

# Incremental refresh Power BI

Peter van den Bos

9-3-2024



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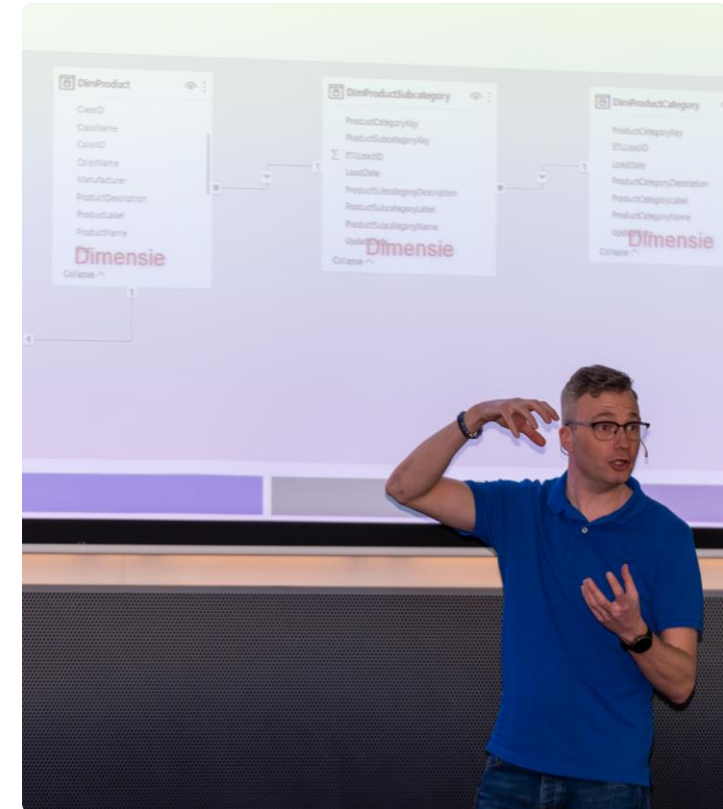
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# Wie ben ik



- Peter van den Bos
- Business Intelligence Consultant
- Speaker
- Microsoft Certified Trainer



# Probleemstelling BNG

Hieronder staan drie tabellen met aantallen die steeds groter worden door de dagelijkse transacties. Dit resulteert tot een grote load als we alles per dag gaan laden.



	Tabel1	Tabel2	Tabel3
Dag 1	100.000	1.000.000	10.000.000
Dag 2	200.000	2.000.000	20.000.000
Dag 3	300.000	3.000.000	30.000.000
Dag 4	400.000	5.000.000	50.000.000
Dag 26	2.600.000	196.418.000.000	1.964.180.000.000
Dag 27	2.700.000	317.811.000.000	3.178.110.000.000
Dag 28	2.800.000	514.229.000.000	5.142.290.000.000
Dag 29	2.900.000	832.040.000.000	8.320.400.000.000
Dag 30	3.000.000	1.346.269.000.000	13.462.690.000.000
Dag 31	3.100.000	2.178.309.000.000	21.783.090.000.000
Jaar 2	6.200.000	4.356.618.000.000	43.566.180.000.000
Jaar 3	9.300.000	6.534.927.000.000	65.349.270.000.000

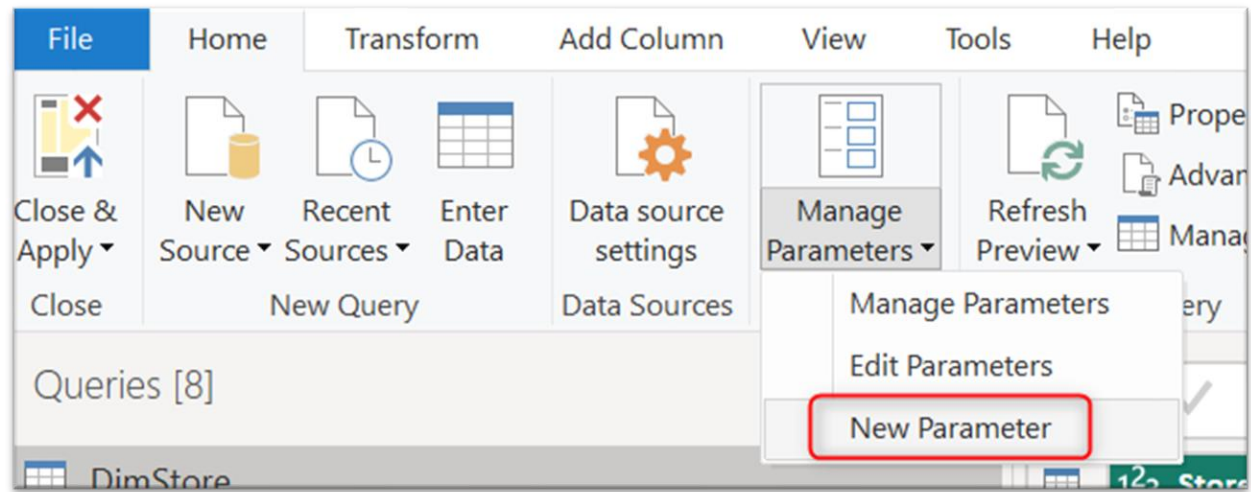


# Incremental refresh Power BI

In plaats van de totale data elke keer bij een refresh te laden, kun je ook incremental refresh gebruiken.

Start hierbij met het toevoegen van twee parameters in Power Query.

Incremental refresh

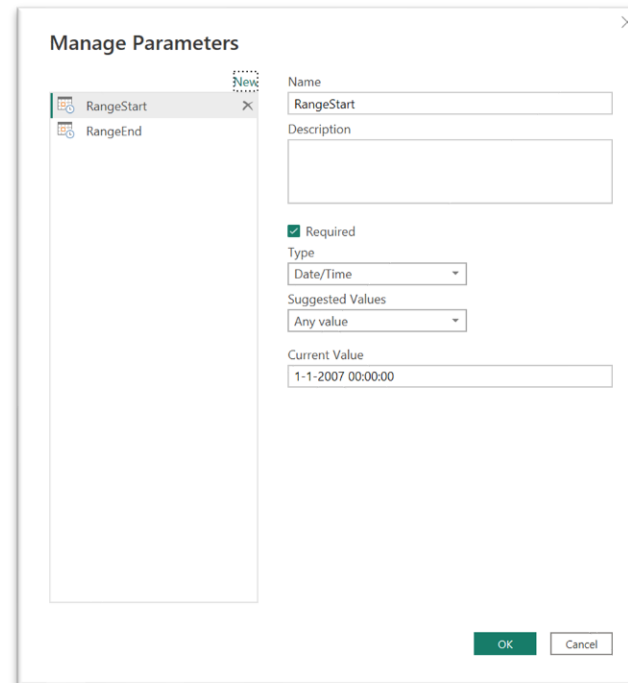


# Parameters

De eerste heet RangeStart en de tweede RangeEnd. Let op: Power Query is hoofdlettergevoelig.

Selecteer 'Type' en vul 'Current Value' in.

Incremental  
refresh



Manage Parameters

RangeStart  
RangeEnd

Name: RangeStart

Description:

Required

Type: Date/Time

Suggested Values: Any value

Current Value: 1-1-2007 00:00:00

OK Cancel



# Queries window

De parameters staan in Queries window.

