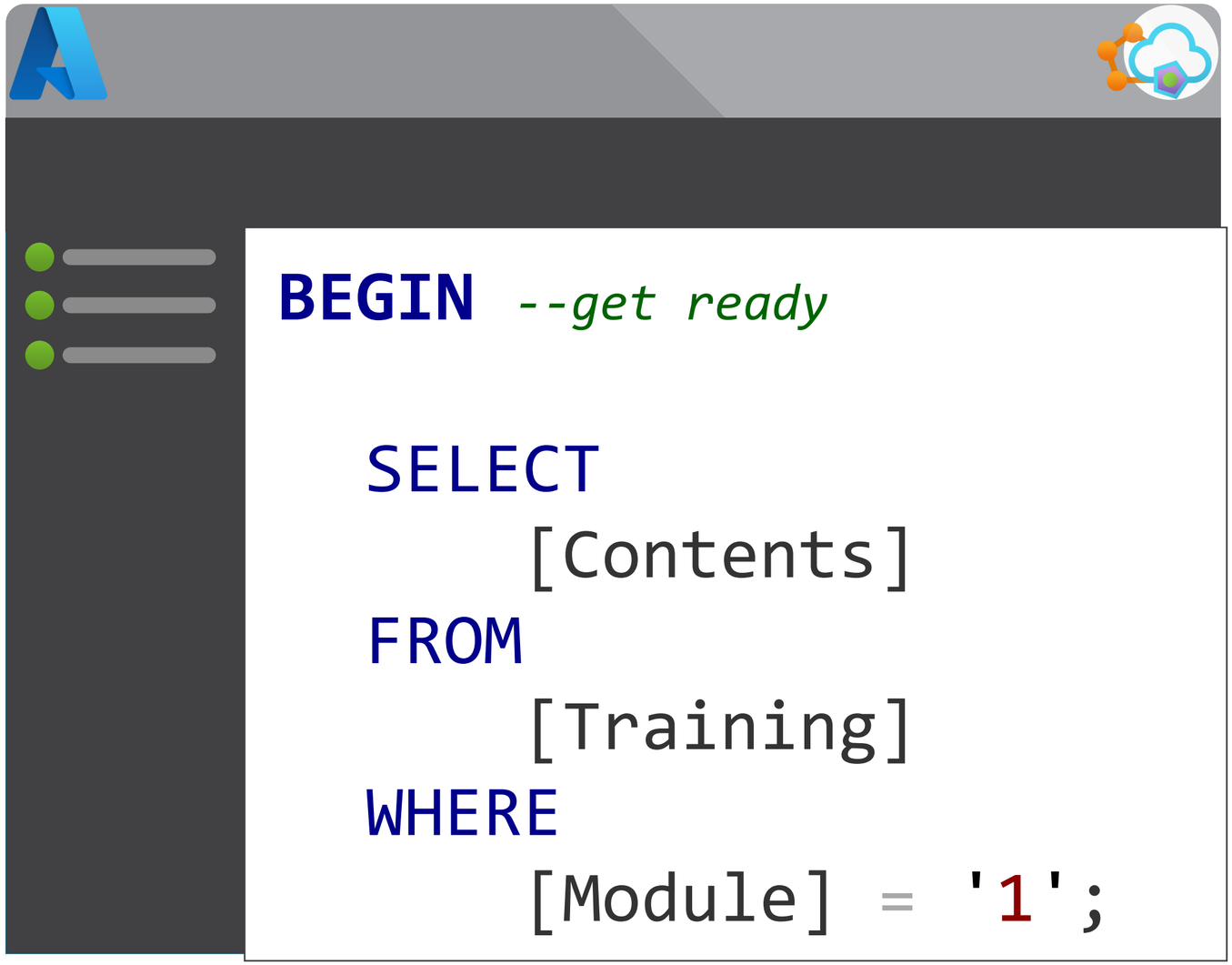
Module 1

Pipeline Fundamentals



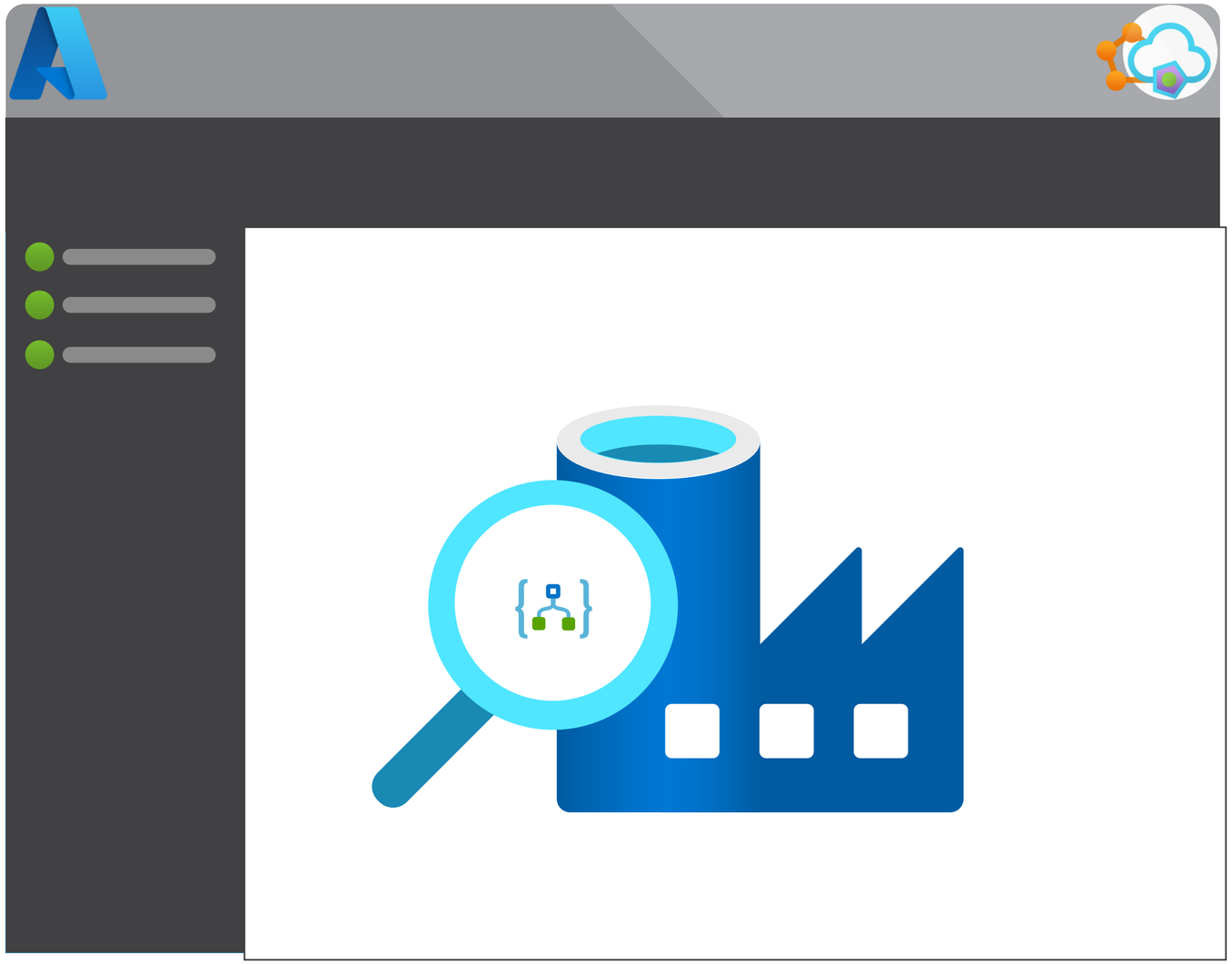
```
BEGIN --get ready

    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '1';
```

- The History of Azure Orchestration
- Synapse Analytics vs Data Factory vs Microsoft Fabric
- Integration Components
- Common Activities
- Execution Dependencies

Module 1

Pipeline Fundamentals



- The History of Azure Orchestration
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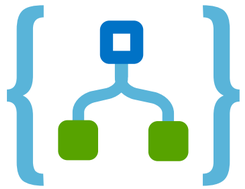
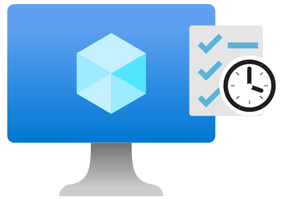
A Quick History Lesson



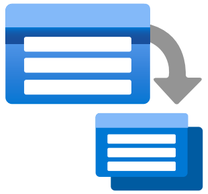
DTU Jobs

Elastic Job Agent

SQL Server
Virtual Machine

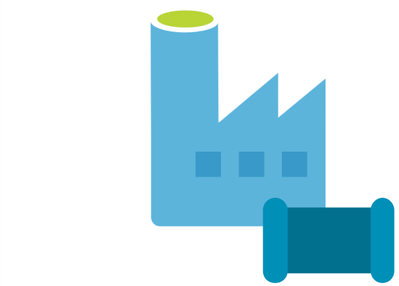


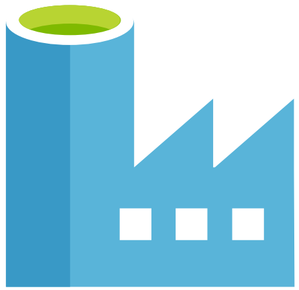
Virtual Machine
Job Schedule

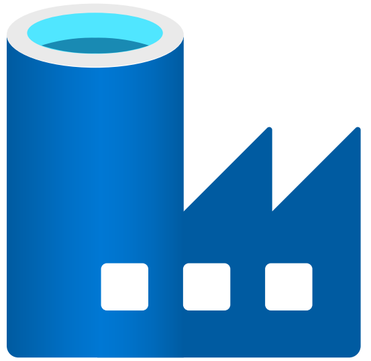


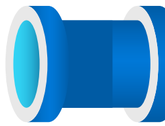
Batch

A Quick History Lesson





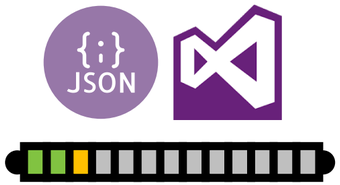




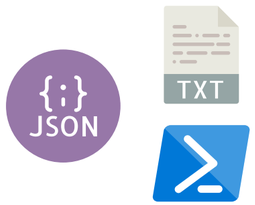
v1
July
2016

v2
Sept
2017

Oct
2020



Time Slices
VS2015 Projects



Notepad
Development

New UI

Source
Control

Data
Flows

Private
Endpoints

What is Azure Data Factory (ADF)?

Home / Products / Data Factory

Data Factory

Hybrid data integration service that simplifies ETL at scale

Start for free >

Already an Azure customer? Getting started >

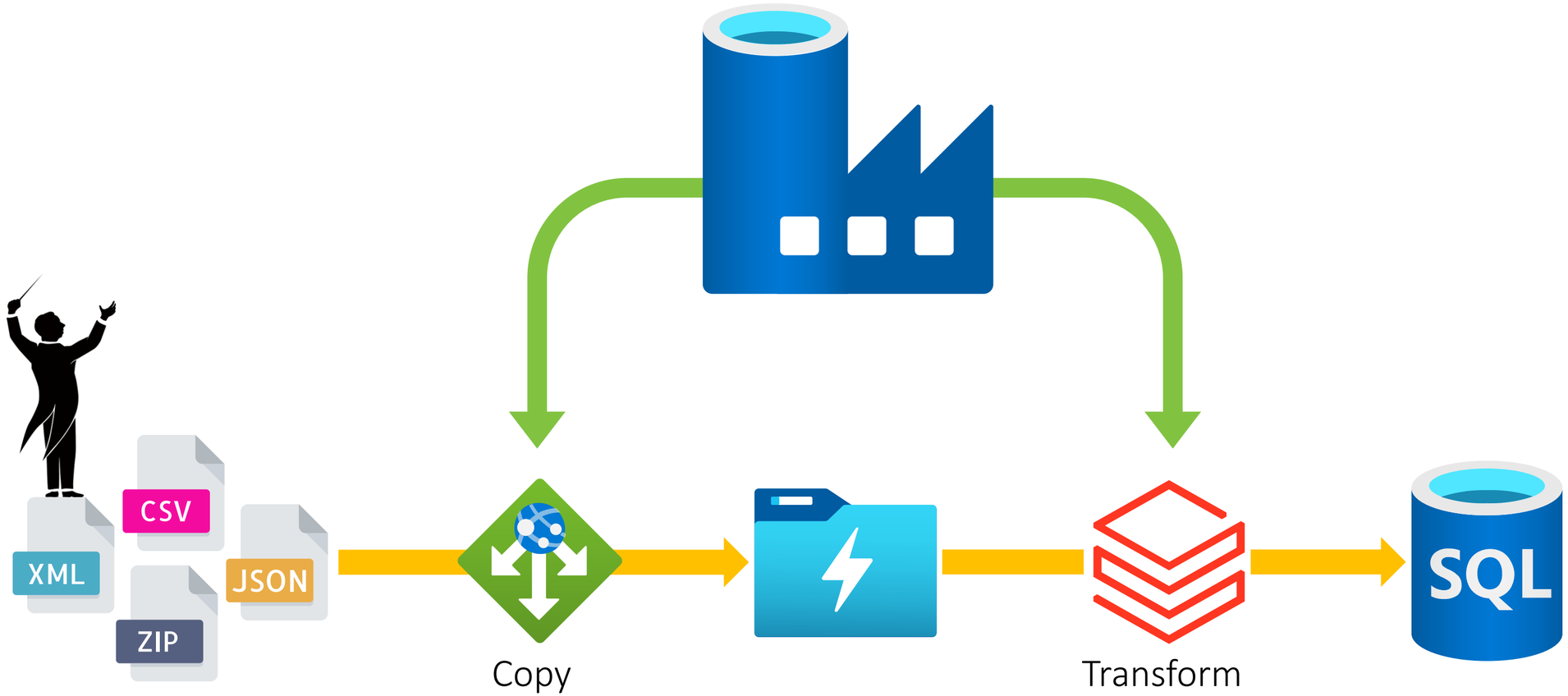
Product overview | Features | Security | Pricing | Customer stories | Getting started | Documentation | FAQs

Accelerate data integration

Integrate data silos with Azure Data Factory, a service built for all data integration needs and skill levels. Easily construct ETL and ELT processes code-free within the intuitive visual environment, or write your own code. Visually integrate data sources using more than 90+ natively built and maintenance-free connectors at no added cost. Focus on your data – the serverless integration service does the rest.

