

Working with External Cubes

Intellicus Enterprise Reporting and BI Platform



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

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Working with External Cubes

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 used by your end-users to perform data analysis.

Setting OLAP connection

This is the first step of external cubes 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**.

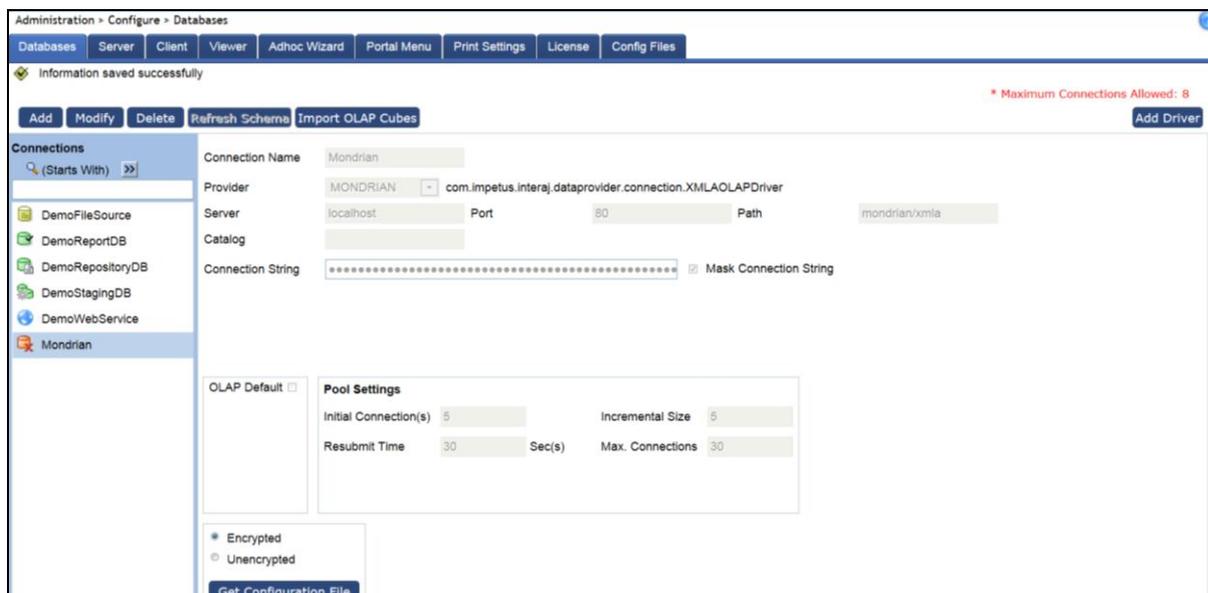


Figure 1: Databases page of Intellicus Portal as displayed to the Super Administrator User

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".

The screenshot shows a configuration window with the following fields and values:

- Connection Name: mondrian
- Provider: MONDRIAN (dropdown menu), com.impetus.interaj.dataprovider.connection.XMLAOLAPDriver
- Server: localhost, Port: 80, Path: mondrian/xmla
- Catalog: (empty)
- Connection String: (masked with dots), Mask Connection String

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 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 numbers 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 **Connection String** that it will use to connect to the database. By default the Connection String is masked. To view the URL, uncheck **Mask Connection String** 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.

The screenshot shows a checkbox labeled "OLAP Default" which is currently unchecked.

Pool Settings

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 Settings 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: 30.

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 external 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.

Data Restriction	
Dimension	Restricted By
<input type="checkbox"/> +	<input type="text"/>
<input type="checkbox"/> + <input type="checkbox"/> x	<input type="text"/>
<input type="checkbox"/> + <input type="checkbox"/> x	<input type="text"/>

Figure 4: Import OLAP Cubes page

Cubes available at the connection that you selected on **Databases** page (and not yet imported) are listed in **Available 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. You can also specify the category where the cube object is created.

Check **Import hierarchies as dimensions** option in case you wish to import cube hierarchy as dimensions on OLAP Viewer.

An OLAP Cube's data will come through OLAP connection. If **Run on selected connections only** is checked, the selected cube object is bound to selected connections.

Drill-Through Report Location and **Data Restriction** are explained later in this document.

To import a cube

1. Click the cube from **Available 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. Specify other options as needed and click **OK**.

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 other settings on **Import OLAP Cubes** screen. 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.

Drill through reporting in OLAP

Intellicus has introduced a drill through functionality. With this functionality you can view the details or records using which the summarized report is prepared. When you create an OLAP report, it gives a summarized report. To view the details of the summarized report drill through is used.

