inn0va community

altitudo

beanTech
IT moves your business

Real Comm
Easy for real

Working in the (Azure Data) Factory the right way

Riccardo Perico

DATA SATURDAY #20
Pordenone, Feb 26th, 2022

DATA SATURDAYS

Sponsor

PREMIUM SPONSORS

altitudo

beanTech
IT moves your business

Real Comm
Easy for real

SUPPORTING SPONSORS

QUANTUMDATIS

UGISS

Riccardo Perico

- BI & Power BI Engineer @ Lucient
- PBIUG Italy Co-leader
- Microsoft Data Platform MVP

Your contacts

- Linkedin: https://linkedin.com/in/riccardo-perico
- Email: rperico@lucient.com

Your sites

- Slideshare: https://www.slideshare.net/RiccardoPerico
- GitHub: https://github.com/R1k91

Where are we? We're in the factory

*"**Big data** requires a service that can **orchestrate** and **operationalize** processes to refine these **enormous stores of raw data** into actionable business insights. Azure Data Factory is a **managed cloud service** that's built for these complex hybrid extract-transform-load (**ETL**), extract-load-transform (**ELT**), and **data integration** projects."*

What about this session?

Starting to work in ADF it's easy but…

You'll learn by doing especially best practices and patterns

Let me share some lessons learnt from by background

ıhn0va
community

Keep it simple
Keep it clean

DATA SATURDAYS

altitudo

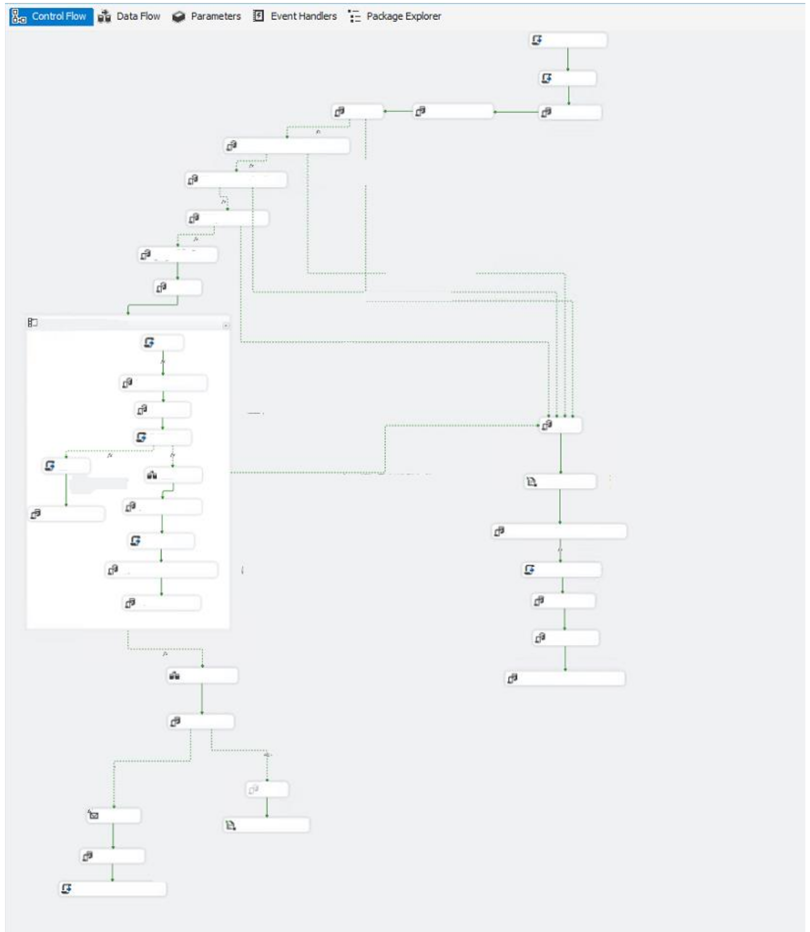
beanTech
IT moves your business

Real Comm
Easy for real

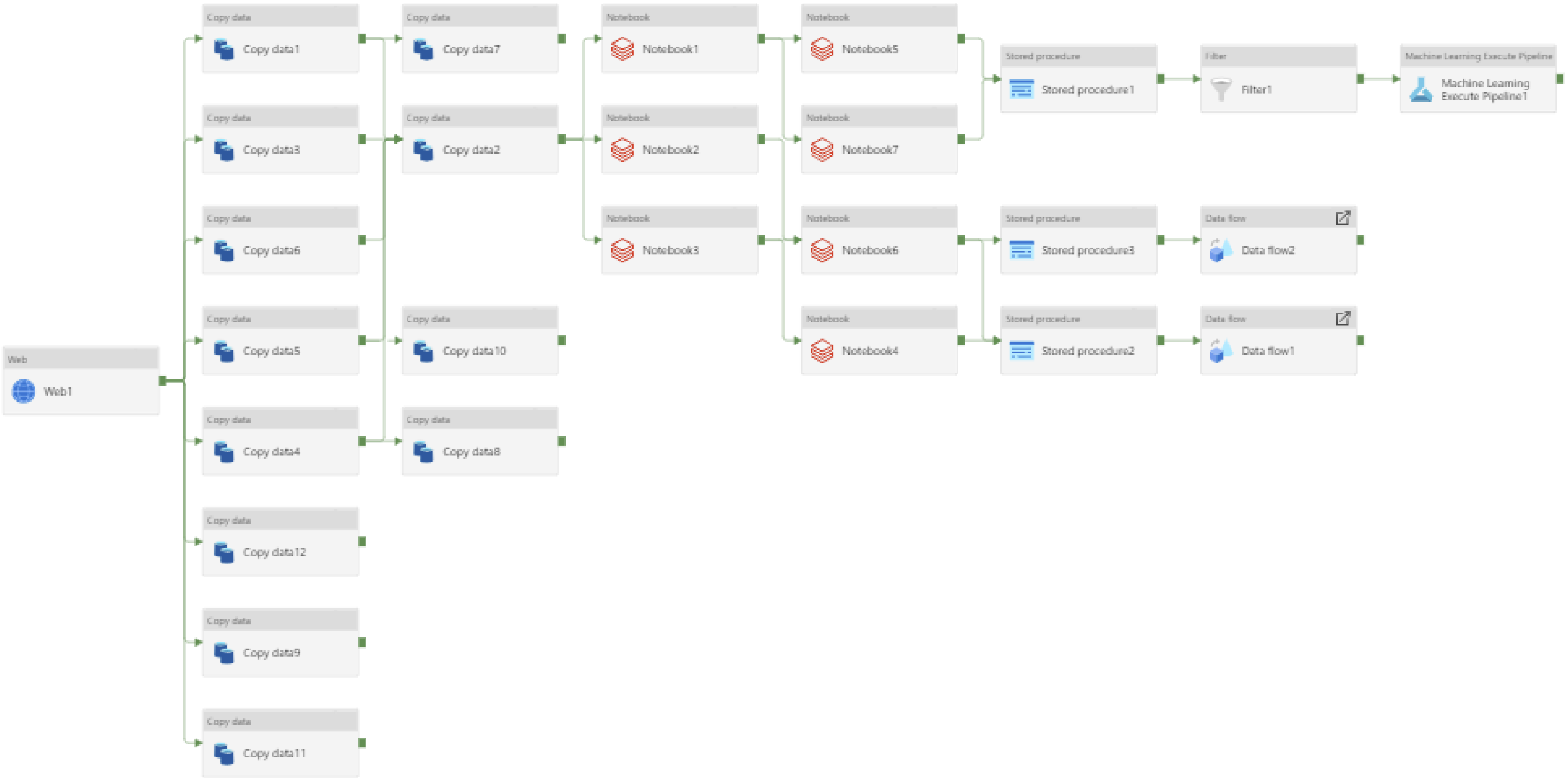
General rules

- Give objects (all the objects!!!) a meaningful name
- Use a “pipeline approach”
- Organize objects accordingly
- …and many others

