

Fast and Furious Power BI Direct Lake

Reza Rad



RADACAD

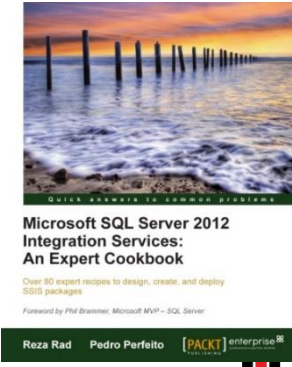
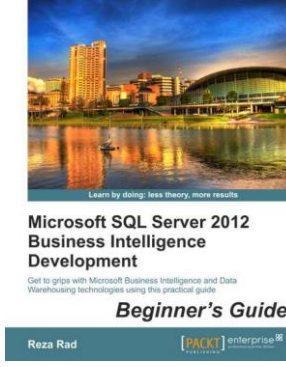
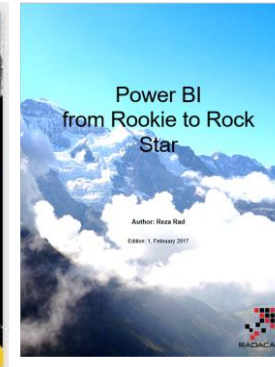
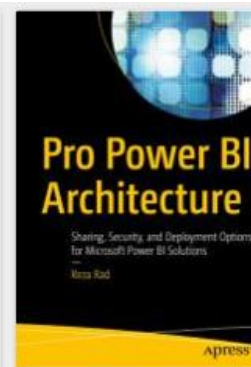




Reza Rad



Consultant, Mentor, Trainer, Speaker
Blogger since 2009 and YouTuber since 2018
Microsoft Regional Director since 2018
Microsoft Data Platform MVP since 2011
Author of 10+ video courses
Author of 13 books
Fasttrack Recognized Solution Architect since 2021
Director of Power BI & Fabric Summit since 2021
Director of Dfinity conferences since 2017





Microsoft Fabric

The unified data platform for the era of AI



Data
Factory



Data
Engineering



Data
Warehouse



Data
Science



Real-Time
Intelligence



Power BI



AI



OneLake

Demo

Demo

Delta Lake

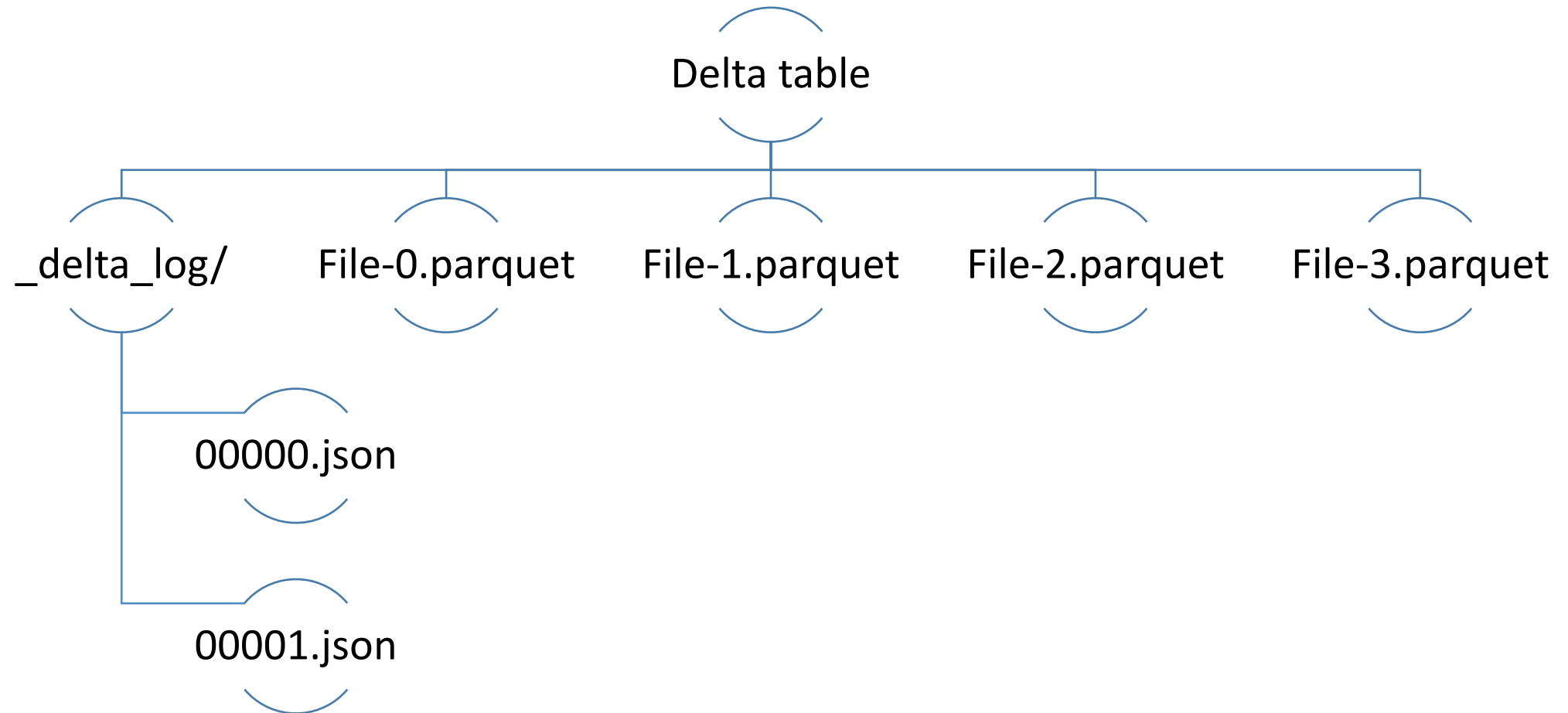
- Delta Lake: Open-source storage layer
- Delta Lake table format: Common format from the Linux, used in Apache Spark



