

Hybrid Tables

Michiel Rozema



About: Michiel Rozema



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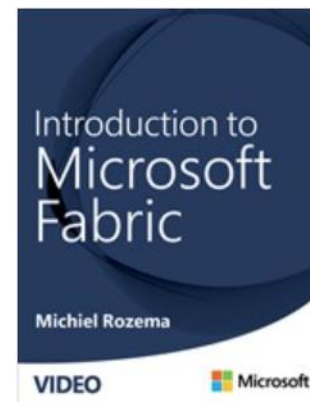
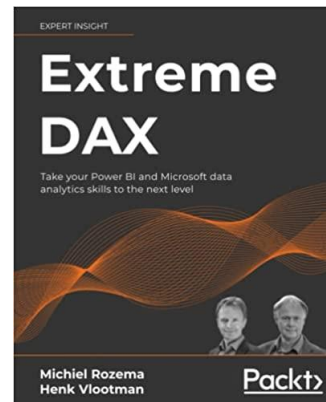
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Founder of Dutch Power BI User Group
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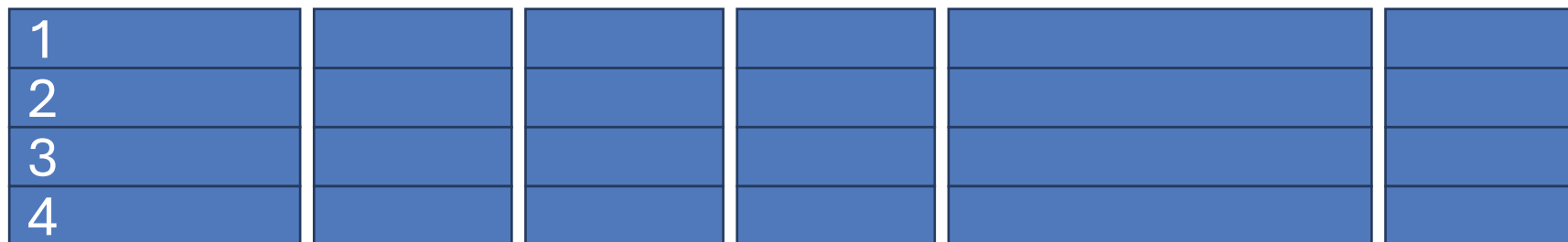
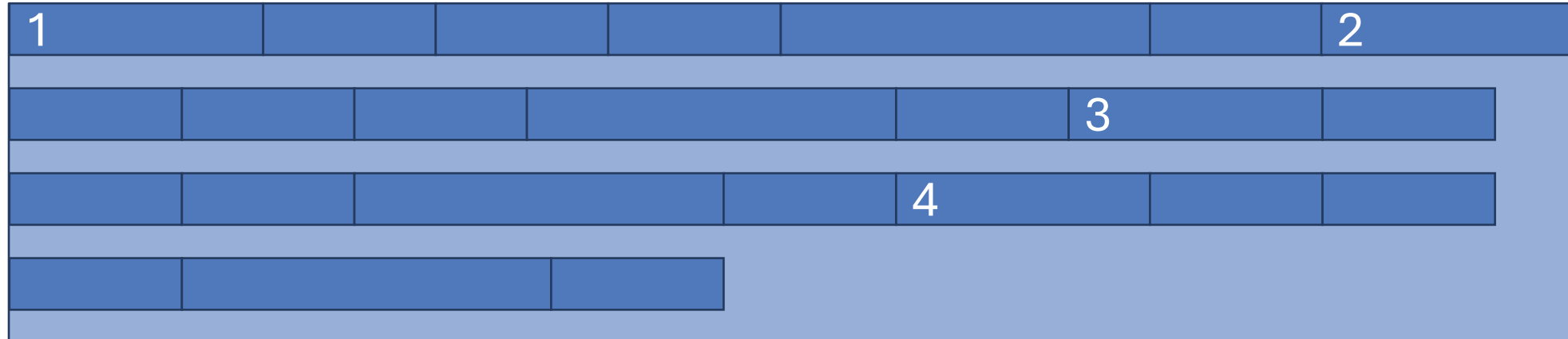
Outline

- Storage modes for semantic models
- Model performance
- What is a hybrid table?
- Setting up hybrid tables
- Caveats and guidance

