Connecting to SAP NetWeaver BI with Microsoft Excel 2007 PivotTables and ODBO

Applies to:

ODBO, MDX Query Language, Microsoft Excel, Microsoft Excel 2007, PivotTables for connecting to SAP NetWeaver BI. For more information, visit the Business Intelligence homepage.

Summary

Microsoft Excel is considered by many to be the most commonly used BI tool in the world. Excel PivotTables are a practical way to access and analyze SAP NetWeaver BI data. Connecting PivotTables to a SAP NetWeaver BI data source is relatively straightforward, if you know a few important items that we will outline here. This paper includes a step-by-step description of the process that will get you connected to your data. Note that all steps presented here are for Excel 2007 connecting to SAP NetWeaver BI 7.0 with SPS 14.

Author: Amyn Rajan, George Chow, Darryl Eckstein and Michael Roop

Company: Simba Technologies Inc.

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Author Bio

Amyn Rajan is President and CEO of Simba Technologies. Amyn has over 17 years experience in custom software development, and is responsible for driving Simba's success as a leader in data connectivity solutions.

George Chow is a Development Manager with Simba Technologies. George has over 16 years experience in software and technology, and is a specialist in SAP NetWeaver BI, database access and data connectivity solutions.

Darryl Eckstein is a Senior Computer Scientist with Simba Technologies. Darryl has over 9 years experience in software development, and is a specialist in SAP NetWeaver BI and OLAP data access.

Michael Roop is a Senior Computer Scientist with Simba Technologies. Michael has over 24 years experience in software development, and is a specialist in SAP NetWeaver BI and OLAP data access.

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Connecting to SAP NetWeaver BI with Microsoft Excel 2007 PivotTables and ODBO

Microsoft Excel is considered by many to be the most commonly used BI tool in the world. Excel PivotTables are a practical way to access and analyze SAP NetWeaver BI data. Excel is ubiquitous and well understood, and PivotTables are an excellent way to explore the world of SAP NetWeaver BI data. However, the first hurdle you face as a new user is connecting to your SAP NetWeaver BI data source. Connecting PivotTables to a SAP NetWeaver BI data source is relatively straightforward, if you know a few important items that we will outline here. What follows is a step-by-step description of the process that will get you connected to your data. Note that all steps presented here are for Excel 2007 connecting to SAP NetWeaver BI 7.0 with SPS 14 along with SAP GUI 7.10 Compilation 2.

Creating a Connection

Connecting to SAP NetWeaver BI and populating an Excel PivotTable is a three-step process. First, you must specify or create a data source connection. Second, you decide what you want to create with the connection. And third, you use this data source to populate a PivotTable or PivotChart report. It all begins with the *Data Connection Wizard*.
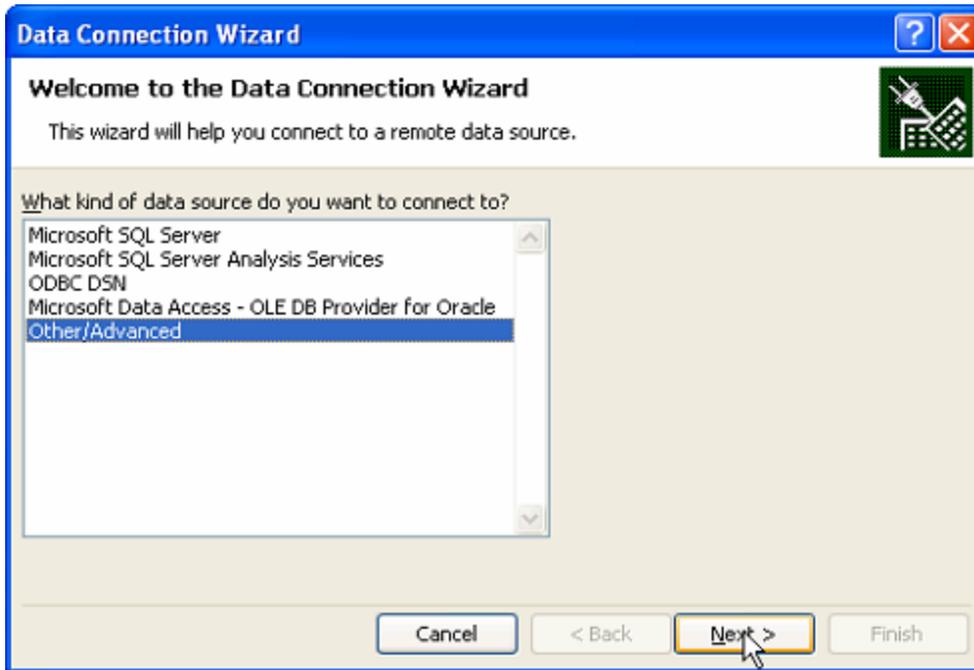
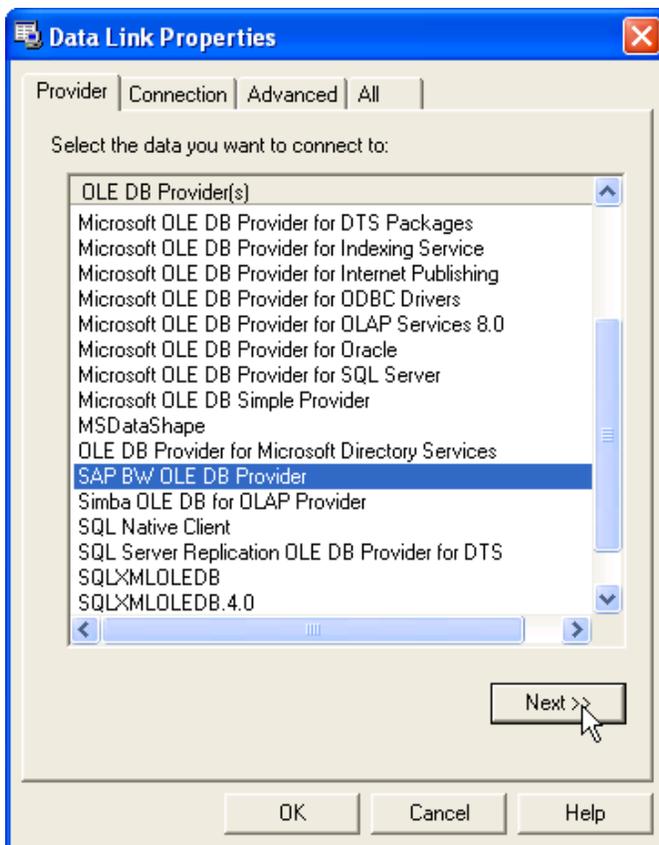To start the *Data Connection Wizard*, select the *Data* tab.
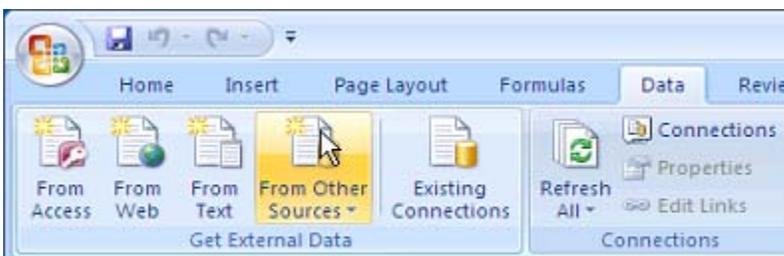
Click on *From Other Sources* on the ribbon and a drop down list will appear.
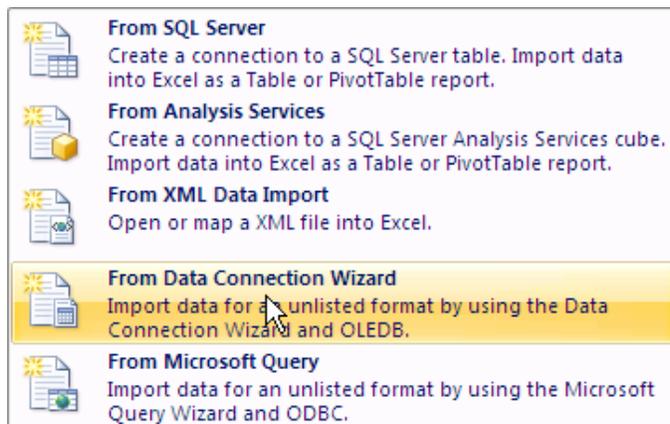

Select *From Data Connection Wizard* and the *Data Connection Wizard* dialog with the *Welcome to the Data Connection Wizard* banner will appear.

Select *Other/Advanced* and then click on *Next*. The *Data Link Properties* dialog will appear.


