

Working with OLAP Reports

Intellicus Enterprise Reporting and BI Platform



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For details, visit: <http://www.intellicus.com/acknowledgements.htm> .

Contents

Working with OLAP Reports	4
Setting OLAP connection	5
Creating an OLAP connection	5
Importing OLAP Cubes	8
What is an OLAP Cube Object	8
Import OLAP Cubes dialog.....	8
To import a cube	9
To Modify cube object details	9
To remove a cube from Imported Cubes list	9
OLAP Viewer	10
Getting dimensions/measures listed	12
Filtering.....	13
Interacting with the grid.....	14
Toolbuttons	15
To create more space on Analysis area	15
Actions on grid.....	16
Interacting with Chart	19
Saving an OLAP Layout.....	22
Open OLAP Layout	23
Folder and Objects List	24
Changing column-width	24
Sorting the list.....	25
Add or remove columns.....	25
Filtering the list (Searching).....	25

Working with OLAP Reports

OLAP feature offers users the ability to explore large complex data sets with drag-and-drop techniques, drilling down through levels of detail to view information from many angles, perform detailed data analysis and retrieve transactional detail.

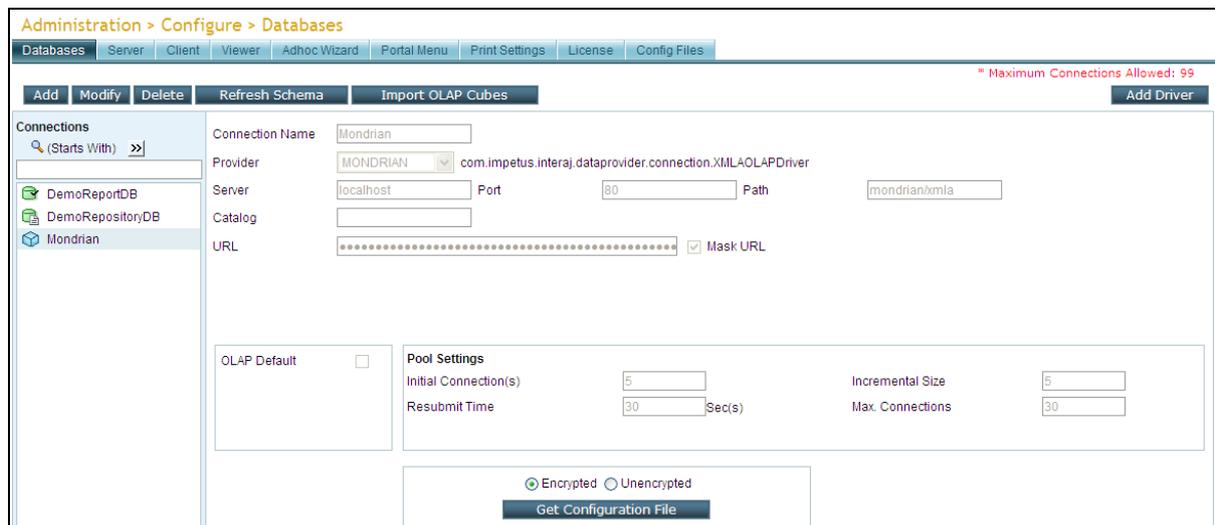
Intellicus can connect to an OLAP Server, import OLAP cubes in Intellicus repository, which in turn can be used to create OLAP layouts (OLAP reports). OLAP layouts are then uses by your end-users to perform data analysis.

Setting OLAP connection

This is the first step of OLAP support in Intellicus. This involves creation of an OLAP type data connection with an OLAP server.

You need to be a super administrator to create a database connection. A database connection is created on **Databases** page.

When you are logged in as super administrator, click **Navigation > Configure > Databases**.



The screenshot displays the 'Administration > Configure > Databases' interface. At the top, there are navigation tabs: Databases, Server, Client, Viewer, Adhoc Wizard, Portal Menu, Print Settings, License, and Config Files. A red notification states '* Maximum Connections Allowed: 99'. Below the tabs are buttons for 'Add', 'Modify', 'Delete', 'Refresh Schema', 'Import OLAP Cubes', and 'Add Driver'. The main area is divided into a left sidebar with a search bar and a list of connections (DemoReportDB, DemoRepositoryDB, Mondrian) and a main configuration panel. The 'Mondrian' connection is selected. The configuration panel includes fields for 'Connection Name' (Mondrian), 'Provider' (MONDRIAN), 'Server' (localhost), 'Port' (80), 'Path' (mondrian/xmla), and 'URL' (masked). There are also 'Pool Settings' for 'Initial Connection(s)' (5), 'Resubmit Time' (30 Sec(s)), 'Incremental Size' (5), and 'Max. Connections' (30). At the bottom, there are radio buttons for 'Encrypted' (selected) and 'Unencrypted', and a 'Get Configuration File' button.

Figure 1: Databases page of Intellicus Portal as displayed to the Super Administrator User

Use **Databases** page to create a database connection (OLAP type), select a database connection and change its details as well as delete a database connection.

Creating an OLAP connection

On **Databases** page, click **Add** button. The page will be re-drawn with blank fields.

In **Connection Name**, specify a name to uniquely identify this connection. This name will be listed on all pages where you will work with OLAP cubes.

Important: Connection Name is a case sensitive field. For example, "SalesDataConnection" is not same as "salesdataconnection".

Connection Name	<input type="text" value="Mondrain"/>		
Provider	<input type="button" value="MONDRIAN"/> ▼	com.impetus.interaj.dataprovider.connection.XMLAOLAPDriver	
Server	<input type="text" value="localhost"/>	Port	<input type="text" value="80"/> Path <input type="text" value="mondrian/xmla"/>
Catalog	<input type="text"/>		
URL	<input type="text" value="....."/>		<input checked="" type="checkbox"/> Mask URL

Figure 2: Information specific to provider

In **Provider**, select name of OLAP Server to connect to. Presently Intellicus supports Mondrian and MSAS as OLAP Data providers.

In **Server**, specify IP of the machine where OLAP server is available.

In **Port**, specify the port at which OLAP server listens.

