



# Microsoft Fabric

## COMMUNITY CONFERENCE

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# **Tips and Tricks for Microsoft Fabric Data Warehouse**

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# Agenda

Brief overview of Microsoft Fabric Data Warehouse

Design for performance

Direct Lake mode in Power BI

Workarounds for T-SQL limitations

My ELT patterns

# What is Microsoft Fabric?

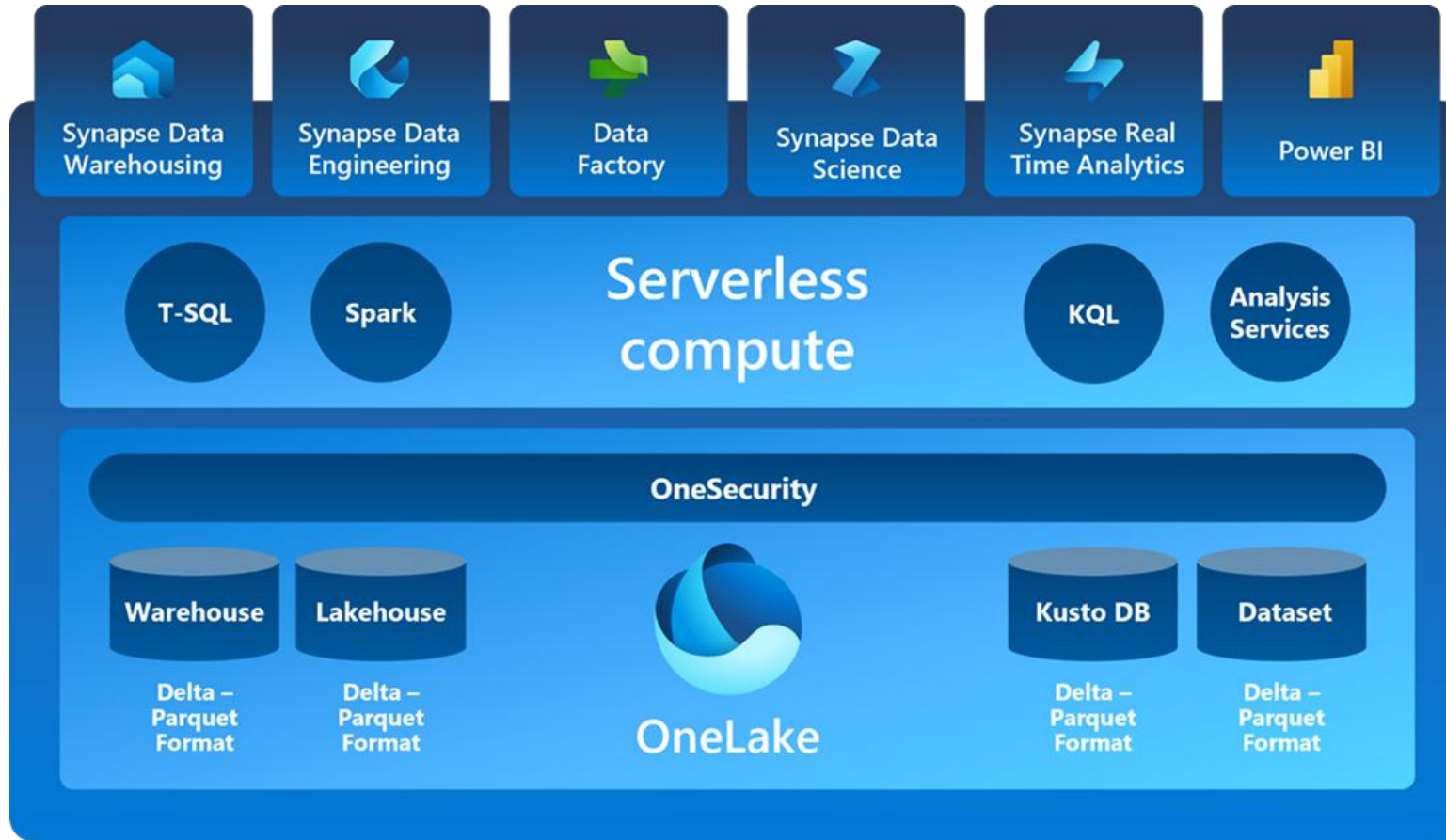
Microsoft's next generation all-in-one data analytics product

Full integration of data warehousing, data engineering, and data science tools into the same portal as Power BI (reporting and data visualization)

Software-as-a-Service (SaaS) rather than Platform-as-a-Service (PaaS)

One copy of data in the integrated OneLake data lake

# SaaS Foundation



# What is Fabric DW?

T-SQL based data warehousing experience

Denormalized tables optimized for reporting

Stored Procedures

Parquet Files

Queryable through query tools, incl. Power BI

# 1. Consider Latency

Collocate resources where possible

Network latency between client and compute

Network latency between compute and shortcuts

Data latency of large result sets

<https://learn.microsoft.com/en-us/fabric/data-warehouse/guidelines-warehouse-performance>