The *Provider* tab will be selected automatically. Scroll down the *OLE DB Provider(s)* list, select *SAP BW OLE DB Provider* and click on *Next*, or on the *Connection* tab. You will then be able to define your connection parameters.
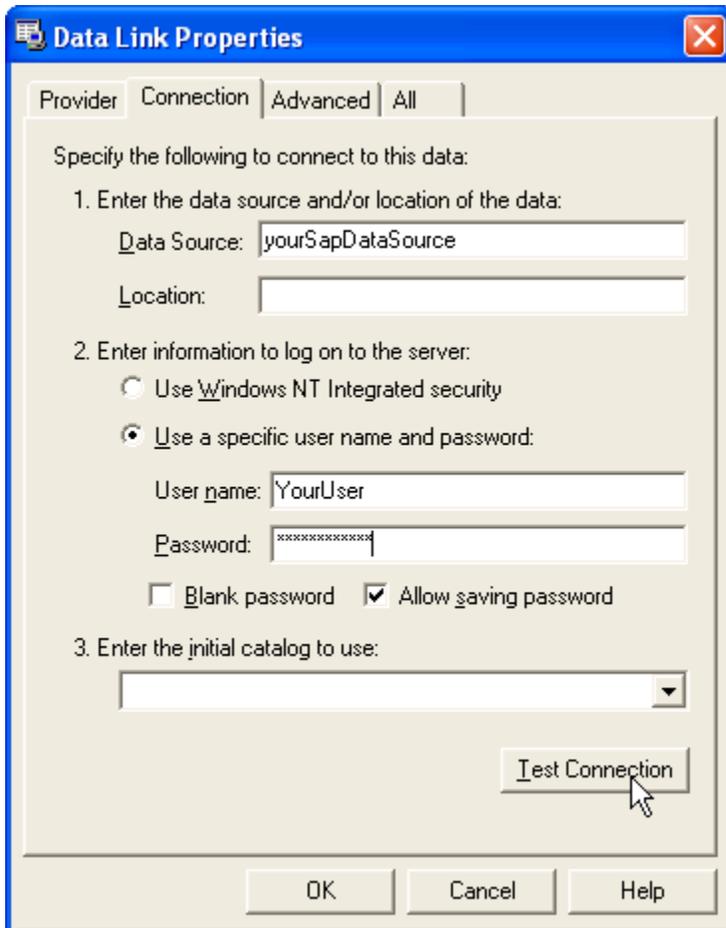
Fill in the following connection information:

- In the *Data Source* box enter the data source name. This would be the "Description" field for the particular connection entry from SAPLogon.

- In the *User Name* box enter the user name.

- Make sure the *Blank password* check box is NOT checked and then enter the password in the *Password* box.

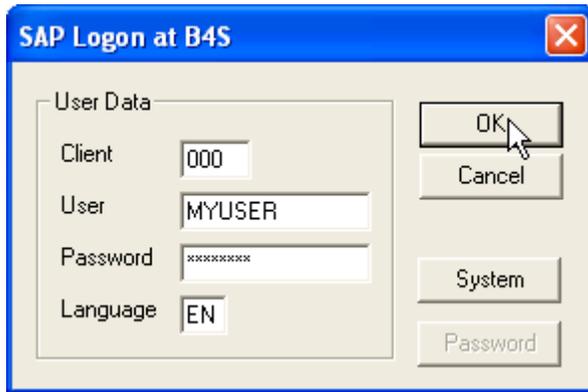- Make sure that the *Allow saving password* check box is checked.

Click on the *All* tab. A list of connection properties will appear. Here you can enter the client and, if required, override the default language to use for the connection in the *Extended Properties* field.
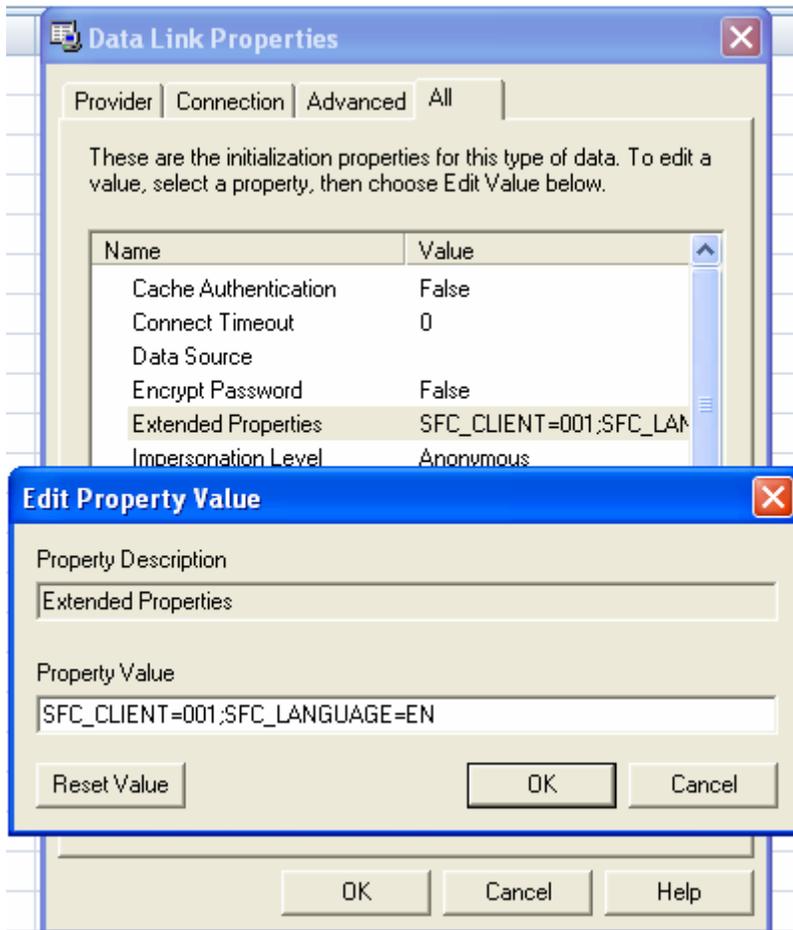
After you have entered the client information click on the *Connection* tab. At the bottom, click on the *Test Connection* button to test the connection. A dialog will appear to tell you if your connection is successful.

If the *SAP Logon* dialog appears, then the credentials or server information that was entered may be incorrect. Make sure the credentials are correct and click on *OK* to continue.
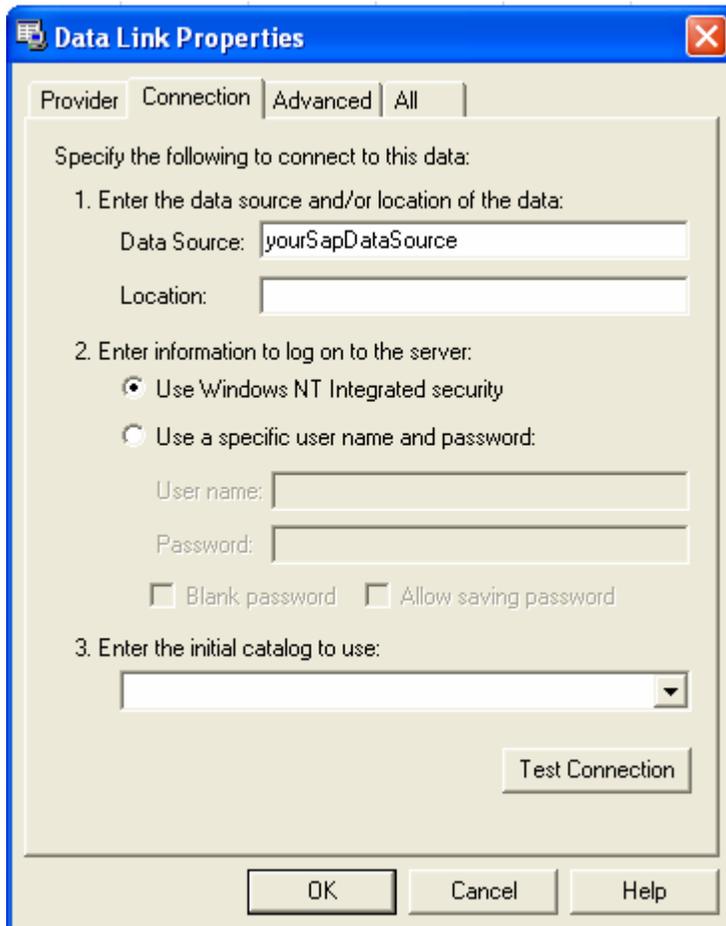
Click on *OK* to continue. You will be returned to the *Data Link Properties* dialog.

Connecting via SNC and Integrated Security

If you have installed BI AddOn Patch for SAPGUI 7.10 601 or higher, then you can use SNC to connect to your NetWeaver system. The SAP NetWeaver BI system you want to connect to first needs to be configured and connect using SNC from SAP GUI.

In the *Data Link Properties* dialog you can either leave the *User name* and *Password* fields blank, or select *Use Windows NT Integrated security*.