Path, is the path to This is path to the XMLA service. For Mondrian data provider, specify mondrian/xmla (where mondrian is name of the web application). For MSAS

- For MSAS 2000, specify xmla/msxisapi.dll (xmla is a virtual directory name)
- For MSAS 2005, specify xmls/msmdpump.dll (xmla is a virtual directory name)

Catalog is a collection of cubes. An OLAP Catalog can contain multiple number of cubes. This is an optional field. If kept blank, first catalog present in the OLAP Schema will be taken.

As you fill in the details for the connection, application auto-generates a URL that it will use to connect to the database. By default the URL is masked. To view the URL, uncheck **Mask URL** checkbox.

You may configure multiple OLAP connections. Check **OLAP Default** checkbox make this OLAP connection, the default OLAP connection. When user will select (Default) option on OLAP Layouts dialog, data will be fetched from this connection.

Pool Setting

Every database access request will consume one data connection. When report server boots up, it opens a pool of all configured connections and caches their metadata.

Pool Settings			
Initial Connection(s)	<input type="text" value="5"/>	Incremental Size	<input type="text" value="5"/>
Resubmit Time	<input type="text" value="30"/> Sec(s)	Max. Connections	<input type="text" value="30"/>

Figure 3: Pool Setting section of Databases page

In **Initial Connection(s)**, specify the number of connections that should be opened initially. Default: 5.

Note: Connections are opened when report server starts. For connections where Runtime checkbox is selected, report server opens connections at the setup time only if user credentials were provided at that time. If not, then they are opened at the time of first request.

In **Incremental Size**, specify the number of connections to open when the all open connections are consumed. For example, if 10 connections are presently opened and Incremental Size is 3, then when these 10 connections are consumed, 3 more connections will be opened. Default: 5.

In **Max. Connections**, specify the maximum number of connections that can be opened to the selected database at a time. Default: 10.

If a connection is idle, it should be resubmitted, so that other applications can use those connections. Connections can be resubmitted when the number of open connections is more than number of Initial Connections. Connections can be resubmitted in a lot of number specified in "Incremental Size". Connections are resubmitted by running a resubmit request. In **Resubmit Time**, specify the waiting-time in seconds before generating re-submitting request. Default: 30 seconds.

Example:

Initial connections: 10
Incremental size: 3
Open connections: 16

When resubmit thread runs:

- Idle connections: 1 or 2: no connection will be resubmitted
- Idle connections: 3 or 4 or 5: 3 connections will be resubmitted
- Idle connections: 6, or more: 6 connections will be resubmitted

Importing OLAP Cubes

What is an OLAP Cube Object

As a super administrator, when you import an OLAP server cube, OLAP cube object is created in Intellicus. An OLAP cube object is wrapper for OLAP Server cube. Intellicus users can use only cube objects to view and analyze OLAP data.

OLAP cubes are imported on **Import OLAP Cube** page. After import, OLAP Objects will be available to end-users on **OLAP Viewer** page where they can select a cube object to view and analyze the data.

OLAP cube object's data comes through OLAP connection. To get data from specific (one or more) OLAP connections, you need to bind the cube object with those connections. To get data from any of the available connections, keep the cube object unbound.

On **OLAP Viewer**, the bound OLAP cube will be listed under connections to which it is bound. An unbound cube object will be listed under all the connections.

Import OLAP Cubes dialog

When you are logged in as super administrator in Intellicus portal, click **Navigation > Configure > Databases** to navigate to Databases page. On **Databases** page, select an OLAP connection and click **Import OLAP Cubes** button.

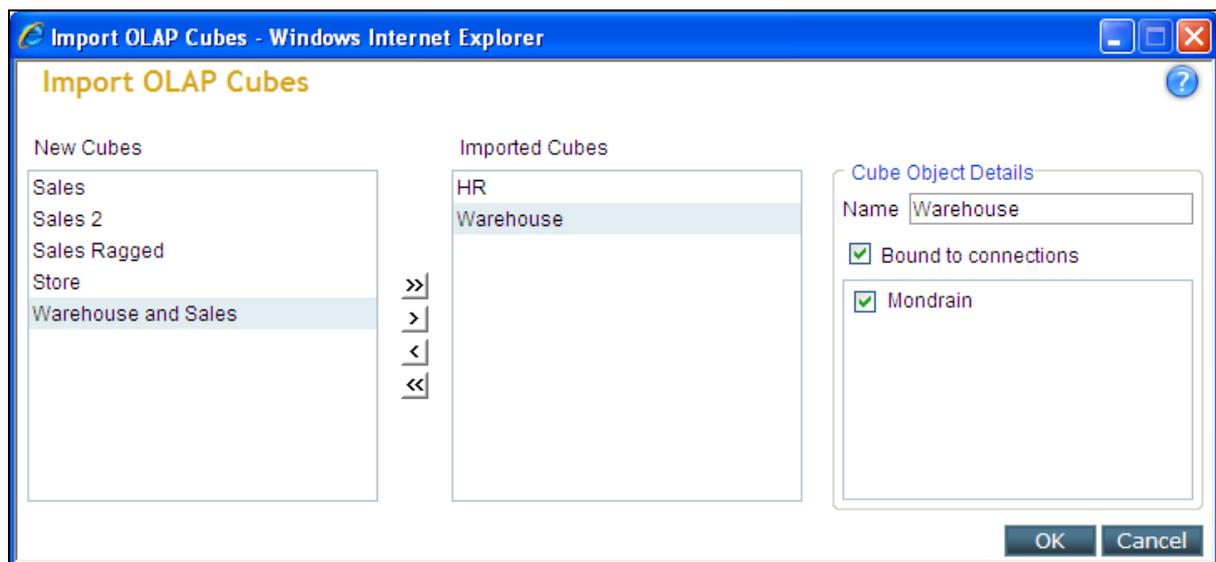


Figure 4: Import OLAP Cubes page

Cubes available at the connection that you selected on **Databases** page (and not yet imported) are listed in **New Cubes** box. Imported cubes (cube objects) are listed in **Imported Cubes** box.

During import, Intellicus auto-generates a unique name for the cube object. This name can be changed, if needed.

An OLAP Cube's data will come through OLAP connection. Status of Bound to Connections checkbox shows if the selected cube object is bound to one or more connections, or it is unbound.

- **Unbound cube object:** Not bound with any connection. On OLAP Viewer, it will be listed under all of the configured OLAP connections.
- **Bound cube object:** Bound with selected connection(s). On OLAP Viewer, it will be listed under the connections to which it is bound.