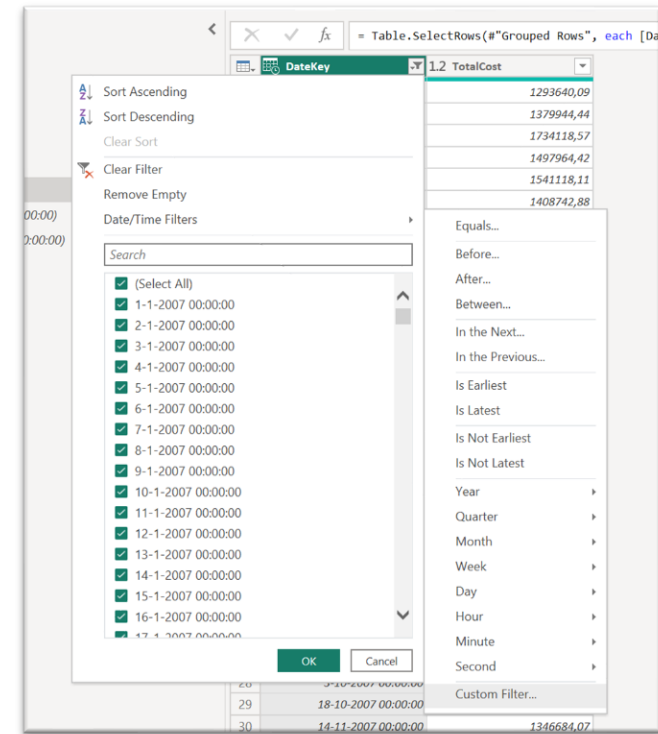
Incremental  
refresh



# Customer filter

Bij het toevoegen van Incremental Refresh aan de tabel stel je een *customerfilter* in op de datumkolom.

Incremental refresh





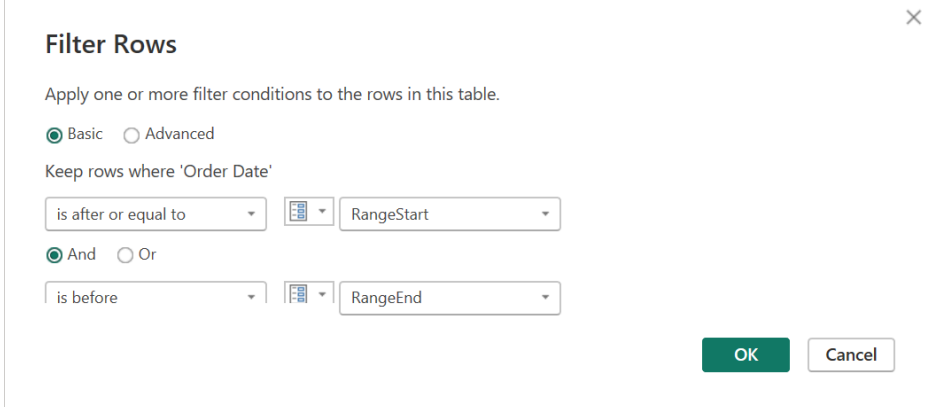
# Customer filter

Selecteer de parameters en gebruik *"is after or equal to"* voor de startdatum en *"is before"* voor de einddatum.

Het voordeel is dat je doormiddel van deze filters, eenvoudig een selectie van een dag kunt maken.

Hierdoor kun je bewerkingen uitvoeren op een kleine dataset en deze vervolgens laden in Power BI Desktop, wat het geheel compact houdt en daardoor ook gemakkelijker maakt om mee te werken. Pas in de cloud wordt alle data geladen.

Incremental  
refresh



**Filter Rows** ✕

Apply one or more filter conditions to the rows in this table.

Basic  Advanced

Keep rows where 'Order Date'

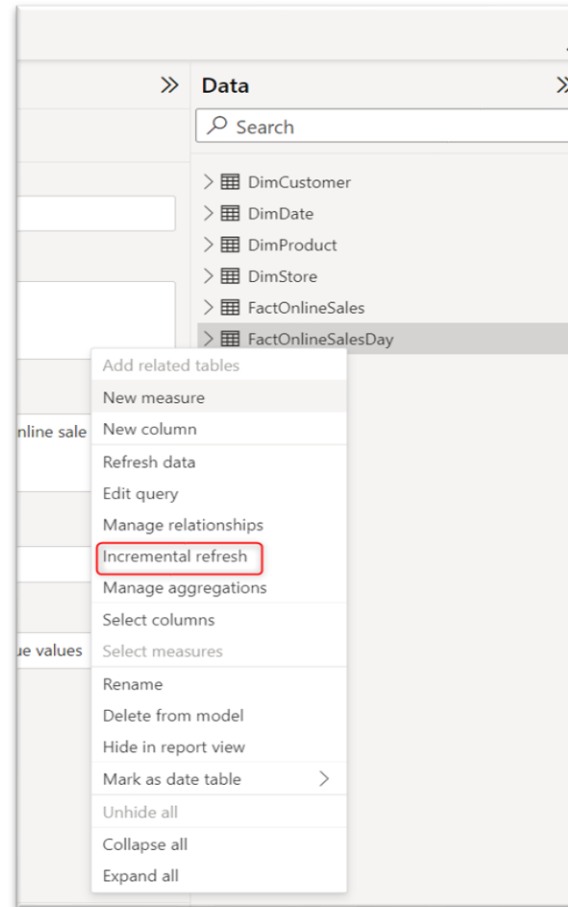
is after or equal to 📅 RangeStart

And  Or

is before 📅 RangeEnd

# Incremental refresh

Als je Close en Apply kiest om de dataset in orde te maken voor Power BI, kun je voor de gewenste tabel kiezen voor Incremental refresh.



Incremental  
refresh

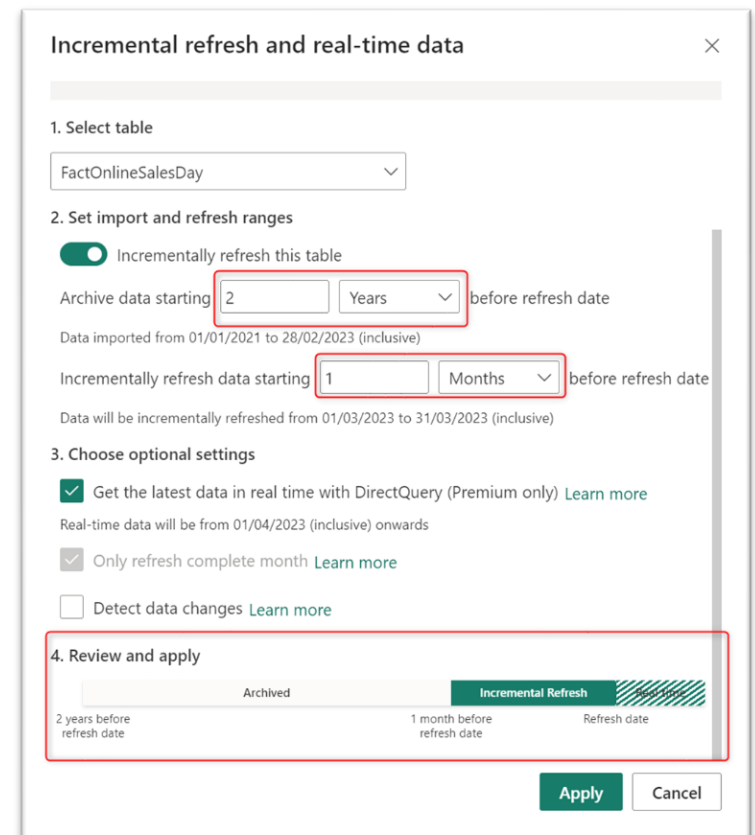


# Incremental refresh

Selecteer de periode die je in je datamodel wilt hebben.

Selecteer ook de periode van het deel van de data die je wilt refreshen.