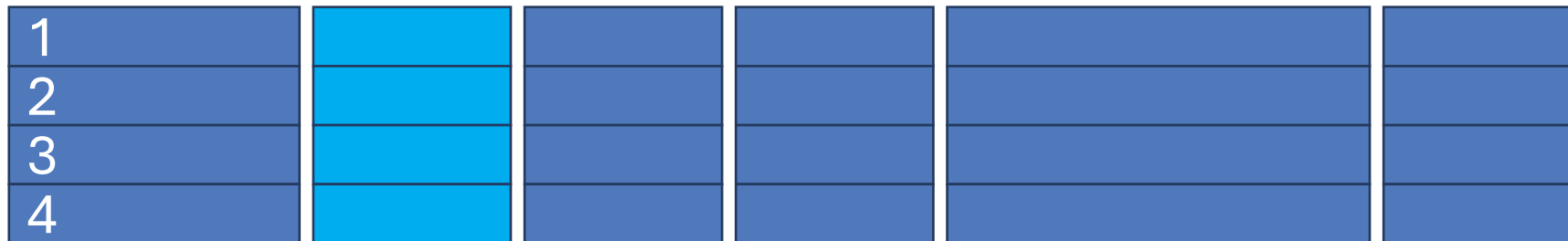
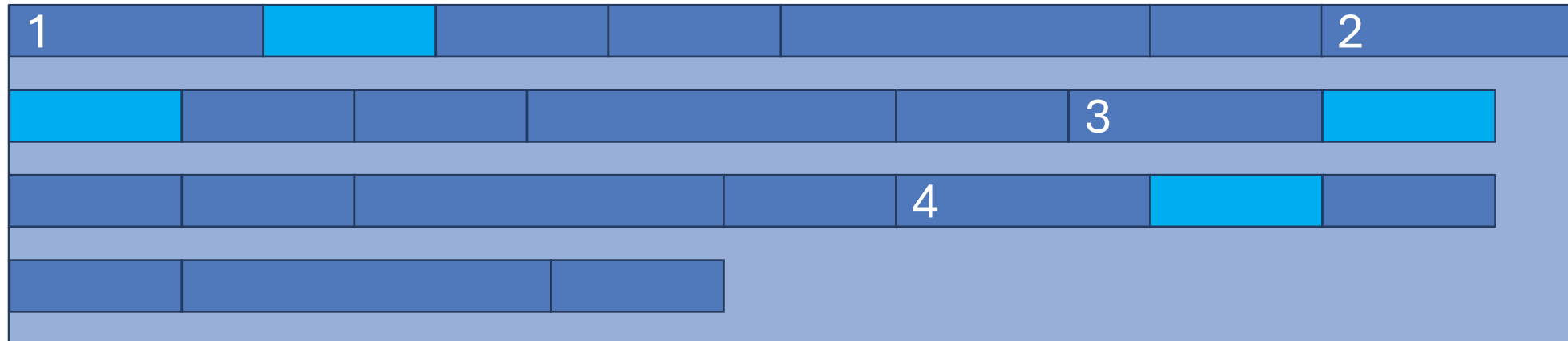


Data Storage in Semantic Models

Row store vs. column store



Obtaining values from a single column

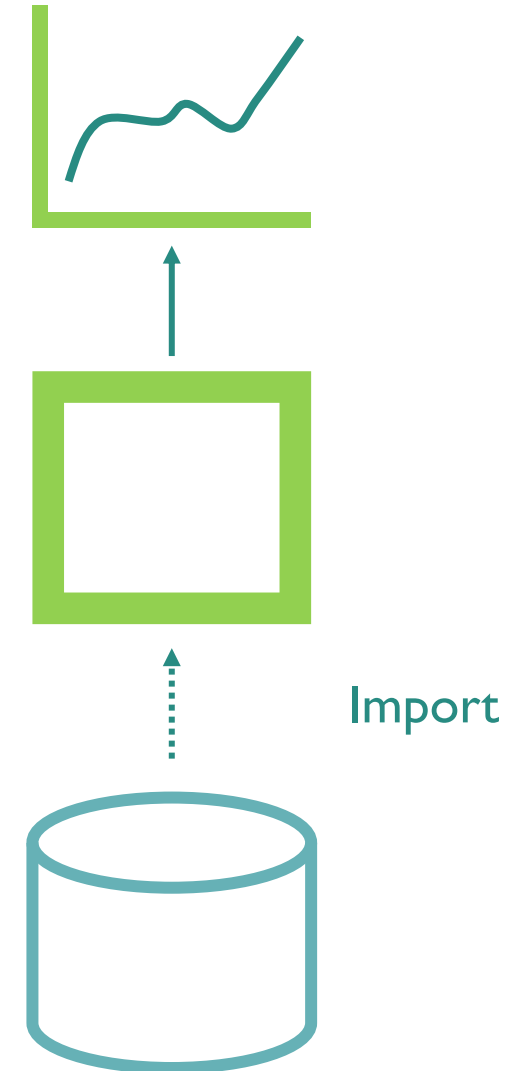


 Column to retrieve



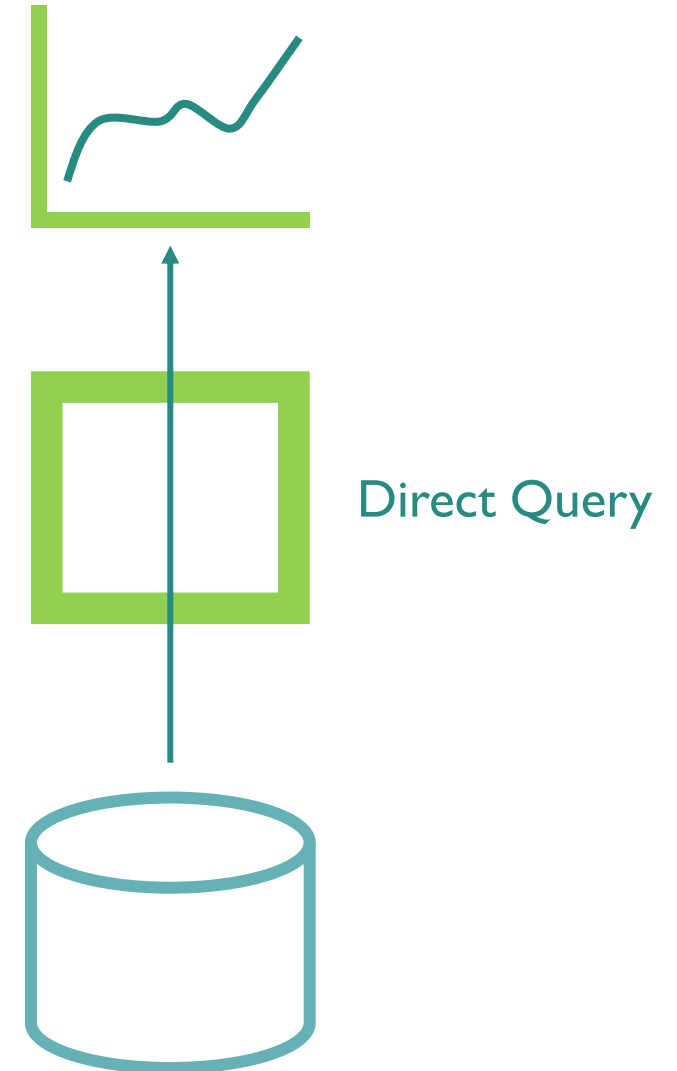
Power BI storage options (1)

