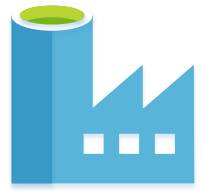
Azure Data Factory v2



SSIS Data Flows & Custom Extensibility

Paul Andrew | Senior Consultant

08/10/2018

@MrPaulAndrew

Microsoft Partner

Microsoft

Gold Data Analytics
Gold Data Platform
Gold Cloud Platform

PLATINUM SPONSOR

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GOLD SPONSORS

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dbWatch DATABASE CONTROL

Quest

PYRAMID ANALYTICS

DATA MOVEMENTS BRINGING DATA INTO FOCUS

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SentryOne

CSL

BRONZE SPONSORS

Coeo Making SQL sense

COZYROC

redgate

business intelligence consultancy purplefrog

DLM Consultants

SQLGLA

GitHub

https://github.com/mrpaulandrew

CommunityEvents

Demo code, content and slides from various community events.

C++

{Event/Location}-{Month}-{Year}

Agenda

Data Factory	Data Factory Extensibility	Conclusions	Coming Soon!
Concepts Components Why use it?	SSIS, Functions, Custom Activities	Design Patterns ETL/ELT in Azure	Data Flows with Data Bricks

Agenda

Data Factory

Concepts
Components
Why use it?

Data Factory Extensibility

SSIS, Functions,
Custom Activities

Conclusions

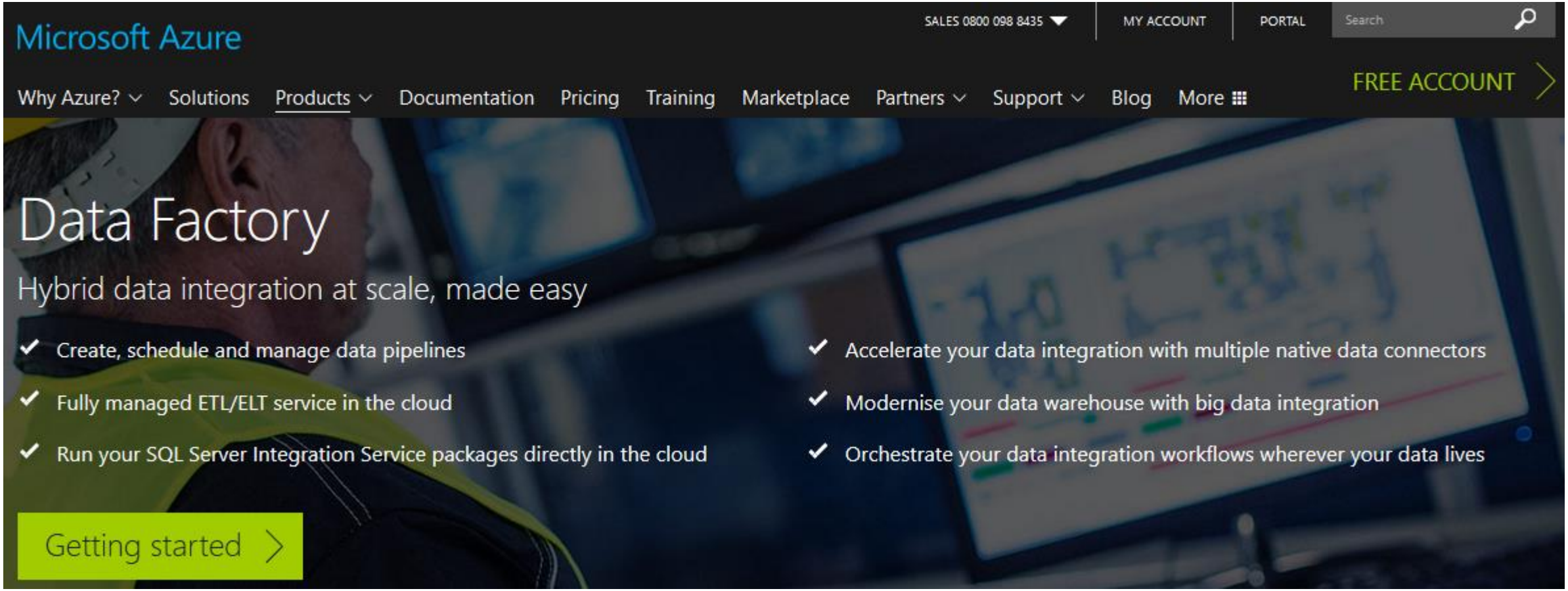
Design Patterns
ETL/ELT in Azure

Coming Soon!

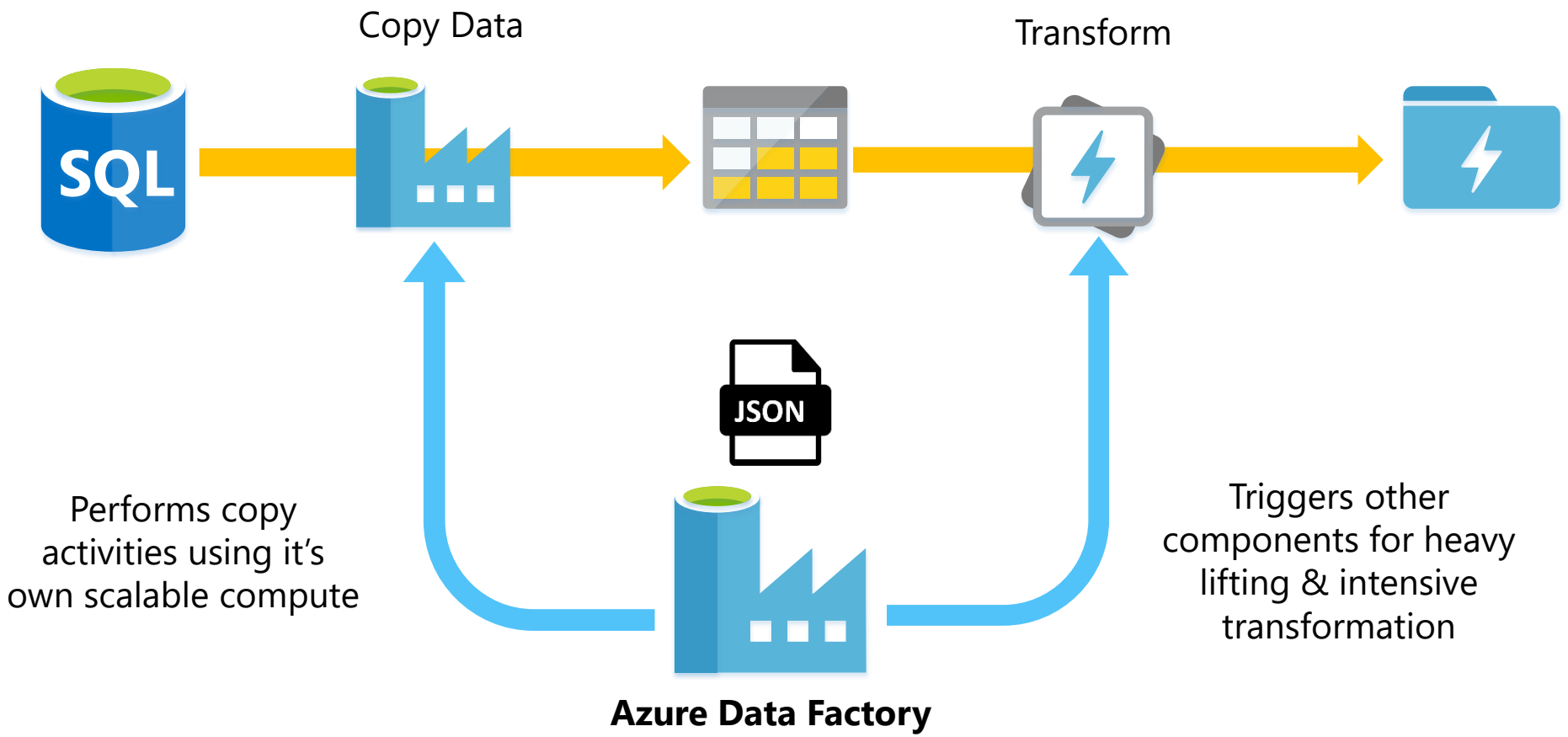
Data Flows with
Data Bricks

What is Azure Data Factory?

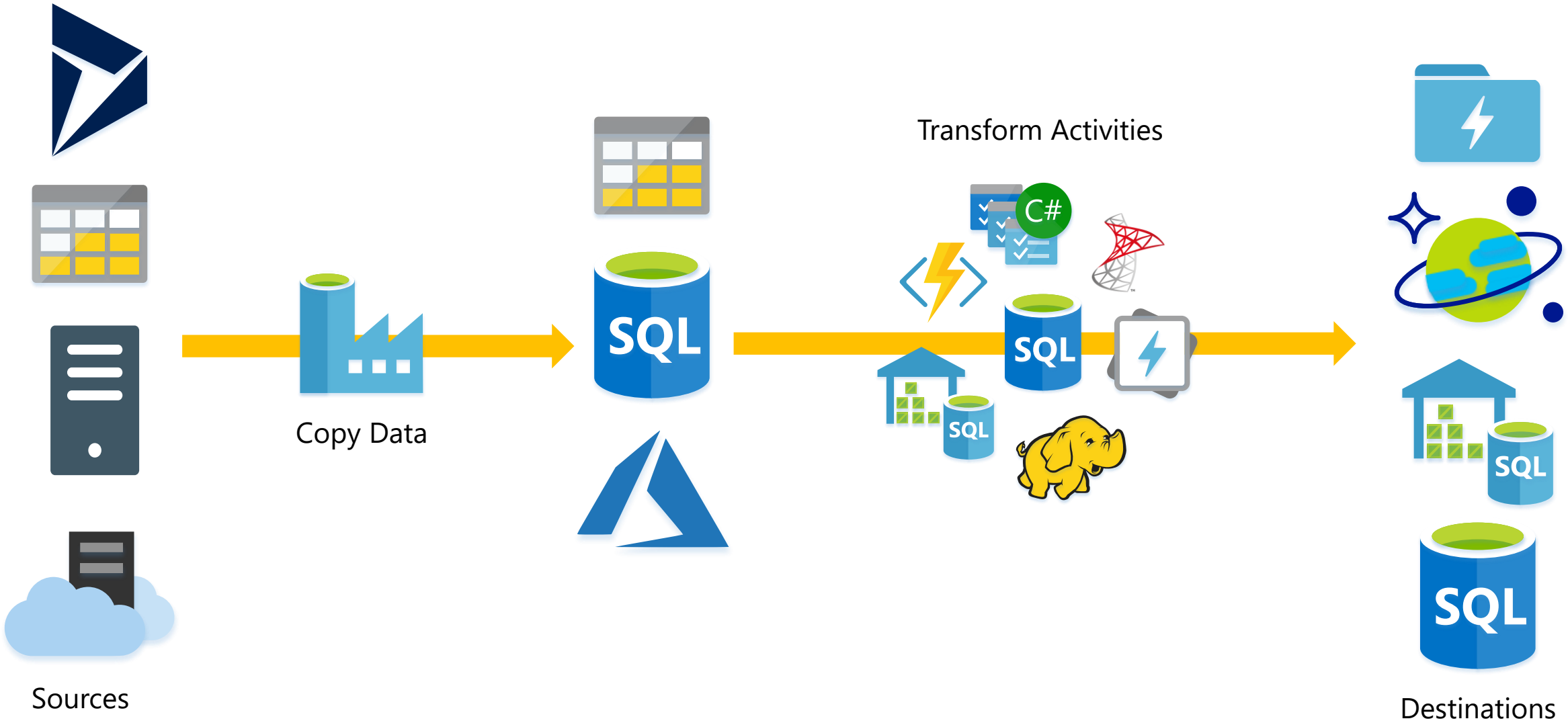
https://azure.microsoft.com/en-gb/services/data-factory/



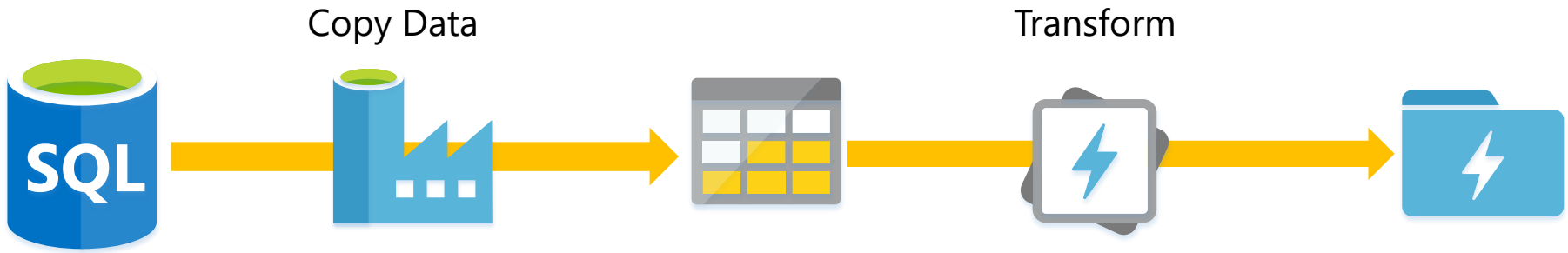
What is Azure Data Factory?



What does Azure Data Factory do?