Incremental refresh



**Incremental refresh and real-time data**

1. Select table  
FactOnlineSalesDay

2. Set import and refresh ranges

Incrementally refresh this table

Archive data starting 2 Years before refresh date  
Data imported from 01/01/2021 to 28/02/2023 (inclusive)

Incrementally refresh data starting 1 Months before refresh date  
Data will be incrementally refreshed from 01/03/2023 to 31/03/2023 (inclusive)

3. Choose optional settings

Get the latest data in real time with DirectQuery (Premium only) [Learn more](#)  
Real-time data will be from 01/04/2023 (inclusive) onwards

Only refresh complete month [Learn more](#)

Detect data changes [Learn more](#)

4. Review and apply

Timeline: Archived (2 years before refresh date) | Incremental Refresh (1 month before refresh date) | Real-time (Refresh date onwards)

**Apply** Cancel

# Incremental refresh | Data change

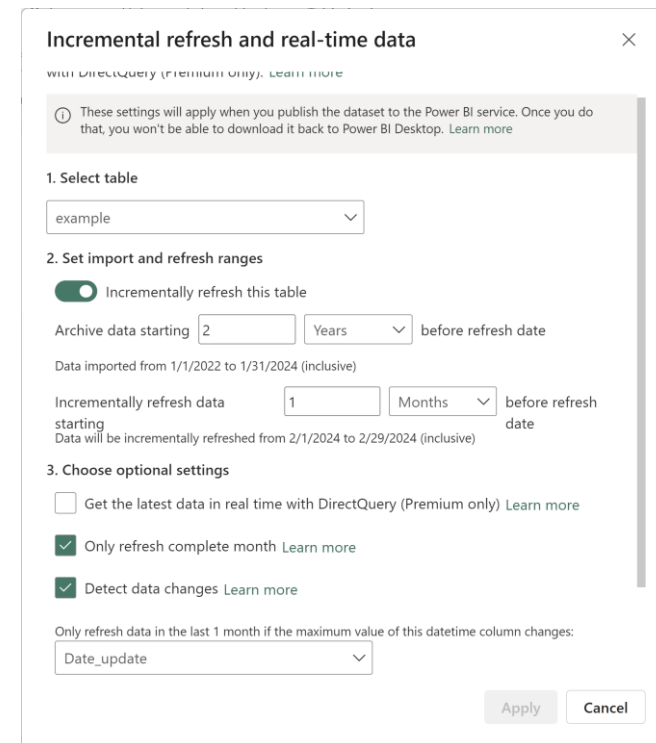
Data change gaat over de hele periode van Incremental refresh, niet over de archiefperiode.

Het is noodzakelijk om in de tabel een kolom te hebben met een datum van de geupdate rij.

Incremental refresh pakt de maximale datum van de periode van verversen, in het voorbeeld de maximale datum van de afgelopen maand. Elke regel die een datum heeft van na de maximale datum wordt geüpdatet.

Het voordeel is dat Incremental refresh veel gericht kan verversen.

Incremental  
refresh



**Incremental refresh and real-time data** ×

with DirectQuery (Premium only). [Learn more](#)

ⓘ These settings will apply when you publish the dataset to the Power BI service. Once you do that, you won't be able to download it back to Power BI Desktop. [Learn more](#)

**1. Select table**

example ▼

**2. Set import and refresh ranges**

Incrementally refresh this table

Archive data starting  Years ▼ before refresh date

Data imported from 1/1/2022 to 1/31/2024 (inclusive)

Incrementally refresh data  Months ▼ before refresh date

starting starting  
Data will be incrementally refreshed from 2/1/2024 to 2/29/2024 (inclusive)

**3. Choose optional settings**

Get the latest data in real time with DirectQuery (Premium only) [Learn more](#)

Only refresh complete month [Learn more](#)

Detect data changes [Learn more](#)

Only refresh data in the last 1 month if the maximum value of this datetime column changes:

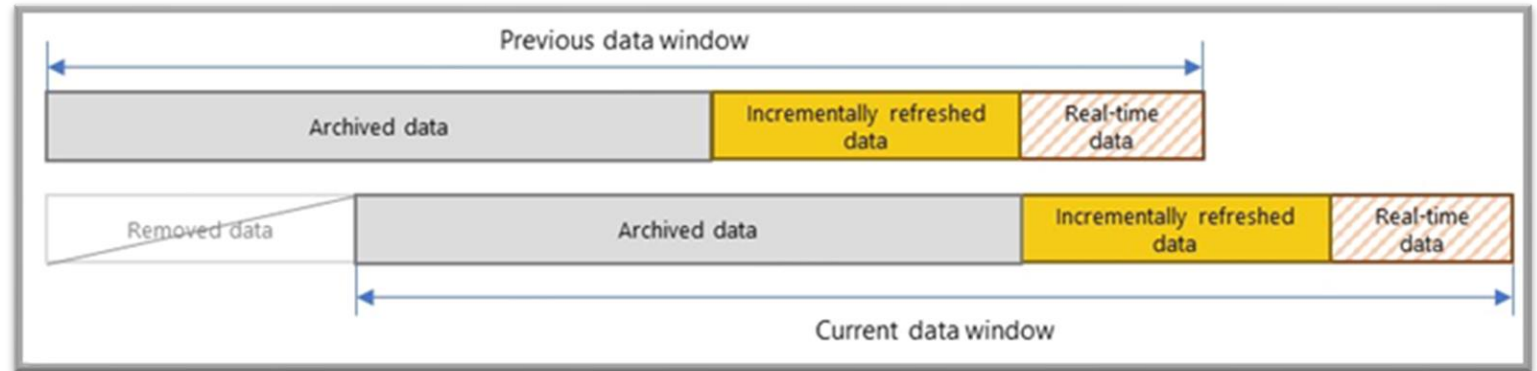
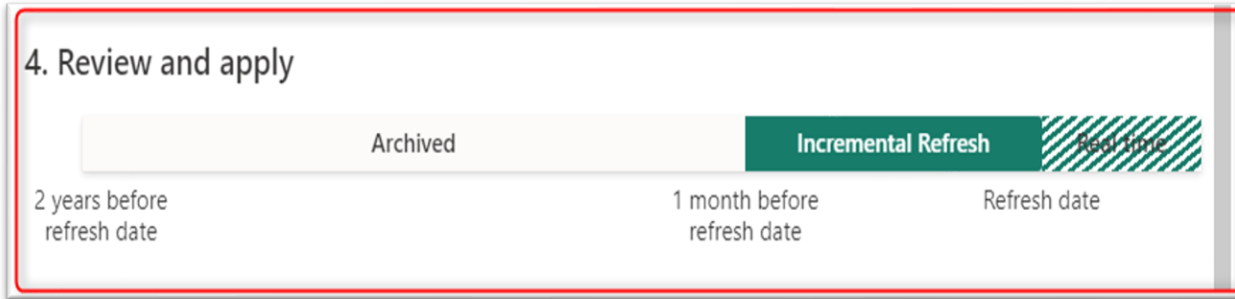
Date\_update ▼

Apply Cancel

# Partities opzet

Incremental refresh

De partities werken met een verschuivend window.