Click on the *All* tab. As before, here you can enter the client and the SNC connection information to use for the connection in the *Extended Properties* field.
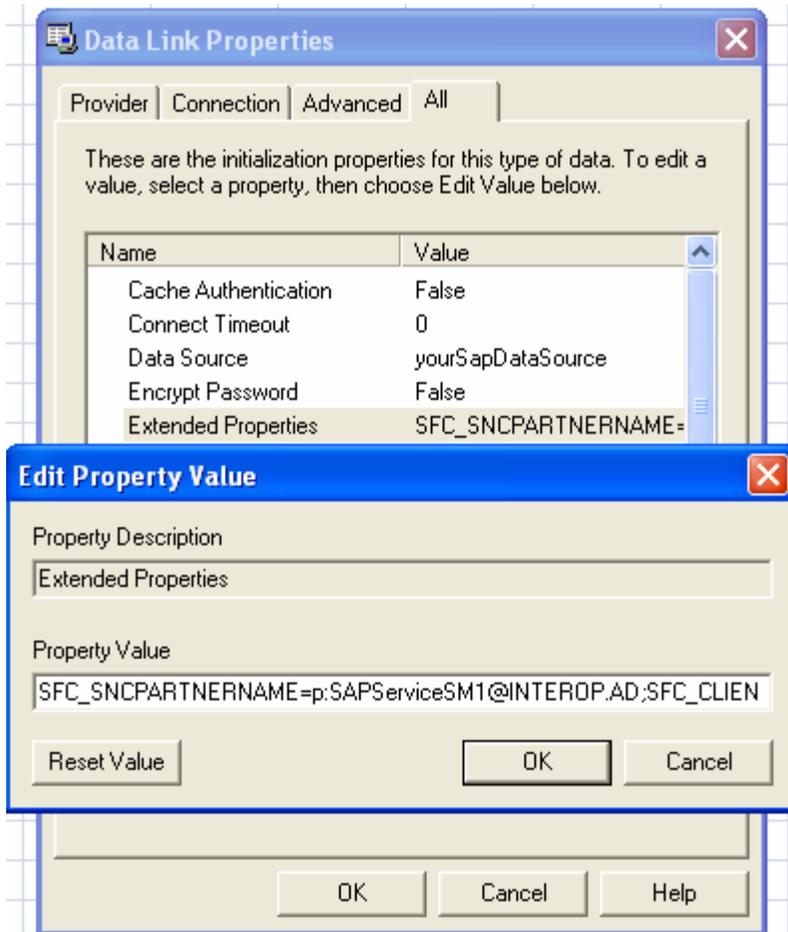
Enter your client information as shown previously, plus add a new value for *SFC_SNCPARTNERNAME*. Entries are separated by a semi-colon (;). In the example above, the *Extended Properties* value is:

```
SFC_SNCPARTNERNAME=p:SAPServiceSM1@INTEROP.AD;SFC_CLIENT=001;SFC_LANGUAGE=EN
```

The *SFC_SNCPARTNERNAME* value is the entry in the SNC Name text box from the SAP Logon entry for your data source.
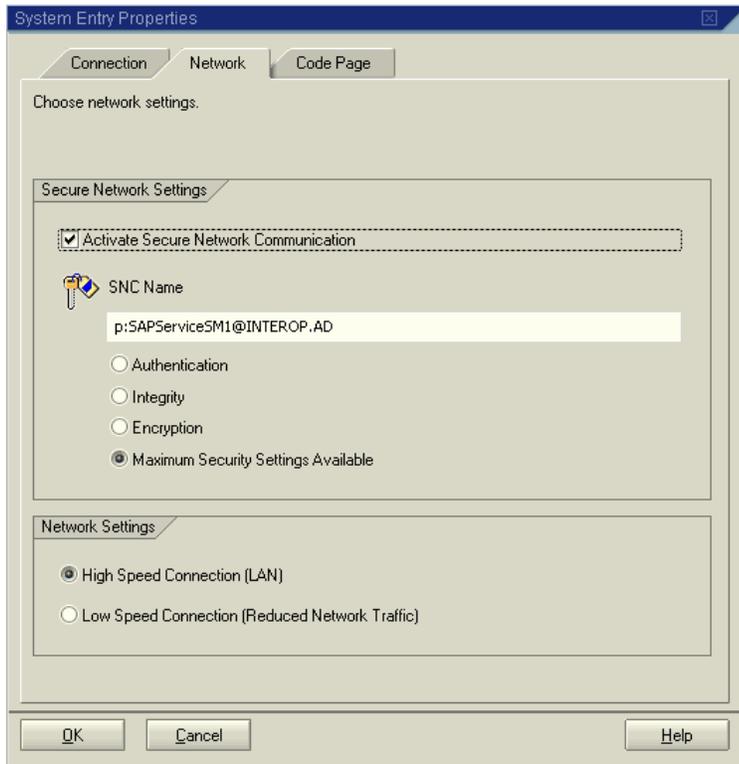
Also note that if your system does not have the *SNC_LIB* environment variable set then you must set it first before using SNC, or specify a value for it in the *Extended Properties* by adding a *SFC_SNCLIB* entry. The value is the path and filename to the SNC library.

After you have entered the SNC information, click on the *Connection* tab. At the bottom, click on the *Test Connection* button to test the connection. A dialog will appear to tell you if your connection is successful.

Cube Selection

After you finish setting up the connection and click *OK* in the *Data Link Properties* dialog, the *SAP Logon* dialog may appear again so that you can log on to the system. The *Data Connection Wizard* dialog appears again – this time with the *Select Database and Table* banner.
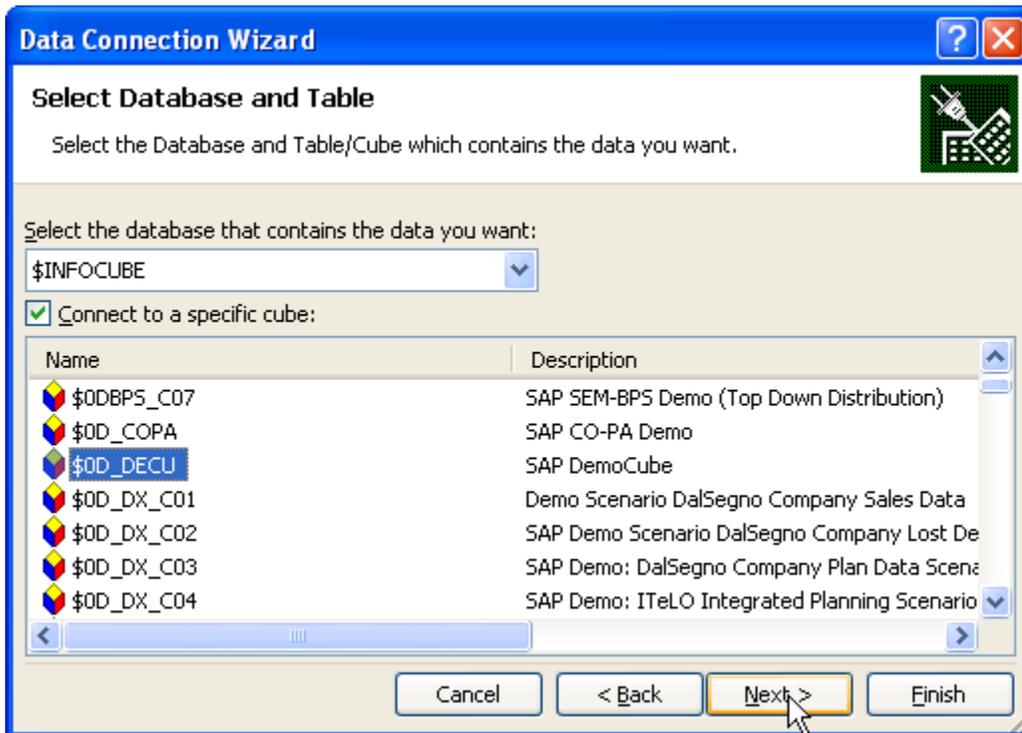
Select the cube you wish to use and then click on *Next >*. The *Data Connection Wizard* will appear with the *Save Data Connection File and Finish* banner.

Enter a file name and a friendly name. The friendly name will show up in the Connections lists. You may
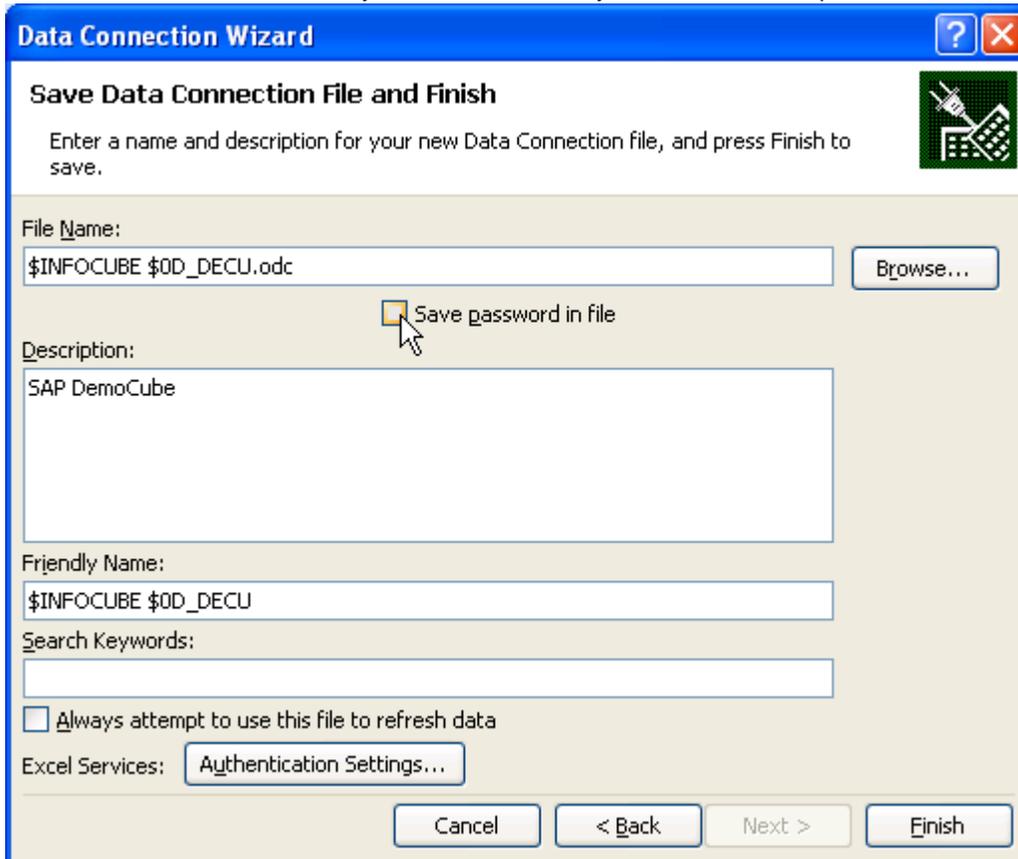
also want to save the password to a file. Otherwise, the logon dialog will appear as you exercise many of the functions of the Excel 2007 PivotTables. To save the password, click on the *Save password to file*