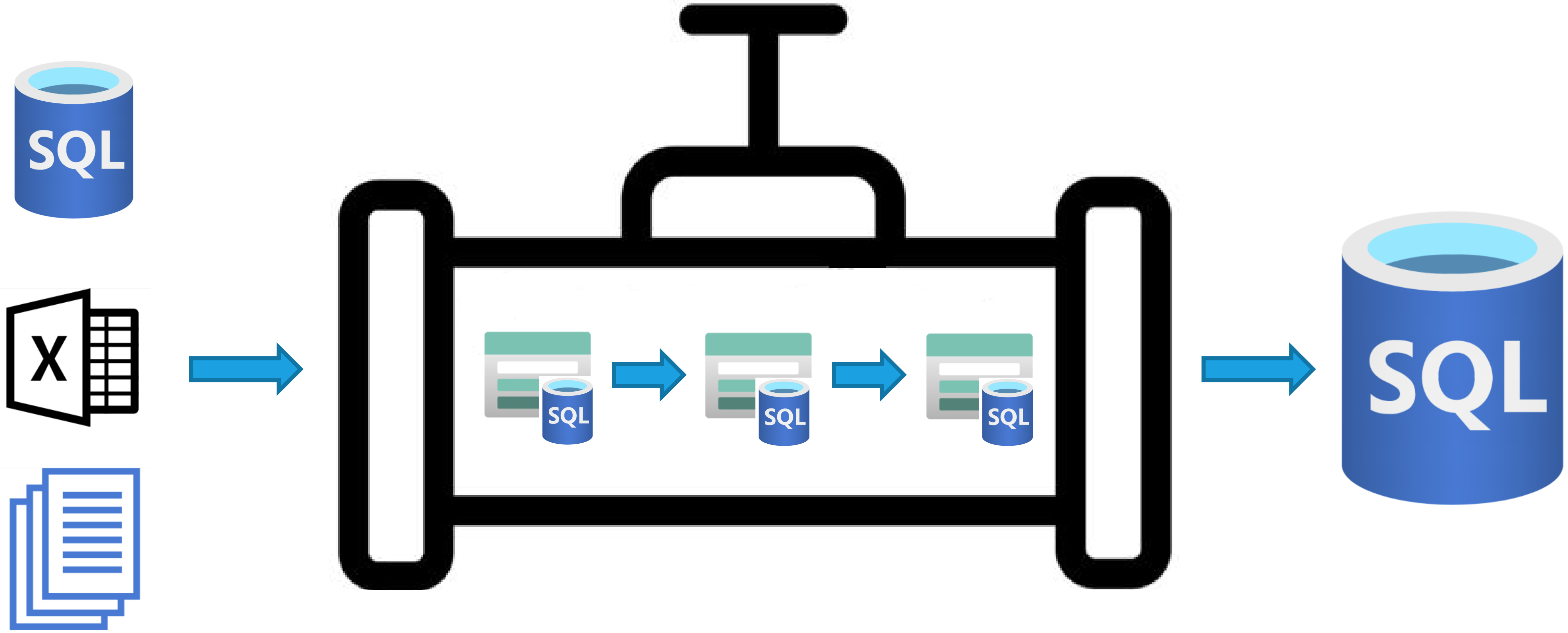
Amarcord


Control Flow
Data Flow
Parameters
Event Handlers
Package Explorer