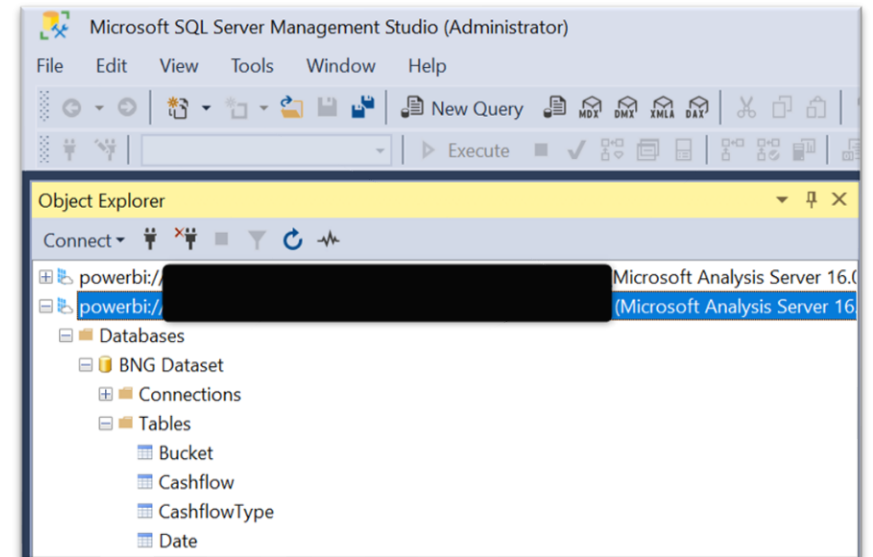
# Partities verversen via SSMS

Incremental  
refresh

We maken verbinding met het semantic model via SQL Server Management Studio.

De volgende modellen zitten in het semantic model:

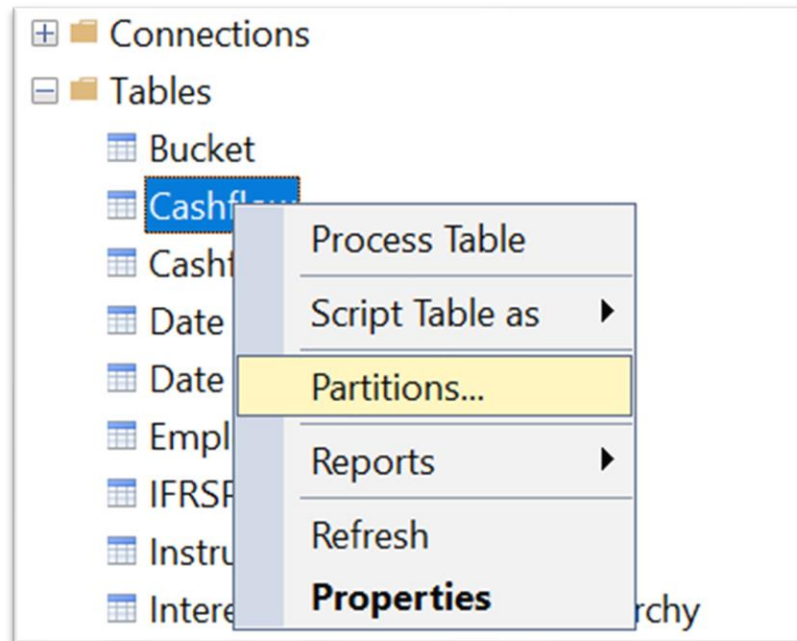
- Bucket
- Cashflow
- Cashflow type
- Date



# Partities verversen via SSMS

Incremental  
refresh

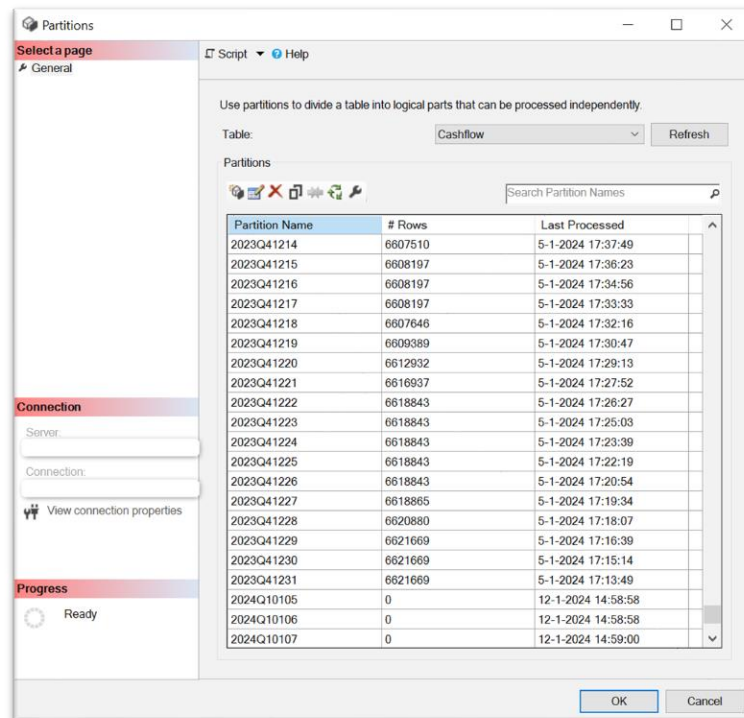
Als we op een tabel rechtermuis toets gebruiken, dan zien we de optie "*Partitions*", deze selecteren we.



# Partities verversen via SSMS

We zien nu een overzicht met de bestaande partities en zien ook het aantal rijen en de datum van de laatste verversing.

Incremental refresh



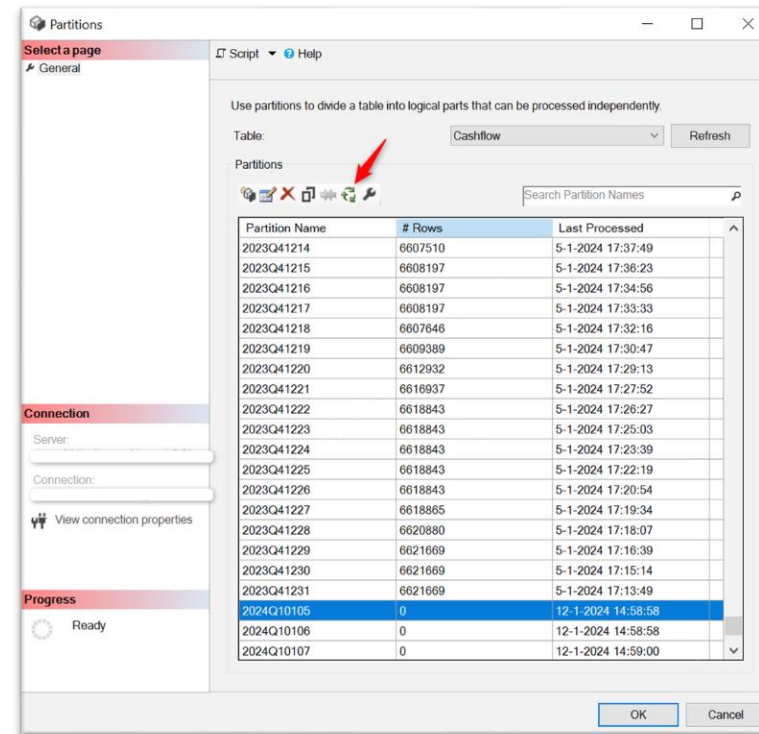


# Partities verversen via SSMS

Incremental refresh

We kunnen partities verversen door op het ververs icon te drukken.

We hebben nu partitie 2024Q10105 geselecteerd.