checkbox. Since the password will be saved in a non-encrypted form on the local machine, a warning dialog will appear.
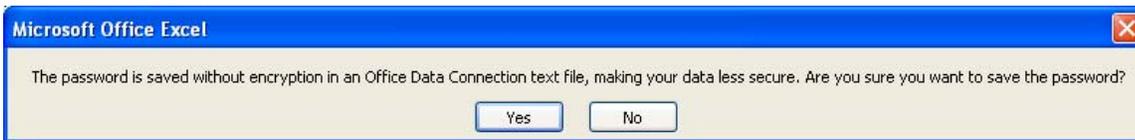
Click on *Yes* to save the password. Then, click on *Finish*. The *Import Data* dialog will appear.

Selecting a View of the Data
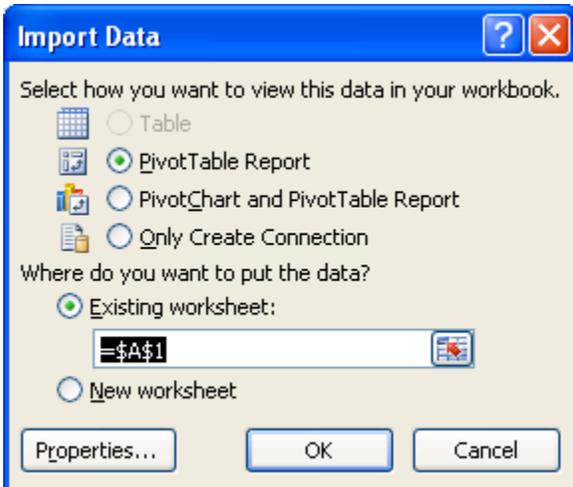
Now you can decide how to view the data. There are three options enabled. We will select *PivotTable Report*. You can select the layout and location options for your new PivotTable, or you can just click *OK* to accept the PivotTable layout defaults and to locate the PivotTable on the current worksheet.

At this point, a *Microsoft Office Excel* error dialog may appear. This is a bug in Excel 2007 and will hopefully be fixed by Microsoft in a future service pack. This error message is false; if you click *OK*, the process of creating the PivotTable will continue. If you want to know in detail why this error occurs and how to make it disappear, see the section *Initialization of the data source didn't really fail after all…* at the end of this document.
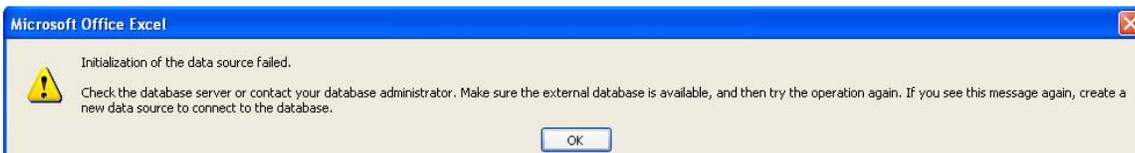
The data source has now been created and saved in an .ODC file. The next time you want to create a PivotTable from this data source, simply select the *Existing Connection* from the *Data* menu tab and select the data source from *Existing Connections* dialog. You will not have to repeat the steps above to reuse an existing data source. You can also select the older OQY connection files created by Microsoft Query under previous versions of Excel.

Populating the PivotTable

If you did not save the password, the *SAP Logon* dialog will prompt you for your SAP credentials one last time. When you enter them and click *OK*, the PivotTable appears.
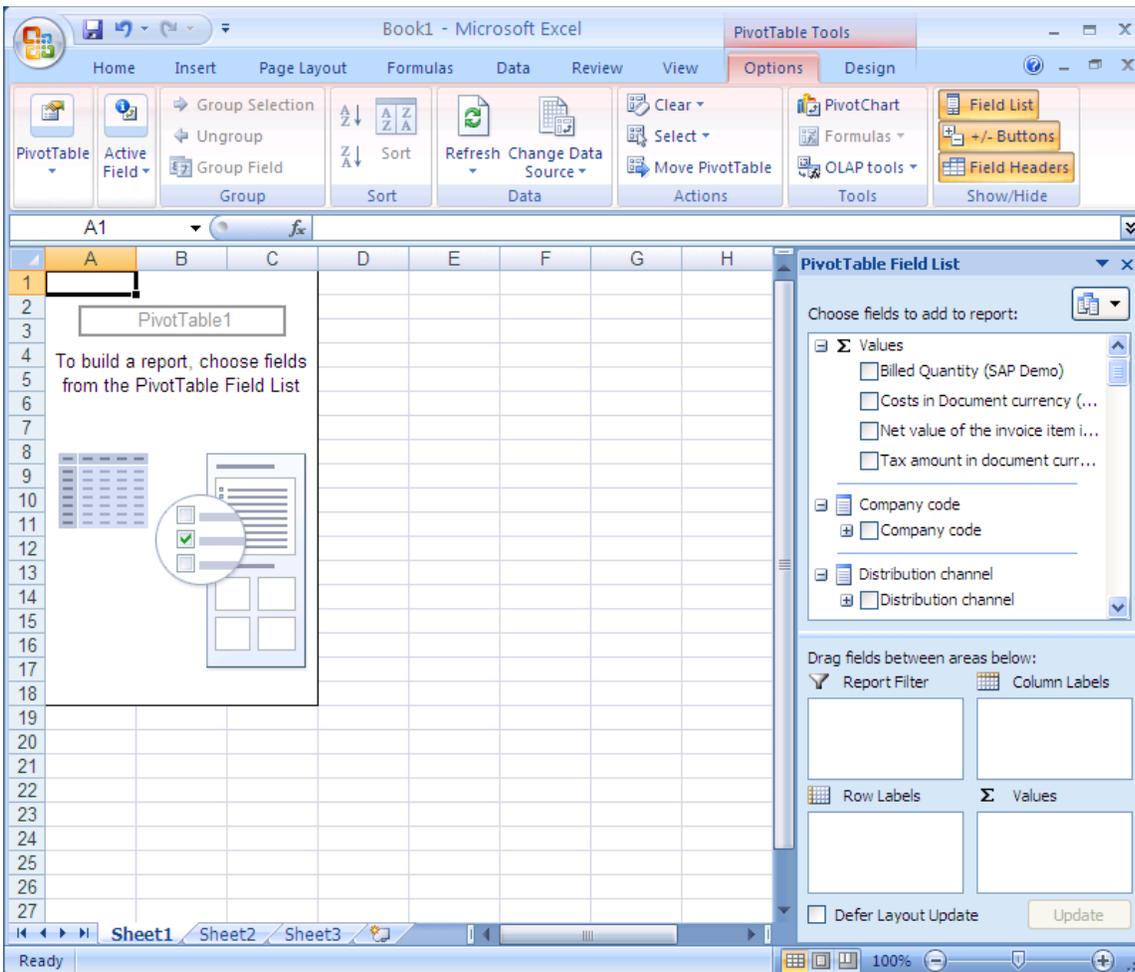
The new PivotTable looks virtually identical to any other PivotTable, except that you can see the characteristics and figures from your chosen cube in the *PivotTable Field List*. The figures come first, grouped under *Σ Values*. If you scroll down, you will see the characteristics.
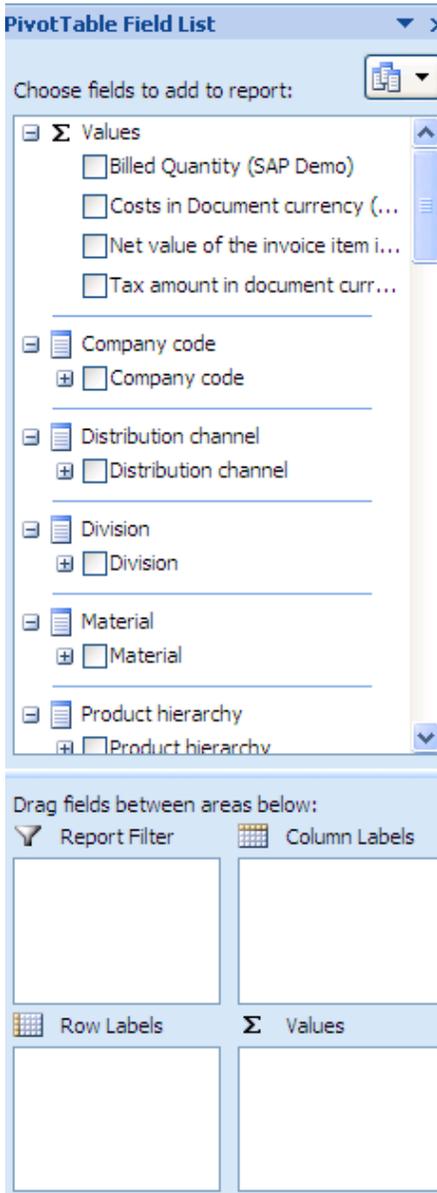
You can drag and drop characteristics and key figures from the *PivotTable Field List* onto the boxes below to have them show up as Column, or Row labels, filters or values. If you just click on them, Values will go to *Values*, characteristics to *Row Labels*, and time characteristics to *Column Labels* by default. Your data will be inserted into the PivotTable directly from your SAP NetWeaver BI server over a live connection.