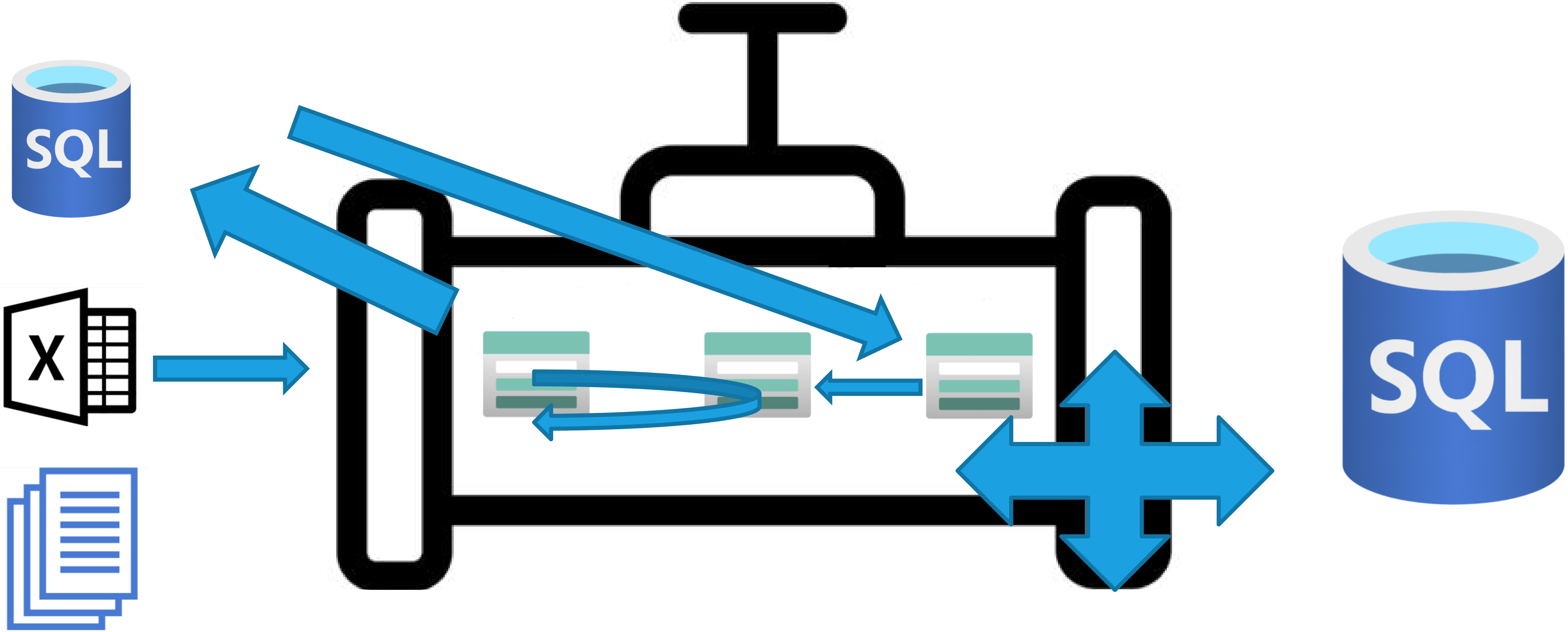
New tools same pitfalls



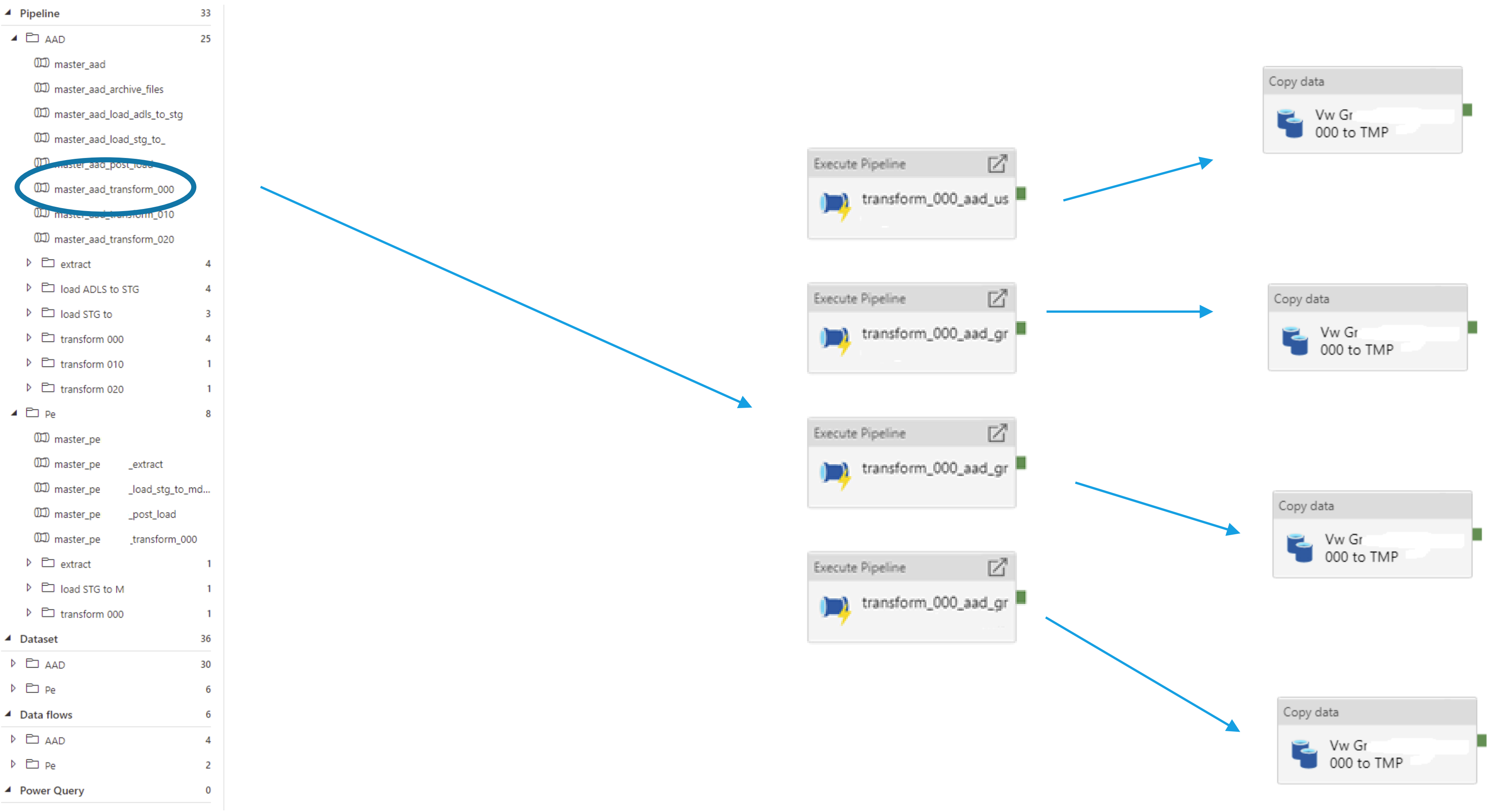
"Pipeline approach": it flows in one way