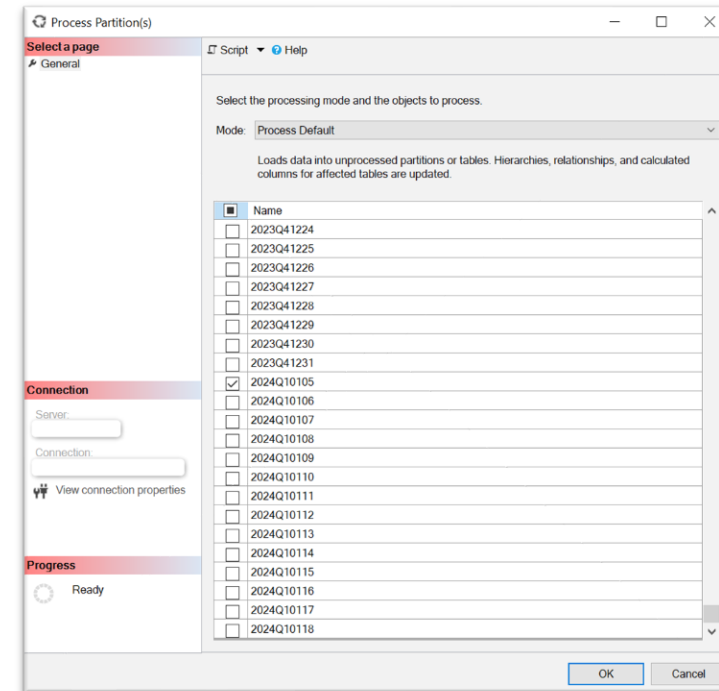


# Partities verversen via SSMS

Incremental  
refresh

Omdat we partitie 2024Q10105 geselecteerd hadden, is deze direct mee geselecteerd.

In deze stap ben je vrij om meerdere partities te selecteren.



# Partities verversen via SSMS

Incremental refresh

Select the processing mode and the objects to process.

Mode: Process Default

- Process Default
- Process Full
- Process Data
- Process Clear
- Process Add

<input checked="" type="checkbox"/>	name
<input type="checkbox"/>	2023Q41224

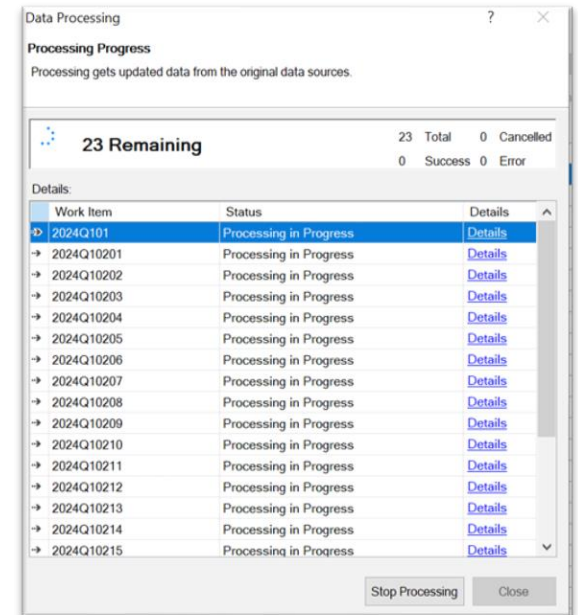
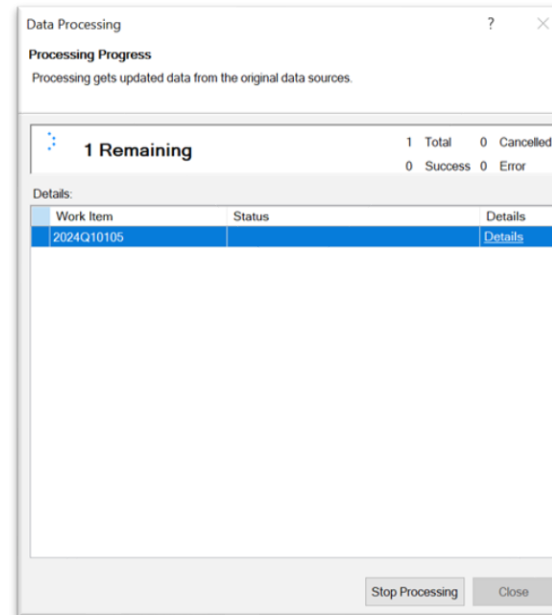


# Partities verversen via SSMS

Op het moment van vernieuwen verschijnt het volgende scherm.

We zien hier geen wijzigingen totdat de partities zijn vernieuwd.

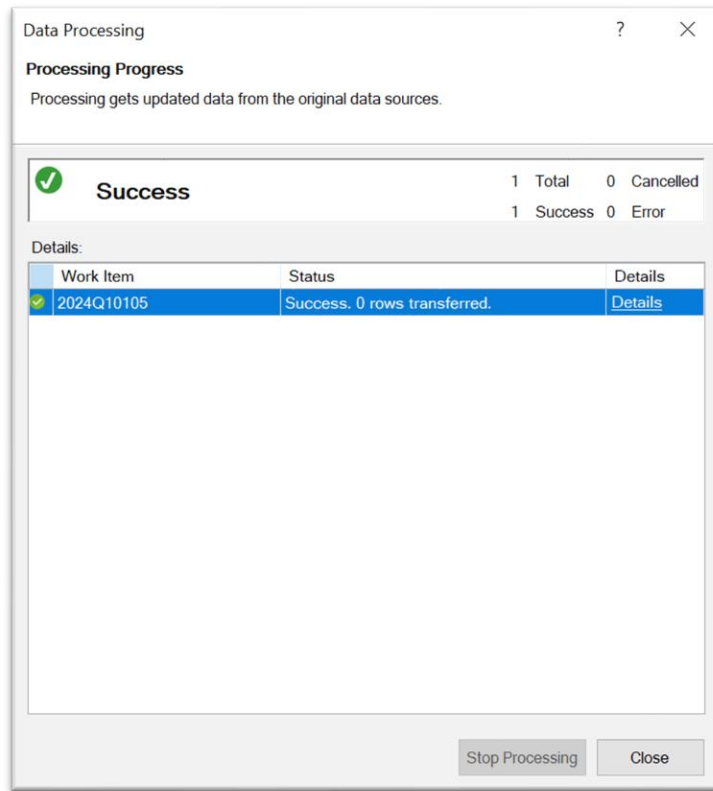
Incremental refresh



# Partities verversen via SSMS

De verversing is voltooid.

Incremental  
refresh



Data Processing

Processing Progress  
Processing gets updated data from the original data sources.

**Success** 1 Total 0 Cancelled  
1 Success 0 Error

Details:

Work Item	Status	Details
2024Q10105	Success. 0 rows transferred.	<a href="#">Details</a>

