



# COMPOSITE MODEL WITH MICROSOFT POWER BI

A clarification to the filter behavior with  
Direct Query and how to use the  
composite model

## Abstract

This article will show you the filter behavior by using Direct Query and which capabilities will be provided by the new Composite Model.

All code and information are provided as it is and without warranty!

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In the most projects where I use Direct Query, the technique to read live the Data from the source system, the customer thinks, that the data first extracted from the source, loaded to Power BI and finally Power BI filter the data. That is in the most cases wrong, because the driver will push the filter from slicers, visuals or filters from the Mash Up Engine (Power Query) to the source system.

So, if you have a slicer that filters the customer table by the name, the query at a SQL Server source system will be the following:  
`SELECT [columns] FROM dbo.Customers WHERE Name = [PREDICATE]`

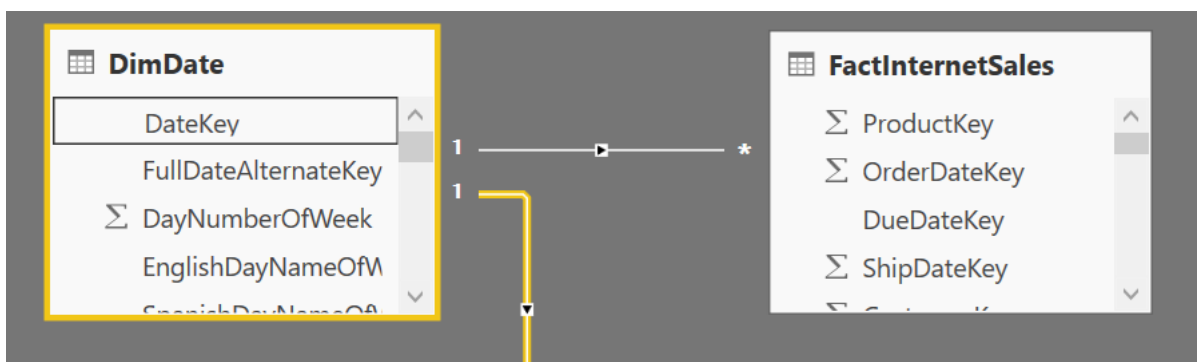
More information's are provided by the msdn website:  
<https://docs.microsoft.com/en-us/power-bi/desktop-directquery-about>

With the new composite model you are able now to add more data sources to the model. Before this, you are limited to add only objects/tables from one source.

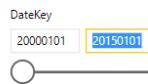
<https://docs.microsoft.com/en-us/power-bi/desktop-composite-models>

Following scenario:

We use the AdventureWorks database with the fact table "InternetSales" and the Data Dimension. Because the data quantity is very big, we use the Direct Query Mode.