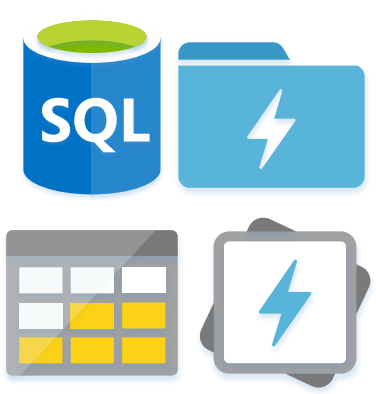


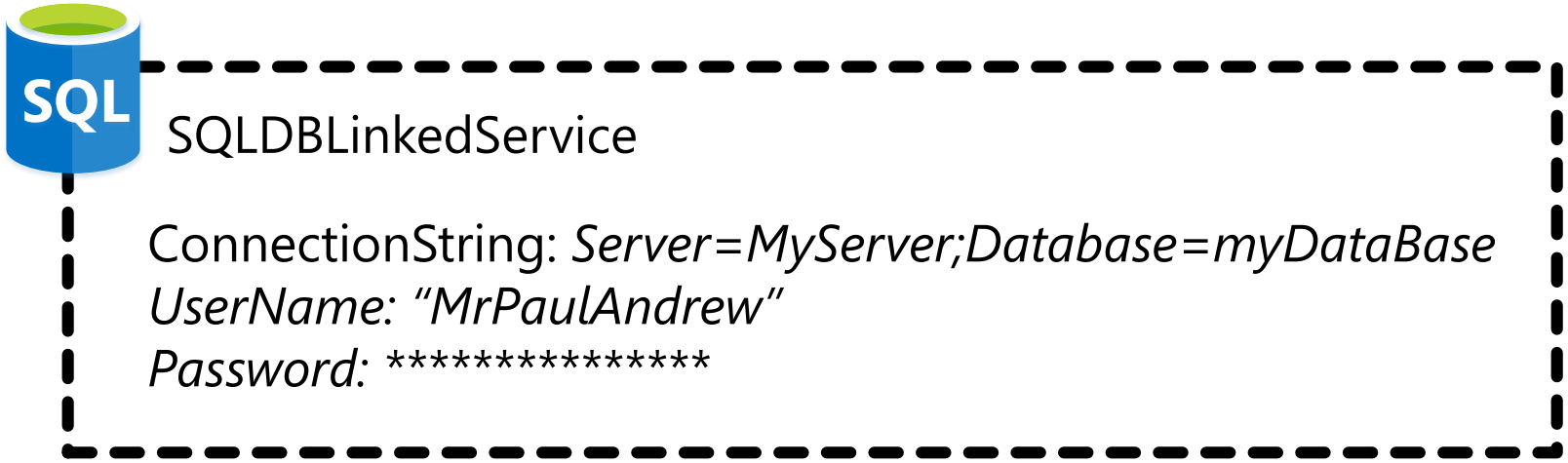
Data Factory Components



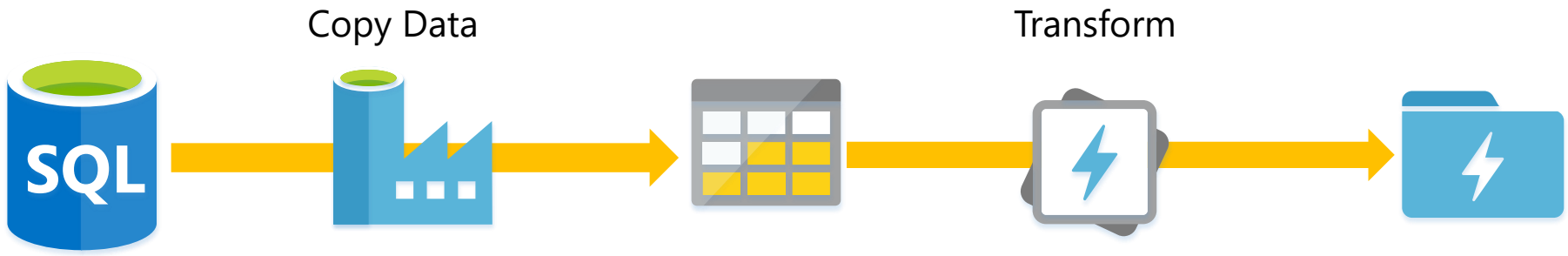
1 **Linked Services** – How do I connect?

Like the SSIS Connection Manager!





Data Factory Components

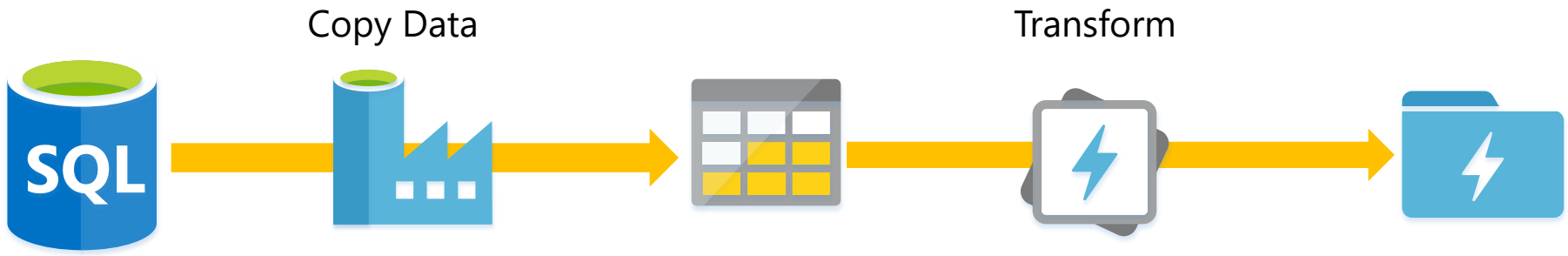


1. **Linked Services**
2. **Data Sets** – What slices/partitions does my data have?

dbo.DimCustomer

/RAW/Orders/2018/01/01/Orders.csv

Data Factory Components

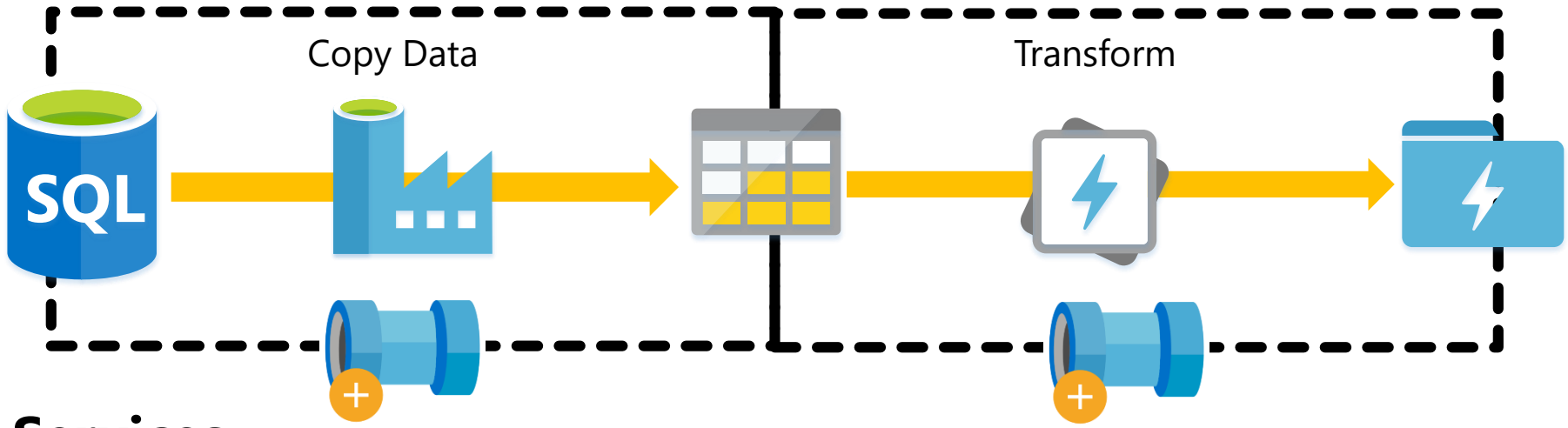


1. **Linked Services**
2. **Data Sets**
3. **Activities** – What do we want to happen? With what conditions?

U-SQL Activity

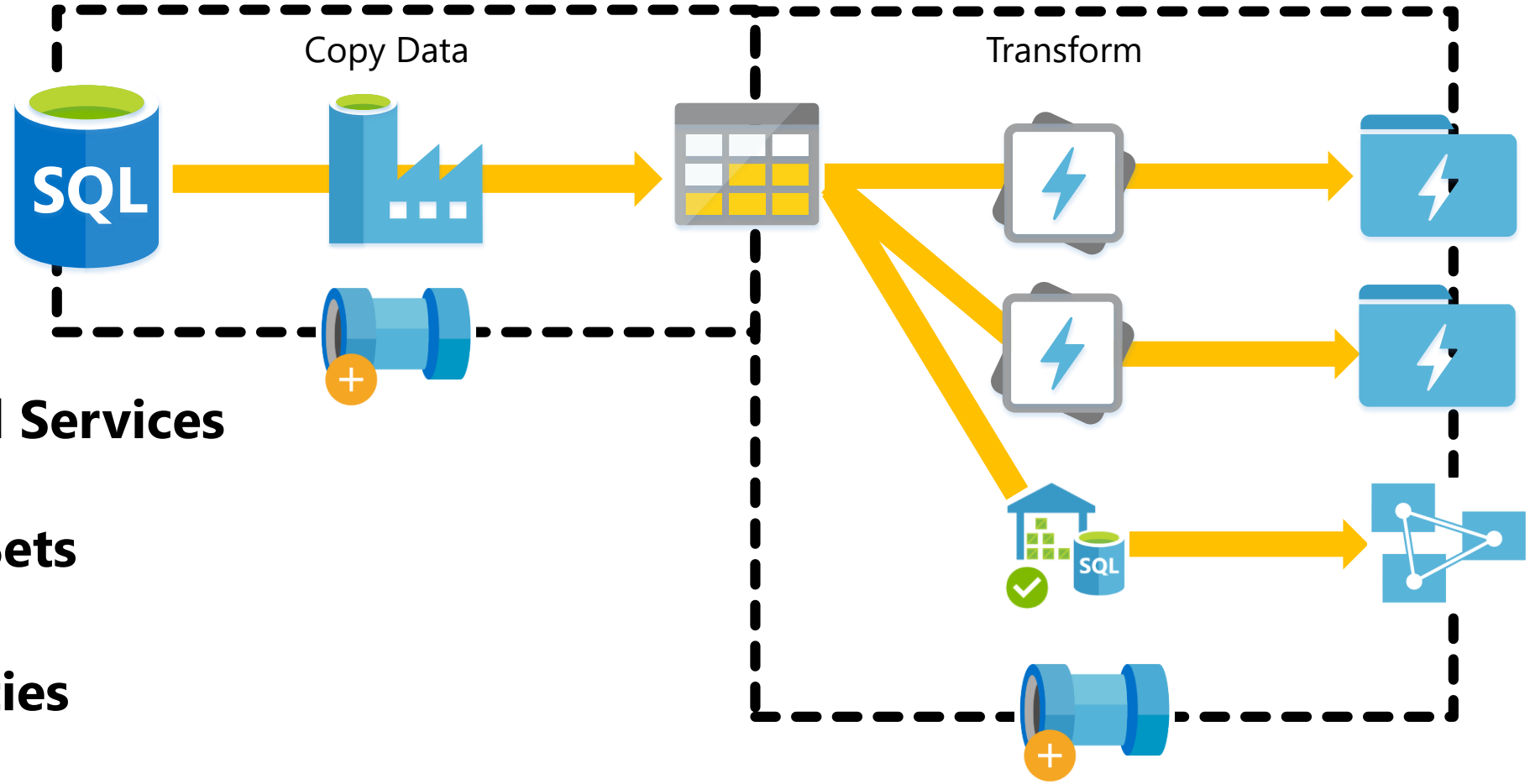
Script: *wasb//:myscripts/ProcessOrders.usql*
AUs: *5 units*
Priority: *1000*
Parameters: *@Output = "RAW/Orders/..."*

Data Factory Components



1. **Linked Services**
2. **Data Sets**
3. **Activities**
4. **Pipelines** – What groups of work do I want to do?