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

What is Azure Data Factory (ADF)?



Module 1

Pipeline Fundamentals

- The History of Azure Orchestration
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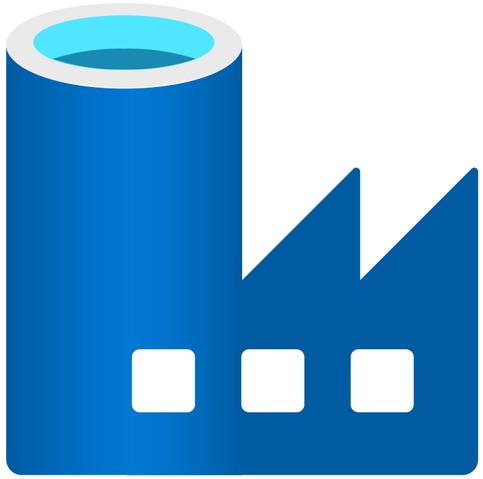
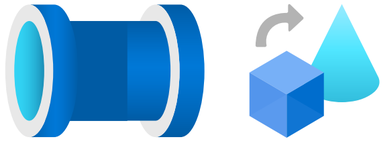
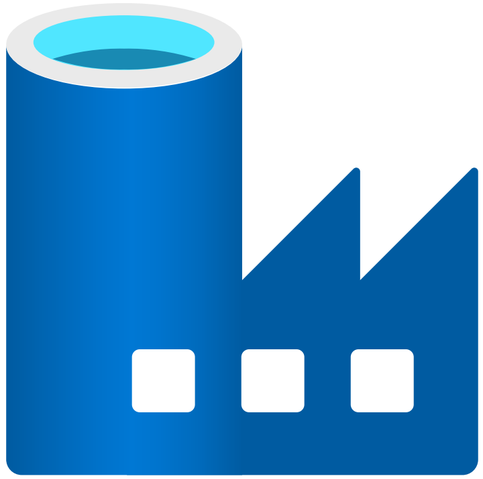
Synapse Analytics vs Data Factory

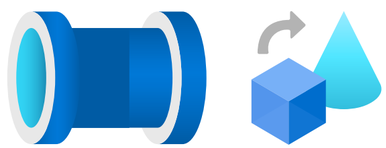
https://docs.microsoft.com/en-us/azure/synapse-analytics/data-integration/concepts-data-factory-differences





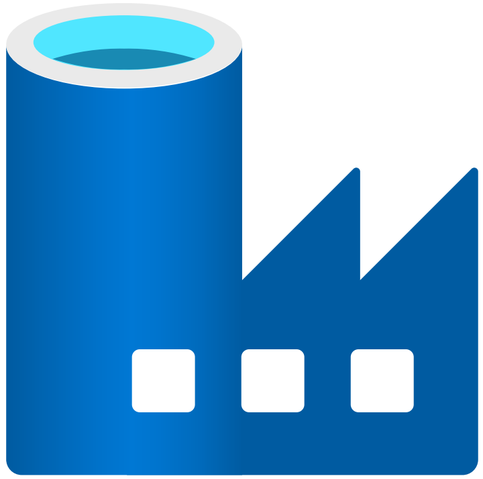
Synapse Analytics vs Data Factory

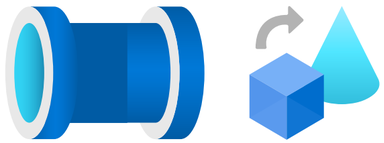




Microsoft Fabric vs Data Factory

https://mrpaulandrew.com/2023/05/31/what-is-microsoft-fabric-my-point-of-view/





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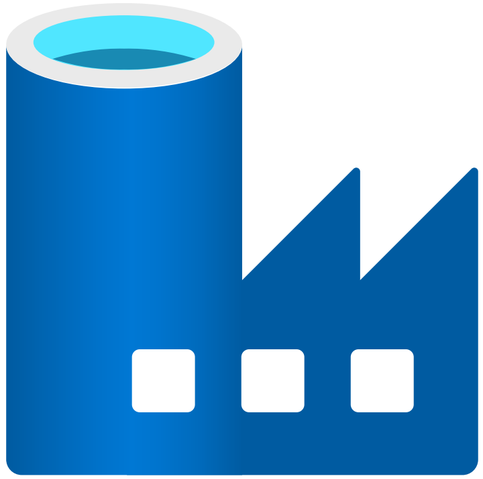

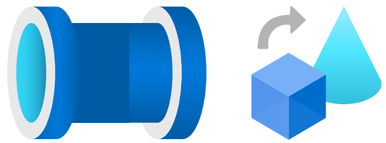

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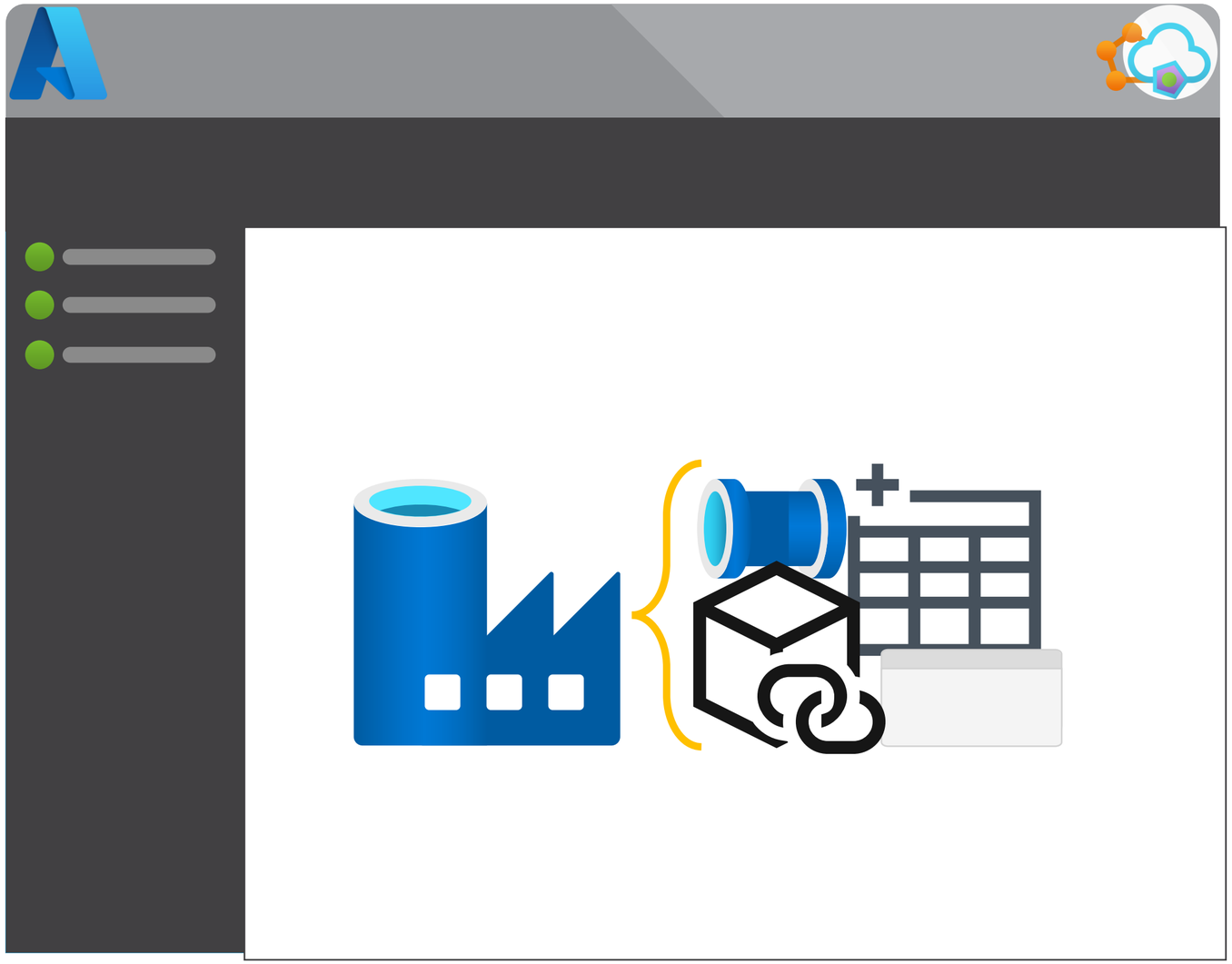
Module 1

