**PivotTable and Cube Dimension Reporting**

**....a neat trick!**

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**FavIcon**

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**The following is a discussion of the two methods demonstrated in the accompanying Excel file.**

I recently updated some documentation to a neat trick I figured out some time ago……wanted to e if it still worked with Excel 2007 and 2010. I first had to figure out how to install and process the Adventure Works 2008 DW cube (Unified Dimensional Model, UDM) using SQL Server Analysis Services 2008.

An employer built several cubes and hadn’t thought about the reporting aspects related to security or exposure of the data. One of the cubes had expenses for all cost centers. The issue was that certain cost centers were t up specifically for executive salaries. If you knew the cost center and selected it from the Report Filter or PageBy field in the PivotTable you could ascertain how much that executive’s compensation was.

The dilemma was how to limit exposure to such sensitive data without incurring any additional development costs to modify or alter the cube!

Overview:

The Report Filter for a Free-form PivotTable (converted to formulas) can be changed to a Data Validation list that is a list of equations that include all or only a select number of members of a dimension in a cube.

The following is a discussion of two solutions using Excel. The data I am using is from Adventure Works cube downloaded from CodePlex.com. The equations will show #ref if you do not have Adventure Works cube (not the Adventure Works database) installed and cannot change the Connection to point to your copy of Adventure Works.

**Adventure Works – old**

The following equation is from a PivotTable converted to formulas:

=CUBEVALUE("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works",$B$5,$A$7,$A9,B$8)

Cell B5 is the Report Filter. I tried using =if(), =iif(), and hard coding values in the formulas but nothing would work. I eventually figured out that using =indirect() produced a workable equation.

=CUBEVALUE("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works",INDIRECT(SUBSTITUTE($B$5," ","")),$A$7,$A10,B$8)

Because a Named Range can’t have spaces and some countries, such as United States, have space in name, the =indirect() equation is used in conjunction with =substitute() to remove the space.

Every converted cell’s equation was modified as shown above….with the exception of the Report Filter equation in cell B5.

I deleted the formula in cell B5 and added a data validation list that listed countries:

All Countries

Australia

Canada

France

Germany

United Kingdom

United States

When user selected country from data validation list, there was a named range with the appropriate equation for each lection made:

Named Range, Equation

All Countries, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[All Geographies]")

Australia, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Australia]")

Canada, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Canada]")

France, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[France]")

Germany, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Germany]")

United Kingdom, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[United Kingdom]")

United States, =CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[United States]")

The problem with this solution is that every equation converted for the PivotTable must be changed.

To reduce the effort I came up the second solution.

**Adventure Works – new**

This is much simpler and does not require every equation be modified. You only need to change the Report Filter to the Data Validation list that points to cells containing equations:

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[All Geographies]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Australia]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Canada]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[France]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[Germany]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[United Kingdom]")

=CUBEMEMBER("XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works","[Geography].[Geography].[Country].&[United States]")

Each of the above equations will evaluate to a value that is displayed and used in the Data Validation list. No Named Ranges are necessary for each specific Country! I only u a Named Range for the Data Validation list.

Getting back to the original dilemma of limiting access to sensitive data. Using the above data, suppose you didn’t want the North America Sales Team to e sales in Europe or vice versa? All you need to do is remove the necessary equations from the Data Validation list for the file distributed or made available to the North America Sales Team.

**Adventure Works Download**

The Adventure Works file I downloaded and installed is available at:

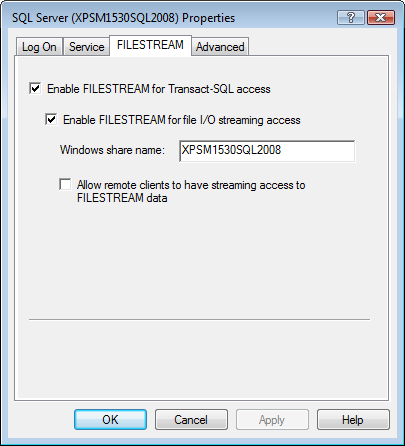
[http://msftdbprodsamples.codeplex.com/releas/view/37109](http://msftdbprodsamples.codeplex.com/releases/view/37109)

It contains both databases and cubes.

**Installing, Deploying and Processing the Cube**

To install the files needed to deploy and process the Adventure Works 2008 DW cube, download the above file (AdventureWorks2008\_SR4.exe) and go through the install process for it. Then follow directions I have outlined below.

Address all issues mentioned at startup of the install process for the above file.  A simpler way to address one issue mentioned:  if FILESTREAM was not enabled during the install process for your instance of SQL Server (nobody ever told me it’s importance), start SQL Server Configuration Manager mentioned below, click on “SQL Server Services”, right-click on SQL Server (your SQL instance), choose Properties, click on both checkboxes (or all) associated with FILESTREAM as shown below:



Make sure using “SQL Server Configuration Manager" that TCP/IP and Named Pipes are “Enabled”.

I also restarted the SQL Server service by right-clicking on SQL Server (your instance name) and choosing Restart but that did not work.  I rebooted and that did work.

The Adventure Works database should be installed and appear in SQL Server Management Studio. If not, find the database files and attach them. What I did not like about the install process for the above file is that the databases did not install to the default location I specified for databases when installing my “Instance” of SQL Server.

Open project in SQL Server Business Intelligence Development Studio:

"C:\Program Files\Microsoft SQL Server\100\Tools\Samples\AdventureWorks 2008 Analysis Services Project\enterprise\Adventure Works.sln"

(your install path may be different)

To “Deploy” the project and create the Cube:

1. In BIDS right-click on the above project, select Properties, click on Deployment, change localhost to computer\sqlinstance (e.g. XPSM1530\XPSM1530SQL2008).
2. Double-click on "Data Sources" and change Connection String's Data Source from localhost to computer\sqlinstance (e.g. XPSM1530\XPSM1530SQL2008).

Right-click on project, click on Deploy.

When opening SQL Server Management Studio, change default of "Database Engine" to "Analysis Services".

To “Process” the Cube:

1. Right-click on "Adventure Works DW 2008" Database,
2. Click on Process,
3. Click on "Change settings" button on lower right,
4. At the bottom of the "Change settings" window, click on the checkbox "Process affected objects",
5. Click OK, click OK.....this process takes awhile.

Be sure to have plenty of RAM and your PageFile.sys (temporary RAM; hard disk RAM; RAM overflow) large enough because it will not automatically resize the PageFile.sys to accommodate system needs in Windows XP or Windows Vista (did not try using Windows 7), you will just get an error message indicating you are out of memory and the processing will cease.  Increase the PageFile.sys, reboot and start the processing all over again.  I t my PageFile.sys to 8GB on my laptop with 4GB of RAM.

**Customizations**

For each PivotTable in the Excel file, you will have to “Change the Data Source”. My Data Source, XPSM1530\_XPSM1530SQL2008 Adventure Works DW 2008 Adventure Works, as shown in equations above will need to be changed.

In addition to changing it for each of the PivotTables, you will need to search and replace the Data Source in the equations on the “free form” PivotTables (those converted to equations) and the equations used for Data Validation on the macros tab.