Row Labels	Q1 2003	Q2 2003	Q3 2003	Q4 2003	Q1 2004	Q2 2004	Q3 2004	Q4 2004	Not assigned	Grand Total *
1		0	0	0	491	70	50	320	0	931
10	881	752	901	1219	478	781	492	731	0	6235
12	113	148	171	277	831	664	1000	742	0	3946
14	140	134	114	50	0	0	0	25	0	463
Not assigned	0	0	0	0	0	0	0	0	0	0
Grand Total *	1134	1034	1186	1546	1800	1515	1542	1818	0	11575
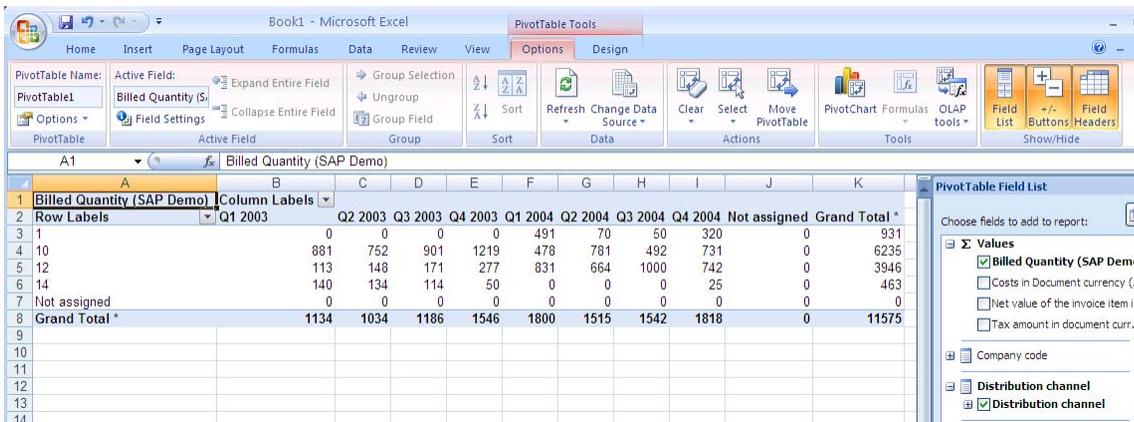
From here, you can begin to explore the world of your SAP NetWeaver BI data. This is a huge topic and can't be covered here, but now you have the tools to get started.

Initialization of the data source didn't really fail after all…

When attempting to connect to the SAP BW ODBO Provider from Excel 2007, if you are not using SNC, a false error message occurs just before the final logon prompt. This is caused by what can charitably be described as a misunderstanding between Excel and the SAP ODBO Provider.

The issue is that Excel attempts to perform a silent logon without providing a password, which of course will fail in the case of the SAP ODBO Provider. Perhaps not coincidentally, it actually works fine with the Microsoft Analysis Services ODBO Provider, because Analysis Services uses NT Integrated security by default. (Integrated security relies on the Windows logon credentials of the current user, which saves the user the hassle of having to type in yet another password.)

If you did not specify that the password was to be saved in the *Data Connection Wizard* dialog with the *Save Data Connection File and Finish* banner upon creation of the connection, you can still add it later.

You first have to get to your connection. If the connection is already open, you can click on the *Data* menu tab.
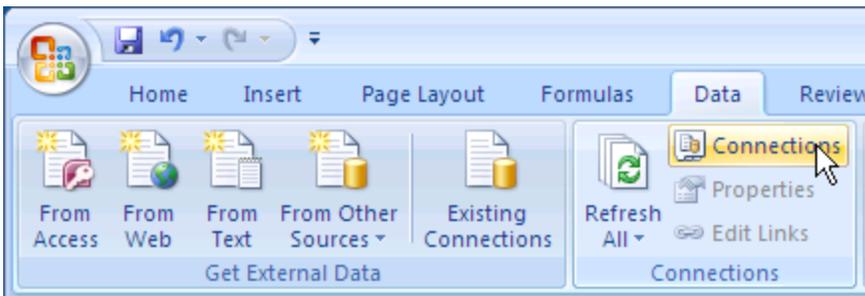
Click on the *Connections* within the *Connections* grouping. The *Workbook Connections* dialog will appear.

If the connection is not active, you can get to the same dialog by clicking on the *Data* menu tab, then on the *Existing Connections* icon and selecting the connection. When the *Import Data* dialog appears, click on the *Properties*… button.
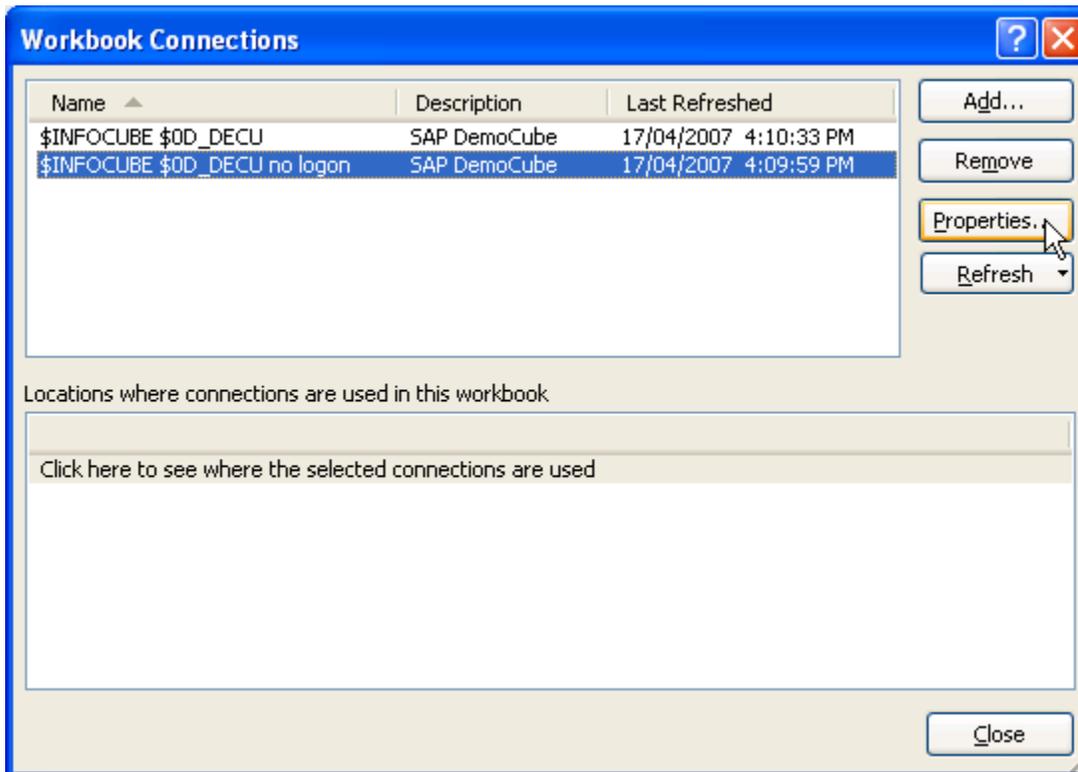
In the *Workbook Connections* dialog, select the connection you want to edit and click on *Properties*… The *Connection Properties* dialog will appear. Select the *Definition* tab.
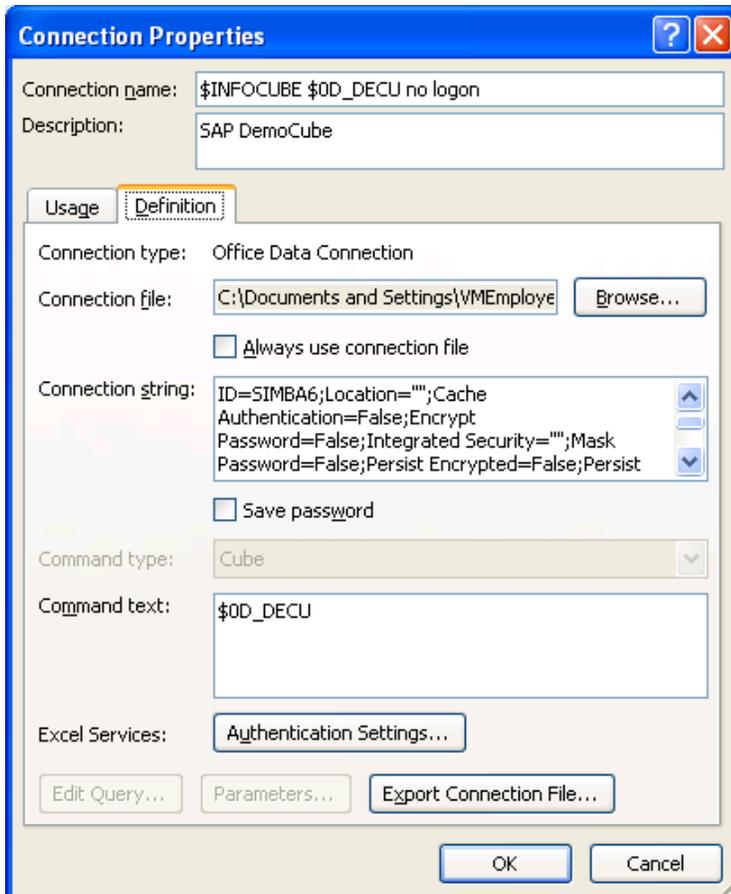
There are three steps required to add the password.