Pipeline approach: not that chaos... please



Keep it clean



- Pipeline 33
  - AAD 25
    - master_aad
    - master_aad_archive_files
    - master_aad_load_adls_to_stg
    - master_aad_load_stg_to_
    - master_aad_post_load
    - master_aad_transform_000
    - master_aad_transform_010
    - master_aad_transform_020
    - extract 4
    - load ADLS to STG 4
    - load STG to 3
    - transform 000 4
    - transform 010 1
    - transform 020 1
  - Pe 8
    - master_pe
    - master_pe _extract
    - master_pe _load_stg_to_md...
    - master_pe _post_load
    - master_pe _transform_000
    - extract 1
    - load STG to M 1
    - transform 000 1
- Dataset 36
  - AAD 30
  - Pe 6
- Data flows 6
  - AAD 4
  - Pe 2
- Power Query 0

inn0va community

altitudo

beanTech IT moves your business

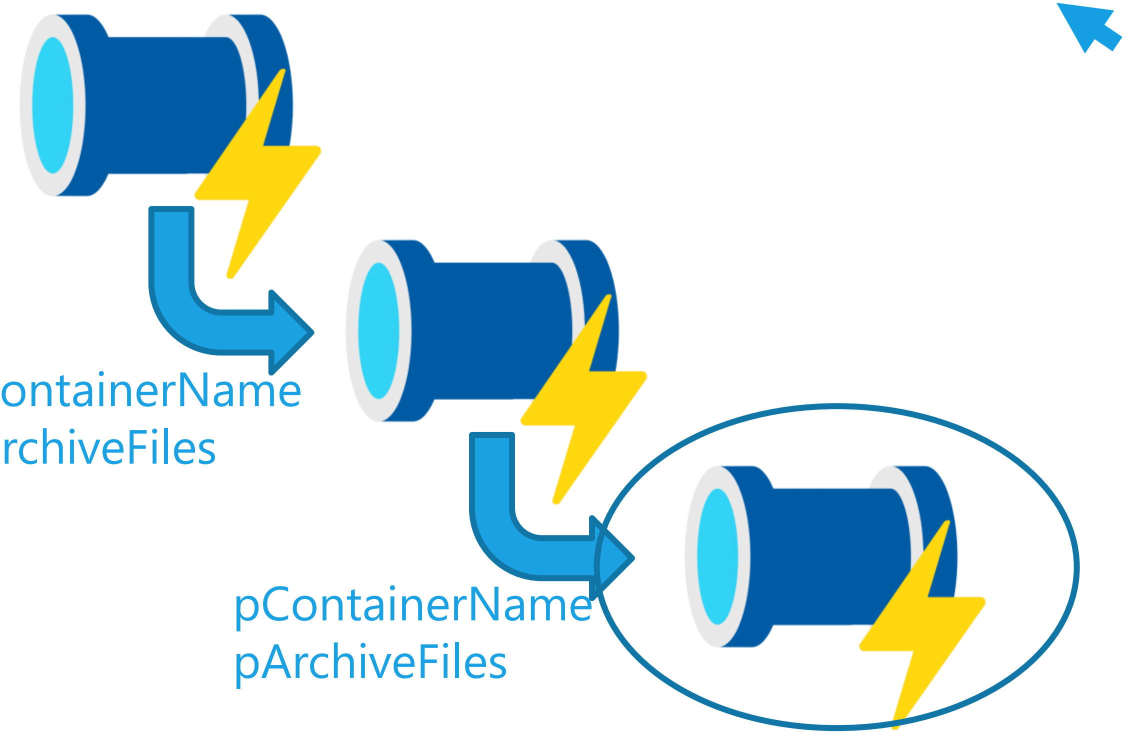
Real Comm Easy for real

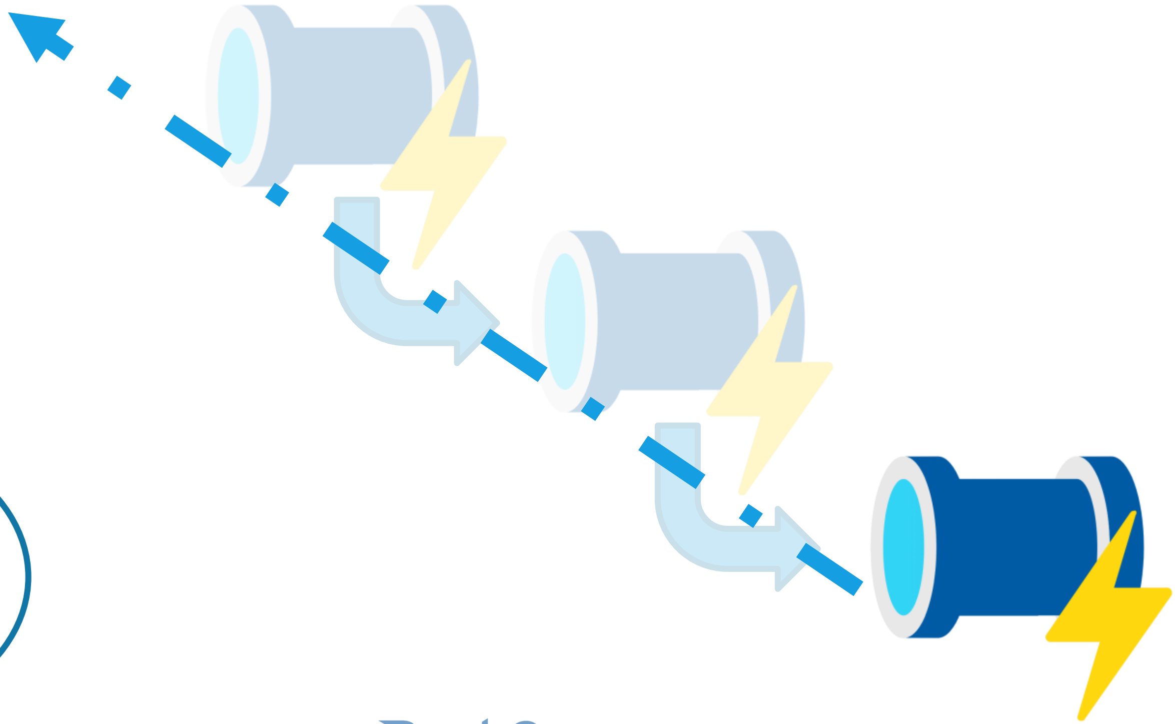
DATA SATURDAYS

Global Parameters

Before and After

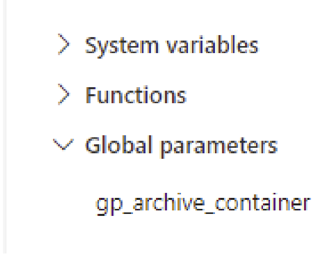
