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Azure Data Factory v2 with Mapping Data Flow (first blood)

Microsoft® MVP Most Valuable Professional

altius

Kamil Nowiński

Principal Microsoft Consultant

Kamil Nowiński

Microsoft Data Platform **MVP**

Speaker, blogger, data enthusiast

Principal Microsoft Consultant at Altius (www.altiusdata.com)

15+ yrs experience as DEV/BI/(DBA)

Member of the Data Community PL

Project member of „SCD Merge Wizard”

Founder of blog SQLPlayer (www.SQLplayer.net)

SQL Server Certificates:

MCITP, MCP, MCTS, MCSA, MCSE Data Platform,

MCSE Data Management & Analytics

Moreover: Bicycle, Running, Digital photography

@NowinskiK, @SQLPlayer

BLOG & Interviews

www.SQLPlayer.net

PODCAST – interviews with...

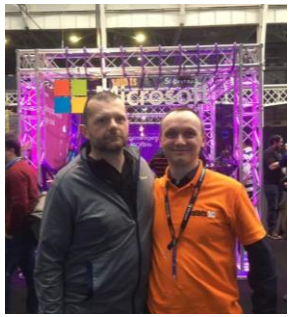










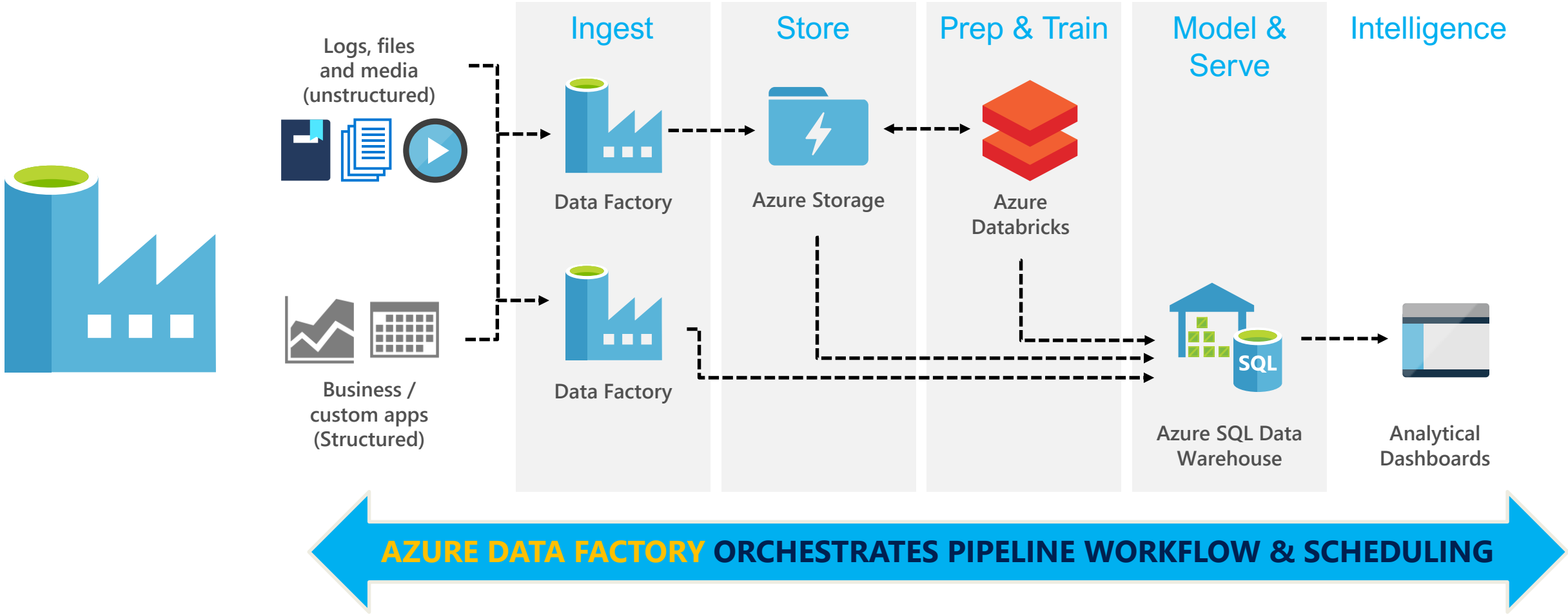





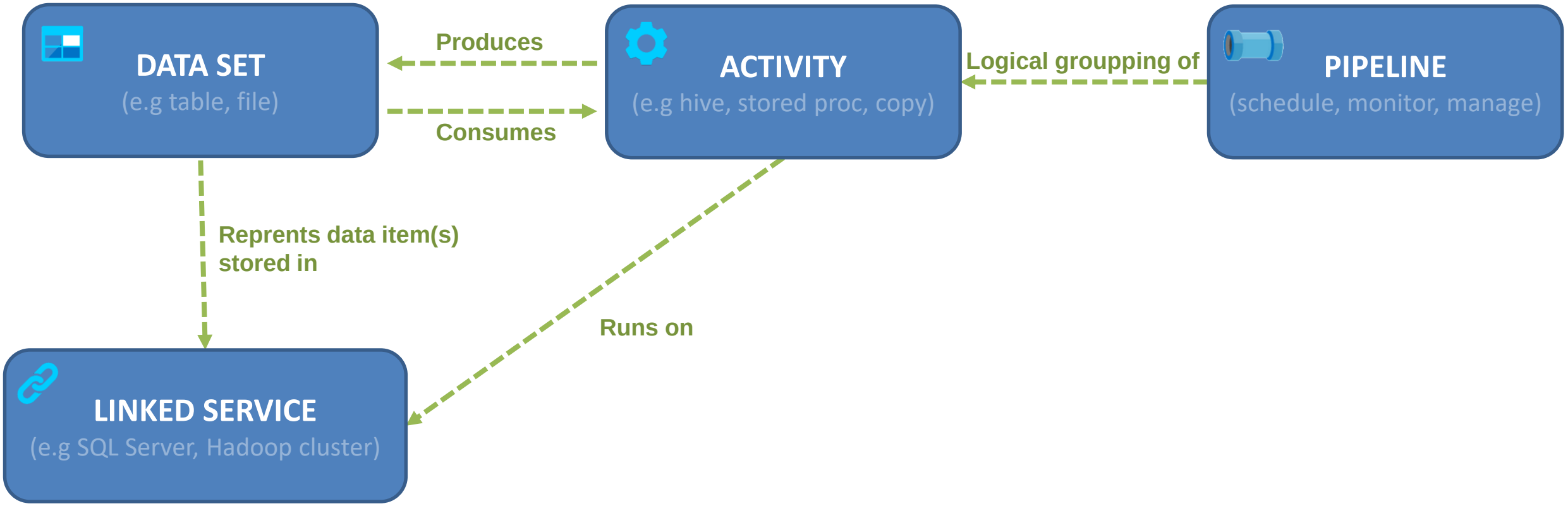




What the Azure Data Factory is?



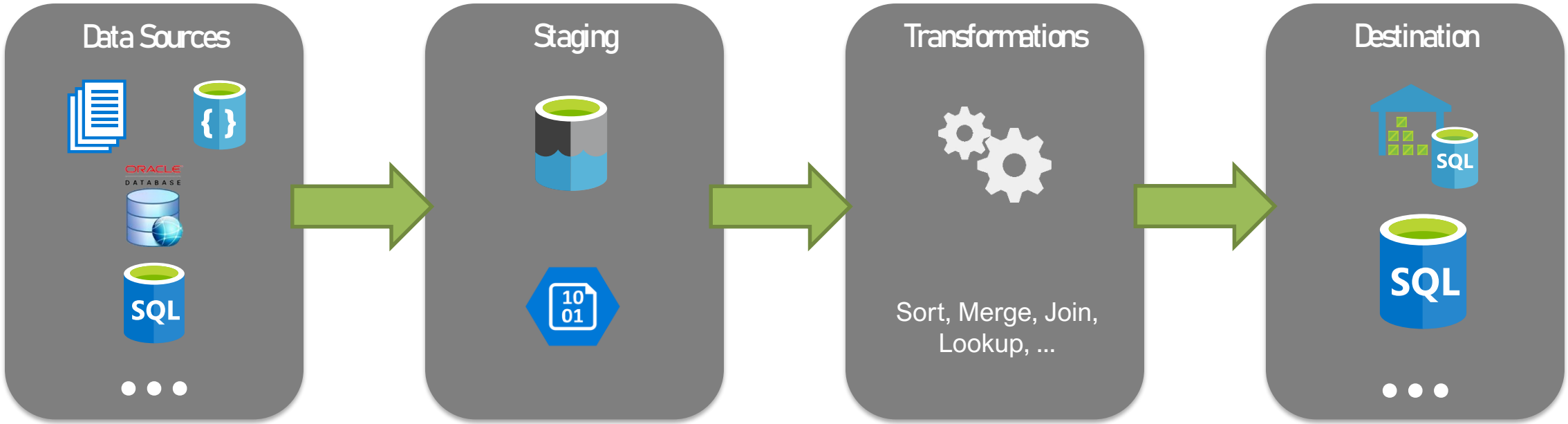
ADF Key Concepts



Visual Data Transformations with

MAPPING DATA FLOW

What the hell (Mapping) Data Flows are?