## 2. Table Design - Star Schema

Denormalized data

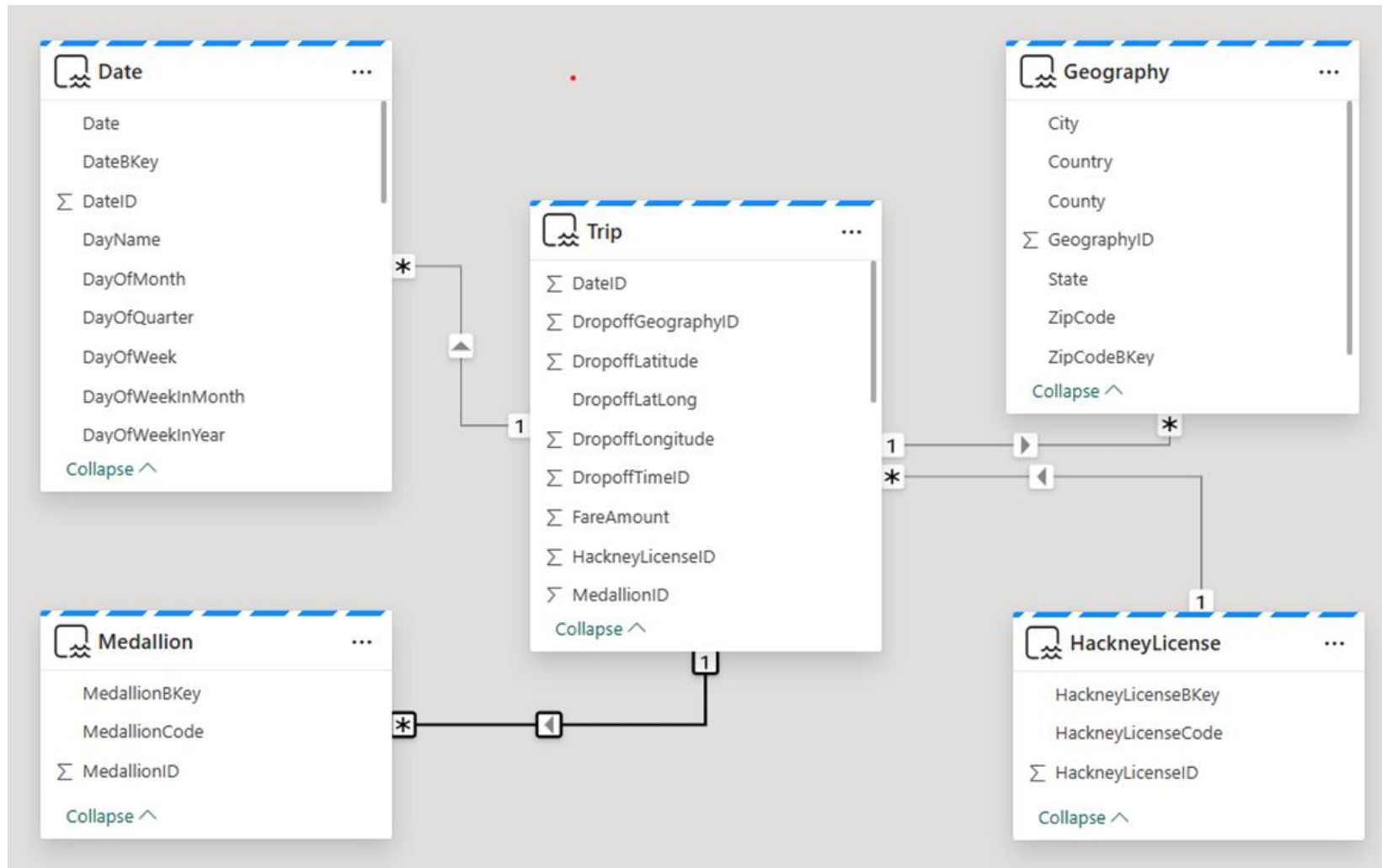
Fact tables - countable data

Dimension tables - slicing-and-dicing

Also will include integration tables

<https://learn.microsoft.com/en-us/fabric/data-warehouse/guidelines-warehouse-performance>

## 2. Table Design - Star Schema



# 3. Table Design - Data Types

Use the smallest data type possible

Use data types supported by parquet

Use NOT NULL instead of NULL where possible, especially primary/foreign key fields

Validate table schemas created by tools (e.g. Pipelines)

<https://learn.microsoft.com/en-us/fabric/data-warehouse/data-types>

# 3. Table Design - Data Types

<code>year bigint</code>	->	<code>year int</code>
<code>amount decimal</code>	->	<code>amount decimal(p, s)</code>
<code>code_id varchar(10)</code>	->	<code>code_id int</code>
<code>name char(50)</code>	->	<code>name varchar(50)</code>
<code>id bigint</code>	->	<code>id bigint NOT NULL</code>
<code>name varchar(8000)</code>	->	<code>name varchar(50)</code>

# Data Pipeline Demo

# 4. Direct Lake Considerations

Power BI Direct Lake mode (diagram next slide)

Several current limitations

Limitations detailed at: <https://learn.microsoft.com/en-us/power-bi/enterprise/directlake-overview#known-issues-and-limitations>

Marco Russo on Direct Lake vs. Import Mode:  
<https://www.sqlbi.com/blog/marco/2024/04/06/direct-lake-vs-import-mode-in-power-bi/>



Delta Tables


Fabric analytical engines write parquet in open format



OneLake



Lakehouse/  
Warehouse



Lakehouse/  
Warehouse

DirectQuery

Import



Copy of Tables

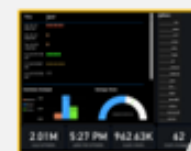


Power BI

Slow, but real-time

Fast, but latent and duplicative

Perfect!!