Pipeline Fundamentals



- The History of Azure Orchestration
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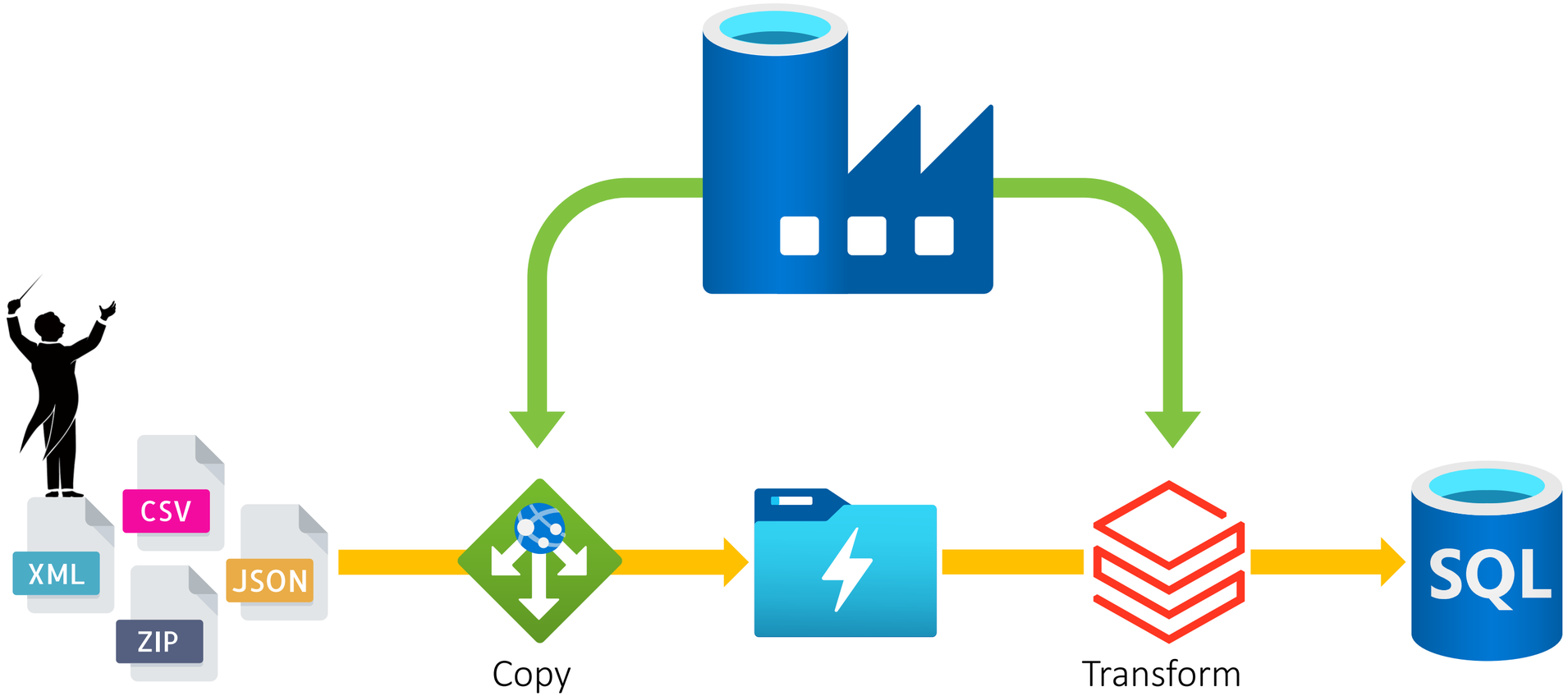
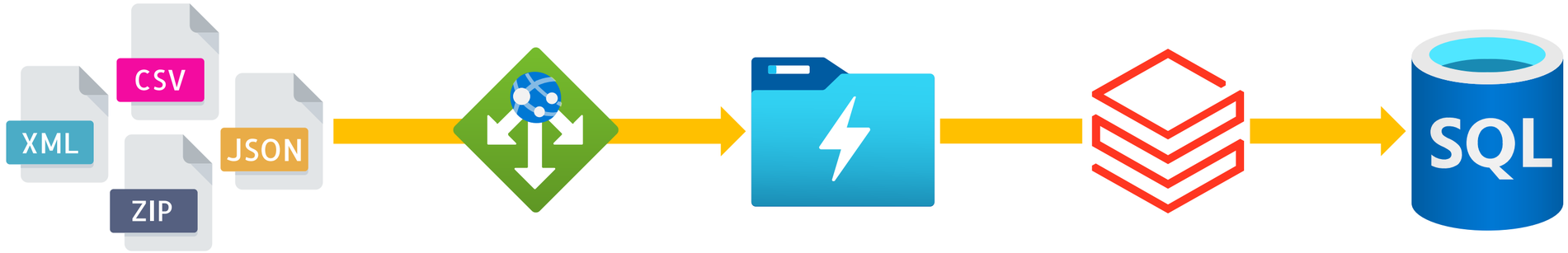
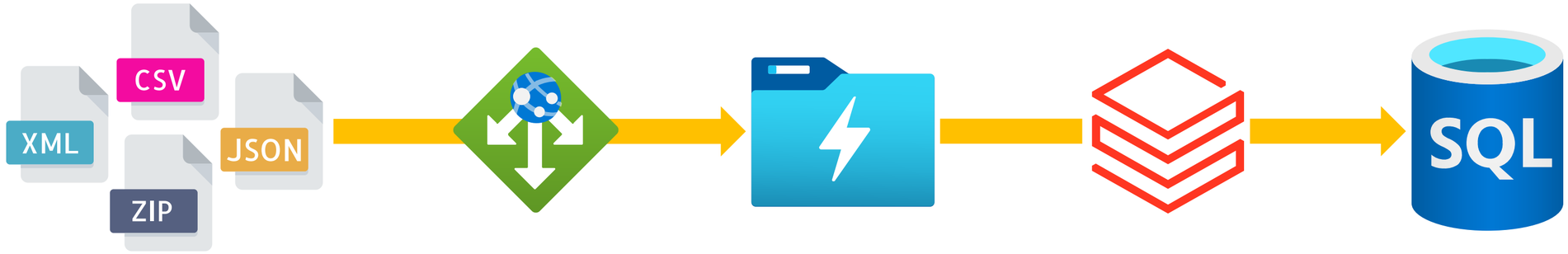
Data Factory Components



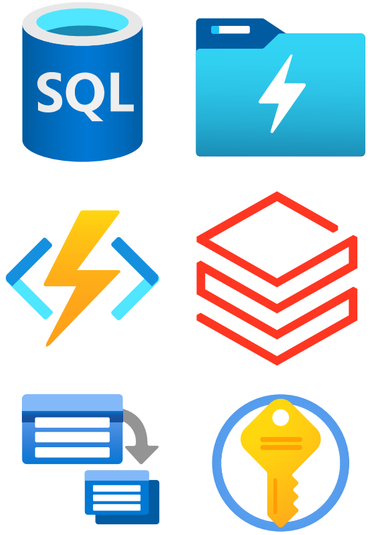
Data Factory Components



Data Factory Components



1 **Linked Services** – What to interact with and how?

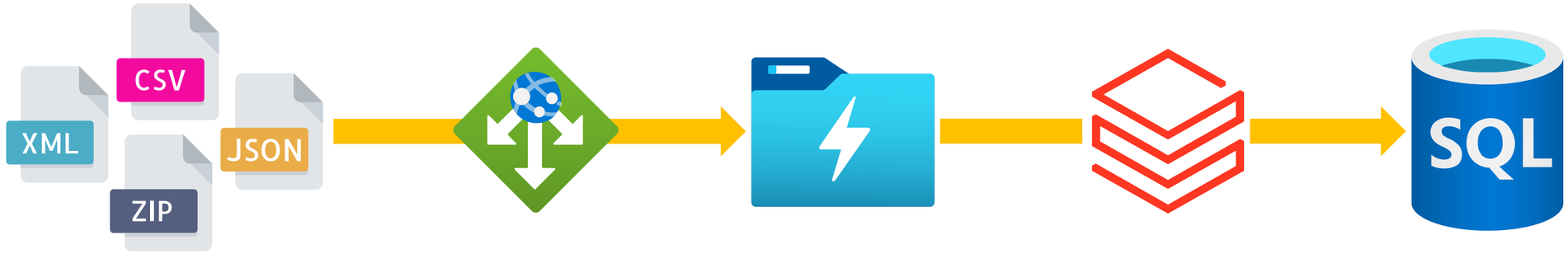


{;} JSON

SQLDBLinkedService

ConnectionString: *Server=MyServer;Database=myDataBase*
UserName: "MrPaulAndrew"
*Password: ****************

Data Factory Components

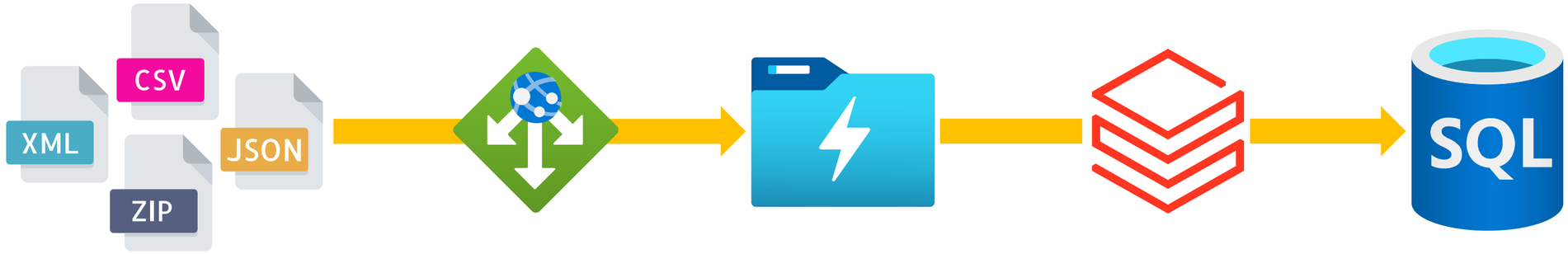


1. **Linked Services**
2. **Datasets** – Where is my data? What format? What file path/table do I need?

SQL [dbo].[SalesOrders]

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

Data Factory Components



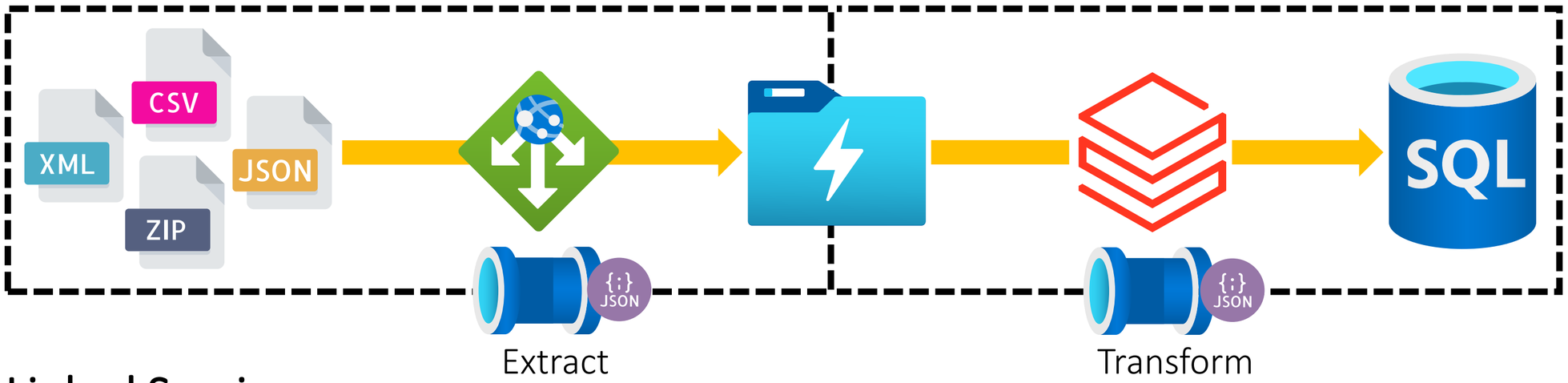
1. **Linked Services**
2. **Datasets**
3. **Activities** – What do we want to happen when we invoke a Linked Service?
   With what conditions?

{;} JSON

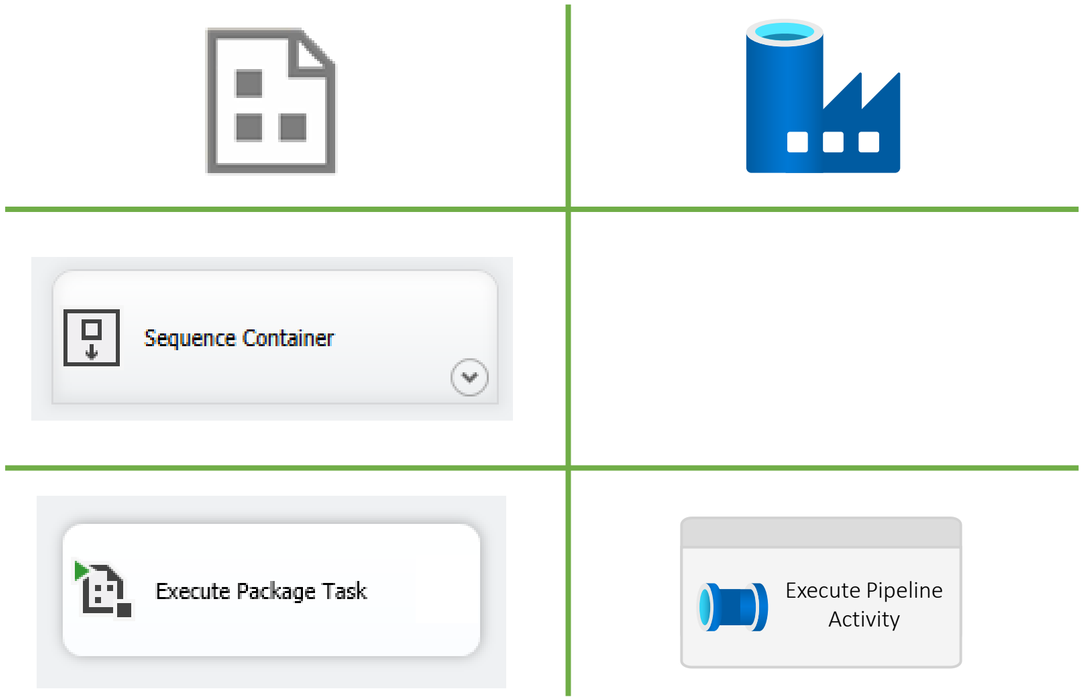
Databricks Notebook Activity

notebookPath: */Playground/Playing*
baseParameters: *Testing*
libraries[jar]: dbfs:/lib1.jar
linkedServiceName: *BricksOfData01*