- Explicit user action
- User places data source(s) on design surface, from toolbox
- Select explicit sources

- Implicit/Explicit
- Data Lake staging area as default
- User does not need to configure this manually
- Advanced feature to set staging area options
- File formats/types: (Parquet, JSON, txt, CSV, ...)

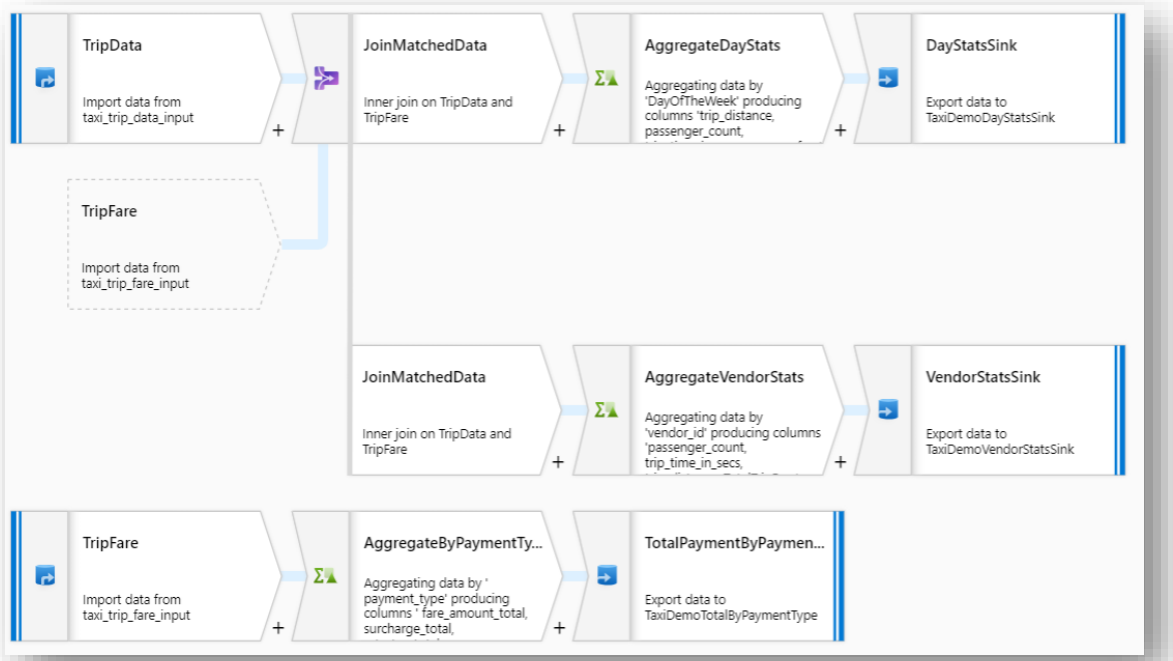
- Explicit user action
- User places transformations on design surface, from toolbox
- User must set properties for transformation steps and step connectors

- Explicit user action
- User chooses destination connector(s)
- User sets connector property options

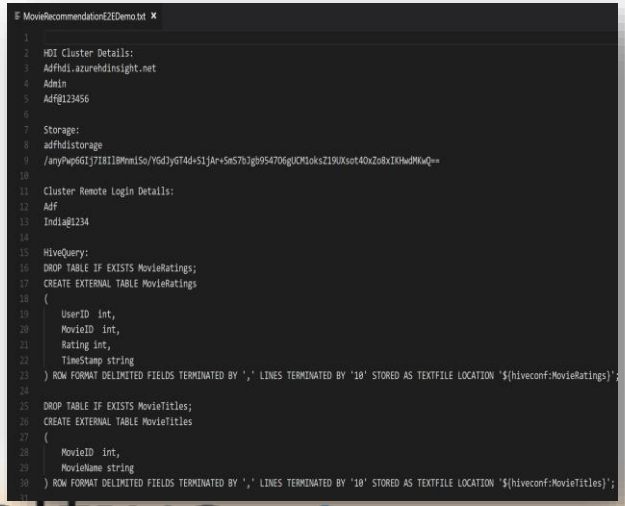
src: (Microsoft) ADF Data Flow Private Preview Overview

Code-free Data Transformation at Scale

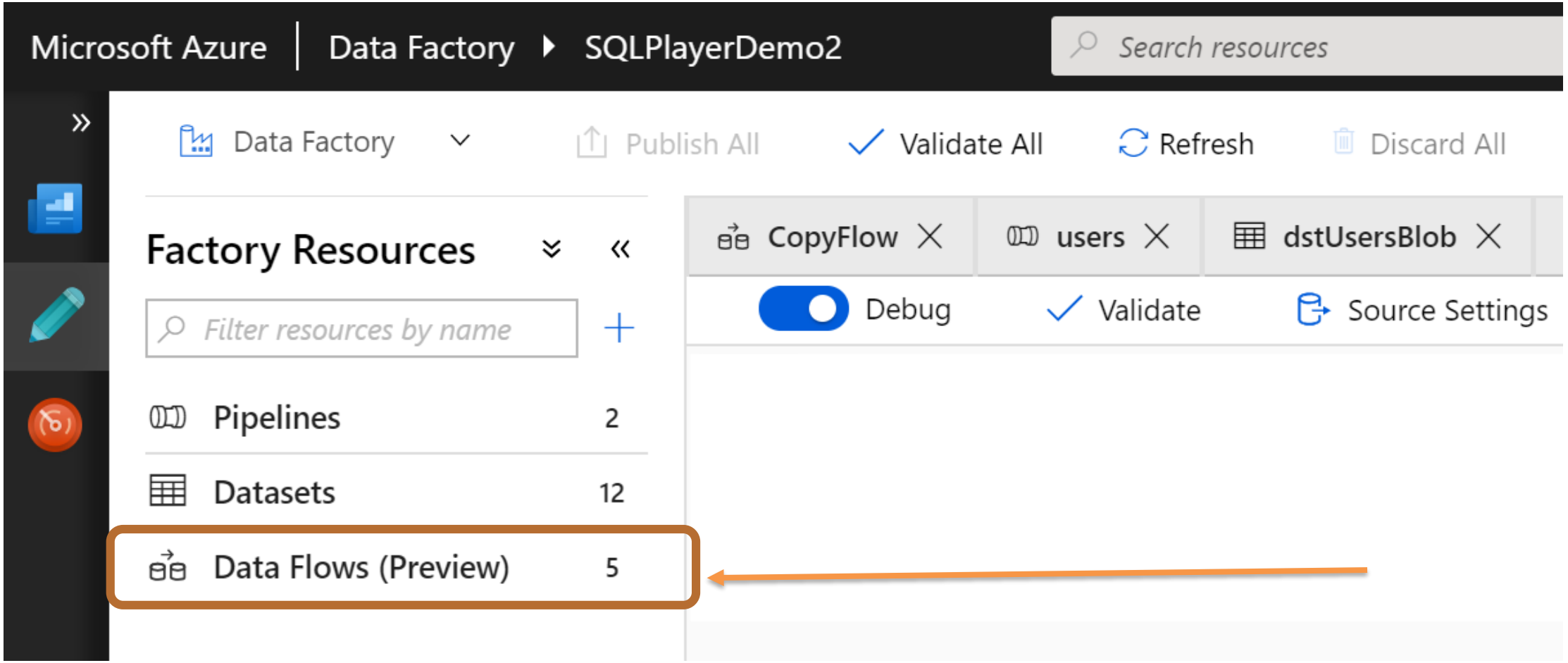
- Does not require understanding of Spark, Big Data Execution Engines, Clusters, Scala …
- Focus on building business logic and data transformation
  - Data cleansing
  - Aggregation
  - Data conversions
  - Data prep
  - Data exploration
  - ETL Data Loading into DW