Benefits of Delta Lake

- ACID transactions
- Versioning and **time travel**
- Audit History
- Updates on the data
- ...

Delta table structure



Parquet

- For storing the data, much smaller than CSV, and performing much faster. Also supporting nested data structure
- Open-source format for storing data in a file
- Optimized for big data processing and Analytics
- They are columnar storage format
- Offers a great compression and encoding



Time Travel

```
%%sql
```

```
DESCRIBE HISTORY <table>
```

Python:

```
df = spark.read.format("delta").option("timestampAsOf", '2022-01-01').load(delta_path)
```

Connection modes in Power BI

- Import Data or Scheduled Refresh
- DirectQuery
- Live Connection
- Composite Mode
- **Direct Lake**

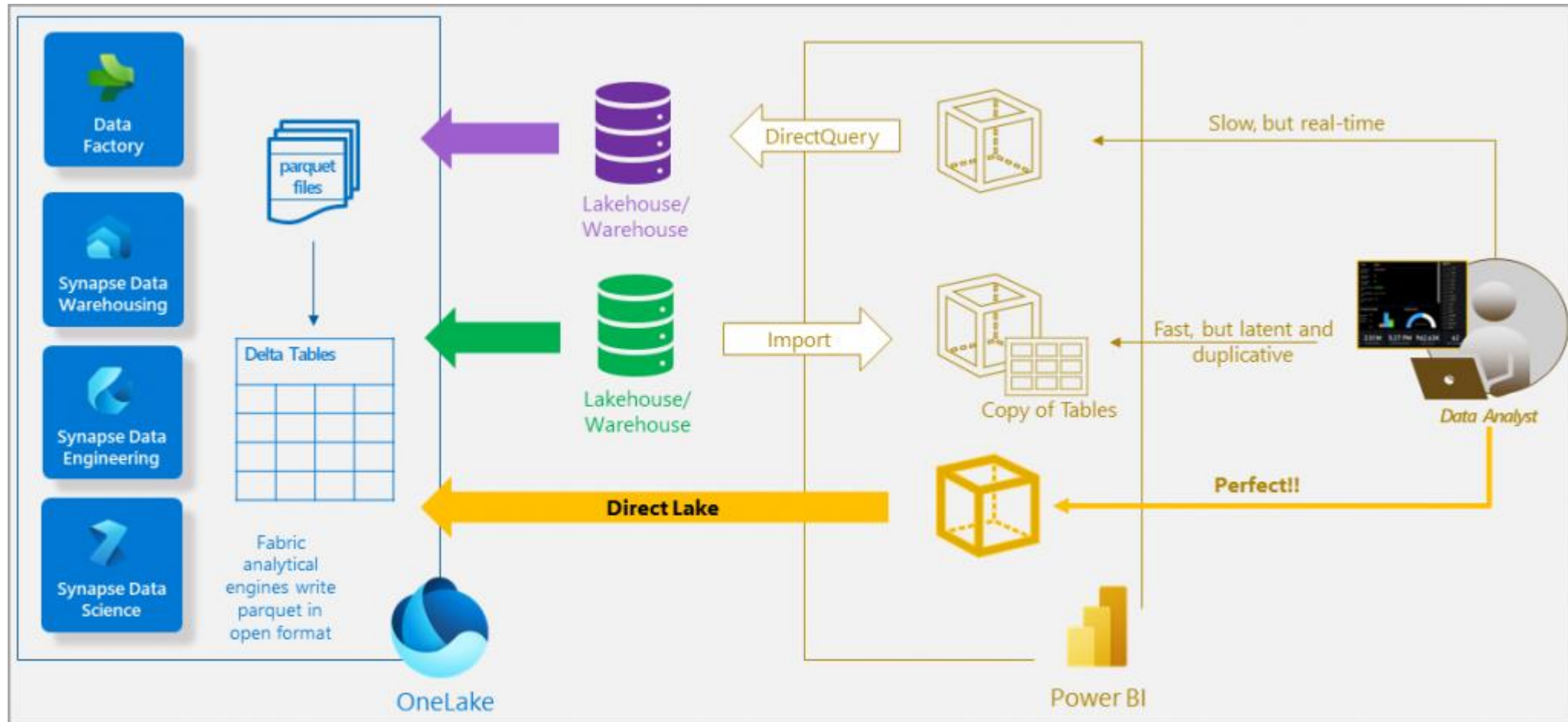
Import Data

- Data will be IMPORTED into Power BI
- Uses extra storage
- Super fast
- Needs refresh to get up-to-date data

DirectQuery

- Larger datasets
- Data will remain in the data source
- Power BI will query the data using SQL commands
- No refresh is needed (data is live)
- Slow

Direct Lake



Demo

Refresh | REFRAME

- The default dataset gets refreshed as soon as the Lakehouse's data gets updated
- Custom datasets can be set as “Keep your Direct Lake data up to date” or not

Refresh

Keep your Direct Lake data up to date

Configure Power BI to detect changes to the data in OneLake and automatically update the Direct Lake tables that are included in this dataset. [Learn more](#)



On

Configure a refresh schedule

Define a data refresh schedule to import data from the data source into the dataset. [Learn more](#)



Off

Fallback

To DirectQuery

Fallback

- If the SKU limits exceeds
- Or features used which are not supported (SQL Views ...)
- Then Fallback to DirectQuery happens

Guardrails