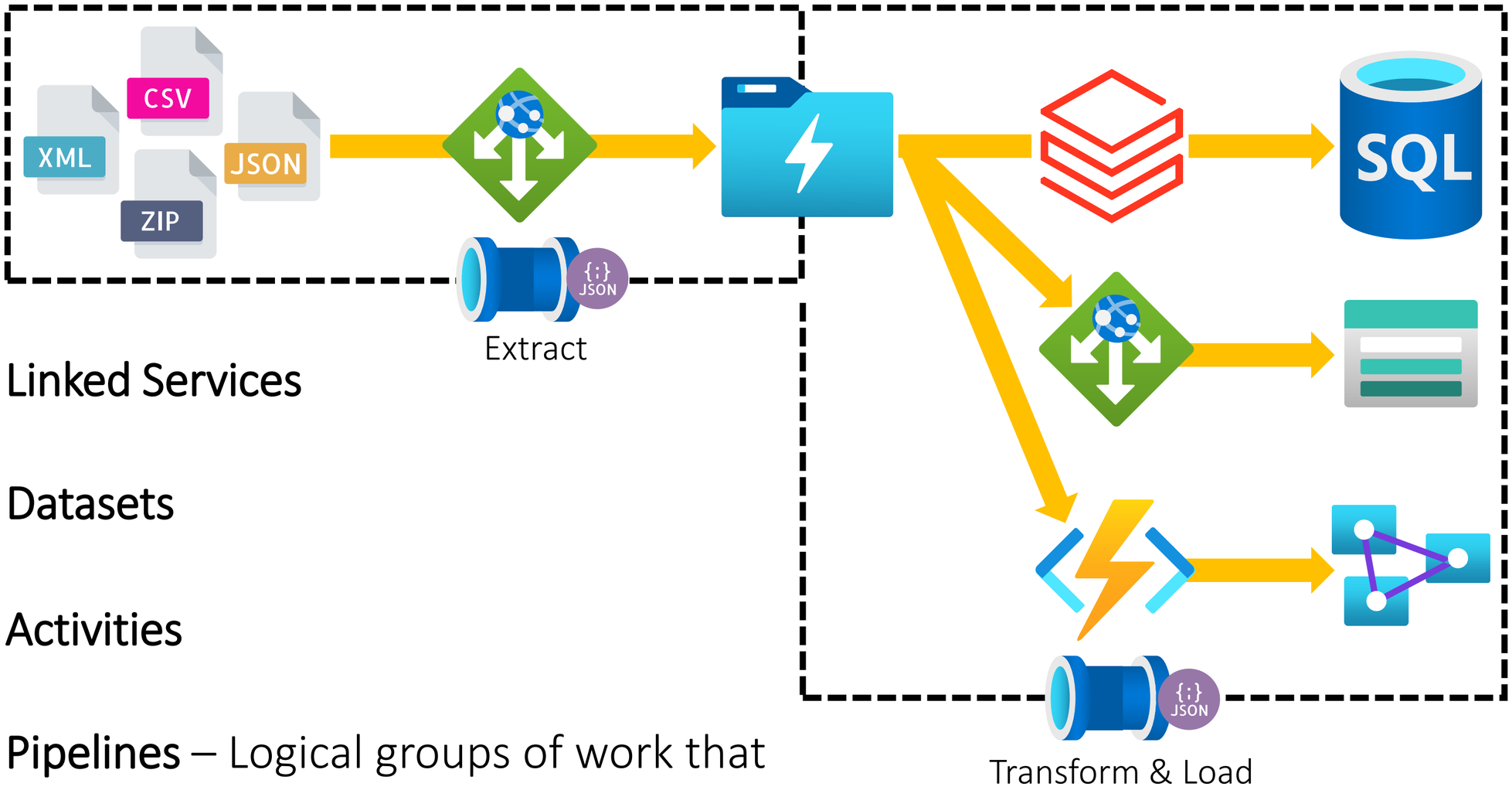
Data Factory Components



1. **Linked Services**
2. **Datasets**
3. **Activities**
4. **Pipelines** – Logical groups of work that can be executed.

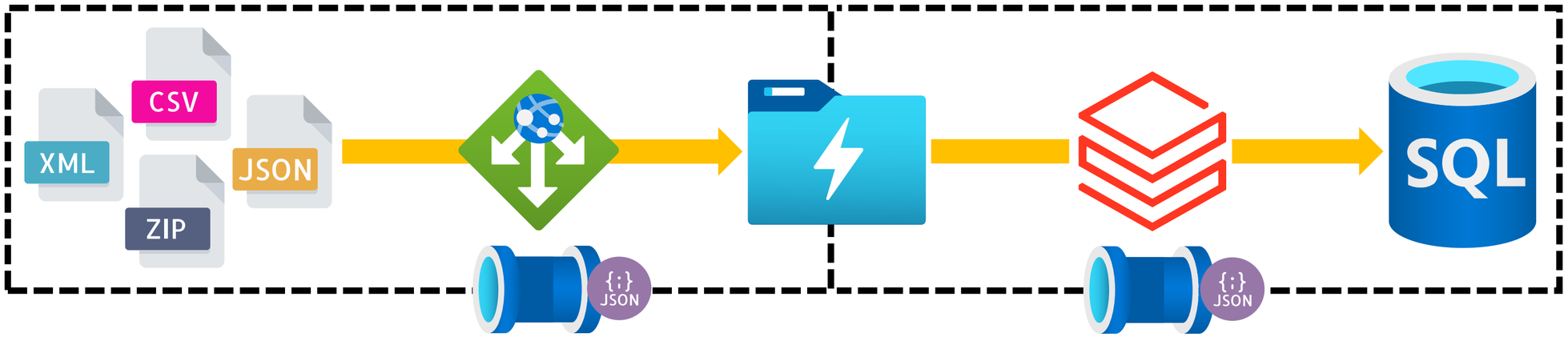


Data Factory Components

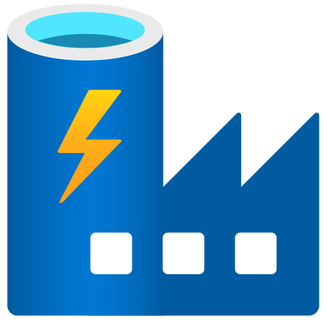


1. **Linked Services**
2. **Datasets**
3. **Activities**
4. **Pipelines** – Logical groups of work that can be executed.

Data Factory Components

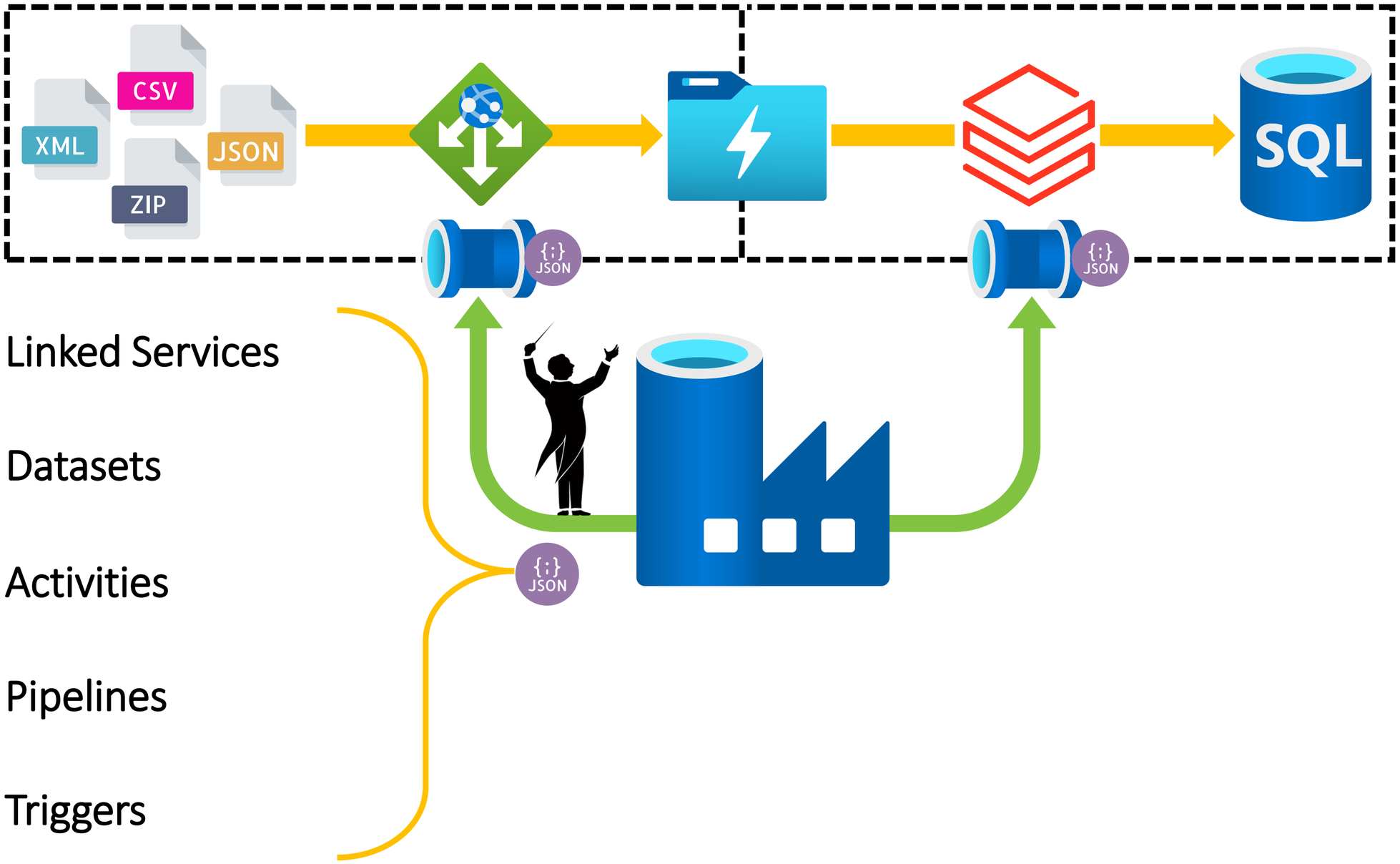


1. **Linked Services**
2. **Datasets**
3. **Activities**
4. **Pipelines**
5. **Triggers** – Telling our when pipelines to run.



- Manually
- Programmatically
- Schedule
- Tumbling Windows
- Storage Events
- Custom Events

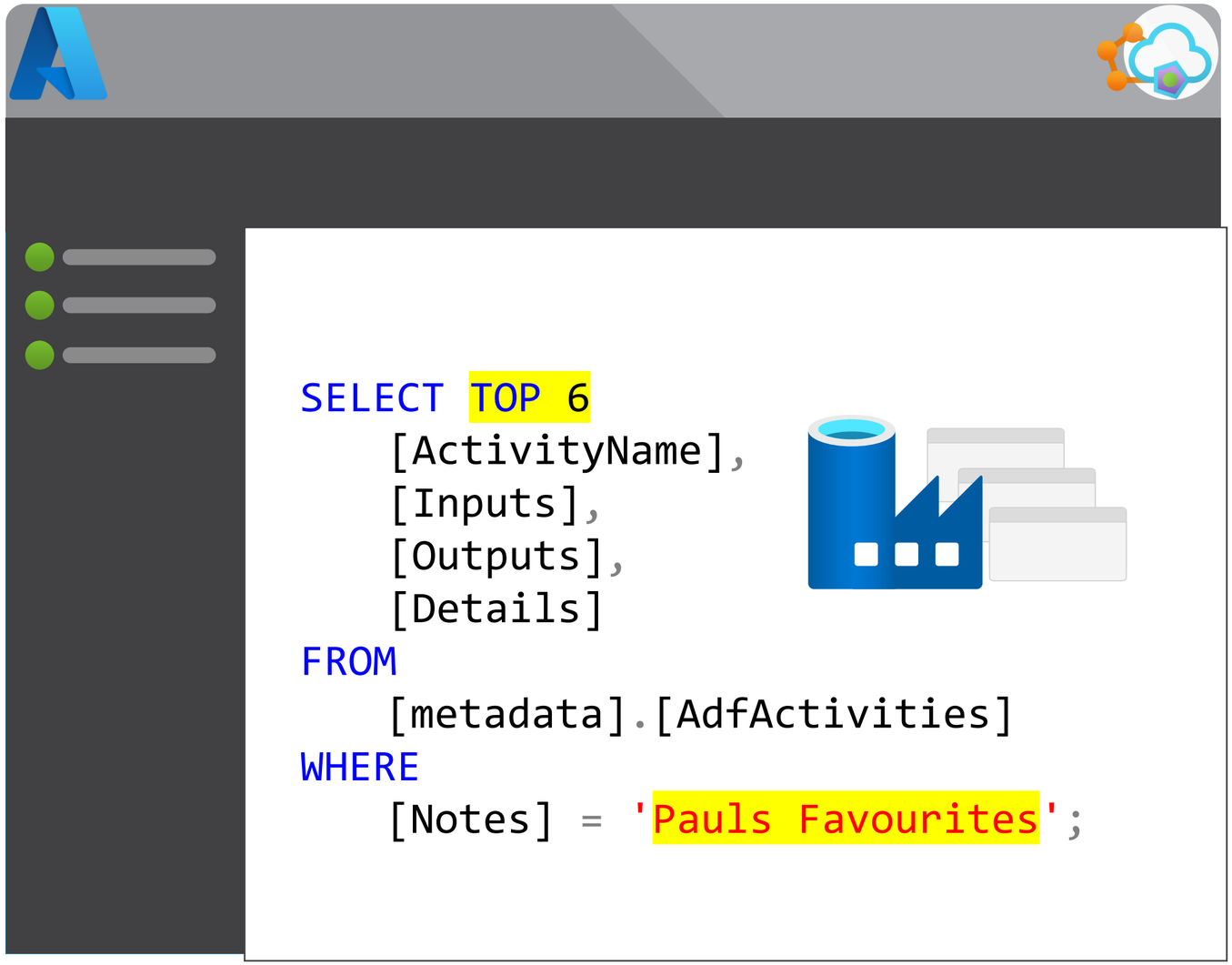
Data Factory Components



1. Linked Services
2. Datasets
3. Activities
4. Pipelines
5. Triggers

Module 1

Pipeline Fundamentals



```
SELECT TOP 6
    [ActivityName],
    [Inputs],
    [Outputs],
    [Details]
FROM
    [metadata].[AdfActivities]
WHERE
    [Notes] = 'Pauls Favourites';
```