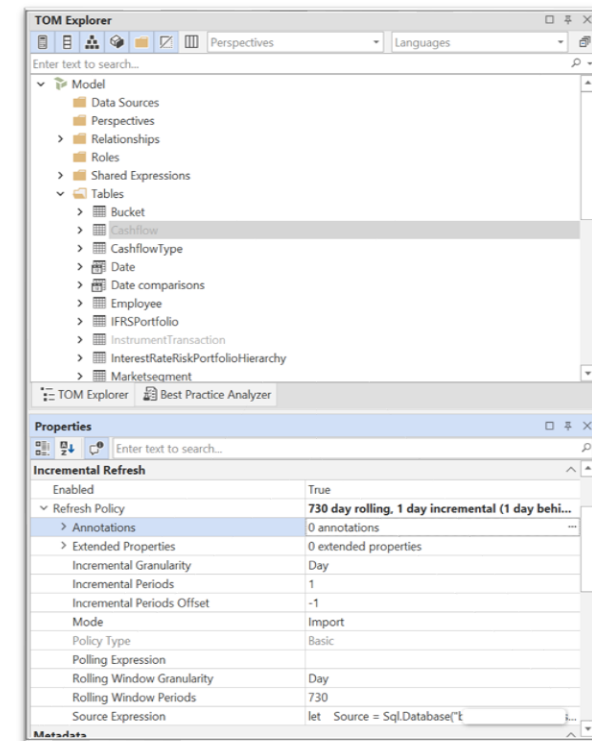
Stop Processing Close

# Partities verversen via Tabular Editor 3

Incremental  
refresh

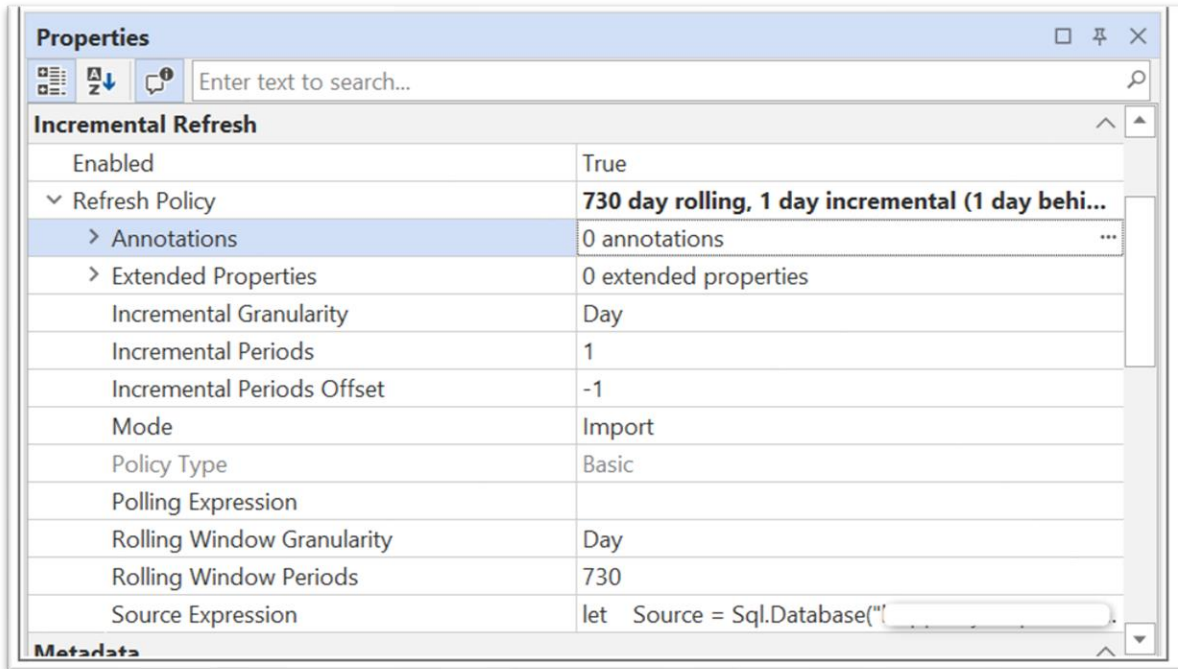
We kunnen Tabular Editor 3 gebruiken voor het verversen, echter kunnen we hiermee ook het model beheersen en ook de Increment refresh beheersen en aanpassen waar noodzakelijk.

Als we op een tabel gaan staan kunnen we bij de properties zien, hoe de Incremental Refresh is ingesteld.



# Partities verversen via Tabular Editor 3

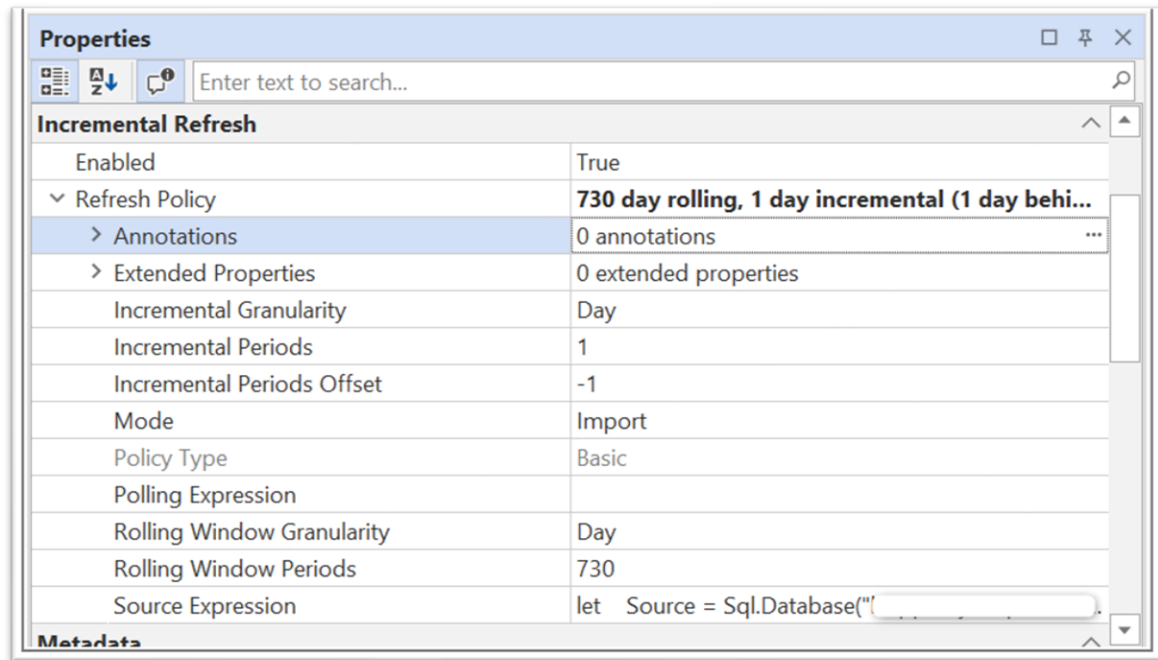
Incremental refresh



Property Name	Power BI Desktop Equivalent	Description	Expected Value
<b>EnableRefreshPolicy</b>	Incrementally refresh this table	Whether a refresh policy is enabled for the table. In Tabular Editor, other Refresh Policy properties will only be visible if this value is set to <code>True</code> .	True or False.
<b>IncrementalGranularity</b>	Incremental Refresh Period	The granularity of the incremental window. Example: "Refresh data in the last <b>30 days</b> before refresh date."	Day, Month, Quarter or Year. Must be smaller than or equal to the IncrementalGranularity.
<b>IncrementalPeriods</b>	Number of Incremental Refresh Periods	The number of periods for the incremental window. Example: "Refresh data in the last <b>30 days</b> before refresh date."	An integer of the number of IncrementalGranularity periods. Must define a total period smaller than the RollingWindowPeriods
<b>IncrementalPeriodsOffset</b>	Only refresh complete days	The offset to be applied to IncrementalPeriods. Example for: IncrementalPeriodsOffset = -1; IncrementalPeriods = 30; IncrementalGranularity = Day; "Only refresh data in the last 30 days, from the day before refresh date."	An integer of the number of IncrementalGranularity periods to shift the Incremental window.
<b>Mode</b>	Get the latest data in real time with DirectQuery	Specifies whether Incremental Refresh is configured with only import partitions or also a DirectQuery partition, to result in a "Hybrid Table".	Import or Hybrid.