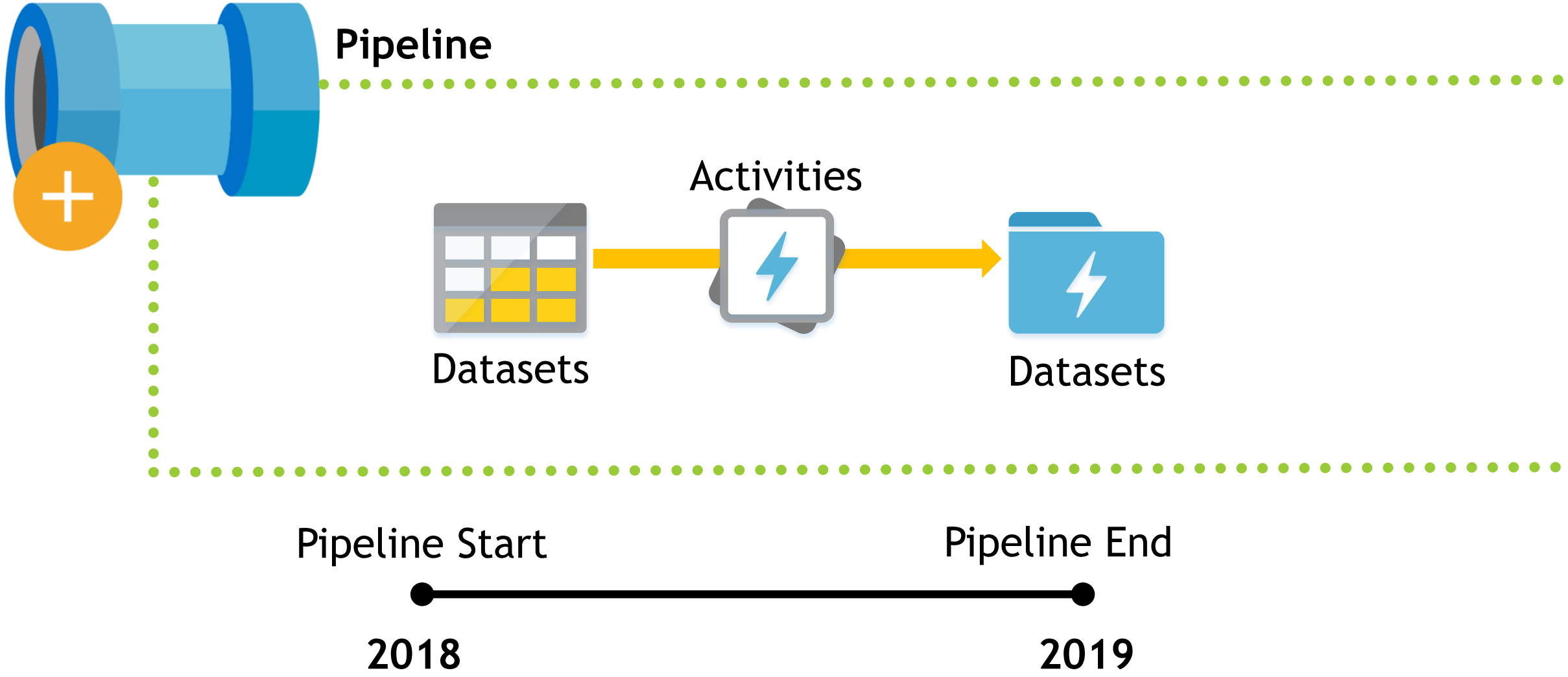
Data Factory Components



1. **Linked Services**
2. **Data Sets**
3. **Activities**
4. **Pipelines** – What groups of work do I want to do?

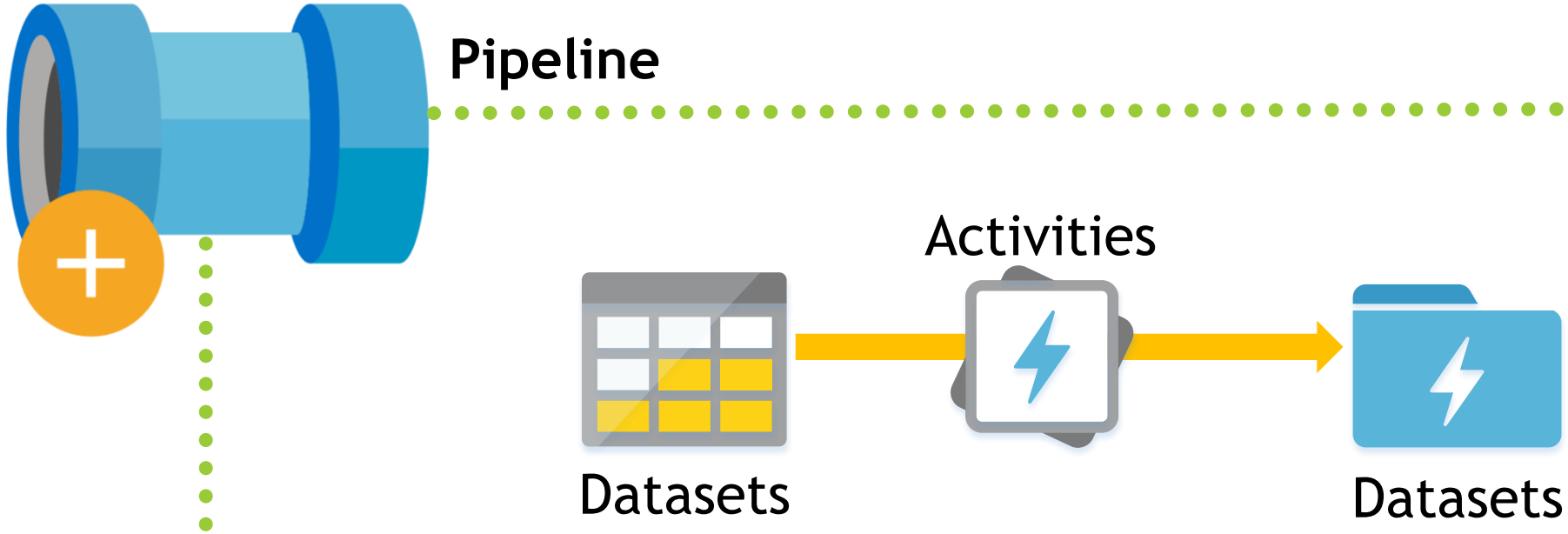
Azure Data Factory Concepts

Time Slices – triggering an activity execution.



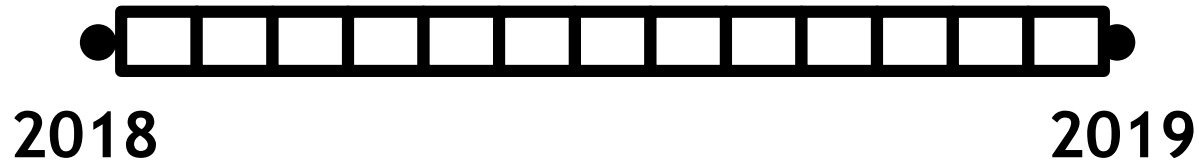
Azure Data Factory Concepts Continued

Time Slices – triggering an activity execution.



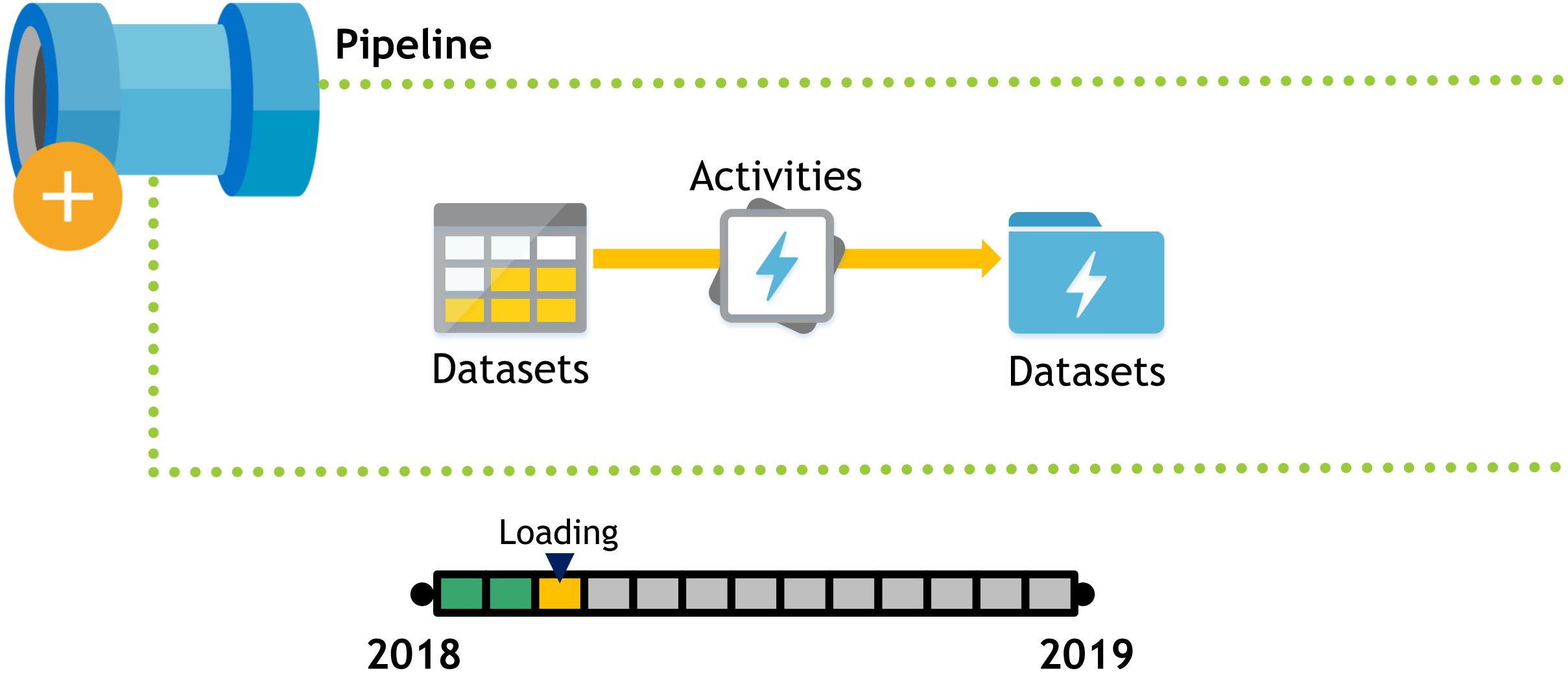
Interval: *Month*

Frequency: *1*

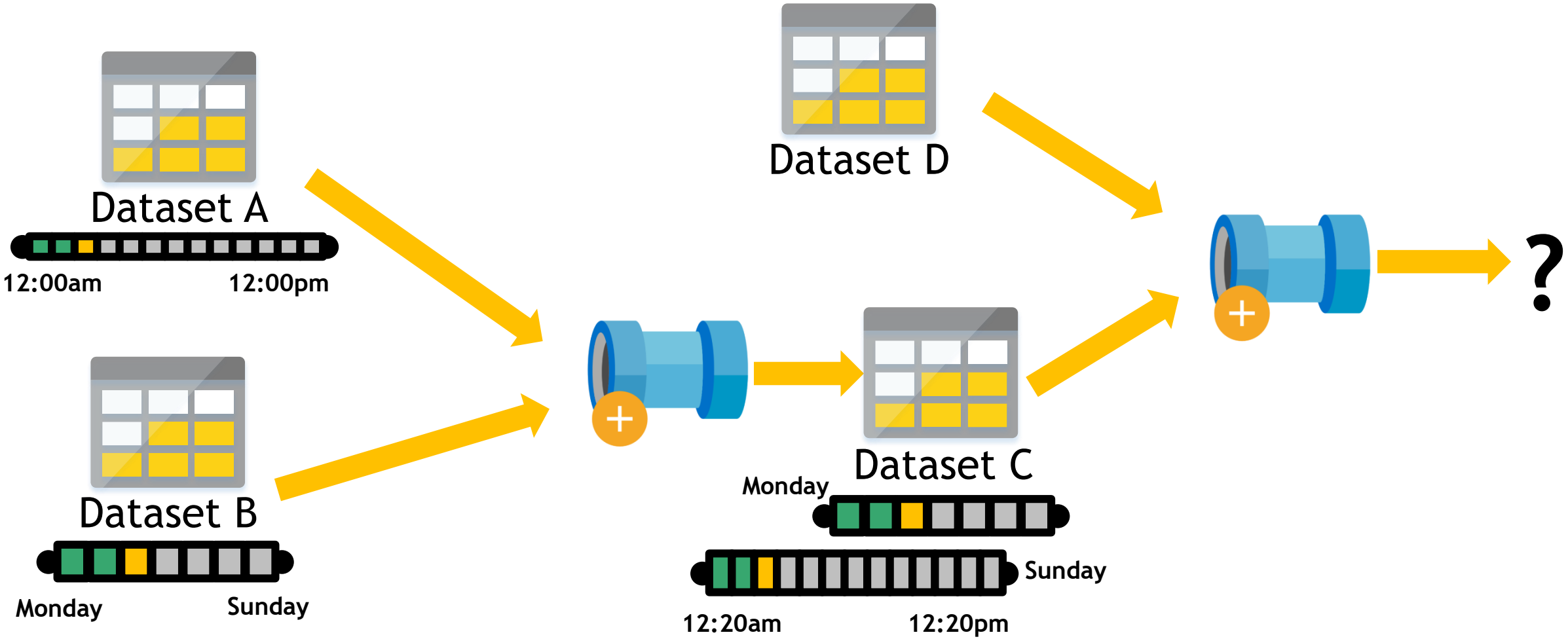


Azure Data Factory Concepts Continued

Time Slices – triggering an activity execution.



