Data flows in Azure Data Factory – endlich auch hier Transformationen!

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About me

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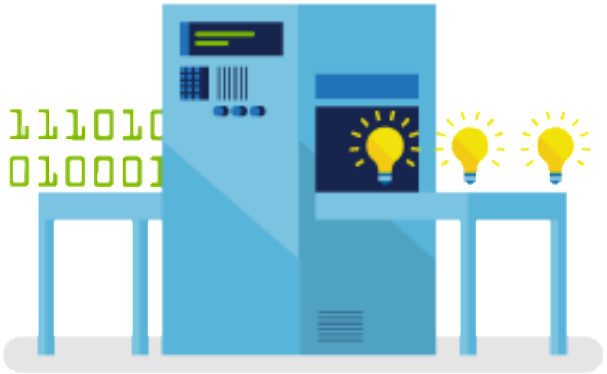
um unsere Kunden glücklich zu machen.
Und uns selbst.

Agenda

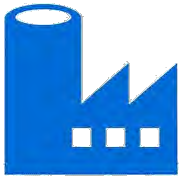
- Intro Data Factory v2
- Control Flow & Triggers
- Data Flow
- Q+A



Intro
Data Factory v2

Data Factory

Managed Data Integration Service



New Pipeline Model

Rich pipeline orchestration
Triggers – on-demand, schedule, event

Data Movement as a Service

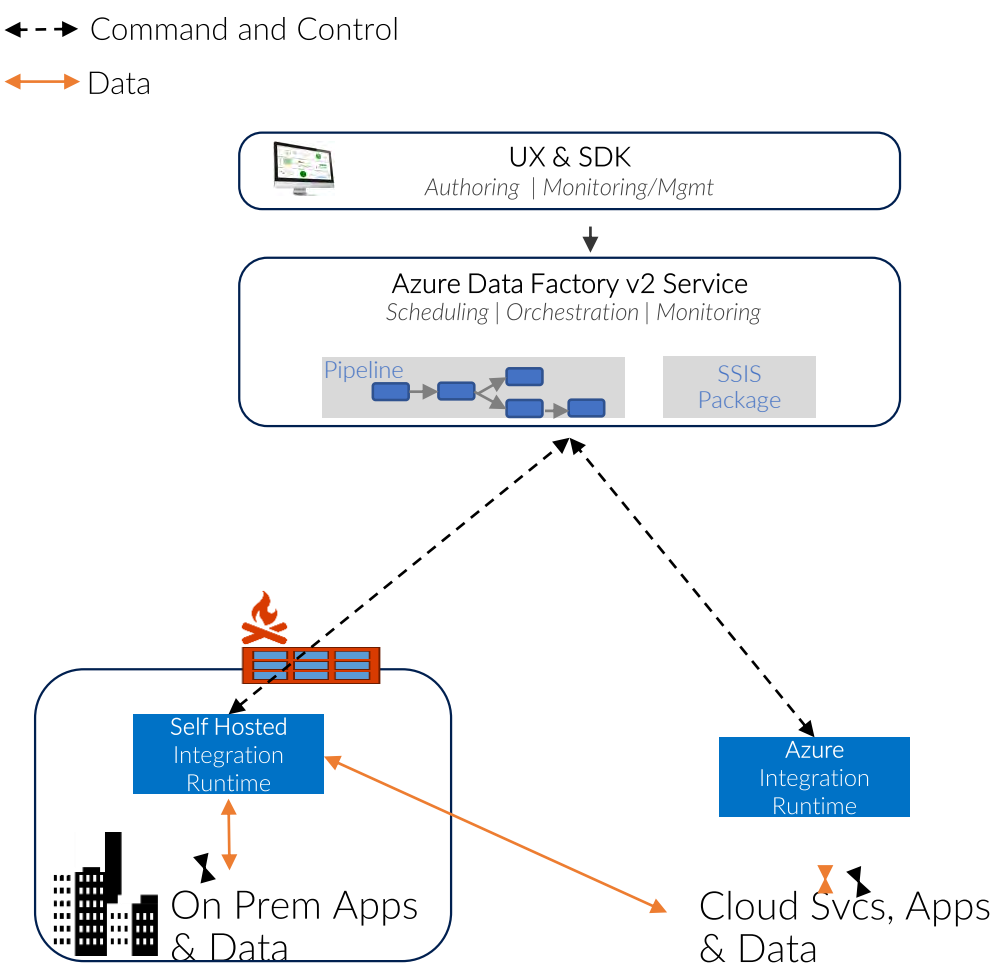
Cloud, Hybrid
30 connectors provided
Data flow as NEW Data Transformation Layer

SSIS Package Execution

In a managed cloud environment
Use familiar tools, SSMS & SSDT

Author & Monitor

Programmability (Python, .NET, Powershell, etc)
Visual Tools for Control Flow and NEW: Data Flow



Data Factory

A data integration account.