- Standard case.
- Data is imported: All data is stored in the column store.



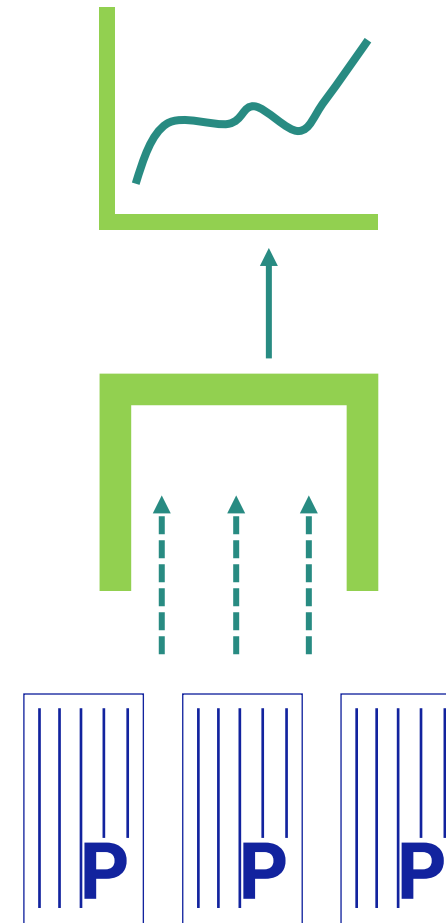
Power BI storage options (2)

- Leave the data in the source.
- Data source is responsible for performance.
- Only on supported data sources. (Must be capable of processing queries.)
- Not all DAX functions can be used.



Power BI Storage options (6)

Direct Lake in Microsoft Fabric: DAX processing directly on external tables in column store format



Model Performance

Why model performance matters

- The semantic model provides all data for visuals
- Power BI visual reports are interactive
- With each user interaction, new data needs to be retrieved from the model

- Let's see import and Direct Query in action! (**Demo!**)



Import vs. Direct Query

Import:

- Fast
- But: needs processing, therefore not (near) real-time

Direct Query:

- ‘Real-time’
- But: typical data source not optimized for BI queries, therefore slow

What if we need both?