	Measures		
Agency Location	Patient Count	Treatment Cost	Survival Rate
All Agencies	27188	858909.56	4723
California	1775	25014.32	384
Colorado	1148	30901.32	380
Florida	2006	40822.42	375
Georgia	2785	34012.04	350
Montana	2234	74414.22	364
New Jersey	2105	18388.18	372
New Mexico	2321	37157.42	376
New York	3515	63438.32	538
Oregon	2761	67253.84	384
South Carolina	1772	275365.85	262
Texas	1511	57575.53	285
Washington	1464	12011.9	293
West Virginia	1791	122554.2	360

Figure 5: An OLAP Report

In our example above we know 'Patient Count' for each 'Agency Location'. Here, we know that for patient count is 1775 for California. We know that for patient count is 2785 for Georgia etc. We are not sure what data gave us these numbers. Drill through will help us know the details of the figures mentioned.

Steps to create a drill through OLAP report

1. Create a MSAS/Mondrian connection under Administration > Configure > Databases.
2. Click **Import OLAP Cubes** to select cubes to import. Check the option **Allow Drill-Through** and click **Generate Report** after specifying report location.

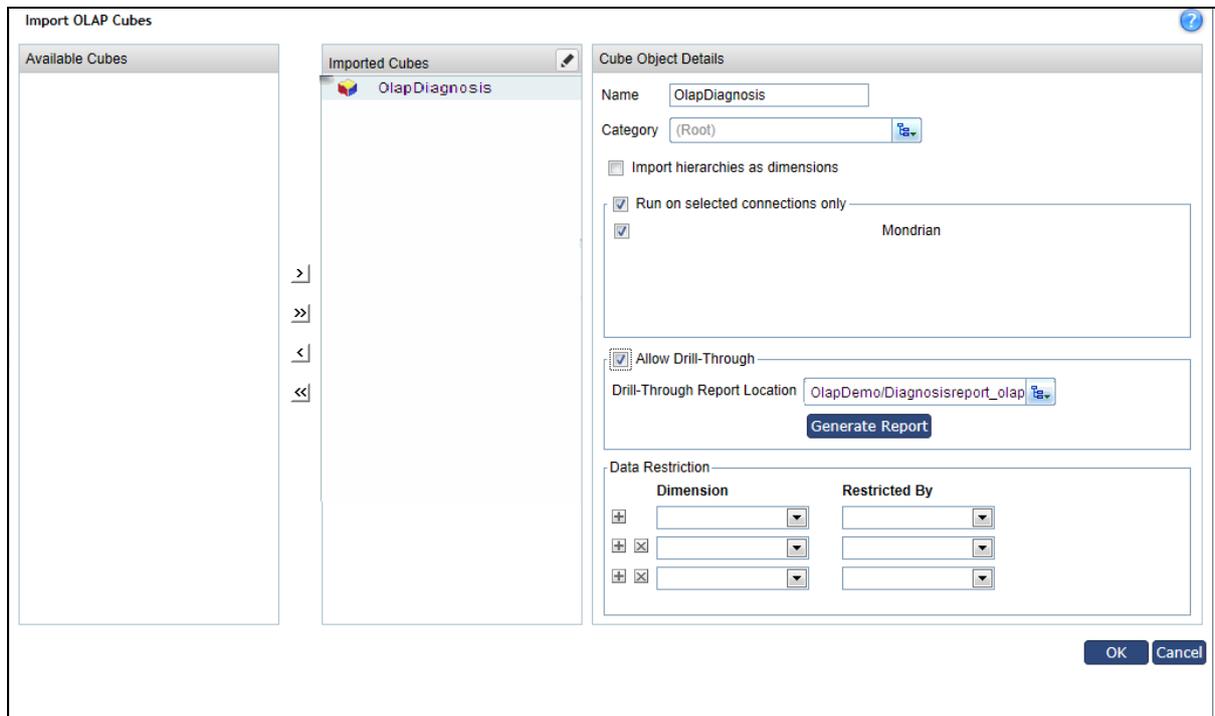


Figure 6: Mapping the Adhoc Report

3. Next go to OLAP Viewer and browse this cube object.
4. Click the hyperlink created on records in order to see the drill-through report.