To import a cube

1. Click the cube from **New Cubes** list.
2. Click  button. Selected cube will be moved to **Imported Cubes** list. Auto-generated unique name of the imported cube is displayed in **Name** box. To import all the cubes, click  button.
3. Change the name of the cube if required. (Guidelines are provided below these steps).
4. Set the status of **Bound to Connections** checkbox.

Guidelines to create a cube object Name

- Name needs to be unique.
- Use alphabets (A - Z, a-z), numbers (0-9), dash (-), space and underscore (_) to form the name.
- A name can up to 256 characters long. It is always good idea to have a smaller name.

To Modify cube object details

You can modify **Name** and status of **Bound to Connections**. To make modifications, select the cube from **Imported Cubes** list, make the required changes.

To remove a cube from Imported Cubes list

- To remove a cube object field from **Imported Cubes** list, select it and click  button.
- To remove all, click  button.

Important: There can be a saved OLAP Layout that uses the cube object which was removed from this page. If users try opening such an OLAP layout, they will receive an error.

OLAP Viewer

Use OLAP Viewer to view and analyze OLAP data in the form of grid as well as chart. Any user can open OLAP Viewer page.

Click **Navigation > OLAP > OLAP Viewer** to navigate to **OLAP Viewer** page.

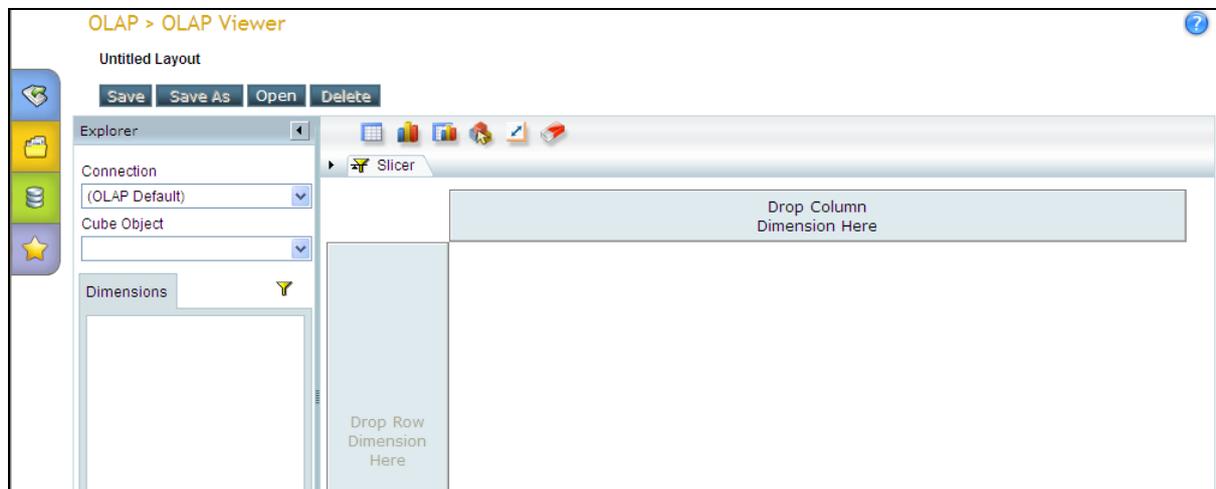


Figure 5: OLAP Viewer

To open an OLAP report and work with OLAP viewer functionalities, you need *Run* rights on the category where layout is available and the layout itself.

To save the changes made on OLAP Report as well as Save As the OLAP report, you need to be a super administrator.

On **OLAP Viewer** you may:

- Work with a new OLAP layout
- Open and work with an existing OLAP layout

OLAP Viewer has Explorer Area and Analysis Area.

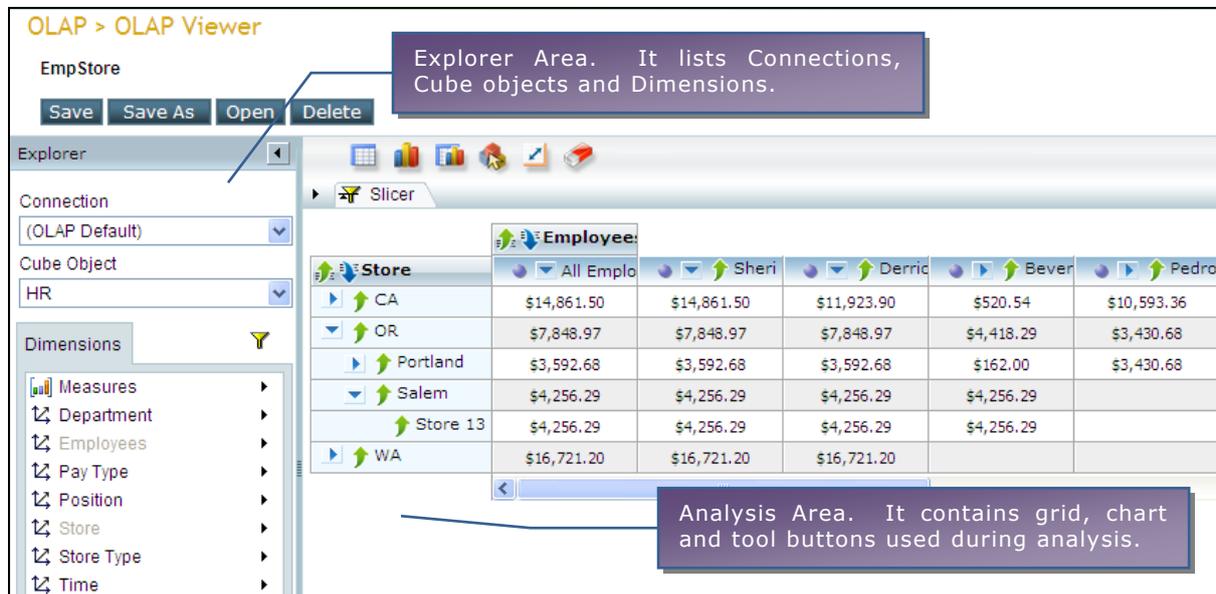


Figure 6: OLAP Viewer: Explorer Area and Analysis Area

- **Explorer area:** It lists OLAP connections accessible to you, cube objects in the selected connection as well as measures/dimensions in the selected cube object.
- **Analysis area:** This area contains grid of column axis and row axis where you can add/remove dimensions to analyze data. It also has toolbuttons to carryout grid operations.