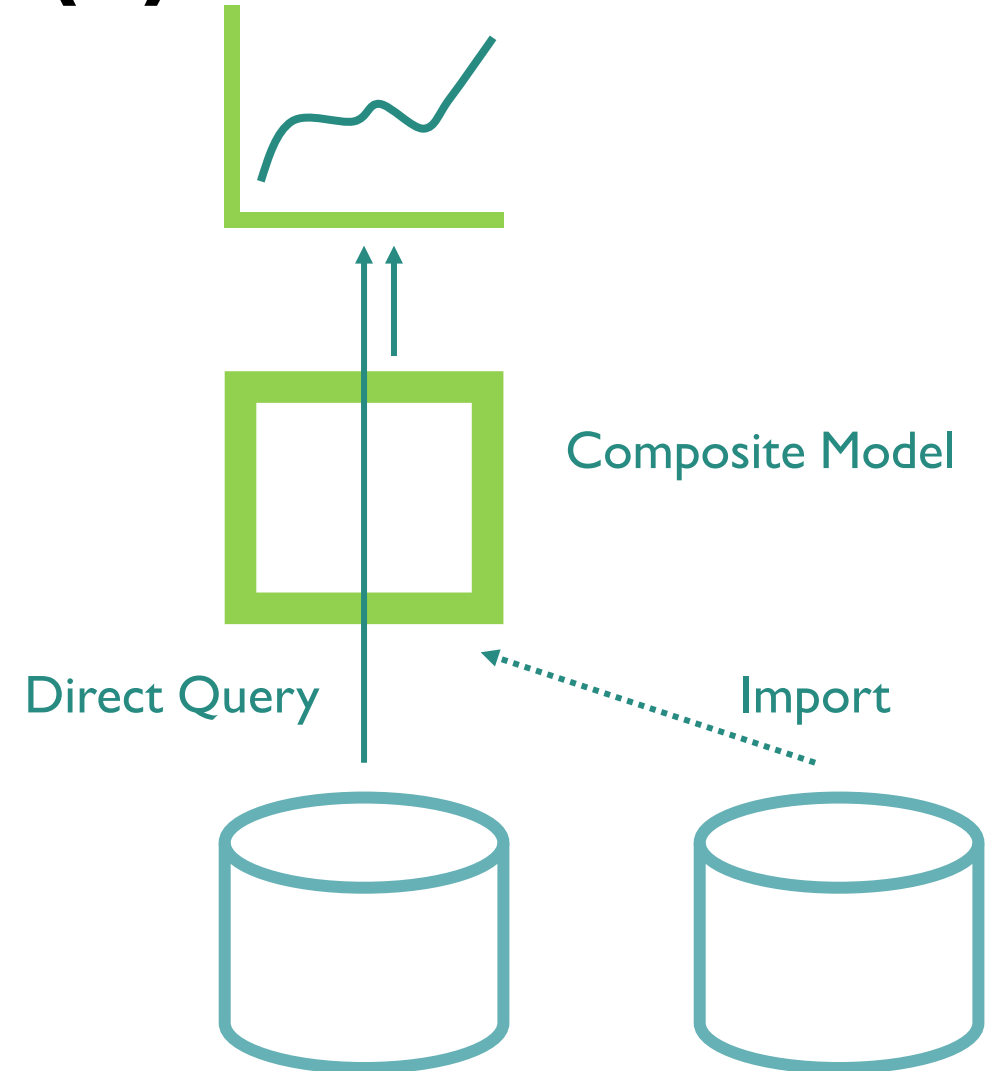
Hybrid Tables

Power BI storage options (3)

Combination of import and Direct Query.

Options per table:

- Import
- Direct Query
- Hybrid: Part import and part Direct Query.
- Dual: both import and Direct Query

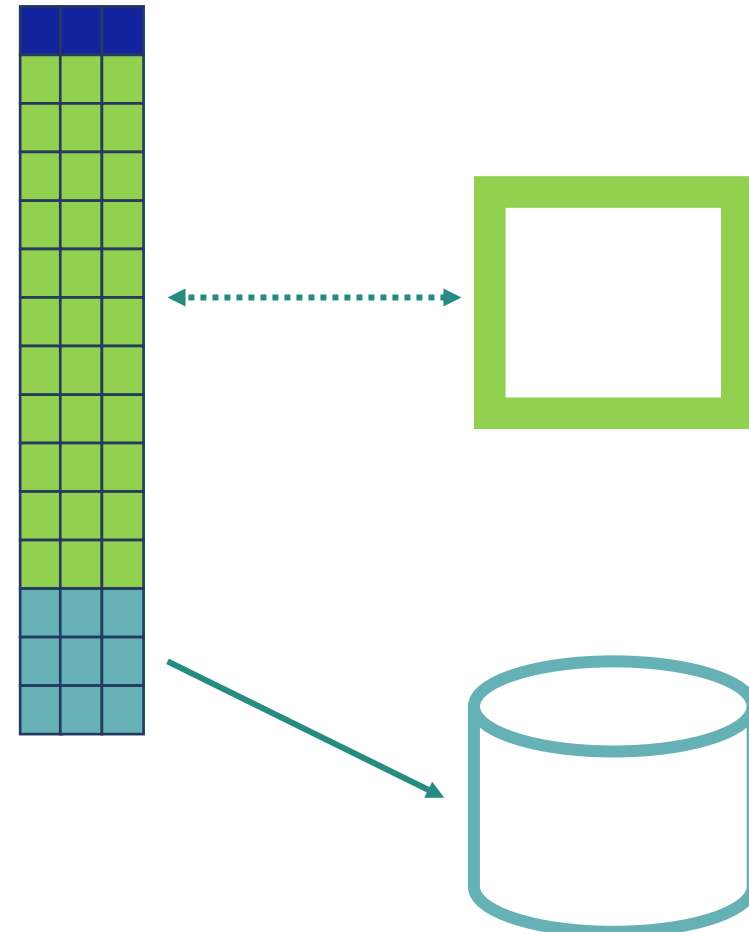


What is a Hybrid Table

Combination of import and Direct Query:

- Most data is imported
- Recent or new data is available through Direct Query

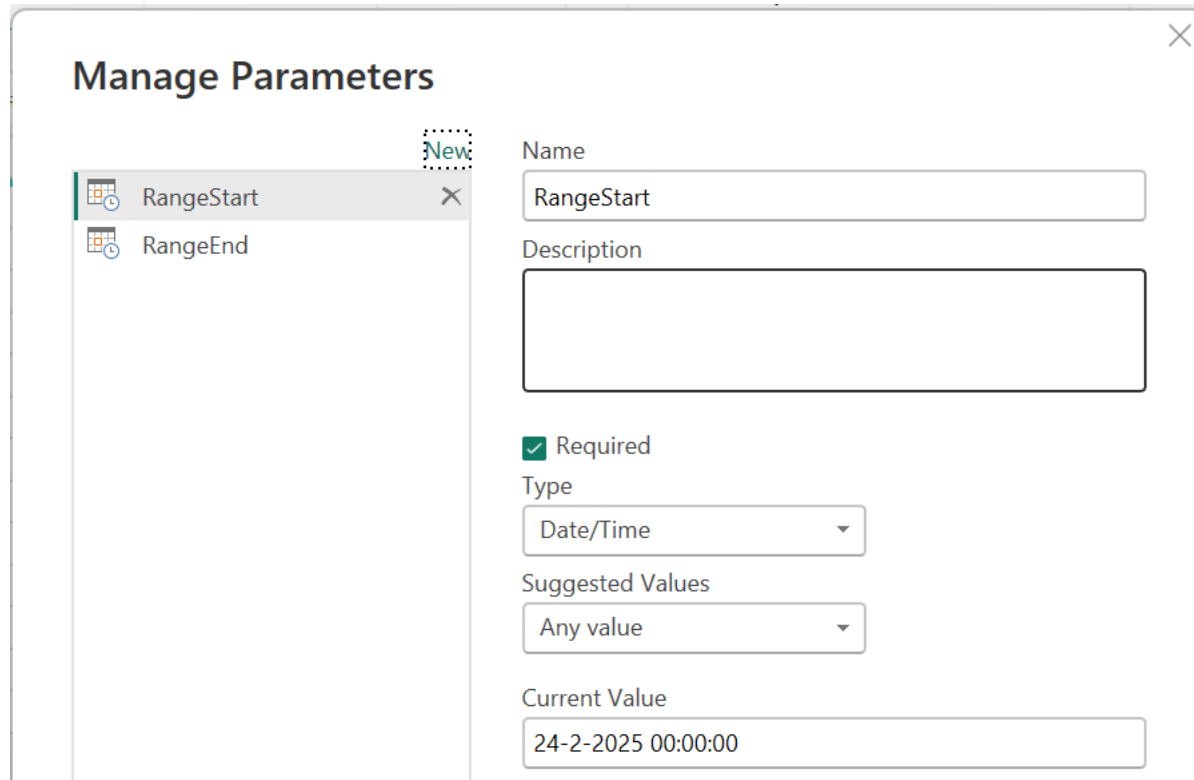
This means that every visual queries both the model and the data source!



Setting up a Hybrid Table

Incremental Refresh (1)

- Set up parameters *RangeStart* and *RangeEnd*
- Filter your data using these parameters



Manage Parameters

New

RangeStart

RangeEnd

Name
RangeStart

Description

Required

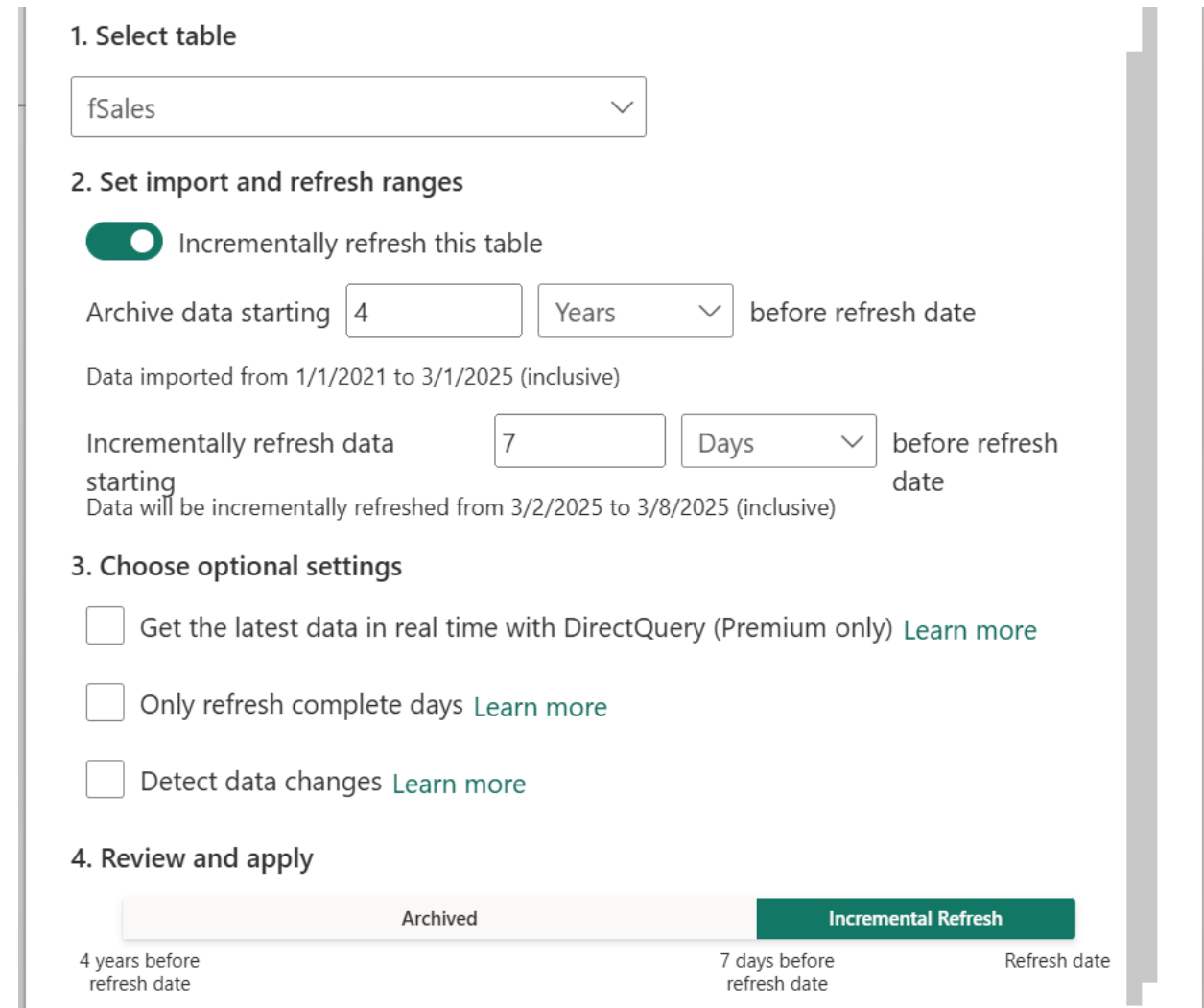
Type
Date/Time

Suggested Values
Any value

Current Value
24-2-2025 00:00:00

Incremental Refresh (2)

