Identify modern data warehouse architecture components

Note: You are not required to complete the processes, tasks, activities, or steps presented in this example. The various samples provided are for illustrative purposes only and it's likely that if you try this out you will encounter issues in your system.

In this reading you can see the steps involved in identifying modern data warehouse architecture components.

There is more to a data warehouse than simply storing business data. Data grows at an exponential rate, year over year. Not just the volume of data, but the variety of data, from structured, to semi-structured, and to a greater degree, unstructured that must be managed. The velocity and variety of data leads to data engineering challenges when it comes to ingesting, transforming, and preparing the data for machine learning, reporting, and other purposes.

The modern data warehouse serves to address these challenges. A good data warehouse adds value, such as acting as a central location for all your data, scale with the data as it grows over time, and providing familiar tools and ecosystem for your data engineers, data analysts, data scientists, and developers.

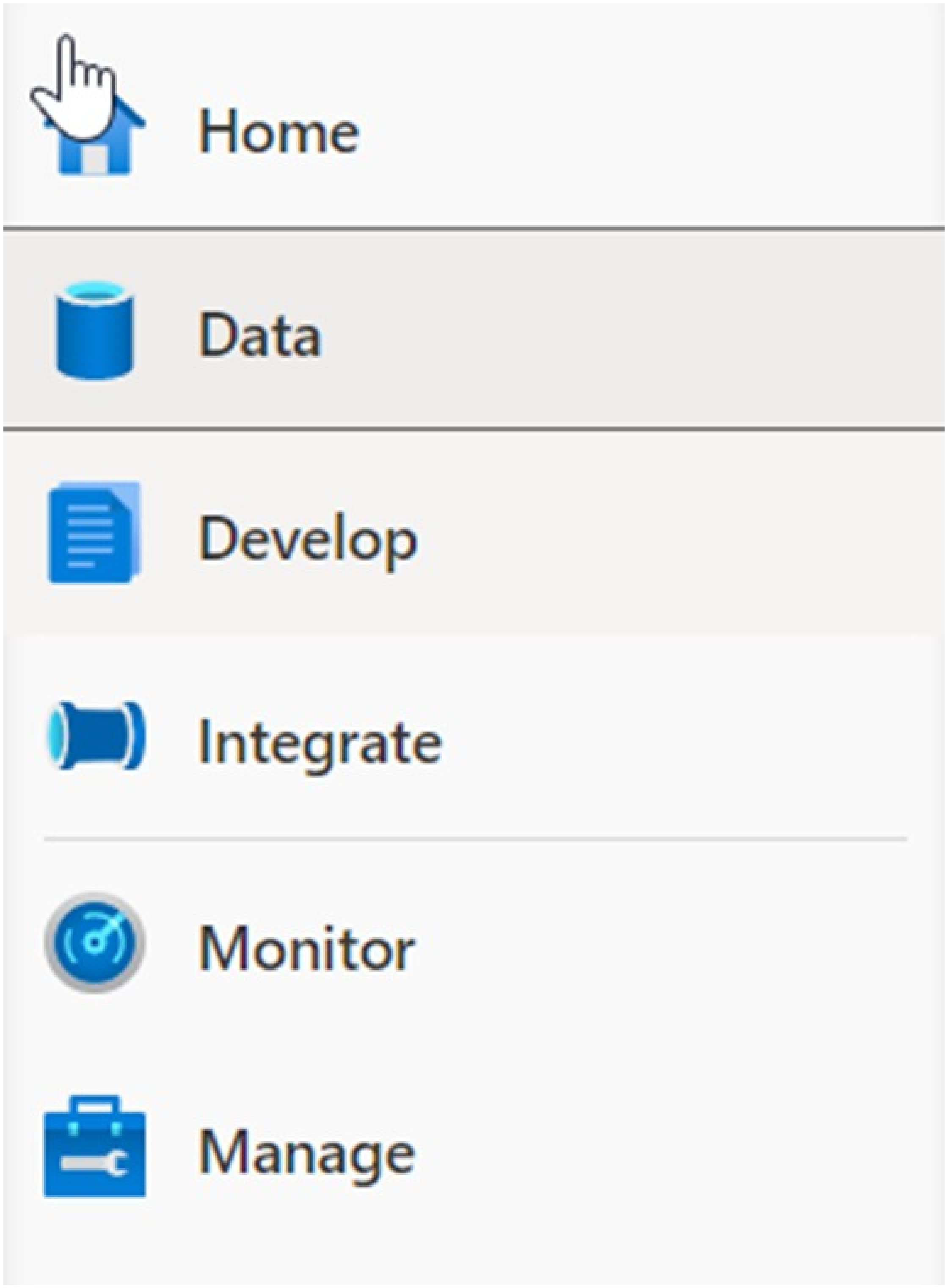
Let's look at each of these elements in detail.

One place for all your data

With a modern data warehouse, we have one hub for all data when using Synapse Analytics.

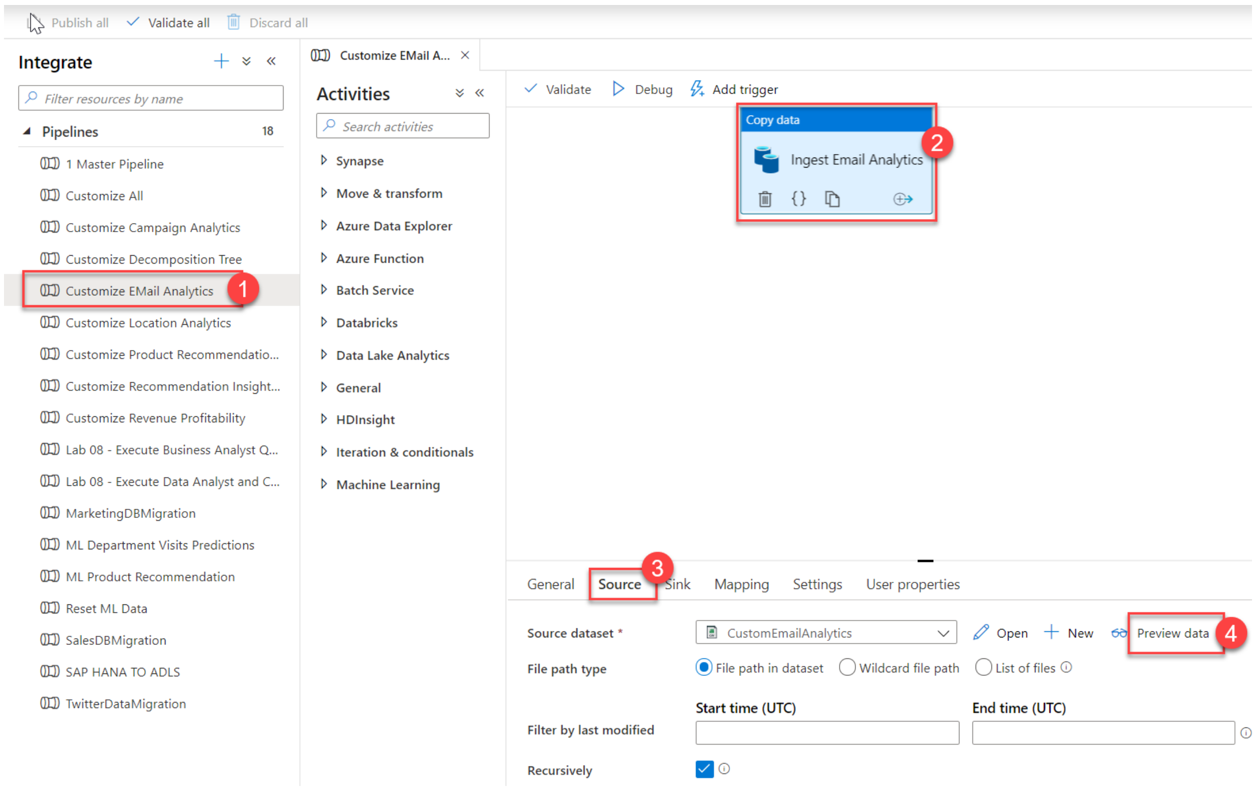
Synapse Analytics enables you to ingest data from multiple data sources through its orchestration pipelines.

1. Select the **Integrate** hub.



Manage integration pipelines within the Integrate hub. If you are familiar with Azure Data Factory (ADF), then you will feel at home in this hub. The pipeline creation experience is the same as in ADF, which gives you another powerful integration built into Azure Synapse Analytics, removing the need to use Azure Data Factory for data movement and transformation pipelines.