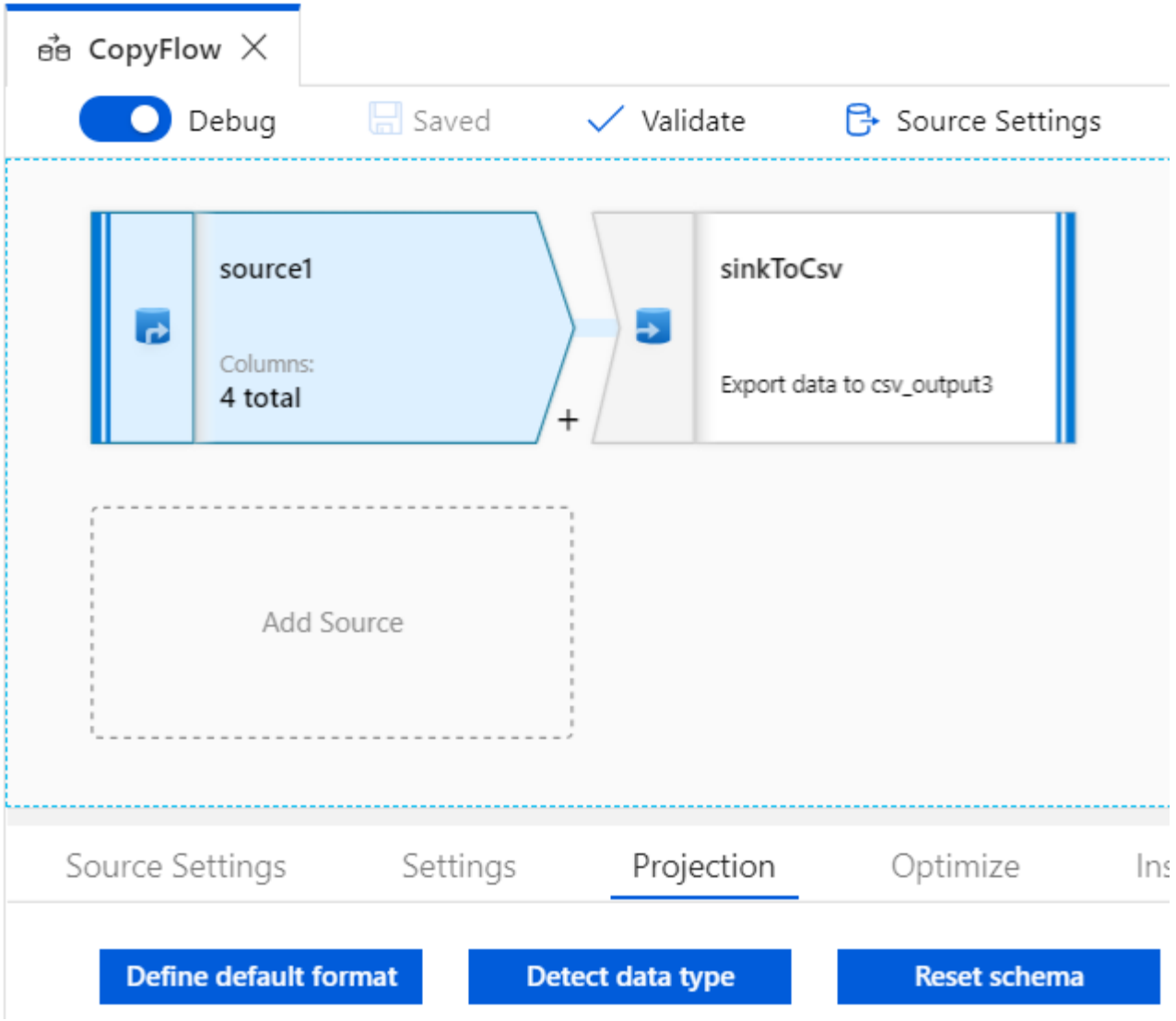
… not



Authoring of Azure Data Factory (v2) – what's new?