Select Save Password

Select the *Definition* tab and then click on the *Save Password* checkbox. A warning dialog will appear. It warns you that you will be saving the password information in a non-encrypted form on the local machine.

Click on *Yes* to continue.

Modify the Connection String

In the *Connection string* box, you will find the OLE DB connection string. When you clicked on the *Save Password* checkbox, a blank password string may have been inserted. Look through the text until you find *Password=""*. Type in your password between the double quotes.
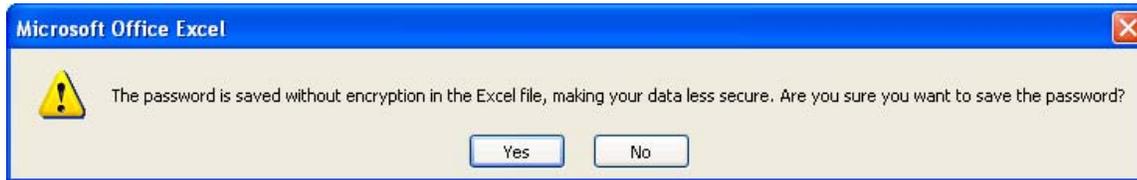
If the blank password was not inserted, you must carefully insert it yourself. You can add this between any of the existing items in the connection string, but it is probably easiest to add it as the first item. All items are separated with semi-colons ";".

As an example, your string might look like the following:

```
Password="YourPassword";Provider=MDrmSap.2;DataSource=YourSource…;etc..
```

Save the Changes

If you click on *OK*, you will get a *Microsoft Office Excel* warning dialog.
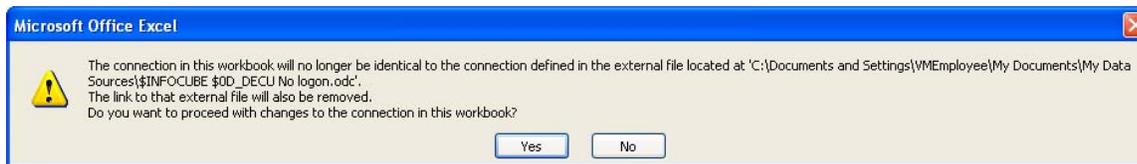
You can click on *Yes* to continue, but the new parameters may not be saved after all. The safest way to do this is to click on the *Export Connection File*… in the *Connection Properties* dialog. You will then be able to select a new name, or overwrite the existing connection file. Your PivotTable should now be able to open without requiring a logon.

The downside to this workaround is that it involves putting your SAP BW password, in plain text, in a file on your local hard drive. This is a security risk, so you should decide carefully whether avoiding the unnecessary error message is worth the risk.

Running Excel 2007 in Compatibility Mode

In order not to break PivotTables created with earlier versions of Excel, Microsoft has devised a scheme it calls *Compatibility Mode*. When opening workbooks created in earlier versions, Excel 2007 will revert to Excel 2003 behavior. Compatibility mode is indicated on the right side of the title bar by displaying *FileName.xls [Compatibility Mode] – Microsoft Excel*.
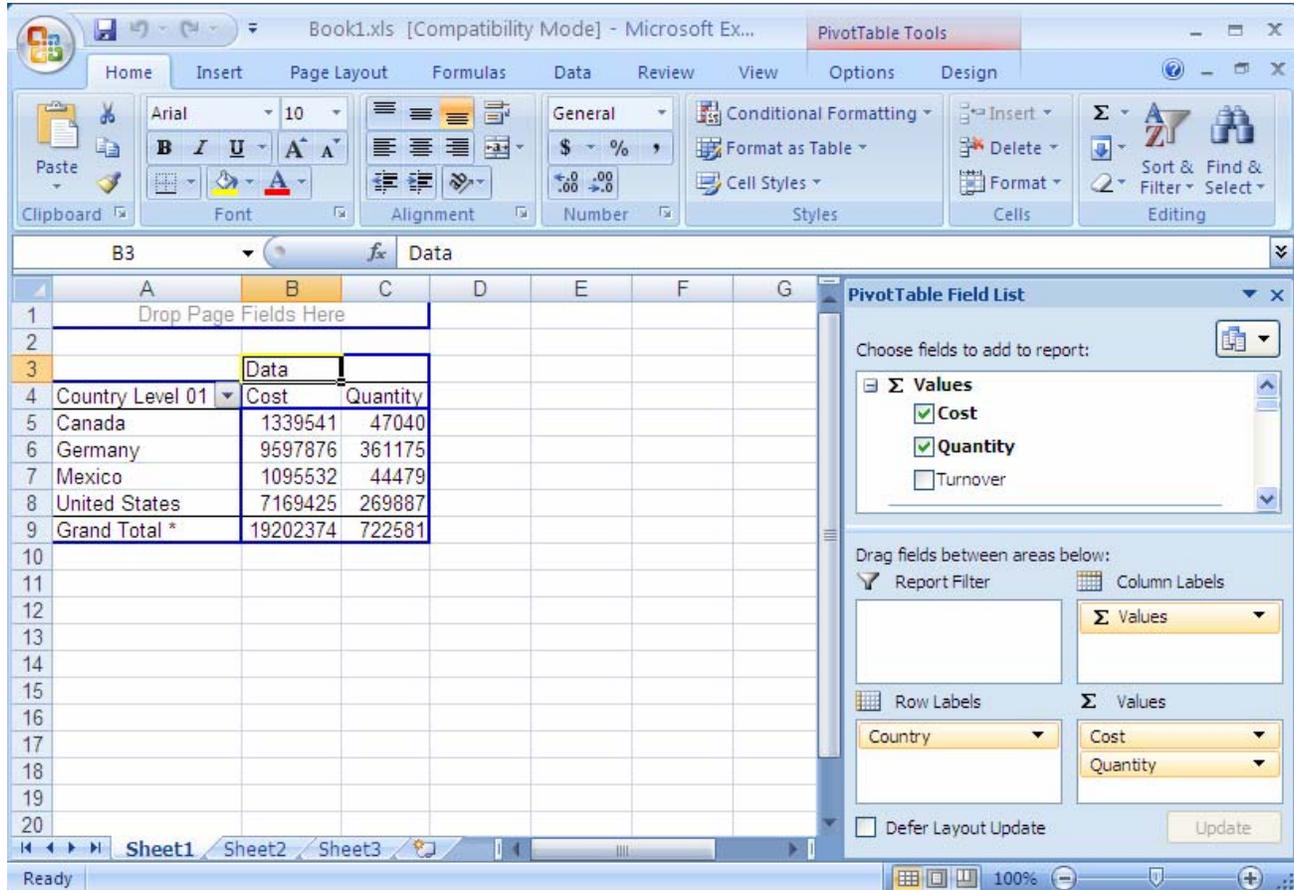
Connection String Parameters

The table below lists the connection string parameters that you can set when connecting via Microsoft Excel and the corresponding parameters to the RFC function RfcOpenEx. Refer to the RFC SDK help document for more information. All of the parameters that start with *SFC* need to be entered into the *Extended Properties* field under the *All* tab within the *Data Links* dialog. Multiple items can be specified by separating the items with semi-colons (;).

Connection String Item	RfcOpenEx Parameter	Description
Data Source	SAPLOGON_ID	The Description field for a SAP system defined with the SAP GUI Logon pad. This value is case sensitive.
		From SAP GUI:
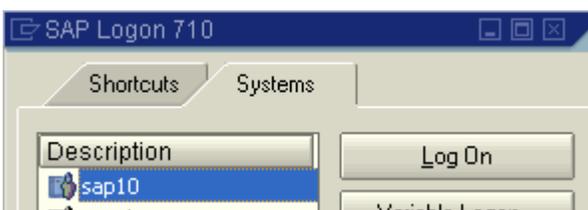
		Then in Microsoft Excel:
User ID	USER	SAP logon user
Password	PASSWD	SAP logon password
SFC_CLIENT	CLIENT	SAP logon client (3 digits)
SFC_LANGUAGE	LANG	SAP logon language (1-byte SAP language or 2-byte ISO language). Specify this value to override the user's default language.
SFC_SYS_NUMBER	SYSNR	SAP system number (2 digits)
SFC_HOSTNAME	ASHOST	Host name of a specific application server (No Load Balancing)
SFC_TICKET	MYSAPSSO2	SAP SSO Ticket
SFC_SNCPARTNERNAME	SNC_PARTNERNAME	SNC name of the message server. This is *SNC Name* value defined within SAP GUI Logon under the network tab.
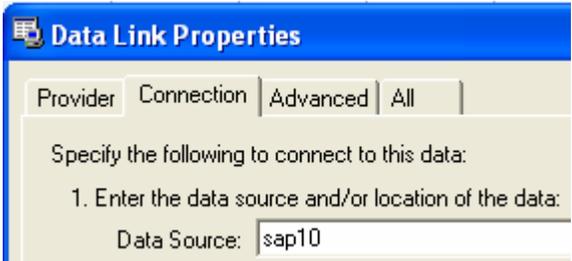
SFC_SNCMODE	SNC_MODE	Set to 0 to disable SNC. Set to 1 to enable SNC. Setting this value is not necessary as the setting the SFC_SNCPARTNERNAME will automatically set this value to 1.
SFC_SNCQOP	SNC_QOP	SNC Quality of service. Valid values are 0, 1, 2, 3, 8, or 9, as described: • 0 - RFC_SNC_QOP_INVALID • 1 - RFC_SNC_QOP_OPEN • 2 - RFC_SNC_QOP_INTEGRITY • 3 - RFC_SNC_QOP_PRIVACY • 8 - RFC_SNC_QOP_DEFAULT • 9 - RFC_SNC_QOP_MAX
SFC_SNCMYNAME	SNC_MYNAME	Own SNC name if you don't want to use the default SNC name.
SFC_SNCLIB	SNC_LIB	Path and name of the SNC Library. This value is not required if an environment variable SNC_LIB is defined.