2. Expand Pipelines and select **Customize EMail Analytics (1)**. Select the **Copy data** activity on the canvas **(2)**, select the **Source** tab **(3)**, then select **Preview data (4)**.



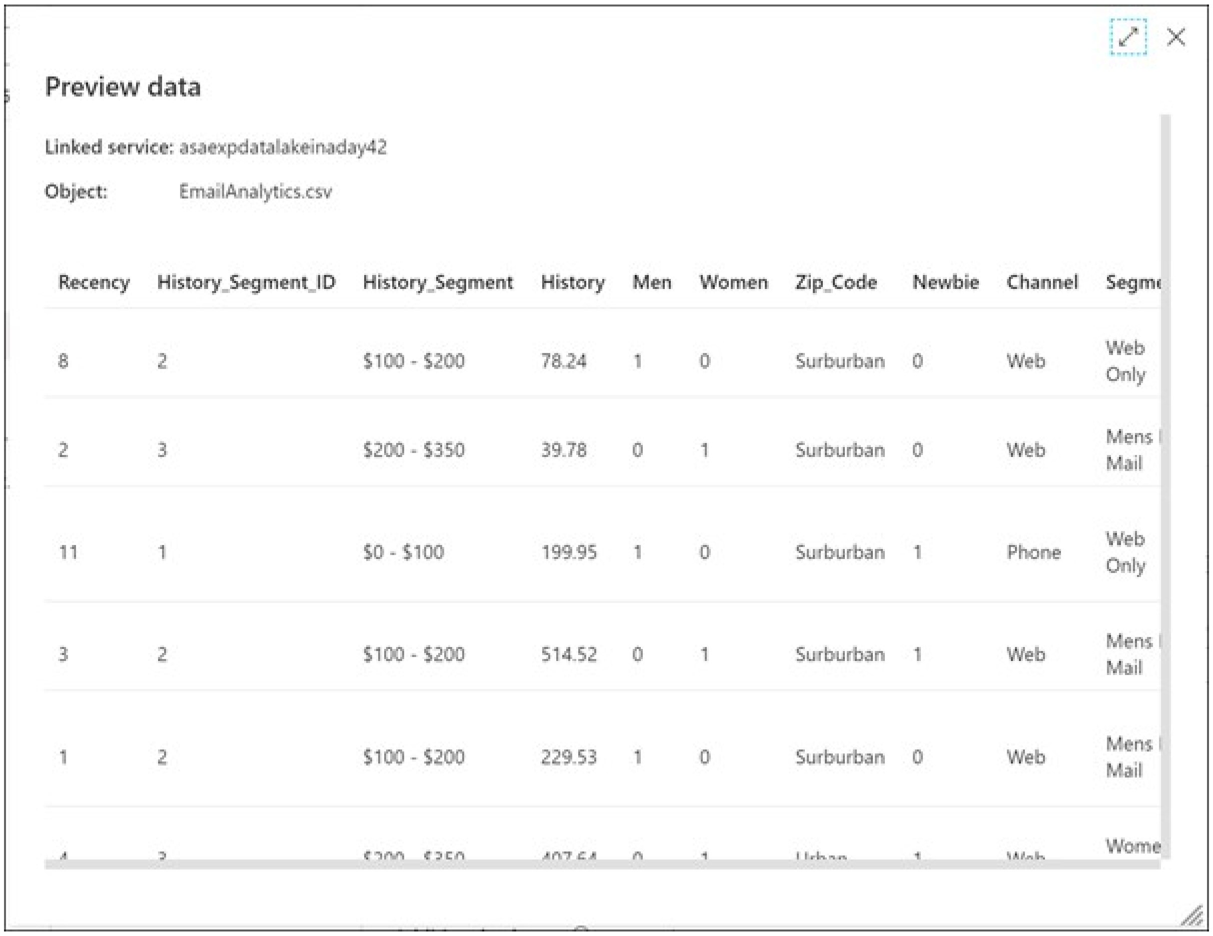
Source dataset * CustomEmailAnalytics — Open — New — Preview data

File path type: [✓ File path in dataset] Wildcard file path List of files

Filter by last modified: Start time (UTC) End time (UTC)

Recursively ✓

Here we see the source CSV data that the pipeline ingests.

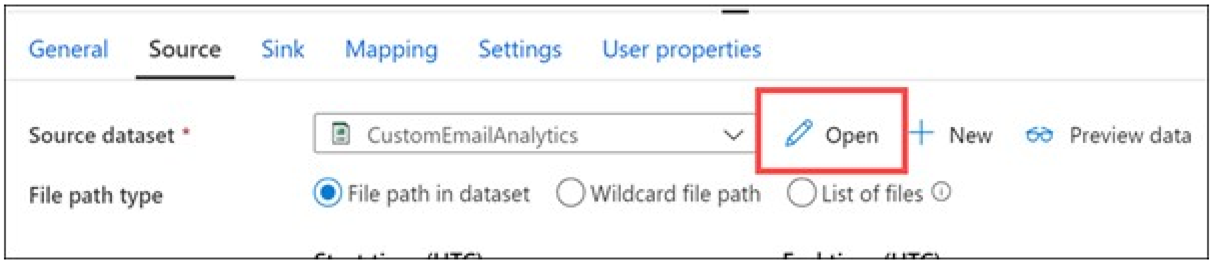

Preview data

Linked service: asaexpdatalakeinaday42

Object: EmailAnalytics.csv

Recency	History_Segment_ID	History_Segment	History	Men	Women	Zip_Code	Newbie	Channel	Segme
8	2	$100 - $200	78.24	1	0	Surburban	0	Web	Web Only
2	3	$200 - $350	39.78	0	1	Surburban	0	Web	Mens Mail
11	1	$0 - $100	199.95	1	0	Surburban	1	Phone	Web Only
3	2	$100 - $200	514.52	0	1	Surburban	1	Web	Mens Mail
1	2	$100 - $200	229.53	1	0	Surburban	0	Web	Mens Mail
4	3	$200 - $350	407.64	0	1	Urban	1	Web	Wome

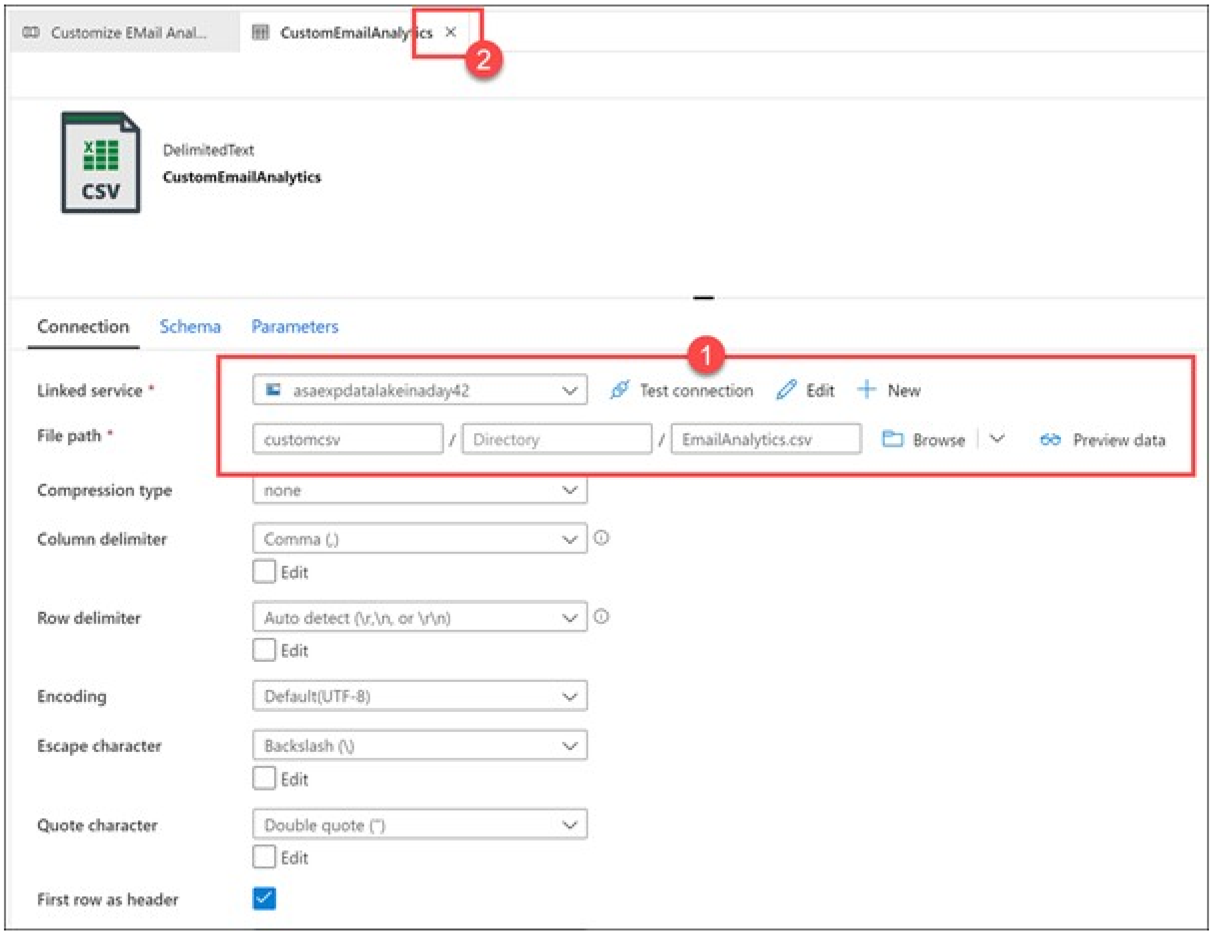
3. Close the preview, then select **Open** next to the **CustomEmailAnalytics** source dataset.