| Fabric SKUs | Parquet files per table | Row groups per table | Rows per table (millions) | Max model size on disk/OneLake¹ (GB) | Max memory (GB) |
|--------------------|--------------------------------|-----------------------------|----------------------------------|--|------------------------|
| F2 | 1,000 | 1,000 | 300 | 10 | 3 |
| F4 | 1,000 | 1,000 | 300 | 10 | 3 |
| F8 | 1,000 | 1,000 | 300 | 10 | 3 |
| F16 | 1,000 | 1,000 | 300 | 20 | 5 |
| F32 | 1,000 | 1,000 | 300 | 40 | 10 |
| F64/FT1/P1 | 5,000 | 5,000 | 1,500 | Unlimited | 25 |
| F128/P2 | 5,000 | 5,000 | 3,000 | Unlimited | 50 |
| F256/P3 | 5,000 | 5,000 | 6,000 | Unlimited | 100 |
| F512/P4 | 10,000 | 10,000 | 12,000 | Unlimited | 200 |
| F1024/P5 | 10,000 | 10,000 | 24,000 | Unlimited | 400 |
| F2048 | 10,000 | 10,000 | 24,000 | Unlimited | 400 |

Fallback behavior setup

- **Automatic** - (Default) Specifies queries fall back to *DirectQuery* mode if data can't be efficiently loaded into memory.
- **DirectLakeOnly** - Specifies all queries use Direct Lake mode only. Fallback to DirectQuery mode is disabled. If data can't be loaded into memory, an error is returned. Use this setting to determine if DAX queries fail to load data into memory, forcing an error to be returned.
- **DirectQueryOnly** - Specifies all queries use DirectQuery mode only. Use this setting to test fallback performance.
- The DirectLakeBehavior property can be configured by using Tabular Object Model (TOM) or Tabular Model Scripting Language (TMSL).

```
// Disable fallback to DirectQuery mode.
```

```
//
```

```
database.Model.DirectLakeBehavior = DirectLakeBehavior.DirectLakeOnly = 1;
```

```
database.Model.SaveChanges();
```


Connect & study more



- YouTube

https://www.youtube.com/playlist?list=PLMXQvYI7QV6dn8eYXtlZT9Jc_p67_CfJR



- Blog

<https://radacad.com/category/microsoft-fabric>



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