- Enable incremental refresh
- Set the refresh policy



1. Select table

fSales

2. Set import and refresh ranges

Incrementally refresh this table

Archive data starting 4 Years before refresh date

Data imported from 1/1/2021 to 3/1/2025 (inclusive)

Incrementally refresh data starting 7 Days before refresh date

Data will be incrementally refreshed from 3/2/2025 to 3/8/2025 (inclusive)

3. Choose optional settings

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

Only refresh complete days [Learn more](#)

Detect data changes [Learn more](#)

4. Review and apply

Archived Incremental Refresh

4 years before refresh date 7 days before refresh date Refresh date

Enable hybrid table

Check the **Get the latest date in real time** option

3. Choose optional settings

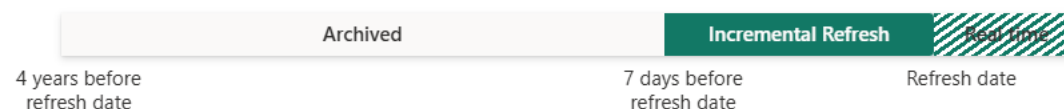
Get the latest data in real time with DirectQuery (Premium only) [Learn more](#)

Real-Time data will be from 3/8/2025 (inclusive) onwards

Only refresh complete days [Learn more](#)

Detect data changes [Learn more](#)

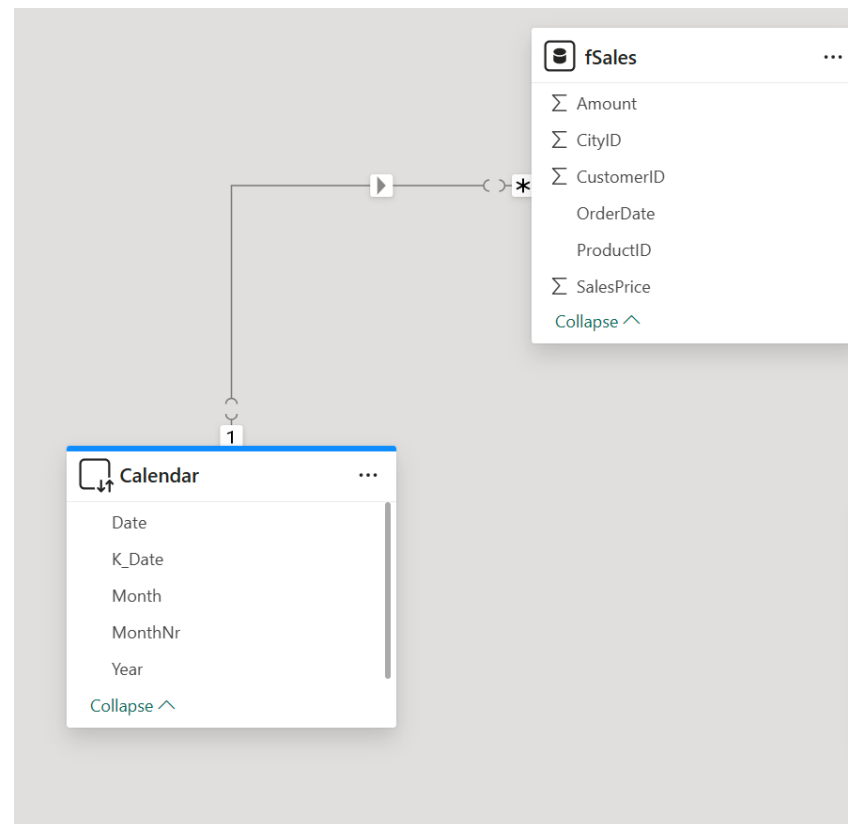
4. Review and apply



Caveats

Caveat 1: related tables

Filter or dimension tables should be in *Dual Mode*



Caveat 2: source query performance

The data source must efficiently handle queries that retrieve data *after* the DateEnd parameter

- For a SQL source, this means you need to have a proper index on the date/time column

(Slow) Demo!



Caveat 3: report page refresh

The report page will **not** automatically show new data

You need to set this up yourself:

- **Auto page refresh** (every x seconds/minutes)
- **Change detection** (when a designated measure changes)