Source dataset * CustomEmailAnalytics

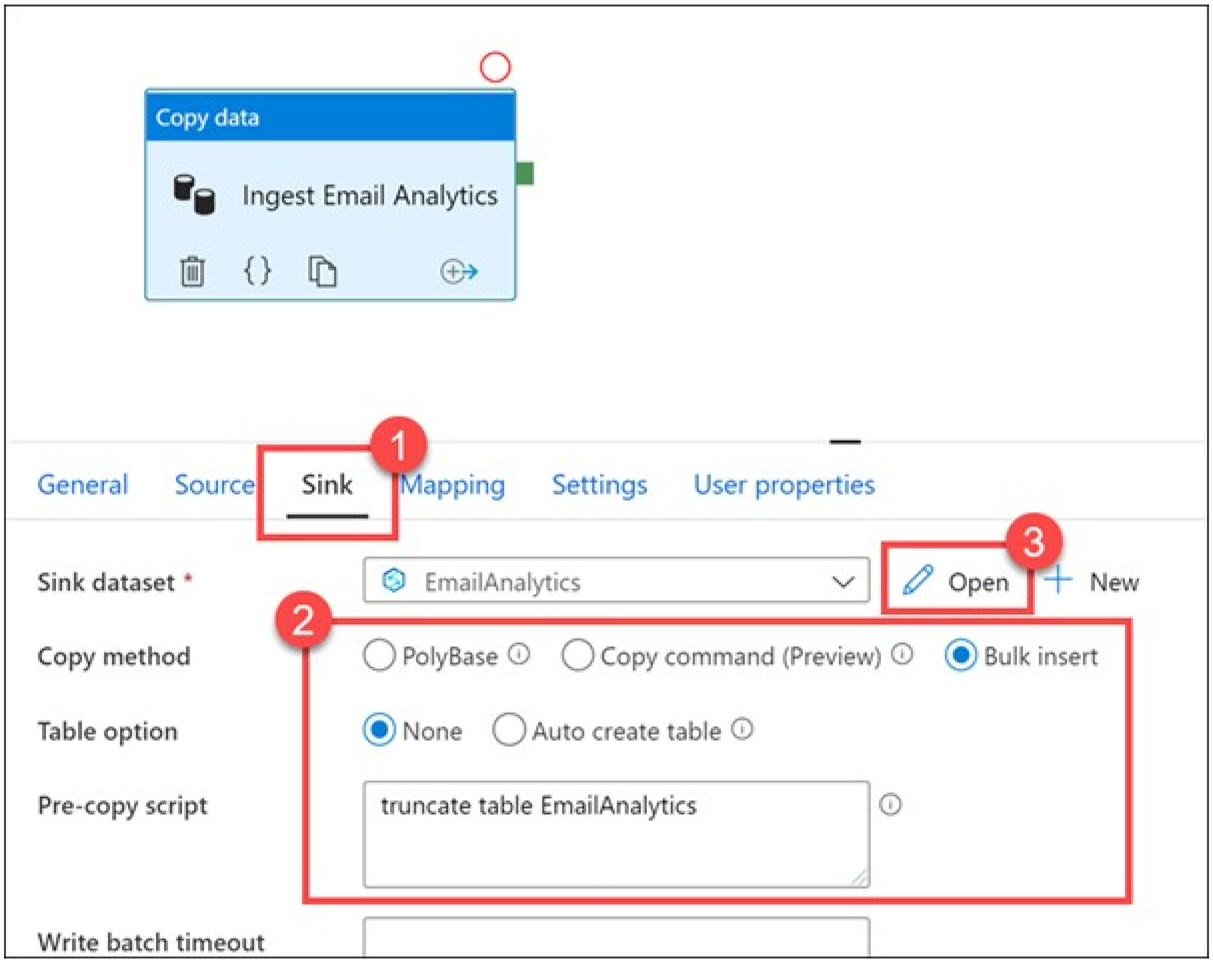
File path type [✓ File path in dataset] Wildcard file path List of files

4. Show the **Linked service** associated with the dataset's connection, as well as the CSV file path **(1)**. **Close (2)** the dataset to return to the pipeline.



Linked service *: asaexpdatalakeinaday42
File path *: customcsv / Directory / EmailAnalytics.csv
Compression type: none
Column delimiter: Comma (,) ☐ Edit
Row delimiter: Auto detect (\r,\n, or \r\n) ☐ Edit
Encoding: Default(UTF-8)
Escape character: Backslash (\) ☐ Edit
Quote character: Double quote (") ☐ Edit
First row as header: ✓

5. On the pipeline, select the **Sink** tab **(1)**. The bulk insert copy method is selected and there is a pre-copy script that truncates the **EmailAnalytics** table, which runs prior to copying the data from the CSV source **(2)**. Select **Open** next to the **EmailAnalytics** sink dataset **(3)**.



Sink dataset * EmailAnalytics

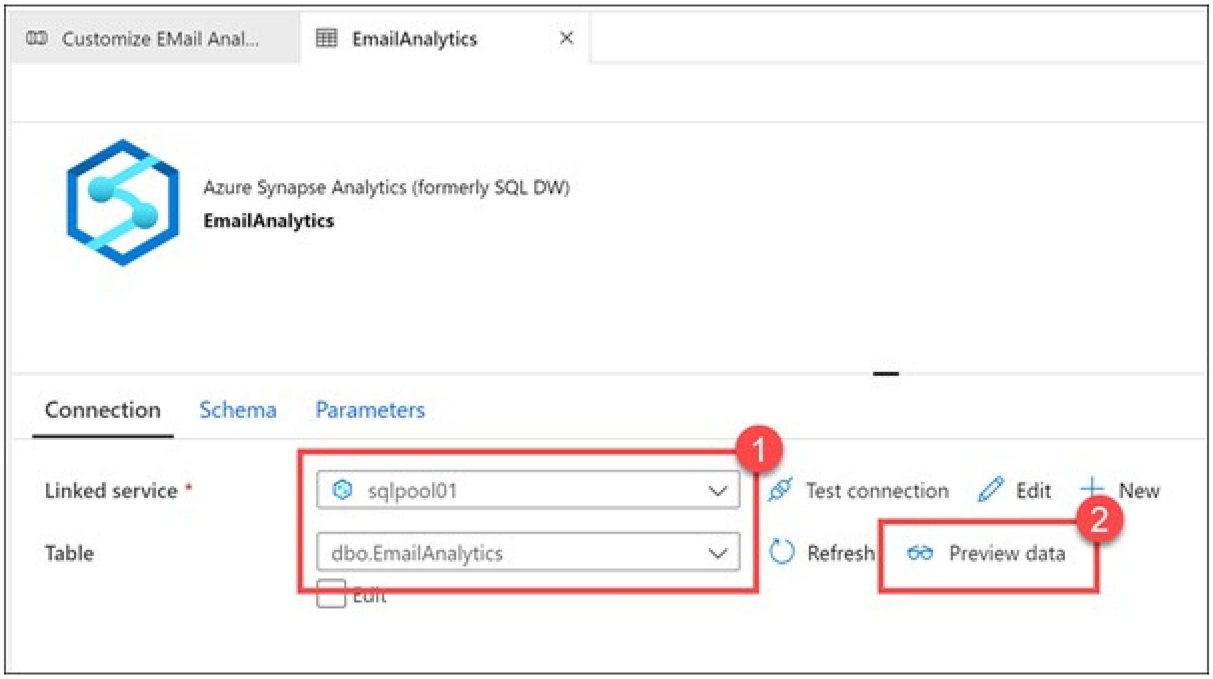
Copy method: PolyBase, Copy command (Preview), [✓ Bulk insert]

Table option: [✓ None], Auto create table

Pre-copy script: truncate table EmailAnalytics

Write batch timeout

6. The **Linked service** is the Azure Synapse Analytics SQL pool, and the **Table** is **EmailAnalytics (1)**. The Copy data activity in the pipeline uses the connection details in this dataset to copy data from the CSV data source into the SQL pool. Select **Preview data (2)**.