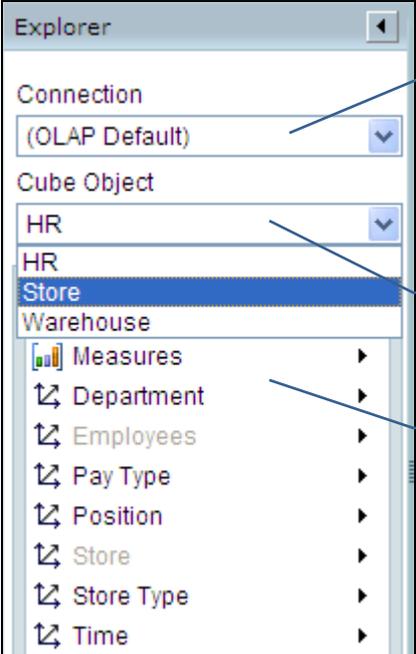
Connections dropdown lists all the OLAP connections configured in the application. When the page is opened, default OLAP connection (It is set on Databases page by application super administrator) is selected (OLAP Default) in the drop down. You may continue with it or select another connection.

Cube Object dropdown lists all the cube objects available with the connection (unbound cube objects, or the ones bound with the selected connection) in Connections dropdown.

Dimensions box lists measures and dimensions available in the cube object selected in **Cube Object** dropdown.

Getting dimensions/measures listed

Dimensions/measures are in cube objects. Cube objects get their data from OLAP Connections. So, to get a list of dimension/measures, you need to:



The screenshot shows the 'Explorer' window with the following structure:

- Connection:** (OLAP Default) [dropdown arrow]
- Cube Object:** HR [dropdown arrow]
- Measures:** Warehouse
 - Measures [arrow]
 - Department [arrow]
 - Employees [arrow]
 - Pay Type [arrow]
 - Position [arrow]
 - Store [arrow]
 - Store Type [arrow]
 - Time [arrow]

Three callout boxes provide instructions:

1. Select a connection from **Connections** dropdown (or continue using OLAP Default). Unbound cube objects and those bound to the selected connections will be listed in Cube Object dropdown.
2. Select a cube object from **Cube Object** dropdown. Dimensions available in selected Cube Object will be listed in **Dimensions** box.
- Dimensions available in selected Cube Object will be listed in **Dimensions** box.

Figure 7: Getting dimensions / measures listed

Filtering

You can filter fields as well as data.

Filtering Fields

Use the Filter on Dimensions List to filter grid / chart by fields.

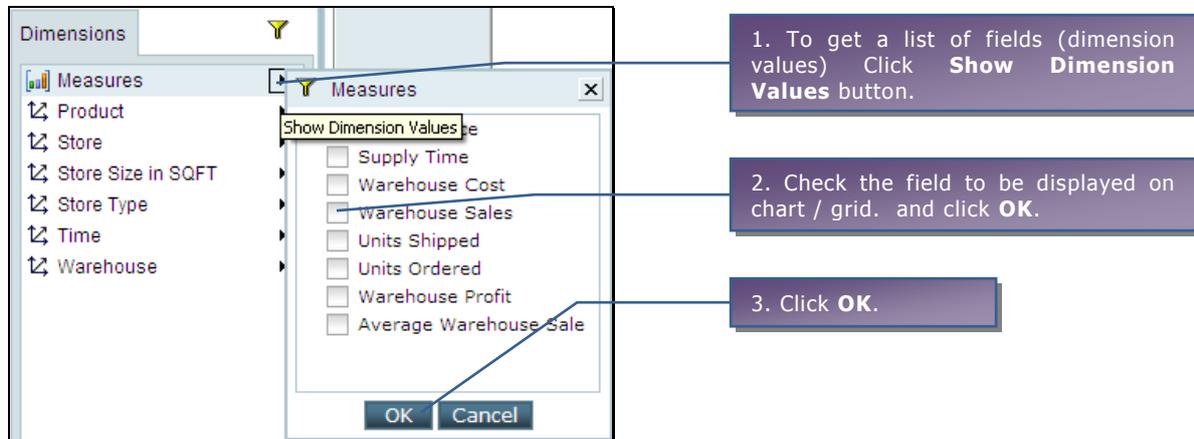


Figure 8: Filtering Fields

Filtering Data

Use Slicer to filter grid / chart by data values. You can filter data by values of dimensions not placed on grid /chart.

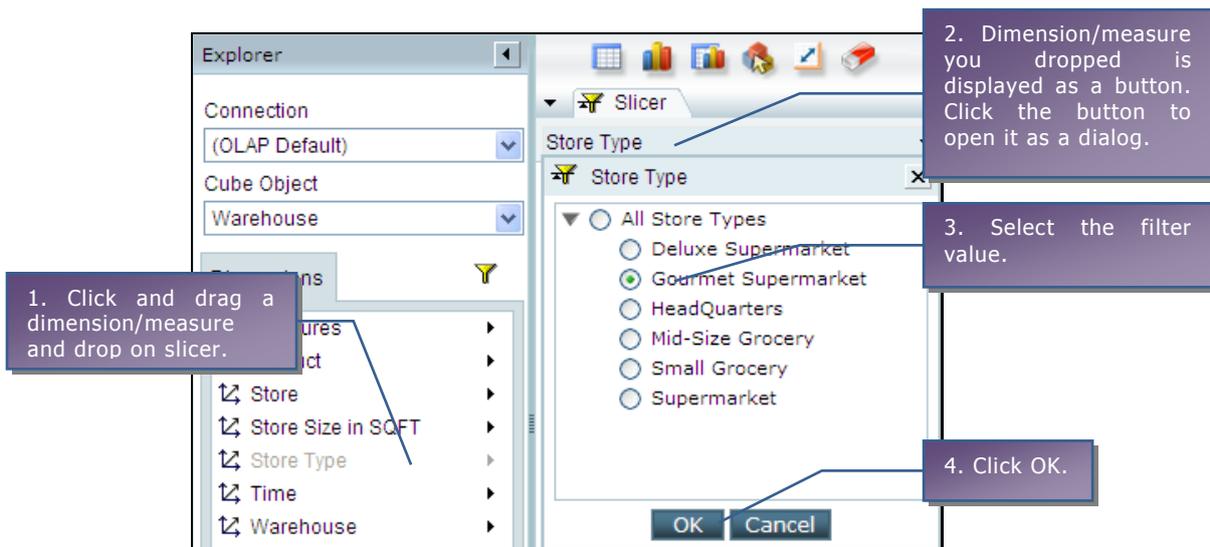


Figure 9: Filtering data

When you apply a filter by field or data, grid / chart will be immediately re-drawn.



