**

```
<CATALOG>
  <LIBRARY file="SampleString">
    <FUNCTION guid="A91BD526-8E7E-4b09-90F2-FFCD350776A8" name="MyHelloWorld">
      <RETURN type="String"/>
      <CATEGORY type="Num"/>
      <HINT value="My simple hello world function."/>
    </FUNCTION>
  </LIBRARY>
</CATALOG>
```
Example

C++ file declaration in HelloWorld.cpp

```cpp
// Headers file include of the Web Intelligence headers
#include <ibovariant.h>
// To not repeat BOExtFunct::
using namespace BOExtFunct;

BO_DECLARE_USER_FCT(
    // Name of function as it was defined in the XML.
    MyHelloWorld,
    // Name of the return value object.
    retVal
    // Don't use parameter.
    /*parameters*/
)
{
    try // Always used a try{}catch(…) to be sure no
    // exception was thrown outside this
    // Web Intelligence user function.
    {
        // Create an std::wstring with wide char Hello world.
        std::wstring helloWorldStr = L"Hello world!!!";
        // Initialise the return value.
        retVal = helloWorldStr;
    }
    catch(...)
    {
        // Unknown exception so notify Web Intelligence
        return BOERROR;
    }
    return BONOERROR; // It’s OK
}
```

Related Information

Using the Web Intelligence sample files [page 853]

6.6.7.4 #EXTERNAL error message

The #EXTERNAL error message is caused by the following problems:

- A formula refers to an external function that is not in the external library folder.
- A document contains an external method and the system cannot load it. The library file is not found, or there is an inconsistent declaration.
- An external method does not initialize the return value.
- An external method initialized the return type with bad type. For example, a double was set to a string.
- An external method returns an error code.

Ask the BusinessObjects administrator to deploy the correct library that implements this function.
6.6.7.5 Trace log message errors

If an error appears during XML parsing/validation, a message appears to the user and errors are created in the trace logs.

<table>
<thead>
<tr>
<th>Log type</th>
<th>Error messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>XML logs</td>
<td>File cannot be read or is missing.</td>
</tr>
<tr>
<td></td>
<td>Bad XML structure due to:</td>
</tr>
<tr>
<td></td>
<td>- Parent/Children relation invalid.</td>
</tr>
<tr>
<td></td>
<td>- Missing field (ID function, name function).</td>
</tr>
<tr>
<td></td>
<td>- Invalid field value.</td>
</tr>
<tr>
<td>DLL logs</td>
<td>File is missing.</td>
</tr>
<tr>
<td></td>
<td>DLL cannot be loaded.</td>
</tr>
<tr>
<td></td>
<td>Function is not found in the DLL.</td>
</tr>
<tr>
<td>Function logs</td>
<td>Function name is already in use.</td>
</tr>
<tr>
<td></td>
<td>Function ID is already used.</td>
</tr>
<tr>
<td></td>
<td>Function name is missing.</td>
</tr>
<tr>
<td></td>
<td>Return type is invalid.</td>
</tr>
<tr>
<td></td>
<td>ID is invalid.</td>
</tr>
<tr>
<td></td>
<td>Number of parameters is invalid.</td>
</tr>
<tr>
<td>Parameters logs</td>
<td>Parameter name is missing.</td>
</tr>
<tr>
<td></td>
<td>Parameter type is invalid.</td>
</tr>
<tr>
<td>Runtime logs</td>
<td>The user function does not initialize the return value.</td>
</tr>
<tr>
<td></td>
<td>The user function initializes the return value with a bad type.</td>
</tr>
<tr>
<td></td>
<td>The user function returns the BOERROR error code.</td>
</tr>
</tbody>
</table>

6.6.8 Troubleshooting formulas

6.6.8.1 Automatic rewrite formula mechanism

The succession of corrective maintenance releases for Web Intelligence can sometimes lead to calculation result differences between versions.

Since version 4.1 SP3, Web Intelligence provides an Automatic Formula Rewrite mechanism that automatically modifies a selection of formulas (see list below) in a document migrated from a previous version. These formulas follow a certain pattern. After modification, the formulas return the same result than before the
calculation change. Therefore, it is recommended to save the document so that the modifications are stored in the document, thus completing the formula rewrite mechanism.

The Automatic Formula Rewrite mechanism is available by default for documents migrated to BI 4.1 SP3 and later, for the following formula patterns:

1. Where() operator with a dimension as parameter in a condition,
2. Running calculations with reset in sections,
3. Running calculations with reset in cross-tables.

This list of rules could be extended in future releases with more formula patterns.

**Rule(1)**

In previous versions, the data was calculated in a specific way if you had a Where() operator with a dimension as a parameter in a condition. Indeed, the dimension was added to the measure context. Rule(1) reproduces the former behavior.

This rules applies to every document migrated from XI 3.1 FP3.6, XI 3.1 FP4.1, XI 3.1 FP5.1 and 4.0 SP5.

**Rule(2)**

In previous versions, running calculations in sections was not properly executed, as calculations would reset at each section instance. Rule(2) reproduces the former behavior.

This rules applies to every document migrated from XI R2 SP4.

**Rule(3)**

In previous versions, running calculations with reset cross-tables meant that calculations were executed in an “N” pattern (column after column) instead of a “Z” pattern (row after row).

Rule(3) introduced a FORCE_COL keyword that forces Web Intelligence to run calculations in a “N” pattern.

For example, with Rule(3), the RunningSum([Sales revenue];([State])) formula will be forced to execute column after column when modified as RunningSum([Sales revenue]:FORCE_COL;([State])).

This rule applies to every document migrated from every version of XI 3.x, 4.0 Patch 2.20, 4.0 SP5, 4.0 SP6, 4.0 SP7, 4.1 and 4.1 SP1.
6.6.8.2 Formula error and information messages

You can format report data that returns error messages using conditional formatting.

In some cases a formula cannot return a value and returns an error or information message beginning with "#". The message appears in the cell in which the formula is placed.

6.6.8.2.1 #COMPUTATION

#COMPUTATION occurs when a slicing dimension specified in the RelativeValue function is no longer available in the calculation context of the block where the function is placed.

#COMPUTATION also occurs when a merged object containing a hierarchy is included in a report.

#COMPUTATION is also related to the misuse of context operators in a formula.

Related Information

RelativeValue [page 822]

6.6.8.2.2 #CONTEXT

#CONTEXT appears in a measure when the measure has a non-existent calculation context.

#CONTEXT is related to the #INCOMPATIBLE and #DATASYNC error messages, which appear in dimensions when a block contains a non-existent calculation context.

In the case of #INCOMPATIBLE the context is non-existent because the dimensions are incompatible; in the case of #DATASYNC the context is non-existent because the dimensions are from multiple unsynchronized data providers.

Example

Non-existent calculation context in a query

If a block based on the Island Resorts Marketing universe contains the Reservation Year and Revenue objects, the #CONTEXT error message appears because it is not possible to aggregate revenue by reservation year. (Reservations have not yet generated any revenue.)
6.6.8.2.3  #DATASYNC

#DATASYNC occurs when you place a dimension from a different data provider in a block containing dimensions from another data provider, and the two data providers are not synchronized through a merged dimension.

#DATASYNC appears in all dimensions in the block and #CONTEXT in the measures.

Example

Dimensions from different data providers in a block

If a report based on the Island Resorts Marketing universe contains data providers with the objects (Year, Revenue) and (Quarter), a block containing Year, Quarter and Revenue displays #DATASYNC in the Year and Quarter columns because the two data providers are not synchronized through a merged dimension.

6.6.8.2.4  #DIV/0

#DIV/0 occurs when a formula tries to divide a number by zero, which is mathematically impossible.

Zero can never appear as a divisor.

Example

Determining revenue per item

You have a report showing sales revenues, numbers of items sold and the revenue per item (which is calculated by dividing the sales revenue by the number of items sold).

You had a very bad quarter in which you didn’t create any revenue; the Revenue per Item column returns #DIV/0 for this quarter, because the formula is attempting to divide by zero; that is, divide the revenue by zero number of items sold.

6.6.8.2.5  #ERROR

#ERROR is the default error message that covers all errors not covered by other error messages.

6.6.8.2.6  #EXTERNAL

#EXTERNAL occurs when a formula references an external function that is not available to use in Web Intelligence.
6.6.8.2.7 #INCOMPATIBLE

#INCOMPATIBLE occurs when a block contains incompatible objects.

- **Example**
  Incompatible objects in a query
  If a block based on the Island Resorts Marketing universe contains the Year and Reservation Year dimensions, the columns containing these dimensions show #INCOMPATIBLE because these objects are incompatible.

6.6.8.2.8 #MIX

#MIX occurs when an aggregated measure has different units.

For example, a cell shows #MIX if it aggregates currency values denominated in different currencies.

6.6.8.2.9 #MULTIVALUE

#MULTIVALUE occurs when you place a formula that returns more than one value in a cell that outputs one value only.

- **Example**
  Multivalue in a cell
  You have a report showing Country, Resort and Revenue and you add a cell to the report containing the formula [Revenue] ForEach ([Country]). This cell returns #MULTIVALUE because Country has two values in the report: ‘US’ and ‘France’.

  One cell cannot display the revenues for both the US and France. Placed outside the table, a cell containing revenue can only aggregate the revenues in the table in some way (for example by summing or averaging them).

  If the report is broken into sections on Country, the formula is correct when placed in a section because there is only one value of Country per section. Outside a section, however, the formula still returns #MULTIVALUE.

6.6.8.2.10 #N/A

When there is a value for a cell in report that is based on a value from a report that is not available on the underlying database (for example, a BW error in a BEx Cell), the cell displays #N/A (not available), meaning that the cell is empty because the data cannot be retrieved.
6.6.8.2.11 #OVERFLOW

#OVERFLOW occurs when a calculation returns a value that is too large for the software to handle. This value, in exponential form, is 1.7E308 (1.7 followed by 307 zeros).

6.6.8.2.12 #PARTIALRESULT

#PARTIALRESULT occurs when all rows associated with a report object were not retrieved.

If #PARTIALRESULT occurs often in your reports and you have the appropriate security rights, modify the MaxRowsRetrieved query property to allow the retrieval of more data. If you do not have the right to modify the query, contact the BI administrator.

If your report contains smart measures it is more likely to display #PARTIALRESULT because smart measures require the retrieval of larger amounts of data than classic measures.

6.6.8.2.13 #RANK

#RANK occurs when you try to rank data based on an object that depends on the order of values.

Objects that use the Previous function or any running aggregate function depend on the order of values. Ranking causes these objects to recalculate their values, which then changes the ranking, resulting in a circular dependency. Such a dependency can occur either when you use the Rank dialog box to create a ranking, or when you use the Rank function.

▶ Example

**Ranking on running average or previous values**

If you attempt to rank a block on a column that contains the Previous function or any running aggregate function, the entire block returns #RANK.

6.6.8.2.14 #RECURSIVE

#RECURSIVE occurs when it is not possible to perform a calculation due to a circular dependency.

▶ Example

**Using the NumberOfPages(), Page() and PageInSection() functions**

If you place the NumberOfPages, Page and PageInSection functions in a cell whose Autofit Height or Autofit Width properties are set, the cell returns #RECURSIVE because the placing of these formulas in an Autofit cell creates a circular dependency. These functions need the exact size of the report to return a value, but the size of the cell, which affects the size of the report, is determined by the cell content.
### 6.6.8.2.15 #REFRESH

#REFRESH appears in report cells whose values are derived from objects that were stripped from a query and then re-added to the query.

Objects are stripped from a query when the *Enable query stripping* query property is selected and the objects do not contribute to any reports based on the query.

The cells are re-populated with values from the objects when the query is refreshed.

### 6.6.8.2.16 #SECURITY

#SECURITY occurs when you attempt to use a function for which you do not have security rights.

#### Example

**Using the `DataProviderSQL()` function**

If a user who does not have the right to view data provider SQL places the `DataProviderSQL()` function in a cell, the #SECURITY message appears in the cell.

### 6.6.8.2.17 #SYNTAX

#SYNTAX occurs when a formula references an object that no longer exists in the report.

#### Example

**Referencing a non-existent object**

You have a report that originally showed Year, Quarter and Sales revenue, with an additional column showing difference between the revenue and the average yearly revenue. This figure is given by the variable *Difference from Yearly Average*.

If the *Difference from Yearly Average* variable is deleted from the report, the column containing it returns #SYNTAX.

### 6.6.8.2.18 #TOREFRESH

#TOREFRESH appears in cells based on smart measures when the value returned by the smart measure is not available.

This situation occurs when the grouping set containing the value is not available in the data provider.

You remove the #TOREFRESH error by refreshing the data.

Some of the measures are "delegated" (for BW, this refers to a measure which is not aggregating with SUM); when you define a table or calculation on a measure, this measure is queried in specific context of aggregation.
(the measure is given for a set of dimensions). If this set of dimensions is a subset of the query dimension set, the measure has to be aggregated along the given dimension set (or grouping set that is referring to a group by clause in SQL).

For normal measures the system is carrying out the aggregation, for delegated measures this aggregation is delegated to the underlying database. For this the system needs to query again this database. Since this is not automatic, it displays #TOREFRESH and waits for the user to proceed with a refresh. Once the user refreshes, the system will run the additional query to get the requested aggregation and then replace #TOREFRESH by the appropriate value.

6.6.8.2.19 #UNAVAILABLE

#UNAVAILABLE appears when it is not possible to calculate the value of a smart measure.

This occurs when it is not possible to display the values in a filtered smart measure without applying a filter to the query. Because this carries a risk of impacting other reports based on the same query, no filter is applied.

6.6.9 Comparing values using functions

6.6.9.1 Comparing values using the Previous function

The Previous function returns a comparative previous value of an expression.

The value returned depends on the layout of the report.

For more powerful comparison capabilities, use the RelativeValue function. RelativeValue returns a previous or subsequent comparative value of an expression. The value returned does not depend on the layout of the report.

Related Information

Previous [page 818]
RelativeValue [page 822]
Comparing values using the RelativeValue function [page 870]

6.6.9.2 Comparing values using the RelativeValue function

The RelativeValue function returns comparative values of an expression. The function returns these values independently of the layout of a report.

When using RelativeValue, you specify the following:
• The expression whose comparative value you want to find (the expression must be a measure or a detail of a dimension available in the block)
• The list of slicing dimensions
• The offset.

The function uses the slicing dimensions, the offset, and the sub-axis dimensions (which are implied by the slicing dimensions) to return a comparative value. The sub-axis dimensions are all the other dimensions in the calculation context apart from the slicing dimensions.

Expressed in general terms, RelativeValue returns the value of the expression in the row which, in the list of values of the slicing dimensions, is offset rows removed from the current row, and where the values of the sub-axis dimensions are the same as in the current row.

**Note**

All slicing dimensions must always be in the calculation context of the block in which the function is placed. If a slicing dimension is subsequently removed, the function returns #COMPUTATION.

**Example**

In this example, the RelativeValue column contains the following formula:

```
RelativeValue([Revenue];([Year]);-1)
```

• The expression is [Revenue];
• The slicing dimension is [Year];
• The offset is -1 (the function returns the immediately previous value in the list).

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Wilson</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Harris</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>4000</td>
<td>1000</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td>2000</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Wilson</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Harris</td>
<td>1700</td>
<td>3000</td>
</tr>
</tbody>
</table>

Expressed as a business question, the formula returns the revenue generated by the same sales person in the same quarter in the previous year.

Expressed as a calculation in words, the formula returns the value of [Revenue] (the expression) in the row where the value of [Year] (the slicing dimension) is the previous value from the list of values of the [Year] object, and where the values of [Quarter] and [Sales Person] (the sub-axis dimensions) are the same as in the current row.
6.6.9.2.1 Slicing dimensions and the RelativeValue function

The RelativeValue function uses the list of values of the slicing dimensions to find the comparative row.

The function returns the comparative value of the expression specified in the function that is offset number of rows away in the list of slicing dimensions.

As a result, the sort order of the slicing dimensions is crucial in determining the function output.

Example

Multiple slicing dimensions

In the table below, the RelativeValue column has the following formula:

\[
\text{RelativeValue([Revenue];([Year];[Quarter]);-1)}
\]

- The expression is [Revenue];
- The slicing dimensions are ([Year];[Quarter]);
- The offset is -1 (the function returns the immediately previous value in the list).

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Smith</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Smith</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Smith</td>
<td>3000*</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Jones</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Jones</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>5000**</td>
<td>3000*</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Smith</td>
<td>3000***</td>
<td>5000**</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Smith</td>
<td>2700****</td>
<td>3000***</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Smith</td>
<td>6800</td>
<td>2700****</td>
</tr>
</tbody>
</table>

Expressed as a business question, the formula returns the revenue generated by the same sales person in the previous quarter.

Expressed as a calculation in words, the formula returns the value of [Revenue] in the row where the values of [Year] and [Quarter] represent the previous value in the ([Year];[Quarter]) list of values, and where the value of [Sales Person] is the same as in the current row.

The function uses the list of values of the slicing dimensions to find the comparative revenue:
The sort order of the slicing dimensions determines the output of the function. The * in the tables show the sort order.

### Related Information

**RelativeValue** [page 822]

#### 6.6.9.2.2 Slicing dimensions and sections

A slicing dimension can be in the section master cell of a report.

**Example**

Slicing dimension in a section header

In the table below, the RelativeValue column has the following formula:

```
RelativeValue([Revenue];([Year];[Quarter]);-1)
```

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Smith</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>Smith</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>Smith</td>
<td>3000*</td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>Jones</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
</tbody>
</table>
The function uses the list of values of the slicing dimensions to find the comparative revenue:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
</tr>
</tbody>
</table>

The sort order of the slicing dimensions determines the output of the function. The * in the tables show the sort order.

### Related Information

- RelativeValue [page 822]

#### 6.6.9.2.3 Order of slicing dimensions

Because the sort order of the list of values of the slicing dimensions determines the output of RelativeValue, the order in which the slicing dimensions are specified impacts the output of the function.

**Example**

**Order of slicing dimensions**

In the table below, the RelativeValue column has the following formula:

```
RelativeValue([Revenue];([Year];[Quarter]);-1)
```
<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Smith</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Smith</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Smith</td>
<td>3000*</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Jones</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Jones</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>5000**</td>
<td>3000*</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Smith</td>
<td>3000***</td>
<td>5000**</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Smith</td>
<td>2700****</td>
<td>3000***</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Smith</td>
<td>6800</td>
<td>2700****</td>
</tr>
</tbody>
</table>

Expressed as a business question, the formula returns the revenue generated by the same sales person in the previous quarter.

The sort order of the slicing dimensions is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
</tr>
</tbody>
</table>

The function is changed to:

```
RelativeValue([Revenue];([Quarter];[Year]);-1)
```

The sort order of the slicing dimensions becomes:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>2007</td>
</tr>
<tr>
<td>Q1</td>
<td>2008</td>
</tr>
<tr>
<td>Q2</td>
<td>2007</td>
</tr>
<tr>
<td>Q2</td>
<td>2008</td>
</tr>
<tr>
<td>Q3</td>
<td>2007</td>
</tr>
</tbody>
</table>
The sort order has the following impact on the function result:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000*</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Smith</td>
<td>2000***</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Smith</td>
<td>1500*****</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Smith</td>
<td>3000*******</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Jones</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Jones</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>5000**</td>
<td>1000*</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Smith</td>
<td>3000****</td>
<td>2000***</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Smith</td>
<td>2700******</td>
<td>1500*****</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Smith</td>
<td>6800********</td>
<td>3000*******</td>
</tr>
</tbody>
</table>

Expressed as a business question, the formula now returns the revenue generated by the same sales person in the same quarter of the previous year.

The change in the sort order of the slicing dimension changes the meaning of the formula. The * in the tables indicate the sort order.

**Related Information**

*RelativeValue [page 822]*
6.6.9.2.4 Slicing dimensions and sorts

Because the sort order of the list of values of the slicing dimensions determines the function output, a sort applied to any dimension in the slicing dimensions impacts the function output.

Example

A custom sort applied to a slicing dimension

In the table below, the RelativeValue column has the following formula:

\[
\text{RelativeValue}([\text{Revenue}] ; ([\text{Year}] ; [\text{Quarter}]) ; -1)
\]

A custom sort (Q1, Q2, Q4, Q3) is applied to [Quarter], giving the following result for the function:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Sales Person</th>
<th>Revenue</th>
<th>RelativeValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Smith</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Smith</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Smith</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Smith</td>
<td>1500*</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q1</td>
<td>Jones</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
<td>Jones</td>
<td>3400</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
<td>Jones</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
<td>Jones</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
<td>Smith</td>
<td>5000**</td>
<td>1500*</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
<td>Smith</td>
<td>3000***</td>
<td>5000**</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
<td>Smith</td>
<td>6800****</td>
<td>3000***</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
<td>Smith</td>
<td>2700</td>
<td>6800****</td>
</tr>
</tbody>
</table>

The sorted list of slicing dimensions is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Q1</td>
</tr>
<tr>
<td>2007</td>
<td>Q2</td>
</tr>
<tr>
<td>2007</td>
<td>Q4</td>
</tr>
<tr>
<td>2007</td>
<td>Q3</td>
</tr>
<tr>
<td>2008</td>
<td>Q1</td>
</tr>
<tr>
<td>2008</td>
<td>Q2</td>
</tr>
<tr>
<td>2008</td>
<td>Q4</td>
</tr>
<tr>
<td>2008</td>
<td>Q3</td>
</tr>
</tbody>
</table>

The * in the tables show the sort order.
6.6.9.2.5 Using RelativeValue in crosstabs

The RelativeValue function works in crosstabs in exactly the same way as in vertical tables. The layout of the data in a crosstab has no impact on the function output.
7 Scheduling and publishing documents

7.1 Introduction to scheduling and publishing

The following sections introduce you to the basic concepts and main functionalities of the scheduling and publishing services offered by the Business Intelligence Platform.

With scheduling and publishing operations, you can send publications with the latest information and data. Both services are about managing assets of your Central Management Server (CMS) such as Web Intelligence documents. At the end of this section, you will be able to schedule documents, publish them, and fine-tune both processes along the way.

This section focuses mainly on the scheduling and publishing possibilities offered by the Business Intelligence Launch Pad. However, the Central Management Console (CMC) lets you schedule and publish documents as well.

7.1.1 Scheduling and publishing concepts

7.1.1.1 Instances

An instance is a single version of a document or publication. For each scheduled document that runs, the BI Platform saves a history of instances to the default Enterprise server.

For each document or publication, the list of instances is available in the History dialog box in the contextual menu when you right-click it. The following information are available:

- Instance time
- Title
- Status
- Created by
- Type
- Parameters

You can view discussions for an instance in the History dialog box or in the Collaboration drawer of the feed panel, if the BI launch pad is integrated with SAP Jam.
# 7.1.1.2 Recurrence

The recurrence pattern defines how often you want the BI Platform to run a document.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>Runs the document once, immediately.</td>
</tr>
<tr>
<td>Once</td>
<td>Runs the document once at a specified time. If you schedule a document with events, it will run once if the event is triggered between the start and end times.</td>
</tr>
<tr>
<td>Hourly</td>
<td>Creates an instance every N hours and X minutes between the interval of dates you specify.</td>
</tr>
<tr>
<td>Daily</td>
<td>Runs the document once every N days between the interval of dates you specify. The first instance will be created at the specified start time, and instances will be created every N days at that time until the document stops running at the specified end time.</td>
</tr>
<tr>
<td>Weekly</td>
<td>Runs the document each week on selected days between the interval of dates you specify. The first instance will be created at the specified start time, and instances will be created each week on those days at that time until the document stops running at the specified end time.</td>
</tr>
<tr>
<td>Monthly</td>
<td>Runs the document once every N months between the interval of dates you specify. The first instance will be created at the specified start time, and instances will be created every N months at that time until the document stops running at the specified end time.</td>
</tr>
<tr>
<td>Nth Day of Month</td>
<td>Creates an instance each month on the specified day, at the specified start time. The first instance will be created at the specified start time, and instances will be created on the specified day of each month at that time until the document stops running at the specified end time.</td>
</tr>
<tr>
<td>1st Monday of Month</td>
<td>Creates an instance on the first Monday of each month between an interval of dates.</td>
</tr>
<tr>
<td>Last Day of Month</td>
<td>Creates an instance on the last day of each month between an interval of dates.</td>
</tr>
<tr>
<td>X Day of Nth Week of the Month</td>
<td>Creates an instance each month on a specified day and week at a specified start time between an interval of dates.</td>
</tr>
<tr>
<td>Calendar</td>
<td>Creates an instance on each calendar date you specify at a specified start time.</td>
</tr>
</tbody>
</table>
7.1.1.3 Prompts

A prompt is a filter in the form of a question displayed by Web Intelligence that you answer by selecting specific values.

When you answer a prompt, it determines the data displayed in a report. If you are working in sales for example, and a prompt asks you to select a region, the document will only display data related to the region you selected.

When a document is scheduled, prompts can have static values and are specified when creating the scheduling job. For SAP Business Explorer (SAP BEx) queries, you can fill prompts dynamically using BW variables default values. This mechanism supports any type of SAP Business Warehouse (SAP BW) default values including SAP exit variables.

The support of dynamic prompt values is also available for SAP HANA variables and universe prompts parameters that contain dynamic expressions in their default values.

**Note**

To have dynamic prompt values in a scheduled document on BEx, make sure that:
- You select the *Use BEx query defined default values at runtime* option in the Variable Manager wizard.
- You purge document data using the *Purge Last Selected Prompt Values* option.
- You purge the prompt(s) value(s) when creating the scheduling job.

The way that options appear in the tab might differ from a document to another, depending on how you system administrator has configured the prompts.

**Note**

If you cannot see the *Prompts* tab, that is because the document you are scheduling doesn’t contain prompts.

**Constant and dynamic values processing**

You can modify a prompt’s value by clicking either *Modify* to edit a value, *Constant Value* or *Dynamic Value* to set it to dynamic or constant.

Constant values are fixed values that don’t require calculations. Web Intelligence can schedule documents with constant values immediately.