Customize EMail Anal...

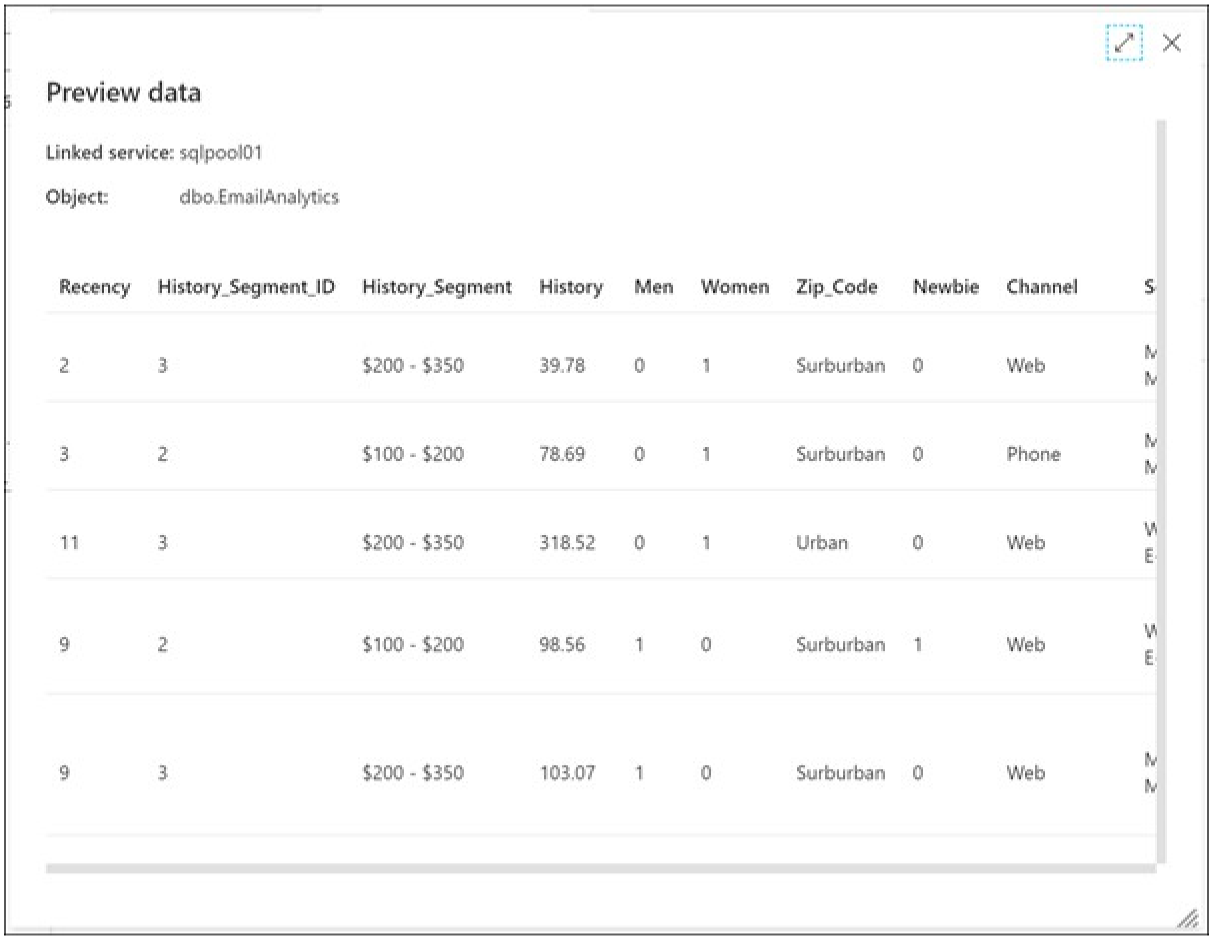
EmailAnalytics

Azure Synapse Analytics (formerly SQL DW)

EmailAnalytics

Linked service *	sqlpool01
Table	dbo.EmailAnalytics

We can see that the table already contains data, which means that we have successfully run the pipeline in the past.