Location of orchestration, service metadata

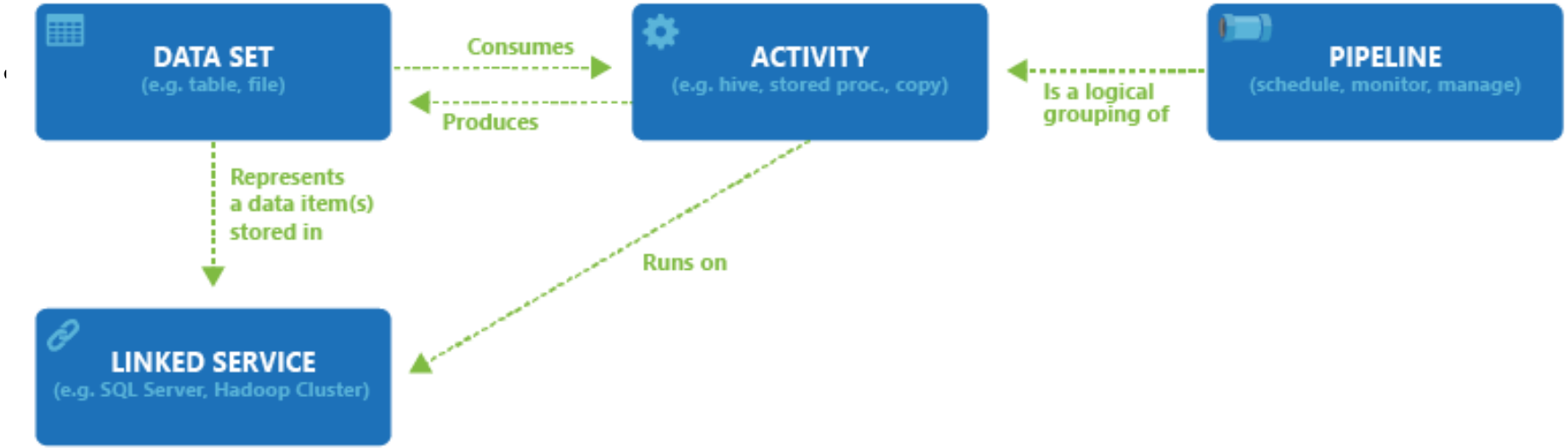
Integration Runtime (IR)

ADF's execution engine

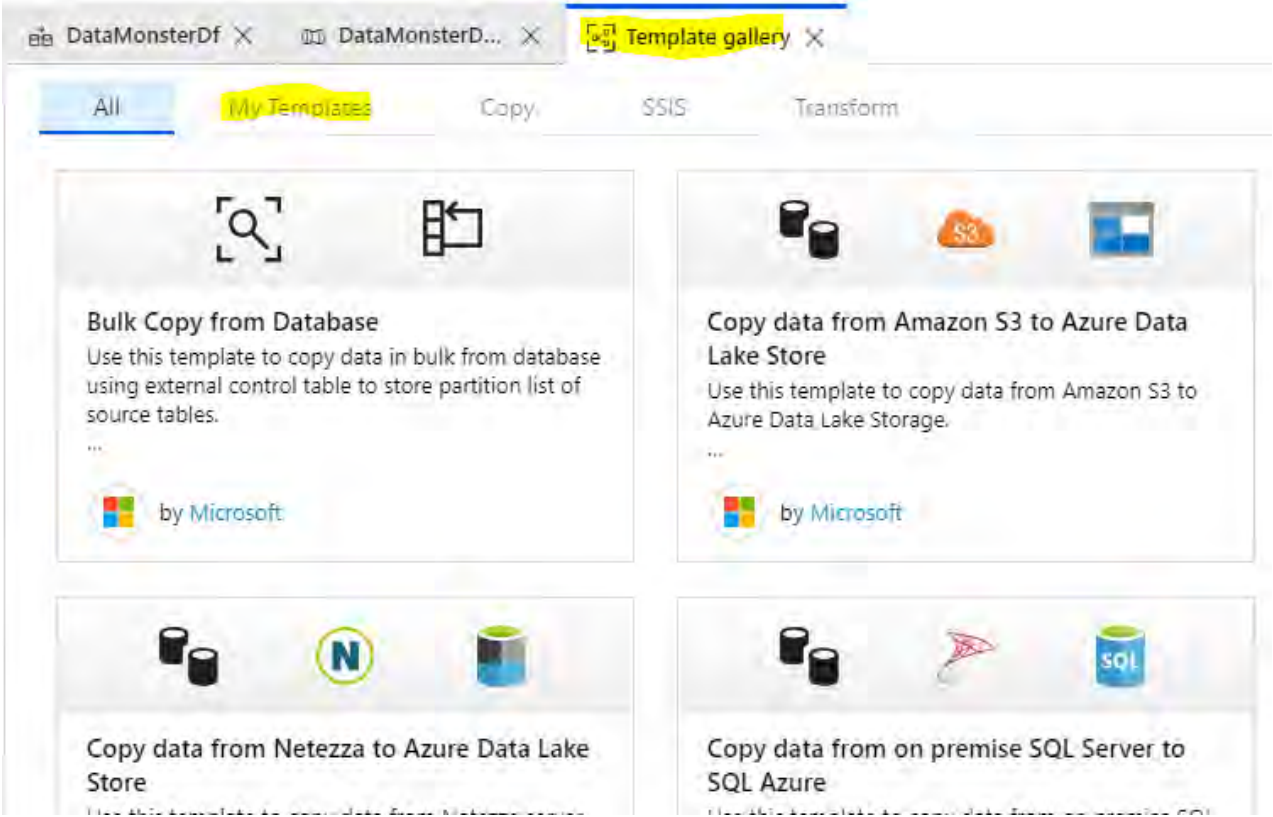
Three core capabilities:

- data movement
- pipeline activity execution
- SSIS package execution

Data Factory Essentials

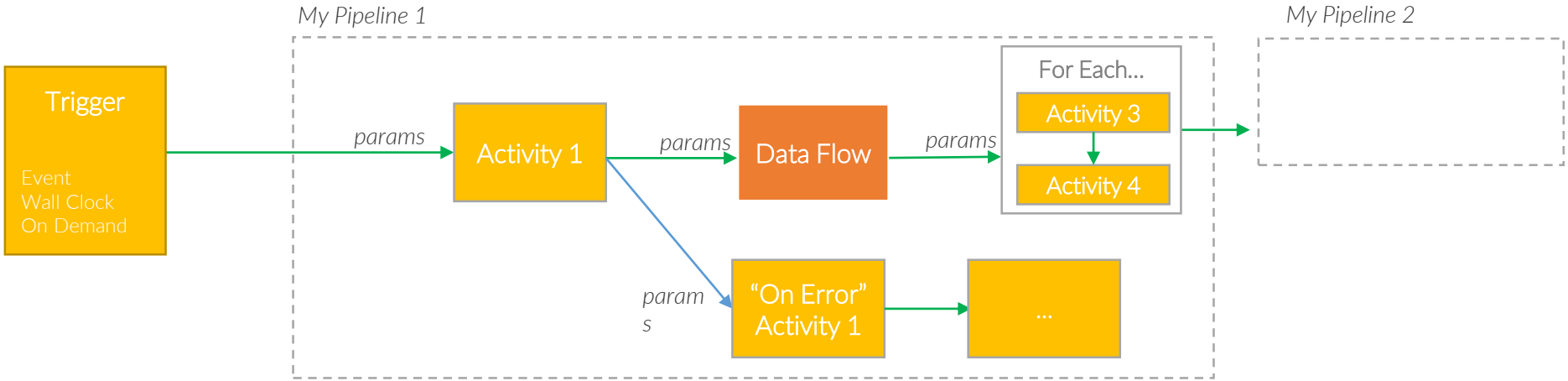


New: Kickstart using Templates



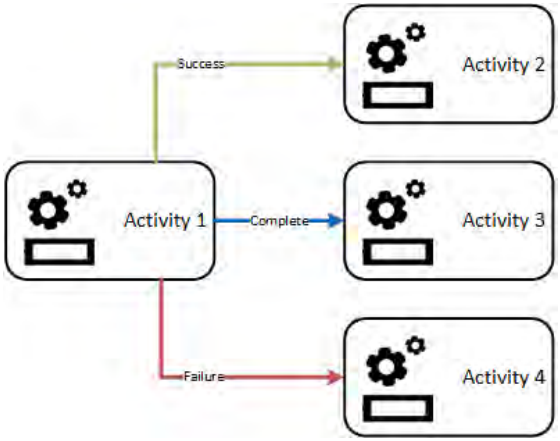
Control Flow & Triggers

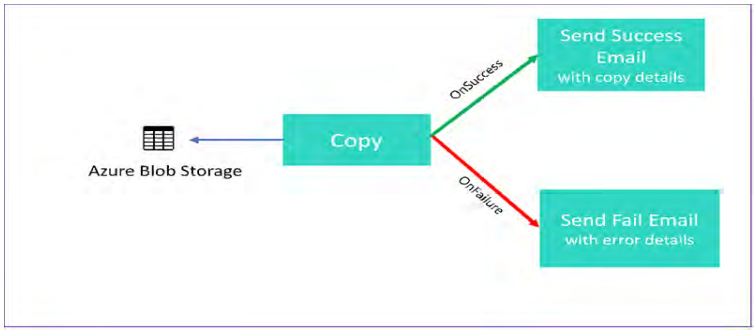
ADFv2 Pipelines



Activities

Concepts





Branching

Dependencies of activities in a pipeline

Possible constraints:

- On success
- On failure
- On completion

Also custom 'if' conditions will be available for branching based expressions

https://www.purplefrogsystems.com/paul/2017/09/whats-new-in-azure-data-factory-version-2-adfv2/

Triggers

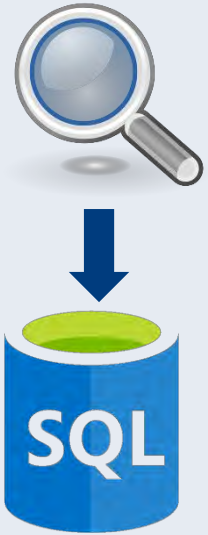
How do pipelines get started

- on-demand
- Wall-clock Schedule
- Tumbling Window (aka time-slices in v1)
- Event on Blob Store