- The History of Azure Orchestration
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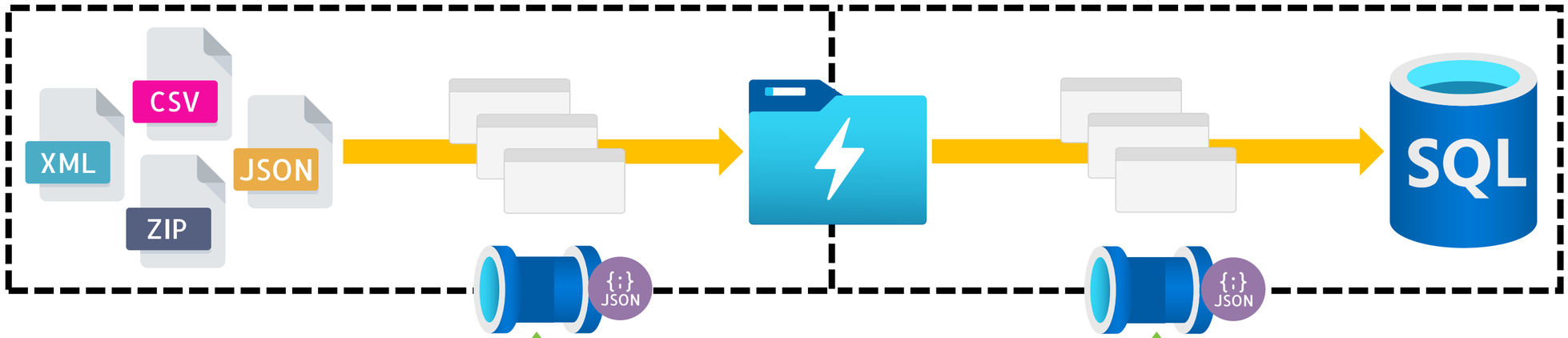
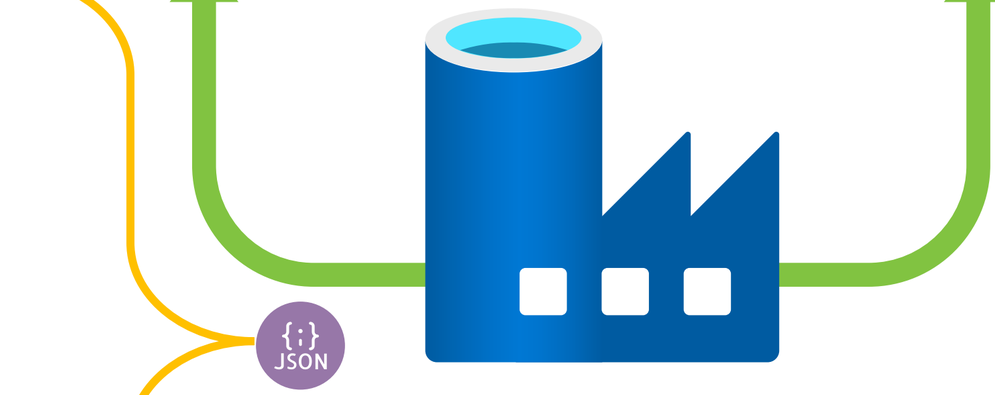
Data Factory Common Activities

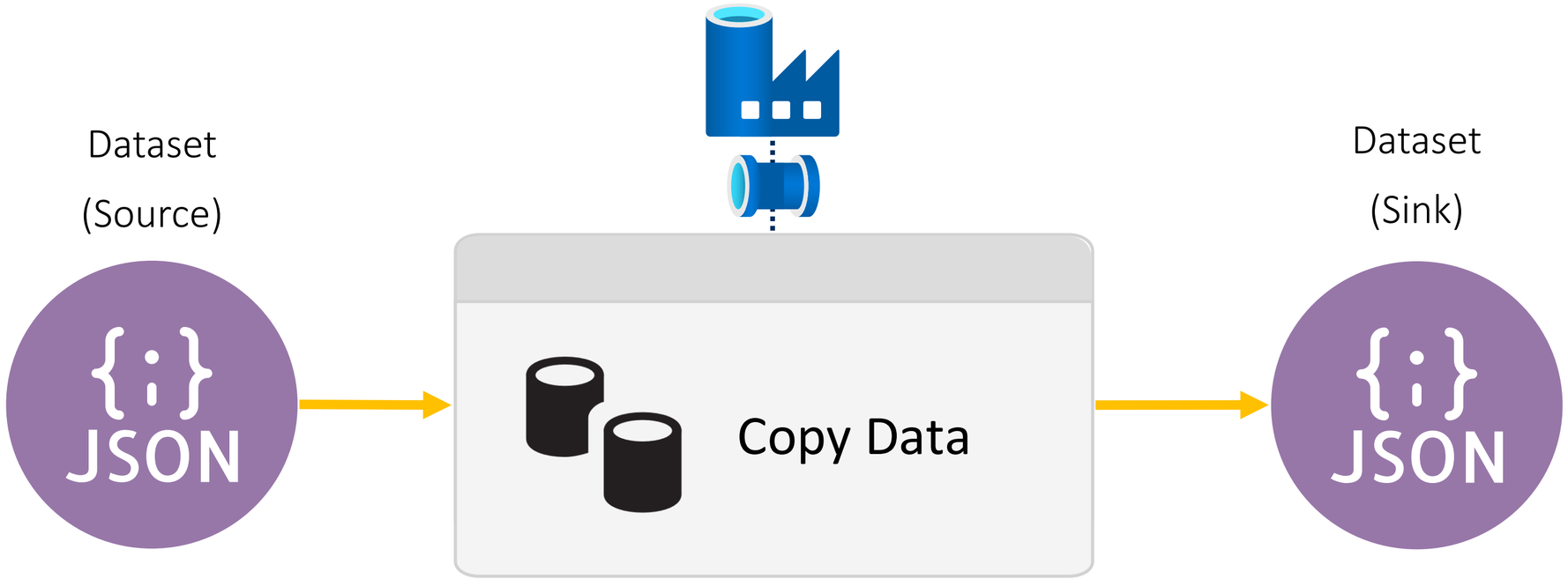


1. Linked Services
2. Datasets
3. Activities
4. Pipelines
5. Triggers



Copy

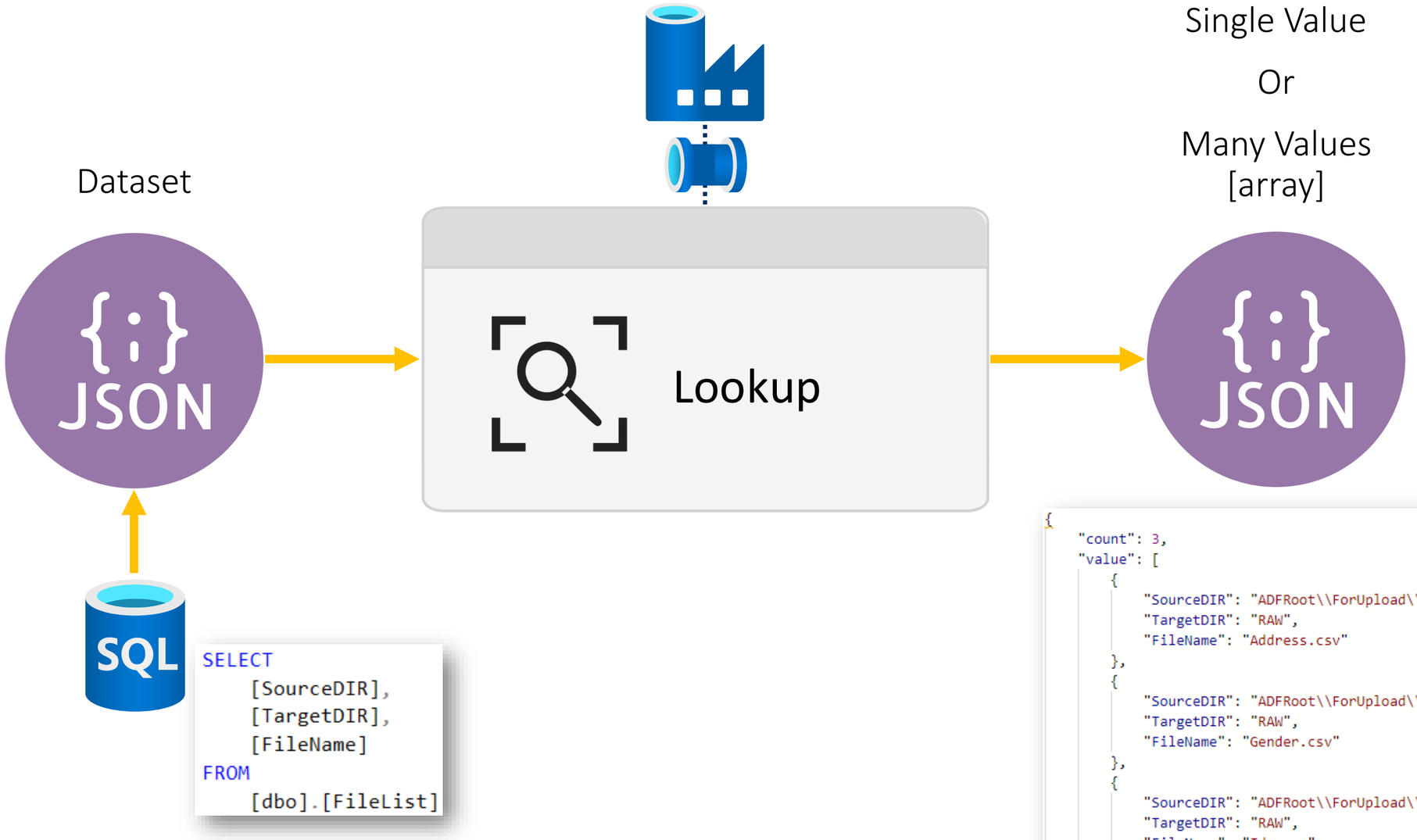
Getting your data from A to B (not a Move operation)



- Auto Scaling
- Transactional Restarts
- Handle Zip Compression
- Attribute Mapping and Schema Drift
- Handle Failed Rows
- Add Custom Attributes
- Parse Excel & JSON Files