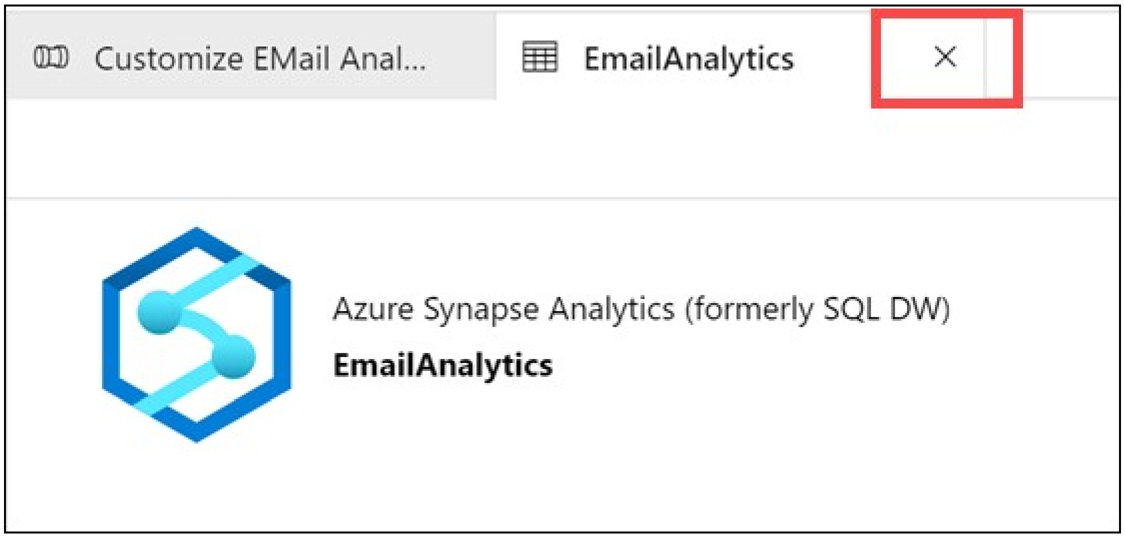

Preview data

Linked service: sqlpool01

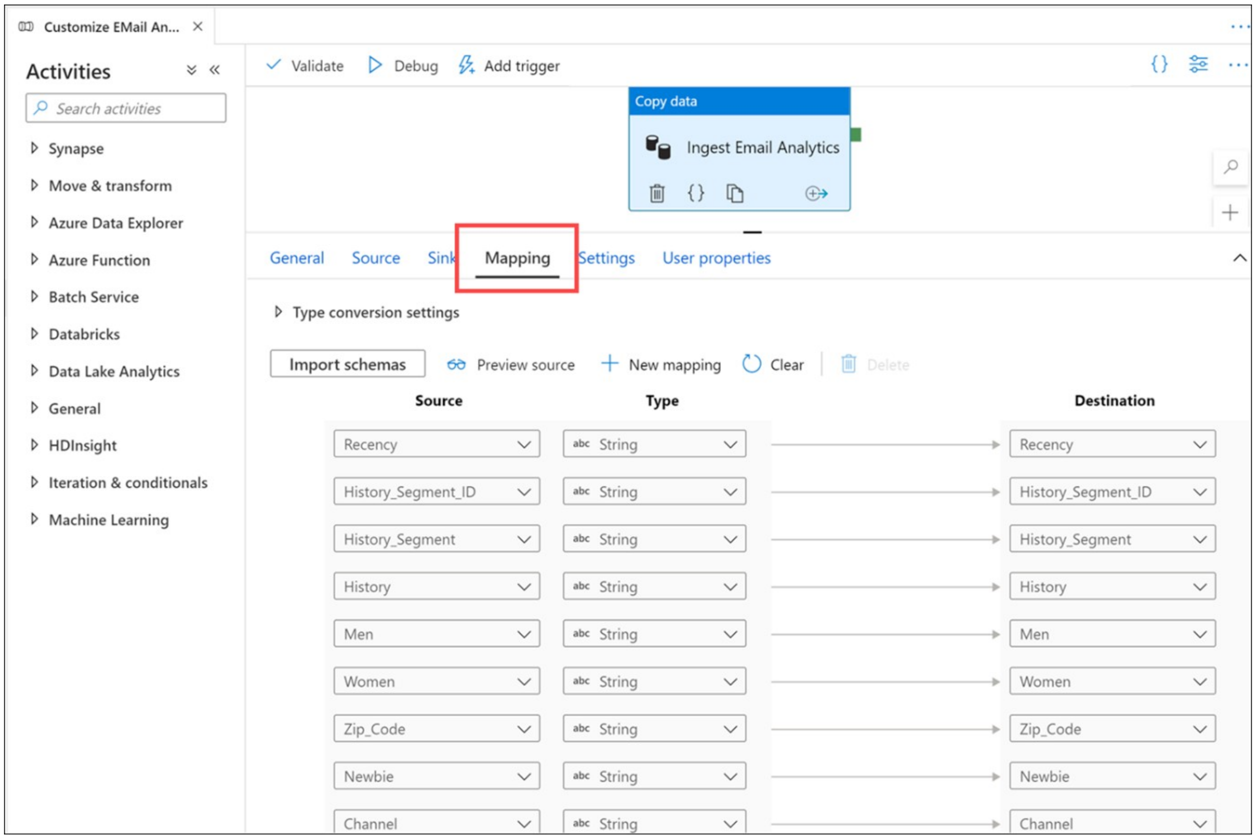
Object: dbo.EmailAnalytics

Recency	History_Segment_ID	History_Segment	History	Men	Women	Zip_Code	Newbie	Channel
2	3	$200 - $350	39.78	0	1	Surburban	0	Web
3	2	$100 - $200	78.69	0	1	Surburban	0	Phone
11	3	$200 - $350	318.52	0	1	Urban	0	Web
9	2	$100 - $200	98.56	1	0	Surburban	1	Web
9	3	$200 - $350	103.07	1	0	Surburban	0	Web

7. **Close** the **EmailAnalytics** dataset.

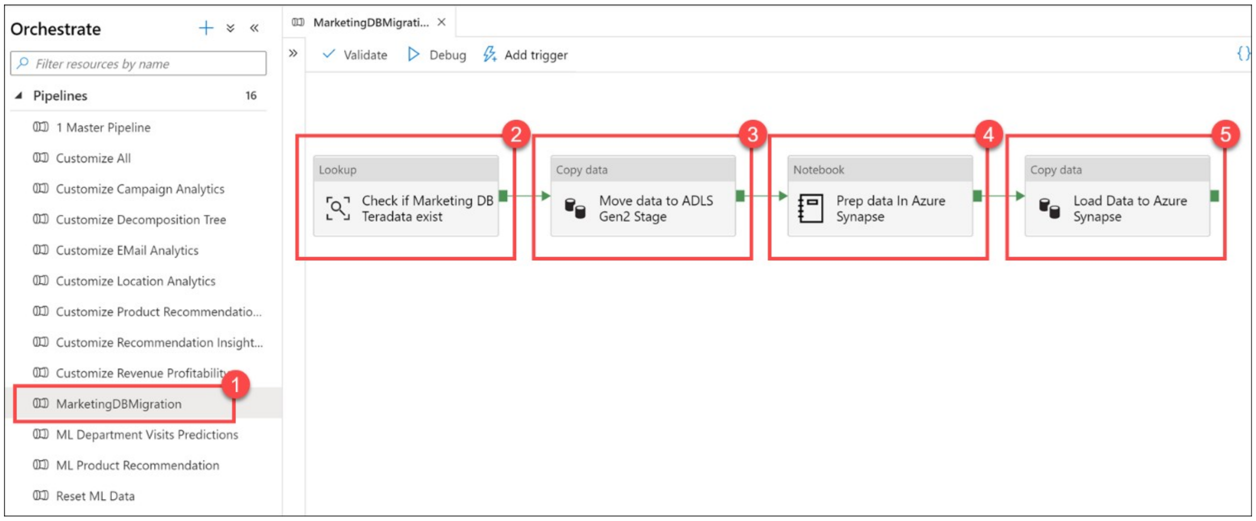


8. Select the **Mapping** tab. This is where you configure the mapping between the source and sink datasets. The **Import schemas** button attempts to infer the schema for your datasets if they are based on unstructured or semi-structured data sources, like CSV or JSON files. It also reads the schema from structured data sources, like Synapse Analytics SQL pools. You also have the option to manually create your schema mapping by clicking on **+ New mapping** or by modifying the data types.



Source	Type	Destination
Recency	String	Recency
History_Segment_ID	String	History_Segment_ID
History_Segment	String	History_Segment
History	String	History
Men	String	Men
Women	String	Women
Zip_Code	String	Zip_Code
Newbie	String	Newbie
Channel	String	Channel

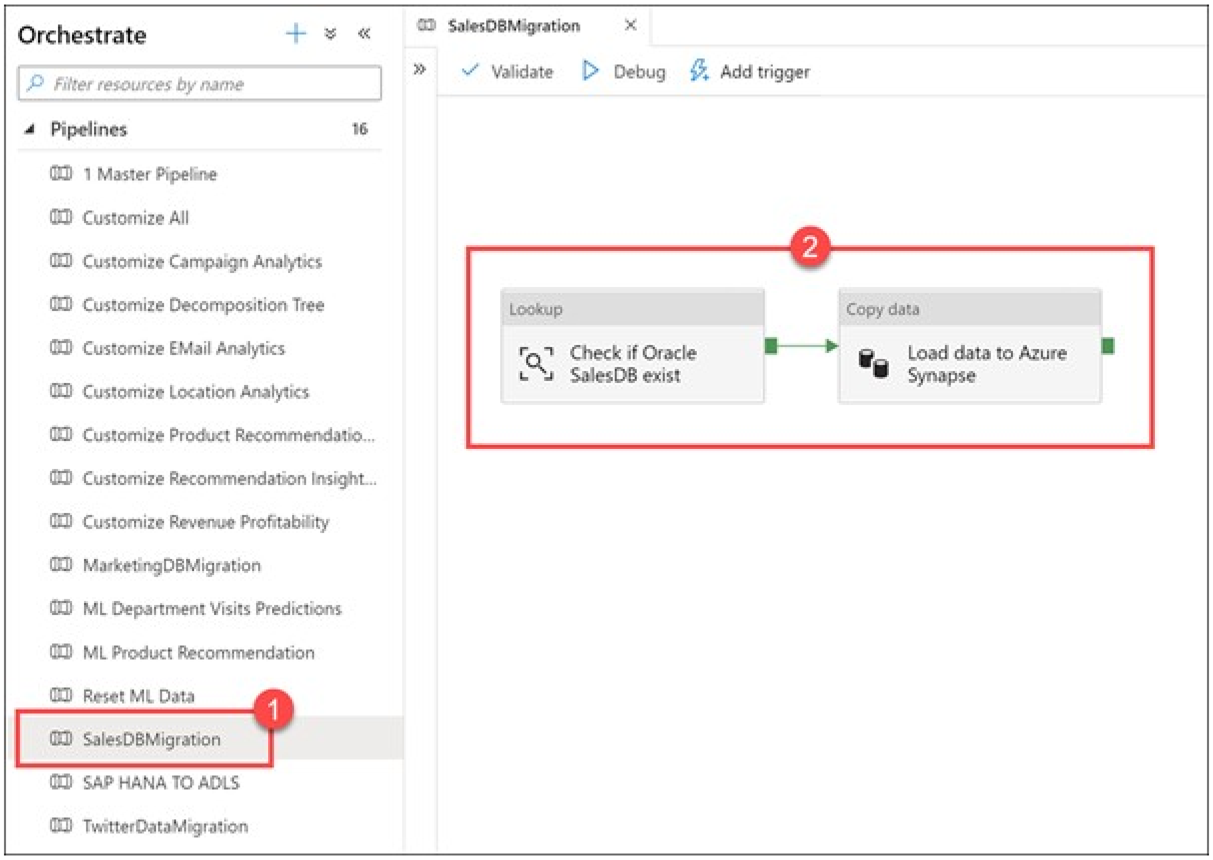
9. Select the **MarketingDBMigration (1)** pipeline. Direct your attention to the pipeline's canvas **(2)**.