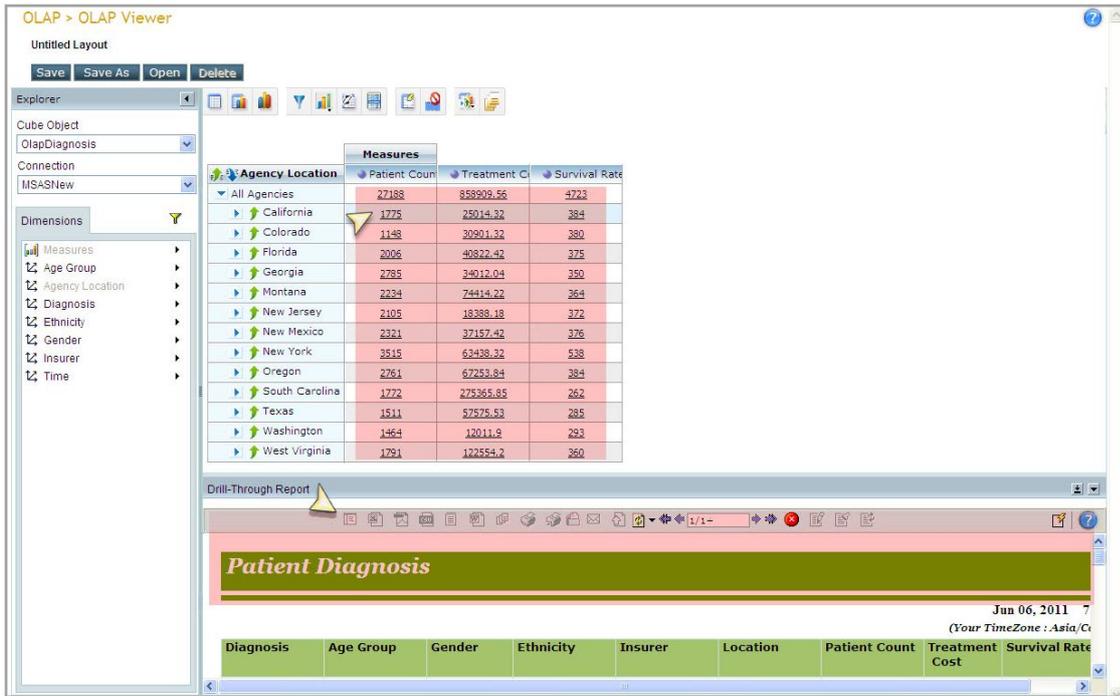


Figure 7: OLAP Report with Drill Through

You can view the details on the same window or can choose to open in a new window. To open in a new window click  icon ('Undock').

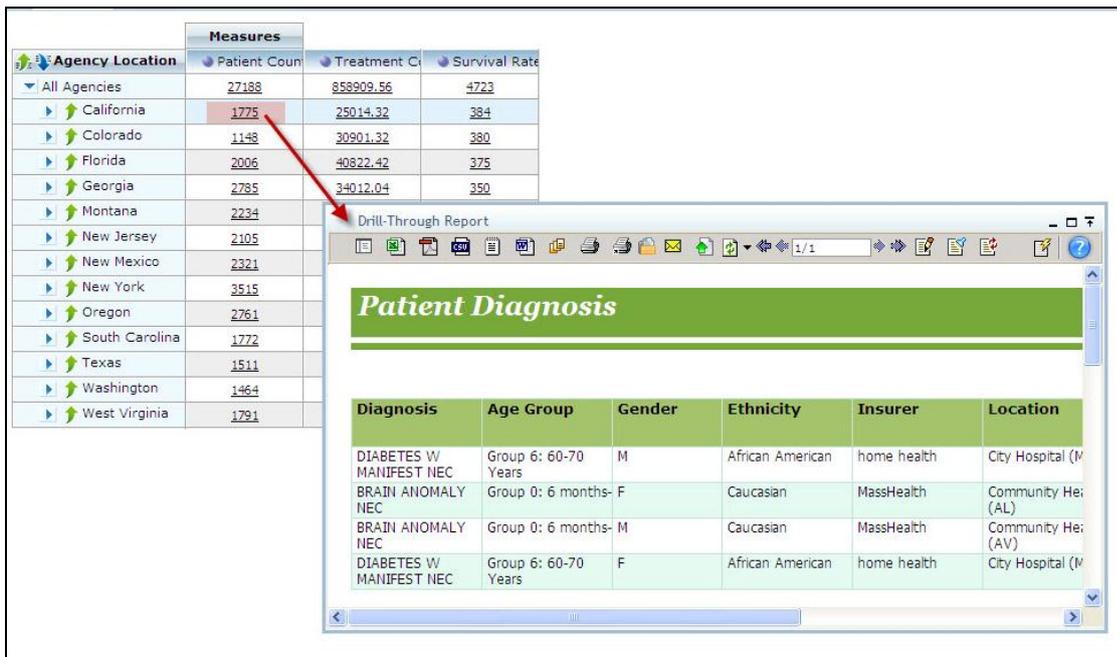


Figure 8: Report in a new window

View a Drill-through report in "Show Grid and Chart" mode.

You can select "Show Chart only" or "Show Grid and Chart" to view a chart of the report you created.

By clicking on any of the bars (in case of Bar chart), you can view options like, Drill Up, Drill Down and Drill-Through.