Demo Control Flow

Get all data of a system by metadata

Pipeline check metadata



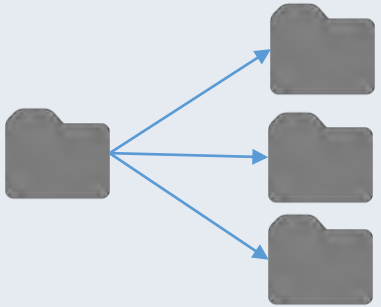
Activity: For each table in source

exec

exec

exec

Activity: Copy Data to Data Lake / Blob Store

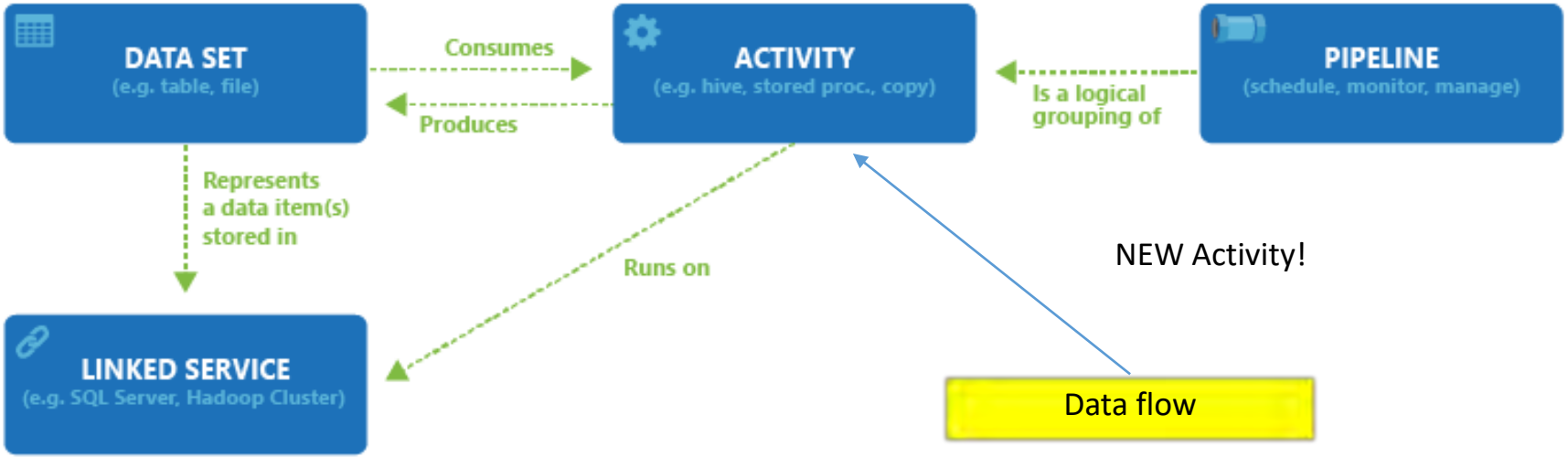


Data Flow

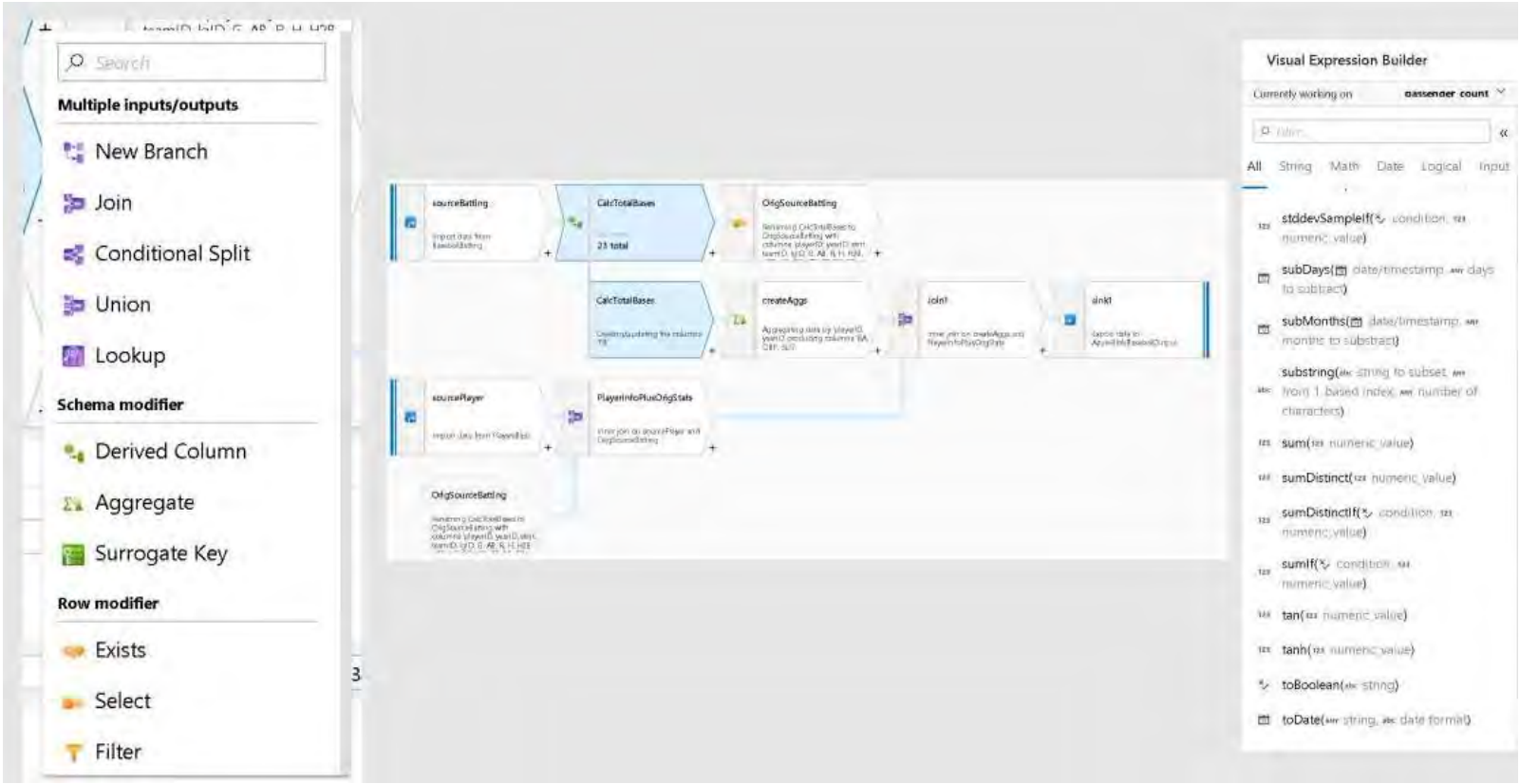
Big data transformations without coding