Setting up Connections to Perform a Silent Logon

There are a number of ways to specify the connection parameters in Excel so that user credentials are not required when creating PivotTables from a connection file, or opening a saved work book. The list below details the required parameters.

1. Data Source, User ID, Password, SFC_CLIENT

2. Data Source, SFC_CLIENT, SFC_SNCPARTNERNAME, SFC_SNCLIB (only required if the SNC_LIB environment variable is not defined)

3. SFC_HOSTNAME, SFC_SYS_NUMBER, User ID, Password, SFC_CLIENT

4. SFC_HOSTNAME, SFC_SYS_NUMBER, SFC_CLIENT, SFC_SNCPARTNERNAME, SFC_SNCLIB (only required if the SNC_LIB environment variable is not defined)

Note that to use the SNC parameters, SNC must be properly setup and configured with SAP GUI to allow single sign-on to the NetWeaver BI 7.0 system.

If the User ID and Password are specified, then you must save the password in the connection file that Excel creates. There are two checkboxes that must be marked. The first is on the *Data Link* dialog.

The second is that last step in the wizard where you save the connection file.
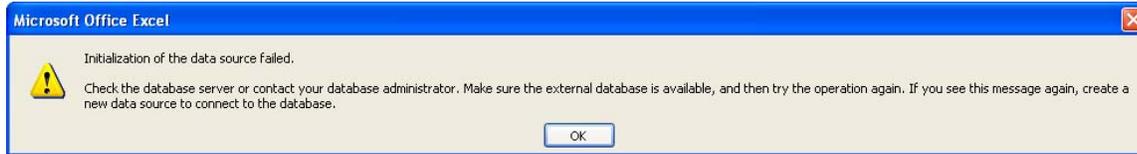
Troubleshooting

This section describes common issues that may occur when using Microsoft Excel 2007 PivotTables with SAP NetWeaver BI 7.0.

Initialization Error When Opening Saved Workbooks

When you open a saved workbook and enable the data connection, an error appears that the data source initialization failed.

This error will occur if you use User ID and Password authentication (the error will not occur if SNC is used), even if you have specified the connection parameters to perform a silent logon and saved the password in the connection file. To workaround this error, you first need to have created a connection as described above to perform a silent logon. Next you need to save the password with the workbook. Under the PivotTable tab, select *Change Data Source* and then *Connection Properties....*
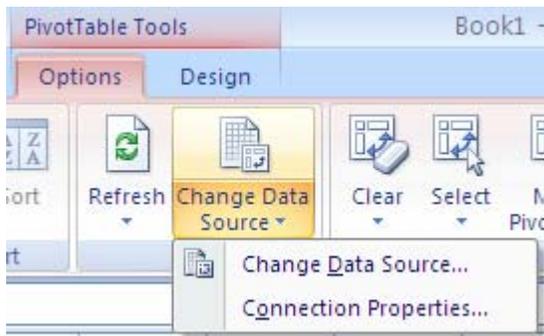
In the dialog that appears, switch to the *Definition* tab and click the *Save password* checkbox. Now when you save and reopen a workbook the error will not appear.
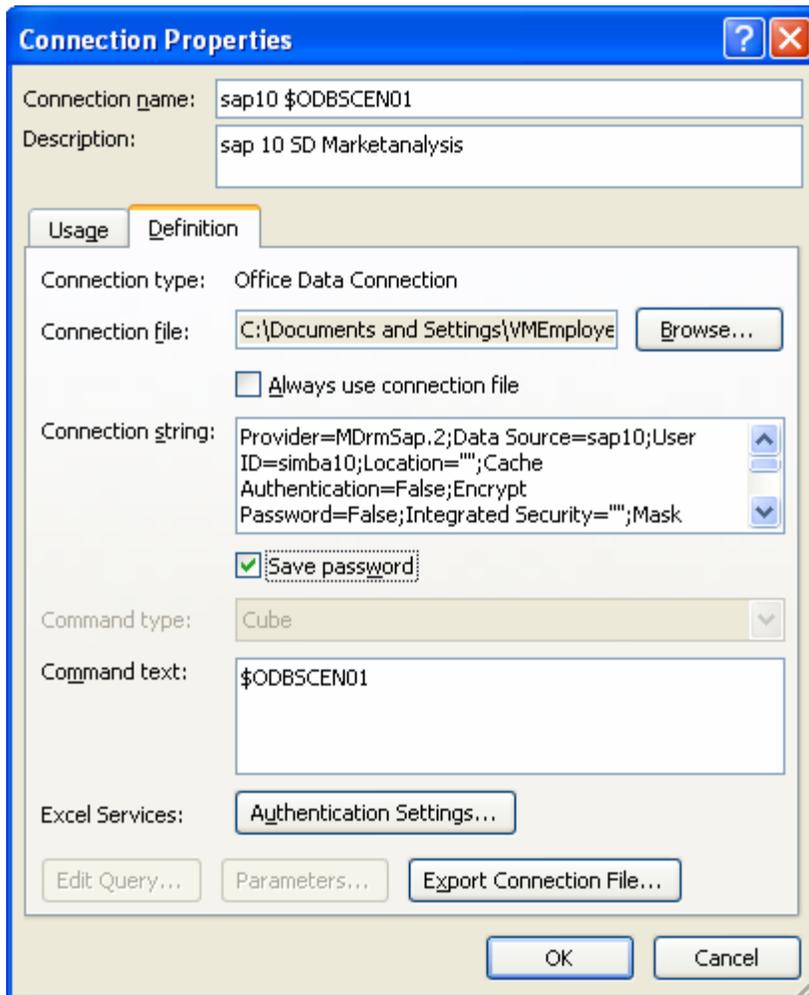
Query Failures

When a query error occurs, Excel may display a generic error message as shown below.

This error can occur for a number of reasons, as detailed in the sections below.

Variable Support

Excel PivotTables does not support BEx Query variables. You can use BEx queries in Excel that contain optional variables, or mandatory variables with default values. However you cannot assign values to the variables from the PivotTable. BEx queries with mandatory variables that do not have default values cannot be used within Excel. A query error will appear whenever a field is added to the PivotTable report.

Incorrect Support Package

The MDX queries that Excel PivotTables generates are only supported in NetWeaver BI 7.0 SPS 14 or later. Earlier support package stacks will not work correctly with Excel 2007.

Using Multiple Hierarchies

The PivotTables interface lets you select multiple hierarchies per characteristic in a single query. However, NetWeaver BI 7.0 only supports queries that contain one hierarchy per characteristic.
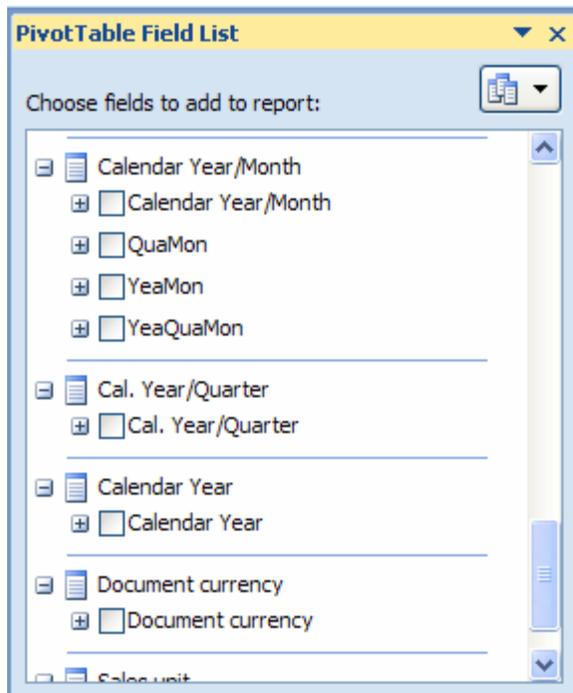
In practice, what this means is, using the Calendar Year/Month (0CALMONTH) characteristic as an example, you can create a query using the *QuaMon* hierarchy. If you then want to add the *YeaMon* hierarchy, you must first remove *QuaMon* from the report and then add *YeaMon*. If you try to use *QuaMon* and *YeaMon* at the same time, your PivotTable data may disappear or you will receive the error below.