Lookup

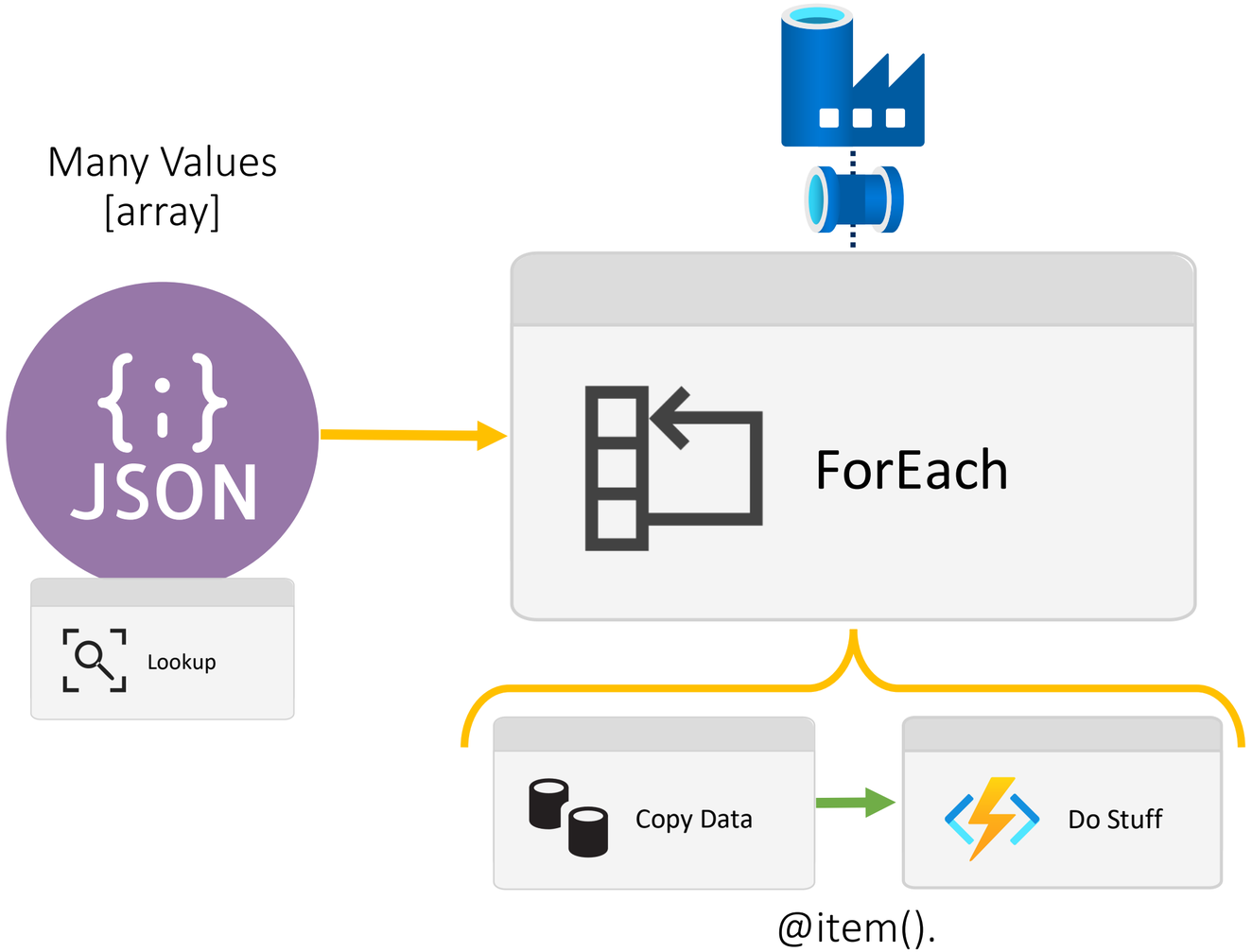
Get value(s) to support other control flow activities



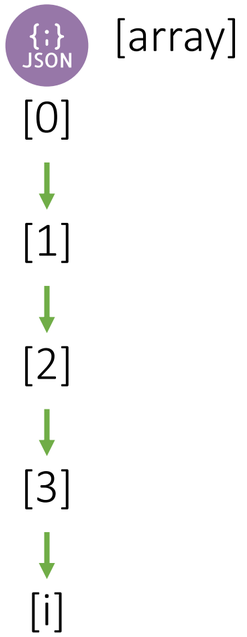
https://docs.microsoft.com/en-us/azure/data-factory/control-flow-lookup-activity

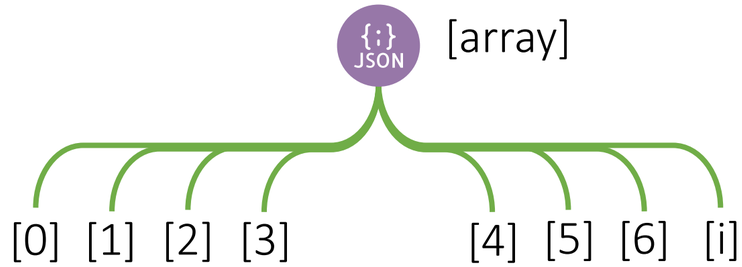
For Each

Iterating over other control flow activities



IsSequential: true





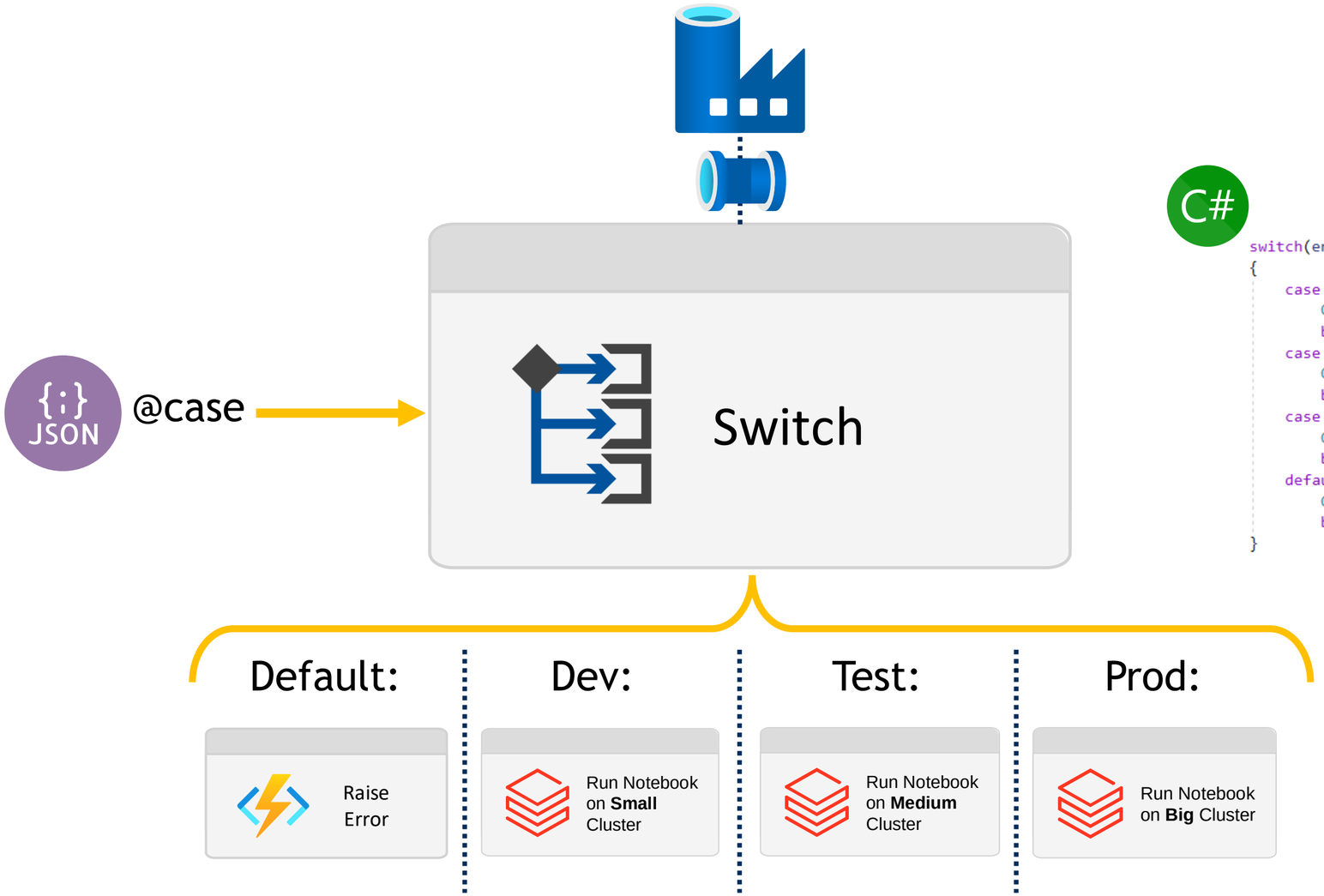
Batch Count Default: 20

Batch Count Max: 50

https://docs.microsoft.com/en-us/azure/data-factory/control-flow-for-each-activity

Switch

Execute other control flow components based on a provided condition

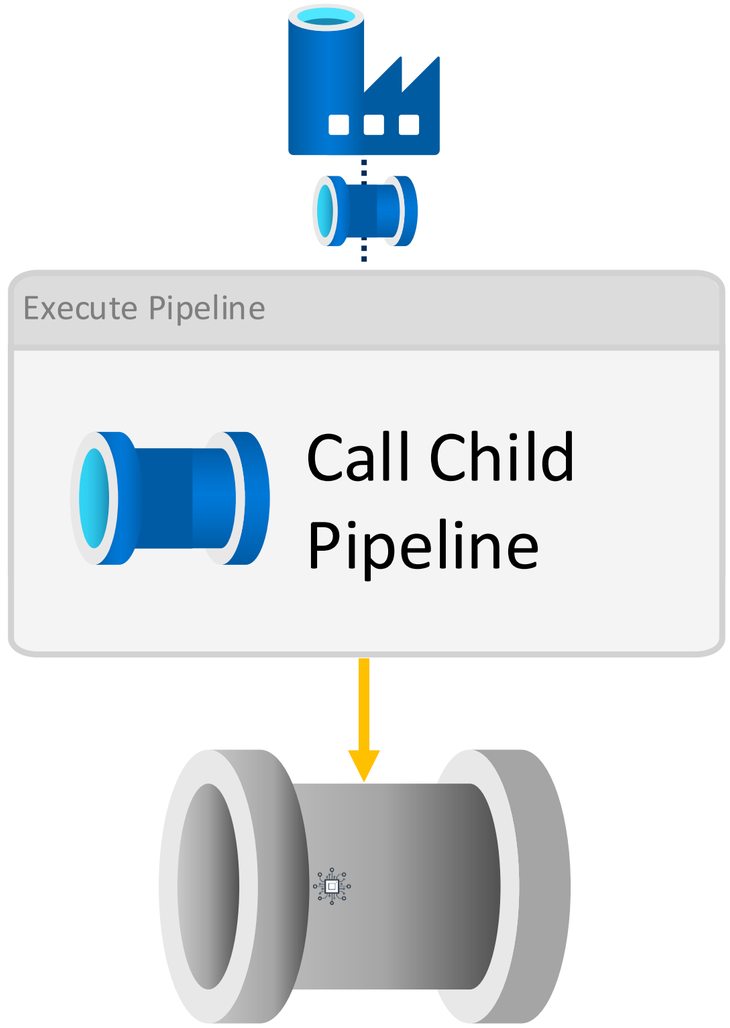



```csharp
switch(environmentValue)
{
    case "Dev":
        Console.WriteLine("Running in development envirnoment.");
        break;
    case "Test":
        Console.WriteLine("Running in testing envirnoment.");
        break;
    case "Prod":
        Console.WriteLine("Running in production envirnoment.");
        break;
    default:
        Console.WriteLine("Envirnoment unknown.");
        break;
}
```

https://mrpaulandrew.com/2020/01/22/using-the-azure-data-factory-switch-activity/