Simple Copy Flow



Mapping Data Flow: Components = Actions *

Multiple inputs/outputs

- New branch
- Join
- Conditional Split
- Exists
- Union
- Lookup

Schema modifier

- Derived Column
- Select
- Aggregate
- Surrogate Key
- Pivot
- Unpivot
- Window

Row modifier

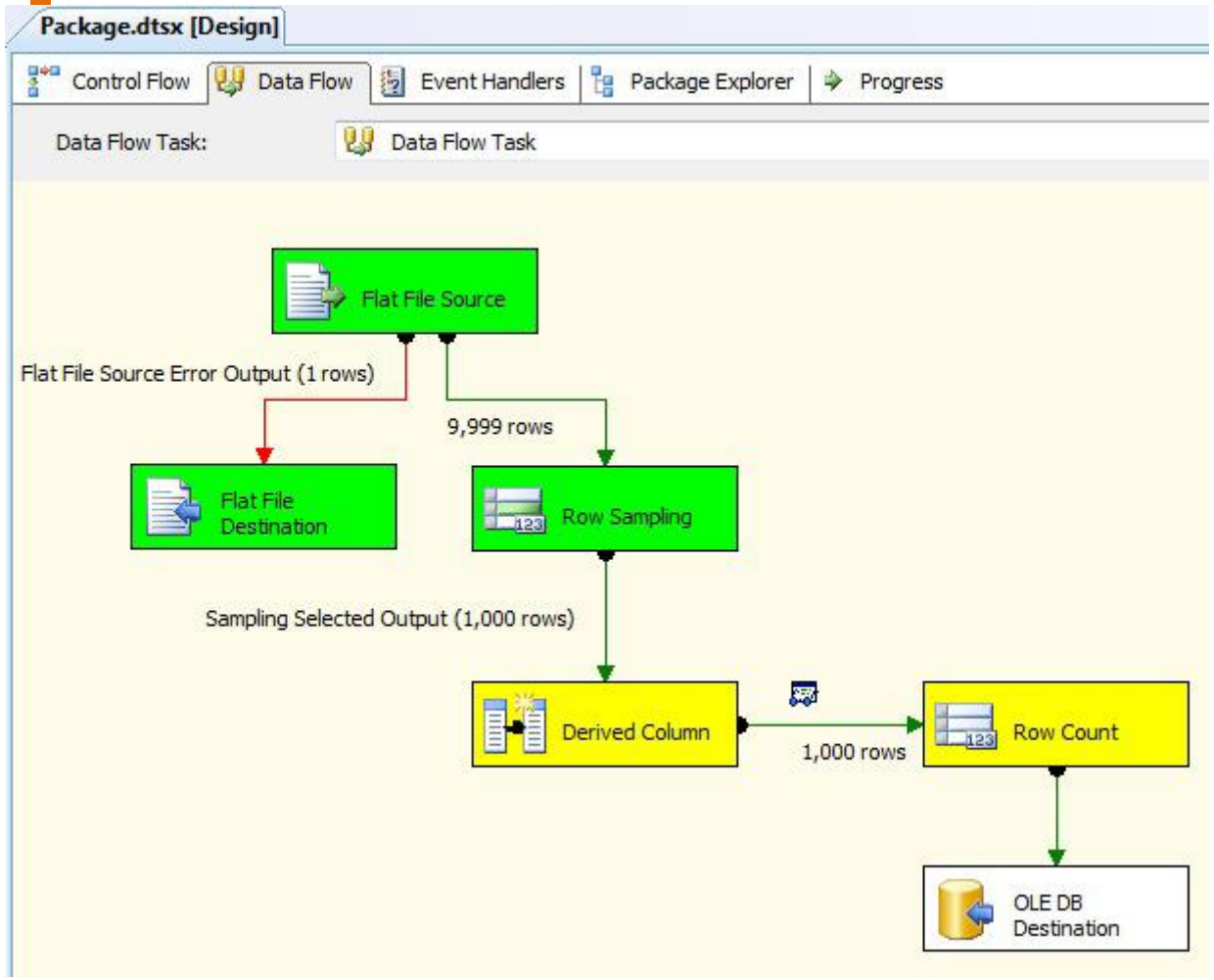
- Filter
- Sort
- Alter Row

Destination

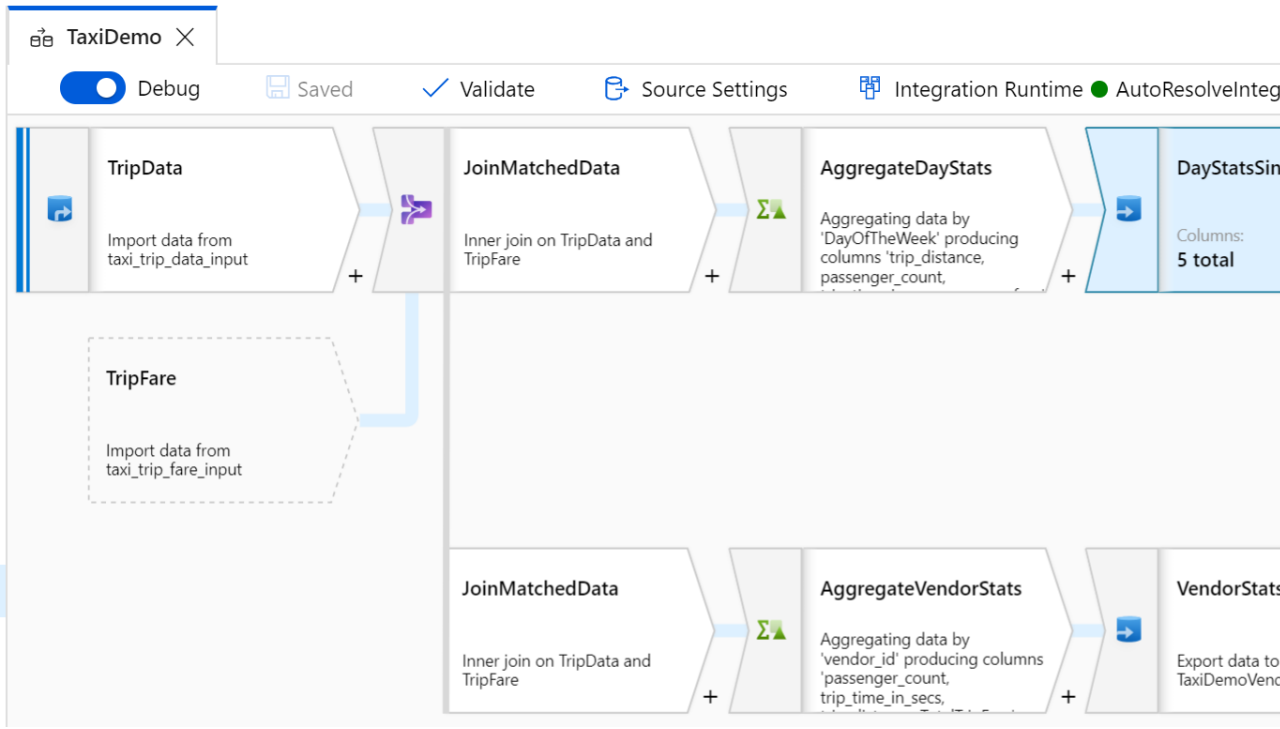
- Sink

* With some small exceptions

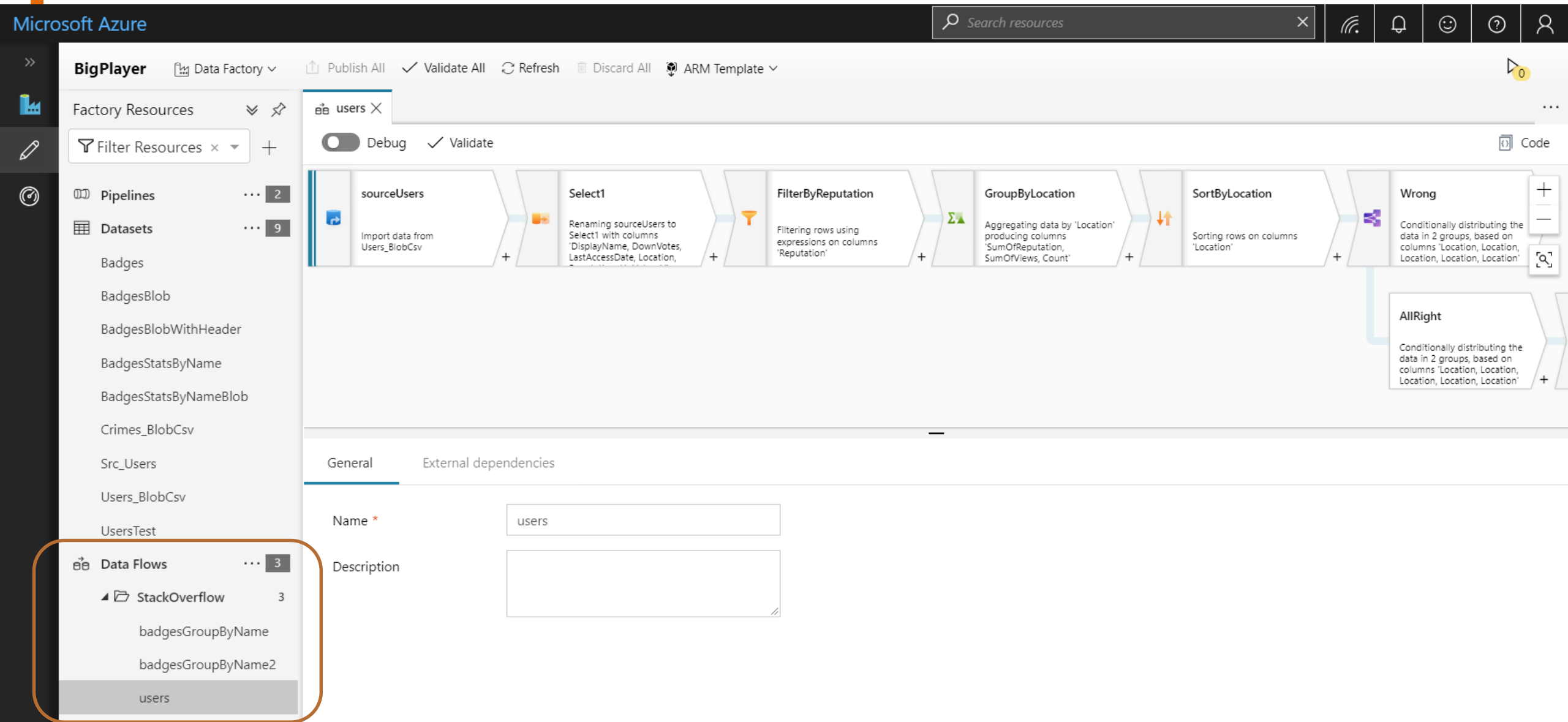
SSIS Data Flow VS ADF Mapping Data Flow



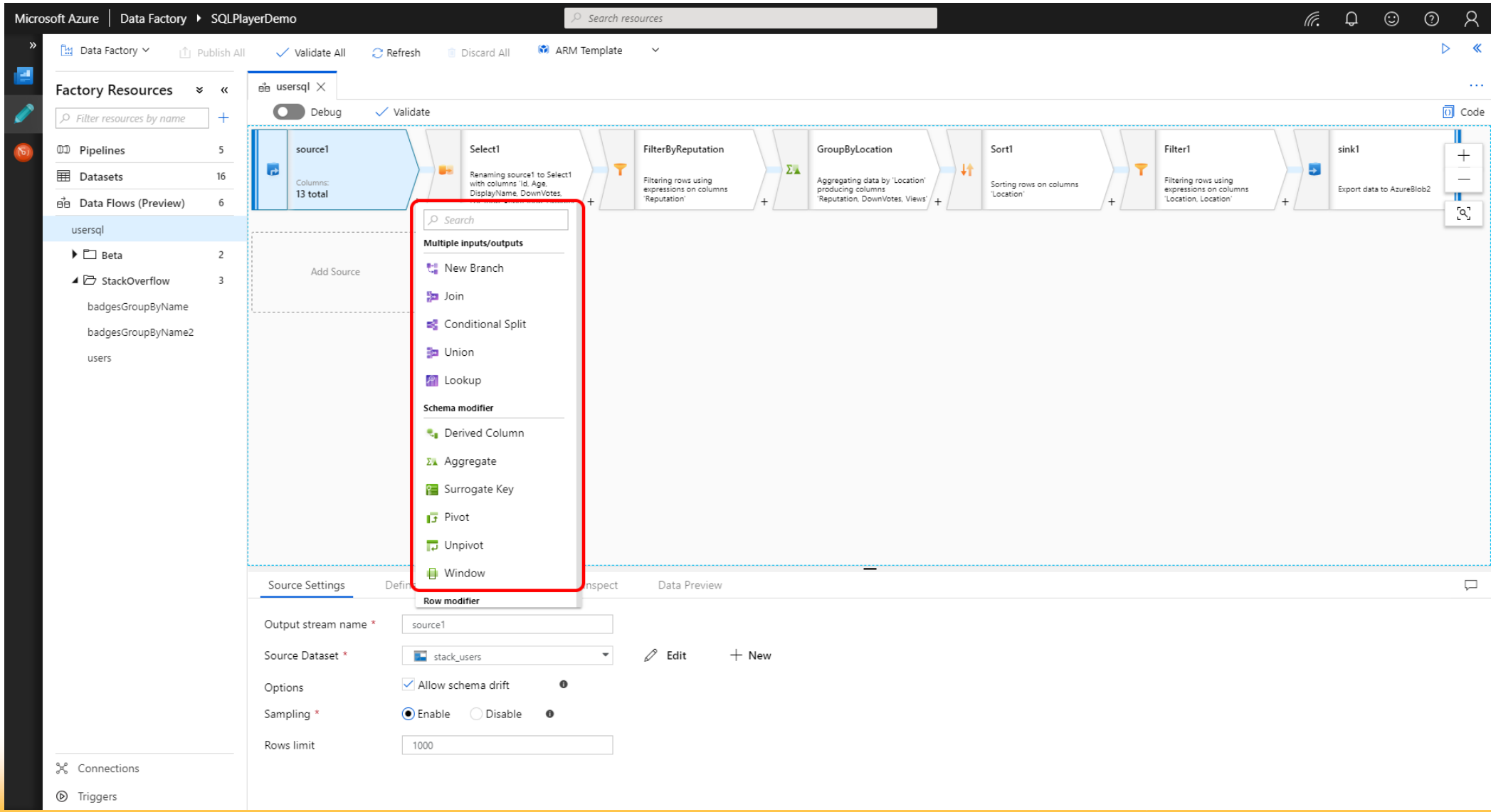
https://www.red-gate.com/simple-talk/sql/ssis/debugging-data-flow-in-sql-server-integration-services/