Data Analyst

# Unsupported in Direct Lake

Model contains tables from more than one warehouse

Model contains calculated columns and tables

Model contains relationships based on datetime columns

Key column data types do not coincide or are not unique



# Fallback to DirectQuery

A query reads data from a view contained in the model

SSO authentication is used when SQL endpoint security has been defined

# Schema Patterns for Direct Lake

On premises / Not using Direct Lake:

- fact and dim contain tables

- data and lookup contain views

- etl contains orchestration items

In Fabric DW for Direct Lake:

- data and lookup contain tables

- etl contains orchestration items

# 5. Modeling Dimension Tables

Slowly-changing dimensions

Dimension metadata fields

Sentinel values

# Slowly-Changing Dimensions

Type 0 - no updates

calendar / date tables

Type 1 - update in place; no historical record reqd.

college example - student name

Type 2 - data versioning

college example - gender and ethnicity

Can mix within same dimension table

# Dimension Metadata Fields

Source System Name

Source System Key

SCD Type 1 Hash Value

SCD Type 2 Hash Value

Active Record Flag

Start Effective Date (in warehouse)

End Effective Date (in warehouse)

Record Last Updated Date/Time

# Sentinel Values

Default dimension members

Unknown

e.g. Student record mismatch

Missing

e.g. Student grades for in-process classes

# 6. T-SQL Limitations

True lift-and-shift not quite there yet

Several T-SQL enhancements on the DW product roadmap

# T-SQL Limitation #1

No temp tables

Making complex business logic simpler

Separating complex business logic from “plumbing”

Workaround - Physically materialize a table in temp schema

But watch out for - Concurrent updates



# T-SQL Limitation #2

No INSERT INTO... EXEC from a stored procedure

Re-locate transformation logic

Separating complex business logic from “plumbing”

Workaround - Use physical “temp” tables

But watch out for - Concurrent updates

# T-SQL Limitation #3

No MERGE statement

Is this really a limitation? 😊

Workaround - Separate INSERT and UPDATE statements

But watch out for - Handling transactions

# T-SQL Limitation #4

No IDENTITY() columns

Workaround - Use ROW\_NUMBER() function plus a seed

But watch out for - No real issues here

# 7. Leverage the Lakehouse

File Storage

Medallion Architecture options

Bronze and Silver layers in the Lakehouse

Gold layer in the Warehouse

Lakehouse shortcuts to Data Warehouses in different workspaces

# Resources

<https://github.com/DrJekyll325/Presentations>

[aka.ms/fabric-learn](https://aka.ms/fabric-learn)

[aka.ms/FabricRoadmap](https://aka.ms/FabricRoadmap)

# Session Feedback Surveys

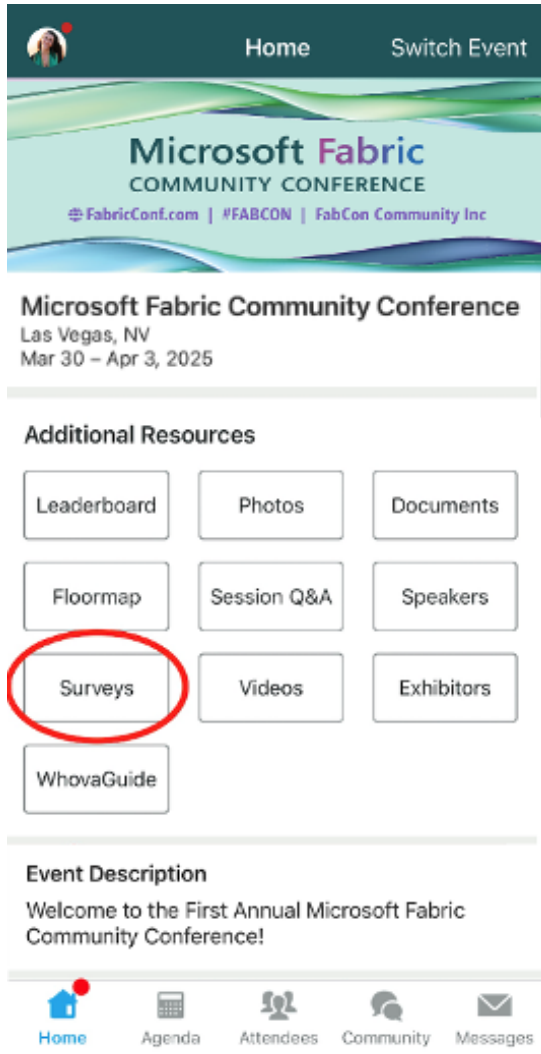
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