Parameter Name	Parameter Value
pContainerName	myContainer
pArchiveFiles	True



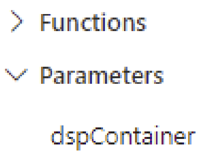


One drawback

- Only pipelines can use them



Pipelines



Datasets

Global Parameters

Demo

1hn0va community

Metadata Driven Approach

DATA SATURDAYS

altitudo

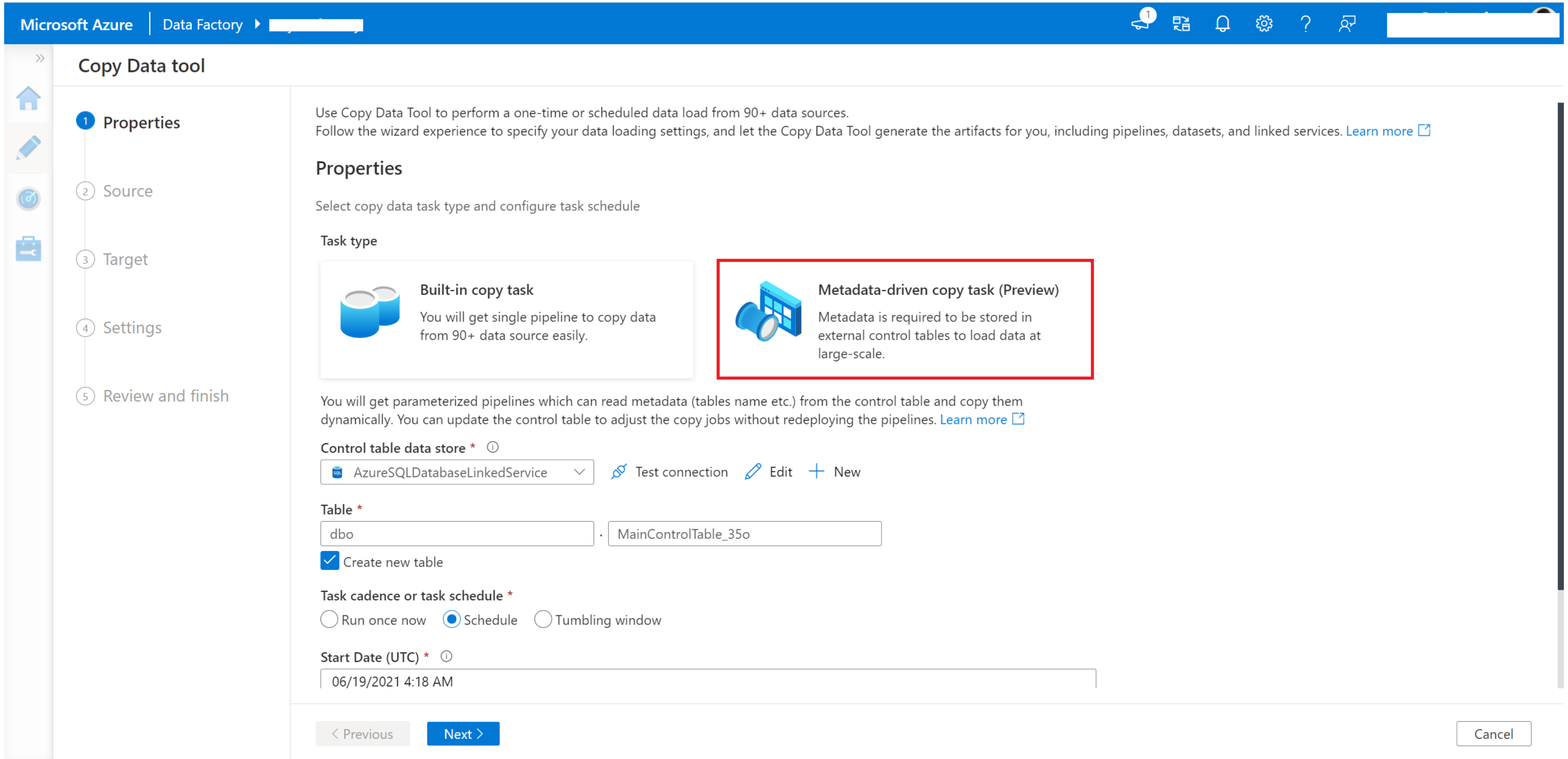
beanTech IT moves your business

Real Comm Easy for real

What is a Metadata-driven approach?

- Don’t do it manually
- Make it flexible and dynamic
- Make it configurable

Is there anything out-of-the-box?



Copy Data tool

Use Copy Data Tool to perform a one-time or scheduled data load from 90+ data sources.
Follow the wizard experience to specify your data loading settings, and let the Copy Data Tool generate the artifacts for you, including pipelines, datasets, and linked services. Learn more

Properties

Select copy data task type and configure task schedule

Task type

Built-in copy task
You will get single pipeline to copy data from 90+ data source easily.