Authoring of Azure Data Factory (v2)

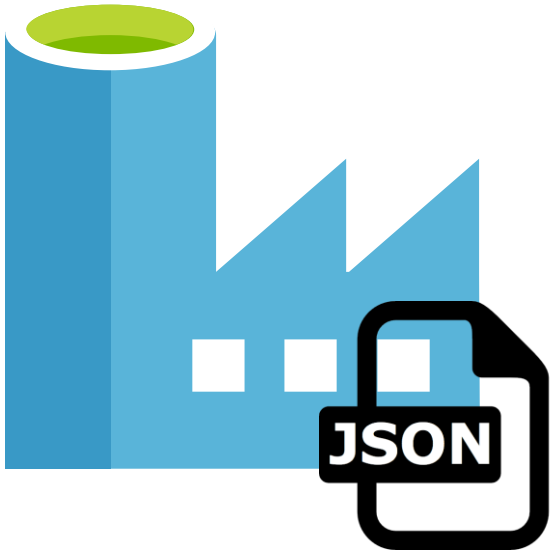


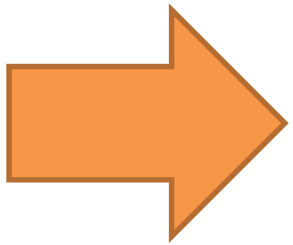
Guided experience to build data flows

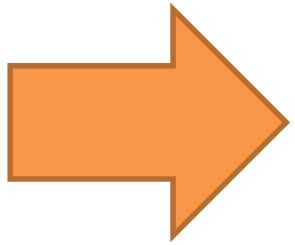


SQL Player
Play with data & have fun!

What is going on behind the scenes?