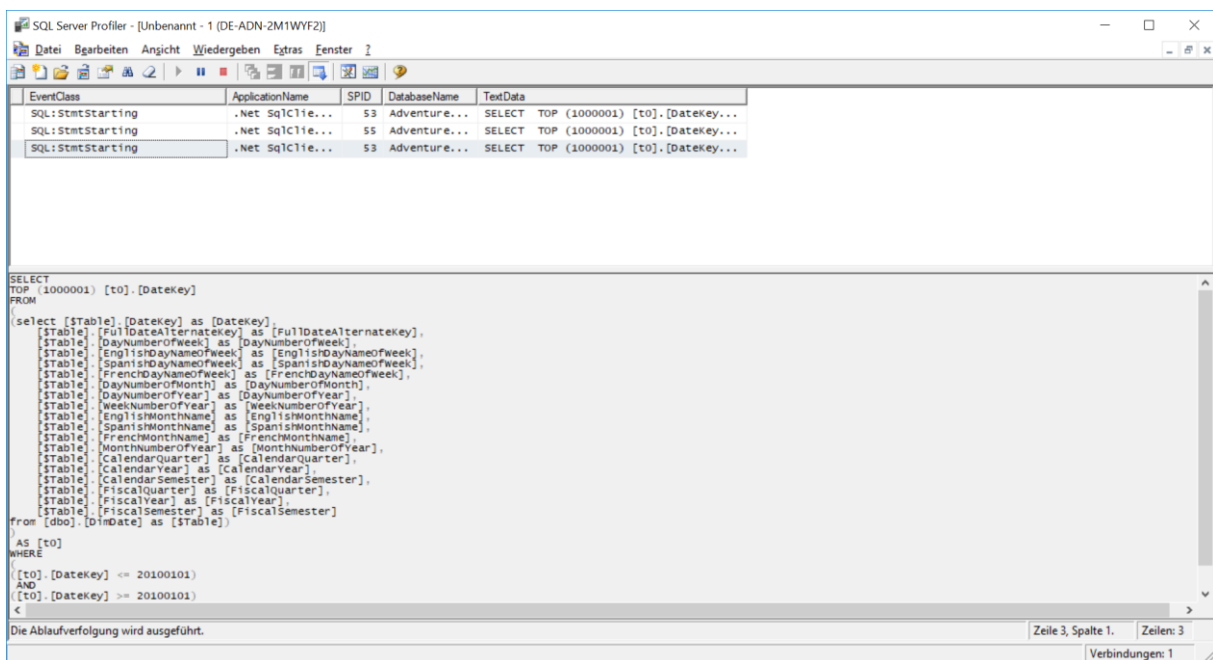
The report only contains a date slicer and count the Internet Sales Table by the Row Count.



If you interact with the slicer the data source joins the date and the fact table by the foreign key column and fires by every click a query against the server. No data will be cached and we make much traffic on the server – but this will be better, because the traffic will not be on the client or the report server or Power BI service.