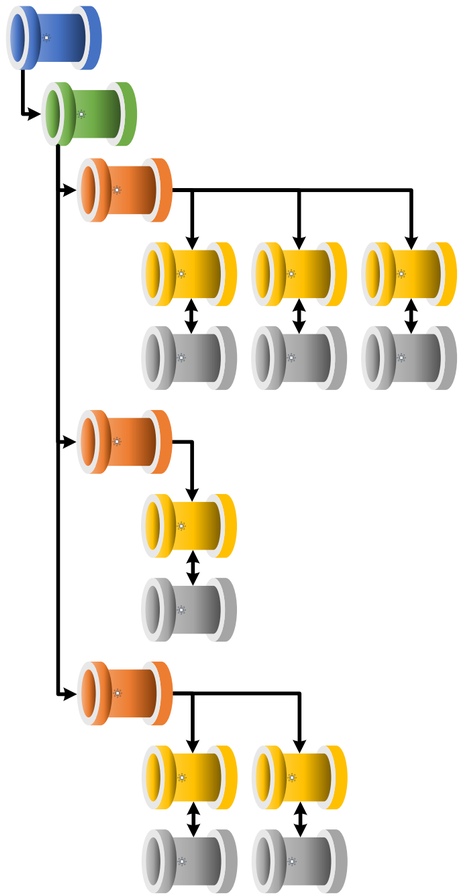
Execute Pipeline

Chaining pipeline executions via an activity



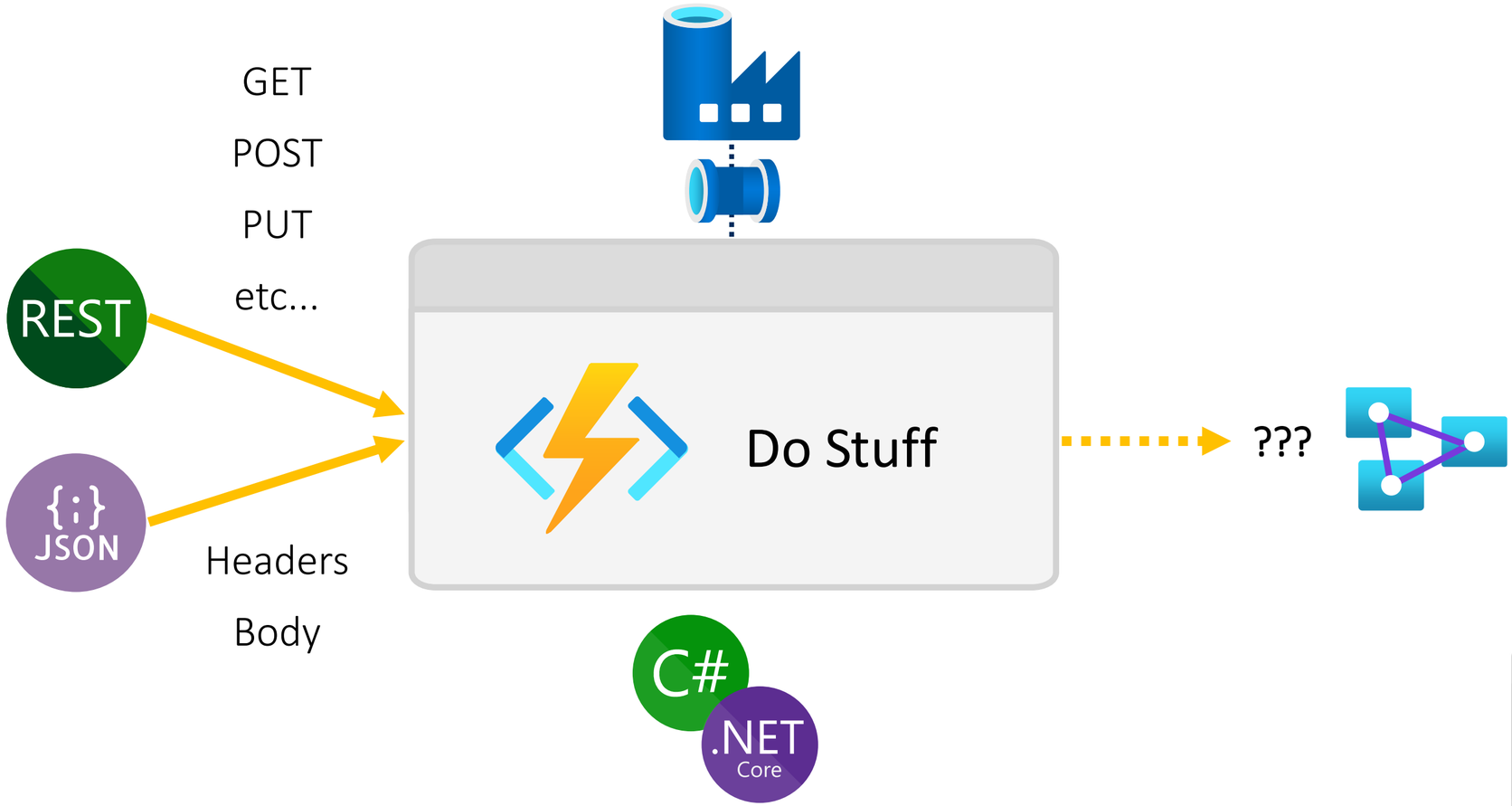
Pipeline Hierarchies Generation Control

https://mrpaulandrew.com/2019/09/25/azure-data-factory-pipeline-hierarchies-generation-control



Azure Function

Extend Data Factory with custom serverless code executions via REST calls



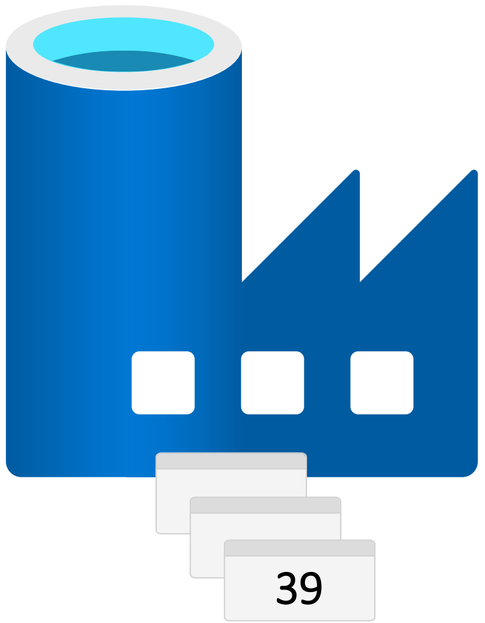
Web

HTTP Do Stuff

Web Hook

Do Stuff

Activities Comparison Between Tools



Fabric Activity Comparison

Not available Microsoft Fabric

Streaming

Streaming

Map Reduce

Map Reduce

Machine Learning Execute Pipeline

ML Pipeline

Pig

Pig

Spark

Native Spark Job

Machine Learning Update Resource

ML Update

U-SQL

U-SQL

Execute SSIS Package

SSIS

Power Query

Power Query

Hive

Hive

Databricks

Jar

Databricks

Python

Spark Job Definition

Spark Job Definition

Only available Microsoft Fabric

Teams

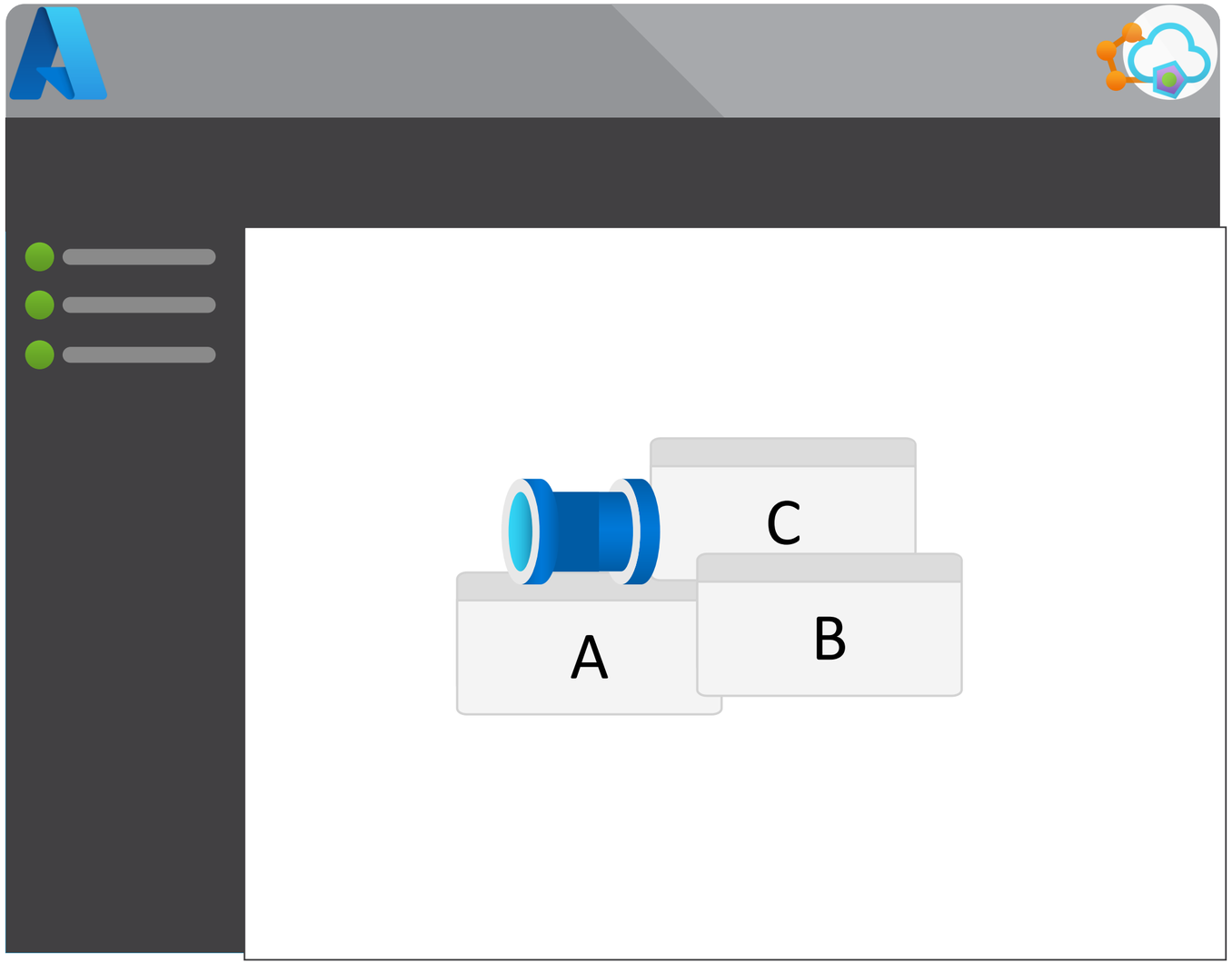
Post to Chat

Outlook

Send an Email

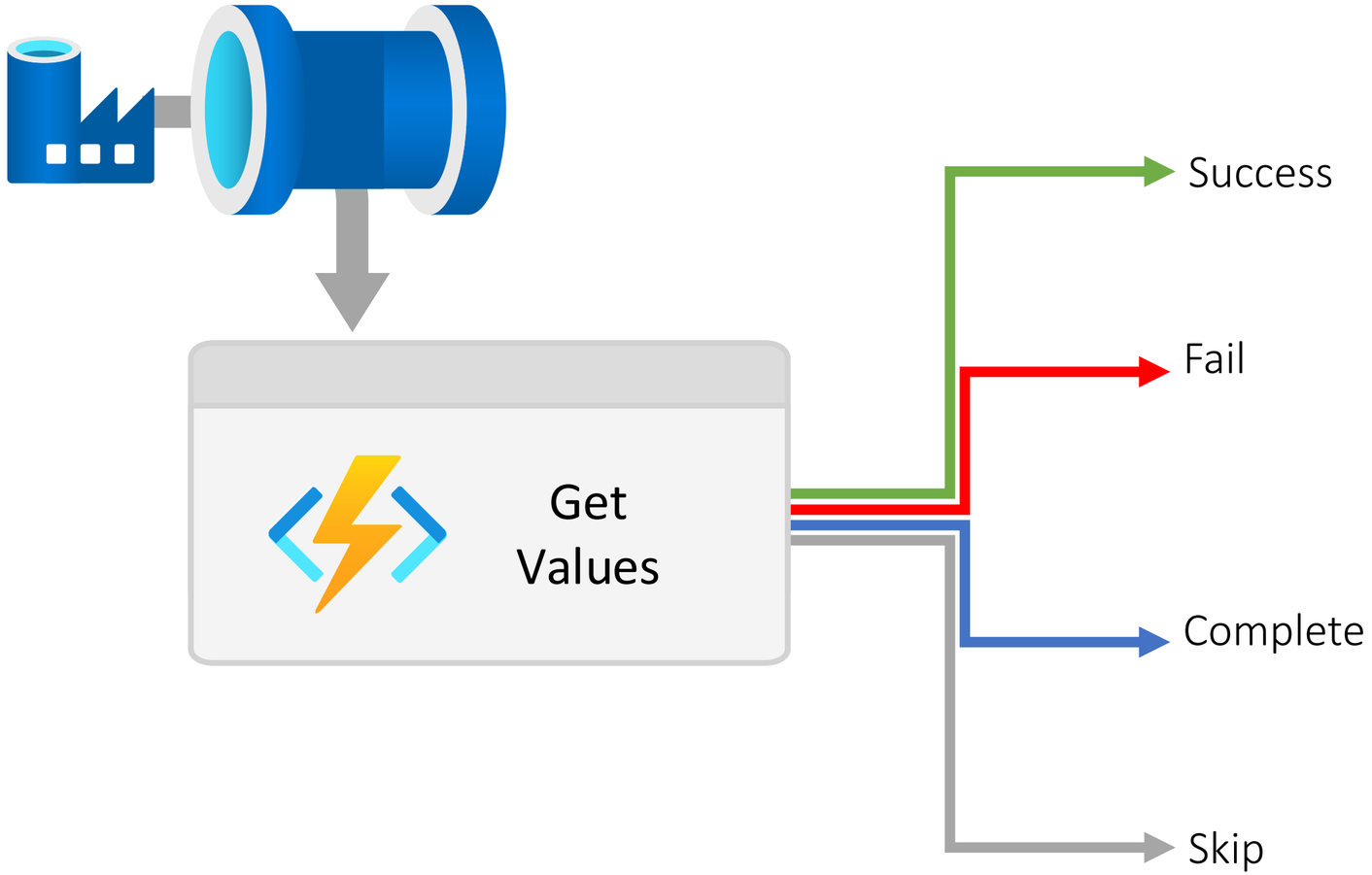
Module 1

Pipeline Fundamentals

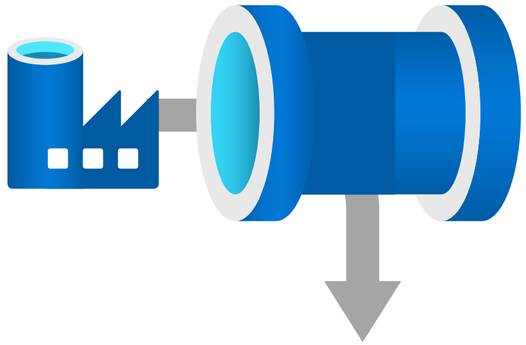


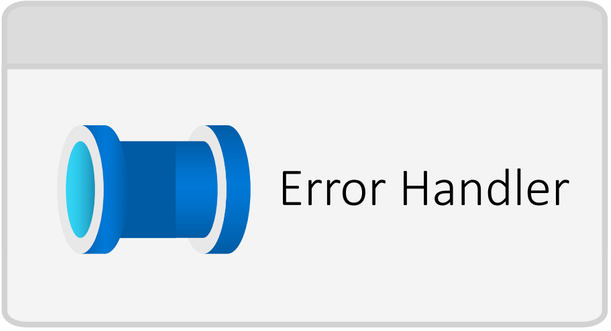
- The History of Azure Orchestration
- Synapse Analytics vs Data Factory vs Microsoft Fabric
- Integration Components
- Common Activities
- Execution Dependencies