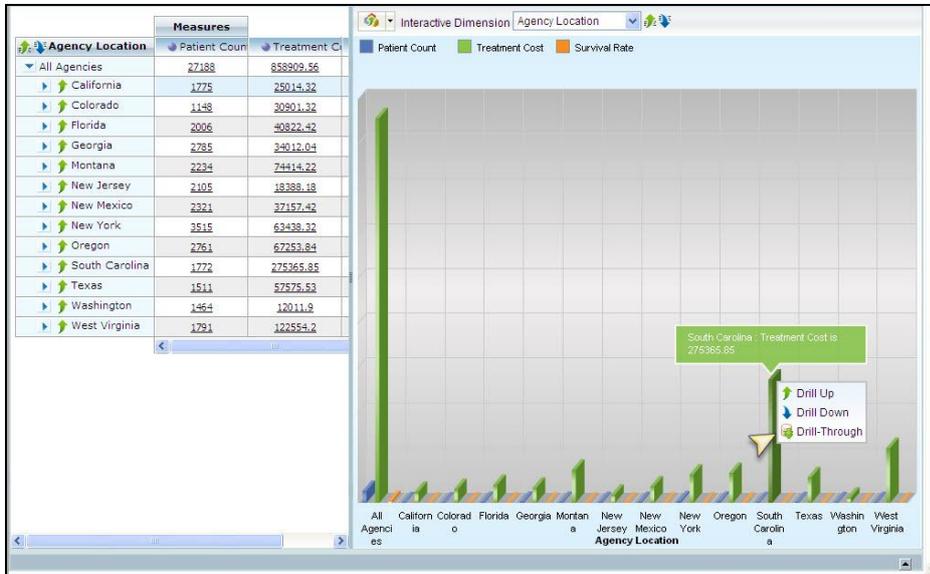


Figure 9: Chart shows Drill-through

Click Drill-Through to view the details of the figures shown on the bar.

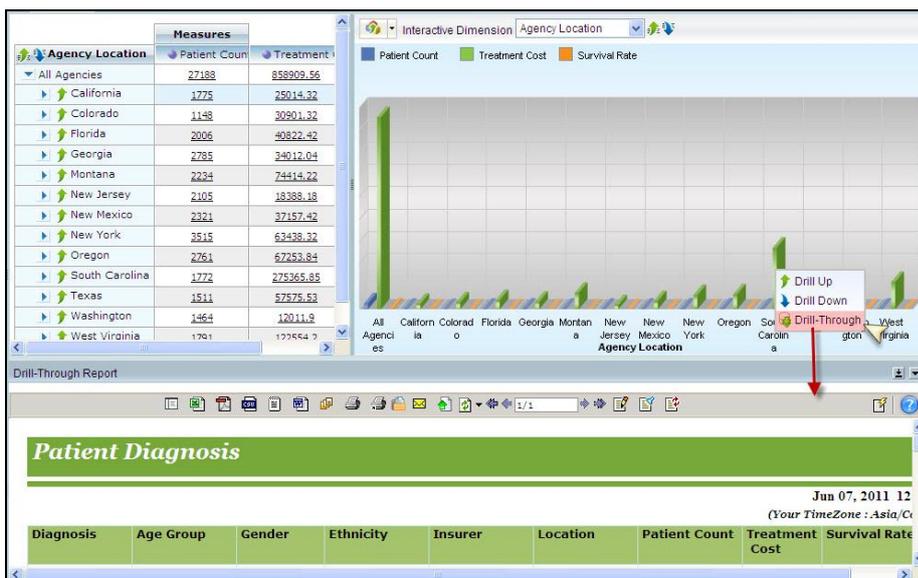


Figure 10: Click Drill-through in Chart

Thus, you have a drill through OLAP report.

Data Restriction in OLAP Reports

A data administrator can restrict the users from viewing data of other users. The data here is the values of a dimension, which can be different for users. This can be achieved by Data Restriction in Intellicus.

NOTE: The data administrator can apply data restriction on a user or an organization.

Steps to apply data restriction

1. A parameter is created and 'Forced' is checked while creating parameter.
 - a. Give a unique name to the Parameter.
 - b. Select Combo from 'Input Type'
 - c. Select 'Pre Defined' from Combo Source.
 - d. Mention the Display Name and Value in Pre Defined List.
 - e. Save the parameter.

The screenshot shows the 'Parameter' configuration window in Intellicus. The 'Name' field is 'prmStates'. The 'Data Type' is 'CHAR' with a size of 3000. The 'Input Type' is 'Combo'. The 'Combo Source' is 'Pre Defined'. The 'Pre Defined List' shows a table with 'Display Name' and 'Value' columns, both containing 'Oregon'. The 'Forced' checkbox is checked. Other options like 'Mandatory', 'Visible', 'Restrict to List', 'Pass Values Using Tables', 'Enable', and 'Restrict to List' are also checked.