SAP BEx variables, SAP HANA variables and Universe variables can support dynamic values. Dynamic values contain expressions and require calculations at runtime. Web Intelligence delegates the calculations to the backend (either the Universe Information Engine, SAP BEx or SAP HANA), and schedules the document after the values are computed. SAP BW exit or customer exit variables for example are often used as dynamic variables in prompts.
7.1.1.4 Formats

You can save an instance in different formats after the BI Platform generates it.

When you schedule a document you can save an instance in the following formats:

- Web Intelligence: .WID
- Microsoft Excel: .XLSX
- Adobe Acrobat: .PDF
- Comma Separated Values (CSV) - Data: .CSV
- Comma Separated Values (CSV) archive - Reports: .ZIP
- Plain text: .TXT
- HTML archive: .ZIP

When you publish a document you can save an instance in the following formats:

- Web Intelligence: .WID
- Microsoft Excel: .XLSX
- Adobe Acrobat: .PDF
- MIME HTML: .MHTML

**CSV formats**

You can choose to save the following CSV options:

- CSV - Data: generates a CSV file with the contents of the data provider.
- CSV archive - Reports: generates a ZIP file of CSV files. Each CSV corresponds to one report and contains the report data.

**HTML archive**

When you schedule a document to save an HTML archive, you select the reports to include in the archive and make sure that each report has a unique name.

The HTML archive contains the following files and folders in a single ZIP file that you can download:

- A default `index.html` file that contains links to the reports in the archive. To see a report, you click the link with the report name. You can replace the default `index.html` file with one you create to suit your business needs.
- A JavaScript file, `report.js` returns the report names from the document included in the archive. This script is used to generate the links in the `index.html` file.
- A sub-folder for each report in the archive. The sub-folder contains additional content for the report.

Note that your administrator manages the resolution (DPI) for charts rendered as pictures through scheduling in the `C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\java\lib\procWebiPublishing.properties` file.

#webi_scheduling/publishing_properties
When the destination for a ZIP file is File System, FTP or Secured FTP and you are defining a schedule, you can choose between the options to automatically name the ZIP file based on BI Platform rule or to name it explicitly.

Related Information

Exporting documents, reports or data [page 514]

### 7.1.1.5 Caching

Each time the BI Platform runs a scheduled document, an instance is generated and saved in the Output File Repository System. You can select the format used to cache the document.

Before selecting a cache format, make sure that:

- A context is set in the Web Intelligence document. If there are multiple contexts, refresh the document with the correct context before scheduling it
- Web Intelligence is selected as the output format for the document. If a different output format is selected, cache options will have no effect.

⚠️ Caution

If you do not select a cache format, the platform will not cache the document.

### 7.1.1.6 Events

Event-based scheduling and publishing provides you with additional control over scheduled documents and publications. You can set up events so that documents are processed only after a specified event occurs.

To successfully schedule a document with an event, you need to create the event first and then schedule the document. After you have created the event, you can select it as a mandatory condition to trigger the scheduling job. If and only if the event occurs, the BI Platform triggers the scheduling job.

You create events in the Central Management Console (CMC), and then select them in the BI launch pad when you schedule documents. For more information on how to create event, refer to the dedicated sections of the *SAP BusinessObjects Business Intelligence Platform User Guide*. 
7.1.7 Scheduling server group

You can set the default server to run the scheduled document. There are three available options regarding the server group:

- **Use the first available server**: runs the document on the server with the most resources free at the time of scheduling. This is the default selection.
- **Give preference to servers belonging to the selected group**: runs the document on servers in a particular server group. If no servers in the selected server group are available, the document runs on the next available server.
- **Only use servers belonging to the selected group**: runs the document only on servers in a particular server group. If no servers in the selected server group are available, the document runs on the next available server.

As a best practice, if your deployment of the BI Platform uses federation and you want to run the document at the site where it is located, check the *Run at origin site* option.

7.1.8 Destinations

You can schedule a document instance to be sent to a specific destination.

The destinations available depend on the destinations your system administrator has enabled and on your access rights. If your administrator specified a destination for an object, that destination option is listed in the Schedule dialog box. You may be able to set options for the destination or to select a different destination. For most destinations, you must provide additional information.

**Note**

You can change options for the default Adaptive Job Server in the Servers area of the Central Management Console (CMC). For more information, refer to SAP BusinessObjects Business Intelligence Platform Administrator Guide.

### Default Enterprise Location options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination</strong></td>
<td><strong>Default Enterprise Location</strong></td>
</tr>
<tr>
<td></td>
<td>The scheduled job will run on the Output File Repository Server (FRS). You do not need to set additional options for this destination. Historical instances are saved to the default Enterprise server but not to any other destination.</td>
</tr>
</tbody>
</table>
## BI Inbox options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination</strong></td>
<td><strong>BI Inbox</strong></td>
</tr>
</tbody>
</table>
| **Keep an instance in the history** | Saves a copy of this instance in the document's history. This option is enabled by default.  
If you want the BI platform to automatically delete the instance from the Output FRS to minimize the number of instances on the server, uncheck the option.  
Even when this option is unchecked, the history keeps the instances of scheduled documents that weren't sent because they failed to meet a delivery rule. |
| **Use default settings** | Uses the default Adaptive Job Server values for BI Inboxes.  
If you do not want to use the default Adaptive Job Server values, disable the option, and set the destination recipient options that appear. |
| **Available Recipients and Selected Recipients** | In the **Available Recipients** list, select users or user groups to send the instance to, and click > to add the users or groups to the **Selected Recipients** list. |
| **Find title (if available)** | Enter a recipient's user name, full name, or email address in the **Find title** box to quickly locate the user in the **Available Recipients** list. |
| **Target Name**         |  
- To use a system-generated file name for the instance, select **Use Automatically Generated Name**.  
- To choose a file name for the instance, select **Use Specific Name**, and enter a name or select variables for the file name from the **Add placeholder** list. You can select from several types of variables: **Title**, **ID**, **Owner**, **DateTime**, (your) Email Address, and (your) User Full Name, and **File Extension**. |
| **Send As**             |  
- To send a shortcut to the instance to recipients, select **Shortcut**.  
- To send a copy of the instance to recipients, select **Copy**. |

## Email options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination</strong></td>
<td><strong>Email</strong></td>
</tr>
</tbody>
</table>
| **Keep an instance in the history** | Saves a copy of this instance in the document's history. This option in enabled by default.  
If you want the BI platform to automatically delete the instance from the Output FRS to minimize the number of instances on the server, uncheck the option.  
Even when this option is unchecked, the history keeps the instances of scheduled documents that weren't sent because they failed to meet a delivery rule. |
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use default settings</td>
<td>Uses the default Adaptive Job Server values for emails. If you do not want to use the default Adaptive Job Server values, disable the option, and set the destination recipient options that appear.</td>
</tr>
<tr>
<td>From</td>
<td>Enter a return email address, or select variables for the email address from the Add placeholder list. You can select from several types of variables: ID, Owner, Date Time, (your) Email Address, and (your) User Full Name. Click a variable to add it. Separate email addresses with a semicolon (;). This option might be unavailable depending on your system configuration.</td>
</tr>
<tr>
<td>To</td>
<td>Enter each email address that you want to send the instance to, or select variables for the email address from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, and (your) User Full Name. Click a variable to add it. Separate email addresses with a semicolon (;).</td>
</tr>
<tr>
<td>Cc</td>
<td>Enter each email address that you want to send a copy of the email and instance to, or select variables for the email address from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, and (your) User Full Name. Click a variable to add it. Separate email addresses with a semicolon (;).</td>
</tr>
<tr>
<td>Bcc</td>
<td>Enter the email address of each undisclosed recipient, or select variables for the email address from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, and (your) User Full Name. Click a variable to add it. Separate email addresses with a semicolon (;).</td>
</tr>
<tr>
<td>Subject</td>
<td>Enter the subject of the email, or select variables for the subject from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, and (your) User Full Name. Click a variable to add it.</td>
</tr>
<tr>
<td>Message</td>
<td>Enter the message for the body of the email, or select variables for the message from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, (your) User Full Name, Viewer, and Document Name. Click a variable to add it.</td>
</tr>
<tr>
<td>Add Attachment</td>
<td>Select this check box if you want to add an attachment to the email message containing the instance.</td>
</tr>
<tr>
<td>File Name</td>
<td>• To use a system-generated file name for the instance, check Use Automatically Generated Name.</td>
</tr>
<tr>
<td></td>
<td>• To select the file name for the instance, check Use Specific Name, and enter a name or select variables for the file name from the Add placeholder list. You can select from several types of variables: Title, ID, Owner, Date Time, (your) Email Address, (your) User Full Name, and File Extension. Check Add File Extension to automatically add the file extension to the instance file name. If you do not add a file extension, you might be unable to open the document.</td>
</tr>
</tbody>
</table>

Enable SSL
## FTP Server options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination</strong></td>
<td>FTP Server</td>
</tr>
<tr>
<td><strong>Keep an instance in the history</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Use default settings</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Host</strong></td>
<td>Enter the port of the FTP server where you want to send the instance. The default is 21.</td>
</tr>
<tr>
<td><strong>Port</strong></td>
<td>Enter the port of the FTP server where you want to send the instance. The default is 21.</td>
</tr>
<tr>
<td><strong>User Name</strong></td>
<td><strong>Account</strong></td>
</tr>
<tr>
<td><strong>Password</strong></td>
<td><strong>Directory</strong></td>
</tr>
<tr>
<td><strong>File Name</strong></td>
<td>• To use a system-generated file name for the instance, check Use Automatically Generated Name.</td>
</tr>
</tbody>
</table>
### File System options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination</strong></td>
<td><strong>File System</strong></td>
</tr>
</tbody>
</table>
| **Keep an instance in the history** | Saves a copy of this instance in the document’s history. This option is enabled by default.  
If you want the BI platform to automatically delete the instance from the Output FRS to minimize the number of instances on the server, uncheck the option.  
Even when this option is unchecked, the history keeps the instances of scheduled documents that weren’t sent because they failed to meet a delivery rule. |
| **Use default settings**  | Uses the default Adaptive Job Server values for the file system.  
If you do not want to use the default Adaptive Job Server values, disable the option, and set the destination recipient options that appear.                                                                 |
| **User Name**             | Enter a user name with access rights to save files to the destination directory.  
You can specify a user name and password only for servers on Windows.                                                                                                                                     |
| **Password**              | Enter the user password that is required to access the destination directory.  
You can specify a user name and password only for servers on Windows.                                                                                                                                     |
| **Directory**             | Enter the path to a local hard disk location or mapped location or a UNC path to the directory where you want to send the instance.  
If you are scheduling a Web Intelligence document and want to create folders based on variables (such as the title of the instance, owner, date and time, or user names), use a placeholder. The placeholder is inserted after the text in the box. |
| **File Name**             |  
• To use a system-generated file name for the instance, check **Use Automatically Generated Name**.  
• To select the file name for the instance, check **Use Specific Name**, and enter a name or select variables for the file name from the **Add placeholder** list. You can select from several types of variables: **Title**, **ID**, **Owner**, **DateTime**, (your) **Email Address**, (your) **User Full Name**, and **File Extension**.  
Check **Add File Extension** to automatically add the file extension to the instance file name. If you do not add a file extension, you might be unable to open the document. |

### 7.1.1.9 Publications

A publication is a collection of documents that you send to a mass audience. Before distributing the documents, you, as the publisher, define the publication using a collection of metadata. The metadata include the publication source, its recipients, and the personalization applied.

Using publications, you send information to your organization efficiently. You can:
- Distribute information to users or groups of users and personalize the information each user or group receives.
- Deliver targeted business information to users or groups of users through a password-protected portal or across an intranet, an extranet, or the Internet.
- Minimize database access by eliminating the need for users to send process requests.

You can create publications using either the BI Launch Pad or the CMC.

Rights appendix

As a publisher, you own the publication and are responsible for scheduling it. You can view all publication instances for all recipients. Recipients can view only their own personalized publication instances.

These viewing rights ensure maximum security for publication data as only you, as a publisher, have rights to schedule publications and view all publication instances.

If you want to add yourself to a publication as a recipient, create two user accounts for yourself: a publisher account and a recipient account. The publisher account grants you access rights to design and to schedule publications, and the Recipient account grants you the access rights of a typical recipient.

The table below details the different rights necessary to each role to complete specific tasks.

<table>
<thead>
<tr>
<th>Role</th>
<th>Task</th>
<th>Rights required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document designer</td>
<td>Create a document to base a publication on</td>
<td>None</td>
</tr>
<tr>
<td>Document designer</td>
<td>Add a document to the BI platform</td>
<td>View right and Add right on the folder or category that the document will be added to</td>
</tr>
<tr>
<td>Document designer</td>
<td>Create a document to use as a dynamic recipient source</td>
<td>View right and Add right on the folder or category that the document will be added to</td>
</tr>
<tr>
<td>Publisher</td>
<td>Create a publication</td>
<td>• Add right on the folder where the publication is saved&lt;br&gt;• View right on the users and the user groups intended as recipients&lt;br&gt;• View right on the profile that will be used for personalization&lt;br&gt;• View right on documents in the publication&lt;br&gt;• Schedule right on documents in the publication&lt;br&gt;• Schedule right on Enterprise recipients</td>
</tr>
<tr>
<td>Role</td>
<td>Task</td>
<td>Rights required</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Publisher</td>
<td>Schedule a publication</td>
<td>Only the publisher should have the Schedule a publication right.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right, Schedule right, Add right, and Modify Security right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Delete Instance right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right on the users and the user groups intended as recipients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right on the profile that will be used for personalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right and Schedule right on documents in the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right and Refresh right on the dynamic recipient source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right and Refresh right on the document that the delivery rule is set for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Data Access right on universes used by publication objects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Data Access right on universe connections used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When scheduling to a BI Inbox, Add right and View right on each recipient’s BI Inbox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Modify the right users have to objects right on the folder containing the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Subscribe right on recipients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When a publisher wants to print publication instances, Print right on Crystal report source documents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If you selected <strong>One database fetch per recipient</strong>, Schedule on behalf of other users right on Enterprise recipients</td>
</tr>
<tr>
<td>Role</td>
<td>Task</td>
<td>Rights required</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Publisher  | Retry a failed publication instance | • Edit right on the publication instance  
• View right, Subscribe right, Add right, and Modify Security right on the publication  
• Delete Instance right on the publication  
• View right on the users and the user groups intended as recipients  
• View right on the profile that will be used for personalization  
• View right and Schedule right on documents in the publication  
• View right and Refresh right on the dynamic recipient source  
• View right and Refresh right on the document for which the delivery rule is set  
• Data Access right on universes used by publication objects  
• Data Access right on universe connections used  
• When scheduling to a BI Inbox, Add right and View right on each recipient’s BI Inbox  
• Modify the right users have to objects right on the folder containing the publication  
• Subscribe right on recipients  
• When a publisher wants to print publication instances, Print right on Crystal report source documents  
• If you selected *One database fetch per recipient*, Schedule on behalf of other users right on Enterprise recipients |

- **Publisher**
  - Retry a failed publication instance
  - Edit right on the publication instance
  - View right, Subscribe right, Add right, and Modify Security right on the publication
  - Delete Instance right on the publication
  - View right on the users and the user groups intended as recipients
  - View right on the profile that will be used for personalization
  - View right and Schedule right on documents in the publication
  - View right and Refresh right on the dynamic recipient source
  - View right and Refresh right on the document for which the delivery rule is set
  - Data Access right on universes used by publication objects
  - Data Access right on universe connections used
  - When scheduling to a BI Inbox, Add right and View right on each recipient’s BI Inbox
  - Modify the right users have to objects right on the folder containing the publication
  - Subscribe right on recipients
  - When a publisher wants to print publication instances, Print right on Crystal report source documents
  - If you selected *One database fetch per recipient*, Schedule on behalf of other users right on Enterprise recipients
### Role Task Rights required

<table>
<thead>
<tr>
<th>Role</th>
<th>Task</th>
<th>Rights required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publisher</td>
<td>Redistribute a publication instance</td>
<td>• View right, Schedule right, Add right, and Modify Security right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When scheduling to a BI Inbox, Add right and View right on each recipient’s BI Inbox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View Instance right and Edit right on the publication instance</td>
</tr>
<tr>
<td>Recipient</td>
<td>View a publication</td>
<td>Rights that enable you to see a publication object in the BI platform:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• View Instance right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You do not need these rights to see content sent to a BI Inbox...</td>
</tr>
<tr>
<td>Recipient</td>
<td>Subscribe to or unsubscribe from a publication</td>
<td>• View right on the publication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Subscribe right on Enterprise recipients</td>
</tr>
</tbody>
</table>

### 7.1.1.10 Report Bursting

During publishing, data in documents is refreshed against data sources and personalized before a publication is delivered to recipients. This process is known as report bursting.

Depending on the size of a publication and how many recipients it is intended for, you can use the following report bursting methods:

- **One database fetch for all recipients**: All documents in a publication are refreshed once, personalized, and delivered to each recipient. This report bursting method uses the data source logon credentials of the publisher to refresh data. This is the default option for Web Intelligence document publications and the recommended option to minimize the impact of publishing on your database. The performance of this option depends on the number of recipients. This option is secure only when source documents are delivered as static documents. For example, a recipient who receives a Web Intelligence document in its original format can modify the document and view data associated with other recipients. However, if the document is delivered as a PDF file, data is secure.

- **One database fetch per recipient**: Data in a document is refreshed for every recipient. This report bursting method uses the data source logon credentials of the recipient to refresh data. For example, if there are five recipients for a publication, the publication is refreshed five times. This option is recommended for maximum security for delivered publications.
7.1.10.1 To select a report bursting method in the CMC

You select a report bursting method to determine how source documents are personalized, processed, and delivered in a publication.

Prerequisites

Before selecting a report bursting method, ensure that the publication contains Web Intelligence documents intended for Enterprise recipients and that profiles used for personalization have filter expressions.

Context

Report bursting methods use different filter types to personalize and process documents. For example, the One database fetch for all recipients option uses a report filter and the One database fetch per recipient option uses a query filter. Each filter type supports a different set of operators. If a filter expression uses an operator that the report bursting method does not support, the publication can fail.

You can select a report bursting method only in the Central Management Console (CMC).

Procedure

1. In the CMC, click Folders, and locate the publication to select a report bursting method for.
2. Right-click the publication job and select Schedule.
3. In the Schedule dialog box, expand Additional Options, and click Advanced.
5. Click Schedule.

7.1.11 Enterprise and dynamic recipients

You can send publications to enterprise recipients via a BI Inbox, email, FTP, the file system, and collaboration or to dynamic recipients via email.

Enterprise recipients are users who are part of the BI platform system.

Dynamic recipients are non-enterprise users, either outside of your network or not configured with users, groups, profiles, security, and so on. For example, dynamic recipients might be suppliers of your company’s monthly office supplies and inventory. A BI Inbox is not a valid destination for dynamic recipients because they do not have a BusinessObjects Enterprise user account.

Dynamic recipients are different from enterprise recipients in the following ways:
Publications can be sent to dynamic recipients only via email. Dynamic recipients can be used only with local profiles.

To create publications, you create a source file and a recipient file first, then set up the publication in the BI launch pad, and finally schedule the publication.

The source file contains raw data for the publication; a publication can include more than one source file. For example, for a monthly document report on suppliers, the source file might list inventory SKU numbers and categories and include a unique ID/supplier defined in a “Supplier ID” field. The recipient file must contain the same unique ID/supplier as the source file as well as recipients email addresses to map to the source file. In this example, the recipient file should include the same ID in a “Supplier ID” field, supplier names, and supplier email addresses.

7.1.1.12 Personalization

Personalization is the process of filtering data in source documents so that only relevant data appears to publication recipients.

With personalization, you alter the view of data but don’t change the data being queried from the data source.

The following illustration explains how personalization works. You have created a document that contains different types of data, all included in the document: 1, 2, and 3. You have to send the document to three different recipients, each one them receiving a single type of data. The first recipient receives data of type 1, the second recipient receives data of type 2, and the third recipient receives data of type 3.
To personalize source documents:

- For Enterprise recipients, make sure to apply a profile when you design a publication. Before you can use profiles to personalize data for Enterprise recipients, the profiles must be configured in the BI Platform. If you need to add profiles to the BI Platform, contact your system administrator.

- For dynamic recipients, you can map a data field or column in the source document to data in the dynamic recipient source. For example, you can map a Customer ID field in a source document to the Recipient ID field in the dynamic recipient source.

To view a list of recipients who will receive unpersonalized publication instances after personalization, select [Additional Options ➔ Advanced] in the New Publication dialog box, and select the Display users who have no personalization applied check box.

Related Information

- Personalized placeholders for source document names [page 896]
- Personalized placeholders for email fields [page 896]
- To select personalized placeholders for source documents [page 906]
- To select personalized placeholders for email fields [page 907]
- To personalize a document with a global profile target [page 909]
- To personalize a document by filtering fields [page 909]
### 7.1.1.12.1 Personalized placeholders for source document names

A placeholder is a container for variable data. Adding personalized placeholders to source file names helps recipients identify filtered data.

Recipients who belong to multiple user groups with different personalization values can distinguish between multiple versions of the same source document, without viewing its contents. If a publication contains more than one source document, the Add placeholder list for Use Specific Name contains personalized placeholders only if all source documents were filtered on the same field.

The following personalized placeholders are available for reports:

- `%fieldname_VALUE%`  
  For example, when selecting the Email Address placeholder, `%SI_EMAIL_ADDRESS%` appears in the Use Specific Name box. At run-time, the placeholder is replaced by the value of the field used to filter the document. This placeholder is unique for each recipient.

- `%fieldname_NAME%`  
  For example, when selecting the Title placeholder, `%SI_Name%` appears in the Use Specific Name box. At run-time, the placeholder is replaced by the actual name of the field. This placeholder is the same for all recipients.

### Related Information

To select personalized placeholders for source documents [page 906]

### 7.1.1.12.2 Personalized placeholders for email fields

A placeholder is a container for variable data. You can use personalized placeholders in the Subject box and the Message box when sending a publication via email.

For each filter used in a document during personalization, the following placeholders appear in the Add placeholder list:

- `%field - Query 1-VALUE%`  
  At run-time, the placeholder is replaced by the personalized value used to filter the document. This placeholder is unique for each recipient.

- `%Field - Query 1-NAME%`  
  At run-time, the placeholder is replaced by the name of the field. This placeholder is the same for all recipients.

Before being able to use personalized placeholders in the Subject or Message box, make sure to personalize all source documents for the publication on the same field. If a publication contains several source documents, the Add placeholder list for the Subject and Message boxes displays personalization parameters only when all source documents are filtered on the same field(s).
Related Information

To select personalized placeholders for email fields [page 907]

7.1.13 Delivery rules for scheduled documents

Prevent the sending of erroneous or empty documents by setting delivery rules for scheduled documents. Define a status for the documents that fail to meet the rules so you can identify them and reschedule them, change the connection details, or take other, appropriate action.

You define conditions that the document must meet for it to be sent to the following destinations:

- BI inbox
- Email
- FTP server
- File system
- SFTP server

When the document fails to meet those conditions, it is not sent. You can choose one or both of the following conditions for a document:

- The scheduled content has been successfully refreshed: The document is sent only when all the data providers for the document have been successfully refreshed. A document that contains data from incomplete results isn’t sent.
- The scheduled content contains data: The document is sent only when at least one report in the document contains data. An empty document isn’t sent.

When you select a condition, you can also define the status that displays in the history for a document that fails to meet the condition, as follows:

- Warning
- Failed

The default status is Warning.

When you select both conditions for the sending of the document and the status of one condition is Warning and the status of the other condition is Failed, the history shows Failed.

7.1.14 Delivery rules for publishing

You can set delivery rules to fine-tune the processing and distribution of publications.

When you set delivery rules for a document, the publication is delivered to recipients only if it meets certain conditions. The BI platform supports several types of delivery rules. For Web Intelligence documents however, you can only set recipient delivery rules. There are two recipient delivery rules available:

- Deliver individual document when condition is met
- Deliver all documents only when all conditions are met
For each document of the publication, a delivery rule is always coupled with a condition. As a publisher, this is a way to fine-tune the publication process according to the recipients you want to deliver the publication to. There are four conditions you can choose from:

- Always deliver
- Never deliver
- If scheduled content contains data
- If scheduled content has been fully refreshed

If a document fails to meet the condition you have purposely selected, you can either cancel the delivery of that specific document or cancel the whole publication.

7.1.15 Publication extensions

A publication extension is a library of code that applies business logic to publications. Use a publication extension to automatically customize publications after processing or delivery. You can use publication extensions to perform the following tasks:

- Merge documents of the same type (for example, merge multiple Excel spreadsheets into a single Excel workbook)
- Add password protection to or encrypt a document
- Convert a document to a different format
- Create custom log files for a publication job

You add publication extensions to publications in the Central Management Console (CMC) of the BI platform. (You cannot use publication extensions when designing a publication in the BI launch pad.) However, before you can add a publication extension, the extension must be deployed on machines that run the Adaptive Processing Server. The location of the server varies, depending on the operating system:

- On Windows, the location is `<InstallDir>\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\java\lib\`.
- On Unix, the location is `<InstallDir>/sap_bobj/enterprise_xi40/java/lib/`.

Once an extension is deployed, you must restart the Adaptive Processing Server and any other servers that host a Publishing Service. For more information about publication extensions, see the SAP BusinessObjects Business Intelligence Platform Java SDK Developer Guide.

7.1.15.1 To add a publication extension in the CMC

Context
**Procedure**

1. In the CMC, click *Folders*, and locate the publication to add a publication extension to.
2. Right-click the publication and select *Properties*.
3. Click *Additional Options* ➤ *Publication Extension*.
4. Give a name for the extension.
5. In the *Class Name* box, enter the fully qualified class name for the extension.
6. **Optional:** In the *Parameter* box, enter a parameter name.
7. To use the extension after processing before or after delivery, above the *Before Publication Delivery* or *After Publication Delivery* list, click *Add*.
8. Click *Save*.