Metadata-driven copy task (Preview)
Metadata is required to be stored in external control tables to load data at large-scale.

You will get parameterized pipelines which can read metadata (tables name etc.) from the control table and copy them dynamically. You can update the control table to adjust the copy jobs without redeploying the pipelines. Learn more

Control table data store *: AzureSQLDatabaseLinkedService

Table *: dbo . MainControlTable_35o

☑ Create new table

Task cadence or task schedule *: ○ Run once now ● Schedule ○ Tumbling window

Start Date (UTC) *: 06/19/2021 4:18 AM

inn0va community

Metadata-driven Approach

Demo

DATA SATURDAYS

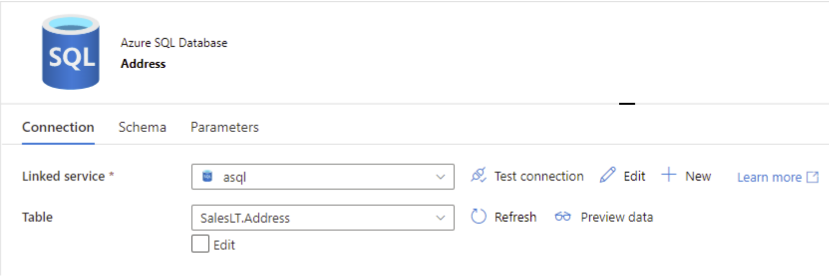
altitudo

beanTech
IT moves your business

Real Comm
Easy for real

Parametrizing Datasets

Parametrizing Datasets

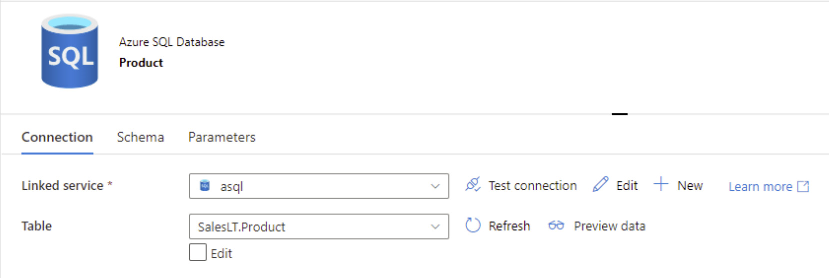

Azure SQL Database
Address

Connection | Schema | Parameters

Linked service * asql — Test connection | Edit | New | Learn more

Table SalesLT.Address — Refresh | Preview data

□ Edit

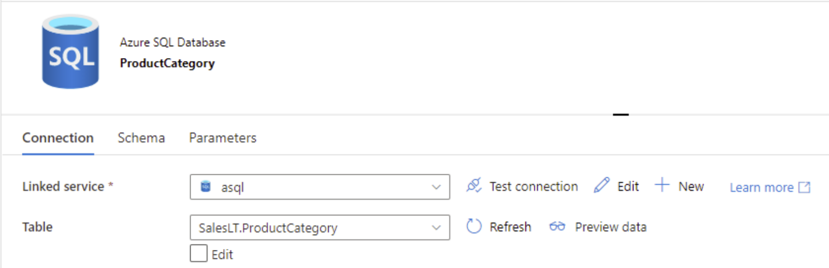

Azure SQL Database
Product

Connection | Schema | Parameters

Linked service * asql — Test connection | Edit | New | Learn more

Table SalesLT.Product — Refresh | Preview data

□ Edit

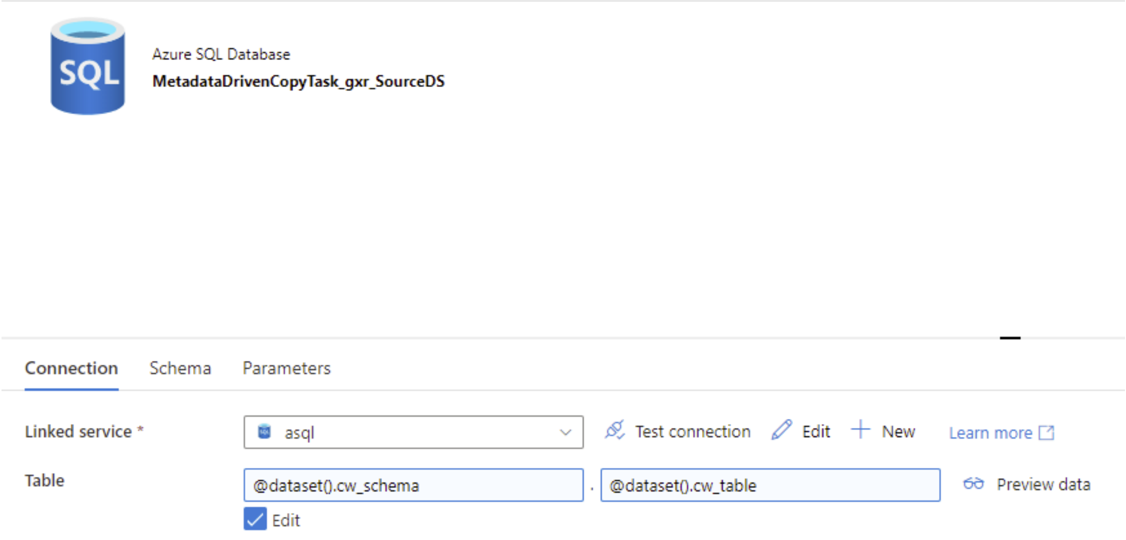

Azure SQL Database
ProductCategory

Connection | Schema | Parameters

Linked service * asql — Test connection | Edit | New | Learn more

Table SalesLT.ProductCategory — Refresh | Preview data

□ Edit


Azure SQL Database
MetadataDrivenCopyTask_gxr_SourceDS

Connection | Schema | Parameters

Linked service * asql — Test connection | Edit | New | Learn more

Table @dataset().cw_schema . @dataset().cw_table — Preview data

☑ Edit

inn0va community

altitudo

beanTech IT moves your business

Real Comm Easy for real

DATA SATURDAYS

Parametrizing Datasets

Demo

ADF loves AKV

ihn0va community

DATA SATURDAYS

altitudo

beanTech IT moves your business

Real Comm Easy for real

ADF loves AKV

- Best practice: always store **secrets outside ADF**
- Azure Key Vault securely stores and gives access to secrets
- PROS:
  - Developers can work **without knowing secrets**
  - Administrators can **setup and rotate secrets** without accessing ADF
- What should we store?
  - Passwords
  - Users Id / Identities
  - Servers' names / Services' names
  - …