Figure 10: Removing a data filter

Interacting with the grid

Just after opening OLAP Viewer, when you select a cube object, data area will be empty. Data is displayed on grid after you add at least one dimension/measure to column axis and row axis. To move a dimension/measure, select it, then drag and drop it on respective axis.

Note: If the grid is empty, you need to move dimension/measure to column axis first.

Moving another dimension/measure to column axis

- **To drop above existing dimension/measure:** From **Dimension** list, click and drag a dimension/measure and drop it to the left end of existing dimension/measure's title.
- **To drop below existing dimension/measure:** From **Dimension** list, click and drag a dimension and drop it to the right end of existing dimension/measure's title.

In both the above cases, the grid will be re-drawn which will display the newly moved dimension/measure too.

Moving another dimension/measure to row axis

Note: Before moving a dimension/measure to row axis, make sure there is a dimension/measure on column axis.

- **To drop before existing dimension/measure:** From **Dimension** list, click and drag a dimension/measure and drop it to the left end of existing dimension/measure's title.
- **To drop after existing dimension:** From **Dimension** list, click and drag a dimension/measure and drop it to the right end of existing dimension/measure's title.

Grid will be re-drawn and newly moved dimension/measure will be displayed on the grid.

To remove a dimension/measure from column axis or row axis

Click the title of the dimension/measure, drag and drop it to any area outside the grid. The grid will be re-drawn which will not contain the removed dimension/measure.

Important: Don't remove all the dimensions from the column area. If you do so, the grid will be cleared.

Toolbuttons

- **Show Grid Only**  : To view only grid in entire data area.
- **Show Chart Only**  : To view only chart in entire data area.
- **Show Grid and Chart**  : To view grid as well as chart in data area.
- **Select Action**  : User can perform Expand / Collapse and drill-in drill-out actions on the OLAP layout. Select the action user will be able to do: All, Expand/Collapse, Drilling or None. Select Action toolbutton will be replaced by the icon for selected action.
- **Swap Axis**  : To swap the dimensions/measures on column with that on row.
- **Clear**  : To clear the data from analysis area.

To create more space on Analysis area

Close the explorer area. This will result into more on-screen space for analysis area. Click  button to close explorer area. To re-open the explorer area, click  button.

Actions on grid

To display members of a parent (Expand)

Click  on left of expandable member of respective dimension to expand and view members along with parent. When the list is in expanded state, the button turns to .



Warehouse	Store Type
USA	All Store

Warehouse	Store Type
USA	All Store
USA	102,278.409
WA	52,477.109
CA	29,607.299
OR	20,194.001

Figure 11: Displaying members of a parent

To hide members of a parent (Collapse)

Click  on left of expandable member of respective dimension to collapse (hide) its members. When the list is in collapse state, the button turns to .

Sorting

All column titles have a button indicating the current sort order. Clicking the button will sort the grid by "next sorting order in sequence" of values in that column.

-  : **Natural order**. Click to sort by ascending order.
-  : **Ascending order**. Click to sort by descending order.
-  : **Descending order**. Click to return to natural order.



Warehouse	Store Type
USA	All Store
CA	29,607.299
OR	20,194.001
WA	52,477.109

Warehouse	Store Type
USA	All Store
OR	20,194.001
CA	29,607.299
WA	52,477.109

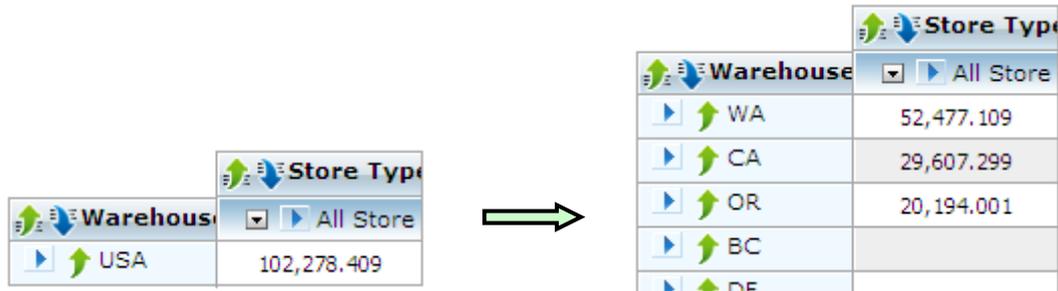
Warehouse	Store Type
USA	All Store
WA	52,477.109
CA	29,607.299
OR	20,194.001

Figure 12: Effect of sorting: Natural order, Ascending order and Descending order

Drilling

Drilling down gets you more details on the grid. When you drill down, parent information is removed from the screen.

 : **Drill down level.** Appears at top level. Click to drill down one level. This will hide parent information and display next level detail.



Warehouse	Store Type
USA	102,278.409

Warehouse	Store Type
All Store	
WA	52,477.109
CA	29,607.299
OR	20,194.001
BC	
DE	

Figure 13: Effect of drill down on the grid

 : **Drill up level.** Appears at top level. Click to hide the detail opened by drilling down and return to one level up.



Warehouse	Store Type
All Warehouses	102,278.409
USA	102,278.409
WA	52,477.109
CA	29,607.299
OR	20,194.001

Warehouse	Store Type
USA	102,278.409

Figure 14: Effect of drill up on the grid

Drill down member: Click a member to drill down and view its detail.



Warehouse	Store Type
USA	102,278.409

Warehouse	Store Type
All Store	
WA	52,477.109
CA	29,607.299
OR	20,194.001

Figure 15: Effect of drill down member

 : **Drill up member.** Click to close the detail of the member and move up one level.