Data Factory Essentials

Artefacts in Data Factory



Visual / Mapping Data Flows



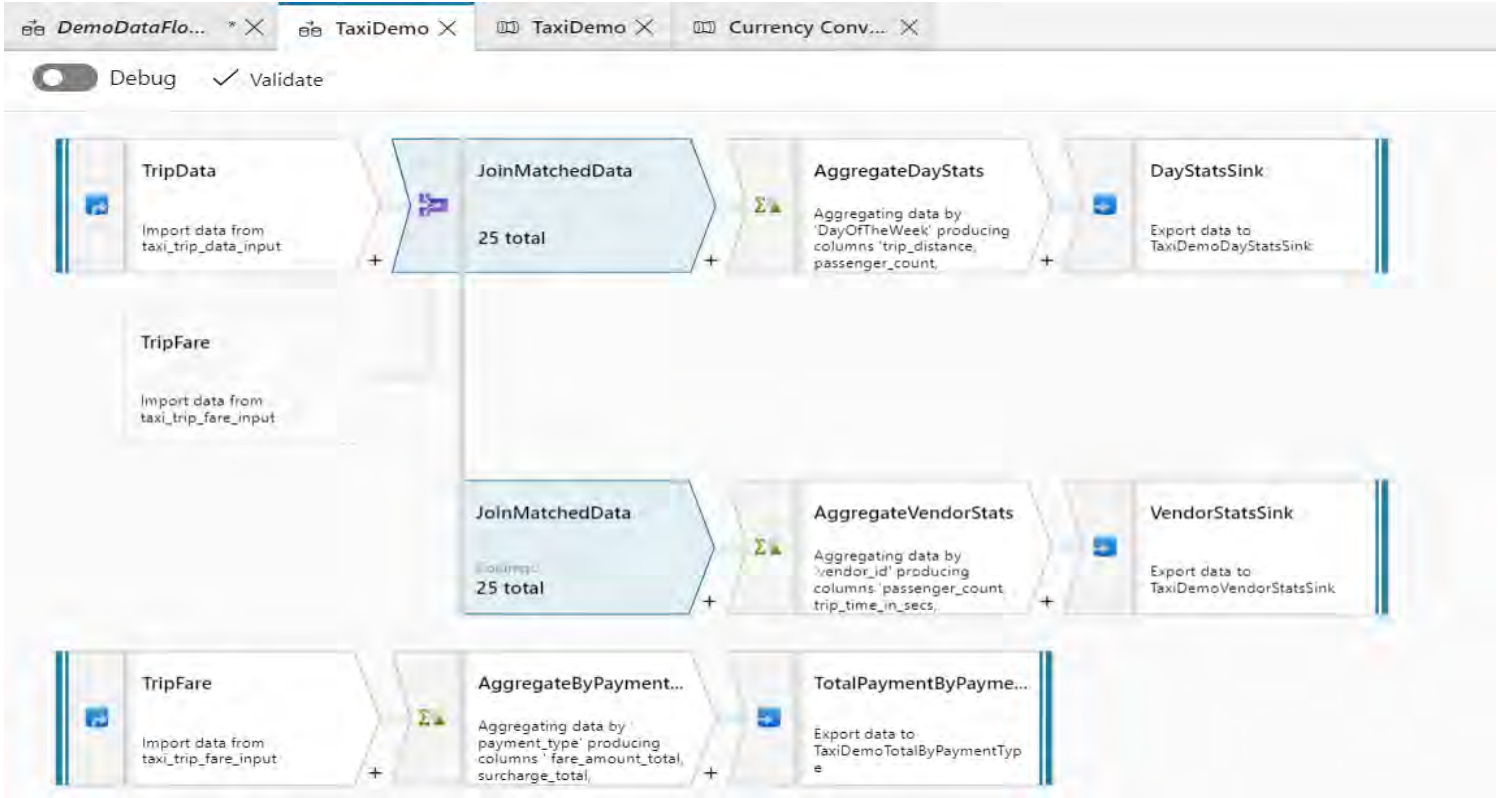
Code-free Data Transformation At Scale

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

… not …

Demo: Data Flow

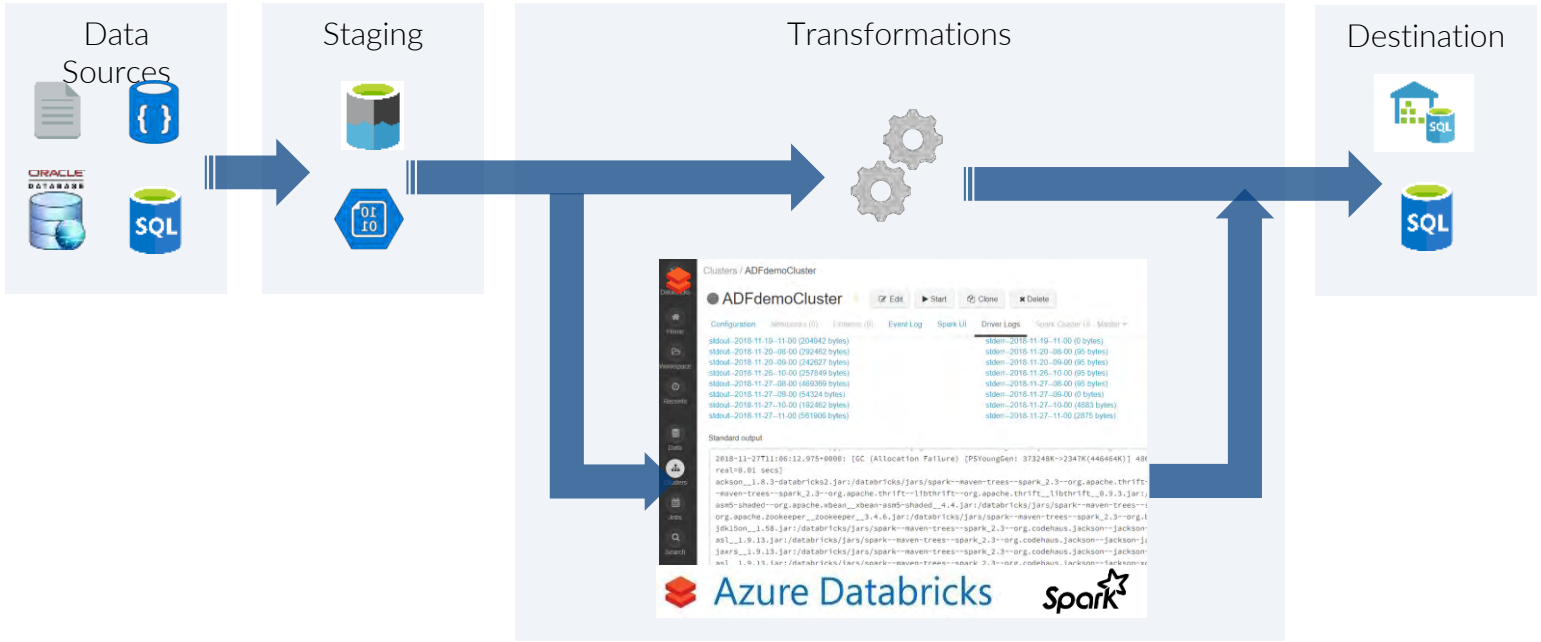
Visual Design of Transformations in Spark