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Session Feedback



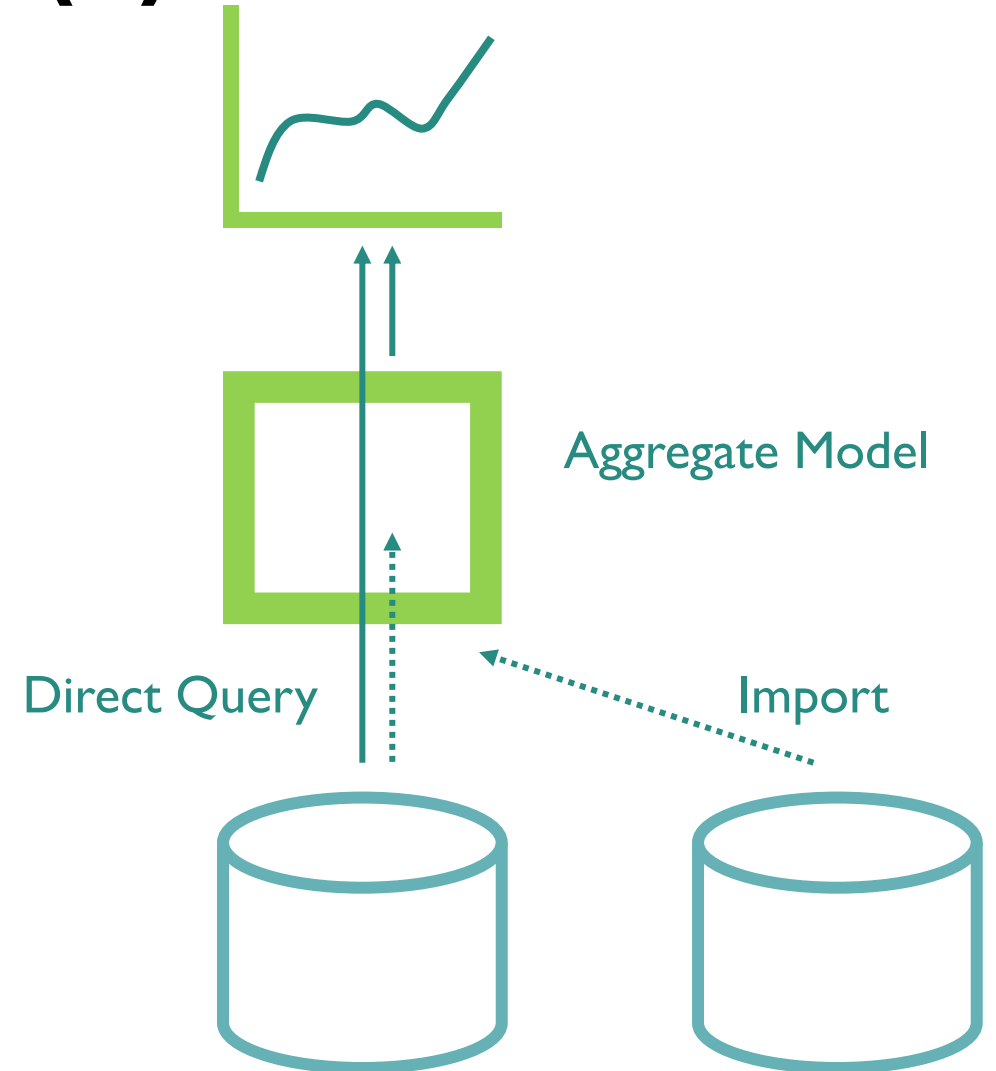
Event Feedback



Reserve

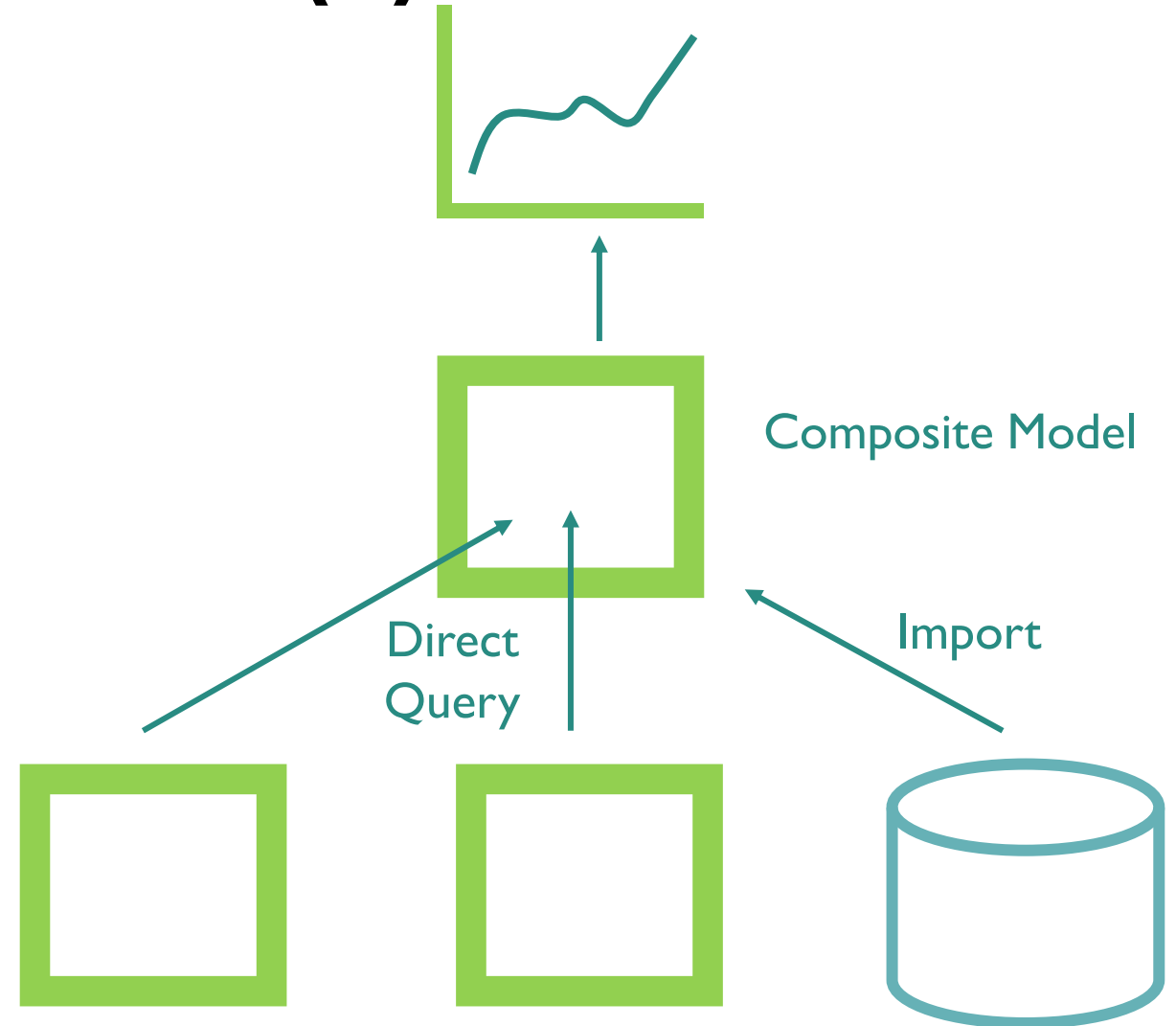
Power BI Storage options (4)