Orchestrate
Filter resources by name
Pipelines 16
1 Master Pipeline
Customize All
Customize Campaign Analytics
Customize Decomposition Tree
Customize EMail Analytics
Customize Location Analytics
Customize Product Recommendatio...
Customize Recommendation Insight...
Customize Revenue Profitabilit...
MarketingDBMigration
ML Department Visits Predictions
ML Product Recommendation
Reset ML Data
MarketingDBMigrati...
Validate
Debug
Add trigger
Lookup
Check if Marketing DB Teradata exist
Copy data
Move data to ADLS Gen2 Stage
Notebook
Prep data In Azure Synapse
Copy data
Load Data to Azure Synapse
1
2
3
4
5

This pipeline is responsible for copying data from a Teradata database. The first activity is a **lookup (2)** to make sure that the source data exists. If data exists, it flows to the **copy data activity (3)** to move the source data into the data lake (ADLS Gen2 primary data source). The next step is a **Notebook activity (4)**, which uses Apache Spark within a Synapse Notebook to perform data engineering tasks. The last step is another **copy data activity (5)** that loads the prepared data and stores it into an Azure Synapse SQL pool table.

This workflow is common when conducting data movement orchestration. Synapse Analytics pipelines makes it easy to define data movement and transformation steps, and encapsulates these steps into a repeatable process that you can maintain and monitor within your modern data warehouse.

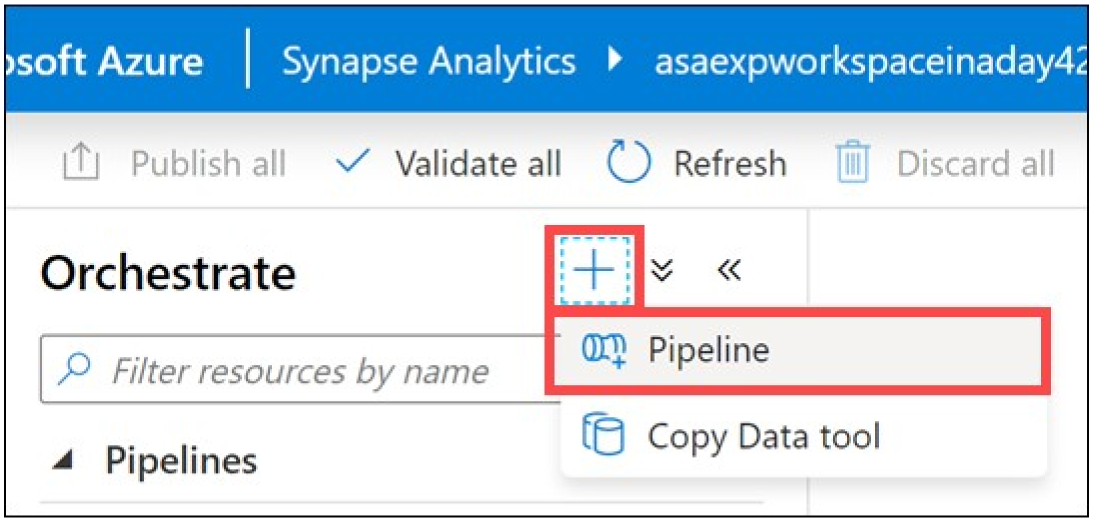
10. Select the **SalesDBMigration (1)** pipeline. Direct your attention to the pipeline's canvas **(2)**.


Orchestrate
Filter resources by name
Pipelines 16
1 Master Pipeline
Customize All
Customize Campaign Analytics
Customize Decomposition Tree
Customize EMail Analytics
Customize Location Analytics
Customize Product Recommendatio...
Customize Recommendation Insight...
Customize Revenue Profitability
MarketingDBMigration
ML Department Visits Predictions
ML Product Recommendation
Reset ML Data
SalesDBMigration
SAP HANA TO ADLS
TwitterDataMigration
1
SalesDBMigration
Validate
Debug
Add trigger
2
Lookup
Check if Oracle SalesDB exist
Copy data
Load data to Azure Synapse

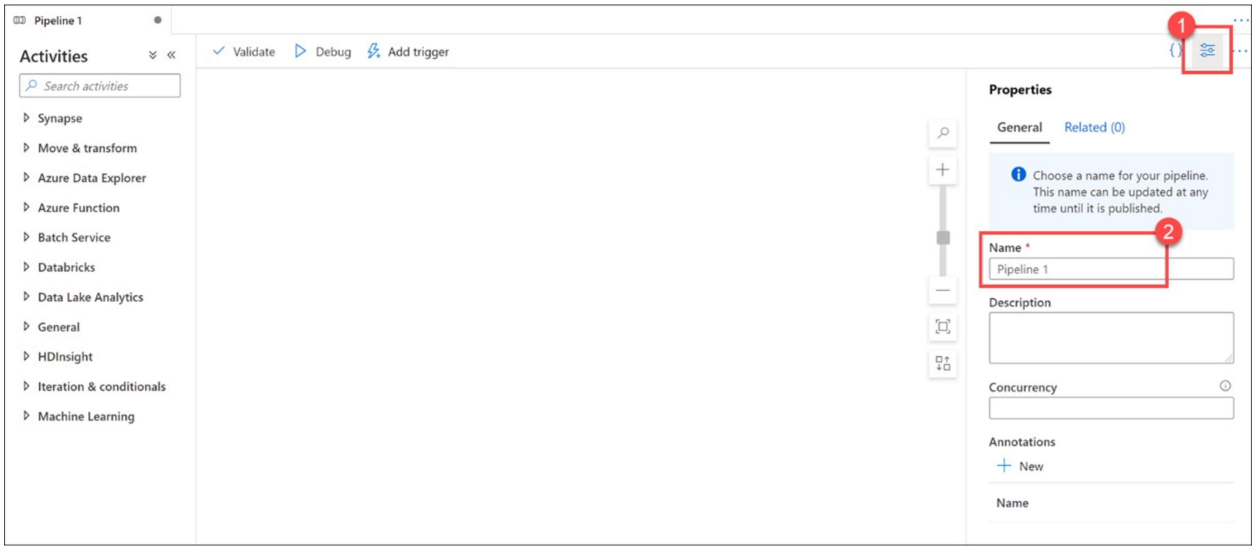
Here is another example of a data movement orchestration pipeline that helps us combine external data sources into our warehouse. In this case, we load data from an Oracle sales database into an Azure Synapse SQL pool table.

11. Select the **SAP HANA TO ADLS** pipeline. This pipeline copies data from a financial SAP HANA data source into the SQL pool.

12. Select the **+** button at the top of the **Orchestrate** blade, then select **Pipeline** to create a new pipeline.



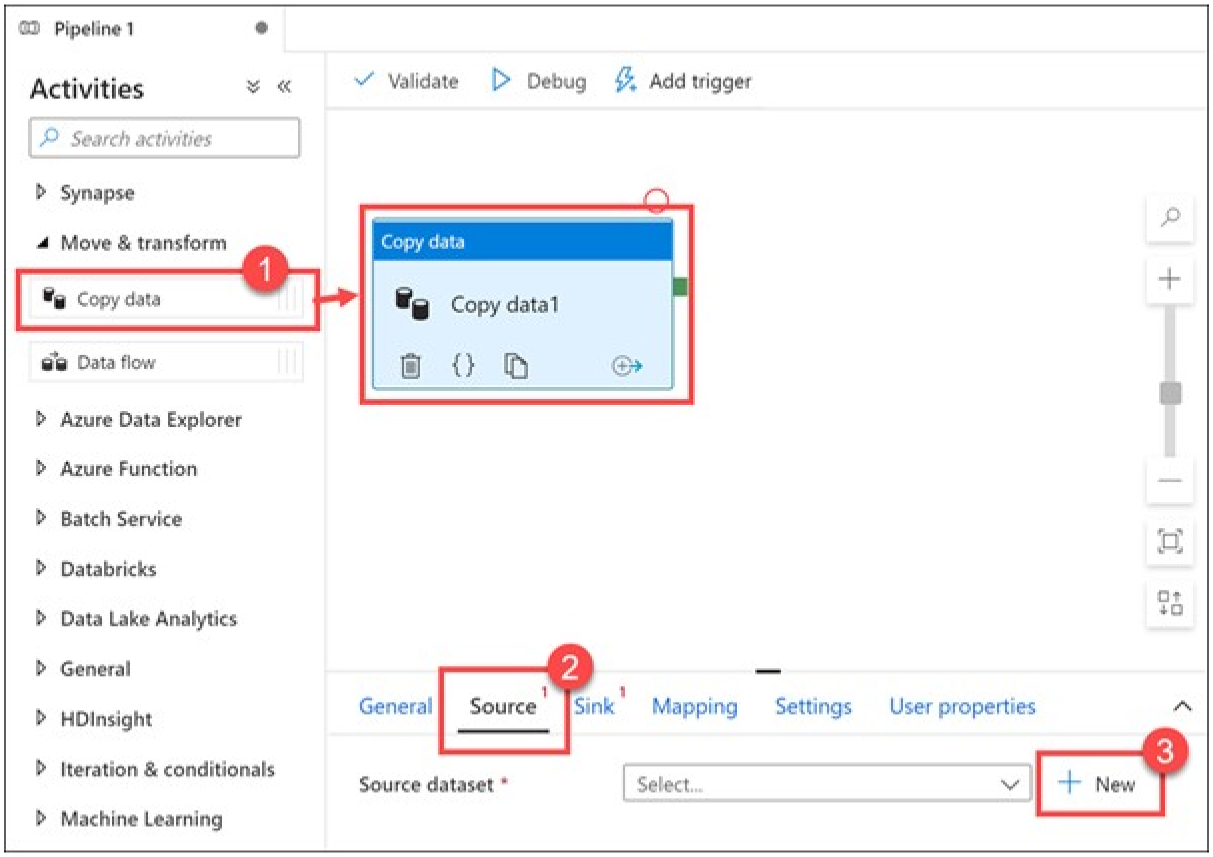
When the new pipeline opens, the **Properties** blade appears **(1)**, allowing you to name the pipeline **(2)**.