ADF loves AKV

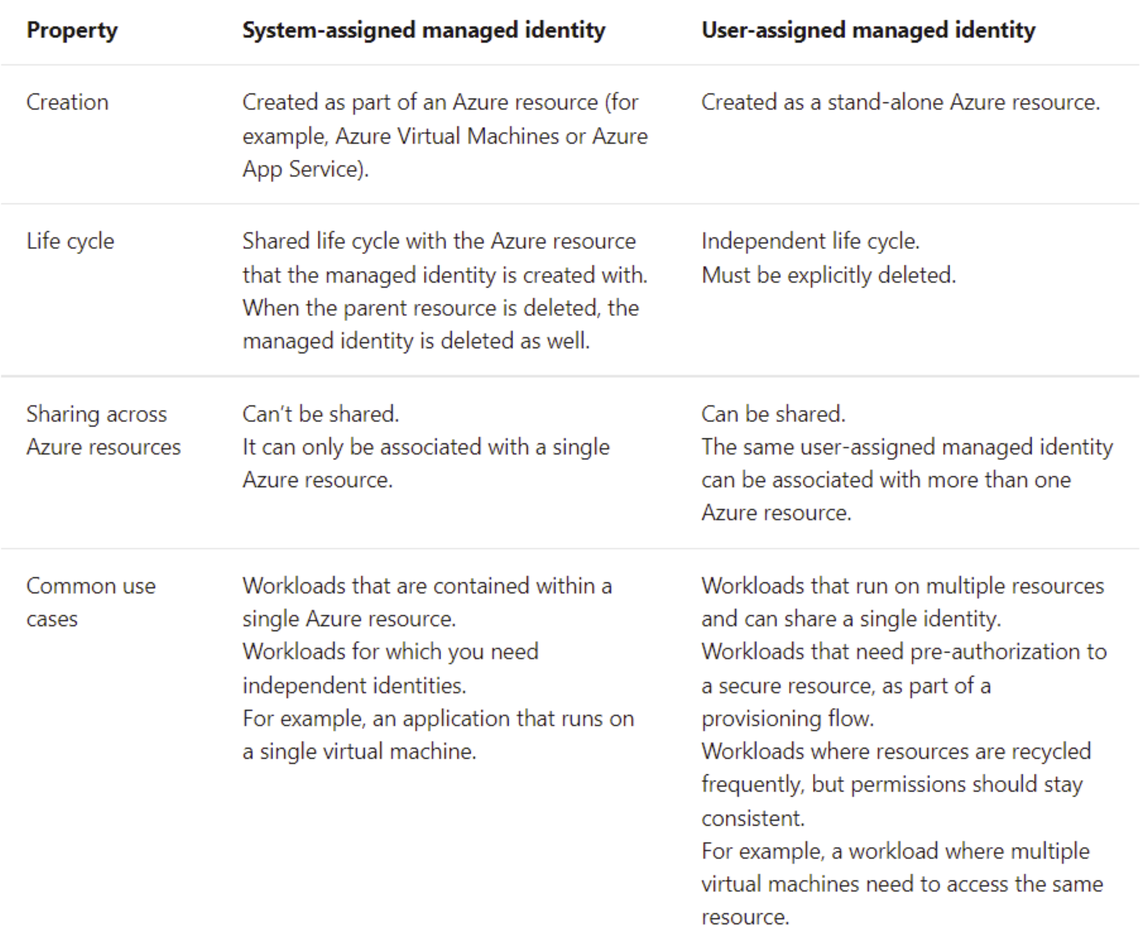
Demo

Managed Identities to get access

What is this?

*“**Managed identities** provide an **identity for applications** to use when **connecting to resources** that support Azure Active Directory (Azure AD) authentication”*

2 types and both supported by ADF



Property	System-assigned managed identity	User-assigned managed identity
Creation	Created as part of an Azure resource (for example, Azure Virtual Machines or Azure App Service).	Created as a stand-alone Azure resource.
Life cycle	Shared life cycle with the Azure resource that the managed identity is created with. When the parent resource is deleted, the managed identity is deleted as well.	Independent life cycle. Must be explicitly deleted.
Sharing across Azure resources	Can't be shared. It can only be associated with a single Azure resource.	Can be shared. The same user-assigned managed identity can be associated with more than one Azure resource.
Common use cases	Workloads that are contained within a single Azure resource. Workloads for which you need independent identities. For example, an application that runs on a single virtual machine.	Workloads that run on multiple resources and can share a single identity. Workloads that need pre-authorization to a secure resource, as part of a provisioning flow. Workloads where resources are recycled frequently, but permissions should stay consistent. For example, a workload where multiple virtual machines need to access the same resource.