Figure 11: Creating a Forced Parameter and Combo Source as Pre Defined

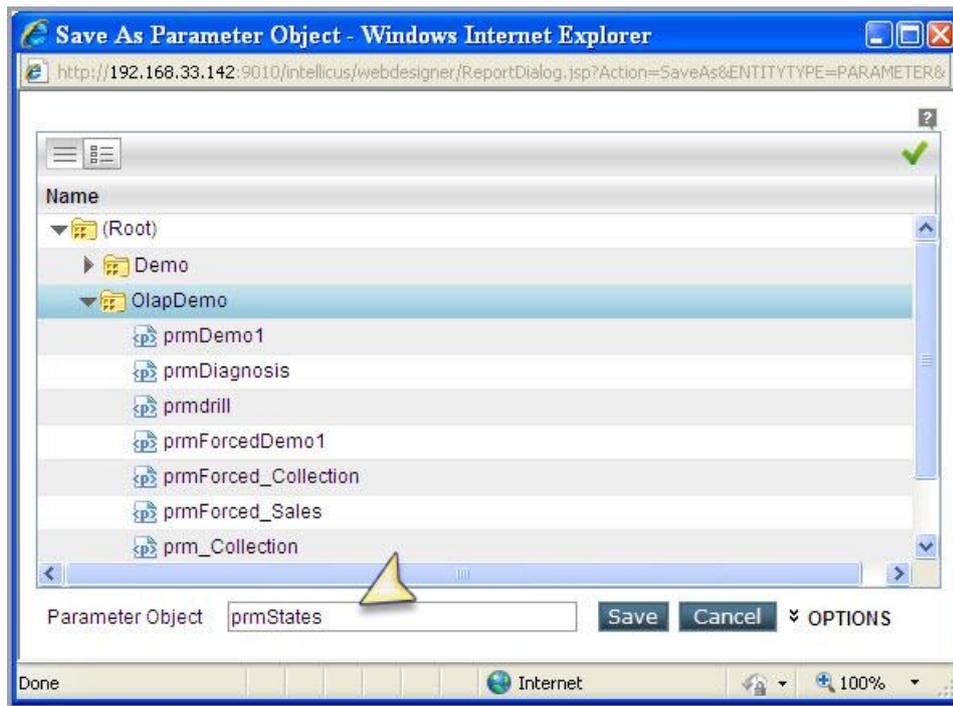


Figure 12: Saving the Parameter Object

2. Go to Administration > Manage Users > User/Role
 - a. Select a User (e.g. Admin)
 - b. Click Data Restriction
 - c. In the new window that is displayed, select the forced parameter you created.
 - d. Specify the value that Admin wants users to have rights on.
 - e. Click 'Save' to save the changes and close the Admin-Data Restriction window.