# Partities verversen via Tabular Editor 3

Incremental refresh

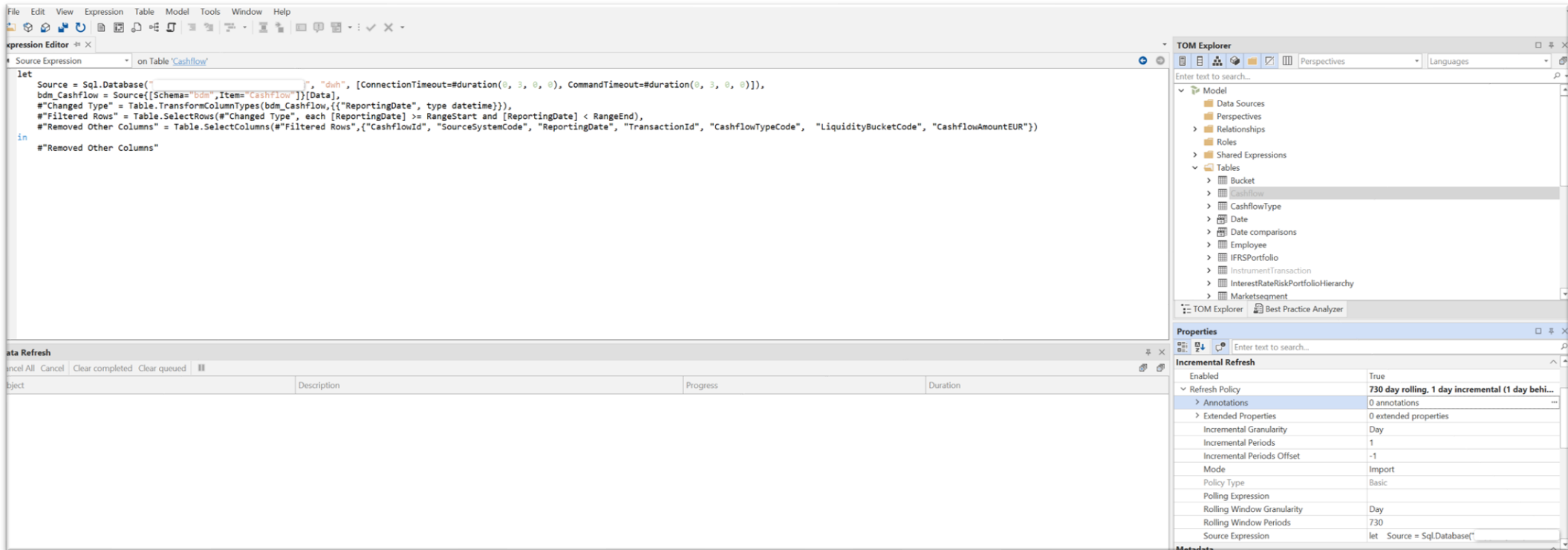


<b>PolicyType</b>	N/A	Specifies the type of refresh policy.	Can only contain a single value: <code>Basic</code> .
<b>PollingExpression</b> (Optional)	Detect Data Changes	The M Expression used to detect changes in a specific column such as <code>LastUpdateDate</code> .  In Tabular Editor, the <b>Polling Expression</b> can be viewed and modified from the <b>Expression Editor</b> window by selecting it from the dropdown menu in the top-left.	A valid M Expression that returns a scalar value of the latest date in a column. All records in incremental window hot partitions containing that value for the column will be refreshed.  Records in archived partitions are <i>not</i> refreshed.
<b>RollingWindowGranularity</b>	Archive Data Period	The granularity of the rolling window.  Example: "Archive data starting 3 years before refresh date."	<code>Day</code> , <code>Month</code> , <code>Quarter</code> or <code>Year</code> . Must be larger than or equal to the <code>IncrementalGranularity</code> .
<b>RollingWindowPeriods</b>	Number of Archive Data Periods	The number of periods for the rolling window.  Example: "Archive data starting 3 years before refresh date."	An integer of the number of <code>RollingWindowGranularity</code> periods. Must define a total period larger than the <code>IncrementalPeriods</code>
<b>SourceExpression</b>	Power Query Source Expression	The M Expression for the table data source. This is where the original table M Expression is, and where any existing Power Query transformations would be modified.  In Tabular Editor, the <b>Source Expression</b> can be viewed and modified from the <b>Expression Editor</b> by selecting it from the dropdown menu in the top-left.	A valid M Expression containing a filter step appropriately using <code>RangeStart</code> and <code>RangeEnd</code> .



# Partities verversen via Tabular Editor 3

Incremental refresh



The screenshot displays the Tabular Editor 3 interface. The main window shows the DAX source expression for the 'Cashflow' table, which is configured for incremental refresh. The code includes a 'let' block with a 'Source' variable and a 'Filtered Rows' filter. The 'Filtered Rows' filter is set to 'RangeStart and [ReportingDate] < RangeEnd', indicating a rolling window refresh.

```

let
    Source = Sql.Database("dw", "dwh", [ConnectionTimeout=#duration(0, 3, 0), CommandTimeout=#duration(0, 3, 0)]),
    bdw_Cashflow = Source[[Schema="bdw", Item="Cashflow"]](Data),
    #"Changed Type" = Table.TransformColumnTypes(bdw_Cashflow,{{"ReportingDate", type datetime}},
    #"Filtered Rows" = Table.SelectRows(#"Changed Type", each [ReportingDate] >= RangeStart and [ReportingDate] < RangeEnd),
    #"Removed Other Columns" = Table.SelectColumns(#"Filtered Rows",{"CashflowId", "SourceSystemCode", "ReportingDate", "TransactionId", "CashflowTypeCode", "LiquidityBucketCode", "CashflowAmountEUR"})
in
    #"Removed Other Columns"
  
```

The right-hand pane shows the 'Properties' window for the 'Cashflow' table. The 'Incremental Refresh' section is expanded, showing the following configuration:

Property	Value
Enabled	True
Refresh Policy	730 day rolling, 1 day incremental (1 day behi...
Annotations	0 annotations
Extended Properties	0 extended properties
Incremental Granularity	Day
Incremental Periods	1
Incremental Periods Offset	-1
Mode	Import
Policy Type	Basic
Polling Expression	
Rolling Window Granularity	Day
Rolling Window Periods	730
Source Expression	let Source = Sql.Database("...

# Partities verversen via Tabular Editor 3

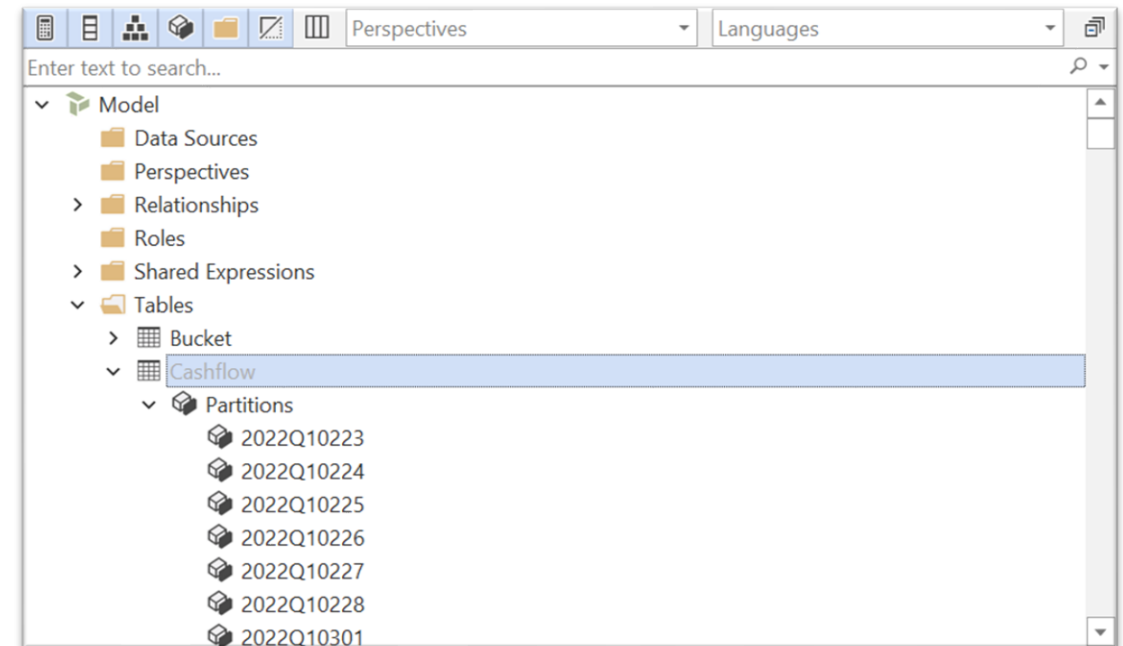
Incremental  
refresh

```
Source Expression | on Table 'Cashflow'
1 let
2   Source = Sql.Database("...", "dwh", [ConnectionTimeout=#duration(0, 3, 0), CommandTimeout=#duration(0, 3, 0)]),
3   bdm_Cashflow = Source[["bdm", "Cashflow"]][Data],
4   #"Changed Type" = Table.TransformColumnTypes(bdm_Cashflow,{{"ReportingDate", type datetime}}),
5   #"Filtered Rows" = Table.SelectRows(#"Changed Type", each [ReportingDate] >= RangeStart and [ReportingDate] < RangeEnd),
6   #"Removed Other Columns" = Table.SelectColumns(#"Filtered Rows",{"CashflowId", "SourceSystemCode", "ReportingDate", "TransactionId", "CashflowTypeCode", "LiquidityBucketCode", "CashflowAmountEUR"})
7 in
8   #"Removed Other Columns"
```