Execution Dependency Options

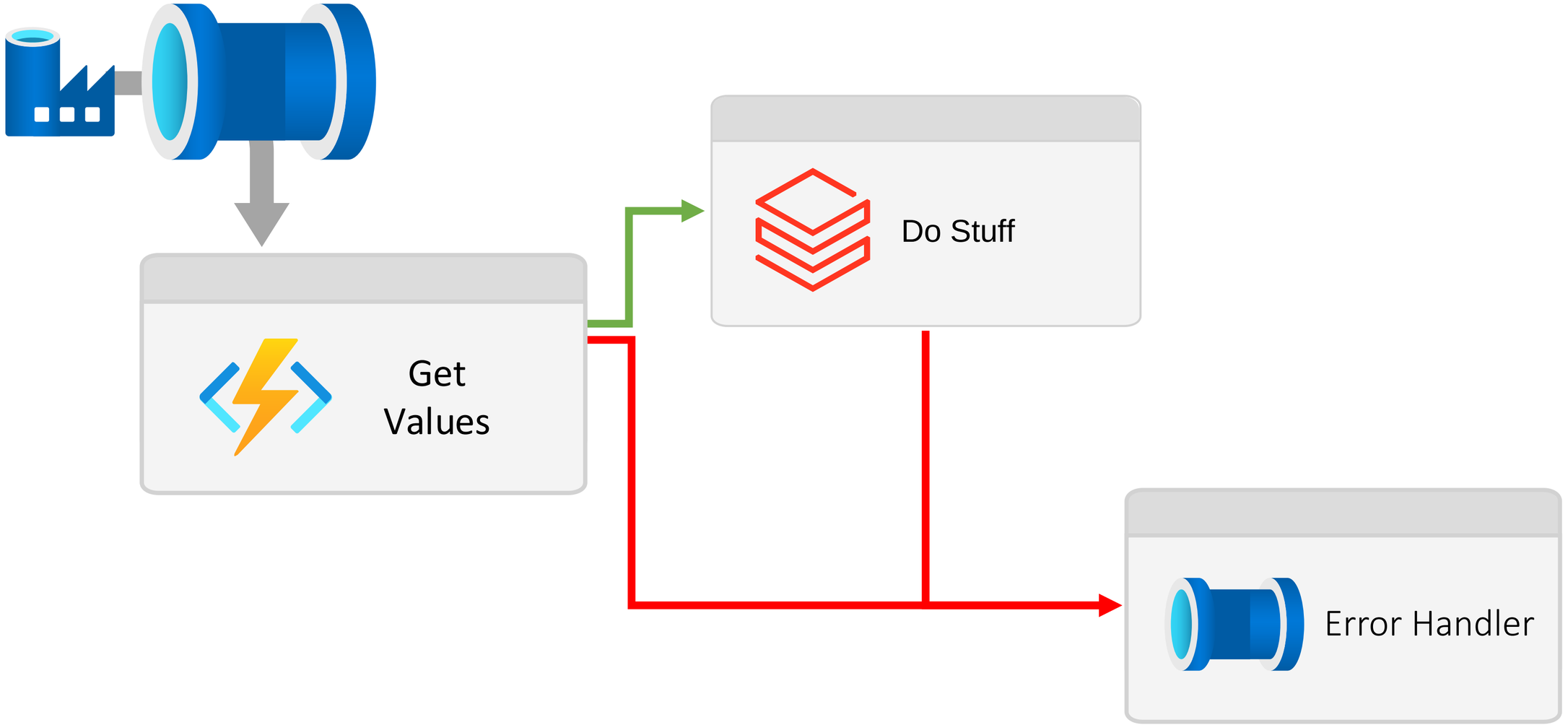


Execution On Failure

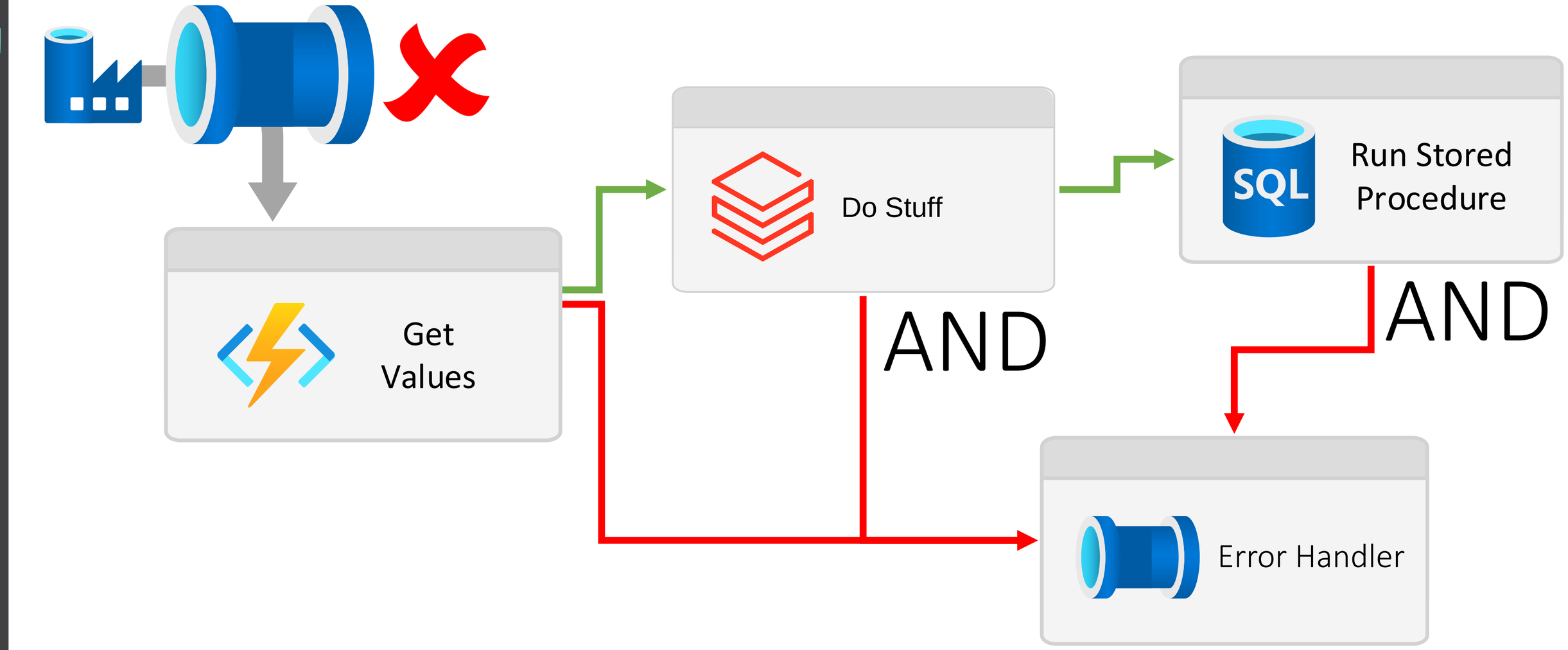




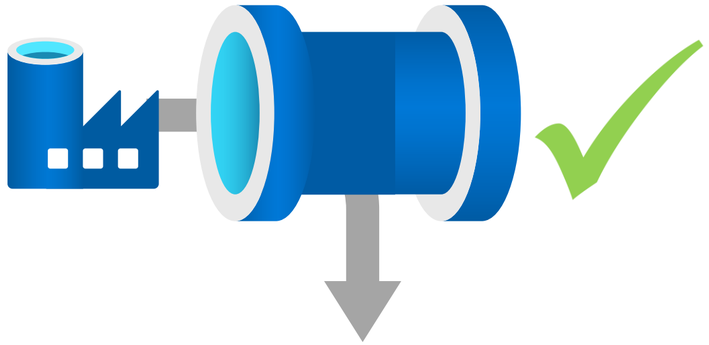
Execution On Failure or On Success



Execution On ???



Execution On Failure or On Success



Get Values

OR

Error Handler

Do Stuff

OR

Error Handler

SQL

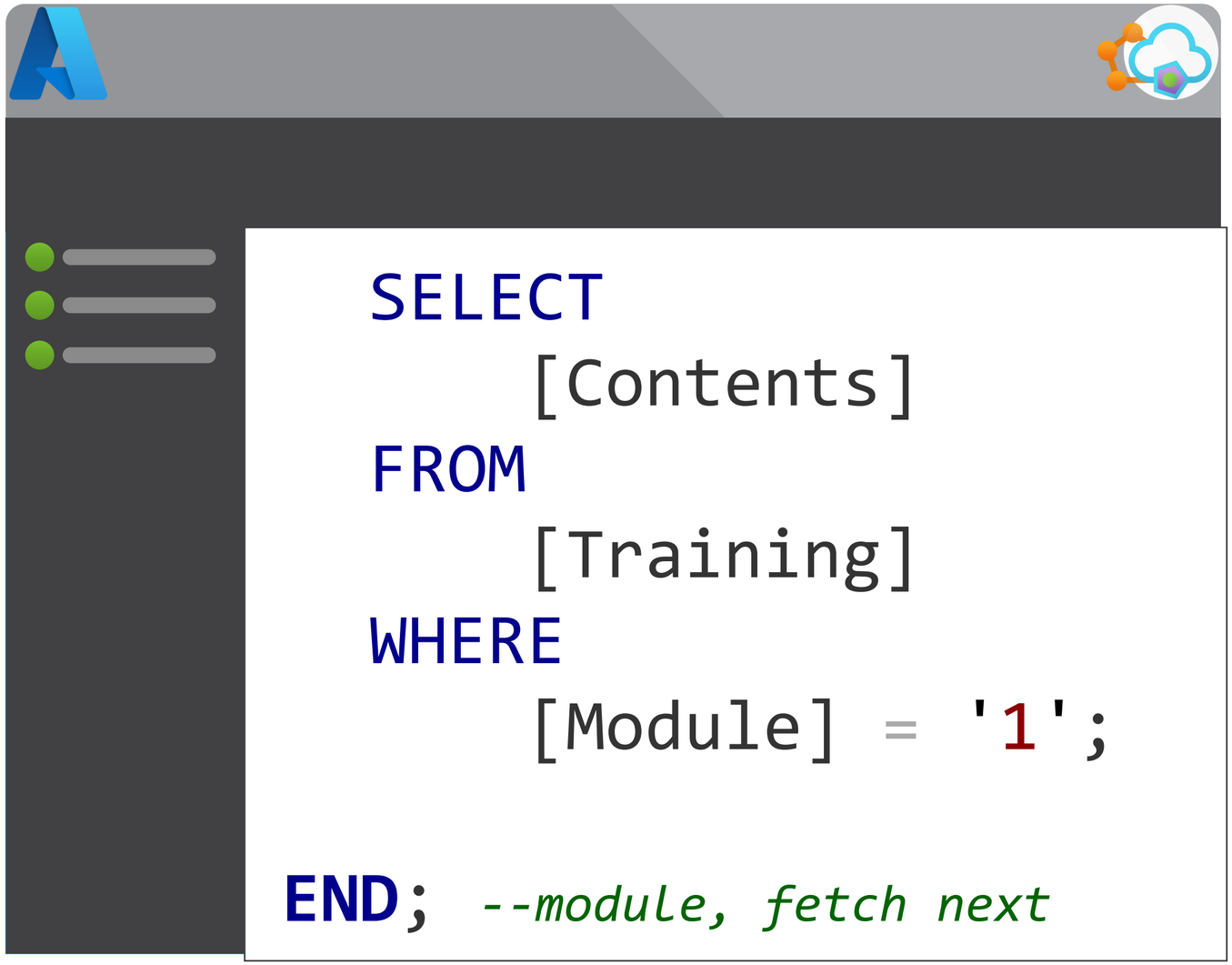
Run Stored Procedure

OR

Error Handler

Module 1

Pipeline Fundamentals



```
    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '1';

END; --module, fetch next
```

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