---

**7.1.1.16 Publications for SAP recipients**

A publication intended for SAP recipients works the same way as a publication intended for Enterprise or dynamic recipients. However, there are differences in the publishing workflow for SAP recipients:

- You do not use personalization to design source documents for SAP recipients. Each SAP recipient has a profile value mapped to a user account outside of the BI platform, and the profile value serves as built-in personalization. You do not need to create profiles and profile values for SAP recipients in the platform or to map profiles to source document fields.
- The only report bursting method that works for a publication intended for SAP recipients is One database fetch per recipient. It maximizes security and individually processes the database logon credentials of each publication recipient.

For information about single sign-on configuration and authentication, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

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**7.1.1.17 Publications for Live Office**

When you design publications for use with SAP BusinessObjects Live Office, consider this information.

- Dynamic content documents can consist only of Web Intelligence documents in the original format.
- Dynamic recipients are not supported.
- The only destination option available is *Default Enterprise Location*.
- If recipients receive multiple publication instances after personalization, they can view only the first publication instance in the Live Office Client. Recipients who inherit multiple profile values from group membership may receive multiple instances. To avoid sending multiple instances, assign only necessary profile values to recipients.
7.1.1.18 Subscriptions

A subscription enables users who are not publication recipients to view the latest instance.

Enterprise recipients can unsubscribe from a publication at any time. Dynamic recipients can neither subscribe to or unsubscribe from a publication.

Users with the appropriate access rights can subscribe and unsubscribe other users. To subscribe to or unsubscribe from a publication, the following items are required:

- A BI Platform account
- Access to the BI Launch Pad or to the Central Management Console (CMC) in the platform
- View rights to see the publication
- Subscriber rights for the user account (Enterprise recipients)

Related Information

To subscribe to or unsubscribe from a publication [page 912]
To subscribe to or unsubscribe from a publication instance [page 913]

7.1.1.19 Viewing publications results

Results of a publication can be viewed by the publisher or recipients. A log file is also available for the publication job.

Viewing results as a publisher

After a publication runs, the publication history appears, listing publication instances, the times when the publication ran, and whether the publication succeeded or failed. In the Instance Time column, you can click a link to a publication instance to view instances generated for all recipients when the publication ran.

Viewing results as a recipient

The following table summarizes the ways you can view a publication.
<table>
<thead>
<tr>
<th>Destination</th>
<th>To view the publication result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Enterprise Location</td>
<td>Dynamic recipients cannot log on to the BI platform to view publication results. As a recipient, you can view only your own personalized publication instances in the platform. You cannot view publication instances that are personalized for other recipients.</td>
</tr>
<tr>
<td>BI inbox</td>
<td>Dynamic recipients cannot log on to the BI launch pad to view publication results.</td>
</tr>
<tr>
<td>Email</td>
<td>Log on to your email to view embedded publication content or to download the attachment or attachments.</td>
</tr>
<tr>
<td>FTP Server</td>
<td>Log on to your FTP host.</td>
</tr>
<tr>
<td>SFTP Server</td>
<td>Log on to your SFTP host.</td>
</tr>
<tr>
<td>Local disk</td>
<td>Go to the location specified when the publication was designed.</td>
</tr>
</tbody>
</table>

**Viewing log files for publications jobs**

Log files are useful for troubleshooting a publication and for identifying which recipients did not receive a publication instance. The BI Platform logs publication job information as each batch of personalized publication instances is processed and then consolidates the details into one or more log files. The maximum log file size is 10 MB and is non-editable. If you run a high-volume publication with many details, expect the publication instance to have several log files.

You can view log files for a publication instance in the following ways in the **History** dialog box:

- To view the last log file in a series, in the **Status** column, click the status (Success, Failed, or Running), and click **View Log File** at the bottom of the **Instance Details** dialog box. You can view the last log file while a publication is running.
- To view all log files, in the **Instance Time** column, click the link for a publication instance. Log files are listed after the personalized instances.

Log files are updated with new information every two minutes. If a publication job has been running less than two minutes, the log file may have a status of Pending.

**7.1.2 Scheduling documents**

You can schedule documents to automatically run at specified times. Each time a scheduled document runs successfully, an instance of that document is created.

An instance is a version of the document containing data from the time the document ran. You can access the list of instances in the document’s history. You can check the status of an instance to see whether the instance was sent and, if not, why not. If you have access rights to view documents on demand, you can view and refresh any instance to retrieve the latest data from the data source. By scheduling and viewing instances, you ensure that documents have the most up-to-date information available for viewing, printing, and distributing.
The default time zone is local to the web server that runs the BI platform, not to the Central Management Server (CMS) that your machine connects to. Before scheduling documents, confirm that your local time zone is selected in the BI launch pad preferences. If you do not have access rights to view or to set your preferences, contact your system administrator.

7.1.2.1 To schedule a document

When scheduling a document, options are sometimes set up with specific settings by default. Feel free to modify these settings according to your needs.

Prerequisites

Before scheduling a Web Intelligence document, confirm that a context is set in the document. If there are multiple contexts in the Web Intelligence document, refresh the document with the correct context before scheduling it.

Procedure

1. In the Documents tab of the BI Launch Pad, right-click a document and click Schedule.
2. In the Schedule dialog box, in the Instance Title tab, give a name to the instance you want to schedule.
3. Click a tab in the navigation list, and set the options in that tab depending on your needs. Repeat this step for each tab in which you want to set options.
4. Click Schedule.
   The History dialog box appears and displays an instance of the document you have scheduled.

7.1.2.2 To view the latest instance of a document

You can view the latest instance of a document.

Procedure

1. Right-click a document.
2. Click History.
   The latest instance of the object appears in a viewer.
3. Optional: If you have refresh rights on the document, click on the viewer toolbar to refresh the report or document with the latest information from the data source.
The latest instance of the document displays in the viewer.

7.1.2.3 To view a specific instance of a document

Procedure

1. Right-click a document.
2. Click History.
3. In the History dialog box, double-click a link in the Instance Time column to view a specific instance.

   You can filter the instances by hovering a column heading and clicking the icon.

7.1.2.4 To pause or resume an instance

You can pause and resume instances of scheduled documents with a Pending or Recurring status.

Context

For example, if a job server is down for maintenance, you can pause a scheduled instance to prevent the BI Platform from running the document. Scheduled jobs fail when the job server is not running. When the job server is running again, you can resume the scheduled instance.

Procedure

1. Right-click a document.
2. Click History.
3. Right-click the instance you want to pause or resume.
4. Click Pause or Resume.
7.1.2.5 To delete instances from your BI Inbox

You can delete all instances from your BI Inbox.

**Procedure**

2. Click *Organize* ➤ *Delete All Messages*.
3. When prompted, click *OK* to confirm the deletion.

7.1.3 Publishing documents

Publishing documents means that you make them available to an audience by sending them via email or an FTP server and saving them to a disk. You can view, archive, retrieve or schedule published documents via the BI Platform.

Using the BI launch pad or the Central Management Console (CMC), you can tailor documents according to users and recipients you want to send documents to, schedule them to run at a specific time, and send documents to multiple destinations, including BI Inboxes and email addresses.

7.1.3.1 To create a publication

**Context**

**Procedure**

1. On the *Documents* tab, expand the *Folders* drawer, and locate the folder to create a publication in.
2. Right-click the folder and select *New* ➤ *Publication*. The *New Publication* dialog box appears, with general property options displayed.
3. Give a name to the publication.
   You can also enter a description and keywords in the corresponding text fields.
4. Click *Source Documents* in the navigation list, and click *Add*. 

Scheduling and publishing documents
5. In the Select Source Documents dialog box, select one or more source documents to add to the publication, and click OK.

   Refresh At Runtime is enabled by default for each source document. This option refreshes the document against its data source when the publication runs. If you don’t want to refresh source documents at runtime, uncheck the box.

6. Select the enterprise recipients and/or dynamic recipients you want to send the publication to.

7. Set up the available options by clicking each tab in the category tree list to fine tune your publication.

   The Recurrence, Prompts, Formats, Events, Scheduling Server Group, and Destinations categories have the exact same content as that of the Schedule dialog box when you schedule document. For more information about options available in these categories, use the links at the end of this topic to access the dedicated documentation.

8. Click Save & Close.

Related Information

Recurrence [page 880]
Prompts [page 881]
Formats [page 882]
Events [page 883]
Scheduling server group [page 884]
Destinations [page 884]

7.1.3.2 To open a publication

Context

Procedure

1. Do one of the following:
   ○ In the BI Launch Pad, on the Documents tab, expand the Folders tab.
   ○ In the Central Management Console (CMC) in the BI platform, click Folders.
2. Right-click a publication and click View.
7.1.3.3 To select an event to trigger a publication

Event-based scheduling gives you additional control over when a publication runs. Use events to trigger a publication to run or use a publication job to trigger an event.

Context

For more information about events, refer to *SAP BusinessObjects Business Intelligence Platform User Guide*.

Procedure

1. Right-click the publication to select events for and select *Schedule*.
2. Click *Events* in the list of categories.
3. Do one of the following:
   - To specify file-based and custom events for a publication, click the > button to move events from the *Available Events* list to the *Events* to wait for list.
     The events trigger the publication job to run.
   - To specify schedule events for a publication, click the > button to move events from the *Available Schedule Events* list to the *Events to trigger on completion* list.
     The events occur after the publication job runs.
4. Click *Schedule*.

7.1.3.4 To select personalized placeholders for source documents

You select personalized placeholders for a publication in the *Schedule* dialog box.

Prerequisites

Before being able to use personalized placeholders in publication instance names, the publication’s source documents must use personalization to filter data.

Context

When scheduling a publication instance, you can use placeholders in the *Use Specific Name* field for source documents, and combine text and multiple placeholders in a publication name.
Procedure

1. Right-click the publication to select placeholders for and select Schedule.
2. Click Destinations in the list of categories.
3. Under Show options for selected destinations, select Use Specific Name and choose a placeholder for the publication name from the Add placeholder list.
4. Optional: To add individual documents:
   - Under Target Name, select Specific Name per Document.
   - For each document title, select a placeholder from the Add placeholder list.
5. Click OK.

7.1.3.5 To select personalized placeholders for email fields

You select personalized placeholders for a publication in the Schedule dialog box.

Context

You can combine text and multiple placeholders in any email field. When scheduling a publication to an email destination, you can use placeholders in the From, To, Cc, Bcc, Subject, Message, and Use Specific Name fields.

Procedure

1. Right-click the publication to select placeholders for and select Schedule.
2. Click Destinations in the list of categories.
3. Select Email.
4. Set the destination options, including placeholders, as needed.
5. Click OK.
7.1.3.6 To embed content from a dynamic source document in an email

You embed content from a source document for a publication in the Schedule dialog box.

Context

You can embed content from dynamic content documents in the body of an email. You can embed an entire document or a single report tab.

Procedure

1. Right-click the publication to take the content from and select Schedule.
2. Click Formats in the list of categories.
3. Choose whether to publish the entire document or one report tab:
   - Under Output Format, select mHTML.
   - Under Output Format Details, select All reports or Select one report and choose a report tab in the list.
4. Click Destinations in the list of categories.
5. Under Select Destinations, select Email.
6. Fill in the entry field or select placeholders from the Add placeholder list.
   - In the From entry field, you can enter Robert, Publisher, or publisher@<EmailServer>. If you enter a name, the name is appended to your email server—for example, Publisher@<EmailServer>.
7. To embed dynamic content in the Message entry field, position the cursor where you want to embed content, and select Report HTML Content in the Add placeholder list. %SI_DOCUMENT_HTML_CONTENT% appears in the Message entry field. When the publication runs, the placeholder is replaced by personalized content from the dynamic content document.
8. Optional: If the publication contains other source documents, select the Add Attachment.
   - Other source documents in the publication will be added to the email as attachments when the publication runs.
9. Click OK.
7.1.3.7 To personalize a document with a global profile target

You can personalize a document for Enterprise recipients by filtering with a global profile target.

Prerequisites

- Before being able to use a profile to personalize data for Enterprise recipients, the profile must be configured in the BI Platform. If a profile is not configured in the platform, personalization will fail.
- Before personalizing a document, make sure that the profile has a global profile target.

Context

When defining personalization under Global Profiles, you don't need to set personalization options under Filters. If you need profiles added to the BI Platform, contact your system administrator.

Procedure

1. Right-click the document to personalize and select Schedule.
2. Click Personalization in the list of categories.
   - This profile maps the document to the universe field (global profile target) that is filtered for Enterprise recipients.
4. Click OK.

7.1.3.8 To personalize a document by filtering fields

Prerequisites

Before being able to use a profile to personalize data for Enterprise recipients, the profile must be configured in the BI Platform. If a profile is not configured in the platform, personalization will fail.
Context

Static-value profiles can filter only string fields in source documents. To filter other types of fields, use expression profile values. If you map an incorrect type of field to the profile, personalization will fail. If you need profiles added to the platform, contact your system administrator.

Scheduling and publishing a document to .WID format generates a .WID file. Filters in .WID files can be removed by any recipient with appropriate security rights. When sending the .WID file to recipients or destinations, use filters carefully. For example, if you filter a document to limit the information that recipients can see and then send the published .wid file to recipients, any recipient with security rights to edit the document can remove or update the filter and access data that should not be visible.

Procedure

1. Right-click the document to personalize and select Schedule.
2. Click Personalization in the list of categories.
3. Under Local Profiles, for each profile listed in the Title column, select a profile from the list in the Report Field column.
   - This profile maps the report field to profile values for Enterprise recipients.
4. Under Local Profiles, in the Enterprise Recipient Mapping column, select a profile.
   - This profile maps the document to the universe field (global profile target) that is filtered for Enterprise recipients.
5. In the Dynamic Recipient Mapping column, select a profile.
   - The field in the source document is mapped to the column that contains corresponding values in the dynamic recipient source.
6. Repeat steps 3 to 5 for each field to filter.
7. Click OK.

7.1.4 Managing publications and instances

At any point during or after publication design, you can view a publication's properties in the Summary dialog box—including the publication's title, location, description, source documents, the number of recipients who will receive the publication (sorted by recipient type, Enterprise or dynamic), how the publication is personalized, the distribution format, and the destination.

Click Summary to open the dialog box. You can use other options on the navigation panel to change the properties of and to save or schedule a publication.
7.1.4.1 To test a publication

Use the test mode in the BI Launch Pad to send a publication to yourself before sending it to recipients.

Context

When testing a publication, you receive the exact same contact your recipients will receive. Destinations are automatically updated so that your BI Inbox or your email address is used instead of publication recipients’ BI Inbox or email address. If necessary, you can exclude selected recipients from the original group of recipients in test mode.

Procedure

1. Right-click the publication to test and select Test Mode.
2. Optional: In the Test Mode dialog box, modify the list of Enterprise recipients:
   a. Click Enterprise recipients.
   b. Under Available, select users or groups, and click > to move the users or groups to the Selected list or the Excluded list.
3. Optional: Modify the list of dynamic recipients:
   a. Click Dynamic recipients.
   b. Under Choose the source for the dynamic recipients, select Web Intelligence Report Dynamic Recipient Provider in the list.
4. Click Test.

Results

The publication runs in test mode and, once done, is sent to intended “test” recipients.

7.1.4.2 To view the progress or history of a publication

Context
Procedure

1. Right-click the publication job and select History.
   The History dialog box appears and shows the status (Success, Failed, or Running) of the job in the Status column.

2. To view the log file for the job, click View Log File at the bottom of the dialog box.

7.1.4.3 To subscribe to or unsubscribe from a publication

To subscribe to a publication after it is scheduled, subscribe to its recurring instance or reschedule the publication.

Prerequisites

You must have appropriate access rights to a publication before you can subscribe to it.

Context

Only Enterprise recipients can subscribe to or unsubscribe from a publication. Dynamic recipients cannot subscribe to or from publications.

Procedure

1. In the Folders drawer on the Documents tab, locate and select the publication to subscribe to or unsubscribe from.

2. Do one of the following:
   ○ In the BI Launch Pad, right-click the publication and select Subscribe or Unsubscribe.
   ○ In the Central Management Console (CMC), select Actions ➔ Subscribe or Unsubscribe.
7.1.4.4 To subscribe to or unsubscribe from a publication instance

After a recurring publication has been scheduled, Enterprise recipients can subscribe to its first recurring instance. For example, when a publication is scheduled to run twice a week, you can subscribe to the first publication instance but not the second one.

Prerequisites

You must have appropriate access rights to a publication before you can subscribe to its instances.

Context

Procedure

1. Do one of the following:
   - In the BI Launch Pad, right-click the instance and select History.
   - In the Central Management Console (CMC), select [Actions] History.
2. Do one of the following:
   - In the BI Launch Pad, right-click the instance and select Subscribe or Unsubscribe.
   - In the Central Management Console (CMC), select [Actions] Subscribe or Unsubscribe.

7.1.4.5 To view publications sent to the Default Enterprise Location

As a recipient, you can view only your own personalized publication instances in the BI platform.

Context
Procedure

1. In the CMC, go to the Folders area, right-click a publication, and select History.
2. Click the link in the Instance Time column.
3. Double-click the instance to view.

7.1.4.6 To view publications sent to a BI Inbox

Dynamic recipients can view publications sent to a BI Inbox. They cannot log on to the BI launch pad to view publication results.

Context

Procedure

1. In the BI launch pad home screen, click My Inbox.
2. Double-click the instance to view.

7.1.4.7 To redistribute a publication instance

When you want to resend an instance to a recipient but do not want to rerun an entire publication, you can redistribute successful publication instances to all or some of the original recipients.

Context

Only recipients specified when the publication was originally run can receive redistributed instances.

Procedure

1. Do one of the following:
   ○ In the BI launch pad, right-click a publication and select History.
In the Central Management Console (CMC), right-click a publication and select **Actions > History**.

2. Select a successful publication instance.

3. Do one of the following:

   ○ In the BI launch pad, right-click a publication and select **More Actions > Reschedule**.
   ○ In the Central Management Console (CMC), right-click a publication and select **Actions > Reschedule**.

4. Choose which recipients will receive redistributed instances:

   ○ To redistribute an instance to Enterprise recipients, click **Enterprise Recipients**, and click > to move recipients from the **Available** list to the **Selected** list.
   ○ To redistribute an instance to dynamic recipients:
     1. Click Dynamic Recipients, and confirm that columns mapped to recipient IDs, full names, and email addresses are correct.
     2. Select **Use entire list** to redistribute the publication to all dynamic recipients or click > to move recipients from the **Available** list to the **Selected** list to select from a restricted list of dynamic recipients.

5. Click **Redistribute**.

**Results**

The publication history appears, and the redistributed instance has a status of Running. The date in the **Instance Time** column is updated to reflect the redistribution time.

**7.1.4.8 To retry a failed publication**

**Prerequisites**

Before retrying a failed publication, view the log file for the publication instance, address any errors, and reschedule the publication.

**Context**

Using the option to “Retry” failed instances of a publication, you can:

- overwrite the failed instance (**Run Now** and **Reschedule** create new instances whereas **Retry** uses the failed instance).
- process only the failed recipients, in case of a partial failure.
• run the full job without creating a new instance, in case of a complete failure.

**Note**

You can also perform auto-retry by setting the *Number of retries allowed* and the *Retry interval in seconds* options under the *Recurrence* property of the publication. In case of a failure, it attempts to run the publication again.

### Procedure

1. Select the failed publication instance.
2. Do one of the following:
   - In the BI launch pad, select *More Actions > History*.
   - In the CMC, select *Actions > History*.
3. Right-click on the failed instance and click *Retry*. The instance status changes to *Running*. Wait until the status changes to *Success*.

### 7.1.5 Publication performance

You can improve publication performance by modifying the Adaptive Processing Server, the Publishing Service, and the Publishing Post Processing Service.

#### Adaptive Processing Server

<table>
<thead>
<tr>
<th>Area</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU and memory</td>
<td>Move the Adaptive Processing Server to a faster machine that has more available CPUs and BI platform Feature Pack 3 or later installed. The server will automatically scale to use more CPUs. Isolate the Publishing Service and the Publication Post Processing Service on dedicated Adaptive Processing Servers and remove unused services hosted on those servers. Each service will consume more shared resources (requests to thread pool, memory, and CPU consumption) on an Adaptive Processing Server, and publishing performance may improve.</td>
</tr>
</tbody>
</table>
## Publishing Service

Because publishing is a hard-drive-intensive process, the Publishing Service should be installed on a machine with fast I/O or SAN disks for the FRS.

<table>
<thead>
<tr>
<th>Area</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many publication instances that execute concurrently</td>
<td>If the underlying CMS, FRS, Adaptive Job Server, and report processing servers have been scaled appropriately, horizontally scale out the Publishing Service across multiple Adaptive Processing Servers, on one or more machines, to concurrently process more publication instances. A single publication job (for example, with one million recipients) is not shared across Publishing Services hosted on different Adaptive Processing Servers. Horizontally scaling out the Publishing Service will not improve processing time for a single publication, regardless of the number of recipients.</td>
</tr>
<tr>
<td>Publications with many recipients</td>
<td>Vertically scale the Adaptive Processing Server on machines with more CPUs and RAM to concurrently process more recipients and to generate more jobs on the Adaptive Processing Server. You may need to scale the Adaptive Job Server and report processing servers accordingly to increase throughput. You may need to increase the Adaptive Processing Server's heap size (that is, set <code>-Xmx</code> to 2 GB or more) when the server runs on a machine with more than eight CPU cores. The larger number of CPU cores enables the Adaptive Processing Server to spawn more threads and increase throughput. Note that more threads require more RAM.</td>
</tr>
<tr>
<td>Publishing cleanup option</td>
<td>For a large publication that does not need redistribution or to view artifacts in the report, do not select the default destination.</td>
</tr>
</tbody>
</table>
| Web Intelligence publications             | Select *[One database fetch for all recipients or One database fetch per recipient]*. When you select *One database fetch for all recipients* for a large publication, to break the database query into multiple, smaller queries, add the following command line option to speed disk delivery to all Adaptive Processing Servers that host the Publishing Service:  

`-Dcom.businessobjects.publisher.scopebatch.max.recipients=<integer>` |
Large publications with slow disk delivery to a single folder on Windows

Search for “disable short file name generation” (article ID 210638) or for “NtfsDisable8dot3NameCreation” on Microsoft TechNet at [http://technet.microsoft.com](http://technet.microsoft.com) and follow the instructions.

Large publications with slow disk delivery to a single folder that contains more than 300,000 files on Windows

Search for “how NTFS works” at [http://technet.microsoft.com](http://technet.microsoft.com) and follow the instructions.

---

### Publishing Post Processing Service

The Publishing Post Processing Service is called when the Package as ZIP File checkbox (in the Schedule dialog box) and/or the Merge Exported PDF checkbox (in the Destinations dialog box) is selected or when custom post-processing plugins are enabled on a publication.

<table>
<thead>
<tr>
<th>Area</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications with both Package as ZIP File and Merge Exported PDF selected</td>
<td>Horizontally scale out the Publishing Post Processing Service to spread the ZIP and PDF merging workloads across multiple Publishing Post Processing Services hosted on different Adaptive Processing Servers.</td>
</tr>
</tbody>
</table>

---

### 7.1.5.1 Best practices for adding source documents

Below are best practices to help you add dynamic content documents to publications.

**Use publication log files to troubleshoot errors in failed publications**

When you schedule publications to run, log files are generated to record errors that may occur when the publications are processed. To view all log files for a publication instance, select ![More Actions](more-actions.png) ![History](history.png) in the History dialog box, click the link for the instance in the Instance Time column. The instance details appear in a new window.

**View and schedule individual dynamic content documents before adding them to a publication**

If you can view and schedule dynamic content documents successfully, the data source connection is working properly and the source document data can be refreshed when the publication is scheduled. If you cannot view
and schedule dynamic content documents, confirm that the data source connection settings are correct. To do so:

1. In the CMC, select a document and click \textit{Manage $\rightarrow$ Default Settings}.
2. In the \textit{Default Settings} dialog box, click \textit{Report universes} on the navigation panel.

In some cases, you may have to open a dynamic content document in the designer to configure the data source connection and to re-export the file to the CMS repository and overwrite the previous copy. For more information about configuring data source connections for dynamic content documents, see the designer documentation.

### Avoid unnecessary data refreshes

If a data refresh is unnecessary for a dynamic content document, in the \textit{Source Documents} section, uncheck \textit{Refresh At Runtime} for that document to improve overall publication performance.

#### 7.1.5.2 Best practices for using dynamic recipient sources

Make sure to sort your dynamic recipients according to the \textit{Recipient ID} column.

In general, you should sort dynamic recipient sources by the \textit{Recipient ID} column. This is especially important when you are running a high-volume publication because it can reduce the number of deliveries to recipients with multiple personalization values.

#### 7.1.5.3 Best practices for sending and receiving email publication instances

**If possible, view embedded-content email-publication instances in Outlook 2003**

View embedded content in email publication instances in Outlook 2003 whenever possible. Embedded content in email publication instances may have formatting issues when viewed in Outlook 2007 or in web email accounts, such as Hotmail or Gmail.
Contact your administrator to confirm that the email settings are configured properly for the Destination Job Server

Make sure that email settings are properly configured for the Destination Job Server. Publications intended for email destinations may fail because email has not been configured properly as a destination for the Adaptive Job Server. For more information, refer to the SAP BusinessObjects Business Intelligence Platform Administrator Guide.
# 8 Sharing content with other applications

## 8.1 Sharing content with other applications

You can make Web Intelligence content available outside Web Intelligence documents by publishing report blocks (tables, charts or forms) as web services known as BI Services.

**Note**

You can only publish content as a web service in the Web Intelligence Applet interface and Web Intelligence Rich Client. This feature is not available for the Web Intelligence HTML interface.

Web services provide a standardized mechanism for sharing data between applications. You publish content to a server where other applications can access the web services that supply the content.

Each web service can publish multiple blocks which are made available to web applications through functions that correspond to the blocks. For example, a table published as a web service can be included in a dashboard which can perform filtering and drilling operations on the table through the web service functions.