Warehouse		Store Type
WA	52,477.109	All Store
CA	29,607.299	All Store
OR	20,194.001	All Store

Warehouse		Store Type
USA	102,278.409	All Store

Figure 16: Effect of drill up member

Interacting with Chart

Actions on Chart

You can carry out expand / collapse and drill actions on chart. To carry out an action on chart, you set the desired interaction action, select the interaction dimension and take the action.

To set interaction action

Interaction action is selected by clicking the button on Select Interaction Action group button.

- **Expand/Collapse:** Click Expand/Collapse action  button.
- **Drill mode:** Click Drill action  button.

To select interactive Dimension

Select the dimension from **Interactive Dimension** dropdown box.

Taking the action

To Expand

When Expand/Collapse action is selected, click the chart. Chart will be expanded.



Figure 17: Effect of "Expand" on chart

To Collapse

When Expand/Collapse action is selected, click the chart depicting expandable member (the member on chart you clicked to expand).

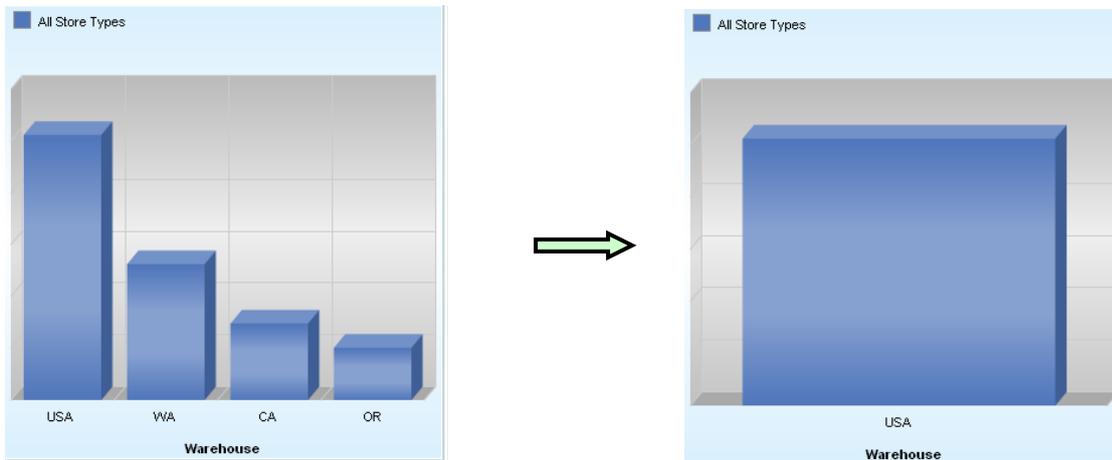


Figure 18: Effect of "Collapse" on chart

Drill up and drill down a level

Drilling down gets you more details on chart. When you drill down, parent information is removed from the screen.

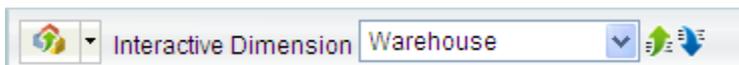


Figure 19: Drill up a level and drill down a level buttons on chart toolbar

 : **Drill down level.** Click this button to drill the entire chart down one level. This will hide parent information and display next level detail.



Figure 20: Effect of "Drill down level"

 : **Drill up level.** When chart is already drilled down, click this button to drill up one level.

Drill down a member and drill up

When the chart is not drilled down, click the chart to drill down the member. Chart will be drilled down.

When the chart is already in drilled down state, click the data point / bar representing the member you want to further drill down. Menu will open up. Click Drill Down  icon to drill further down. On the menu, click Drill Up  icon to drill up. Chart will be re-drawn.

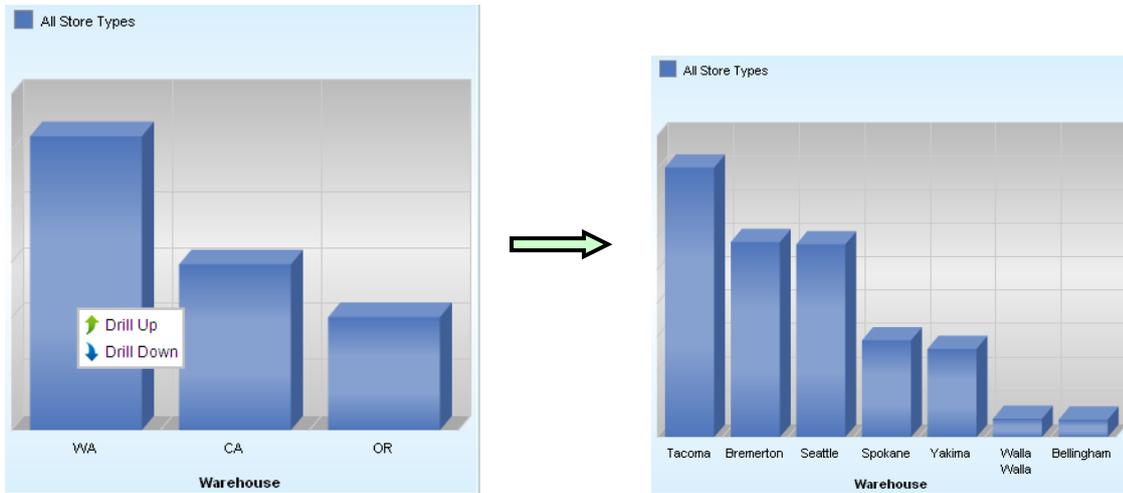


Figure 21: Effect of Drill Down a member

Saving an OLAP Layout

After you create an OLAP layout, you may save it so that next time, you can begin from where you left last time.

Use this dialog box to save the OLAP layout. **Save OLAP Layout As** dialog box opens up when you click **Save** button for the first time after working on a new layout. It also opens up when you click **Save As** button.