Time Slice Problems…



Integration Runtimes

1 **Azure** Integration Runtime

Movement Hours

Activity Orchestration

Flexible Region

2 **SSIS** Integration Runtime

SSIS Package Execution

Specified Region

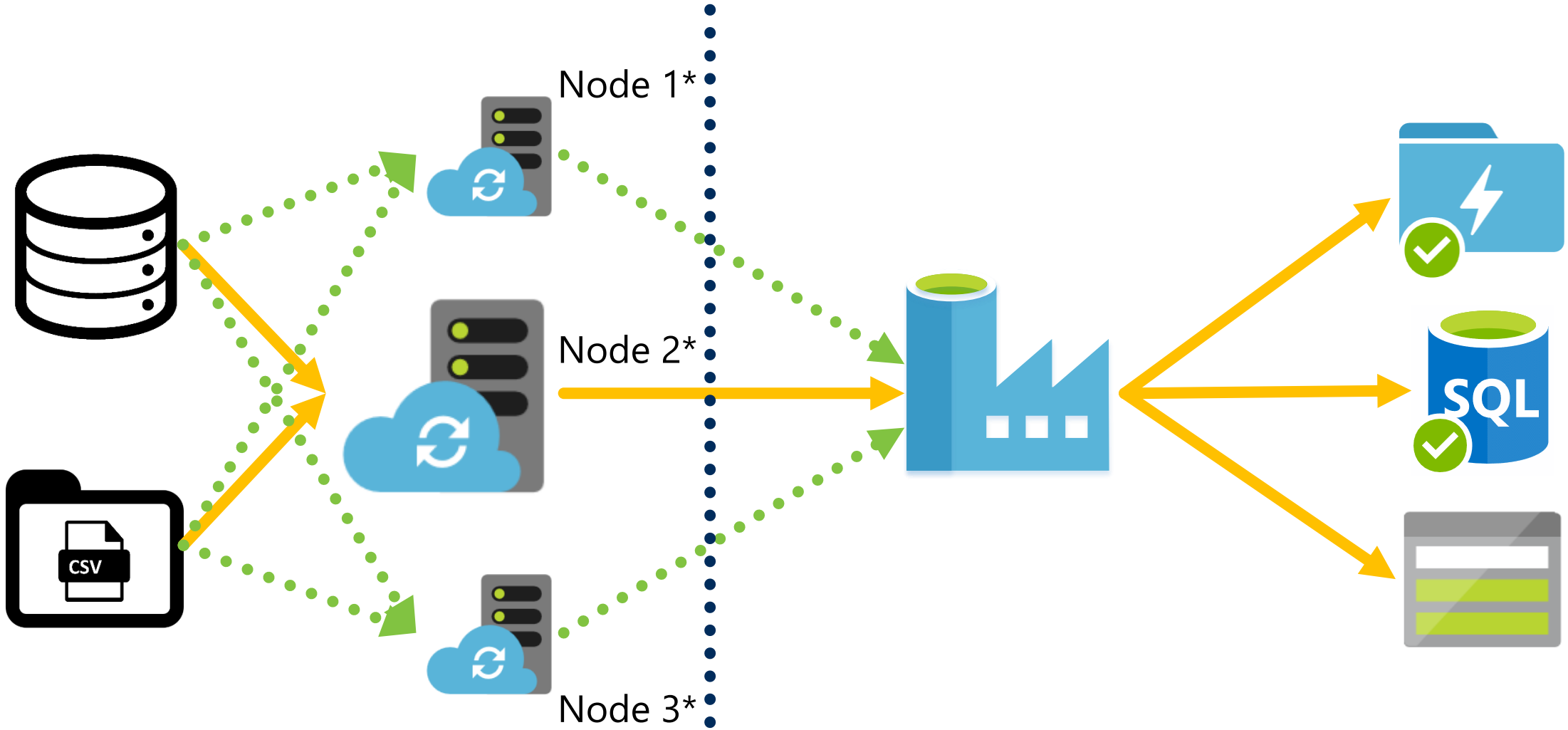
3 **Self Hosted** Integration Runtime

Local Compute

Activity Orchestration

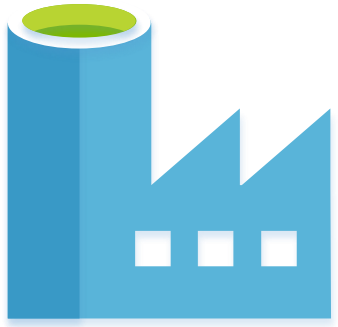
On-Prem Server

The Integration Runtime *(AKA The Data Management Gateway)*

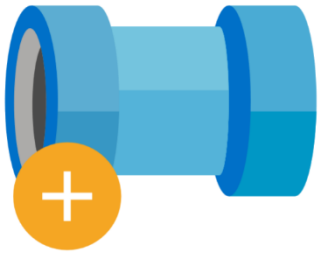


*Failover & Load Balancing

Azure Data Factory Concepts & Components Recap



1. **Linked Services**
2. **Data Sets**
3. **Activities**
4. **Pipelines**

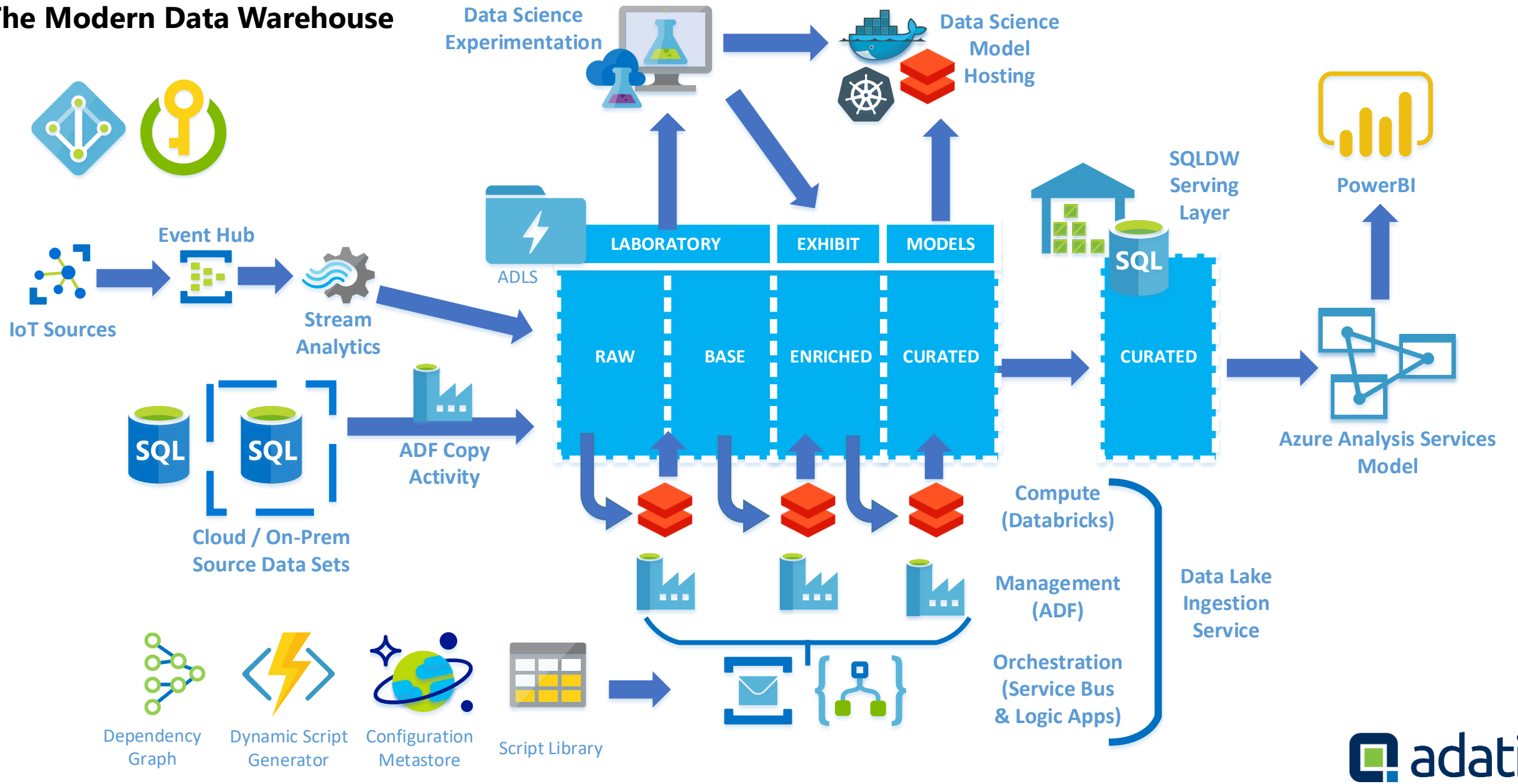


Time Slices

1. **Azure** Integration Runtime
2. **SSIS** Integration Runtime
3. **Self Hosted** Integration Runtime

Why use Azure Data Factory?

The Modern Data Warehouse



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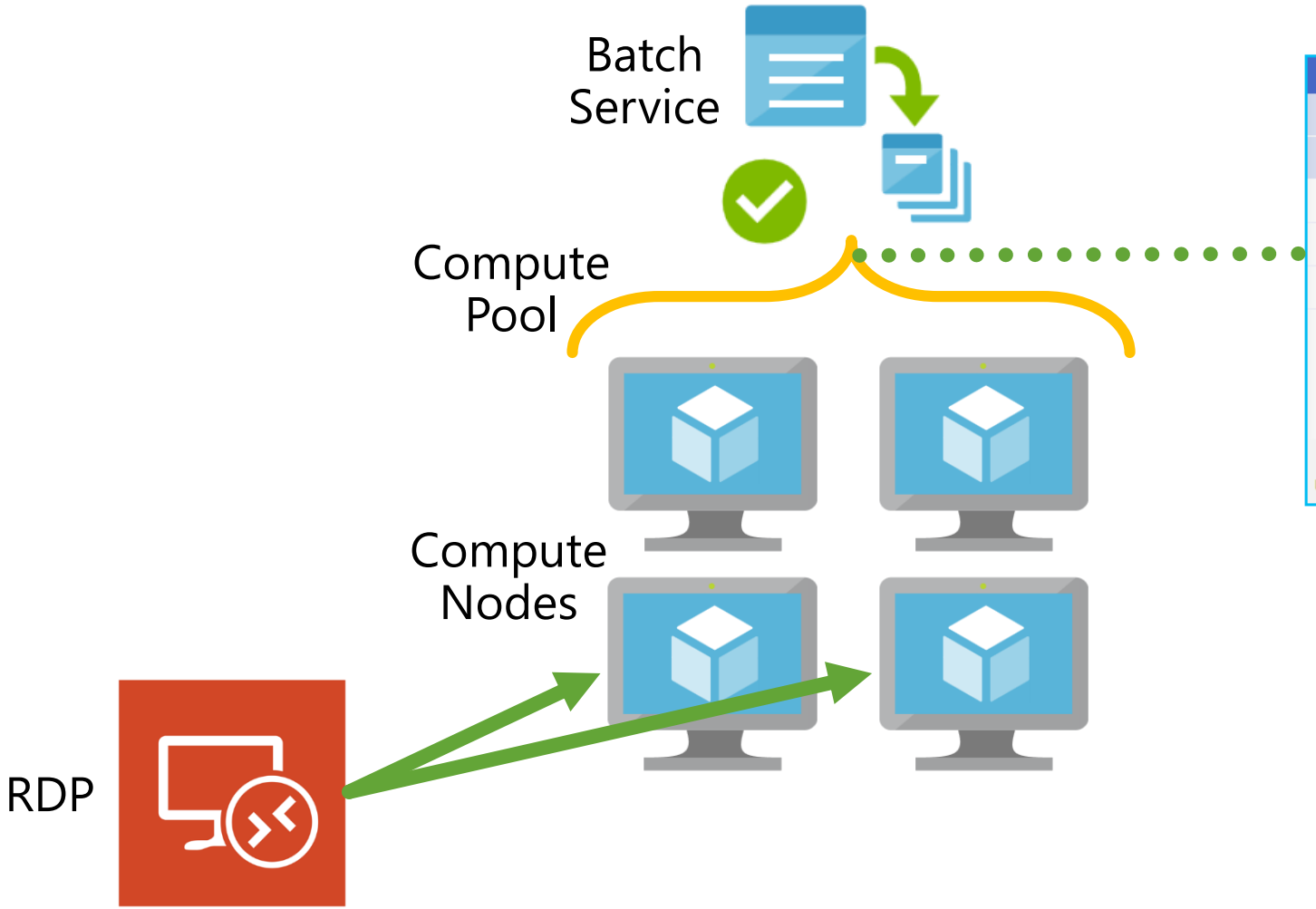
Agenda

Data Factory	Data Factory Extensibility	Conclusions	Coming Soon!
Concepts Components Why use it?	SSIS, Functions, Custom Activities	Design Patterns ETL/ELT in Azure	Data Flows with Data Bricks