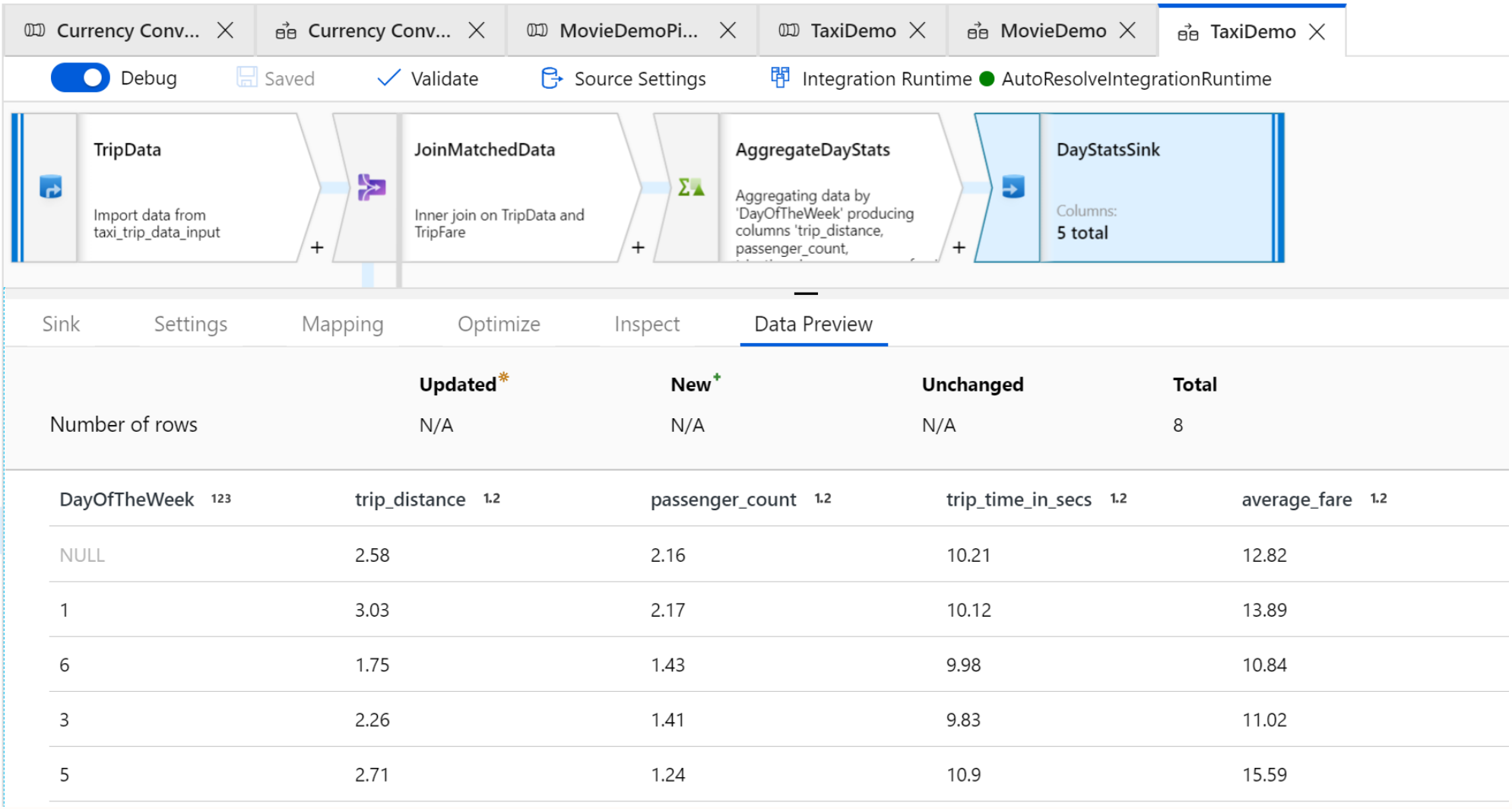


JAR

Azure Databricks

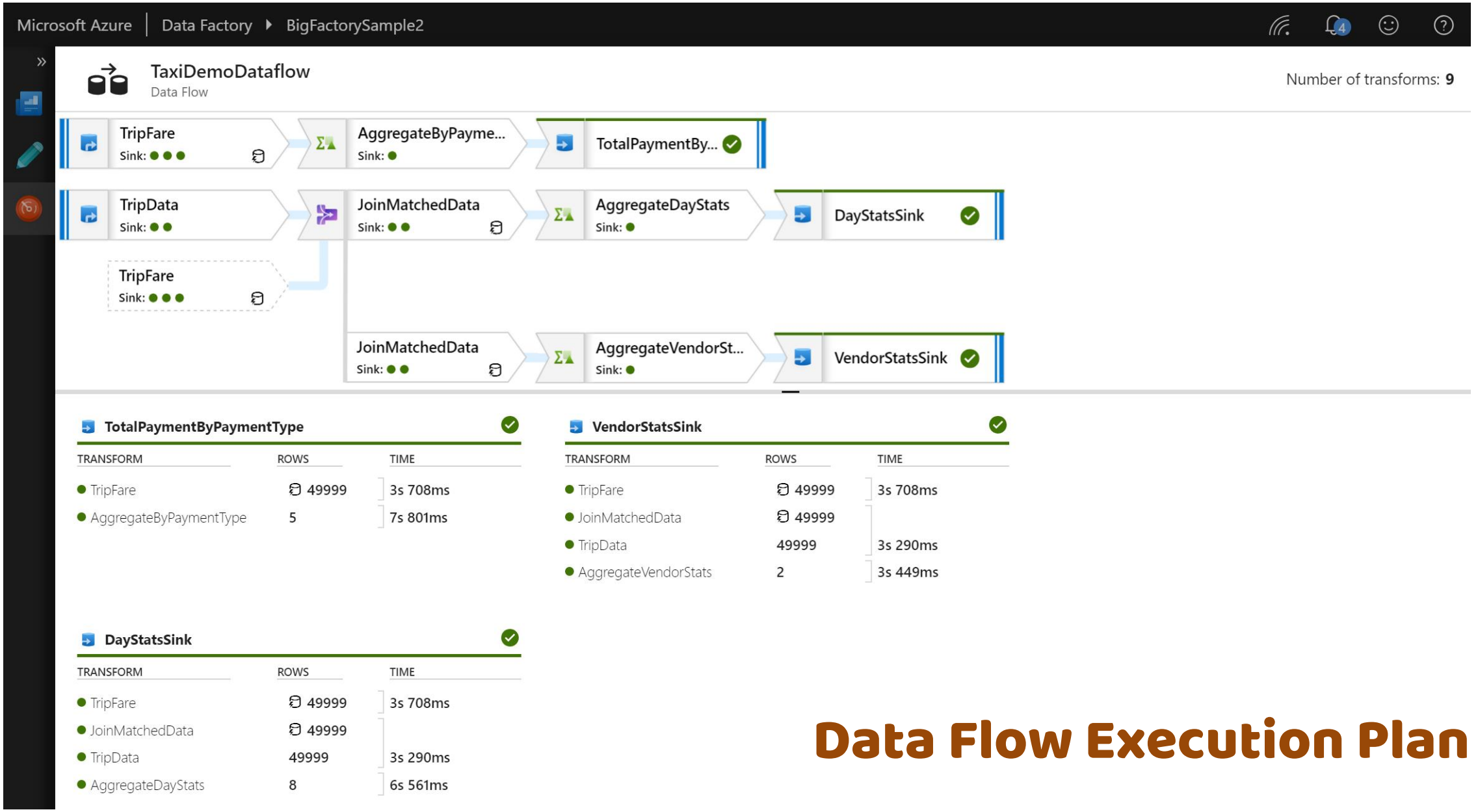
DEMO TIME

Data Preview in Debug mode

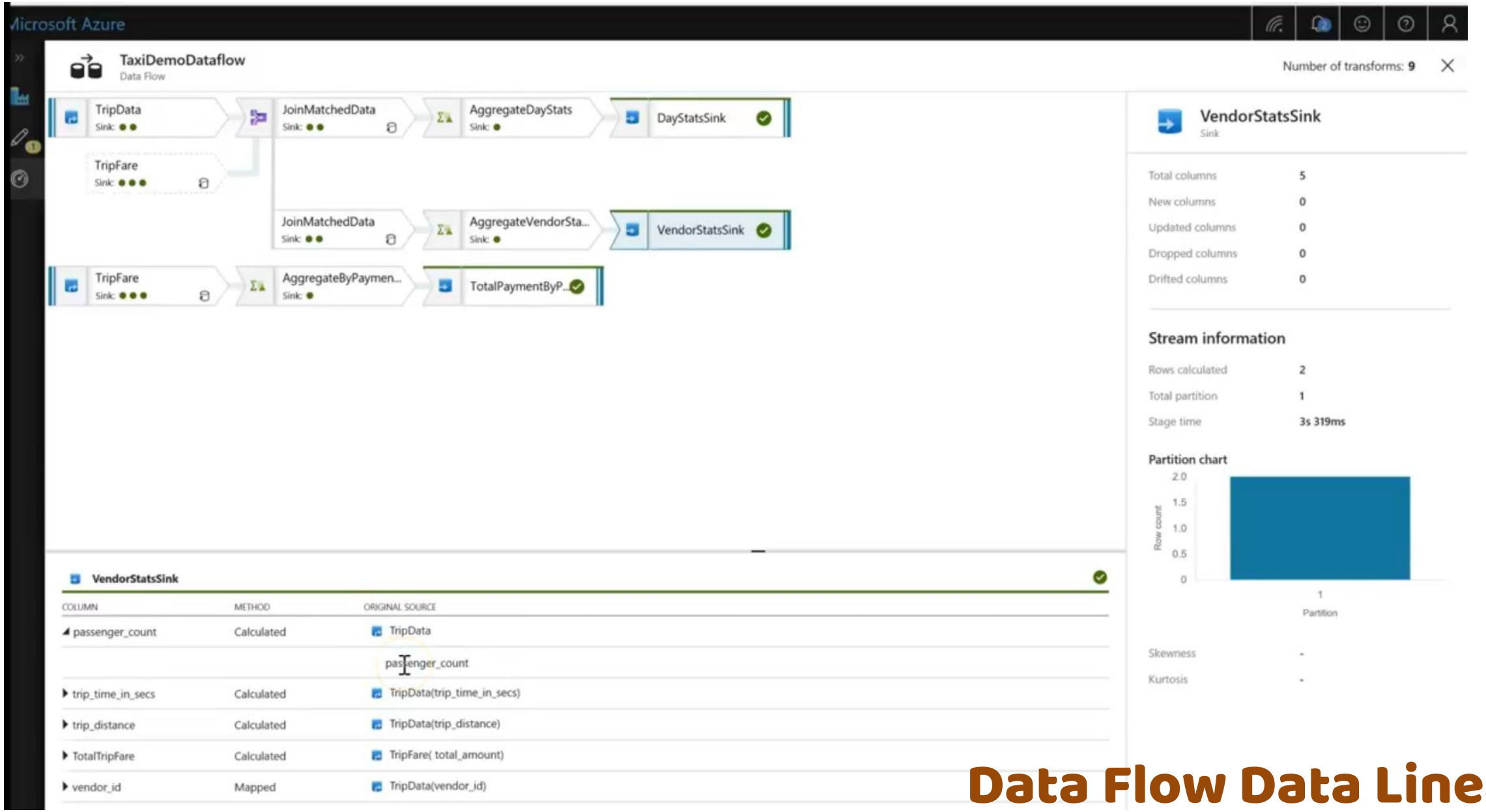


	Updated*	New+	Unchanged	Total
Number of rows	N/A	N/A	N/A	8

DayOfTheWeek 123	trip_distance 1.2	passenger_count 1.2	trip_time_in_secs 1.2	average_fare 1.2
NULL	2.58	2.16	10.21	12.82
1	3.03	2.17	10.12	13.89
6	1.75	1.43	9.98	10.84
3	2.26	1.41	9.83	11.02
5	2.71	1.24	10.9	15.59

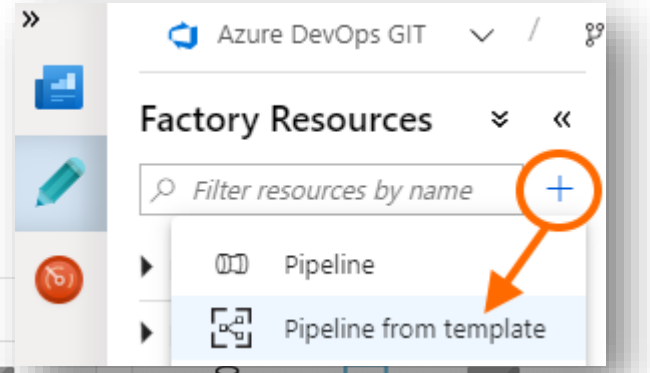


Data Flow Execution Plan



Data Flow Data Lineage

ADF Template Gallery



Template gallery

Filter Reset all filter

Search templates

Categories
- Copy
- Data Flow
- SSIS
- Transform

Create by
- Microsoft
- My templates

Tag
All

Services used
All

Import template

Bulk Copy from Database to Azure Data Explorer
Use this template to copy large amount of data in bulk from database like SQL Server, Google BigQuery, etc to Azure Data Explorer (ADX), using...
by Microsoft

Bulk Copy from Database
Use this template to copy data in bulk from database using external control table to store partition list of source tables.
...
by Microsoft

Copy data from Google BigQuery to Azure Data Lake Store
Use this template to copy data from Google BigQuery to Azure Data Lake Storage.
...
by Microsoft

Copy data from HDFS to Azure Data Lake Store
Use this template to copy data from HDFS (Hadoop Distributed File System) to Azure Data Lake Storage.
...
by Microsoft

Copy data from Netezza to Azure Data Lake Store
Use this template to copy data from Netezza server to Azure Data Lake Storage.
...
by Microsoft

Copy data from on premise SQL Server to SQL Azure
Use this template to copy data from on premise SQL Server to SQL Azure.
...
by Microsoft