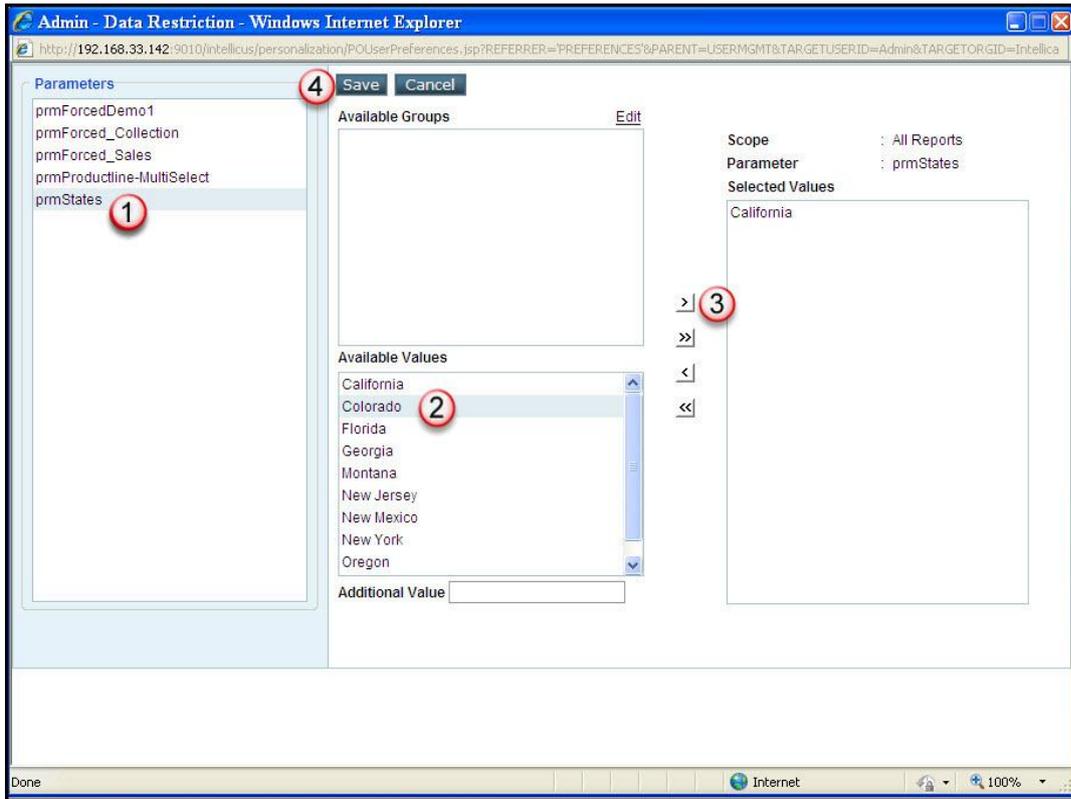


Figure 13: Data Restriction

3. Link Parameter Object with the Dimension name.

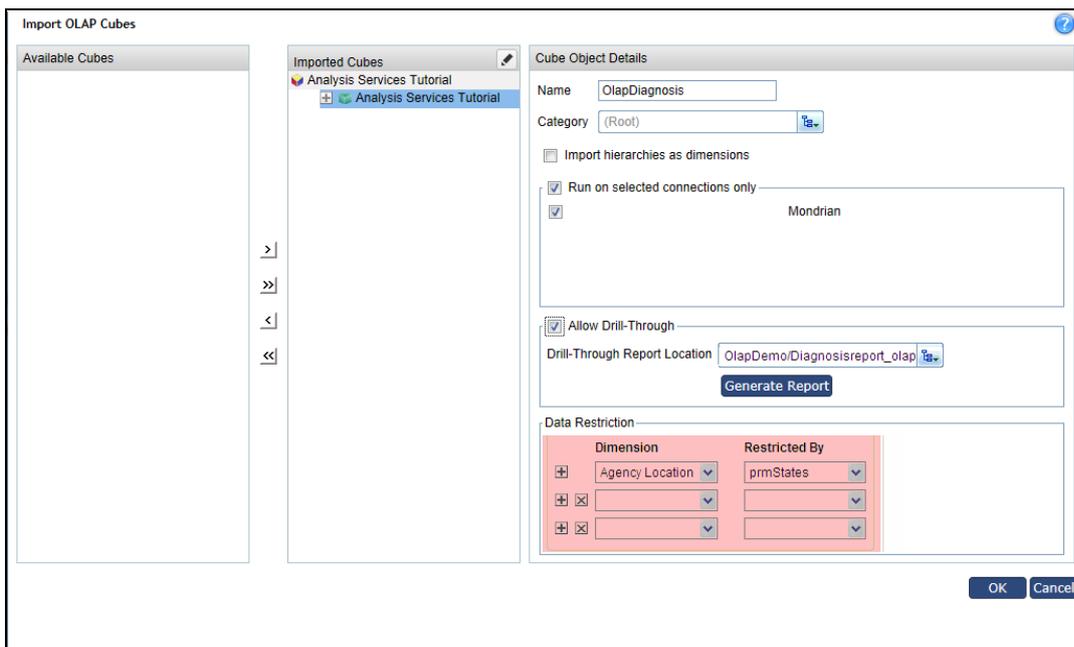


Figure 14: Link Parameter Object with Dimension Value

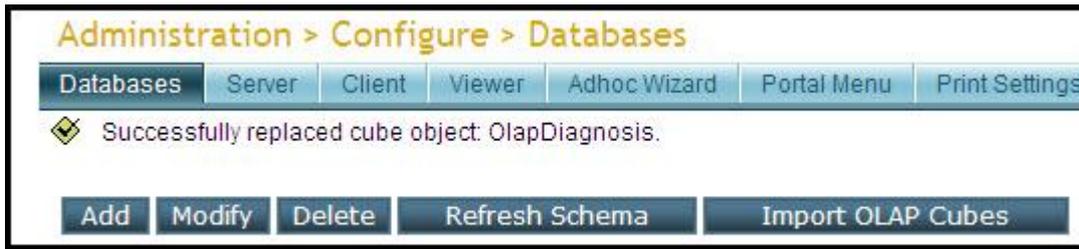


Figure 15: Saved the link

Create OLAP report. It shall show the data of values restricted for a **user**.