The structure of a BI service is defined using WSDL (Web Service Definition Language), a standard format for describing web services. Web applications interact with BI services (by passing parameters to them and receiving data in return) using Simple Object Access Protocol (SOAP), a standard protocol for exchanging structured information.

**Related Information**

BI service structure [page 927]

## 8.1.1 Making data available for filtering in a web service

When you publish a report block as a web service, you can make report objects available that web applications can use to filter the data returned by the web service.

For example, if you publish a table containing [Country], [Region] and [Revenue], you can make the [Country] dimension available as a filter. Web applications accessing the web service can then filter on the [Country] dimension.

Filtering objects appear as FilterCondition parameters in the GetReportBlock_<blockname> function in the web service.

You make objects available for filtering in the Define published content screen of the Publish Content wizard. The screen lists all the objects in the report and selects the objects in the block you are publishing by default. You can deselect these objects and select any object in the report to make it available as a filter. For example,
you can make the [Country] dimension available as a filter when you publish a table containing the [Region] and [Revenue] objects if the [Country] dimension appears in the report. You can also choose not to make the [Region] and [Revenue] objects available as filters.

You do not have to include any report objects as filters except for objects that appear in section headers. These appear selected and you cannot unselect them.

If you publish a block in a section, by default the web service filters on the value of the section object corresponding to the block you selected. For example, if you have a report containing [Country], [Region] and [Revenue] with [Country] as the section header, and you publish the block in the section where [Country]=“France”, the web service uses “France” as the default value of [Country]. A web application accessing the web service can supply a different value for [Country] and the data returned by the web service changes to correspond with the filter.

If you publish a block in a report containing report filters, the objects on which report filters are defined are selected by default in the screen. You can unselect these objects. If you publish the block without making the objects available as filters, the web service filters data according to the values of the report filters. If you make the objects available, web applications can apply the report filters using different values.

Related Information

GetReportBlock_<blockname> [page 927]

8.1.2 To publish a chart or table as a web service

You use the Publish Content wizard to publish a chart or table as a web service.

Context

! Restriction

This feature is only available in the Web Intelligence Rich Client and Applet interfaces. It is not available in the Web Intelligence HTML interface.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Select the table or chart that you want to publish, right-click and select Publish as Web Service to display the Publish Content wizard.
3. Click Next to move to the first publishing step.
If the table or chart that you are publishing as a web service has already been published, the **Identify Duplicate Content** screen highlights the duplicated table or chart. The duplicate table or chart appears in bold beneath the web services that publish it.

4. Click **Next** to move to the next step.

**i Note**

If your query has prompts, the **Choose prompt** screen appears. In this case, continue to the next step. If your query has no prompts, the **Defined Published Content** screen appears. In this case, skip the next step.

5. In the **Choose Prompt** screen:
   a. Select or unselect the prompts you want to include or exclude in the list of prompts. 
      
      Click **Select all** to select all prompts or **Clear all** to clear all prompts.
   b. Click **Next** to move to the next step.

**i Note**

For web services, to use multiple values in prompts, you must reproduce the prompt as many times as different responses are expected, and the user will be prompted for each response.

If you do not publish a prompt, the web service uses the prompt value supplied when the document was last refreshed and saved. For example, if a user answers "US" to a prompt on [Country], then saves the document, the web service filters data on [Country]="US" the next time it is called with the \( \text{refresh=true} \) parameter.

If a web service publishes prompts, web applications must supply values for the prompts in the custom data provider web service window if they call the web service with the \( \text{refresh=true} \) parameter. If the user does not enter values for the prompts, the last values entered are used.

6. In the **Define Published Content** screen:
   a. Type the name and description under which you want to publish the table.
   b. Select **Share report content for all consumers** when you want all web service consumers (sessions) get the table or chart content from the same (and single) instance of document.

   The **Share report content for all consumers** option below all web service consumers (sessions) to get the table or chart content from the same (and single) instance of document. This option reduces memory load on the processing server, and should be enabled when content is to be consumed by many concurrent users.

   Technically, the document is opened by the first consumer who sends a request for it, and is then consumed by any other consumer sending same request after ‘on behalf’ of first user (for example, using his authorization). Document security cannot therefore be applied with web service calls designed with this option. To avoid any conflicts, all consumers should be granted the permission to open the corresponding document. Users should also be granted permission to view/access data from the underlying data sources.

**i Note**

Filtering and drilling from a web service are not compatible with the **Share report content for all consumers** option. The only way to filter Web Intelligence document data from web services is to use report sections exposed as filters in the corresponding web service.
c. Click **Set Filters** and select the objects you want to make available for filtering in the web service. When **Share report content for all consumers** is selected, the **Set Filters** option is disabled because consumers will not be able to use report filters, section filters being the only available way to filter content through mandatory input parameters.
d. Select the server where you want to publish the content beneath **Host server**.
e. To add, remove or edit servers in the list of host servers, click **Manage servers**, then click **Add**, **Edit** or **Remove** and update the list of servers.
f. Click **Next** to move to the next step.

7. In the **Publish new content or re-publish existing content as Web Service** screen:
   a. To re-publish an existing web service, select the web service, click **Publish**.
   b. To publish a new web service, select the folder where you want to publish the content and click **Create** to display the **Publish Web Service** dialog box.

   **Note**
   
   Folders are optional. you publish to an existing web service or a new web service, and you can create folders in order to organize your work. Click **New Folder** to add a folder.

c. Type the name of the web service in the **Web service name** box and the service description in the **Description** box.
d. Select the authentication method for the web service from the **Authentication** list.
e. Click **OK** to close the dialog box and save and publish the web service.
f. Choose the web service where you want to publish to and click **Finish**.

### 8.1.3 Viewing and managing published content

You can browse the content published on different Web servers by using the **Web Service Publisher** pane. The **Web Service Publisher** pane also allows you to edit published Web services and import QaaWS (Query as a Web Service) queries, which you can then republish as Web Intelligence content.

### 8.1.3.1 To view and manage published content

You can view and manage published Web Service content in the **Web Service Publisher** pane of the Side Panel.

**Procedure**

1. Open a Web Intelligence document in **Design** mode.
2. Click the **Web Service Publisher** icon of the Side Panel.
3. In the **Web Service Publisher** pane, select the server from the **Host server** list.
4. Do one of the following:
○ To add, remove or edit servers in the list of host servers, click Manage servers, then click Add, Edit or Remove and update the list of servers.

○ From the Views dropdown list, select the way you want the content to be organized from the menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>View by web service</td>
<td>Published content is organized as web service &gt; block</td>
</tr>
<tr>
<td>View by document and web service</td>
<td>Published content is organized as a document &gt; web service &gt; block</td>
</tr>
<tr>
<td>View by document and block</td>
<td>Published content is organized as a document &gt; block &gt; web service</td>
</tr>
<tr>
<td>Show Web Services queries</td>
<td>QaaWS (Query as a Web Service) queries appear below the published content. QaaWS queries are stored in the same repository folder as BI services.</td>
</tr>
</tbody>
</table>

○ To edit a published block, right-click the block and select Edit to launch the Publish Content wizard.

○ To delete published content, right-click the published block or the web service and select Delete.

○ To rename a web service, right-click the web service, select Rename and type the new name.

○ To refresh the list of published content, click the Refresh icon, or right-click on a folder or web service and select Refresh list.

○ To search the list of web services, type the text you want to search for in the search box and select your search options from the search box dropdown list.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case sensitive</td>
<td>Match case when searching</td>
</tr>
<tr>
<td>Case insensitive</td>
<td>Ignore case when searching</td>
</tr>
<tr>
<td>Match from start</td>
<td>Return only those web services or blocks whose name starts with the search text</td>
</tr>
<tr>
<td>Match anywhere</td>
<td>Return only those web services or blocks whose name contains the search text</td>
</tr>
</tbody>
</table>

Related Information

Importing and using QaaWS queries as a BI service [page 926]
To publish a chart or table as a web service [page 922]
8.1.3.2 To test published content

You can test published content and examine the structure of the web service that publishes it.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Click the Web Service Publisher icon of the Side Panel.
3. Select the web service you want to test and click the Test icon.
4. Select the web service function you want to test from the Operation dropdown list.
5. Select the parameters and operators for which you want to specify values in the Input pane and type their values beneath Value.
6. Click Send to call the web service with the values you specified. The data returned by the web service appears in the Server Response pane.
7. Click Change to tree view or Change to table view to toggle the web service data between a tree view and table format.

8.1.4 Importing and using QaaWS queries as a BI service

You can import QaaWS (Query as a Web Service) queries and run them to produce a block that is inserted in a new report.

When you import a QaaWS query, the application builds a query based on the structure of the QaaWS query, then runs this query and inserts the resulting block in a new report. The original QaaWS query is not modified.

Because Web Intelligence does not support the publication of QaaWS queries directly, you can publish QaaWS queries as BI services by publishing the resulting block as a BI service.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no support for sorts defined on QaaWS queries. When you run the QaaWS query, any sorts it contains are lost.</td>
</tr>
</tbody>
</table>
8.1.4.1 To publish a QaaWS query

You can publish a QaaWS query in the Publish Content wizard.

Procedure

1. Open a Web Intelligence document in Design mode.
2. Click the Web Service Publisher icon of the Side Panel.
3. Select View Display QaaWS queries to display QaaWS queries.
4. Select the QaaWS query you want to import and click Import Web Service query.
   The QaaWS query is added to the document as a Web Intelligence query. A report tab is added with the same name as the QaaWS query. The report tab contains a table corresponding to the query objects.
5. Refresh the added query to display the web service query data.
6. Right-click the added table and select Publish as Web Service to publish the table as a web service.

Related Information

To publish a chart or table as a web service [page 922]

8.1.5 BI service structure

Applications use the Simple Object Access Protocol (SOAP) protocol to call the functions and receive the function output which they can then parse.

External web applications access Web Intelligence content published as web services by calling two functions:

- GetReportBlock_<blockname>
- Drill_<blockname>

In both these function calls, <blockname> is the name of the block as defined in the web service.

8.1.5.1 GetReportBlock_<blockname>

Function name

GetReportBlock_<blockname>
**Input parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Mandatory?</th>
</tr>
</thead>
<tbody>
<tr>
<td>login</td>
<td>CMS login</td>
<td>Yes, unless <code>sessionID</code> or <code>serializedSession</code> is specified.</td>
</tr>
<tr>
<td>password</td>
<td>CMS password</td>
<td>Yes, unless <code>sessionID</code> or <code>serializedSession</code> is specified.</td>
</tr>
<tr>
<td>reportfilter</td>
<td>One or more report filters. See the <code>reportfilter</code> table below for more information.</td>
<td>Yes when the report block contains section entries; no otherwise. Blocks with sections therefore have a mix of mandatory and optional <code>reportfilter</code> parameters.</td>
</tr>
<tr>
<td>prompt</td>
<td>Prompt values. See below for more information on <code>LovIndexValue</code> parameters</td>
<td>Yes when <code>refresh</code> = true and the prompt is mandatory. No otherwise (<code>refresh</code> = false). If you don't enter a prompt value, then the prompt takes the values previously defined values. The consumption of web services having prompts in Web Intelligence does not mean that you will be prompted, you must enter prompt values in the Custom Data Provider - Web Service window.</td>
</tr>
<tr>
<td>closeDocument</td>
<td>Forces the document to be closed once the web service has replied with the requested content. This behavior helps to optimize memory consumption on the server, as consumers can control how long documents are stored.</td>
<td>Boolean, default value: <code>false</code> (by default document is kept open, when web service is replied). Values: <code>false</code> or <code>true</code>.</td>
</tr>
<tr>
<td>startRow</td>
<td>Defines the first row number retrieved from the source. This parameter is used with the <code>endRow</code> parameter to define the chunk size to retrieve in table output parameter. For example, <code>startRow = 10 / endRow= 55</code>, will retrieve 46 rows between row 10 and row 55 included. The last row of a table has rank set equal to table size; any greater value is internally corrected to that number.</td>
<td>Optional. If not declared, the entire table contents are retrieved. By default, the entire table contents are retrieved.</td>
</tr>
<tr>
<td>endRow</td>
<td>Defines the last row number retrieved from the source. This parameter is used with the <code>startRow</code> parameter to define the chunk size to retrieve in table output parameter. For example, <code>startRow = 10 / endRow= 55</code>, will retrieve 46 rows between row 10 and row 55 included. The last row of a table has rank set equal to table size; any greater value is internally corrected to that number.</td>
<td>Optional. If not declared, the entire table contents are retrieved. By default, the entire table contents are retrieved.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
<td>Mandatory?</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>resetState</td>
<td>Re-opens the document when the web service is called, resetting drills and filters.</td>
<td>No. The default value is false.</td>
</tr>
<tr>
<td>refresh</td>
<td>Forcers a document refresh.</td>
<td>No. The default value is false.</td>
</tr>
<tr>
<td>getFromLatestDocumentInstance</td>
<td>Retrieves data from the latest document instance.</td>
<td>No. The default value is true.</td>
</tr>
<tr>
<td>getUserInstance</td>
<td>Retrieves data from the user inbox if the document has been published.</td>
<td>No. The default value is false.</td>
</tr>
<tr>
<td>turnOutputToVTable</td>
<td>Turns the output to a vertical table.</td>
<td>No. The default value is false.</td>
</tr>
</tbody>
</table>

**i Note**

If the block is a chart, it is always turned into a vertical table, even if this parameter is set to false.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Mandatory?</th>
</tr>
</thead>
<tbody>
<tr>
<td>sessionID</td>
<td>Session token to avoid submitting the login or password. Increases the session count when submitted.</td>
<td>No.</td>
</tr>
<tr>
<td>serializedSession</td>
<td>Serialized session to avoid submitting the login or password. Does not increase the session count when submitted.</td>
<td>No.</td>
</tr>
</tbody>
</table>

## The reportfilter parameter

The reportfilter parameters contain two elements:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>filtering_value</td>
<td>The value used to filter the data</td>
<td>Any</td>
</tr>
<tr>
<td>filtering_operator</td>
<td>The filter operator</td>
<td>EQUAL (default)</td>
</tr>
</tbody>
</table>

### Example of reportFilter parameter

The filter [Country]="US" is specified as follows:

```xml
<Country>
  <value>US</value>
</Country>
```
Output parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>table</td>
<td>TTable</td>
<td>Table cells</td>
</tr>
<tr>
<td>headers</td>
<td>THeader</td>
<td>Table headers</td>
</tr>
<tr>
<td>footers</td>
<td>TFooter</td>
<td>Table footers</td>
</tr>
<tr>
<td>user</td>
<td>string</td>
<td>Login used by the web service call</td>
</tr>
<tr>
<td>documentation</td>
<td>string</td>
<td>The web service description supplied by the service designer</td>
</tr>
<tr>
<td>documentname</td>
<td>string</td>
<td>The document name</td>
</tr>
<tr>
<td>lastrefreshdate</td>
<td>dateTime</td>
<td>The date of the last document refresh</td>
</tr>
<tr>
<td>creationdate</td>
<td>dateTime</td>
<td>The date the web service was created</td>
</tr>
<tr>
<td>creator</td>
<td>string</td>
<td>User name of the web service creator</td>
</tr>
<tr>
<td>isScheduled</td>
<td>boolean</td>
<td>Specifies if document is scheduled</td>
</tr>
<tr>
<td>scheduleStartTime</td>
<td>dateTime</td>
<td>The schedule start time if the document is scheduled</td>
</tr>
<tr>
<td>scheduleEndTime</td>
<td>dateTime</td>
<td>The schedule end time if the document is scheduled</td>
</tr>
<tr>
<td>tableType</td>
<td>string</td>
<td>The table type</td>
</tr>
<tr>
<td>nbColumns</td>
<td>int</td>
<td>The number of columns in the output table</td>
</tr>
<tr>
<td>nbLines</td>
<td>int</td>
<td>The number of rows in the output table</td>
</tr>
</tbody>
</table>

Related Information

Drill_<blockname> [page 930]
Sample BI service return data [page 934]
Note
This web service call cannot be used when the document sharing option (Share report content for all consumers in the Publish Content wizard) is enabled because such methods will not be specified in web service WSDL file. An error will be returned to the consumer if the document is called when this option is enabled.

Input parameters

The syntax of the Drill_<blockname> function is similar to GetReportBlock_<blockname>, with the following differences:

- there are no reportfilter parameters
- there are additional drillpath parameters
- there are additional drillfilter parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Mandatory?</th>
</tr>
</thead>
<tbody>
<tr>
<td>drillpath</td>
<td>Specifies a drill instruction</td>
<td>Yes</td>
</tr>
<tr>
<td>drillfilter</td>
<td>Specifies a filter to apply when drilling</td>
<td>No</td>
</tr>
</tbody>
</table>

The drillpath parameter

The drillpath parameters are of DrillPath type. They contain three elements:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>from</td>
<td>The dimension to drill</td>
<td>Any</td>
</tr>
<tr>
<td>value</td>
<td>The value to drill on</td>
<td>Any</td>
</tr>
<tr>
<td>drilloperation</td>
<td>The type of drill operation</td>
<td>UP</td>
</tr>
</tbody>
</table>

Note

- As well as single values (for example "Los Angeles"), value can pass definitions such as "All Cities".
- If the drill instruction is invalid, the web service returns the original table data.
- At the end of the drill hierarchy, the web services returns the last available values in the drill hierarchy.
- You can supply more than one drillpath parameter, providing that the parameters do not refer to different levels in the same drill hierarchy.

The drillfilter parameter

The drillpath parameters allow you to apply drill filters at the same time as drilling:
### dimension

- **Description:** The dimension to filter
- **Values:** Any.

### value

- **Description:** The value to filter on
- **Values:** Any.

### operator

- **Description:** The filter operator
- **Values:**
  - EQUAL
  - GREATER
  - GREATER_OR_EQUAL
  - LESS
  - LESS_OR_EQUAL
  - NOT_EQUAL
  - INLIST
  - NOT_INLIST

#### Note
- As well as single values (for example "Los Angeles"), `value` can pass definitions such as "All Cities"
- If the drill instruction is invalid, the web service returns the original table data
- At the end of the drill hierarchy, the web services returns the last available values in the drill hierarchy
- You can supply more than one `drillpath` parameter, providing that the parameters do not refer to different levels in the same drill hierarchy.

### Related Information

GetReportBlock_<blockname> [page 927]

### 8.1.5.3 BI Services output parameters

There are several output parameters that can be returned by a BI service.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>table</td>
<td>TTable</td>
<td>Table cells</td>
</tr>
<tr>
<td>headers</td>
<td>THeader</td>
<td>Table headers cells</td>
</tr>
<tr>
<td>footers</td>
<td>TFooter</td>
<td>Table footers cells</td>
</tr>
<tr>
<td>user</td>
<td>string</td>
<td>Login used by the web service call</td>
</tr>
<tr>
<td>documentation</td>
<td>string</td>
<td>The web service description supplied by the service designer</td>
</tr>
<tr>
<td>documentname</td>
<td>string</td>
<td>The document name</td>
</tr>
<tr>
<td>lastrefreshdate</td>
<td>dateTime</td>
<td>The date of the last document refresh</td>
</tr>
<tr>
<td>creationdate</td>
<td>dateTime</td>
<td>The date the web service was created</td>
</tr>
<tr>
<td>creator</td>
<td>string</td>
<td>User name of the web service creator</td>
</tr>
<tr>
<td>isScheduled</td>
<td>boolean</td>
<td>Specifies if document is scheduled</td>
</tr>
<tr>
<td>scheduleStartTime</td>
<td>dateTime</td>
<td>The schedule start time if the document is scheduled</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>scheduleEndTime</td>
<td>dateTime</td>
<td>The schedule end time if the document is scheduled</td>
</tr>
<tr>
<td>tableType</td>
<td>string</td>
<td>The table type</td>
</tr>
<tr>
<td>nbColumns</td>
<td>int</td>
<td>The number of columns in the output table</td>
</tr>
<tr>
<td>nbLines</td>
<td>int</td>
<td>The number of rows in the output table</td>
</tr>
</tbody>
</table>

**Example of table parameter**

```xml
<table>
  <row>
    <cell xsi:type="xsd:string">Australia</cell>
    <cell xsi:type="xsd:string">Accommodation</cell>
    <cell xsi:type="xsd:string">Bungalow</cell>
    <cell xsi:type="xsd:double">172980</cell>
  </row>
  <row>
    <cell xsi:type="xsd:string">Australia</cell>
    <cell xsi:type="xsd:string">Accommodation</cell>
    <cell xsi:type="xsd:string">Hotel Room</cell>
    <cell xsi:type="xsd:double">345510</cell>
  </row>
  ...
</table>
```

**Example of headers parameter**

```xml
<headers>
  <row>
    <cell xsi:type="xsd:string">Country</cell>
    <cell xsi:type="xsd:string">Service Line</cell>
    <cell xsi:type="xsd:string">Service</cell>
    <cell xsi:type="xsd:string">Revenue</cell>
  </row>
</headers>
```

**Related Information**

Sample BI service return data [page 934]
8.1.5.4 **Sample BI service return data**