Copy data from on premise SQL Server to SQL Data Warehouse
Use this template to copy data from on premise SQL Server to SQL Data Warehouse.
...
by Microsoft

Copy data from Oracle to SQL Data Warehouse
Use this template to copy data from Oracle server to SQL Data Warehouse.
...
by Microsoft

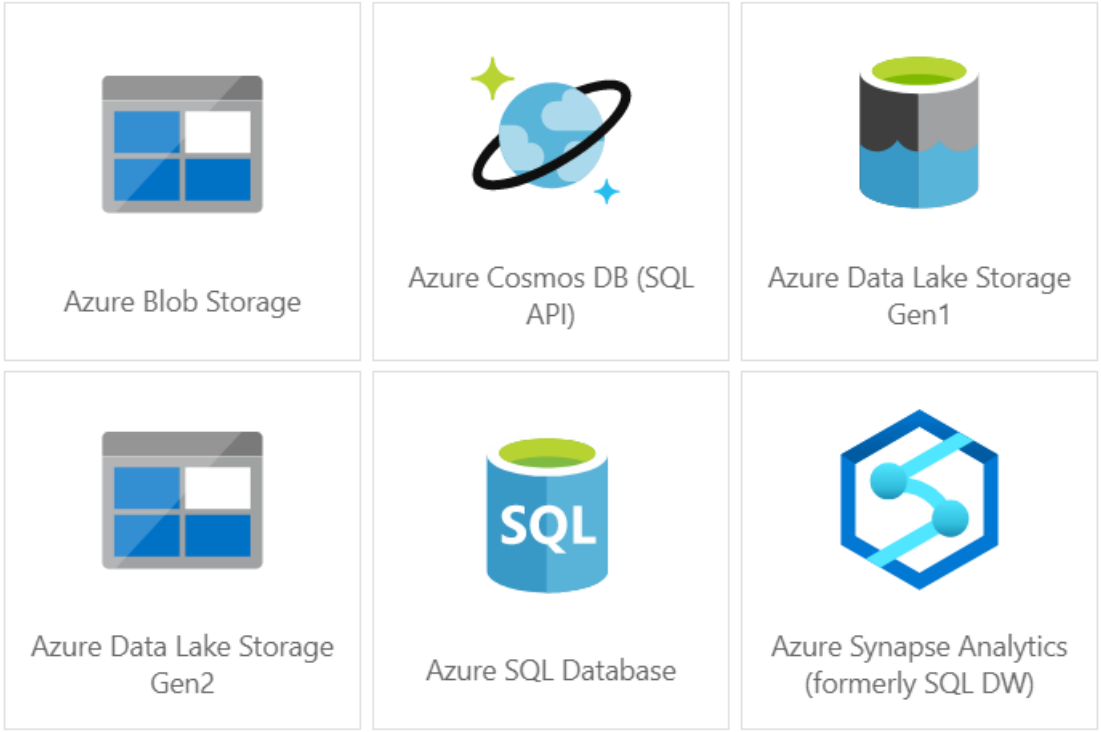
Copy delta data from AWS S3 to Azure Data Lake Storage Gen2

Copy multiple files containers between File Stores

Copy new files only by LastModifiedDate
Use this template to copy new and changed files only by using LastModifiedDate.

Data Flow Search Log Analytics
This is a sample that takes the U-SQL SearchLog analytics example and turns it into an ADF Data Flow:

Mapping Data Flow – Source & Sink

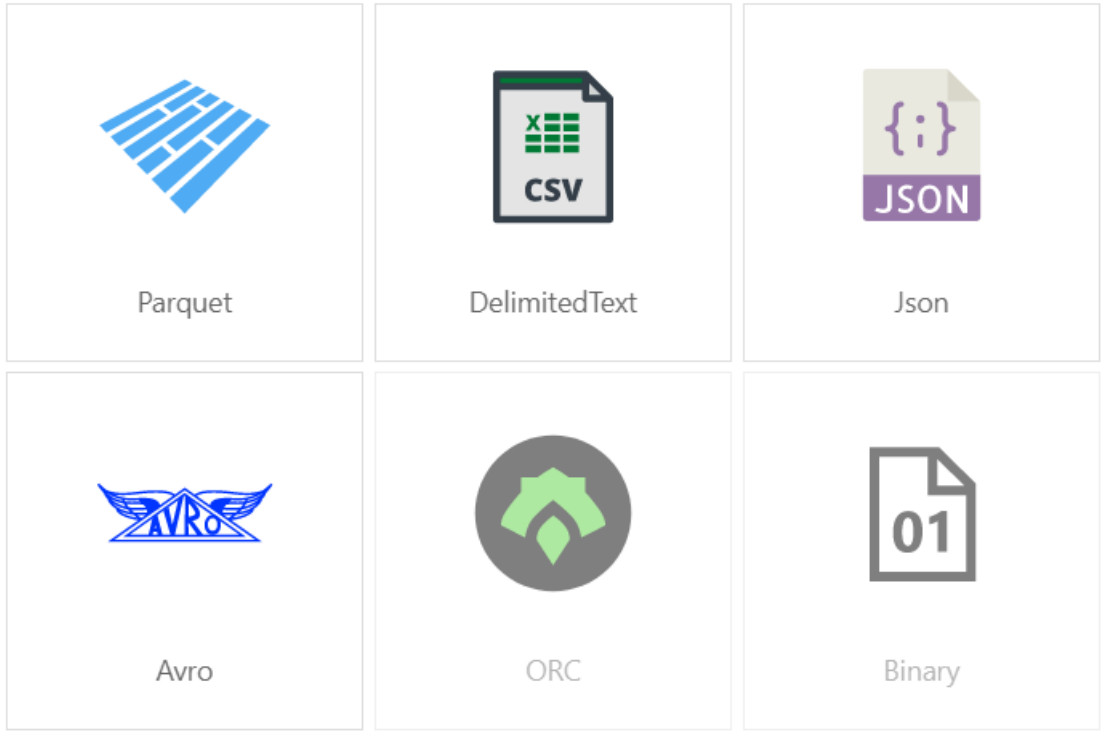


Mapping Data Flow – Source & Sink capabilities

- New capabilities for Source transformations:
  - wildcards, file sets,
  - move file / Delete file,
  - auto-detect types,
  - schema validation
  - query statement

- New capabilities for Sink transformations:
  - output to single file,
  - clear folder,
  - truncate table / recreate table,
  - naming patterns