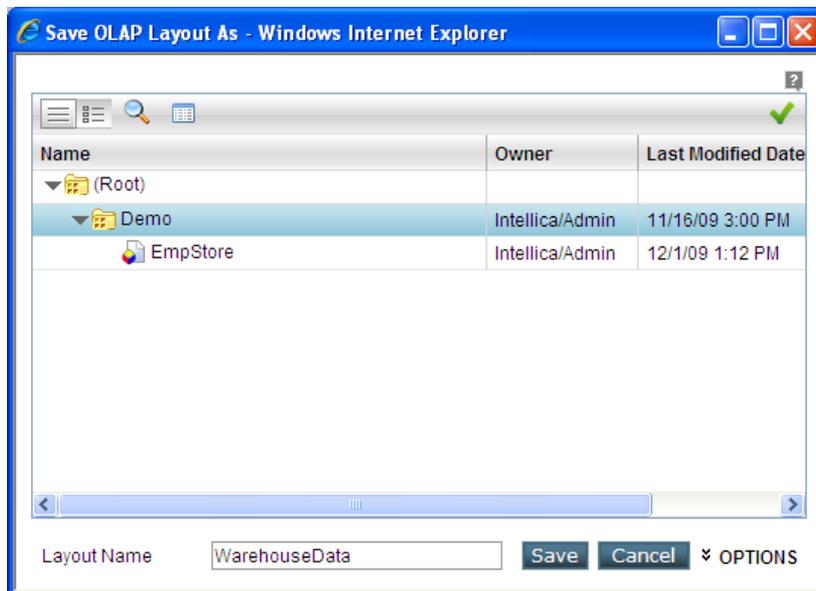


Figure 22: Save OLAP Layout As dialog

OLAP Layouts are saved in a folder. Folders are stored as multi-level structure in the repository and can be viewed on Object Selector. You need to navigate to the folder where you want to save the layout.

At the time of saving, you need to provide a unique **Layout Name**. Naming guidelines are provided later in this section. Along with the layout name application also saves **Owner** (the organization and user ID who created the layout) and **Last Modified Date**.

When you click Options link, the dialog box expands. This area has options that you can set for the OLAP Layout being saved.

Specify **Description** of the OLAP Layout and set its scope to **Public** (available to all) or **Private** (available to you).

Click **Save** to save the layout.

Save As a OLAP report

1. Open the OLAP report which already exists.
2. Click Save As button.
3. A Save As dialogue is available. Mention the name of the OLAP report. Click 'Options' to have access to more properties. There is a checkbox available "Copy Access Rights". This checkbox is to be checked if the access rights need to be the same for both OLAP reports, source and

target (saved as). Keep the checkbox as unchecked if you want to assign different access rights for the OLAP reports.

4. Click Save. This will close the Save As dialogue after saving the settings.

Layout naming guidelines

- Layout name needs to be a unique name across all layouts.
- Use alphabets (A - Z, a-z), numbers (0-9), dash (-), space and underscore (_) to form the name.
- A name can up to 256 characters long. It is always good idea to have a smaller name.

Open OLAP Layout

To open an OLAP layout, you need to click **Open** button on **OLAP Viewer**. It opens Open OLAP Layout dialog, which will list folders and OLAP layouts accessible to you.

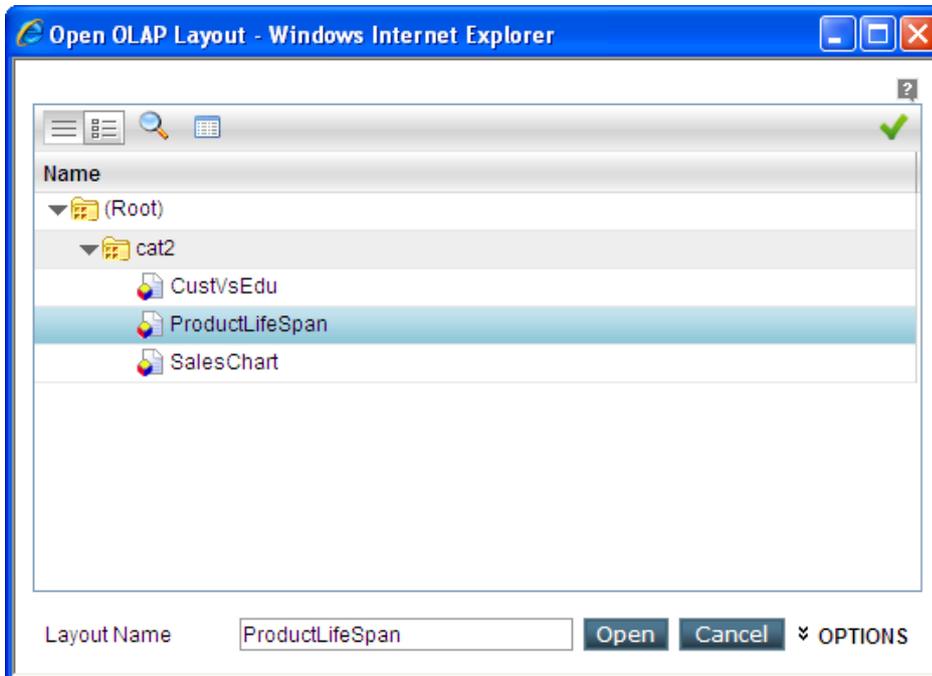


Figure 23: Open OLAP Layout dialog

To open an OLAP Layout

OLAP Layouts are available in a folder. Folders are multi-level structure in the repository and can be viewed on Object Selector. You need to navigate to the desired folder and locate the layout you want to open.

Click **Options** link to view the description and the scope of the OLAP Layout.

Select an OLAP Layout and double-click it or click **Open** button to open it.

Tip: OLAP layout (report) can also be opened from Object Explorer.

Folder and Objects List

Folder and Object List (also known as Object selector) has following features:

- Detailed and List View
- Search
- Sort

Click ▶ to open a folder and list its contents. Click ▼ to close the folder. Double-click on the folder or object will select it.

When dialog opens, List View is active, which lists folders and objects. If you are dealing with large number of objects, you may search objects by attributes like last modified date or the person who created it.

To get such (and other object-based) details, switch to **Detailed View** by clicking  button. In this view, columns of **Owner** (the organization and the user ID used to create the folder/object) and **Last Modified Date** are displayed by default. To get columns that you need,

1. While in **Detailed View**, right-click on title-bar to open a context-menu.
2. Context-menu has checkboxes of columns that can be displayed. Check what you want to view and uncheck what you don't. Respective column will be instantly added / removed from the view.

To close the context-menu, click anywhere on the title-bar.

Changing column-width

If an object name is not completely visible or if a column is too wide hiding other columns in the row, you may wish to adjust respective column-width. To do this, take the mouse pointer towards the right boundary of the column-title till pointer changes to double-headed arrow.