Web services return data using Simple Object Access Protocol (SOAP). The following is a sample SOAP file returned by a web service.

```xml
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance...">
  <GetReportBlock_Block1Block1BeachResponse xmlns="multidocmultiuniversesmultime">
    <table>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Accommodation</cell>
        <cell xsi:type="xsd:string">Bungalow</cell>
        <cell xsi:type="xsd:double">172980</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Accommodation</cell>
        <cell xsi:type="xsd:string">Hotel Room</cell>
        <cell xsi:type="xsd:double">345510</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Accommodation</cell>
        <cell xsi:type="xsd:string">Hotel Suite</cell>
        <cell xsi:type="xsd:double">464850</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Food &amp; Drinks</cell>
        <cell xsi:type="xsd:string">Fast Food</cell>
        <cell xsi:type="xsd:double">19530</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Food &amp; Drinks</cell>
        <cell xsi:type="xsd:string">Poolside Bar</cell>
        <cell xsi:type="xsd:double">27073</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Food &amp; Drinks</cell>
        <cell xsi:type="xsd:string">Restaurant</cell>
        <cell xsi:type="xsd:double">41160</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Recreation</cell>
        <cell xsi:type="xsd:string">Activities</cell>
        <cell xsi:type="xsd:double">59820</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Recreation</cell>
        <cell xsi:type="xsd:string">Excursion</cell>
        <cell xsi:type="xsd:double">113170</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Recreation</cell>
        <cell xsi:type="xsd:string">Sports</cell>
        <cell xsi:type="xsd:double">69575</cell>
      </row>
      <row>
        <cell xsi:type="xsd:string">Australia</cell>
        <cell xsi:type="xsd:string">Travels</cell>
        </row>
  </table>
</GetReportBlock_Block1Block1BeachResponse>
</soap:Body>
</soap:Envelope>
```
<table>
<thead>
<tr>
<th>Location</th>
<th>Category</th>
<th>Subcategory</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Rent</td>
<td>Australia</td>
<td>Australia</td>
<td>49160</td>
</tr>
<tr>
<td></td>
<td>Travels</td>
<td>Travel Reservation</td>
<td>63300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Australia</td>
<td>126240</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hotel Room</td>
<td>116790</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hotel Suite</td>
<td>320220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fast Food</td>
<td>28440</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poolside Bar</td>
<td>46320</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restaurant</td>
<td>32640</td>
</tr>
<tr>
<td></td>
<td>Recreation</td>
<td>Activities</td>
<td>9000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excursion</td>
<td>120050</td>
</tr>
<tr>
<td></td>
<td>Recreation</td>
<td>Sports</td>
<td>35720</td>
</tr>
<tr>
<td></td>
<td>Nepal</td>
<td>Bungalow</td>
<td>323231</td>
</tr>
<tr>
<td>Country</td>
<td>Category</td>
<td>Description</td>
<td>Price</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Nepal</td>
<td>Accommodation</td>
<td>Hotel Room</td>
<td>330240</td>
</tr>
<tr>
<td>Nepal</td>
<td>Accommodation</td>
<td>Hotel Suite</td>
<td>320754</td>
</tr>
<tr>
<td>Nepal</td>
<td>Food &amp; Drinks</td>
<td>Fast Food</td>
<td></td>
</tr>
<tr>
<td>Nepal</td>
<td>Food &amp; Drinks</td>
<td>Poolside Bar</td>
<td>37915</td>
</tr>
<tr>
<td>Nepal</td>
<td>Food &amp; Drinks</td>
<td>Restaurant</td>
<td>32980</td>
</tr>
<tr>
<td>Nepal</td>
<td>Recreation</td>
<td>Activities</td>
<td>78200</td>
</tr>
<tr>
<td>Nepal</td>
<td>Recreation</td>
<td>Excursion</td>
<td>96440</td>
</tr>
<tr>
<td>Nepal</td>
<td>Recreation</td>
<td>Sports</td>
<td>102720</td>
</tr>
<tr>
<td>Nepal</td>
<td>Travels</td>
<td>Car Rent</td>
<td>56370</td>
</tr>
<tr>
<td>Nepal</td>
<td>Travels</td>
<td>Travel Reservation</td>
<td>74495</td>
</tr>
<tr>
<td>US</td>
<td>Accommodation</td>
<td>Bungalow</td>
<td>368870</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Country</th>
<th>Service Line</th>
<th>Service</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Accommodation</td>
<td>Hotel Room</td>
<td>746828</td>
</tr>
<tr>
<td>US</td>
<td>Accommodation</td>
<td>Hotel Suite</td>
<td>842046</td>
</tr>
<tr>
<td>US</td>
<td>Food &amp; Drinks</td>
<td>Fast Food</td>
<td>66330</td>
</tr>
<tr>
<td>US</td>
<td>Food &amp; Drinks</td>
<td>Poolside Bar</td>
<td>88508</td>
</tr>
<tr>
<td>US</td>
<td>Food &amp; Drinks</td>
<td>Restaurant</td>
<td>331860</td>
</tr>
<tr>
<td>US</td>
<td>Recreation</td>
<td>Activities</td>
<td>207950</td>
</tr>
<tr>
<td>US</td>
<td>Recreation</td>
<td>Excursion</td>
<td>170305</td>
</tr>
<tr>
<td>US</td>
<td>Recreation</td>
<td>Sports</td>
<td>74060</td>
</tr>
<tr>
<td>US</td>
<td>Travels</td>
<td>Car Rent</td>
<td>34580</td>
</tr>
<tr>
<td>US</td>
<td>Travels</td>
<td>Travel Reservation</td>
<td>43200</td>
</tr>
</tbody>
</table>
8.1.5.5 BI service WSDL definition

```xml
<?xml version="1.0" encoding="utf-16"?>
<definitions xmlns:http="http://schemas.xmlsoap.org/wsdl/http/
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s0="zozo2" xmlns:tns1="dsws.businessobjects.com"
targetNamespace="zozo2" xmlns="http://schemas.xmlsoap.org/wsdl/"
name="BIServices">
  <types>
    <s:simpleType name="Operator">
      <s:restriction base="s:string">
        <s:enumeration value="EQUAL" />
        <s:enumeration value="GREATER" />
        <s:enumeration value="GREATER_OR_EQUAL" />
        <s:enumeration value="LESS" />
        <s:enumeration value="LESS_OR_EQUAL" />
        <s:enumeration value="NOT_EQUAL" />
        <s:enumeration value="INLIST" />
        <s:enumeration value="NOT_INLIST" />
      </s:restriction>
    </s:simpleType>
    <s:complexType name="FilterCondition">
      <s:sequence>
        <s:element name="value" type="s:string" />
        <s:element name="operator" type="s0:Operator" />
      </s:sequence>
    </s:complexType>
    <s:complexType name="LovValueIndex">
      <s:sequence>
        <s:element name="valueofPrompt" type="s:string" />
        <s:element name="index" type="s:string" />
      </s:sequence>
    </s:complexType>
    <s:complexType name="DrillFilter">
      <s:sequence>
        <s:element name="dimension" type="s:string" />
        <s:element name="value" type="s:string" />
        <s:element name="operator" type="s0:Operator" />
      </s:sequence>
    </s:complexType>
    <s:element name="GetReportBlock_Block1">
      <s:complexType>
        <s:sequence>
          <s:element name="login" type="s:string" minOccurs="0" nillable="true" />
          <s:element name="password" type="s:string" minOccurs="0" nillable="true" />
          <s:element name="Country" type="s0:FilterCondition" />
        </s:sequence>
      </s:complexType>
    </s:element>
  </types>
</definitions>
```
<s:element name="nbColumns" type="s:int" />
<s:element name="nbLines" type="s:int" />
</s:sequence>
</s:complexType>
</s:element>
<s:element name="Drill_Block1Response">
<s:complexType>
<s:sequence>
<s:element name="table" type="s0:TTable" />
<s:element name="headers" type="s0:THeader" />
<s:element name="footers" type="s0:TFooter" />
<s:element name="user" type="s:string" />
<s:element name="documentation" type="s:string" />
<s:element name="documentname" type="s:string" />
<s:element name="lastrefreshdate" type="s:dateTime" />
<s:element name="creationdate" type="s:dateTime" />
<s:element name="creator" type="s:string" />
<s:element name="isScheduled" type="s:boolean" />
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<s:element name="scheduleEndTime" type="s:dateTime" />
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<s:element name="nbLines" type="s:int" />
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</s:element>
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<s:element name="footers" type="s0:TFooter" />
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<s:element name="documentation" type="s:string" />
<s:element name="documentname" type="s:string" />
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<s:element name="scheduleStartTime" type="s:dateTime" />
<s:element name="scheduleEndTime" type="s:dateTime" />
<s:element name="tableType" type="s:string" />
<s:element name="nbColumns" type="s:int" />
<s:element name="nbLines" type="s:int" />
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<s:element name="Drill_Block1ffResponse">
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<s:element name="footers" type="s0:TFooter" />
<s:element name="user" type="s:string" />
<s:element name="documentation" type="s:string" />
<s:element name="documentname" type="s:string" />
<s:element name="lastrefreshdate" type="s:dateTime" />
<s:element name="creationdate" type="s:dateTime" />
<s:element name="creator" type="s:string" />
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<s:element name="scheduleStartTime" type="s:dateTime" />
<s:element name="scheduleEndTime" type="s:dateTime" />
<s:element name="tableType" type="s:string" />
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<s:element name="nbLines" type="s:int" />
</s:sequence>
</s:complexType>
</s:element>
<s:element name="GetReportBlock_Bloc1Response">
  <s:complexType>
    <s:sequence>
      <s:element name="table" type="s0:TTable" />
      <s:element name="headers" type="s0:THHeader" />
      <s:element name="footers" type="s0:TFooter" />
      <s:element name="user" type="s:string" />
      <s:element name="documentation" type="s:string" />
      <s:element name="documentname" type="s:string" />
      <s:element name="lastrefreshdate" type="s:dateTime" />
      <s:element name="creationdate" type="s:dateTime" />
      <s:element name="creator" type="s:string" />
      <s:element name="isScheduled" type="s:boolean" />
      <s:element name="scheduleStartTime" type="s:dateTime" />
      <s:element name="scheduleEndTime" type="s:dateTime" />
      <s:element name="tableType" type="s:string" />
      <s:element name="nbColumns" type="s:int" />
      <s:element name="nbLines" type="s:int" />
    </s:sequence>
  </s:complexType>
</s:element>

<s:element name="Drill_Bloc1Response">
  <s:complexType>
    <s:sequence>
      <s:element name="table" type="s0:TTable" />
      <s:element name="headers" type="s0:THHeader" />
      <s:element name="footers" type="s0:TFooter" />
      <s:element name="user" type="s:string" />
      <s:element name="documentation" type="s:string" />
      <s:element name="documentname" type="s:string" />
      <s:element name="lastrefreshdate" type="s:dateTime" />
      <s:element name="creationdate" type="s:dateTime" />
      <s:element name="creator" type="s:string" />
      <s:element name="isScheduled" type="s:boolean" />
      <s:element name="scheduleStartTime" type="s:dateTime" />
      <s:element name="scheduleEndTime" type="s:dateTime" />
      <s:element name="tableType" type="s:string" />
      <s:element name="nbColumns" type="s:int" />
      <s:element name="nbLines" type="s:int" />
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  </s:complexType>
</s:element>
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<message name="GetReportBlock_Block1SoapIn">
  <part name="parameters" element="s0:GetReportBlock_Block1" />
  <part name="request_header" element="s0:QaaWSHeader" />
</message>

<message name="GetReportBlock_Block1SoapOut">
  <part name="parameters" element="s0:GetReportBlock_Block1Response" />
</message>

<message name="Drill_Block1SoapIn">
  <part name="parameters" element="s0:Drill_Block1" />
  <part name="request_header" element="s0:QaaWSHeader" />
</message>

<message name="Drill_Block1SoapOut">
  <part name="parameters" element="s0:Drill_Block1Response" />
</message>
<message name="GetReportBlock_Block1ffSoapIn">
  <part name="parameters" element="s0:GetReportBlock_Block1ff" />
</message>
<message name="GetReportBlock_Block1ffSoapOut">
  <part name="parameters" element="s0:GetReportBlock_Block1ffResponse" />
</message>
<message name="Drill_Block1ffSoapIn">
  <part name="parameters" element="s0:Drill_Block1ff" />
</message>
<message name="Drill_Block1ffSoapOut">
  <part name="parameters" element="s0:Drill_Block1ffResponse" />
</message>
<message name="GetReportBlock_Bloc1SoapIn">
  <part name="parameters" element="s0:GetReportBlock_Bloc1" />
</message>
<message name="GetReportBlock_Bloc1SoapOut">
  <part name="parameters" element="s0:GetReportBlock_Bloc1Response" />
</message>
<message name="Drill_Bloc1SoapIn">
  <part name="parameters" element="s0:Drill_Bloc1" />
</message>
<message name="Drill_Bloc1SoapOut">
  <part name="parameters" element="s0:Drill_Bloc1Response" />
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    <output message="s0:GetReportBlock_Block1SoapOut" />
  </operation>
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    <documentation />
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  </operation>
  <operation name="GetReportBlock_Block1ff">
    <documentation />
    <input message="s0:GetReportBlock_Block1ffSoapIn" />
    <output message="s0:GetReportBlock_Block1ffSoapOut" />
  </operation>
  <operation name="Drill_Block1ff">
    <documentation />
    <input message="s0:Drill_Block1ffSoapIn" />
    <output message="s0:Drill_Block1ffSoapOut" />
  </operation>
  <operation name="GetReportBlock_Bloc1">
    <documentation />
    <input message="s0:GetReportBlock_Bloc1SoapIn" />
    <output message="s0:GetReportBlock_Bloc1SoapOut" />
  </operation>
  <operation name="Drill_Bloc1">
    <documentation />
    <input message="s0:Drill_Bloc1SoapIn" />
    <output message="s0:Drill_Bloc1SoapOut" />
  </operation>
</portType>

SAP BusinessObjects Web Intelligence User's Guide
Sharing content with other applications
<soap:header message="s0:GetReportBlock_Block1SoapIn" part="request_header" use="literal" />
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<output>
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<documentation />
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</soap:header>
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<output>
<soap:body use="literal" />
</output>
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<documentation />
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<input>
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<soap:headerfault message="s0:Drill_Block1ffSoapIn" part="request_header" use="literal" />
</soap:header>
<soap:body use="literal" parts="parameters" />
</input>
<output>
<soap:body use="literal" />
</output>
</operation>
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<documentation />
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<documentation />
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</soap:header>
<soap:body use="literal" parts="parameters" />
</input>
<output>
<soap:body use="literal" />
</output>
</operation>
<operation name="Drill_Bloc1">
<documentation />
<soap:operation soapAction="zozo2/Drill_Bloc1" style="document" />
<input>
<soap:header message="s0:Drill_Bloc1SoapIn" part="request_header" use="literal" />
<soap:headerfault message="s0:Drill_Bloc1SoapIn" part="request_header" use="literal" />
</soap:header>
<soap:body use="literal" parts="parameters" />
</input>
<output>
<soap:body use="literal" />
</output>
</operation>
<operation name="GetReportBlock_Bloc1ff">
<documentation />
<soap:operation soapAction="zozo2/GetReportBlock_Bloc1ff" style="document" />
<input>
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<soap:headerfault message="s0:GetReportBlock_Bloc1ffSoapIn" part="request_header" use="literal" />
</soap:header>
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</input>
<output>
<soap:body use="literal" />
</output>
</operation>
<soap:body use="literal" />
</operation>
<operation name="Drill_Bloc1">
<documentation />
<soap:operation soapAction="zozo2/Drill_Bloc1" style="document" />
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<soap:headerfault message="s0:Drill_Bloc1SoapIn" part="request_header" use="literal" />
</soap:header>
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</input>
<output>
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</output>
</operation>
</binding>
<service name="zozo2">
<documentation />
<port name="BIServicesSoap" binding="s0:BIServicesSoap">
</port>
</service>
</definitions>
## 9 Rights appendix

### 9.1 General rights

In this topic, find all the general rights relevant to Web Intelligence.

<table>
<thead>
<tr>
<th>Right</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Lists of Values</td>
<td>Lets you use lists of values.</td>
</tr>
<tr>
<td>Export the report’s data</td>
<td>Lets you export document data to Excel, PDF, and CSV formats. If you do not have this right, you require the Save as CSV, Save as Excel, or Save as PDF right; these rights let you export documents in the specified format only.</td>
</tr>
<tr>
<td>Query script - enable viewing (SQL, MDX…)</td>
<td>Lets you view query scripts (SQL and MDX).</td>
</tr>
<tr>
<td>Query script - enable editing (SQL, MDX…)</td>
<td>Lets you edit query scripts (SQL and MDX). You can also edit Free-hand SQL (FHSQL) data sources.</td>
</tr>
<tr>
<td>Refresh the report’s data</td>
<td>Lets you refresh document data.</td>
</tr>
<tr>
<td>Edit Query</td>
<td>Lets you edit queries in the document.</td>
</tr>
<tr>
<td>Refresh List of Values</td>
<td>Lets you refresh lists of values for prompts when you create the prompt or when you view the document. To do this, you also require the Use Lists of Values right on the document.</td>
</tr>
<tr>
<td>Save as CSV</td>
<td>Lets you export documents as CSV files only. If you have the Export the report’s data right on a document already, you do not require this right.</td>
</tr>
<tr>
<td>Save as Excel</td>
<td>Lets you export documents as Excel files only. If you have the Export the report’s data right on a document already, you do not require this right.</td>
</tr>
<tr>
<td>Save as PDF</td>
<td>Lets you export documents as PDF files only. If you have the Export the report’s data right on a document already, you do not require this right.</td>
</tr>
<tr>
<td>Send to</td>
<td>Lets you send documents to the Scheduler, to a BI platform Inbox, or to send as hyperlinks in email. This right also lets Web Intelligence Rich Client users send documents as email attachments.</td>
</tr>
</tbody>
</table>
# 9.2 Document rights

In this section, find all the rights relevant to Web Intelligence documents.

<table>
<thead>
<tr>
<th>Right</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data - enable data tracking</strong></td>
<td>Enables a user to track changed data</td>
</tr>
<tr>
<td><strong>Data - enable formatting of changed data</strong></td>
<td>Enables a user to select formatting for changed data</td>
</tr>
<tr>
<td><strong>Desktop interface - enable Web Intelligence Desktop</strong></td>
<td>Enables a user to use the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - export documents</strong></td>
<td>Enables a user to export documents to the CMS in the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - import documents</strong></td>
<td>Enables a user to import documents from the CMS in the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - install from BI launch pad</strong></td>
<td>Enables a user to download the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - print documents</strong></td>
<td>Enables a user to print documents from the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - remove document security</strong></td>
<td>Enables a user to remove document security from the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - save document for all users</strong></td>
<td>Enables a user to save documents for all users from the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - save documents locally</strong></td>
<td>Enables a user to save documents to a local disk in the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop interface - send by mail</strong></td>
<td>Enables a user to send document in an email message from the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Desktop Interface - enable local data providers</strong></td>
<td>Enables a user to use personal data providers in the Web Intelligence Desktop interface</td>
</tr>
<tr>
<td><strong>Documents - disable automatic refresh on open</strong></td>
<td>Prevents documents from automatically refreshing when they are opened</td>
</tr>
<tr>
<td><strong>Documents - enable autosave</strong></td>
<td>Enables documents to be automatically saved, if autosaving is activated in the CMC by the administrator</td>
</tr>
<tr>
<td><strong>Documents - enable creation</strong></td>
<td>Enables a user to create new documents</td>
</tr>
<tr>
<td><strong>Documents - enable publishing and content management</strong></td>
<td>Enables a user to publish document in the CMS</td>
</tr>
<tr>
<td>Right</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Interactive: Reporting - Create and edit alerter</strong></td>
<td>Enables a user to create and to edit alerts in the interactive viewer</td>
</tr>
<tr>
<td><strong>Interfaces - enable Rich Internet Application</strong></td>
<td>Enables a user to use the viewing and editing interface in the Rich Internet Application The Rich Internet Application was called Java Report panel in earlier releases.</td>
</tr>
<tr>
<td><strong>Interfaces - enable web viewing interface</strong></td>
<td>Enables a user to use the Web viewing interface The Web viewing interface was called the DHTML viewer in earlier releases.</td>
</tr>
<tr>
<td><strong>Interfaces - enable web query panel</strong></td>
<td>Enables a user to use of the web query panel The web query panel was called Query - HTML in earlier releases.</td>
</tr>
<tr>
<td><strong>General - edit 'My Preferences'</strong></td>
<td>Enables a user to edit preferences in the BI launch pad</td>
</tr>
<tr>
<td><strong>General - enable right-click menus</strong></td>
<td>Enables a user to use context menus</td>
</tr>
<tr>
<td><strong>Left pane - enable document summary</strong></td>
<td>Enables a user to display the document summary in the left pane</td>
</tr>
<tr>
<td><strong>Left pane - enable document structure and filter</strong></td>
<td>Enables a user to display the document structure and filters in the left pane</td>
</tr>
<tr>
<td><strong>Query script - enable editing (SQL, MDX...</strong></td>
<td>Enables a user to edit SQL and MDX query scripts</td>
</tr>
<tr>
<td><strong>Query script - enable viewing (SQL, MDX...</strong></td>
<td>Enables a user to view SQL and MDX query scripts</td>
</tr>
<tr>
<td><strong>Reporting - create and edit breaks</strong></td>
<td>Enables a user to create and to edit breaks</td>
</tr>
<tr>
<td><strong>Reporting - create and edit conditional formatting rules</strong></td>
<td>Enables a user to create and to edit conditional formatting rules</td>
</tr>
<tr>
<td><strong>Reporting - create and edit predefined calculations</strong></td>
<td>Enables a user to create and to edit predefined calculations</td>
</tr>
<tr>
<td><strong>Reporting - create and edit input controls</strong></td>
<td>Enables a user to create and to edit input controls</td>
</tr>
<tr>
<td><strong>Reporting - create and edit report filters and consume input controls</strong></td>
<td>Enables a user to creation and editing of report filters and input controls(Input Controls pane in the Left Pane are not displayed when disabled)</td>
</tr>
<tr>
<td><strong>Reporting - create and edit sorts</strong></td>
<td>Enables a user to create and to edit sorts</td>
</tr>
<tr>
<td><strong>Reporting - create formulas and variables</strong></td>
<td>Enables a user to create formulas and variables</td>
</tr>
<tr>
<td><strong>Reporting - enable formatting</strong></td>
<td>Enables a user to edit report formatting</td>
</tr>
</tbody>
</table>
Right | Description
--- | ---
Without this access right, the Design and Data mode is not available.

**Reporting - enable merged dimensions**
Enables a user to synchronize data using merged dimensions in reports and in the data manager.

**Reporting - insert and remove reports, tables, charts and cells**
- Enables a user to insert and to remove reports, tables, charts, and cells
- Enables the duplicates workflow (copy/paste)

**Sharing - publish shared elements**
Enables a user to create shared elements in a document.

**Sharing - insert shared elements**
Enables a user to add shared elements in a document.

**Change preferences for objects that the user owns**
Displays the Preferences menu in an application object.
Without this access right, a user cannot set personal preferences in any application and no Preferences menu will appear in applications. For example, without this right, users cannot select the unit of measurement (inches or millimeters) to use in reports in the Web Intelligence or BI launch pad application.

### 9.3 Connection rights

The rights in this section are type-specific rights that apply to universe connections or general rights that have a specific meaning in the context of universe connections. These rights apply to connections published in the repository.

#### Relational connection rights

<table>
<thead>
<tr>
<th>Right</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>View objects</td>
<td>Lets you view the connection.</td>
</tr>
<tr>
<td>Edit objects</td>
<td>Lets you edit the connection parameters.</td>
</tr>
<tr>
<td>Download connection locally</td>
<td>Lets you use universes created on the connection in Web Intelligence Rich Client in offline mode. Lets you use the local middleware driver in the information design tool. To do so, select the local middleware option in</td>
</tr>
</tbody>
</table>
## OLAP connection rights

<table>
<thead>
<tr>
<th>Right</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>View objects</td>
<td>Lets you view the connection.</td>
</tr>
<tr>
<td>Edit objects</td>
<td>Lets you edit the connection parameters in the information design tool.</td>
</tr>
<tr>
<td>Delete objects</td>
<td>Lets you delete the connection.</td>
</tr>
<tr>
<td>Copy objects to another folder</td>
<td>Lets you copy the connection from one folder to another.</td>
</tr>
</tbody>
</table>
10 Security

10.1 Data protection and privacy

Data protection is associated with numerous legal requirements and privacy concerns. In addition to compliance with applicable data privacy regulations, it is necessary to consider compliance with industry-specific legislation in different countries. SAP provides specific features and functions to support compliance with regards to relevant legal requirements, including data protection. SAP does not give any advice on whether these features and functions are the best method to support company, industry, regional, or country-specific requirements. Furthermore, this information does not give any advice or recommendation in regards to additional features that would be required in particular IT environments; decisions related to data protection must be made on a case-by-case basis, under consideration of the given system landscape and the applicable legal requirements.

i Note

In the majority of cases, compliance with applicable data protection and privacy laws will not be covered by a product feature. SAP software supports data protection compliance by providing security features and specific data protection-relevant functions, such as simplified blocking and deletion of personal data. SAP does not provide legal advice in any form. Definitions and other terms used in this document are not taken from any given legal source.

10.2 General principles

Web Intelligence documents are stored in the Business Intelligence Platform to ensure that only authenticated and authorized users can access them. Web Intelligence doesn’t collect personal data, and processes data in a generic manner, meaning that the application cannot determine whether metadata should be processed as personal.

To fulfill most of General Data Protection Regulation (GDPR) requirements, Web Intelligence documents must be built so that the content is always synchronized with that of underlying databases. We recommend leveraging the Refresh on Open and Scheduling capabilities. Open or freely configurable text fields should not contain personal data.

10.3 Building Web Intelligence reports

Web Intelligence reports must be built leveraging the Refresh on Open feature. When enabled, the document is purged from its content and refreshed each time you open it. That is a way to always keep the document up to
date. Besides, the document is set according to the user’s rights. This ensures that data that is no longer available in the database is removed tables, charts and other report elements that are part of the document.

Since the refresh is performed after the purge, users will not be able to display previous content, even in case of errors during the refresh process. This behavior is also applicable if the document is saved locally.

### 10.4 Retention policy

The BI Platform offers a scheduling feature that you can use to implement a retention policy. These functionalities create instances of a document periodically. A document can be refreshed and stored every morning, for instance. Administrators can then create rules that allow for the deletion of these instances after a period that they have configured upfront. For more information, read this blog post: https://blogs.sap.com/2013/04/03/businessobjects-instance-management/. These rules can be configured either at the BI platform, that is for a specific folder and all the documents it contains, or at a document level.

### 10.5 Read access logging

Administrators can enable auditing for Web Intelligence documents by enabling logs for document access or refreshes on given universes. Logs are then stored in a database, and use the BI platform to build a Web Intelligence document on that database that you can later use to determine which documents each user have read access to.

Web Intelligence doesn’t collect personal data, and processes data in a generic manner, meaning that the application cannot determine whether metadata should be processed as personal. It’s customer responsibility to identify documents that contain personal data.

### 10.6 Logs

Server logs may contain pieces of information that allow to establish a connection between users and the document they have launched. To fulfill GDPR requirements, administrators must ensure to set up regular log deletion in the Central Management Console, or even disable them altogether if necessary.
10.7 Reporting

GDPR compliant products must offer capabilities to display report of the data related to a specific user. Web Intelligence being a adhoc reporting tool, customers can build reports that suit their specific usage of Web Intelligence. The Auditing database can be a great help for this purpose.

10.8 Saving documents locally

When saving documents outside of the CMS, it is customer responsibility to protect their content. We recommend installing third party tools that support operating system level encryption.
11 Web Intelligence error messages

Error messages may appear while you are using Web Intelligence.
This section lists the messages and their descriptions grouped by the different components that make up Web Intelligence.

11.1 Web Intelligence (WIJ) Error Messages

Web Intelligence Java interface error messages include the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIJ 10000 - WIJ 77778</td>
<td>Web Intelligence Java interface</td>
</tr>
</tbody>
</table>

11.1.1 You need to use the Formula Editor to create a formula. (Error: WIJ 10000)

Cause

You typed a formula into a cell using the Cell Properties panel instead of the Formula Editor.

Action

Launch the Formula Editor and define the formula in the Formula Definition pane.
11.1.2 You cannot position this report component in relation to a block, cell, or section that is positioned relative to this report component. Select a different block, cell or section in the dropdown list or unselect the Relative To option. (WIJ 10500)

**Cause**

When you position a report component in relation to another report component that references the selected one, you create a circular attachment.

**Action**

Remove relative positioning, or select a different block, cell, or section for relative positioning.

11.1.3 Web Intelligence requires the Java Runtime Environment (JRE) 1.4.2_01. The currently installed JRE is {0}. Contact your administrator to upgrade to 1.4.2_01 or select the [default VM] entry in the [Java Plug-in Control Panel], if you already have the required version installed. (WIJ 11111)

**Cause**

When you use the Java interface, a Java applet is installed on your local PC. The Java Runtime Environment 1.4.2_01 (or later version) needs to be installed and selected in order for the report panel to function.

**Action**

If Java Runtime Environment 1.4.2_01 (or later version) is already installed on your PC, then launch the Java Plug-in Control panel. To do this:

- Select the Windows menu: Start ➔ Settings ➔ Control Panel ➔
- Double-click Java Plug-in.
- On the Advanced tab, select Use Java Plug-in Default, then click Apply.

Or

Contact your administrator, and request help with installing Java Runtime Environment 1.4.2_01 (or later version).
11.1.4 An error occurred while the document was being decoded. Try to open the
document in the BI Launch Pad, or contact your administrator for further
information. (WIJ 20000)

**Cause**

Web Intelligence cannot decode and open the document in the Java Report Panel.

**Action**

Open the document in InfoView by clicking the document title where the document is listed on the InfoView
Corporate Documents or Personal Documents page.
If this does not work, see your administrator.

11.1.5 An unexpected problem occurred when during document refresh and open. The
data source has been modified or deleted, or a prompt on the document has
no value selected. (WIJ 20001)

**Cause**

The document has the Refresh on open option selected. One or more of the following explanations can account
for this error:

- The data source has been modified since the document was created.
- The data source has been deleted since the document was created.
- One or more prompts have no values selected.

**Action**

See your administrator.
11.1.6 Unexpected error. If you cannot reconnect to the server, close your session and start again. (WIJ 20002)

**Cause**

The server may be down or your user session may be closed.

**Action**

See your administrator.

11.1.7 Unable to get the first page of the current report. Check the validity of your report. (ERR WIJ 20003).

**Cause**

The report cannot be displayed because it contains structural errors.