Visual Data Flow Key Tenets

- Visual “Data Flow Builder” / “Data Mapping”
- Extensible through scripting and expressions
- Data Flow can be embedded into ISV / SaaS apps
  - Embed UI
  - Embed Parameterize Data Flows
- A graphical UI for building data transformation routines on Spark
- Built for resiliency and operationalized environments

ADF Data Flow Overview

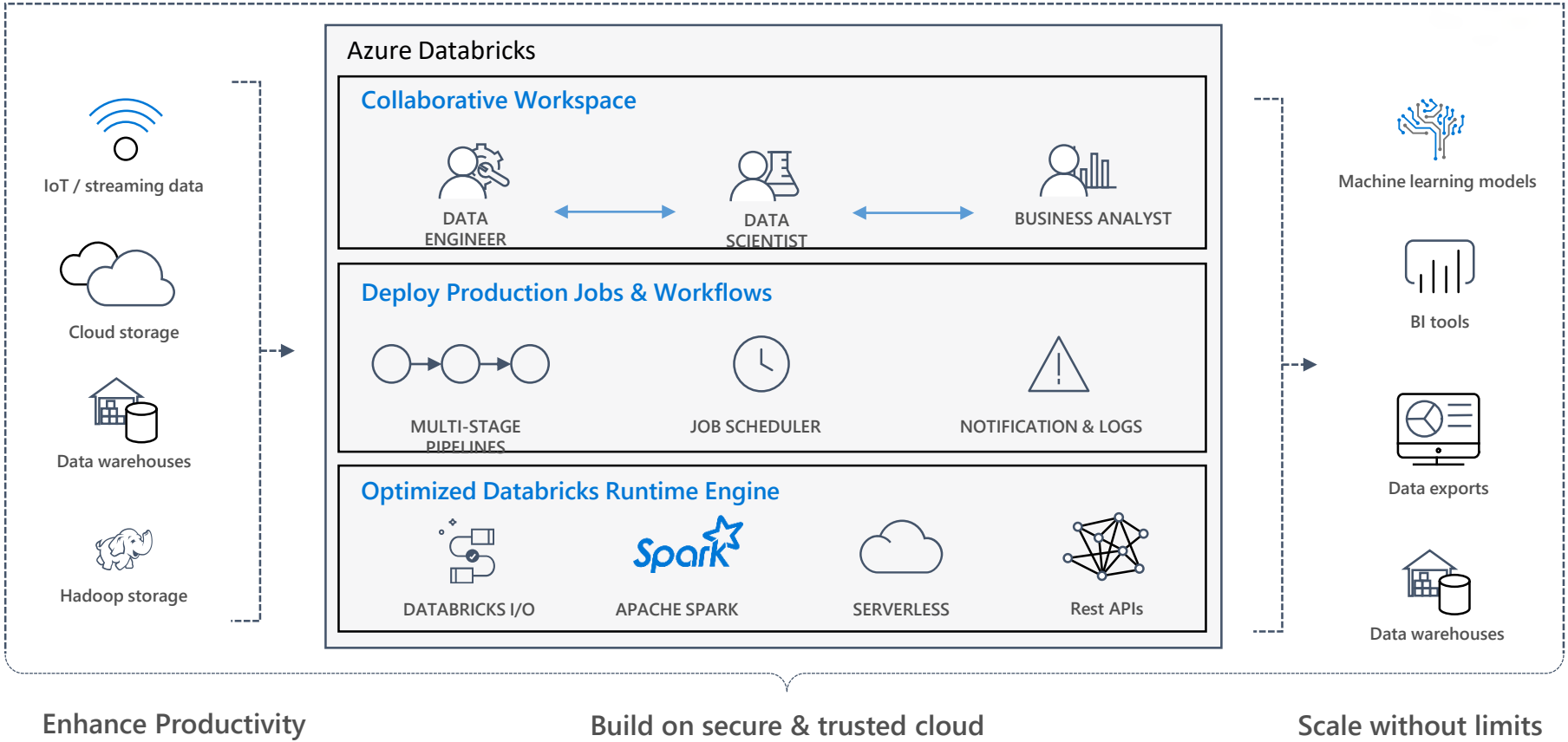


Data flow started - what happens at databricks?