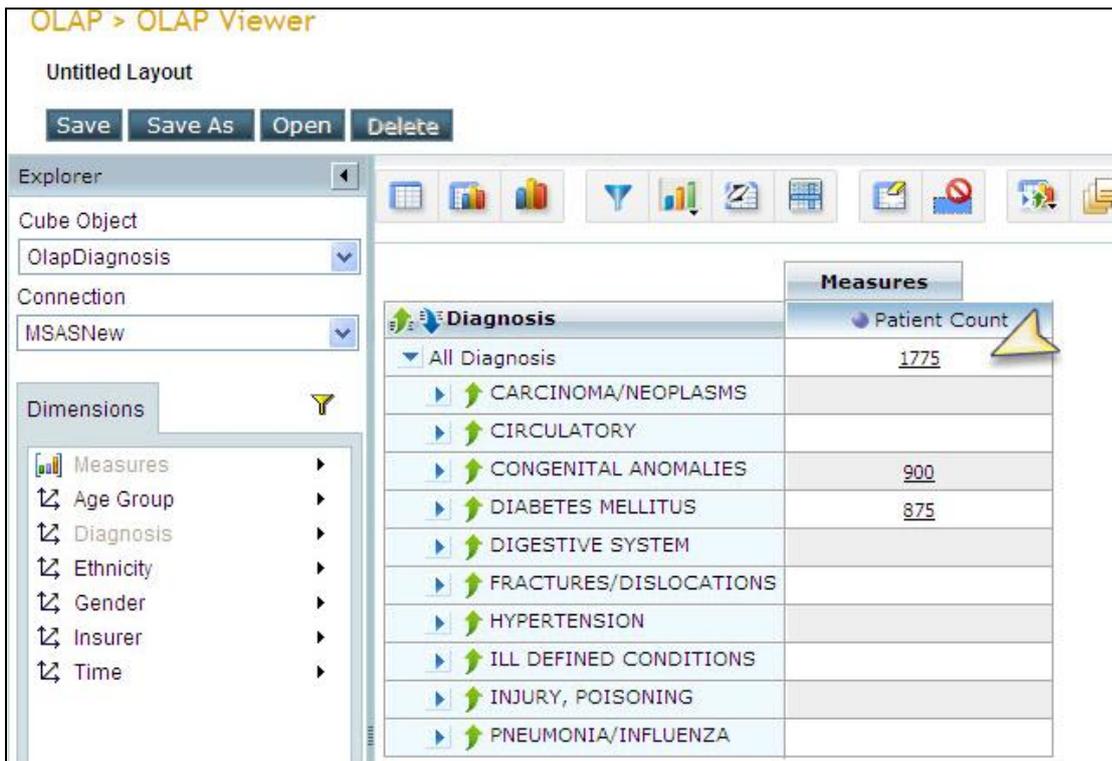


Figure 16: Administration login

NOTE: Restricted dimension will not be visible in the dimensions list on Olap Viewer.

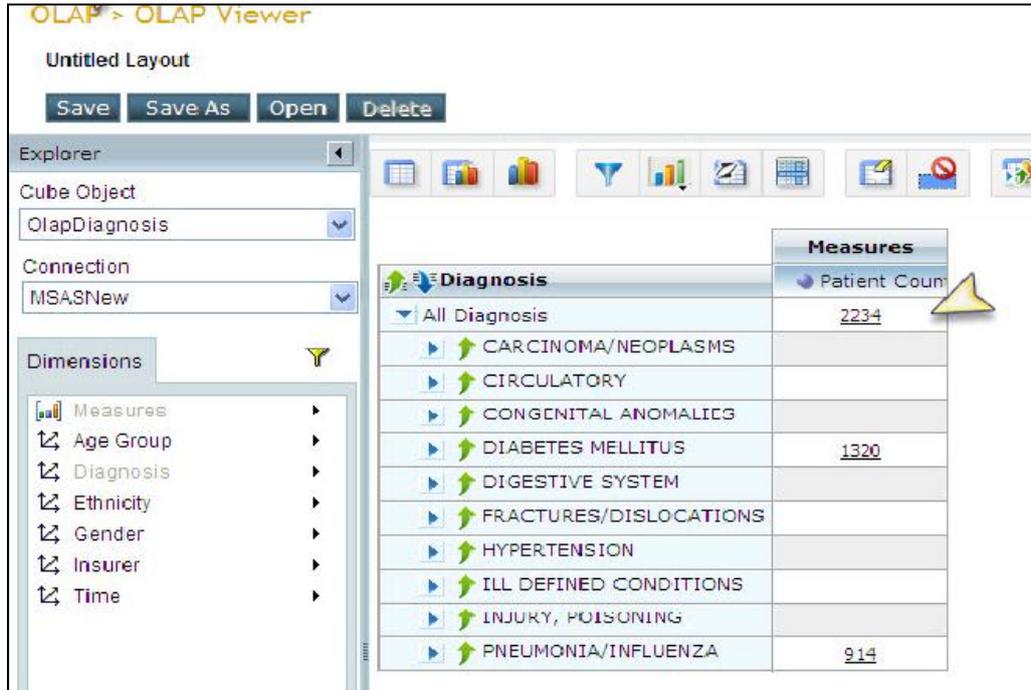


Figure 17: User Login

OLAP Report without Data restriction:

Agency Location	Measures		
	Patient Count	Treatment Cost	Survival Rate
All Agencies	27188	858909.56	4723
California	1775	25014.32	384
Colorado	1148	30901.32	380
Florida	2006	40822.42	375
Georgia	2785	34012.04	350
Montana	2234	74414.22	364
New Jersey	2105	18388.18	372
New Mexico	2321	37157.42	376
New York	3515	63438.32	538
Oregon	2761	67253.84	384
South Carolina	1772	275365.85	262
Texas	1511	57575.53	285
Washington	1464	12011.9	293
West Virginia	1791	122554.2	360

Figure 18: OLAP report with values of all States

Create OLAP report.
It shall show the data of values restricted for an **Organization**.