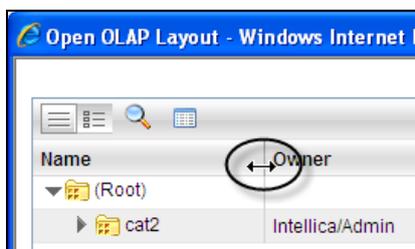


Figure 24: Changing column-width

Now, drag it on the right or left to increase or decrease the column-width respectively.

Sorting the list

It is quicker to find the desired item if the reference is sorted. To sort the list by a column, click its column-title. The list will be sorted in Ascending Order of the column.

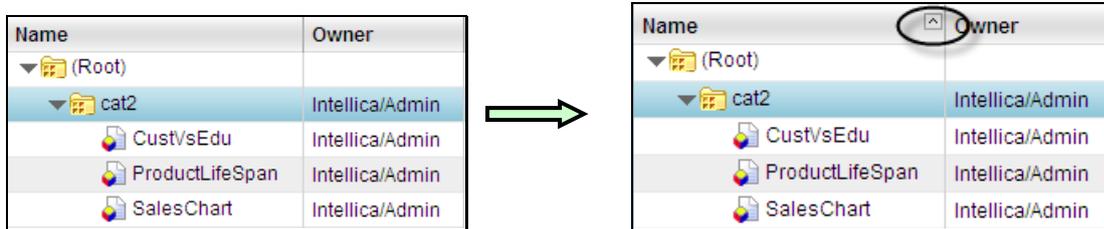


Figure 25: Effect of sorting a column

Look for an arrow icon on the right edge of the column. It indicates current sort order. Click the column once more to sort the list in opposite order. Clicking another column's title will sort the list in Ascending order of that column.

Add or remove columns

By adding or removing columns in the list, you may include in the list only the columns that you need.

Right-click on title-bar to open a context-menu. Context-menu has checkboxes of columns that can be displayed.

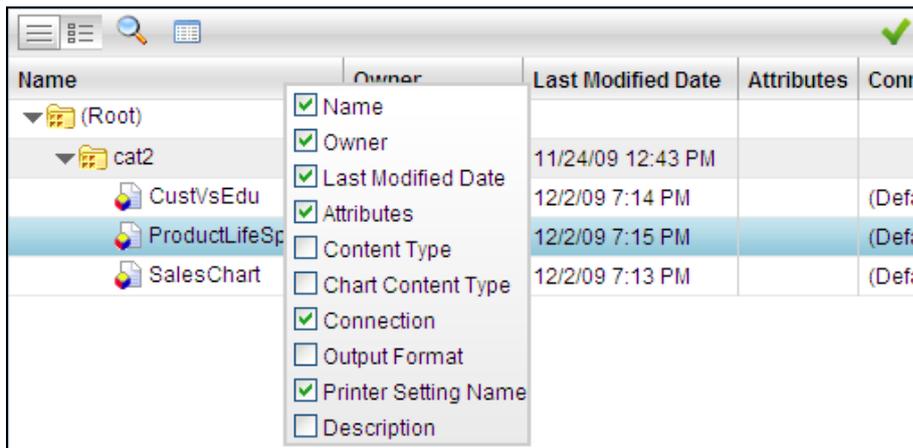


Figure 26: Add or remove columns

Check name of the column to display and clear the column that you don't want to display. The columns will be instantly added / removed from the view.

To close the context-menu, click anywhere on the title-bar.

Filtering the list (Searching)

When a list has a large number of items, it becomes a bit difficult to navigate to the item you are looking for. On this page, you can filter list using Quick Search and Advanced Search to get a smaller list.

Quick Search

Use Quick Search to search the objects by Name. Click **Search**  to open the search box. In the box, specify a few characters of the name. The list will be refreshed with objects having the characters specified in the search box.

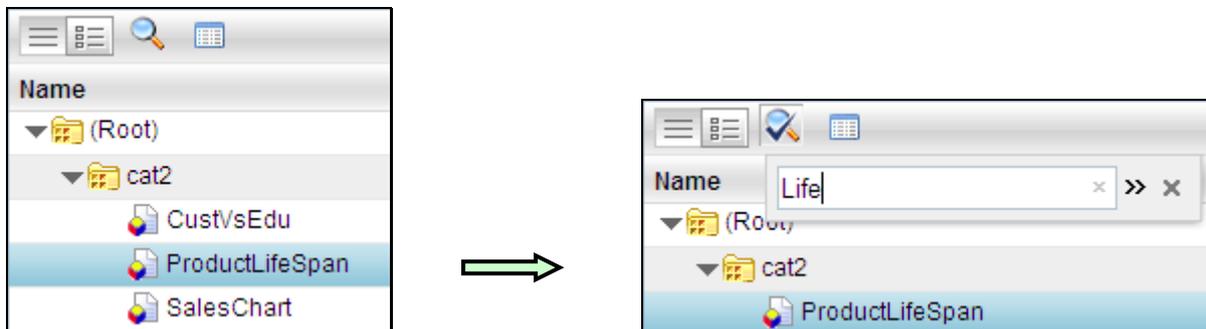


Figure 27: Effect of Quick Search

When you apply a search filter, the  button turns to  button (even when the search box is closed). To remove the filter, click **x** button in the box. To close search box, click **Search** button again.

Advance Search

Use Advance Search to search organizations by multiple attributes like Name, Text in the description and creation date. You can create search criteria using any of the conditional operators like "Is", "Contains", "Starts with" and "Ends with". Multiple criteria set on the same attribute are joined by OR. Multiple criteria set on different attribute are joined by AND.

To specify a search criteria

Click **Search**  button to open the **Search** box. In **Search** box, click **>>** icon to open **Advance Search** box. When open for the first time, this box will have one criteria row. Specify the criteria.



Figure 28: Advance Search dialog

Depending on attribute, value box will remain text box (to type in the value) or change to a dropdown (to select a value from preset values) or a date box (to select a date). Using buttons provided on the left of the row you may open another criteria row **+** (add filter) or delete current row **x** (remove filter).

After specifying the criteria, click **Search** button to start the search. Filtered organizations will be listed. To return to unfiltered list, click  button. To view filtered list, click  button.

To close the **Advance Search** box, click  button.