Log4j output

```
 21:39:35 INFO FileSourceScanExec: Pushed Filters:
18/12/03 21:39:35 INFO CodeGenerator: Code generated in 39.168945 ms
18/12/03 21:39:35 INFO MemoryStore: Block broadcast_34 stored as values in memory (estimate
18/12/03 21:39:35 INFO MemoryStore: Block broadcast_34_piece0 stored as bytes in memory (es
18/12/03 21:39:35 INFO BlockManagerInfo: Added broadcast_34_piece0 in memory on 10.139.64.5
18/12/03 21:39:35 INFO SparkContext: Created broadcast 34 from load at External.scala:73
18/12/03 21:39:35 INFO FileSourceScanExec: Planning scan with bin packing, max size: 419430
18/12/03 21:39:35 INFO SparkContext: Starting job: load at External.scala:73
18/12/03 21:39:35 INFO DAGScheduler: Got job 21 (load at External.scala:73) with 1 output p
18/12/03 21:39:35 INFO DAGScheduler: Final stage: ResultStage 35 (load at External.scala:73
18/12/03 21:39:35 INFO DAGScheduler: Parents of final stage: List()
18/12/03 21:39:35 INFO DAGScheduler: Missing parents: List()
18/12/03 21:39:35 INFO DAGScheduler: Submitting ResultStage 35 (MapPartitionsRDD[124] at lo
18/12/03 21:39:35 INFO MemoryStore: Block broadcast_35 stored as values in memory (estimate
```