ADF Extensibility

1 **Custom Activities** – A .Net Console App Executed Using Azure Batch Service



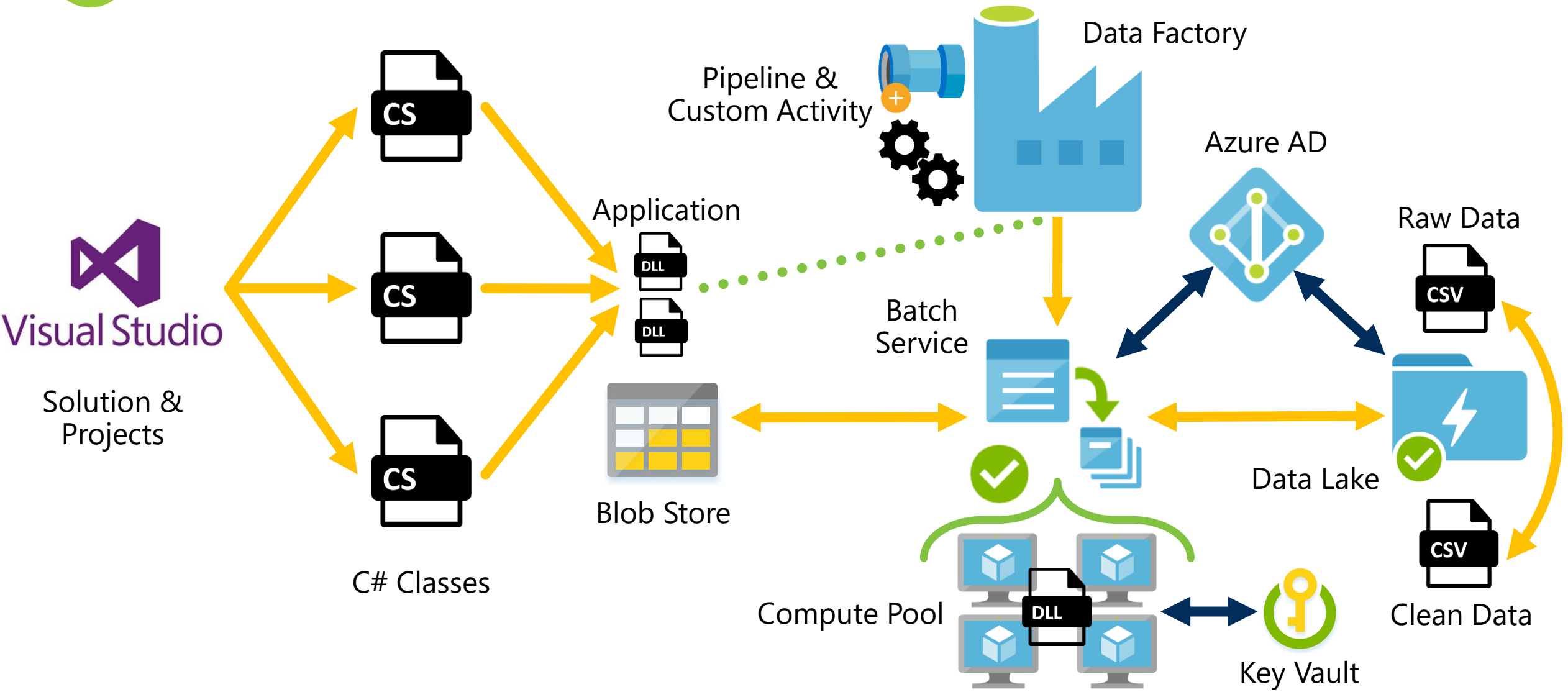
VM node size set per compute pool:

A1 Standard	A2 Standard	A3 Standard
1 Cores	2 Cores	4 Cores
1.8 GB	3.5 GB	7 GB
1 TB OS disk size	1 TB OS disk size	1 TB OS disk size
70 GB Resource disk size	135 GB Resource disk size	285 GB Resource disk size
2 Max data disk	4 Max data disk	8 Max data disk
Unable to display pricing	Unable to display pricing	Unable to display pricing

- 1 compute node = 1 virtual machine.
- 1 job per compute node.
- Max of 4 tasks per node.
- OS on D drive, not C.
- Special environment variables.

ADF Extensibility Continued

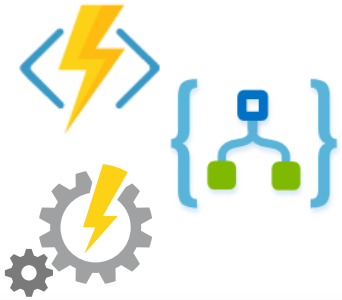
1 **Custom Activities** – A .Net Console App Executed Using Azure Batch Service



ADF Extensibility Continued

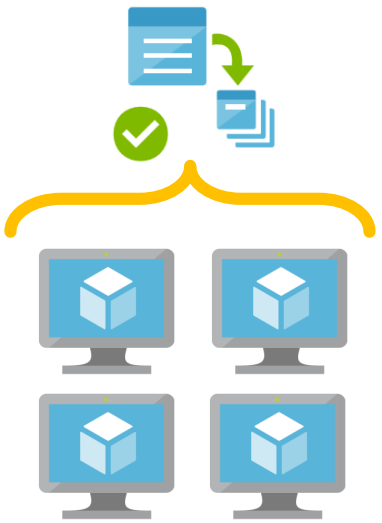
1. **Custom Activities** – A .Net Console App Executed Using Azure Batch Service
2. **Rest API Calls** – Eg. Web Activities Calling:

Azure Functions
Azure Logic Apps
Azure Automation

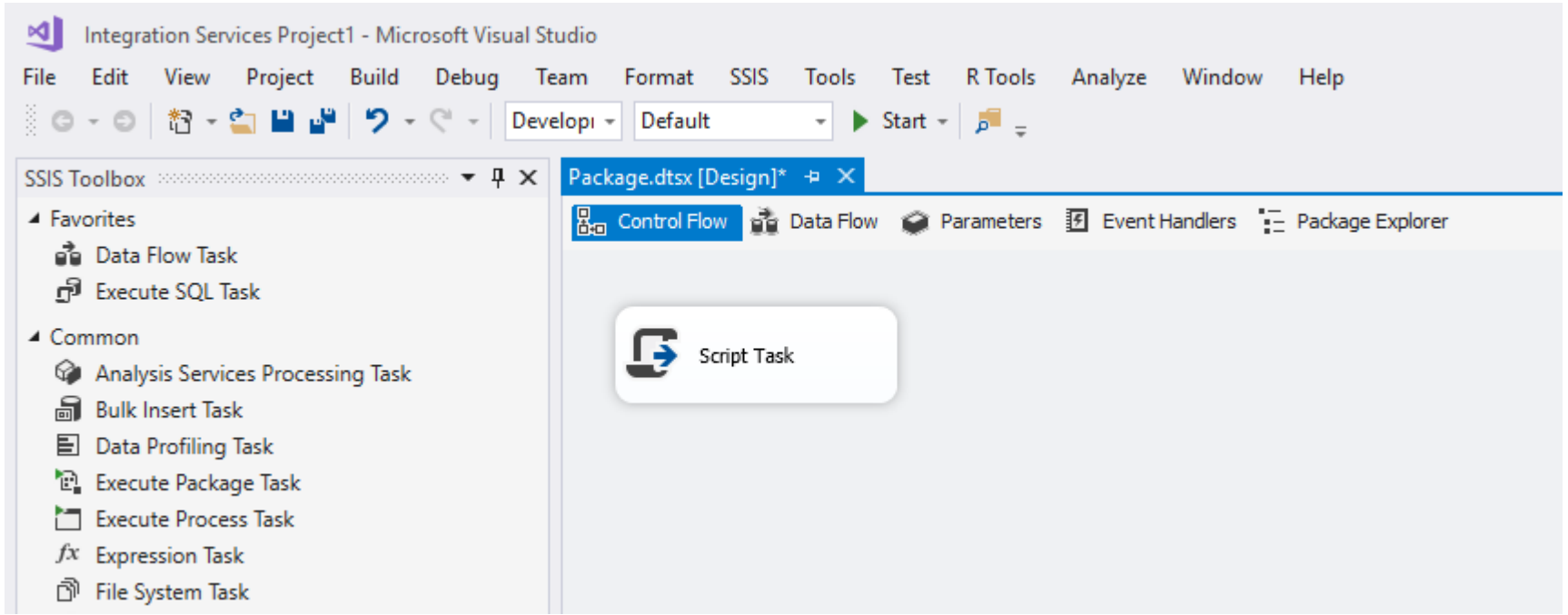


ADF Extensibility Continued

1. **Custom Activities**
2. **Rest API Calls**
3. **SSIS** – Packages with Control Flows and Data Flows



ADF SSIS IR



https://mrpaulandrew.com/2018/06/19/how-to-control-the-ssis-ir-from-your-adfv2-pipelines/

How do we schedule an SSIS Package in Azure?

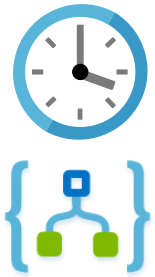
Azure Data Factory v2

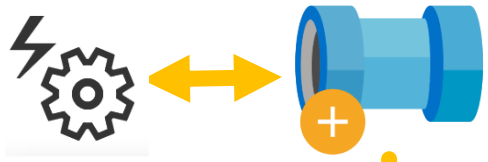
Azure Logical or MI SQL Server Instance

SSIS IR

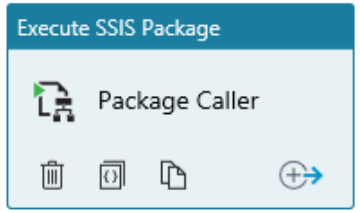
Azure SQLDB (SSISDB)

ADF Pipeline





Trigger



SSIS Activity

SQL Agent

Package

DTU Job

Elastic DTU Pool

```
EXEC
[catalog].[start_execution]
        @execution_id;
```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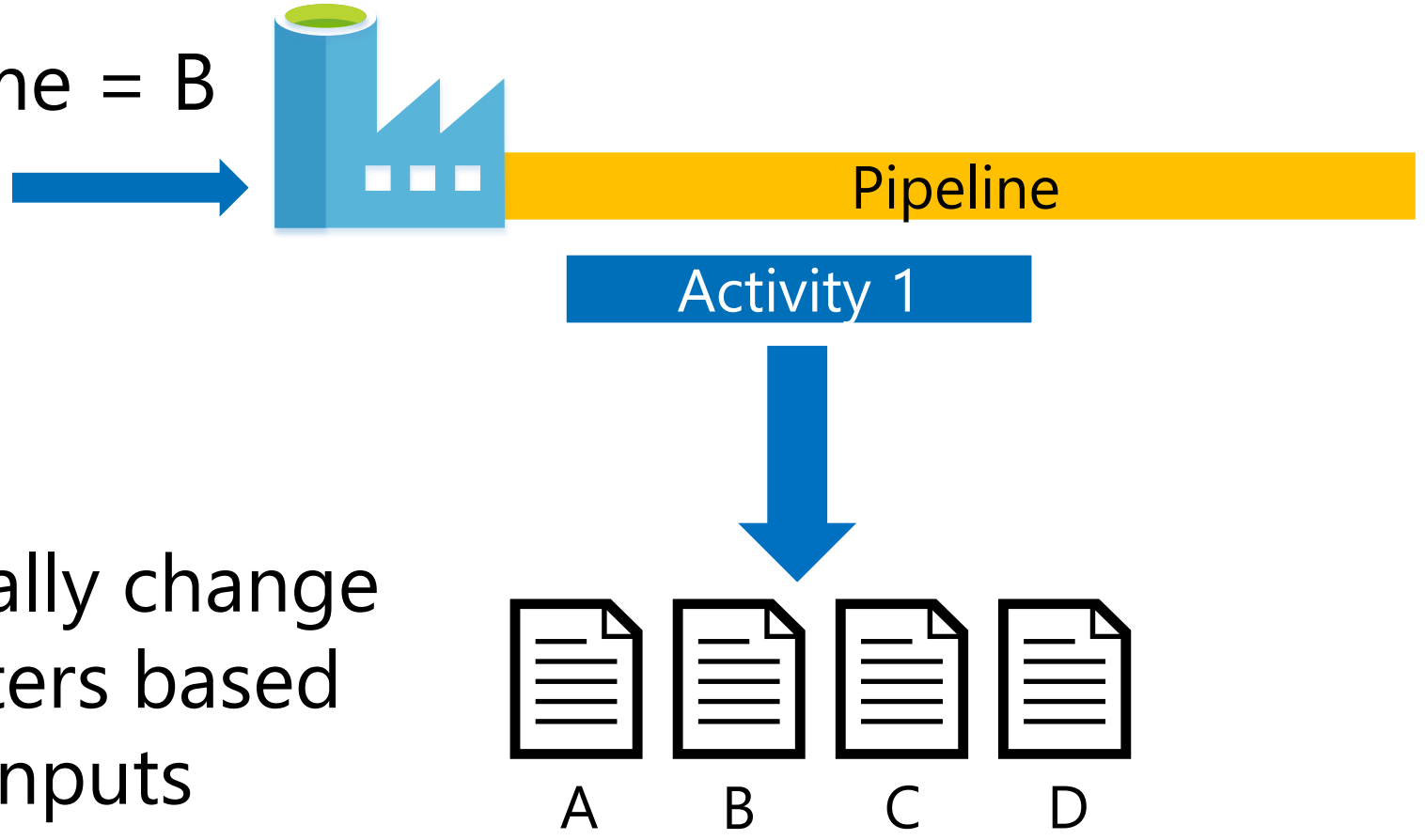
Agenda

Data Factory	Data Factory Extensibility	Conclusions	Coming Soon!
Concepts Components Why use it?	SSIS, Functions, Custom Activities	Design Patterns ETL/ELT in Azure	Data Flows with Data Bricks