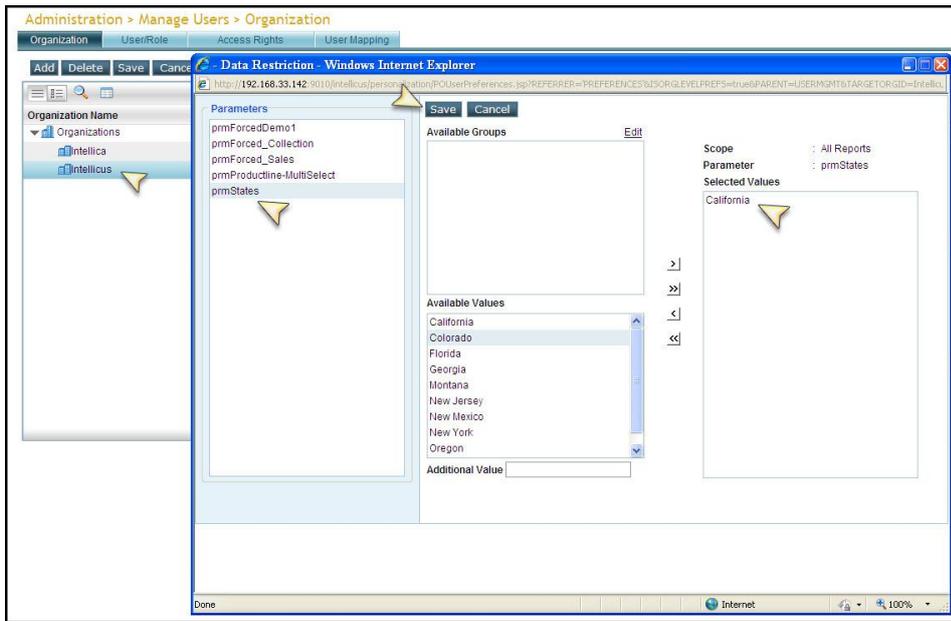


Figure 19: Data Restriction on Organization

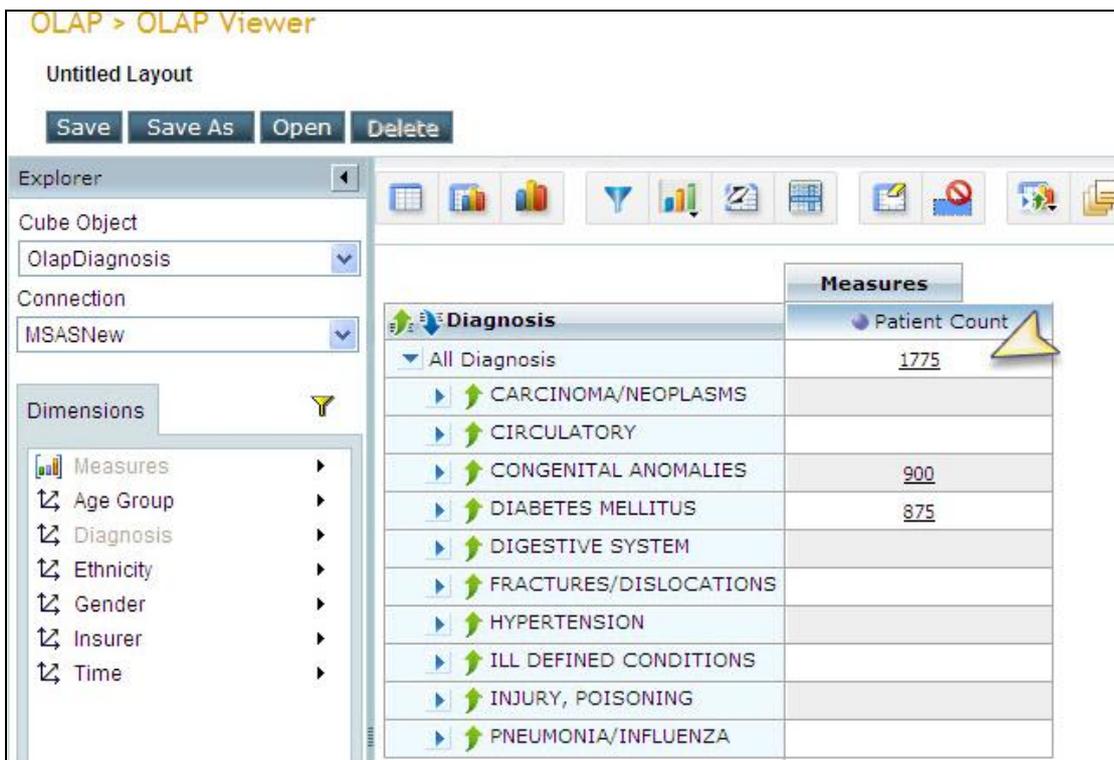


Figure 20: Organization as Intellicus