**Action**

Do one of the following:

- View the report in Structure View and verify the report structure. For example, errors can be caused if report blocks overlap or if the structure of a table contains cells that create an asymmetrical table format. Modify the report structure appropriately.
- Contact your administrator and request them to search for structural anomalies in the report.

11.1.8 The current query contains unresolvable objects. The query will be updated (WIJ 20004).

**Cause**

There are objects that cannot be resolved in the query.
Action

Check that the related objects have not been deleted from the data source.

11.1.9 The current request has returned corrupted data. Contact your administrator for further information (WIJ 20005).

Cause

The returned data is corrupted. This could be due to data source or network issues.

Action

Contact your administrator.

11.1.10 Unable to contact the application server. Contact your administrator for further information (WIJ 20010).

Cause

The application server could be down, or address different to the one expected.

Action

Contact your administrator.

11.1.11 The \{0,number\} MB report element you want to copy is too large to be exported to an external application. The maximum allowed size is \{1,number\} MB. (Error: WIJ 30004)

Cause

The report element you want to copy is too large to be copied.
**Action**

Do not attempt to copy the report element.

**11.1.12** Your user profile does not give you access to a document domain to save corporate documents. Save this document as a personal document or contact your administrator (ERR WIJ 40000).

**Cause**

You do not have the rights to save the document to the corporate repository.

**Action**

Save the document as a personal document or ask your administrator for the rights to save the document to the repository.

**11.1.13** The query in this document is empty. Check that the Result Objects pane on the query tab includes objects before running the query (ERR WIJ 30000).

**Cause**

The query does not contain any result objects.

**Action**

Edit the query and add result objects.
11.1.14 At least one query in this document is empty. Check that the Result Objects pane on each query tab includes objects before running the queries (ERR WIJ 30001).

**Cause**

A query does not contain any result objects.

**Action**

Add the result objects to the empty query.

11.1.15 Out of memory. Reduce the browser window size or re-launch the report panel. (WIJ 30003).

**Cause**

Your computer has run out of the memory. This may be because your browser window size is too large.

**Action**

Do one of the following:
- Reduce the size of the browser window.
- Relaunch the Java interface.

11.1.16 Your user profile does not allow you to save personal or corporate documents. Contact your administrator for further details. (WIJ 40001)

**Cause**

Your user profile, defined by your administrator, does not allow you to save personal or corporate documents.
Action

If you think you need to be allowed to save personal documents and/or corporate documents to InfoView, contact your administrator to request they modify your security profile.

11.1.17 An unexpected error occurred. (WIJ 44444)

Cause

An unexpected error was encountered.

Action

Please contact your administrator with details of the actions you performed before the error occurred.

11.1.18 Your version of Web Intelligence Rich Client is not up-to-date to connect to this system (ERR WIJ 50003). You must upgrade your Web Intelligence Rich Client by clicking <a href="{0}">here</a>.

Cause

Your version of Web Intelligence Rich Client is not recent enough to connect to the repository.

Action

Upgrade your version of Web Intelligence Rich Client by following the link.

11.1.19 The information sent to the server contains invalid character(s). Use the Undo button to cancel the latest changes to the document and then retry. (Error: WIJ 55555)

Cause

There is an error in the XML sent to the server by the application.
Action

Use the *Undo* feature to remove the erroneous modification made to the document, and then run the query or refresh the document again.

11.1.20  The session timed out. The document {document_name}.wid has been autosaved in the Favorites\~WebIntelligence folder. Click Restore to retrieve it. (WIJ 60001)

Cause

Due to a server timeout, the current document was autosaved in the Favorites\~WebIntelligence folder.

Action

Click *Restore* to retrieve the autosaved document.

If you cannot restore the document automatically, retrieve it manually from the folder. The name of the autosaved document is the original document name with an automatically-generated prefix and postfix.

Retrieve the document from the autosave folder as quickly as possible. This folder is not a permanent storage location for autosaved documents.

11.1.21  The session timed out, but the document could not be autosaved because the following security rights are not assigned (WIJ 60002):

{list_of_rights}

Cause

The document could not be autosaved because you do not have some or all of the following security rights:

- Edit object
- Delete object
- Add object

Action

Ask your administrator to assign you the appropriate security rights.
11.1.22 The document cannot be retrieved due to a server problem (WIJ 77777).

Cause

The document cannot be retrieved because the server is down.

Action

See your administrator.

11.1.23 Your session timed out. Please close the Java interface and log on again. (WIJ 77778)

Cause

You have remained logged in to the BI launch pad without using the Java interface for longer than the maximum time allowed by the system.

Action

Log out and then log back into the BI launch pad to continue using the Java interface (you will lose any unsaved modifications you made previous to timeout).

To increase the length of time you are allowed to remain logged in to the BI launch pad ask your administrator to increase your session timeout parameter.

11.1.24 The Central Management System is not functioning. Contact your administrator for further information. (WIJ 77779)

Cause

The Central Management System (CMS) is not running.
**Action**

Contact your administrator.

**11.1.25** Your user profile does not allow you to edit or create documents based on Free-hand SQL. Please contact your BI administrator to be granted this right. (WIJ 77780)

**Cause**

The rights that you were assigned for Web Intelligence do not include the right to edit SQL/MDX query scripts in Web Intelligence, which you need to be able to create documents based on Free-hand SQL.

**Action**

If you need to create Web Intelligence documents based on a Free-hand SQL statement, contact your BI administrator to request the right to edit SQL/MDX query scripts in Web Intelligence.

**11.2 Web Intelligence Desktop HTML Interface (WIH) Error Messages**

Web Intelligence Desktop HTML interface error messages include the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIH 00000 - WIH 00020</td>
<td>Web Intelligence Desktop HTML interface</td>
</tr>
</tbody>
</table>

**11.2.1** Invalid session. Please close your browser and log on again. (WIH 00013)

**Cause**

This error message occurs when more than one document is open in the BI launch pad and you try to work with a document that has been inactive longer than session expiration time.
Action

Log out of the BI launch pad and close the browser, and then log into the BI launch pad again.

11.2.2 The document could not be saved. (WIH 00014)

Cause

The document could not be saved to the repository. This error can occur for a number of reasons. For example: you do not have the security rights to the folder where you tried to save the document.

Action

See your administrator to determine why you could not save the document.

11.2.3 The session timed out. The document {document_name}.wid has been autosaved in the Favorites\~WebIntelligence folder. Click Restore to retrieve it. (WIH 00015)

Cause

Due to a server timeout, the current document was autosaved in the Favorites\~WebIntelligence folder.

Action

Click Restore to retrieve the autosaved document.

If you cannot restore the document automatically, retrieve it manually from the folder. The name of the autosaved document is the original document name with an automatically-generated prefix and postfix.

Retrieve the document from the autosave folder as quickly as possible. This folder is not a permanent storage location for autosaved documents.
11.2.4 The session timed out, but the document could not be autosaved because the following security rights are not assigned (WIH 00016): {list_of_rights}

Cause

The document could not be autosaved because you do not have some or all of the following security rights:

- Edit object
- Delete object
- Add object

Action

Ask your administrator to assign you the appropriate security rights.

11.2.5 An unexpected error occurred. For information about this error, please refer to SAP Knowledge Base Article 2054722 on the SAP Support Portal. (WIH 44444)

Cause

The server has failed without being able to identify the root cause of the error.

Action

Close the document and reopen it again.

If this does not resolve the issue, contact your BI administrator.

If you are a BI administrator and need more information about this error, please refer to the SAP Knowledge Base Article 2054722 on the SAP Support Portal.

11.3 Web Intelligence Desktop (WIO) Error Messages

Web Intelligence Desktop (Rich Client) error messages include the following:
11.3.1  Web Intelligence Desktop cannot log in. (WIO 00001)

Cause

The browser cache might be full – under certain circumstances this can prevent Web Intelligence Desktop from logging in.

Action

Empty the browser cache if it is full. If Web Intelligence Desktop still cannot log in, see your administrator.

11.3.2  Cannot open the hyperlink (WIO 00002).

Cause

- The URL in the hyperlink is incorrectly constructed.
- The hyperlink references a document in the Central Management Console (CMC). Documents in the CMC are not always accessible from Web Intelligence Rich Client for two reasons:
  - The hyperlink does not specify the name of the server hosting the document because the *Use complete URL path to build document hyperlink* setting is not selected. Incomplete URLs are invalid when used outside the BI launch pad.
  - The hyperlink builds the complete URL, but the server specified in the URL is not accessible from the computer running Web Intelligence Rich Client.

Action

Correct the hyperlink or see your IT administrator for help.
11.3.3 There is no more memory available. (WIS 30280) (WIO 30280)

Cause

Your system is out of memory.

Action

Close open documents to free memory.

11.3.4 Cannot continue because memory is low. Please close documents to free memory. (WIO 30284)

Cause

Your system memory is low.

Action

Close open documents to free memory.

11.4 Web Intelligence Server (WIS) Error Messages

Web Intelligence Server error messages include the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIS 30000 - WIS 40000</td>
<td>Web Intelligence Server</td>
</tr>
</tbody>
</table>
11.4.1 The query in this document is empty. (WIS 30000)

**Cause**

No data is defined for this document.

**Action**

Add result objects to the query.

11.4.2 At least one query in the document is empty. (WIS 30001)

**Cause**

No data is defined for at least one of the queries in this document.

**Action**

Add result objects to the query.

11.4.3 Your security profile does not include permission to edit queries. (WIS 30251)

**Cause**

You do not have the right to edit queries.

**Action**

Contact your administrator to request the ability to edit the queries in documents.
11.4.4 Your security profile does not include permission to edit documents. (WIS 30252)

**Cause**

You do not have the right to edit documents.

**Action**

Contact your administrator and request the ability to edit documents.

11.4.5 Your security profile does not include permission to refresh documents. (WIS 30253)

**Cause**

You do not have the right to refresh documents.

**Action**

Contact your administrator to request the ability to refresh documents.

11.4.6 Your security profile does not include permission to refresh lists of values. (WIS 30254)

**Cause**

You do not have permission to refresh lists of values.

**Action**

Contact your administrator to request the ability to refresh lists of values in documents.
11.4.7  Your security profile does not include permission to use lists of values.  
(WIS 30255)

Cause

You do not have permission to use lists of values.

Action

Contact your administrator to request the ability to use lists of values in documents.

11.4.8  Your security profile does not include permission to view the script generated by the query.  (WIS 30256)

Cause

You do not have the permission to view the script generated by the query.

Action

Contact your administrator to request the ability to view the script in queries.

11.4.9  Your security profile does not include permission to use the formula language.  (WIS 30257)

Cause

You do not have permission to use the formula language or create variables.

Action

Contact your administrator to request the ability to use the formula language and create variables in documents.
11.4.10 Your security profile does not include permission to perform drill analysis. (WIS 30258)

**Cause**

You do not have permission to perform drill analysis.

**Action**

Contact your administrator to request the ability to drill on reports.

11.4.11 Your security profile does not include permission to extend the scope of analysis. (WIS 30259)

**Cause**

You attempted to perform a drill operation outside the defined scope of analysis, and you do not have permission to drill outside the scope of analysis.

**Action**

Contact your administrator.

11.4.12 An internal error occurred while calling the {api_name} API. (WIS 30270)

**Cause**

Information about the document or the data source is invalid or not available.

**Action**

Your administrator can trace the problem that caused the error by activating the tracking and verifying the trace associated with the API.
11.4.13 The document is too large to be processed by the server. (WIS 30271)

Cause

When you view a document in Portable Document Format (PDF) or Microsoft Excel format, the server generates binary based output, which is then interpreted by your web browser. This error occurs if the size of the binary output is greater than the maximum size specified by your administrator for the server.

Action

Contact your administrator and ask them to increase the maximum size.

11.4.14 The document is too large to be processed by the server. (WIS 30272)

Cause

When you view a document in HTML format, the server generates character-based output, which is then interpreted by your web browser. This error occurs if the size of the character output is greater than the maximum size specified by your administrator for the server.

Action

Ask your administrator to increase the maximum document size.

11.4.15 The query or report could not be generated. (WIS 30351)

Cause

It was not possible to complete one or more of the steps required to define a query and generate a report. This is due to one of the following reasons:

- the document was not initialized
- the data source is not valid
- the query was not defined
- the query context was not defined at the universe level
- no values were specified for prompts at the universe level
**Action**

Contact your administrator and ask them to check the connection to the data source, and that the universe does not contain unspecified contexts and prompt values.

**11.4.16** A query with this name already exists. (WIS 30371)

**Cause**

Another query used in this document already has this name.

**Action**

Enter a different name for this query.

**11.4.17** The Web Intelligence server memory is full. Log off and try to connect later. If the problem persists, contact your administrator. (Error: ERR_WIS_30280) (WIS 30280)

**Cause**

The server memory is full.

**Action**

Try again later. If the problem persists, see your administrator.

**11.4.18** The Web Intelligence server is busy. Save any pending change and try again later. If the problem persists, contact your administrator. (Error: ERR_WIS_30284) (WIS 30284)

**Cause**

The server is busy.
Action

Save any changes and try again later. If the problem persists, see your administrator.

11.4.19 The Web Intelligence server is running out of memory, your document has been closed. If the problem persists, contact your administrator. (Error: ERR_WIS_30285) (WIS 30285)

Cause

The server memory is full.

Action

Try again later. If the problem persists, see your administrator.

11.4.20 You cannot edit this document because the query property option "Allow other users to edit the query" was not enabled when the document was created. (WIS 30381)

Cause

The creator of the document did not select the query property option: "Allow other users to edit the query".

Action

Do one of the following:

- Ask the document creator to enable the option and re-save the document.
- Save a copy of the document as a personal document and then edit the query in the copy.
11.4.21 An internal error has been generated by the WIQT. (WIS 30551)

Cause

An unexpected error occurred on the WIQT.

Action

Contact your administrator.

11.4.22 Your WIQT session has reached timeout. Log out and log in again to the BI launch pad. (WIS 30553)

Cause

You have remained logged into the BI launch pad without using Web Intelligence for longer than the maximum time allowed by the system.

Action

Log out and then log back into the BI launch pad (you will lose any unsaved modifications you made previous to timeout).

To increase the length of time you are allowed to remain logged in to the BI launch pad, ask your administrator to increase your session timeout parameter.

11.4.23 No more WIQT servers are available. The maximum number of concurrent users is already logged in. (WIS 30554)

Cause

The maximum number users are already logged in.
**Action**

Try again later, or ask your administrator to increase the maximum number of concurrent users.

**11.4.24** Your security profile does not include permission to save documents as corporate documents or to send documents using the BI launch pad. (WIS 30555)

**Cause**

Your security profile does not allow you to save documents as personal or corporate documents, or to schedule documents.

**Action**

Contact your administrator to request the ability to do the following:

- Save corporate documents
- Send documents to users in own groups
- Send documents to users in other groups

**11.4.25** A corporate document with this name already exists. Your security profile does not include permission to delete corporate documents created by other users. (WIS 30556)

**Cause**

Your security profile does not allow you to overwrite existing corporate documents.

**Action**

Contact your administrator to request the ability to delete corporate documents saved by other users.
11.4.26  There is no document with this name in the repository. Specify a different document name. (WIS 30557)

**Cause**

There is no document with this name in the repository for one of the following reasons:

- You have typed the document name incorrectly
- The document with this name has been deleted from the repository

**Action**

Check that you have entered the document correctly.

**i Note**

Deleted documents cannot be retrieved.

11.4.27  Cannot perform the intended action on this document. (WIS 30650)

**Cause**

The server is unable to complete the current task because of lack of resources or access problems.

**Action**

Do one of the following:

- Close your session, log out of the BI launch pad then log in again.
- Ask your administrator to verify that your security profile allows you access to the corporate repository.

11.4.28  The server failed to load the XML document. (WIS 30751)

**Cause**

When you migrate a BusinessObjects document to Web Intelligence 6.x, an XML file is created that can be opened by the Web Intelligence Report Server. (The related module on the Administration Console is called the
WIReportServer). In this case an unexpected error occurred on the Web Intelligence Report Server while migrating a document to Web Intelligence 6.x.

**Action**

Your administrator can trace the problem that caused this error by activating the tracking and verifying the trace associated with the WIReportServer. Contact your administrator with this information.

**11.4.29** The XML file for this document cannot be opened. Contact your administrator. (WIS 30752)

**Cause**

When you migrate a Desktop Intelligence document to Web Intelligence 6.x, an XML file is created that can be opened by the server. This error occurs when the XML file cannot be opened by the server, and so migration cannot be completed. There are two common causes:

- The XML is Read Only.
- The file path to the XML file is incorrect.

**Action**

Contact your administrator with this information.

**11.4.30** An error occurred while parsing the XML document. Contact your administrator. (WIS 30753)

**Cause**

When you migrate a Desktop Intelligence document to Web Intelligence 6.x, an XML file is created that can be opened by the server. This error occurs when the XML file contains structural anomalies that the server cannot interpret, and so migration cannot be completed.

**Action**

There are two possible actions that an administrator can take to solve this problem:
- Open the XML file with an XML editing tool and verify the structure of the document.
-Activate the tracking and verify the trace associated with the WIReportServer.

11.4.31  
Your user profile does not provide you with access to a document domain to save corporate documents. Save this document as a personal document or contact your administrator. (WIS 40000)

**Cause**

Your user profile does not include permission to save documents to a corporate document domain in the repository.

**Action**

Do one of the following:

- Save the document as a personal document.
- Contact your administrator and request access to a corporate document domain.

11.5  Information Engine Services (IES) Error Messages

Information Engine Services error messages include the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>IES 00001 - IES 01031</td>
<td>Query execution errors</td>
</tr>
<tr>
<td>IES 01501 - IES 01513</td>
<td>Graph execution errors</td>
</tr>
<tr>
<td>IES 10001 - IES 10903</td>
<td>Query execution errors (specific to Web Intelligence)</td>
</tr>
</tbody>
</table>
11.5.1 IES 00001 -IES 01031 Query execution errors

11.5.1.1 Some objects are no longer available in the universe. (IES 00001)

Cause

One or more objects in a universe are no longer available to a document.

Action

Delete the missing objects from the query by comparing the objects in the query with the available objects.

11.5.1.2 Query can’t be refreshed. You don’t have sufficient rights or some objects are not available to your user profile. Contact your administrator to request the necessary rights. (IES 00002)

Cause

You do not have the correct user rights to access the data for one or more objects included in a query or the object is not available in your profile. Therefore, you cannot refresh the report.

Action

Ask your administrator to change your user profile to make these objects accessible.

11.5.1.3 Some pre-defined filters are no longer available in the universe. (IES 00003)

Cause

Compare the available universe objects with query objects. Perhaps the objects are no longer available or you don’t have the rights.
**Action**

Compare universe objects with query objects. If you don't have rights, contact your universe designer or administrator.

**11.5.1.4** Some database tables are no longer available in the universe. (IES 00004)

**Cause**

One or more database tables referenced by objects in the universe are no longer available. The tables may have been renamed, or removed from the database.

**Action**

Ask your universe designer to refresh the universe to remove non-existent tables or update table names.

**11.5.1.5** Invalid prompt definition. (IES 00005)

**Cause**

The syntax in a prompt is not valid, or the prompt makes reference to an object that no longer exists in the universe.

**Action**

Ask your universe designer to verify the prompt.

**11.5.1.6** Invalid aggregate aware definition. (IES 00006)

**Cause**

One or more objects in the query use aggregate awareness, and the aggregate awareness syntax in the universe is not valid.
**Action**

Ask your universe designer to verify the aggregate awareness syntax.

**11.5.1.7** A filter contains a wrong value. You cannot run this query. (IES 00007)

**Cause**

A filter has an incorrect operand. For example, a filter has an empty constant, or a filter that expects a numeric value is defined with an alphanumeric value.

**Action**

Correct the filter.

**11.5.1.8** The query cannot run because it contains objects that reference incompatible tables. (IES 00008)

**Cause**

The query contains objects that return data sets that cannot be combined or synchronized, possibly because the universe does not allow multiple SQL statements for each context or measure.

**Action**

Ask your universe designer to do the following:

- Allow multiple SQL statements for each context and measure.
- Create a new context that includes the incompatible objects.
11.5.1.9  You cannot run the query because an advanced filter contains an incompatible object. Try simplifying the filter set and run your query again. (IES 00009)

**Cause**

An advanced filter uses incompatible objects.

**Action**

Change the advanced filter to use compatible objects only.

11.5.1.10  The universe does not allow using a complex expression in a GROUP BY statement. You cannot run this query. (IES 00010)

**Cause**

A query contains a GROUP BY clause that uses formulas or aliases. The universe does not allow these expressions in GROUP BY clauses. The behavior is determined by the parameter

```xml
<Parameter Name="GROUPBY_EXCLUDE_COMPLEX">Y</Parameter>
```

in the PRM file for the target RDBMS.

**Action**

- Modify the query so that objects using formulas or aliases are not included in the query.
- If your RDBMS supports complex GROUP BY expressions, ask your universe designer to change the value of the `GROUPBY_EXCLUDE_COMPLEX` parameter to `N`.
11.5.1.11 The expression "{0}" contains multiple attributes. This syntax is not supported in this version. (IES 00011)

**Cause**

One or more objects in the query use a comma ("," ) instead of a concatenation operator in their definition. This syntax is no longer supported.

**Action**

Ask your universe designer to perform one of the following actions:

- Redefine the objects that use the comma to concatenate the data for two objects using the standard concatenation operator for the RDBMS.
- Add the following line to the PRM file for the target RDBMS:

  ```xml
  <Parameter Name = "REPLACE_COMMA_BY_SEPARATOR"=Y>
  ```

  This will enable the comma to be accepted syntax for concatenation in object definitions.
- Set the value of REPLACE_COMMA_BY_CONCAT to "Yes" in the universe.

11.5.1.12 You cannot run this query because it will produce a Cartesian product. (IES 00012)

**Cause**

The query will produce a Cartesian product. A Cartesian product returns all possible combinations of rows from the tables referenced by objects in the query and is rarely correct.

**Action**

Ask your universe designer to perform one of the following actions:

- Prevent Cartesian products by modifying the universe table schema to include appropriate joins and restrictions.
- Allow the universe to return Cartesian products if they are acceptable.
11.5.1.13  Query script generation failed. See your administrator. (0) (IES 00013)

Cause

Errors occurred during generation of the query SQL.

Action

Ask your universe designer to verify the SQL.

11.5.1.14  Aggregate aware resolution failed. (IES 00014)

Cause

The query objects exclude all possible SQL choices for an aggregate aware function.

Action

Ask your universe designer to remove the incompatibility between the objects.

11.5.1.15  Multiple Query Filters contain a prompt with the same text, but different operand type or operator count of values. (IES 00015)

Cause

The query has multiple prompts that display the same message. Prompts with the same message are usually combined, but this is not possible if some require you to enter one value and others require multiple values.

Action

Modify the prompts so they all require one or multiple values.
11.5.1.16 The query contains a @script() function, which is not supported. (IES 00016)

Cause
The SQL generated by the query for this document includes a @script() function, which is not supported.

Action
Ask your universe designer to remove the @script() function.

11.5.1.17 The following objects cannot be used as Result Objects: {0}. See your administrator. (IES 00017)

Cause
The query includes objects that cannot be used as result objects in queries.

Action
Remove the objects, or ask your universe designer to allow the objects to be included in as result objects in queries.

11.5.1.18 The following objects cannot be used as query filters: {0}. Contact your administrator. (IES 00018)

Cause
The query contains objects used as query filters that are not valid as query filters.

Action
Remove the objects, or ask your universe designer to allow them as query filters.
11.5.1.19  A query filter object contains too many values for the object to be used in a query filter. (IES 00019)

Cause

A query filter contains too many values.

Action

Select fewer values.

11.5.1.20  The only authorized SQL statement is SELECT. (0) (IES 00020)

Cause

The SQL generated by the query is invalid.

Action

Ask your universe designer to verify the SQL.

11.5.1.21  The combined query cannot run because one of the queries contains incompatible objects. (IES 00021)

Cause

A query in a combined query contains incompatible objects.

Action

Remove the incompatible objects.
11.5.1.22  The query does not reference any table when attempting to build the WHERE clause. (IES 00022)

Cause

The WHERE clause of the generated SQL does not reference a table.

Action

Modify the query to reference a table.

11.5.1.23  Invalid sub-query filter. Either data cannot be retrieved (null) or no result objects are defined. (IES 00023)

Cause

The query contains an invalid sub-query. Either data cannot be retrieved or no result objects are defined.

Action

Modify the sub-query.

11.5.1.24  Incompatible object types in the sub-query filter. (IES 00024)

Cause

The subquery contains incompatible object types.

Action

Remove the incompatible object types.
11.5.1.25 The query is too complex to apply a sampling function. When the
function is applied, no SQL is generated so query aborts. Try to
simplify your query (such as, combined query, or query with JOIN or
SYNCHRO operators). (IES 00025)

Cause

The query is too complex to apply a sampling function.

Action

Try to simplify the query.

11.5.1.26 Failed to regenerate SQL for optional prompts, the following required
prompts were skipped: {0}. (IES 00026)

Cause

The SQL relating to optional prompts could not be regenerated.

Action

See your universe designer.

11.5.1.27 Removing optional prompts from the query will introduce new prompts.
This introduces complexities that cannot be supported. (IES 00027)

Cause

The query cannot be processed due to optional prompts.
**Action**

Remove the optional prompts from the query.

**11.5.1.28** No value specified for the Keydate parameter. (IES 00028)

**Cause**

No value was specified for the Keydate parameter.

**Action**

Specify a value for the Keydate.

**11.5.1.29** The universe is already open with write permission by another user. (IES 00029)

**Cause**

The universe could not be opened because it is already opened with write permission by another user.

**Action**

See your administrator.

**11.5.1.30** Queries that do not contain a measure are not allowed to run on this universe. (IES 00030)

**Cause**

The query does not contain a measure, and therefore cannot be used with the universe.
**Action**

Check that the query definition is correct, add the relevant measure if necessary.