Query is Too Large

Microsoft Excel 2007 removes limits on spreadsheet size that were in previous versions. In Microsoft Excel 2007, the maximum spreadsheet size is 1,048,576 rows by 16,384 columns (further information is available here). You will receive an error if you construct a PivotTable report that goes beyond those limits.

However, there are limits within SAP NetWeaver BI 7.0 that affect the size of data that can be retrieved. The first limit is that a query is limited to a maximum of 1 million rows. Trying to use a characteristic or crossjoin of characteristics that contains over 1 million rows will result in a query error. Furthermore, there is a limit of 1 million key figures values in a single report. For example, if your PivotTable report contains 10,000 rows and 101 columns (> 1 million key figure values), then a query error will occur.

The various open analysis interfaces for SAP NetWeaver BI 7.0 were designed to support ad-hoc reporting and not the retrieval of large data volumes. If you require mass-data transfer from your SAP NetWeaver BI 7.0 system, then you should use the Open Hub Service.

Disable Property/Attribute Retrieval to Decrease Response Time

By default, Excel will retrieve all of the property (or attribute) values for a characteristic when it is inserted onto the PivotTable report. If you use a characteristic (for example 0MATERIAL) that has a large number (>50) of attributes, the query may fail or take a very long time to complete. By disabling property retrieval, the query performance can improve quite noticeably. To disable property retrieval, press the *Options* button on far left of the *PivotTable Tools Option* tab.

In the *PivotTable Options* dialog, select the *Display* tab and ensure that the *Show properties in tooltips* checkbox is not checked, as shown below.
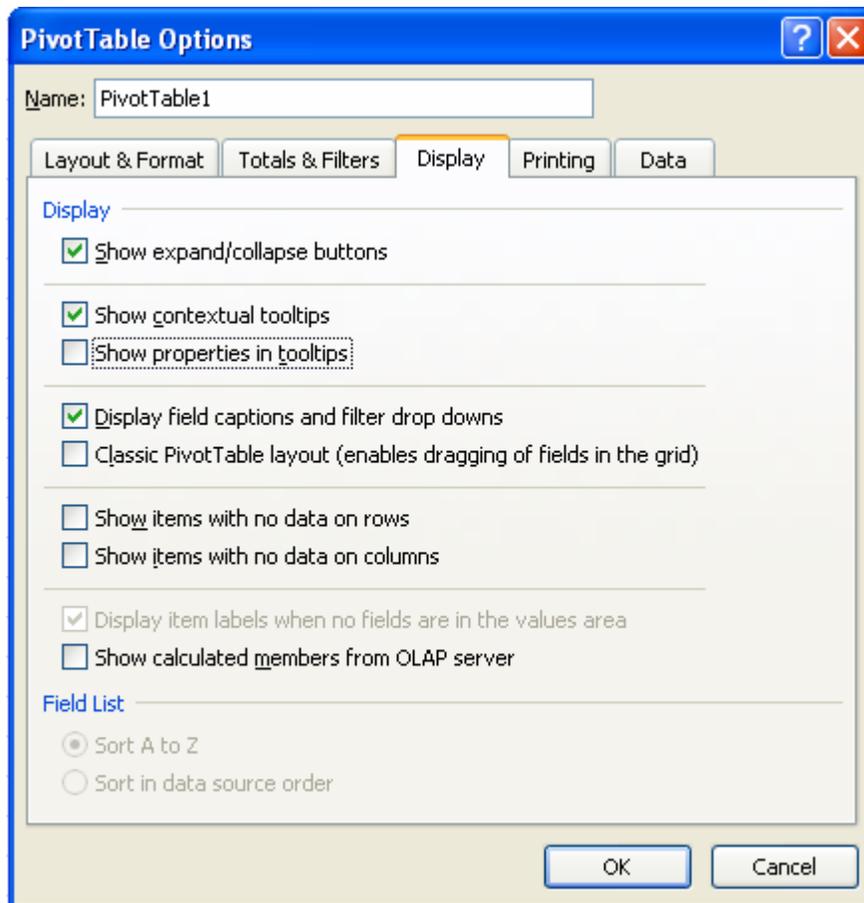
"Cannot process Unicode RFC in non-unicode system" Error

You may receive an error "Cannot process Unicode RFC in non-unicode system" after entering your user credentials, if your NetWeaver BI 7.0 system is non-unicode. This error and the solution are described in note 1173537.

Unable to connect from Windows Vista

You may be unable to connect to servers defined in SAP GUI Logon, if you are running Windows Vista with UAC enabled. Your server information has been correctly defined in SAP GUI Logon and you have entered your Data Source, user credentials, and client information correctly, yet an error occurs when you press *Test Connection*. A description of this error and solution are described in note 1031740.

Another workaround is to define your connection parameters to use a silent logon via the SFC_HOSTNAME and SFC_SYS_NUMBER parameters, as described in items 3 and 4 the section **Error! Reference source not found.**.

Mixed Units and Currencies: Key Figure Values are Blank or Show '*'

When you add certain fields or key figures to the report, the key figure values may show a '*' instead of a numeric value. This occurs when the key figure value contains mixed units or currencies. The raw value is shown in the formula bar at the top of the spreadsheet.

To modify this behavior, start transaction *rscustv4* on your SAP NetWeaver BI 7.0 system.

The *Mixed values* field controls the display character(s) used for mixed values. Also, if you check the *Mixed values* checkbox, then the values will appear in Excel as shown below.

Excel Cannot Find SAP BW OLE DB Provider

In the *Data Link Properties* window, the SAP BW OLE DB Provider is not present or is missing. When installing SAP GUI, ensure that you have checked OLE DB for OLAP Provider item for installation.
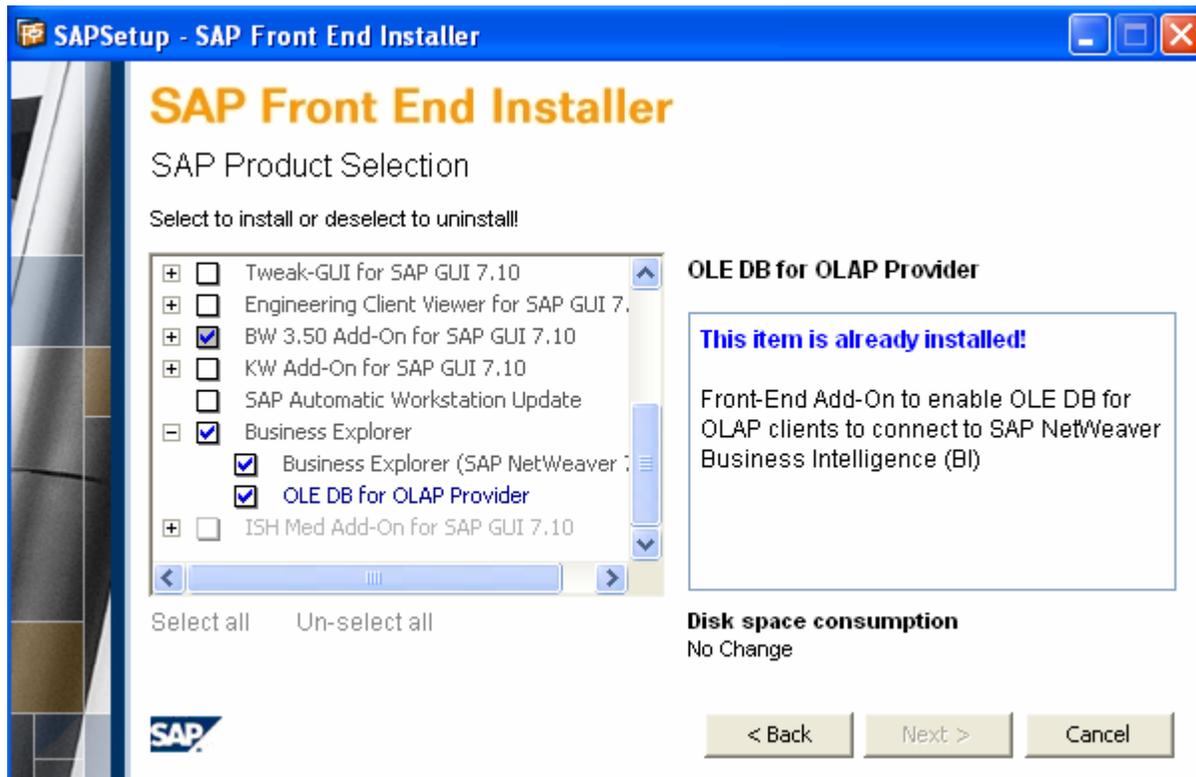
If the files have been installed correctly, then it is possible that they may not have been registered correctly. For SAP GUI 7.10 Compilation 2, the installation location is "C:\Program Files\Common Files\SAP Shared\BW\OleOlap". You can register the files as follows:

1. Go to Start --> Run and enter the following

2. regsvr32 C:\Program Files\Common Files\SAP Shared\BW\OleOlap\mdrmsap.dll

3. regsvr32 C:\Program Files\Common Files\SAP Shared\BW\OleOlap\scerrlkp.dll

You will get a system message saying that DllRegister server "..." succeeded. If registration fails, it is either because the install files are missing or you do not have appropriate privileges on your Windows machine. Try logging into Windows using an account with administrative privileges and re-registering the files.

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