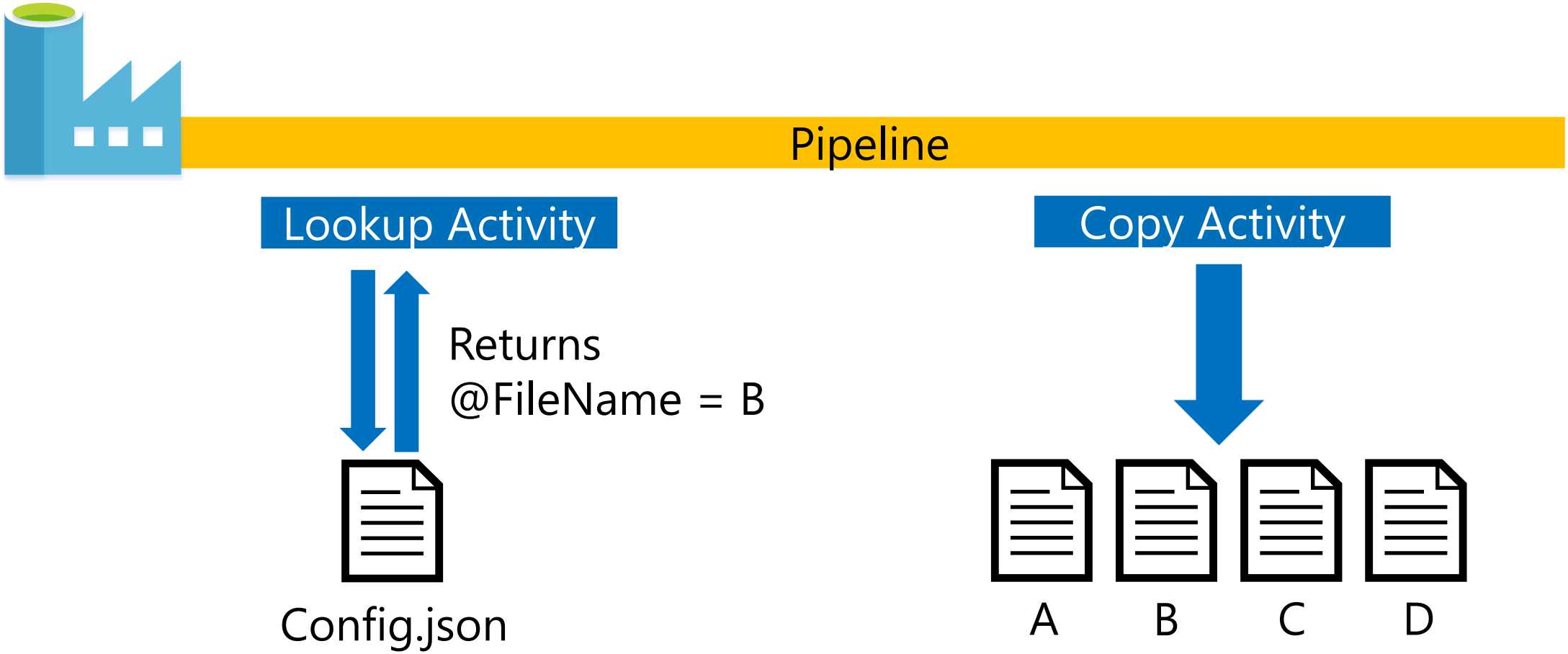
Dynamic Pipelines using Parameters & Expressions

@FileName = B



Dynamically change parameters based on inputs

Dynamic Pipelines using Lookup Activity



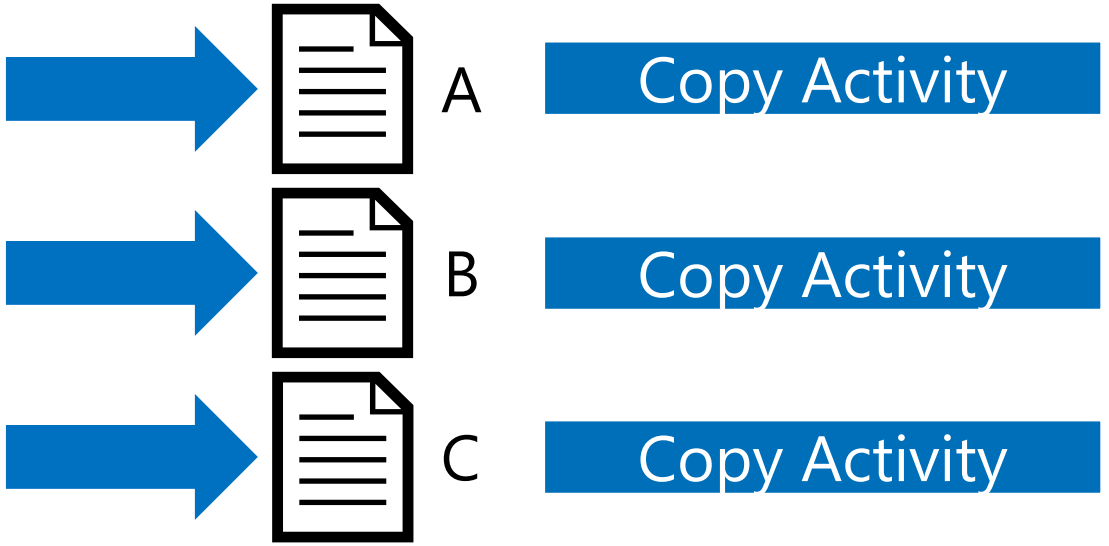
For Each Pipelines

@Files = [A,B,C]

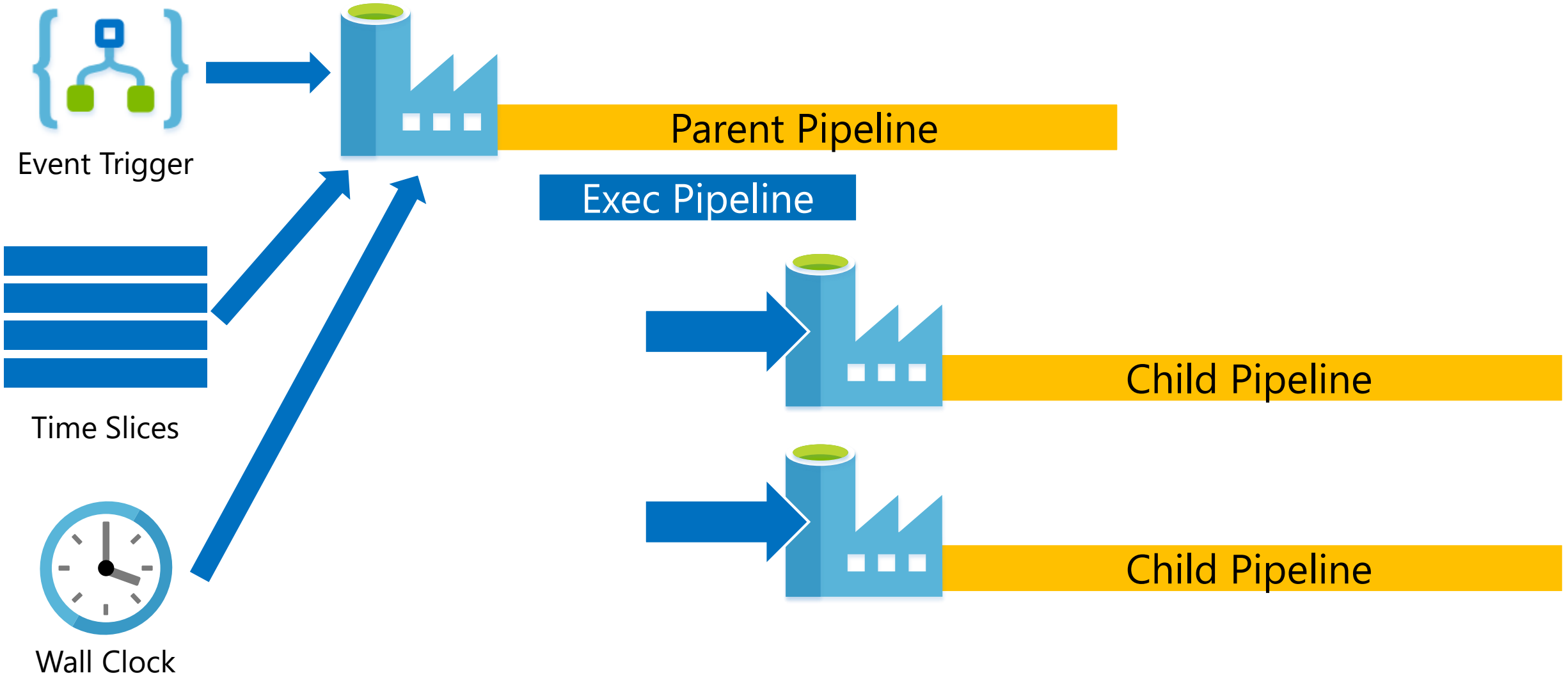
ForEach Activity

Run activity for each item in an array

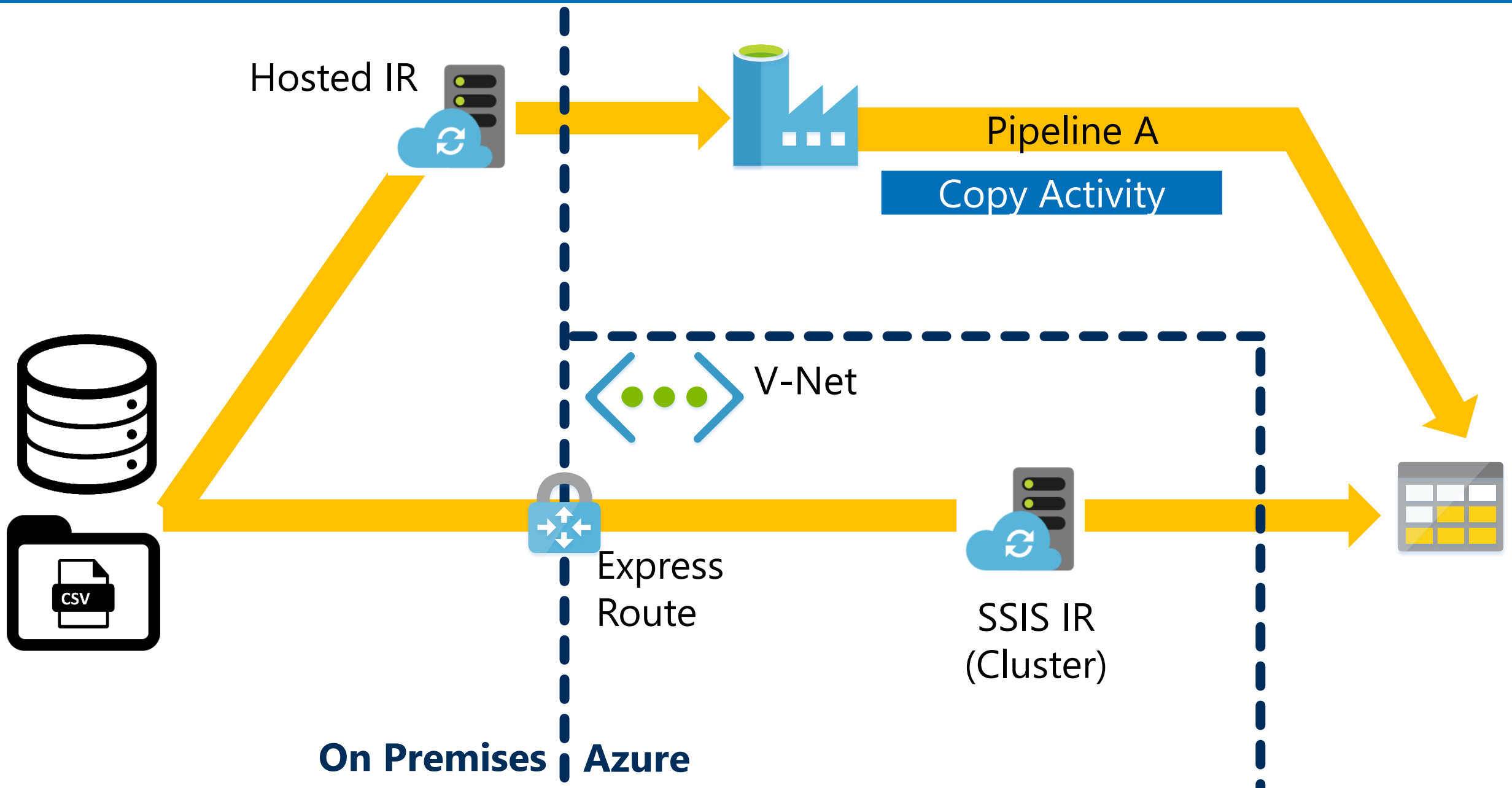
(max DOP 20)