# Partities verversen via Tabular Editor 3

Incremental  
refresh

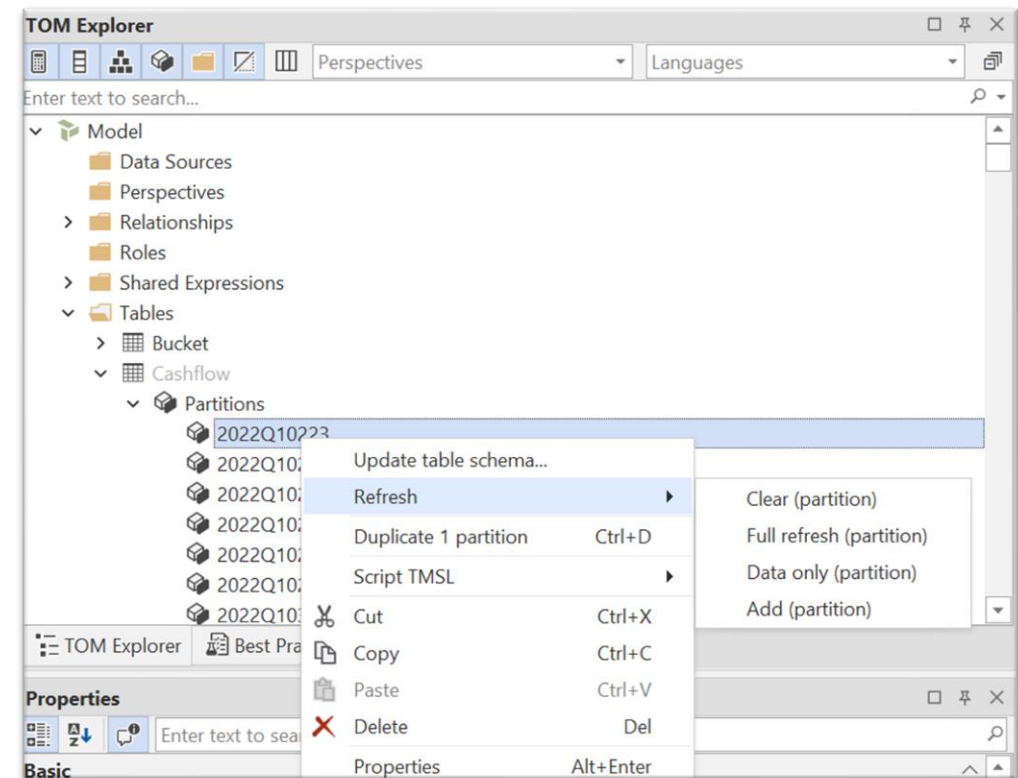
Open Partities bij de tabel om de partities te zien.



# Partities verversen via Tabular Editor 3

Incremental  
refresh

Wanneer je op de juiste partitie klikt met de rechtermuisknop vind je hier de optie “Refresh”. Kies hier de gewenste refresh optie.



# Partities verversen via Tabular Editor 3

Incremental refresh

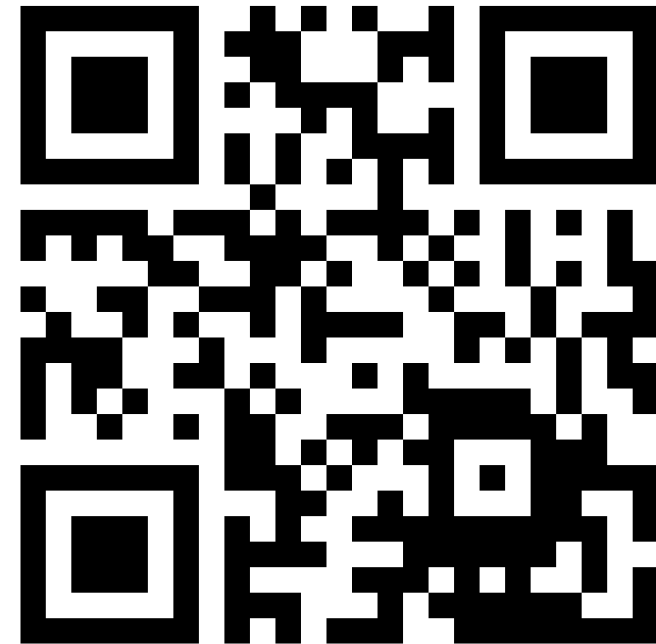
Het voordeel ten opzichte van SSMS is dat je tijdens het vernieuwingsproces kunt zien wat er gebeurt. Je kunt per partitie observeren hoe rijen worden geladen, en zodra het proces is voltooid, wordt dit ook weergegeven.

Object	Description	Progress	Duration
Full refresh of 23 partitions			0.00:04:45
	Sequentiepuntalgoritme gestart.		0.00:04:42
2024Q10204	De verwerking van partitie '2024Q10204' van tabel 'InstrumentTransaction' is voltooid. (TableTMID='13...	100.014	0.00:04:28
2024Q10201	De verwerking van partitie '2024Q10201' van tabel 'InstrumentTransaction' is voltooid. (TableTMID='13...	99.939	0.00:01:29
2024Q10202	De verwerking van partitie '2024Q10202' van tabel 'InstrumentTransaction' is voltooid. (TableTMID='13...	100.014	0.00:04:20
2024Q10203	De verwerking van partitie '2024Q10203' van tabel 'InstrumentTransaction' is voltooid. (TableTMID='13...	100.014	0.00:04:28
2024Q10205	De verwerking van partitie '2024Q10205' van tabel 'InstrumentTransaction' is voltooid. (TableTMID='13...	99.890	0.00:02:56
2024Q10206	let __AS_Query__ = let RangeStart=DateTime.FromText("20240206T00:00:00"),		0.00:00:20
2024Q10207	let __AS_Query__ = let RangeStart=DateTime.FromText("20240207T00:00:00"),		0.00:00:13
2024Q10208	let __AS_Query__ = let RangeStart=DateTime.FromText("20240208T00:00:00"),		0.00:00:11
2024Q10209	let __AS_Query__ = let RangeStart=DateTime.FromText("20240209T00:00:00"),		0.00:00:11

## Session evaluation



## Event evaluation





**Heb je vragen of  
interesse?  
Neem contact op.**



**Peter van den Bos**

**Business Intelligence Consultant**



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