Overview Azure Databricks

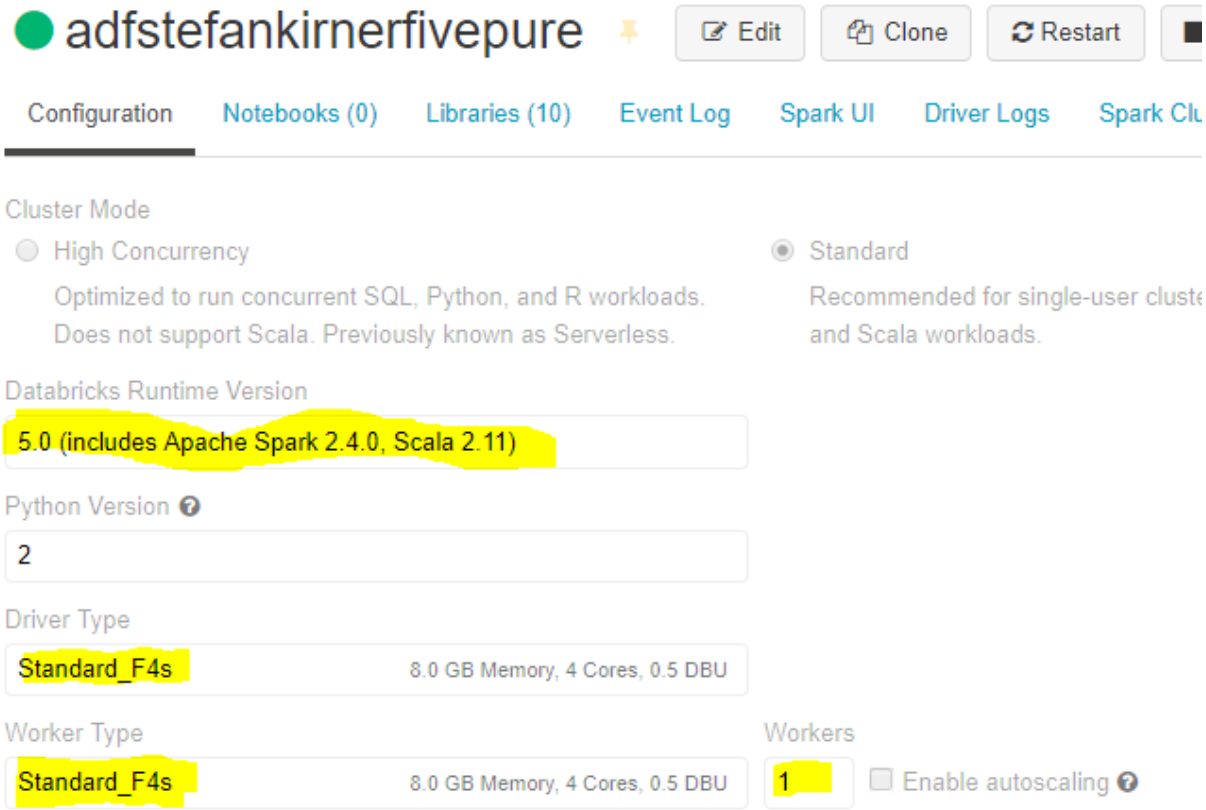


Enhance Productivity

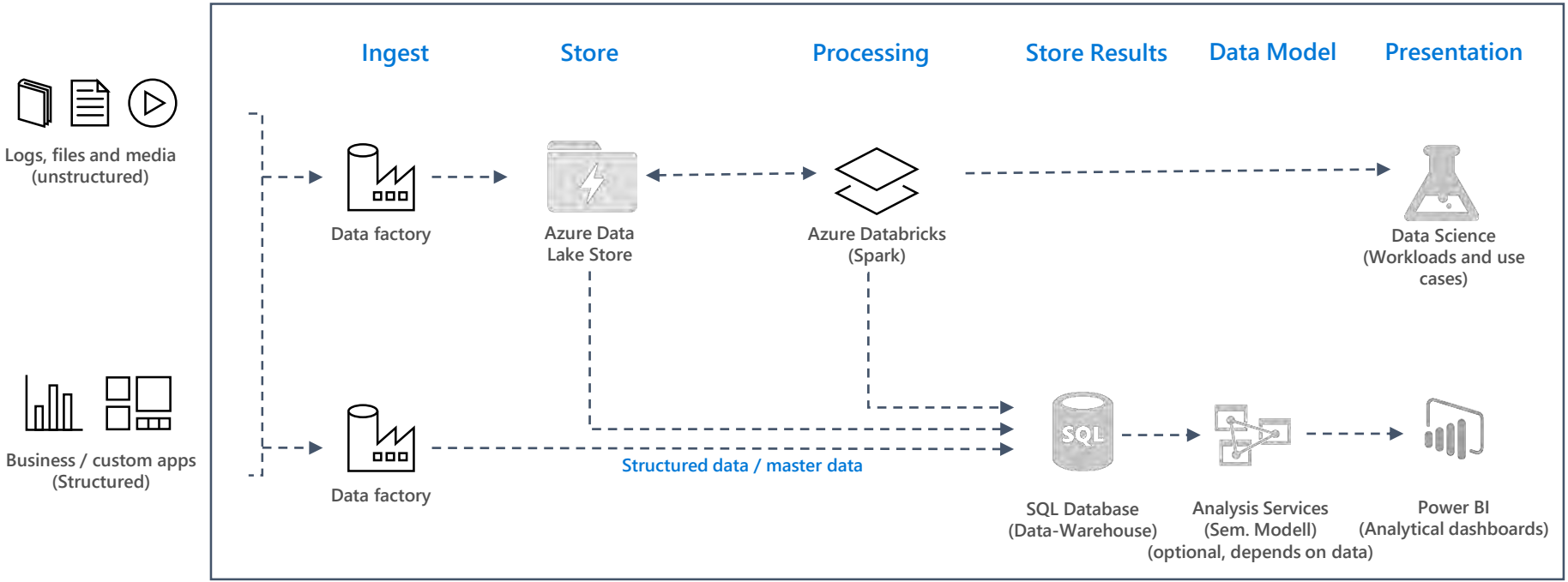
Build on secure & trusted cloud

Scale without limits

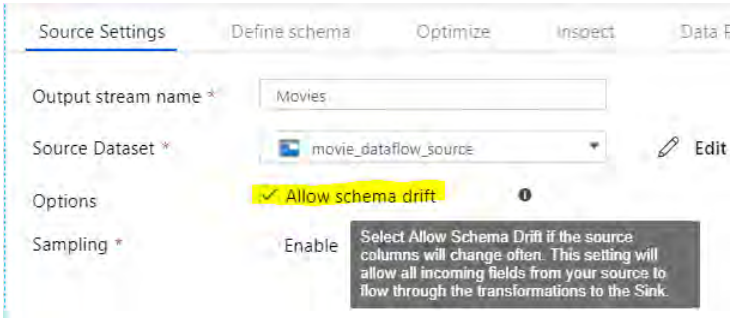
Databricks Backend- Configuration



In context of Microsofts “Modern DWH”

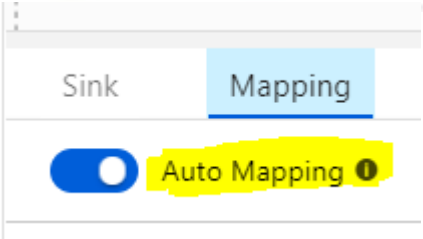


Nice Feature: Handling Schema Changes



Data flow will accept both columns (here in derived columns)

Use Auto Mapping
in Sink



- https://www.youtube.com/watch?v=vSTn_aGq3C8 Video zum Feature von Mark Kromer

Conclusion: Data Flow in ADF

Is cool because…

- **visual design** for fast learning & understanding
- ETL using spark technology in the background which **could** scale (but does not have to in any case)
- Azure Databricks as **elastic processing engine** for different workloads, tools and user groups
- Integration in Control Flow enables modelling **dependencies** and **cost-efficient** orchestration of Azure resources

Data Flow Limited Preview Support & SLAs

- Azure SLAs are NA for preview services (private or public preview) until GA of the service.
- Limited Preview Support
  - Handled directly with the Azure Engineering team via adfdataflowext@microsoft.com. Turn-around time on fixing issues during private preview will depend upon access to customer data sources and customer Databricks clusters for RCA and debugging.
- Public Preview Support
  - Normal Azure customer service channels

February Release

Data Flows

- DFs included in general V2 version
- The new Templates also support DF
- On-demand clusters managed by ADF instead of BYO
- Move or delete source files after execution (!)
- Auto-detect data types & wildcards
- Exec data flow: parameters & cluster size
- Still whitelisting of subscription needed

- https://kromerbigdata.com/2019/02/14/adf-data-flows-preview-updates-for-february/

Q+A

Links and further informations

1. Microsoft documentation:
https://docs.microsoft.com/en-us/azure/data-factory/
2. Azure Data Factory – data flows preview documentation
https://github.com/kromerm/adfdataflowdocs
3. Cool screencasts about data flows
https://github.com/kromerm/adfdataflowdocs/tree/master/videos
4. Another good blogpost about ADF Data Flows
https://visualbi.com/blogs/microsoft/azure/azure-data-factory-data-flow-activity/
5. Comparison ADF Data Flows vs. SSIS vs. T-SQL
https://sqlplayer.net/2018/12/azure-data-factory-v2-and-its-available-components-in-data-flows/

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Thank you very much for your attention.

Vielen Dank für Eure Aufmerksamkeit.

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Unbedingt! Euer Feedback zu meiner Session