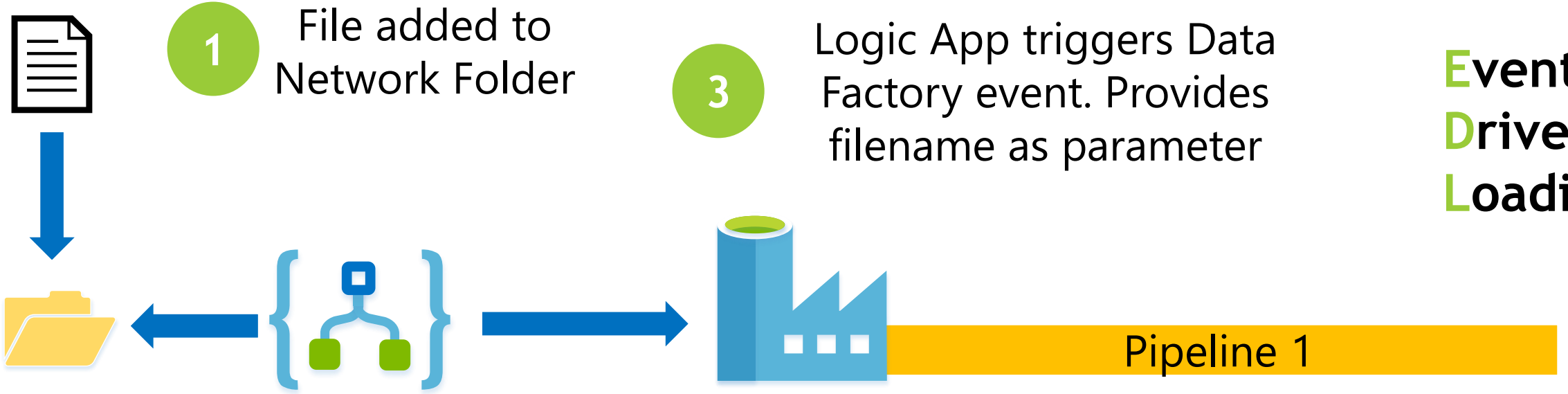
Parent/Child Pipelines & Triggering



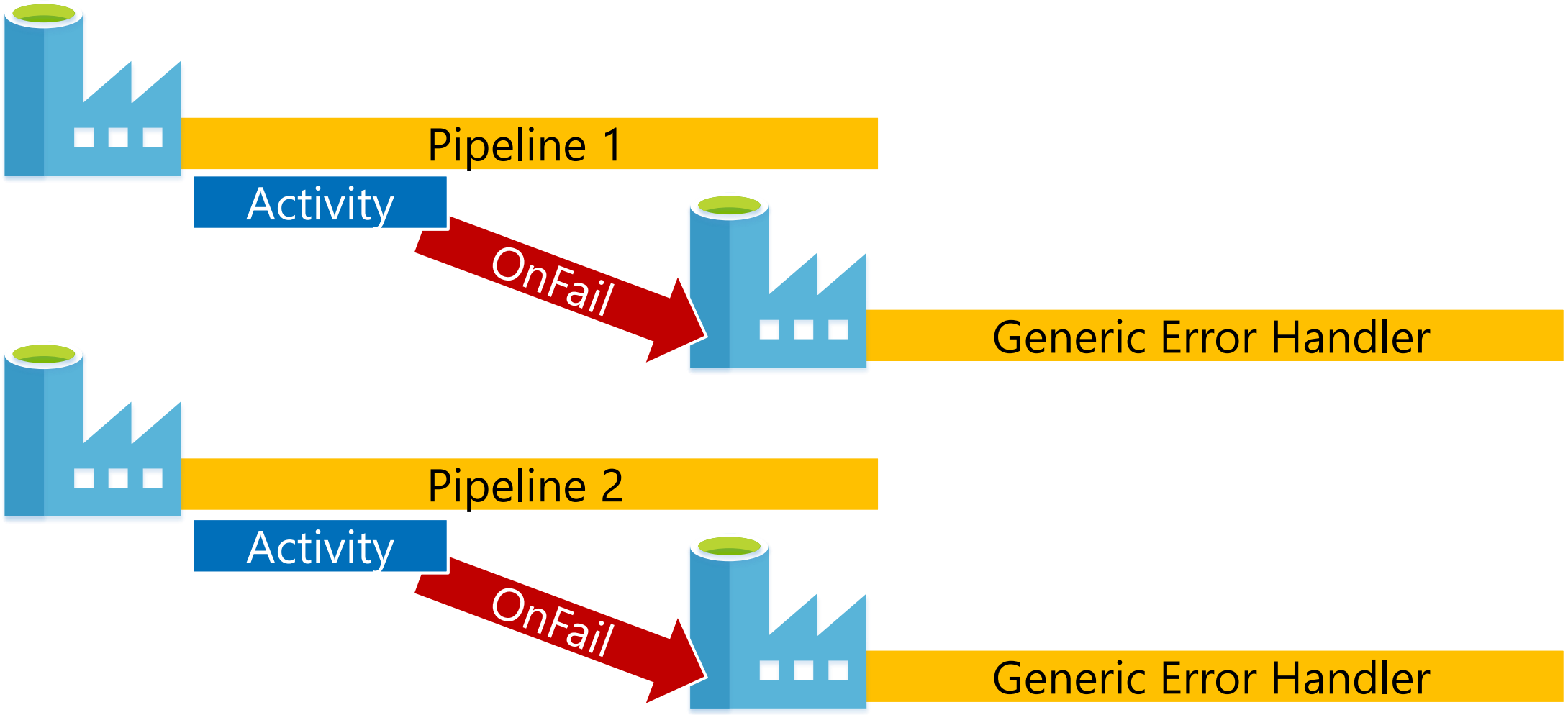
The SSIS IR with Azure V-Net Access



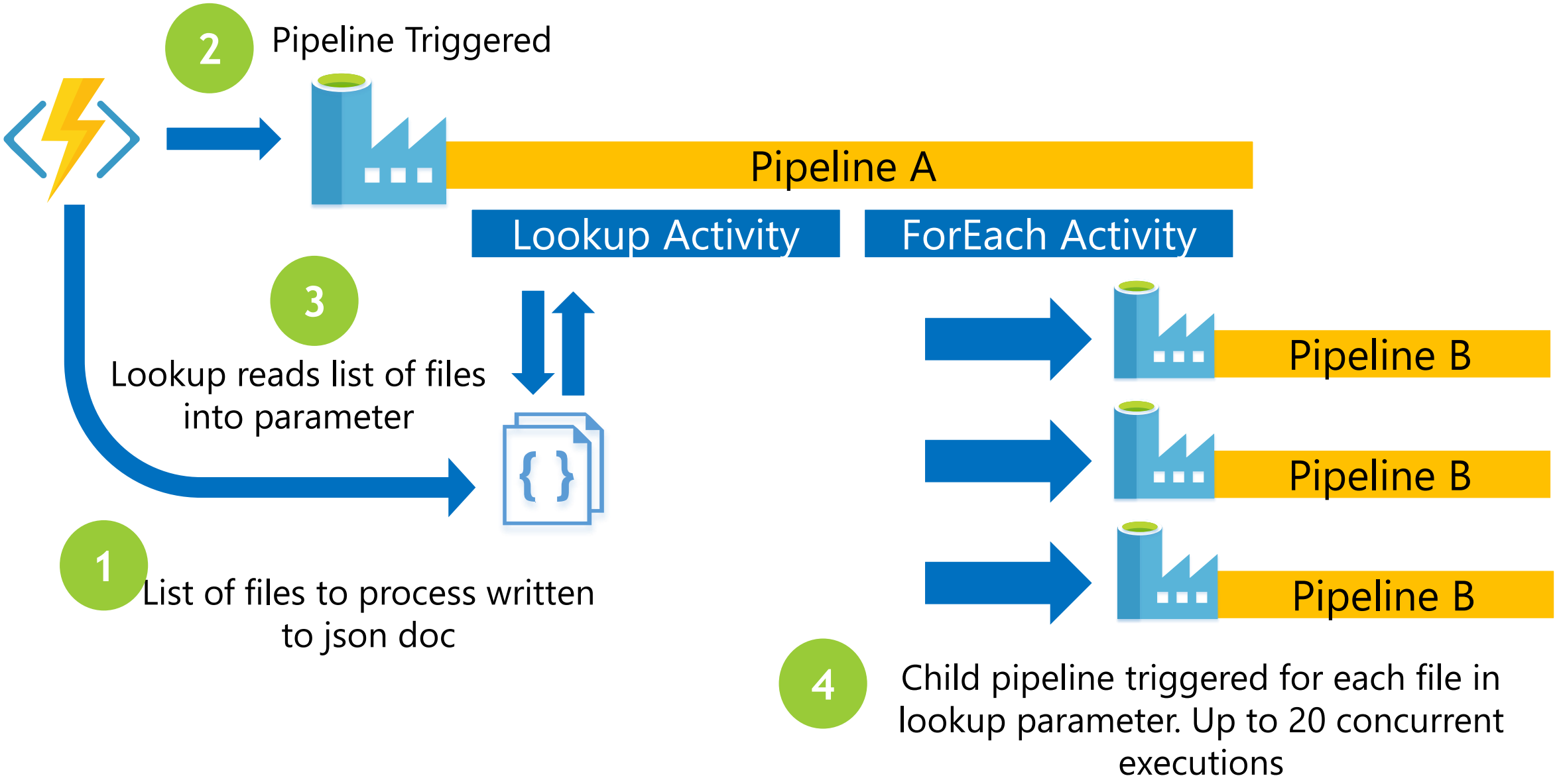
Event Driven Loading



Reusable Pipelines with Conditional Logic



Design Pattern Combinations



Is ADF the right tool for our data integration & orchestration in Azure?

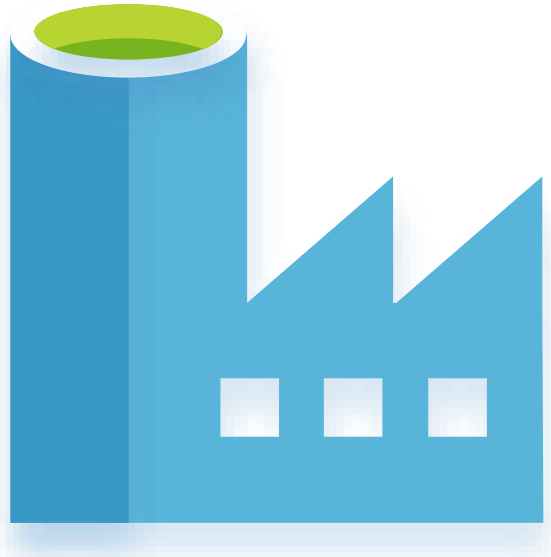
Maybe, limited use.

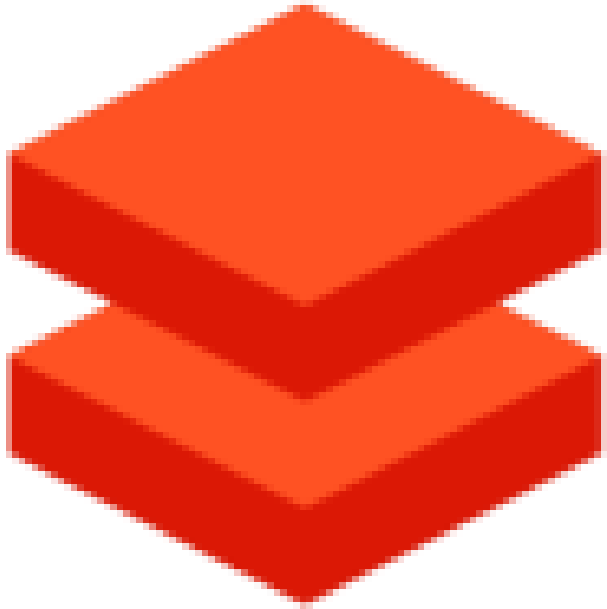
Yes, definitely.

Agenda

Data Factory	Data Factory Extensibility	Conclusions	Coming Soon!
Concepts Components Why use it?	SSIS, Functions, Custom Activities	Design Patterns ETL/ELT in Azure	Data Flows with Data Bricks

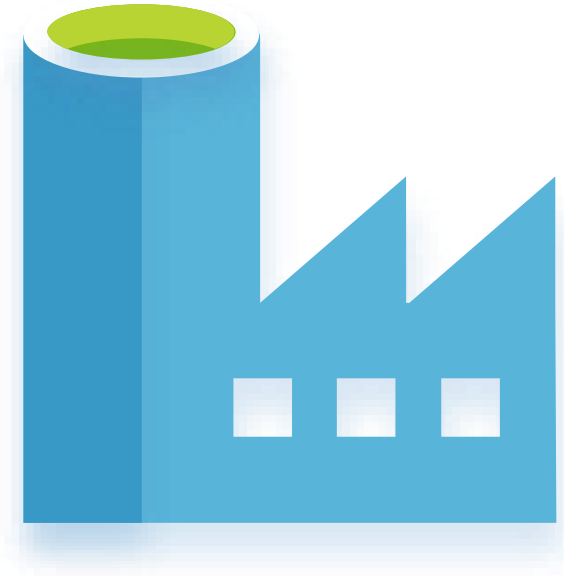
Did you know...