Mapping Data Flow – DataSet File Formats



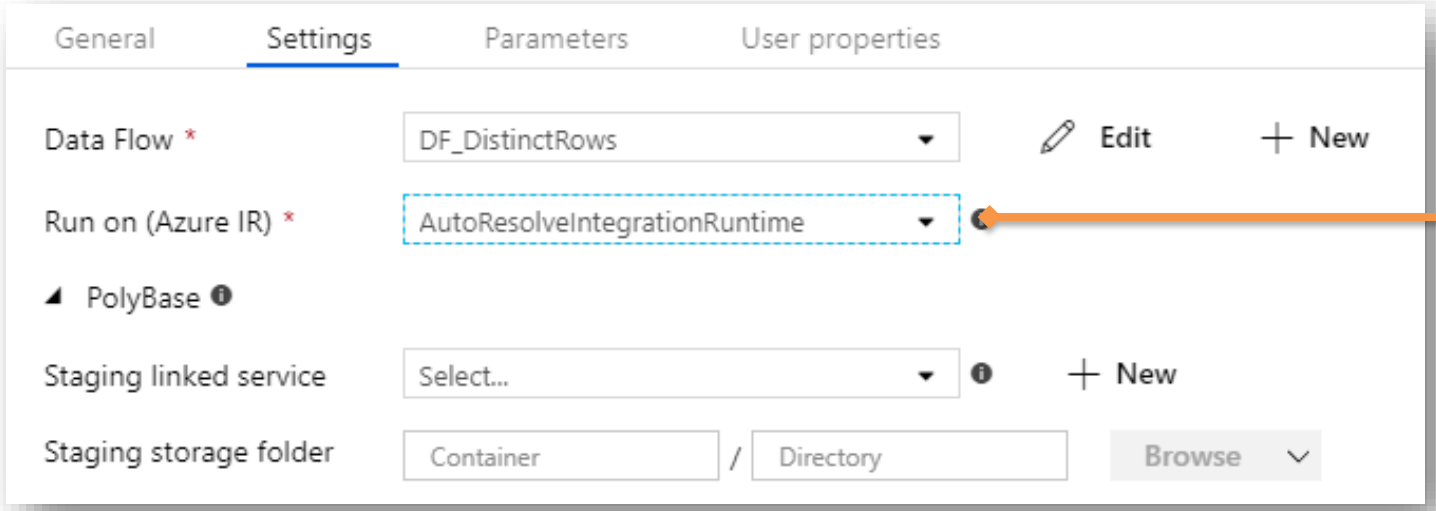
Available NOW

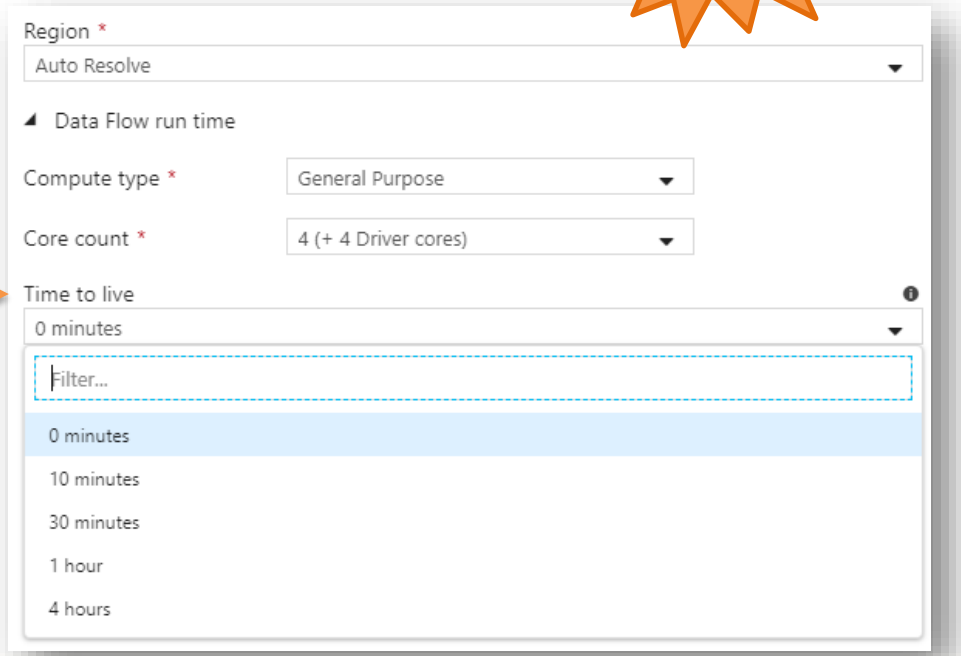
Available SOON

Mapping Data Flow – Execution Settings

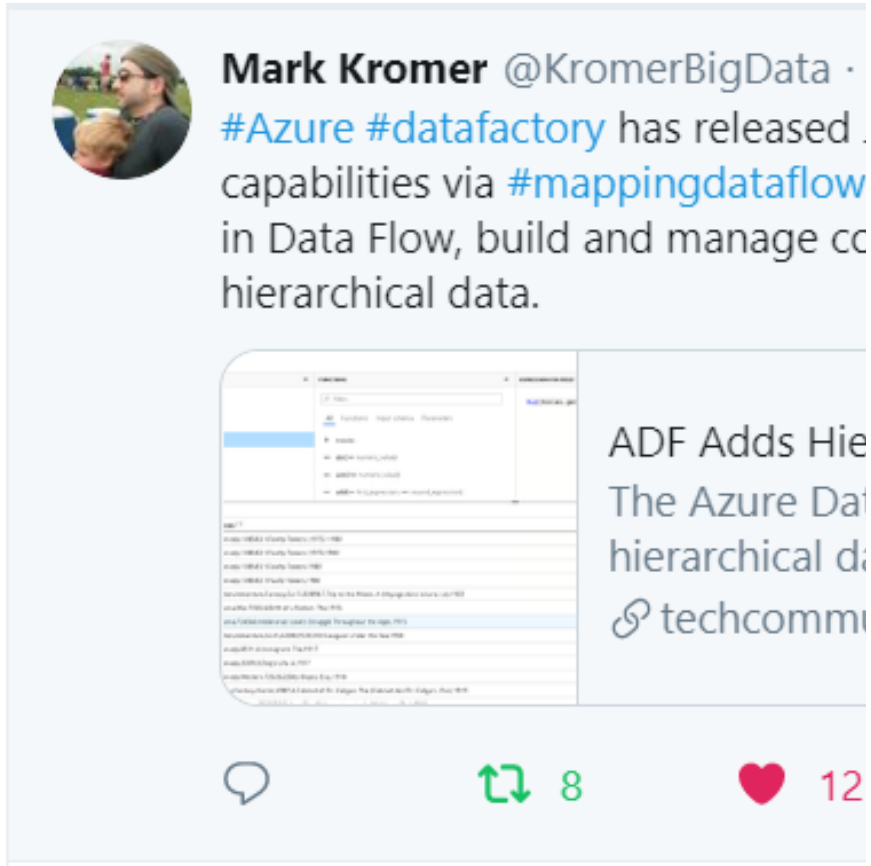
- The Execute Data Flow transformation:
  - Support **parameterized datasets**
  - Control **size of cluster** for specific Azure IR
  - Define **TTL (Time-To-Live)** to Azure IR to reduce data flow activity time

NEW!





Latest updates? Go Twitter!



SSIS vs ADF activities vs T-SQL

Activity	Description	SSIS equivalent	SQL Server equivalent
New branch	Create a new flow branch with the same data	Multicast (+icon)	`SELECT INTO` `SELECT OUTPUT`
Join	Join data from two streams based on a condition	Merge join	`INNER | LEFT | RIGHT JOIN,` `CROSS | FULL OUTER JOIN`

Conditional Split	Route data into different streams based on conditions	Conditional Split	`SELECT INTO WHERE condition1`
			`SELECT INTO WHERE condition2`
			`CASE ... WHEN`

Union	Collect data from multiple streams	Union All	`SELECT col1a UNION (ALL)` `SELECT col1b`
Lookup	Lookup additional data from another stream	Lookup	`LEFT | RIGHT JOIN`
Derived Column	Compute new columns based on the existing once	Derived Column	`SELECT Column1 * 1.09 as NewColumn`

Aggregate	Calculate aggregation on the stream	Aggregate	`SELECT Year(DateOfBirth) as Year,`
			`MIN(), MAX(), AVG()`
			`GROUP BY Year(DateOfBirth)`

http://bit.ly/ADFDFvsSSIS

http://bit.ly/ADFDF-CheatSheet

Resources

http://sqlplayer.net/ADF

Q&A

Thank you! **Obrigado!**

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kamil@nowinski.net

@NowinskiK @SQLPlayer

SQLPlayer.net

https://github.com/NowinskiK/CommunityEvents

Kamil Nowinski

Microsoft Data Platform MVP

MCSE Data Platform & MCSE Data Management and Analytics


CREATE A GOLDEN RECORD WITH PROFISEE
Multiple Source Systems
Profisee
Downstream Decision Making

09:30 AM - 10:30 AM	SQL Server & Containers Andrew Pruski Level: Beginner	Azure Data Factory v2: Mapping Data Flows - first blood Kamil Nowinski Level: Intermediate	Index Tuning for the developer Stijn Wynants Level: Beginner
Coffee Break			
10:45 AM - 11:45 AM	From Docker to Big Data Clusters: a new era for SQL server Christophe Laporte Level: Intermediate	My experience implementing DistinctCount measures in SSAS Tiago Rente Level: Beginner	Will my workload run faster with In-Memory OLTP? Ned Otter Level: Intermediate
Lunch			
01:00 PM - 02:00 PM	Running SQL Server as Stateful(set) application on Kubernetes David Barbarin Level: Intermediate	Disposable Development environments with Azure DevOps and AzureRM Gavin Campbell Level: Intermediate	My Company is going to cloud, what can I do? Paresh Motiwala Level: Beginner
02:00 PM - 02:20 PM	Claranet: Manage monoliths as containers using DevOps solutions Eduardo Namba Level: Advanced	Microsoft: What's up with SQL Server & Azure SQLDB (including MI) Vitor Faria Tomaz Level: Beginner	
02:30 PM - 03:30 PM	SQL Server 2019 what's new for the DBA's Ivan Campos Level: Intermediate	DevOps and automation in a modern Microsoft DataWarehouse and BI/AI world Gergely Csom Level: Intermediate	Adjusting management rules in a business environment Ana Raquel Teixeira Level: Beginner
Coffee Break			
03:50 PM - 04:50 PM	dbatools' recipes for Data Professionals Cláudio Silva Level: Intermediate	Power up Power BI… with AI Rita Dias Level: Intermediate	Batch Execution Mode on Rowstore Indexes Niko Neugebauer Level: Intermediate