**11.5.1.31** The Free-hand SQL query does not contain a valid executable statement:
{detail_message} (IES 00031)

**Cause**

Either the SQL contains forbidden SQL keys, or the SQL statement or the call to a stored procedure is invalid.

**Action**

Remove the forbidden SQL keys from the SQL and verify the SQL statement.
If the issue is still not resolved, contact your IT administrator for assistance.

**11.5.1.32** Universe not found. Either the universe was deleted from the repository or you do not have sufficient rights to see the universe in the repository. (IES 00501)

**Cause**

Cannot find the universe.

**Action**

Check with your administrator or universe designer to find out why the universe is not available.
11.5.1.33 The appropriate user rights were not found. Contact your administrator. (IES 00502)

Cause
You cannot perform this action because your user rights cannot be found.

Action
Ensure that you have used the correct logon credentials. If the are correct, verify with your IT administrator that your user rights have not been deleted.

11.5.1.34 You are not authorized to access the universe {0}. Contact your administrator to request the appropriate rights. (IES 00503)

Cause
Your user rights do not permit this action.

Action
Ask your IT administrator to check that your user credentials are correctly defined.

11.5.1.35 You do not have the right to access data for this universe. Contact your administrator to request the appropriate rights. (IES 00504)

Cause
Your current user rights do not allow you to access the data.

Action
Ask your IT administrator to check that your user credentials are correctly defined.
11.5.1.36 You do not have the right to access data for this universe connection. Contact your administrator to request the appropriate rights. (IES 00505)

**Cause**

Your current user rights do not allow you to access the connection.

**Action**

Ask your IT administrator to check that your user credentials are correctly defined.

11.5.1.37 Failed to download universe {0} from repository {1}. Check that there is enough memory available and try again. (IES 00506)

**Cause**

Cannot download the universe.

**Action**

Contact your administrator to report the problem.

11.5.1.38 You do not have the right to access data for this core universe. Contact your administrator to request the appropriate rights. (IES 00507)

**Cause**

Your current user rights do not allow you to access the data.
**Action**

Ask your IT administrator to check that your user credentials are correctly defined.

11.5.1.39  *Universe data connection could not be found. The connection has been deleted or you do not have the right to use it.* (IES 00509)

**Cause**

The connection has been lost.

**Action**

Contact your administrator to report the problem.

11.5.1.40  *Cannot generate the SQL for this query because one of its objects is based on a derived table (table_name) that contains a loop in its definition.* (IES 00510)

**Cause**

When a derived table contains a loop, it is not possible to generate the SQL.

**Action**

Redefine your query, or try to avoid having a loop in the derived table.

11.5.1.41  *Cannot generate the SQL for this query because one of its objects is based on a derived table (table_name) that is unknown.* (IES 00511)

**Cause**

The SQL cannot be generated.
**Action**

Check that the derived table is correctly defined and can be used. Check that your query is correct.

**11.5.1.42** Cannot generate the SQL for this query because one of its objects is based on a derived table (table_name) with an incorrect definition. (IES 00512)

**Cause**

The derived table is not correctly defined.

**Action**

Check the definition of the derived table and correct it if necessary.

**11.5.1.43** The query statement cannot be generated because of a syntax error. Check the syntax of the statement that uses the @Variable function. (IES 00513)

**Cause**

Your query contains one or more syntax errors.

**Action**

Check the syntax of the SQL statement that uses the @Variable function. Refer to the @Functions section of the Universe Designer user documentation (pdf document or online help)
11.5.1.44  The database SQL generation parameters file could not be loaded
({database_name}, {network_layer}). (IES 00514)

Cause

Cannot find the relevant SQL parameter file.

Action

Contact your administrator.

11.5.1.45  Unexpected enumerated type {0}. (IES 01001)

Cause

A new enumerated type has been declared but is not supported.

Action

Contact your administrator.

11.5.1.46  Nested @aggregate_aware functions are not supported. (IES 01002)

Cause

The expression contains nested @aggregate_aware functions.

Action

The designer can edit the business layer and remove nested @aggregate_aware functions.
11.5.1.47  Circular references: check the references to other business layer objects in the expression. (IES 01003)

Cause

The expression contains circular references.

Action

The designer can edit the business layer and check for circular references between business layer objects.

11.5.1.48  Invalid @Select reference. Check the definition of the @Select declaration. (IES 01004)

Cause

The expression contains and invalid reference to the @Select function.

Action

The designer can edit the business layer and validate the use of the @Select function in the object expression.

11.5.1.49  Invalid @Where reference. Check the definition of the @Where declaration. (IES 01005)

Cause

The expression contains and invalid reference to the @Where function.

Action

The designer can edit the business layer and validate the use of the @Where function in the object expression.
11.5.1.50  Some prompt parameters are no longer available in the universe. (IES 01006)

**Cause**

The expression contains and invalid reference to the @Prompt function.

**Action**

The designer can edit the query or the business layer and validate the use of the @Prompt function in the object expression.

11.5.1.51  Bad hierarchy reference. (IES 01007)

**Cause**

The hierarchy declared in the query contains an error.

**Action**

Check the query expression for errors.

11.5.1.52  Catalog for source "{0}" cannot be retrieved. Check Data Foundation connection. (IES 01008)

**Cause**

Catalog for source "{0}" cannot be retrieved.

**Action**

Check the connection to the data source in the data foundation.
11.5.1.53 The prompt cannot be validated but it may be correct. Associate a list of values or at least one default value to the prompt. (IES 01010)

**Cause**

The prompt cannot be validated but it may be correct.

**Action**

Associate a list of values or at least one default value to the prompt.

11.5.1.54 More than 100 levels of nested derived tables is not supported. (IES 01015)

**Cause**

There are more than 100 levels of nested derived tables.

**Action**

Edit the @DerivedTable expression to reduce the number of nested levels.

11.5.1.55 The definition of the list of values {0} is invalid. The list or the current column is hidden. (IES 01025)

**Cause**

The list of values is hidden, or the current column is hidden.

**Action**

Check for hidden objects in the universe or business layer. Either make the objects active or redefine the list of values expression.
11.5.2 IES 01501 - IES 01513 Graph execution errors

11.5.2.1 Detection cannot take place because the data foundation contains cycles. Use the Visualize Loops command to visualize the cycles. Modify the cardinality of the joins involved in the cycles before detecting aliases or contexts. (IES 01501)

Cause

The data foundation contains loops.

Action

In the information design tool, edit the data foundation and use the Visualize Loops command to find loops in the data foundation. Modify the cardinality of the joins involved in the loops before detecting aliases or contexts.

11.5.2.2 Detection cannot take place because some tables have at least two joins with opposite cardinalities: {0}. Modify the joins between these tables. (IES 01502)

Cause

Some tables in the data foundation have at least two joins with opposite cardinalities.

Action

In the information design tool, edit the data foundation and modify the joins between these tables.

11.5.2.3 Detection cannot take place because all join cardinalities have not been set. Set all the join cardinalities. (IES 01504)

Cause

All join cardinalities have not been set in the data foundation.
**Action**

In the information design tool, edit the data foundation and detect or set the cardinalities for all joins.

**11.5.2.4** Automatic detections will fail as long as some cardinalities are many-to-many. (IES 01505)

**Cause**

Some joins in the data foundation have cardinality many-to-many.

**Action**

In the information design tool, edit the data foundation modify the cardinality for these joins.

**11.5.2.5** Detection cannot take place because no fact table was detected. A fact table is always joined to other tables with a 'many to one' join, with the 'many' side of the join connected to the fact table. The problem could be the cardinalities that are currently set on the data foundation joins, or the way the database schema is built. (IES 01510)

**Cause**

No fact table was detected. A fact table relates other tables only with many-to-one cardinality joins, with many being on the side of the join connected to the fact table.

**Action**

In the information design tool, edit the data foundation check the cardinality of the joins. There might be a problem with the cardinalities that are currently set on the data foundation joins or with the way the database schema is built.
11.5.2.6 Detection cannot take place because there are loops in the schema. Use the Detect Aliases command to detect the alias tables that will resolve the loops. (IES 01512)

**Cause**

The data foundation contains loops.

**Action**

In the information design tool, edit the data foundation and use the Detect Aliases command to detect the alias tables that will resolve the loops.

11.5.3 IES 10001 - IES 10903 Query execution errors (Web Intelligence only)

11.5.3.1 Syntax error in formula '%1%' at position %2%. (IES 10001)

**Cause**

There is a syntax error in your formula at the position indicated.

**Action**

Correct the formula.

11.5.3.2 Problem initializing the dictionary of functions. (IES 10002)

**Cause**

The dictionary of functions could not be initialized.
Action
See your administrator.

11.5.3.3 The object '%1%' at position '%2%' is not unique in the report. (IES 10005)

Cause
An object has a name that conflicts with the name of another object in the report.

Action
Use the fully-qualified name for the object.

11.5.3.4 The object '%1%' at position '%2%' does not exist in the report. (IES 10006)

Cause
The formula refers to an object that no longer exists in the report.

Action
Remove the reference to the object from the formula.

11.5.3.5 Unexpected empty expression after '='. (IES 10009)

Cause
The expression appears to be incomplete.
**Action**

Check the syntax of your expression and correct it.

11.5.3.6  The integer '%1%' at position '%2%' is too long. (IES 10013)

**Cause**

An integer in a formula exceeds the maximum limit.

**Action**

Edit the formula.

11.5.3.7  The number '%1%' at position '%2%' has a format that is incompatible with your regional settings. (IES 10014)

**Cause**

The format of the real number {number} is not compatible with your regional settings.

**Action**

Change the number format to conform with the format permitted by your regional settings.

11.5.3.8  Missing quotation mark after '%1%' at position '%2%'. (IES 10016)

**Cause**

There is a missing closing quotation mark in the formula.
Action

Add the closing quotation mark.

11.5.3.9 The list of dimensions in the input or output context is empty. (IES 10032)

Cause

The list of dimensions in the input or output context is empty.

Action

Specify a list of dimensions.

11.5.3.10 The variable '%1%' cannot be deleted because it has dependant formulas or variables linked to: '%2%'. (IES 10033)

Cause

The variable cannot be deleted because it is referenced by other variables or formulas.

Action

Delete the dependent formulas/variables before deleting the variable.

11.5.3.11 You attempted to create a variable or update a variable name using a variable name that already exists. (IES 10034)

Cause

You attempted to create a variable or update a variable name using a variable name that already exists.
**Action**

Choose a variable name that does not already exist.

**11.5.3.12** The date or time format '%1%' at position '%2%' is not valid. (IES 10035)

**Cause**

The formula contains an invalid date/time format (for example, “bb/MM/yyyy”).

**Action**

Specify a valid date/time format in the formula.

**11.5.3.13** The expression or sub-expression at position '%2%' is not valid. (IES 10036)

**Cause**

The formula contains an invalid expression/sub-expression.

**Action**

Specify a valid expression/sub-expression.

**11.5.3.14** The expression or sub-expression at position '%2%' in the '%1%' function uses an invalid data type. (IES 10037)

**Cause**

An expression contains an invalid data type. (For example, you have attempted to pass a string to a function that requires a date.)
**Action**

Use a valid data type in the expression.

**11.5.3.15** Invalid character '{character}' in variable name at position '{position}'. (IES 10038)

**Cause**

The character {character} is not valid in the variable name.

**Action**

Remove {character} from the variable name.

**11.5.3.16** The formula for variable '{variable}' contains a reference to a variable with the same short name. (IES 10040)

**Cause**

The formula of a variable references another variable with the same short name.

**Action**

To resolve this issue, remove the reference to the variable with the same short name from the formula.

**11.5.3.17** Incorrect use of multiple comparison operators (<,>,<=,=>,=) at position '{position}'. (IES 10041)

**Cause**

The formula uses multiple comparison operators incorrectly (for example: if(1<2=3;0;-1)).
Action

Re-structure the formula to avoid using comparison operators incorrectly.

11.5.3.18 There is a circular reference because the formula for variable '%1%' references a variable whose formula references '%1%'. (IES 10042)

Cause

A formula contains a circular reference.

Action

Remove the circular reference.

11.5.3.19 There is no opening parenthesis after function '%1%' at position %2%. (IES 10060)

Cause

There is no opening parenthesis in the location indicated by the error message.

Action

Add an opening parenthesis in the location indicated.

11.5.3.20 The function '%1%' has missing arguments or closing parenthesis at position %2%. (IES 10061)

Cause

Arguments or a closing parenthesis are missing from the formula.
Action

Supply the arguments or closing parenthesis.

11.5.3.21 Missing ';' before argument in function '%1%' at position %2%. (IES 10062)

Cause

The syntax of your expression is incorrect

Action

Check the syntax and correct the expression.

11.5.3.22 Missing ';' or closing parenthesis in function '%1%' at position %2%. (IES 10063)

Cause

The syntax is incorrect.

Action

Check the syntax and correct your expression.

11.5.3.23 Missing ';' or closing parenthesis in list '%1%' at position %2%. (IES 10064)

Cause

A semicolon or closing parenthesis is missing from the formula.
**Action**

Supply the semicolon or closing parenthesis.

**11.5.3.24** Missing closing parenthesis in function '%1%' at position %2%. (IES 10065)

**Cause**

The syntax is incorrect.

**Action**

Check the expression and correct the syntax.

**11.5.3.25** Missing aggregate operator or closing parenthesis in function '%1%' at position %2%. (IES 10066)

**Cause**

The syntax is incorrect.

**Action**

Check the expression and correct the syntax.

**11.5.3.26** Missing operator or closing parenthesis in '%1%' at position %2%. (IES 10067)

**Cause**

The syntax is incorrect.
Action

Check the expression and correct the syntax.

11.5.3.27 Missing list element in '%1%' at position %2%. (IES 10068)

Cause

The syntax is incorrect. An element is missing.

Action

Check the expression and correct the issue.

11.5.3.28 Missing object identifier in '%1%' at position %2%. (IES 10069)

Cause

An object identifier is missing from the formula.

Action

Correct the formula.

11.5.3.29 Missing or bad operand in '%1%' expression at position %2%. (IES 10070)

Cause

Either the operand is not compatible, or the operand is missing.
**Action**

Check the syntax and correct the expression.

**11.5.3.30** Incorrect calculation context %1% at position %2%. (IES 10071)

**Cause**

The calculation context is incorrect.

**Action**

Check the syntax of your expression and correct it.

**11.5.3.31** Incorrect reset context at position %2%. (IES 10072)

**Cause**

The formula contains an incorrect reset context.

**Action**

Correct the reset context.

**11.5.3.32** Invalid Where clause in function '%1%': a dimension is missing at position %2%. (IES 10073)

**Cause**

The expression is missing an expression.
Action

Check the syntax of the expression and ensure that there is the expected dimension.

11.5.3.33 Incompatible object '%1%' at position %2%. (IES 10076)

Cause

You cannot use this type of object.

Action

Ensure that the correct object has been declared.

11.5.3.34 The object '%1%' at position %2% is incompatible. (IES 10077)

Cause

The formula contains an incompatible object.

Action

Correct the formula.

11.5.3.35 Invalid character '%1%' at position %2%. (IES 10080)

Cause

There is an invalid character in the expression.

Action

Check the syntax of the expression.
11.5.3.36 Invalid string '%1%' at position %2%. (IES 10082)

**Cause**

The formula contains an invalid string.

**Action**

Correct the string.

11.5.3.37 The qualification of the variable '%1%' cannot be changed. (IES 10083)

**Cause**

You cannot change the qualification of the variable. (For example, you cannot change a measure to a dimension if its definition includes an aggregate.)

**Action**

Create a new variable with the appropriate qualification.

11.5.3.38 Expecting object member in '%1%' at position %2%. (IES 10084)

**Cause**

There is no object member.

**Action**

Check the syntax of the expression and correct it as necessary.
11.5.3.39  Invalid member '%1%' at position %2%. (IES 10085)

**Cause**

You cannot use this type of member in this context.

**Action**

Correct the expression.

11.5.3.40  Invalid set definition. (IES 10086)

**Cause**

A query contains an invalid set definition.

**Action**

Verify the query.

11.5.3.41  Custom functions could not be loaded. (IES 10100)

**Cause**

The custom function library could not be loaded because it is not correctly defined. This could be due to invalid XML, a duplicate function name or duplicate function ID.

**Action**

See the trace log for more details and provide these details to your administrator.
11.5.3.42 Your database server does not support the Both and Except operators. (IES 10701)

**Cause**

The database on which this document is based does not support the Both and Except operators. This means that you cannot use the Both operator or the Except operator when you define filters on the query.

**Action**

Remove the operators from the query filters.

11.5.3.43 A filter is defined on an object that is incompatible with the result objects. (IES 10702)

**Cause**

One of the query filters is defined on an object which is incompatible with all the result objects returned by the query.

**Action**

Remove the query filter or the result objects.

11.5.3.44 The numeric value for the query filter based on '{object}' is invalid. (IES 10703)

**Cause**

You specified an invalid numeric value for a query filter.

**Action**

Edit the query filter and specify a valid numeric value.
11.5.3.45  The date for the prompt '{prompt}' is invalid. (IES 1070) (IES 10704)

Cause

You specified an invalid date for a query filter.

Action

Edit the query filter and specify a valid date.

11.5.3.46  The prompt '{prompt}' contains an invalid numeric value. (IES 10705)

Cause

You specified an invalid numeric value for a prompt.

Action

Specify a valid numeric value.

11.5.3.47  The date for the prompt '{prompt}' is invalid. (IES 10706)

Cause

You specified an invalid date for a prompt.

Action

Edit the prompt and specify a valid date.
11.5.3.48  The server cannot build the SQL for the query. (IES 10707)

Cause

Your query cannot be converted to SQL to run against the database.

Action

Reformulate the query or see your administrator.

11.5.3.49  The object '{ObjName}' in the prompt '{PromptName}' can no longer display a list of values. Remove the prompt from the query or contact your administrator to clear the "Select only from list" option of the object properties tab. (IES 10708)

Cause

The object in the prompt can no longer display a list of values.

Action

Remove the prompt, or ask your administrator to allow the prompt to accept values not selected from a list.

11.5.3.50  A class already exists with this name : '{ClassName}'. (IES 10709)

Cause

You cannot have two classes with the same name.

Action

Use a different name for the class.
11.5.3.51  You do not have the right to refresh this document. (IES 10801)

Cause
Your user profile does not permit you to view data for one of the objects included in the query for this document.

Action
Cancel the refresh, or ask your administrator for the security rights necessary to refresh the document.

11.5.3.52  The query SQL has {nbHaving} instead of {nbWanted} columns. (IES 10810)

Cause
The SQL generated by the query has an invalid number of columns.

Action
See your administrator.

11.5.3.53  The data type of a column in the query is not valid. (IES 10811)

Cause
The data type of a column in the query is not valid.

Action
See your administrator.
11.5.3.54  Custom SQL cannot contain optional prompts. (IES 10812)

**Cause**

Optional prompts are not supported in custom SQL.

**Action**

Remove the optional prompts.

11.5.3.55  Incompatible objects cannot be used in combined queries. (IES 10820)

**Cause**

A combined query contains incompatible objects.

**Action**

Edit the combined query and remove the incompatible objects.

11.5.3.56  A subquery in the '{dp_name}' data provider has missing objects. (IES 10830)

**Cause**

Objects necessary to generate query SQL are missing from a subquery in the {dp_name} data provider.

**Action**

Edit the subquery and add the missing objects.
11.5.3.57 The filtered object is missing in a ranking in the '{dp_name}' data provider. (IES 10831)

**Cause**

The filtered object is missing in a ranking.

**Action**

Edit the ranking and add the filtered object.

11.5.3.58 The rank-based object is missing in a ranking in the '{dp_name}' data provider. (IES 10832)

**Cause**

The rank-based object is missing in a ranking.

**Action**

Edit the ranking and add the rank-based object.

11.5.3.59 The document cannot be loaded. (IES 10833)

**Cause**

The interactive analysis document could not be loaded.

**Action**

See your administrator.
11.5.3.60  Additional context resolution is not supported with optional prompts.  
(IES 10834)

**Cause**

The optional prompts in a query generate additional query context resolution that is not supported.

**Action**

Remove the optional prompts or make them obligatory.

11.5.3.61  Invalid data in column "{col_name}".  (IES 10840)

**Cause**

A database column referenced by the query contains invalid data.

**Action**

See your administrator.

11.5.3.62  Invalid UTF-8 string in column "{col_name}".  (IES 10841)

**Cause**

A database column referenced by the query contains invalid data.

**Action**

See your administrator.
11.5.3.63  Sorry, your Data Refresh action cannot be completed because the maximum amount of concurrent Data Refresh actions is currently being processed by the server \(\text{nb_thread} / \text{nb_max_thread}\). Please, try again later. (IES 10845)

**Cause**

You have used the data refresh option more than the maximum refresh actions allowed.

**Action**

Please wait and retry the refresh action later.

---

11.5.3.64  Database error: \{error_db\}. (IES 10846)

**Cause**

The database returned the error given in the message.

**Action**

See your administrator with the details of the error that occurred.

---

11.5.3.65  Query exceeded fixed time limit: \{error_db\}. (IES 10847)

**Cause**

The query could not return data because it took too long to run.
Action

Run the query again. If the problem persists, see your administrator.

11.5.3.66 The file that is required to create or update the query cannot be found on the file system. File not found: "{filename}". (IES 10850)

Cause

The file {filename} cannot be found on the file system.

Action

Check the location of {filename} or see your administrator.

11.5.3.67 The file that is required to refresh the query cannot be found on the file system. File not found: "{filename}" (IES 10851)

Cause

The file seems to be missing, deleted, or renamed.

Action

Check with your administrator.

11.5.3.68 Unable to refresh the query on this file: the structure of file "{filename}" does not match. (IES 10852)

Cause

The file might have been modified since the query was last run.
**Action**

Check with the administrator or universe designer that the file has not been modified.

**11.5.3.69** Error originates from the Personal Data Provider: {message}. (IES 10853)

**Cause**

The file that supplies data to a personal data provider might be corrupt or missing.

**Action**

Check that the file is present, and that it does not contain errors.

**11.5.3.70** The query cannot be refreshed; the structure of "{dpName}" does not match. (IES 10854)

**Cause**

The columns returned by the database do not match with those of data provider objects.

**Action**

In the Web Intelligence document, open the Query Panel and check that you have the right objects in your query compared to the database.

**11.5.3.71** Unable to create or update the Excel personal data provider: the file path is invalid. (IES 10870)

**Cause**

The Excel file could not be found on the file system.
11.5.3.72 Unable to create or update the Excel personal data provider: cannot retrieve the named ranges. (IES 10872) (IES 10871)

Cause

The Excel personal data provider could not be created or updated because the workbook is protected.

Action

Remove the protection from the Excel workbook or see your administrator if you do not have access to the Excel file.

11.5.3.73 Unable to create or update the Excel personal data provider: cannot open the workbook. (IES 10872)

Cause

The Excel file could not be opened.

Action

Verify the Excel file or see your administrator.

11.5.3.74 Unable to create or update the Excel personal data provider: cannot retrieve the named ranges. (IES 10873)

Cause

Data could not be retrieved from a named range of cells.
**Action**

Check the Excel file or see your administrator.

**11.5.3.75** Unable to create or update the Excel personal data provider: cannot retrieve data from the file. (IES 10874)

**Cause**

Data could not be retrieved from the Excel file.

**Action**

Verify the file or see your administrator.

**11.5.3.76** Unable to create or update the Excel personal data provider: cannot retrieve data from the file. (IES 10875)

**Cause**

No data could be retrieved from the Excel file.

**Action**

Verify the file or see your administrator.

**11.5.3.77** Unable to create or update the Excel personal data provider: cannot build the iterator on the data set. (IES 10876)

**Cause**

An error occurred when retrieving data from the Excel file.
Action

Verify the file or see your administrator.

11.5.3.78 Unable to create or update the Excel personal data provider: no worksheet available. (IES 10877)

Cause

No worksheet could be found in the Excel file.

Action

Verify the file or see your administrator.

11.5.3.79 Unable to create or update the Excel personal data provider: unable to retrieve the list of worksheets. (IES 10878)

Cause

The list of worksheets could not be retrieved from the Excel file.

Action

Verify the file or see your administrator.

11.5.3.80 Unable to create or update the Excel personal data provider: invalid data retrieved from the selected range. (IES 10879)

Cause

The data retrieved from a range in the Excel file is invalid.
Action

Verify the file or see your administrator.

11.5.3.81 Unable to create or update the Excel personal data provider: the selected worksheet is invalid. (IES 10880)

Cause

The Excel worksheet is invalid.

Action

Verify the Excel file or see your administrator.

11.5.3.82 Unable to create or update the Excel personal data provider: an error occurred while retrieving the data sampling. (IES 10881)

Cause

An error occurred during data retrieval from the Excel file.

Action

Verify the file or see your administrator.

11.5.3.83 Unable to create or update the Excel personal data provider: an error occurred while creating the data iterator. (IES 10882)

Cause

An error occurred during data retrieval from the Excel file.
Action
See your administrator.

11.5.3.84 Unable to create or update the Excel personal data provider: an error occurred during data retrieval. (IES 10883)

Cause
An error occurred during data retrieval from the Excel file.

Action
See your administrator.

11.5.3.85 Unable to create or update the Excel personal data provider: an internal error occurred. (IES 10884)

Cause
An error occurred during data retrieval from the Excel file.

Action
See your administrator.

11.5.3.86 Unable to create or update the Excel personal data provider: the range selection is invalid. (IES 10885)

Cause
An error occurred during data retrieval from the Excel file because the range selected was not valid.
**Action**

Verify the file or see your administrator.

**11.5.3.87** Unable to create or update the Excel personal data provider: the range selection does not match the worksheet. (IES 10886)

**Cause**

An error occurred during data retrieval from the Excel file because the range selection does not match the worksheet.

**Action**

Verify the file or see your administrator.

**11.5.3.88** A condition on an object refers to an object from another query that has a different type. (IES 10887)

**Cause**

The object in the other query has a different data type from the object in the condition.

**Action**

Correct the condition.