Choose a name for your pipeline. This name can be updated at any time until it is published.

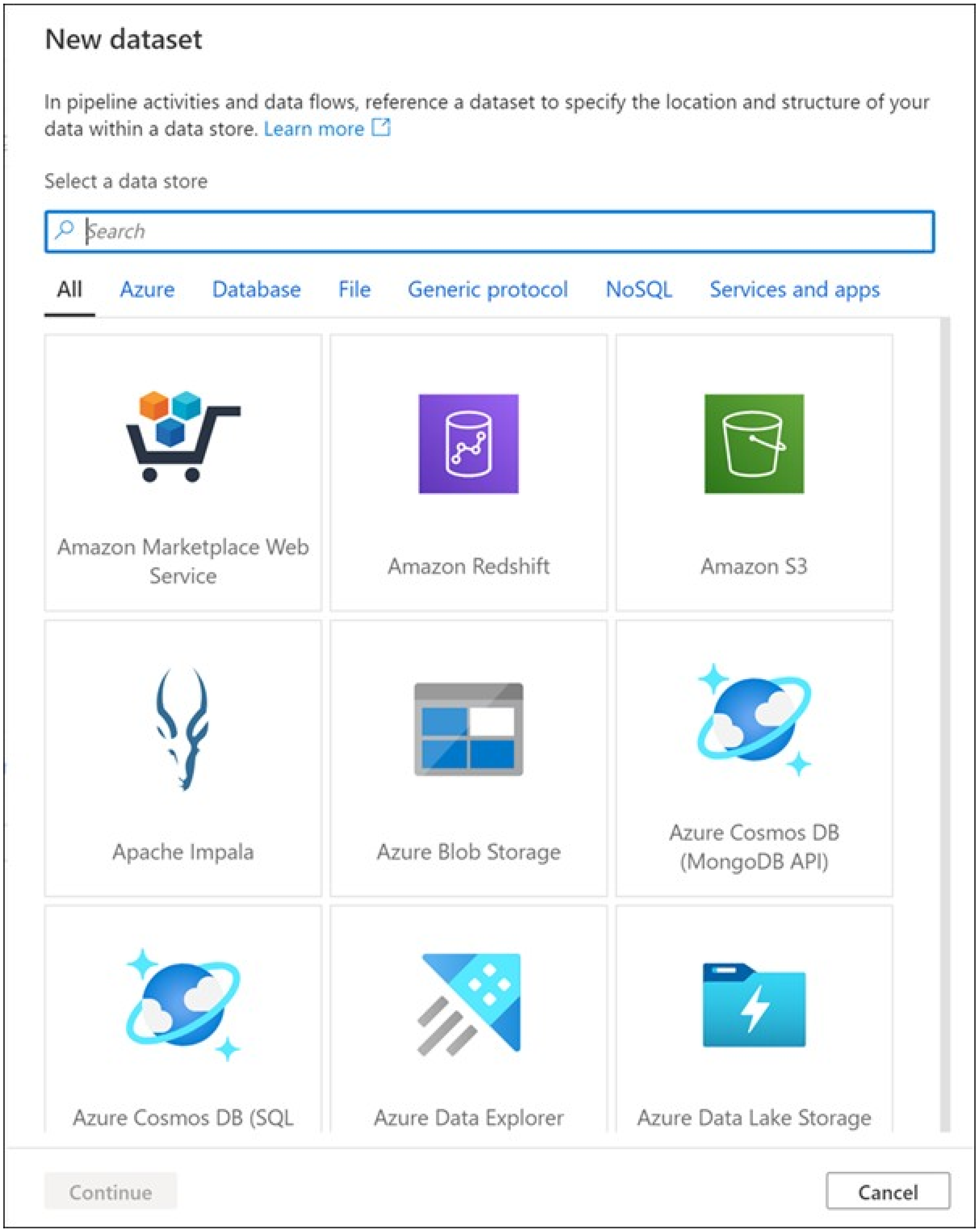
Name * Pipeline 1

13. Expand the Move & transform activity group, then drag the **Copy data** activity onto the design canvas **(1)**. With the Copy data activity selected, select the **Source** tab **(2)**, then select **+ New** **(3)** next to the source dataset.



Source dataset * Select...

14. Scroll through the list of dataset sources to show the large number of data connections at your disposal, and then click **Cancel**.