- All details in Direct Query mode and aggregated data in import mode
- Best balance between performance and detailed information



Power BI Storage options (5)

Use other semantic models as a data source via Direct Query.



- Filter tables (dimensions) must be in 'dual mode' (what is that?)
- Need proper indexing on the data source
 - Demo!
- Automatic page refresh

- What about Direct Lake?



- Incremental refresh
 - RangeStart, RangeEnd parameters
 - Mind query folding!
 - Development vs Production
- ‘New data available through Direct Query’ setting
 - Power BI Premium only!
- Demo
 - Hybrid table
 - Power automate flow

1. Select table

fSales

2. Set import and refresh ranges

Incrementally refresh this table

Archive data starting 4 Years before refresh date

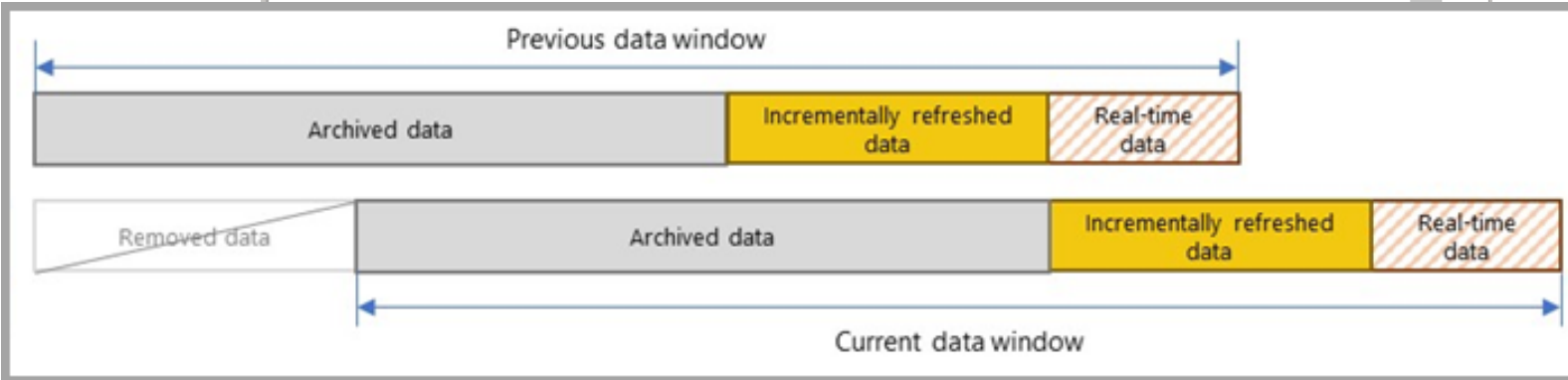
Data imported from 1/1/2021 to 3/1/2025 (inclusive)

Incrementally refresh data 7 Days before refresh date
Data will be incrementally refreshed from 3/2/2025 to 3/8/2025 (inclusive)

Refresh data

Refresh. Plus, get the latest data in real time

dataset to the Power BI service. Once you do Power BI Desktop. [Learn more](#)

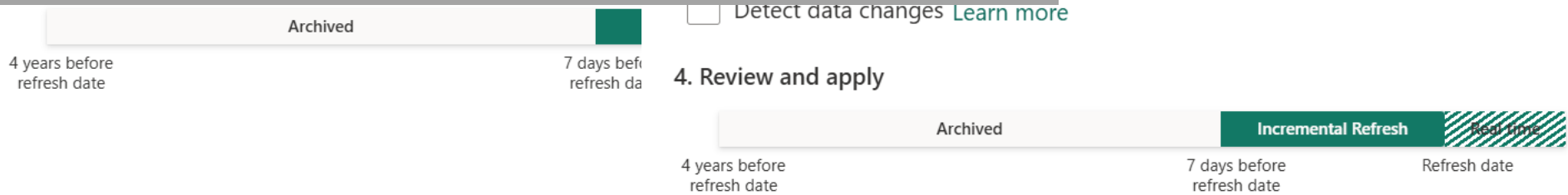


with DirectQuery (Premium only) [Learn more](#)

(inclusive) onwards

[Learn more](#)

4. Review and apply



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