**11.5.3.89** A condition on an object refers to an object in another query that does not exist. (IES 10888)

**Cause**

Either the object or query referred to by the condition does not exist.
**Action**

Correct the condition.

**11.5.3.90** There is a circular dependency in the query. (IES 10889)

**Cause**

The query has a circular dependency.

**Action**

Edit the query to remove the circular dependency.

**11.5.3.91** Database error: {error_db}. (IES 10901)

**Cause**

The database returned the error given in the message.

**Action**

See your administrator with the details of the error that occurred.

**11.5.3.92** Query exceeded fixed time limit: {error_db}. (IES 10902)

**Cause**

The query could not return data because it took too long to run.

**Action**

Run the query again. If the problem persists see your administrator.
11.5.3.93 Invalid Database Field Type : {db_fieldname}. (IES 10903)

Cause

The database field given in the message contains an invalid data type.

Action

See your administrator.

11.6 ReportEngine Web Intelligence (RWI) Error Messages

ReportEngine Web Intelligence error messages include the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWI 00000 - RWI 00850</td>
<td>ReportEngine Web Intelligence</td>
</tr>
</tbody>
</table>

11.6.1 RWI 00000 - RWI 00314

11.6.1.1 User input is required for the prompt in the query. (RWI 00000)

Cause

The server requires prompt values in order to fulfill the request.

Action

Enter values for all mandatory prompts.
11.6.1.2  User input is required to select an universe context for the query. (RWI 00001)

Cause
The server requires context(s) selection in order to fulfill the request.

Action
Supply context(s) choice.

11.6.1.3  The argument cannot be null. (RWI 00010)

Cause
The specified argument is "null".

Action
Enter a non-null value for the argument.

11.6.1.4  Invalid value: {0}. (RWI 00011)

Cause
The specified argument value is invalid.

Action
Enter a valid value for the argument.
11.6.1.5  The argument is out of range. (RWI 00012)

**Cause**

The specified argument value is not within the allowed range.

**Action**

Specify a value within the allowed range.

11.6.1.6  Unable to retrieve the requested report part(s). Either the report part references are invalid, or the corresponding data does not exist anymore. (RWI 00013)

**Cause**

One or more report part references are invalid, or the corresponding data is not available.

**Action**

Ensure that you are using valid report part references. Subsequently, ensure that the requested data is available after refreshing the document's data providers.

11.6.1.7  Cannot retrieve more than one report part simultaneously in DHTML output format. (RWI 00014)

**Cause**

You cannot retrieve more than one report part in DHTML output format simultaneously.

**Action**

Enter a single report part reference.
11.6.1.8 Cannot turn off search mode for delegated search. (RWI 00015)

Cause

A list of values defined as "delegated" search cannot have search mode disabled.

Action

Before disabling the search mode, check if the list of values is defined as "delegated search".

11.6.1.9 One of the supplied OutputCacheEntry instances is invalid or not supported by the Web Intelligence server. (RWI 00016)

Cause

While preloading the server output cache, one or more output formats specified are invalid or unsupported.

Action

Ensure that the requested output formats are valid and supported.

11.6.1.10 Could not read (0)bytes from the specified stream. (RWI 00017)

Cause

Upon upload of the resource into a document, the supplied data could not be read.

Action

Ensure that the specified parameters are correct and consistent.
11.6.1.11 The Web Intelligence server returned an invalid XML output. Contact your administrator. (RWI 00200)

Cause

The server returned an invalid or incorrect XML output.

Action

Contact your technical support.

11.6.1.12 Could not get page number. (RWI 00223)

Cause

The requested page could not be retrieved because of an invalid page number.

Action

Ensure that the requested page number is valid.

11.6.1.13 Cannot initialize Report Engine server. (RWI 00226)

Cause

Communication with the server could not be established. This may occur when attempting to create or open a document.

Action

Ensure that the server is installed correctly. Also, check if the server is started and enabled.
11.6.1.14  Your Web Intelligence session is no longer valid because of a timeout.

(RWI 00235)

Cause

The server session allocated to a particular document has been closed, either explicitly or because of a timeout.

Action

Ensure that the document has not been explicitly closed. Alternatively, increase the `<server session timeout>` value.

To modify the server session timeout value:

1. Log on to the Business Intelligence platform Central Management Console (CMC).
2. Click Servers.
3. Expand Server Categories, and click Web Intelligence Services.
5. In Properties window, under Web Intelligence Core Service, enter the value for Idle Connection Timeout.

11.6.1.15  The Web Intelligence server cannot be reached. Contact your administrator. (RWI 00236)

Cause

An error occurred while attempting to communicate with the server.

Action

Contact the administrator to ensure that the server is enabled and running. Also, check for network problems.

11.6.1.16  Cannot write output stream. Contact your administrator. (RWI 00237)

Cause

An I/O error occurred when writing data in response to a view request.
**Action**

Contact the administrator to ensure that the specified destination parameter is valid.

**11.6.1.17** Connection failed. The server has reached the maximum number of simultaneous connections. (RWI 00239)

**Cause**

The maximum number of server connections allowed has been reached.

**Action**

Either raise the value of the `<maximum_connections>` server parameter, or add another server instance.

To modify the maximum connections value:

1. Log on to the Business Intelligence platform Central Management Console (CMC).
2. Click Servers.
3. Expand Server Categories, and click Web Intelligence.
5. In Properties window, under Web Intelligence Core Service, enter the value for Maximum Connections.

**11.6.1.18** Your server version is incompatible with this client version. Contact your administrator. (RWI 00240)

**Cause**

The server does not support this SDK version.

**Action**

Contact the administrator to ensure that the server version is compatible with the client version.
11.6.1.19  Cannot find an XML transformer. (RWI 00301)

Cause

Unable to instantiate the XSLT transformer used for XML to HTML transformation.

Action

Try again later.

11.6.1.20  Cannot create translet. (RWI 00309)

Cause

Unable to compile the XSLT stylesheet used for XML to HTML transformation.

Action

Try again later.

11.6.1.21  Cannot get an output file for the document. (RWI 00314)

Cause

While serializing a document state, an error occurred. This might be due to insufficient memory or an I/O error.

Action

Ensure that there is sufficient memory available. Also, check for any <webi.properties> customization.
11.6.2  RWI 00315 - RWI 00605

11.6.2.1  Cannot retrieve an XML parser ID. (RWI 00316)

**Cause**

An error occurred during XSLT transformation. This might be because you are requesting output in XML format using a client supplied stylesheet.

**Action**

Ensure that the specified XSLT stylesheet is correct.

11.6.2.2  Cannot transform XML to HTML. (RWI 00317)

**Cause**

During XSLT transformation, an error occurred while requesting output in HTML.

**Action**

Try again later.

11.6.2.3  The Java Runtime Environment does not support UTF-8 encoding. (RWI 00321)

**Cause**

The JRE does not support UTF-8 encoding.

**Action**

Switch to a JRE that supports UTF-8 encoding.
11.6.2.4  An error occurred while retrieving the document from the storage token.  
(RWI 00322)

Cause
An error occurred during document state deserialization. This might be due to insufficient memory or an I/O error.

Action
Ensure that there is sufficient memory available. Also check for any <webi.properties> customization.

11.6.2.5 Cannot retrieve the document with the passed obsolete token. (RWI 00323)

Cause
An error occurred during document state deserialization. This might be caused by a storage token that identifies a document state, which is no longer available in the storage tokens stack.

Action
In the <webi.properties> file, increase the value of < storage tokens stack size>. Also, ensure that the storage token is valid before using it.

11.6.2.6 Cannot retrieve the document with the passed malformed token. (RWI 00324)

Cause
An error occurred during document state deserialization. This might be due to an invalid storage token.

Action
Specify a valid storage token.
11.6.2.7 There are too many operands for the current operator. (RWI 00501)

**Cause**

For the current operator, the condition or filter has too many operands to be able to add a new one.

**Action**

Remove existing operands before attempting to add a new one.

11.6.2.8 There are not enough operands for the current operator. (RWI 00502)

**Cause**

The condition or filter does not have enough operands with respect to the current operator.

**Action**

Add operand(s) to the condition or filter.

11.6.2.9 Prompts are not supported on filters created at the report level. (RWI 00503)

**Cause**

Report filters do not support prompts. Only query conditions support prompts.

**Action**

Do not use prompts in report filters.
11.6.2.10 You cannot modify operators and operands in predefined filters. (RWI 00504)

Cause

While using a pre-defined condition, you cannot specify an operator for a condition or filter.

Action

Ensure that the operator in the pre-defined condition does not have any filters or conditions.

11.6.2.11 LIKE and NOT_LIKE operators are allowed only on ObjectType.TEXT objects. (RWI 00506)

Cause

You attempted to use "LIKE" or "NOT_LIKE" operators for objects that are not of character type.

Action

When the object used in a filter is not of &lt;character&gt; type, ensure that you do not use the "LIKE" and "NOT_LIKE" operators.

11.6.2.12 The specified operator cannot be applied to a document filter. (RWI 00507)

Cause

The specified operator cannot be used with report filters. It can be used only with query conditions.

Action

Do not use this operator when working with report filters.
11.6.2.13 Web Intelligence is unable to attach a LOV (List of Values) to the prompt because the associated source object does not have a LOV. (RWI 00508)

**Cause**

Cannot use a list of values with the prompt being defined. This is because the object used in this condition does not contain a LOV.

**Action**

Before requesting the prompt to use the list of values, ensure that the object used within the condition has a defined list of values.

11.6.2.14 There are incompatible data source objects in the filter condition comparison. (RWI 00509)

**Cause**

You have attempted to compare two objects of different types within a condition.

**Action**

Use objects of the same type.

11.6.2.15 Cannot create a report filter on a formula. (RWI 00511)

**Cause**

Formulas cannot be used as report filters. Only data providers and variable expressions can be used.

**Action**

Use a data provider or variable expression when defining a report filter.
11.6.2.16  A percentage rank cannot have values greater than 100. (RWI 00512)

Cause

When you defined the percentage ranking, you chose a rank size that was greater than 100.

Action

Ensure that the rank size is less than 100.

11.6.2.17  The expression is not available in the axis. (RWI 00602)

Cause

You have attempted to create a break, calculation, or sort using an expression that is not in the axis.

Action

Use an expression that is available in the axis.

11.6.2.18  Only measure objects can be included on the y-axis. (RWI 00603)

Cause

You have attempted to add an expression to the axis, where the expression is not of `<measure>` type.

Action

Specify an expression of `<measure>` type.
11.6.2.19  You cannot base a section on a measure. (RWI 00604)

Cause

A section cannot be based on an expression of <measure> type.

Action

Do not use an expression of <measure> type as the basis for a section.

11.6.2.20  You cannot add more than one expression to a section axis. (RWI 00605)

Cause

A section axis does not support more than one expression.

Action

Do not use several expressions in a section axis.

11.6.3  RWI 00606 - RWI 00850

11.6.3.1  You cannot include a circular attachment in a document. (RWI 00606)

Cause

You have attempted to define a report attachment that causes a circular attachment.

Action

Define a report that does not generate a circular attachment.
11.6.3.2  The expression is different from the table cell expression. (RWI 00607)

**Cause**

You have attempted to create a calculation on a table cell, specifying an expression different from the one contained in the table cell.

**Action**

Create a calculation table with the expression that is already defined in the table cell.

11.6.3.3  You cannot copy a ReportElement object to an element in a different ReportElementContainer. (RWI 00608)

**Cause**

Report attachments can only be defined between report elements belonging to the same container.

**Action**

Ensure that you are creating report attachments between report elements that belong to the same container.

11.6.3.4  You cannot create a horizontal attachment on a section. (RWI 00609)

**Cause**

You have attempted to create a horizontal attachment in a section.

**Action**

Do not create horizontal attachments in a section, as sections cannot exceed the maximum allowed width.
11.6.3.5  You cannot remove all rows and columns from the table body. The table must contain at least one row and column. (RWI 00610)

Cause

You have attempted to remove the last row or column in a table body.

Action

Ensure that the table contains at least one row and column.

11.6.3.6  Dimension and detail objects only are allowed on this axis. (RWI 00611)

Cause

You have attempted to add an expression of incompatible type on an axis where only dimension and detail expression types are allowed.

Action

Specify an expression of compatible type.

11.6.3.7  Additional objects cannot be added to the block axis based on the block shape. (RWI 00612)

Cause

Cannot add more expressions to the specified block axis.

Action

Do not add more expressions.
11.6.3.8 This report element cannot have a double side attachment. (RWI 00613)

Cause

A report element cannot be horizontally and vertically attached to two distinct report elements.

Action

Ensure that the report element is attached (horizontally and vertically) to the same report element.

11.6.3.9 The table cell has been removed from its table. (RWI 00614)

Cause

You have attempted to use a table cell that has been removed from its containing table.

Action

You cannot use a table cell after it has been removed from its containing table.

11.6.3.10 Alerter isn't defined in current document. (RWI 00619)

Cause

Alerter referenced in report doesn’t belong to alerter dictionary of document.

Action

Add alerter in dictionary.
11.6.3.11  Track data change mode should be active to perform a track data change action. (RWI 00620)

Cause

Unable to perform track data change action because track data was not activated.

Action

Enable track data changes mode in the Web Intelligence document.

11.6.3.12  An exception occurred in the visualization framework. (RWI 00621)

Cause

An exception occurred in the visualization framework.

Action

Check the inner exception.

11.6.3.13  Drill mode should be active to perform drill actions (RWI 00624)

Cause

Unable to perform drill action due to drill state.

Action

Activate the drill mode in the Web Intelligence document.
11.6.3.14 You cannot run an empty query. (RWI 00701)

Cause

You have attempted to run an empty query.

Action

Before running a query, add result objects to it.

11.6.3.15 Cannot delete the last data provider. (RWI 00702)

Cause

You have attempted to delete the last data provider in a document.

Action

A document must contain at least one data provider.

11.6.3.16 A data provider with this name already exists. (RWI 00703)

Cause

You have attempted to give a data provider a name that already exists in the document.

Action

Every data provider within a document must have a unique name.
11.6.3.17 Combined queries are incompatible with sampling mode activated. (RWI 00706)

**Cause**

Sampling cannot be used with combined queries.

**Action**

Do not use sampling with combined queries.

11.6.3.18 Processing remove data source objects while there are only two data source expressions. (RWI 00800)

**Cause**

You have attempted to remove an expression from a synchronized dimension that contains only two expressions.

**Action**

Ensure that a synchronized dimension always contains at least two expressions.

11.6.3.19 Cannot create a Link with a name that already exists ({0}). (RWI 00801)

**Cause**

You have attempted to create a synchronized dimension with a name that already exists.

**Action**

Provide a unique name for each synchronized dimension.
11.6.3.20 Cannot update CustomSortLov with a new list of values more than the size supported by CustomSortLov. (RWI 00825)

**Cause**

You have attempted to update the list of values of a custom sort definition with more values than allowed.

**Action**

Ensure that the number of values in the list is within the specified custom sort range.

11.6.3.21 Cannot create CustomSortLov while Report Expression's Lov size is greater than the size supported by CustomSortLov . (RWI 00826)

**Cause**

You have attempted to create the list of values of a custom sort definition with more values than allowed.

**Action**

Ensure that the number of values in the list is within the specified custom sort range.

11.6.3.22 The provided expression violates one of the feed restrictions. (RWI 00830)

**Cause**

The provided expression violates one of the feed restrictions.

**Action**

There is an error in the formula. Check the feed restrictions before adding a formula.
11.6.3.23 {0} feature is not supported. (RWI 00850)

Cause

You have attempted to use a particular feature that is not supported in the current context.

Action

Before using this feature, ensure that it is supported.

11.7 Custom Data Source (CDS) Framework Error Messages

Custom Data Source (CDS) Framework error messages include the following categories:

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDS 00001 - CDS 00013</td>
<td>Custom Data Source User Interface Framework error messages</td>
</tr>
<tr>
<td>CDS 10100 - CDS 10400</td>
<td>Web Services Custom Data Source Plugin error messages</td>
</tr>
<tr>
<td>CDS 15102 - CDS 15122</td>
<td>Custom Data Source Framework error messages</td>
</tr>
</tbody>
</table>

11.7.1 Custom Data Source User Interface Framework error messages

11.7.1.1 The selected file extension is not correct. (CDS 00001)

Cause

The extension of the file is not as expected or is different from the previously selected file.

Action

Check whether the correct file is selected.
11.7.1.2 Cannot access the file. (CDS 00002)

Cause

You have entered an incorrect file path.

Action

Check whether the correct path is entered.

11.7.1.3 The file does not exist. (CDS 00003)

Cause

The file does not exist at the path specified.

Action

Check whether you have specified valid path and filename.

11.7.1.4 The selected file is a directory. (CDS 00004)

Cause

The path entered points to a directory instead of a file.

Action

Enter the correct filename.
11.7.1.5  Error in processing data source – There was an invalid operation for the plug-in. (CDS 00005)

Cause

The plug-in is not able to retrieve all the data source parameters.

Action

Check the logs and verify that the plug-in code is working properly.

11.7.1.6  An error occurred in the user interface of the plug-in. (CDS 00006)

Cause

An error has occurred in the plug-in user interface.

Action

Check the logs and verify that the plug-in code is working properly.

11.7.1.7  An error occurred while accessing the updated inputs. (CDS 00007)

Cause

An error occurred while accessing the data source parameters retrieved from the plug-in.

Action

Check the logs and verify that the plug-in code is working properly.
11.7.1.8 An object with this name already exists. (CDS 00008)

**Cause**

Another object with this name exists.

**Action**

Change the name of the object to a unique value.

11.7.1.9 The query with this name already exists. (CDS 00009)

**Cause**

Another query with this name exists.

**Action**

Change the name of the query to a unique value.

11.7.1.10 A problem was detected with the install. Please check and try again. (CDS 00010)

**Cause**

A problem was detected with the install.

**Action**

Check the installation setup. Refer to the documentation for more details.
**11.7.1.11** Error in processing data source. (CDS 00011)

**Cause**

A problem was detected while identifying the data source.

**Action**

Check the logs to get the detailed error message.

**11.7.1.12** The requested action could not be completed. (CDS 00012)

**Cause**

An error was detected.

**Action**

Check the logs to get the detailed error message.

**11.7.1.13** Could not retrieve plug-in display component. (CDS 00013)

**Cause**

A error occurred while retrieving the plug-in component.

**Action**

Check the logs to get the detailed error message. Verify that the plugin-in code is correct.
11.7.2 Web Services Custom Data Source Plugin error messages

11.7.2.1 An error occurred while processing the requested action. (CDS 10100)

Cause

An unexpected error occurred while processing the requested action.

Action

Contact your enterprise administrator.

11.7.2.2 No selection made in Output Message panel. (CDS 10101)

Cause

User has not selected the field(s) for the query from the Output Message panel.

Action

Select the field(s) that need to be displayed in the report from the Output Message panel.

11.7.2.3 An error occurred while invoking Web Service. (CDS 10200)

Cause

An error occurred while invoking a web service.

Action

Contact your enterprise administrator.
11.7.2.4  Error executing web service: "%(0)" (CDS 10201)

**Cause**

The Web Service Endpoint could not be invoked because of incorrect input parameters.

**Action**

Enter the correct values while invoking the Web Service.

11.7.2.5  An error occurred while instantiating the Web Service plugin. (CDS 10202)

**Cause**

The extension descriptor of the web service plug-in did not return the correct dstype.

**Action**

Contact your administrator to fix the problem.

11.7.2.6  Parsing Exception: The input WSDL type or structure is not supported.  
          (CDS 10203)

**Cause**

The structure of the WSDL is not supported by Web Services Custom Data Source plug-in.

**Action**

Refer the documentation for supported WSDLs.
11.7.2.7  WSDLs that refer to Microsoft’s types namespace are not supported. (CDS 10204)

Cause

WSDLs that refer to http://microsoft.com/wsdl/types/ namespace are not supported.

Action

Modify the WSDL or select the supported WSDL.

11.7.2.8  WSDLs that have cyclical references are not supported. (CDS 10205)

Cause

WSDL type definitions contain cyclical references.

Action

Modify the WSDL or select the supported WSDL.

11.7.2.9  WSDLs that do not have type definitions are not supported. (CDS 10206)

Cause

WSDL does not contain any type definitions in <types> tags.

Action

Modify the WSDL or select the supported WSDL.
11.7.2.10 Unable to send SOAP request as the target URL is malformed. (CDS 10207)

**Cause**

The SOAP action target URL mentioned for this service in the WSDL is malformed.

**Action**

Modify the WSDL or select another WSDL that is supported.

11.7.2.11 WSDLs that use encoded messages are not supported. (CDS 10208)

**Cause**

The WSDL has operations that expect encoded messages.

**Action**

Modify the WSDL or select another WSDL that is supported.

11.7.2.12 An error was detected while parsing the response. (CDS 10400)

**Cause**

An error was detected while parsing the response from server.

**Action**

Check the product logs to get the actual cause of error.
11.7.3 Custom Data Source Framework error messages

11.7.3.1 Unable to create or update the Custom Data Provider: unable to retrieve information from the provided source. (CDS 15102)

Cause
An unexpected error occurred while trying to retrieve information from the provided source.

Action
Contact your administrator to resolve the error.

11.7.3.2 Unable to create or update the Custom Data Provider: unable to retrieve structure information from the provided source. (CDS 15103)

Cause
An unexpected error occurred while trying to retrieve the structure information from the provided source.

Action
Contact the plug-in support to verify that the plug-in is working properly. If the error is not resolved contact SAP support to resolve the error.

11.7.3.3 Unable to create or update the Custom Data Provider: unable to build the iterator on the data set. (CDS 15104)

Cause
An unexpected error occurred while trying to build the iterator on the dataset.
Action

Contact the plug-in support to verify that the plug-in is working properly. If the error is not resolved contact support to resolve the error.

11.7.3.4 Unable to create or update the Custom Data Provider: a problem was encountered in Data Source plug-in management and the requested action cannot be completed. (CDS 15106)

Cause

An unexpected error has occurred.

Action

Contact support to resolve the error.

11.7.3.5 Unable to create or update the query on this file: the file "{filename}" does not exist in the file system. (CDS 15107)

Cause

The file does not exist at the specified location.

Action

Check whether the file path specified for source file is correct.

11.7.3.6 Unable to create or update the Custom Data Provider: the path is invalid. (CDS 15108)

Cause

The file path mentioned is incorrect.
Action

Check that the path specified for the source is correct.

11.7.3.7 Unable to create or update the Custom Data Provider: invalid information retrieved while trying to get the structure. (CDS 15109)

Cause

An error occurred while trying to retrieve the structure information from the data provider.

Action

Contact the plug-in support to verify that the plug-in is working properly. If the error is not resolved, contact support to resolve the error.

11.7.3.8 Unable to create or update the Custom Data Provider: could not find matching Data Source plug-in for this request. (CDS 15110)

Cause

An error occurred while trying to retrieve the plug-in information.

Action

Check that plug-in implementation returns required plug-in information correctly. Refer to documentation for information on configuring the plug-in.

11.7.3.9 Unable to create or update the Custom Data Provider: could not instantiate matching Data Source plug-in for this request. (CDS 15111)

Cause

An error occurred while trying to instantiate the plug-in.
**Action**

Check that the plug-in details and MODULE-PATH in the plug-in MANIFEST file is correct. Refer to the documentation for information on configuring the plug-in.

**11.7.3.10** Unable to create or update the Custom Data Provider: could not instantiate Data Source plug-in's Data Provider for this request. (CDS 15112)

**Cause**

An error occurred while trying to instantiate the Data Provider component of the plug-in extension.

**Action**

Contact the plug-in support to verify if the plug-in is working properly.

**11.7.3.11** Unable to create or update the Custom Data Provider: an error occurred while retrieving the data sampling. (CDS 15113)

**Cause**

An error occurred in the plug-in while trying to retrieve sample data from the data provider.

**Action**

Contact the plug-in support to verify if the plug-in is working properly.

**11.7.3.12** Unable to retrieve data from the Custom Data Provider: an error occurred while creating the data iterator. (CDS 15114)

**Cause**

An error occurred in the plug-in while trying to retrieve the data iterator.
Action

Contact the plug-in support to verify if the plug-in is working properly.

11.7.3.13 Unable to retrieve data from the Custom Data Provider: an error occurred while fetching data through the iterator. (CDS 15115)

Cause

An error occurred in the plug-in while trying to fetch the data through the iterator.

Action

Contact the plug-in support to verify if the plug-in is working properly.

11.7.3.14 Unable to create or update the Custom Data Provider: unsupported object type was provided by the Data Source plug-in while trying to get the structure. (CDS 15116)

Cause

The plug-in has data types that are not supported.

Action

Refer to the documentation for the list of supported data types.

11.7.3.15 Unable to create or update the Custom Data Provider: an internal error occurred while trying to open the session. (CDS 15117)

Cause

An error occurred in the plug-in while trying to open a session.
**Action**

Contact the plug-in support to verify if the plug-in is working properly.

**11.7.3.16** Unable to create or update the Custom Data Provider: the source in the provided path is protected. (CDS 15118)

**Cause**

The plug-in could not proceed as the source file provided is a password-protected file.

**Action**

Refer to the plug-in documentation.

**11.7.3.17** Unable to create or update the Custom Data Provider: the provided URL is invalid. (CDS 15119)

**Cause**

The plug-in could not proceed as the URL is invalid.

**Action**

Refer to the plug-in documentation.

**11.7.3.18** Unable to create or update the Custom Data Provider: the provided URL cannot be found. (CDS 15120)

**Cause**

The plug-in could not proceed as the provided URL could not be found.
**Action**

Refer to the plug-in documentation.

**11.7.3.19** Unable to interact with the Custom Data Provider on the provided source. (CDS 15121)

**Cause**

An unexpected error has occurred.

**Action**

Contact support to resolve the error.

**11.7.3.20** A problem was encountered. The requested action cannot be completed. (CDS 15122)

**Cause**

An unexpected error has occurred.

**Action**

Contact support to resolve the error.
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