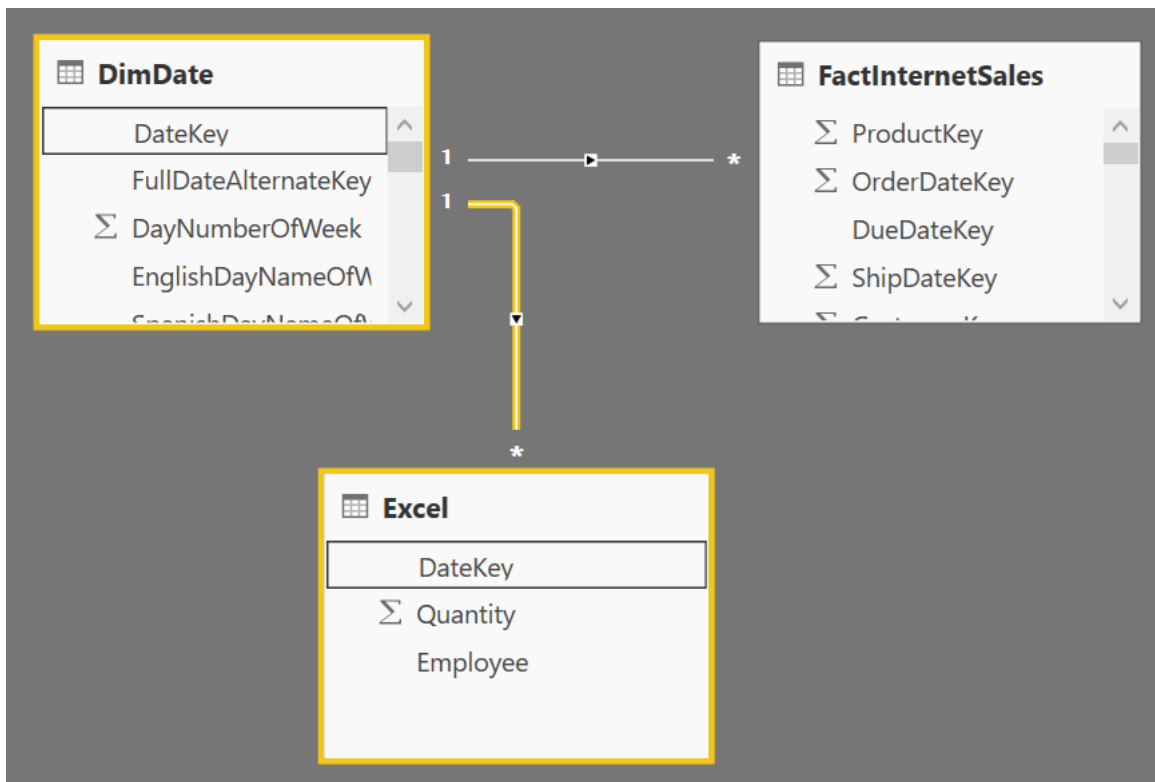
60,40K  
Count of Freight

If you enable the SQL Server Profiler, you see following interactions:



If you read the query, you will notice that all columns from both tables will be used. If you need performance on the client and server (who not?!), you should consider adding only the needed columns to the report!

Now we will add a new excel table to th model. This allows the new Composite Model feature. The table can connect to the date dimension.



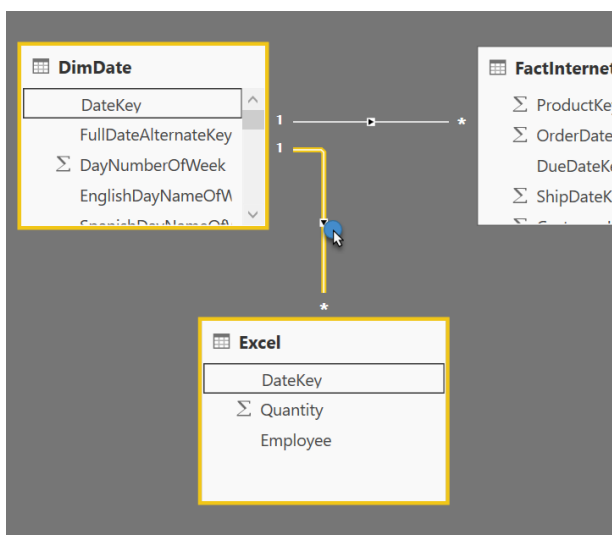
Power BI will be automatically set the data Dimension to the Dual Mode. This Mode will cache the data from the date table. But please beware of a strange behavior: If you not set the DimDate Table via the frontend, the relationship to the Excel Data can only with a N:M type. If you correct this, you can set a One to many relationship which meets the requirement for this model.

**FIELD PROPERTIES** ✕

Name: DimDate

Description: This will appear in tooltips when you hover over the field.

Storage ...: Dual



Excel

DateKey	Quantity	Employee
20100101	3	Max
20100210	4	Stefan
20100215	5	Luise

DimDate

DateKey	FullDateAlternateKey	DayNumberOfWeek	EnglishDayNameOfWe
20100701	Donnerstag, 1. Juli 2010	5	Thursday
20100702	Freitag, 2. Juli 2010	6	Friday
20100703	Samstag, 3. Juli 2010	7	Saturday

Cardinality: Many to one (\*:1)

Cross filter direction: Single

Make this relationship active

Assume referential integrity

Apply security filter

Now we have following:

1. Our Fact Table "Internet Sales" are set to Direct Query – only when I interact with this table I read data from the source system
2. The Date Dimension is set to Dual. If we interact with the fact Table "Internet Sales", we will join the data on the datasource and our filter will be passed to the source system too
3. The Excel Table is imported. So the data is saved to the Power BI Report and when the table interact with the Date Dimension, the date information are read from the report, because the data was cached / imported.

Conclusion:

The composite model is a very powerful feature. Because you can combine Direct Query Sources and Imported data. With the storage mode options, you can control the usage from the data.