Connect to ASQL via Managed Identity

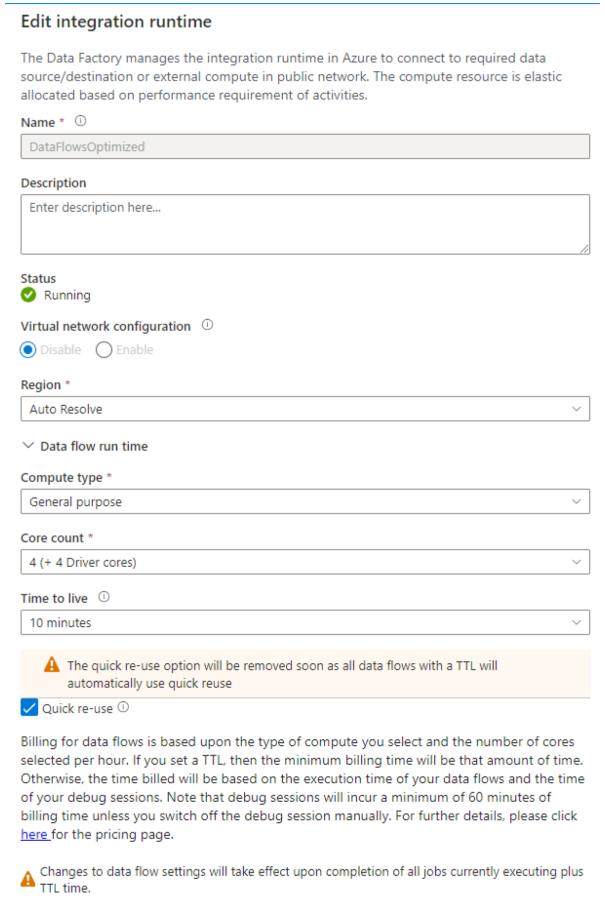
```
CREATE USER [my-adf-name] FOR EXTERNAL PROVIDER;
GO

GRANT CONNECT TO [my-adf-name];
GO

ALTER ROLE [db_owner] ADD MEMBER [my-adf-name];
GO
```

TTL integration runtime

You definitely should use it



Edit integration runtime

The Data Factory manages the integration runtime in Azure to connect to required data source/destination or external compute in public network. The compute resource is elastic allocated based on performance requirement of activities.

Name * ⓘ

DataFlowsOptimized

Description

Enter description here...

Status

✓ Running

Virtual network configuration ⓘ

● Disable ○ Enable

Region *

Auto Resolve

Data flow run time

Compute type *

General purpose

Core count *

4 (+ 4 Driver cores)

Time to live ⓘ

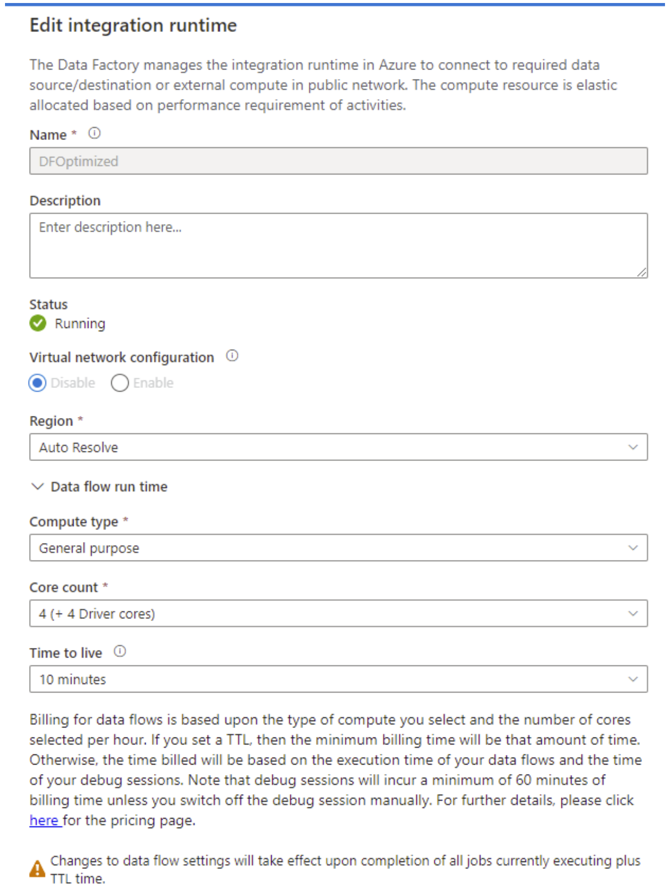
10 minutes

⚠ The quick re-use option will be removed soon as all data flows with a TTL will automatically use quick reuse

☑ Quick re-use ⓘ

Billing for data flows is based upon the type of compute you select and the number of cores selected per hour. If you set a TTL, then the minimum billing time will be that amount of time. Otherwise, the time billed will be based on the execution time of your data flows and the time of your debug sessions. Note that debug sessions will incur a minimum of 60 minutes of billing time unless you switch off the debug session manually. For further details, please click here for the pricing page.

⚠ Changes to data flow settings will take effect upon completion of all jobs currently executing plus TTL time.



Edit integration runtime

The Data Factory manages the integration runtime in Azure to connect to required data source/destination or external compute in public network. The compute resource is elastic allocated based on performance requirement of activities.

Name * ⓘ

DFOptimized

Description

Enter description here...

Status

✓ Running

Virtual network configuration ⓘ

● Disable ○ Enable

Region *

Auto Resolve

Data flow run time

Compute type *

General purpose

Core count *

4 (+ 4 Driver cores)

Time to live ⓘ

10 minutes

Billing for data flows is based upon the type of compute you select and the number of cores selected per hour. If you set a TTL, then the minimum billing time will be that amount of time. Otherwise, the time billed will be based on the execution time of your data flows and the time of your debug sessions. Note that debug sessions will incur a minimum of 60 minutes of billing time unless you switch off the debug session manually. For further details, please click here for the pricing page.

⚠ Changes to data flow settings will take effect upon completion of all jobs currently executing plus TTL time.

TTL integration runtime

Demo

My last advice for today…

No demo sorry...

Azure DevOps

Useful Links

- ADF docs: http://tiny.cc/adfrw1
- Metadata driven out-of-the-box: http://tiny.cc/adfrw2
- Metadata driven by Paul Andrew: https://github.com/mrpaulandrew/procfwk
- Managed identities: http://tiny.cc/adfrw3
- Connect to ASQL using ADF's Managed Identity: http://tiny.cc/adfrw4

Q&A

1hn0va community

DATA SATURDAYS

altitudo

beanTech IT moves your business

Real Comm Easy for real

Thank you!

innOva community

altitudo

beanTech
IT moves your business

Real Comm
Easy for real

DATA SATURDAY #20
Pordenone, Feb 26th, 2022

DATA SATURDAYS