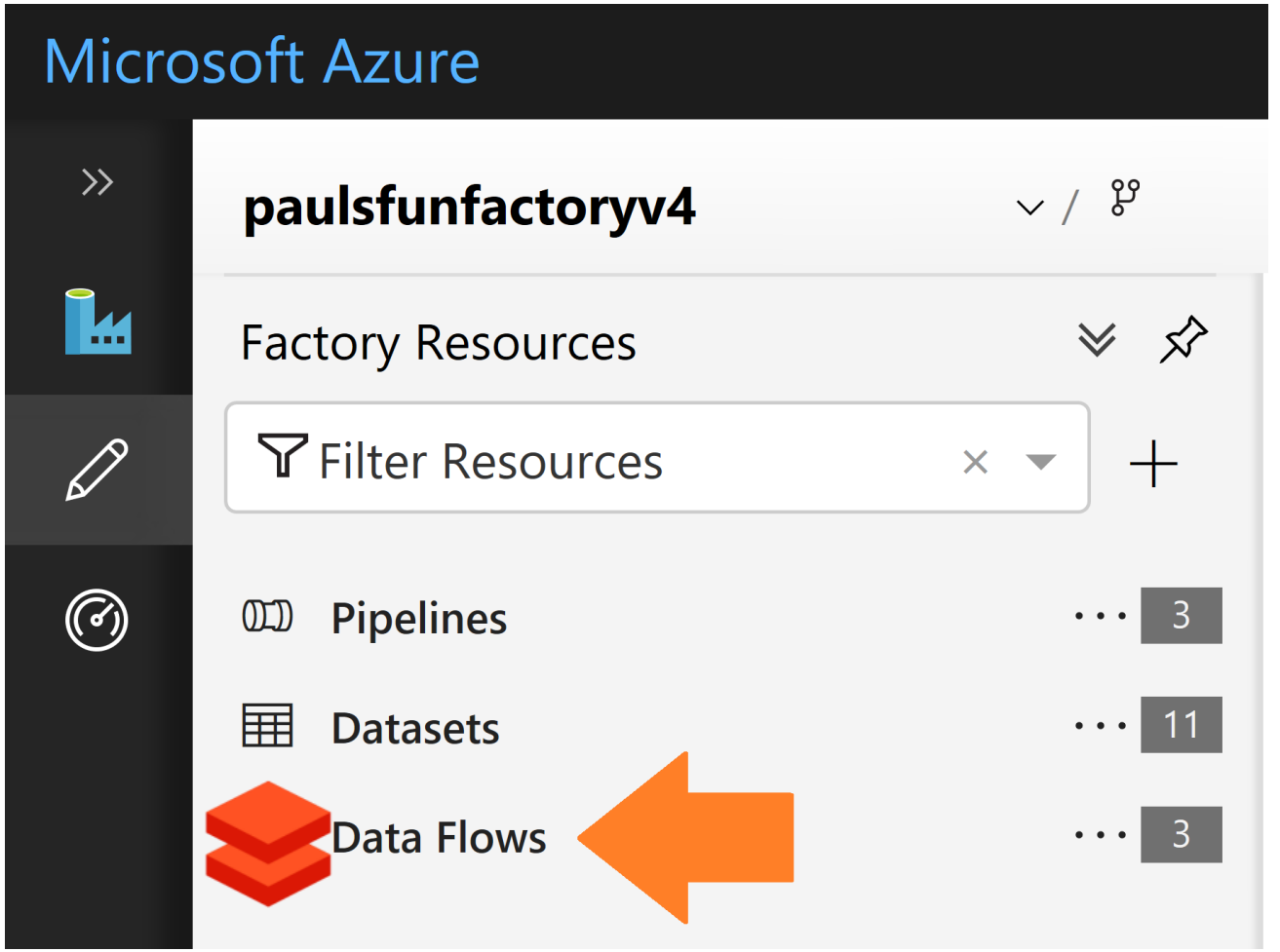
Azure Data Factory with Azure Data Bricks

Currently
Data Bricks Activities

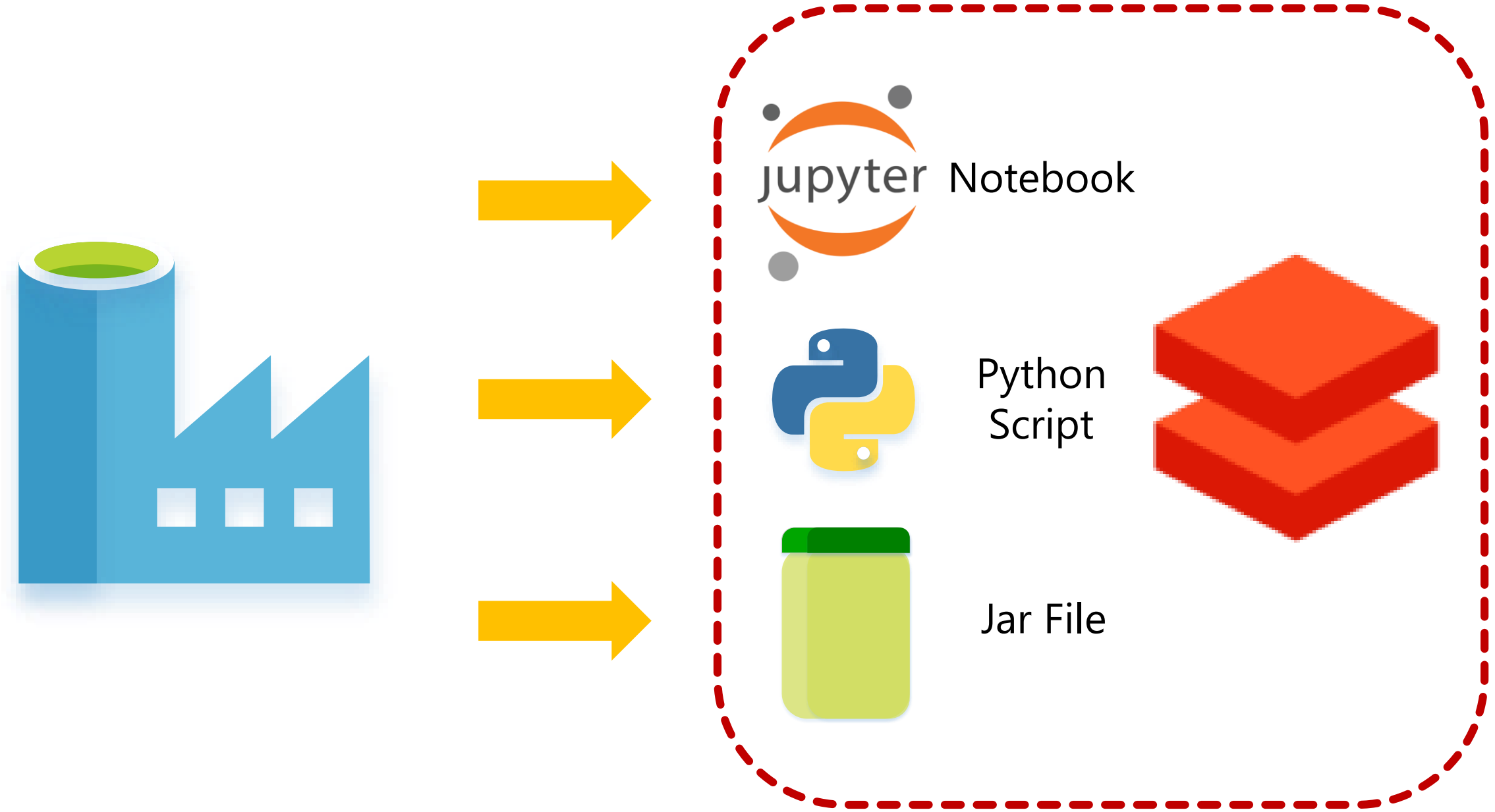


- Notebook
- Jar
- Python

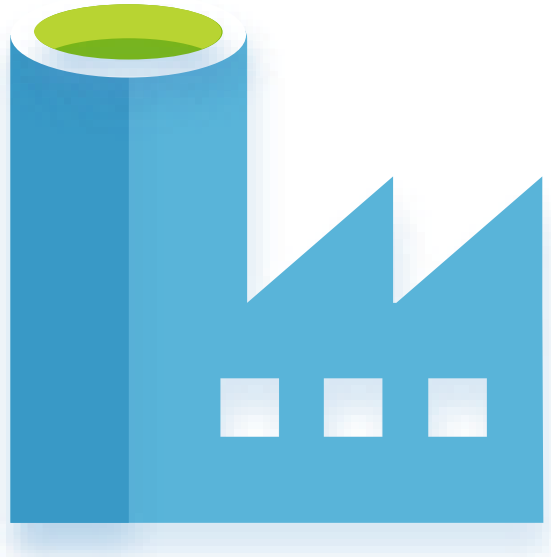
Coming Soon
ADF Data Flow Engine



Azure Data Factory with Azure Data Bricks

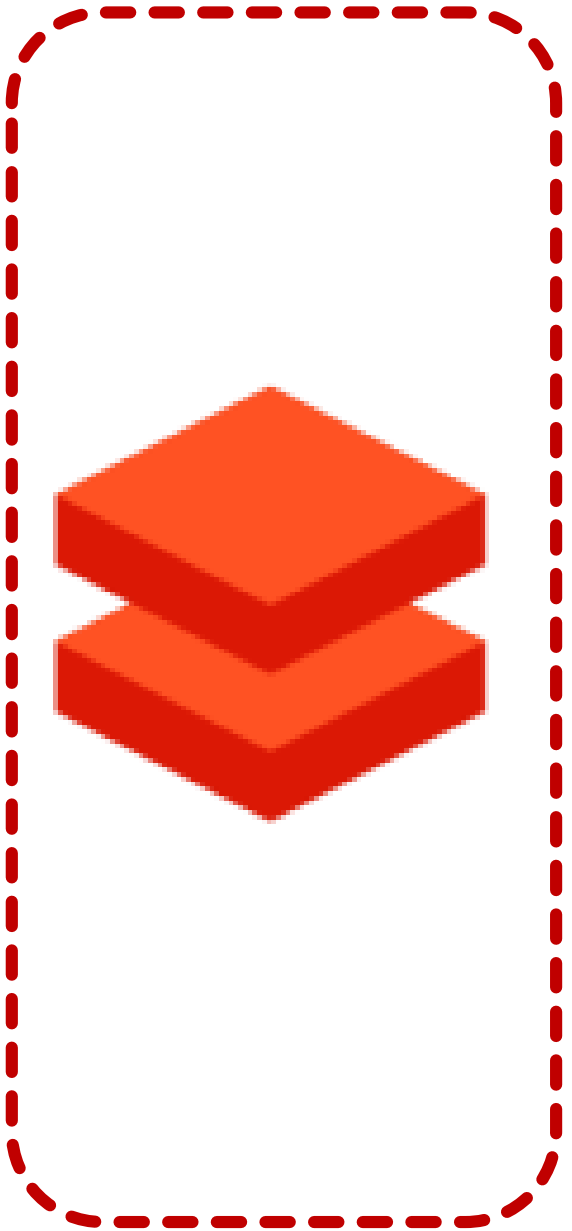


Azure Data Factory with Azure Data Bricks



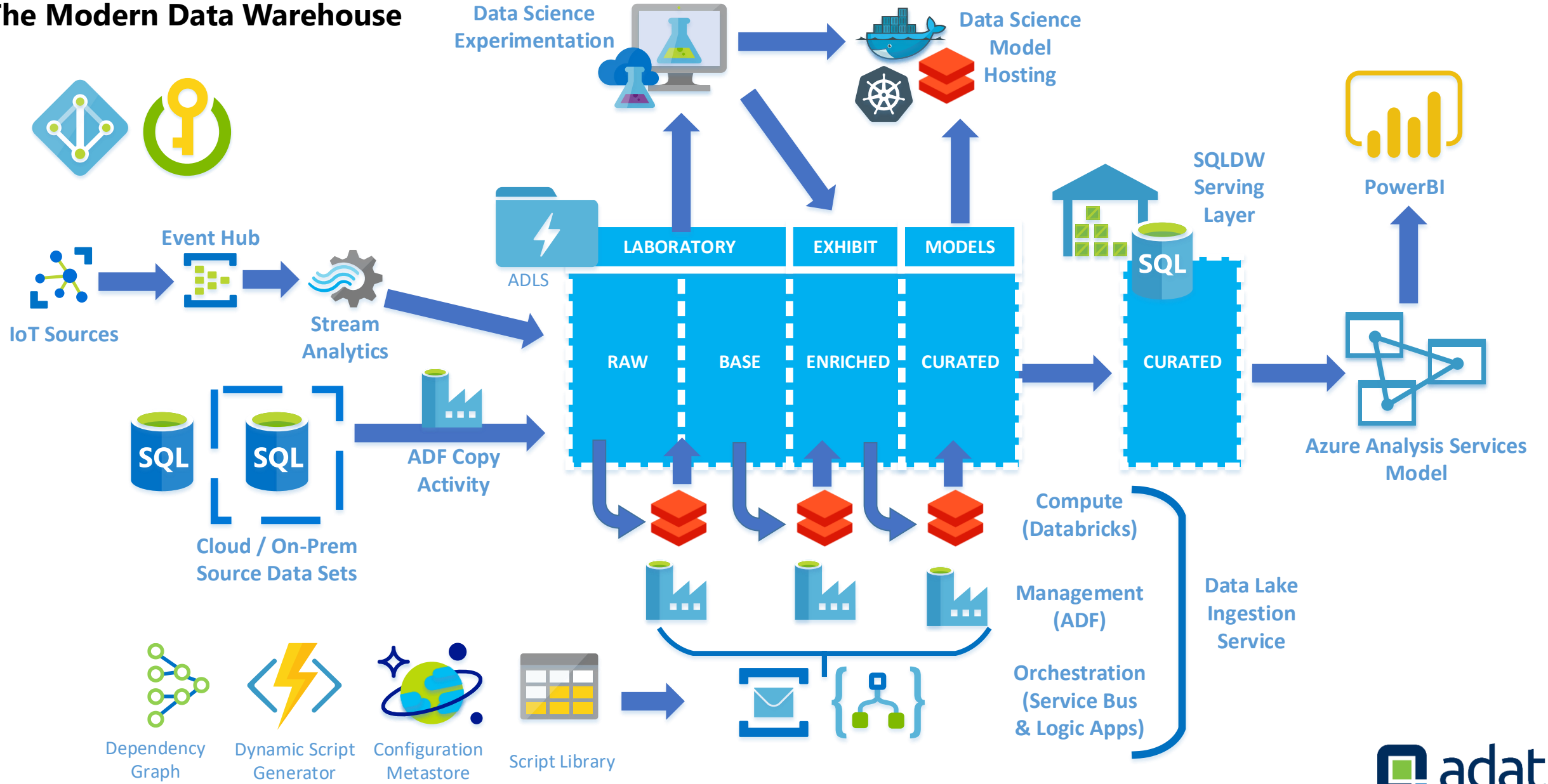
Data Flow

Jar File



Why use Azure Data Factory?

The Modern Data Warehouse



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Thanks for Listening

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