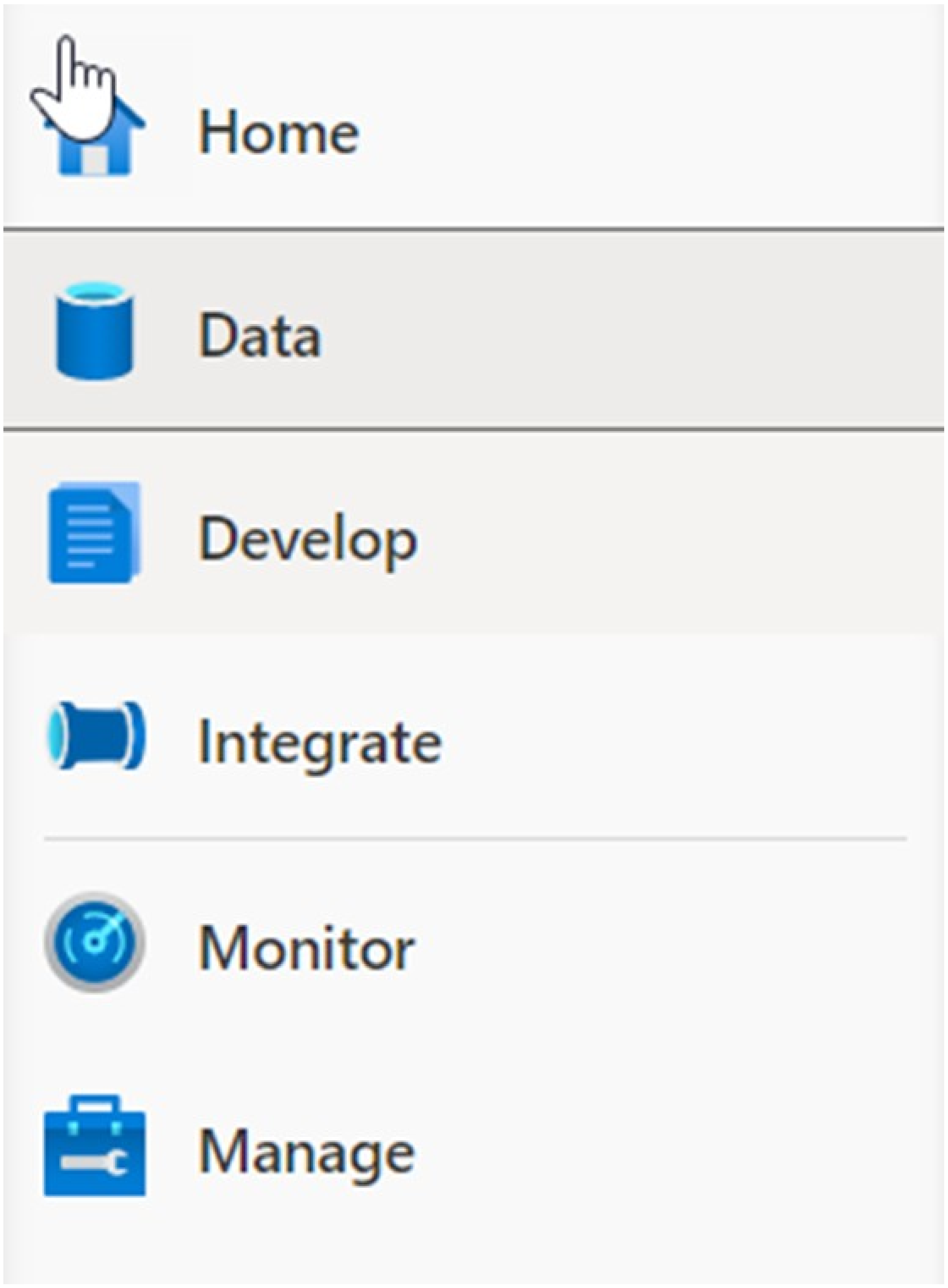
New dataset

In pipeline activities and data flows, reference a dataset to specify the location and structure of your data within a data store. Learn more

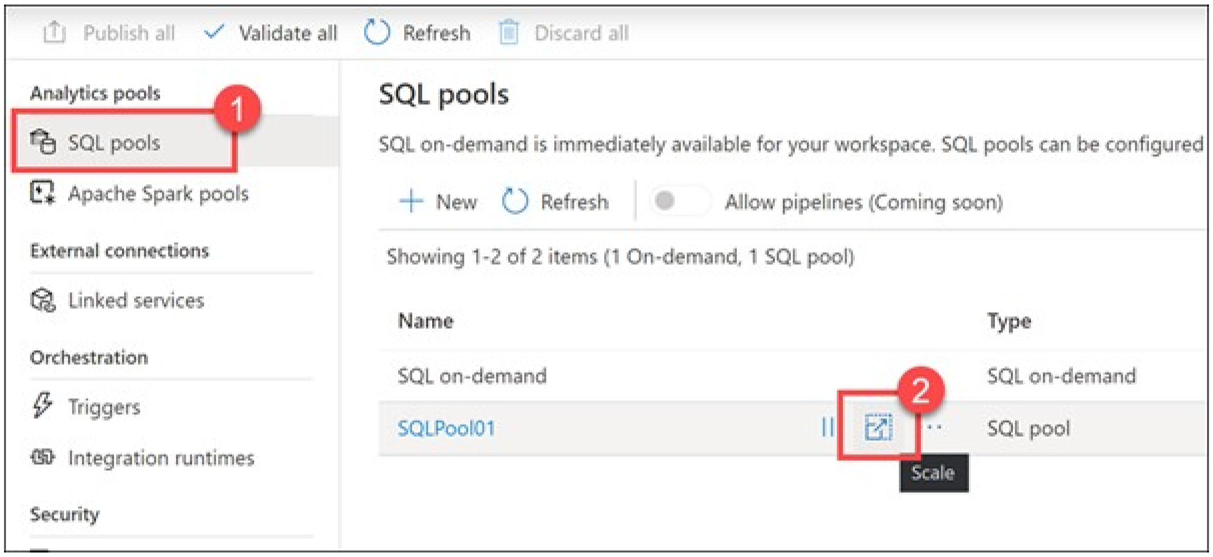
Select a data store

Unlimited data scale

1. Select the **Manage** hub.



2. Select **SQL pools (1)**. Hover over **SQLPool01** and select the **Scale** button **(2)**.



SQL pools

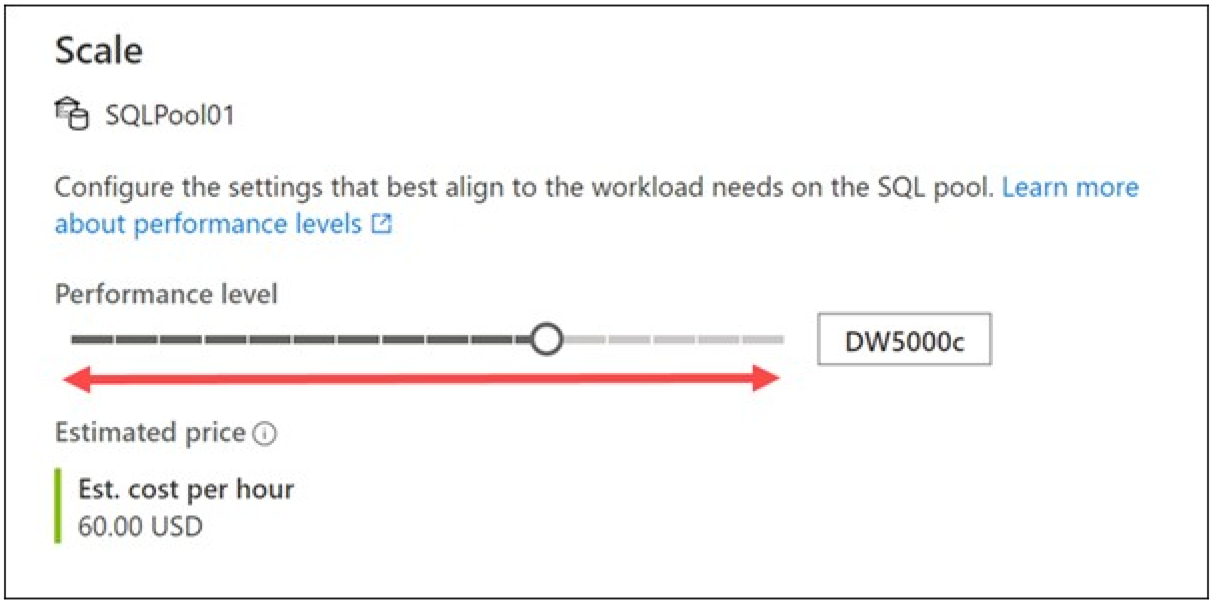
SQL on-demand is immediately available for your workspace. SQL pools can be configured

+ New Refresh Allow pipelines (Coming soon)

Showing 1-2 of 2 items (1 On-demand, 1 SQL pool)

Name	Type
SQL on-demand	SQL on-demand
SQLPool01	SQL pool

3. Drag the **Performance level** slider right and left.



Scale

SQLPool01

Configure the settings that best align to the workload needs on the SQL pool. Learn more about performance levels

Performance level: DW5000c

Estimated price

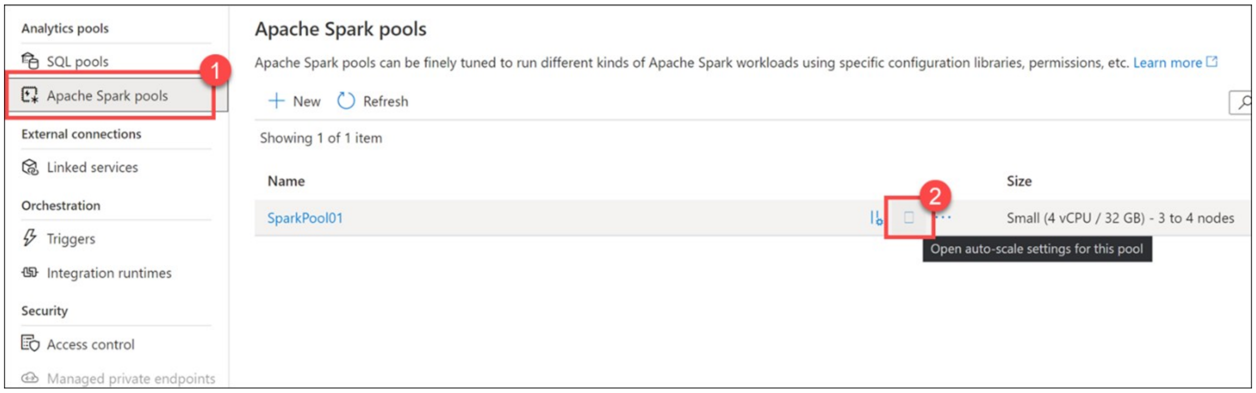
Est. cost per hour
60.00 USD

You can scale out or back compute by adjusting the number of Data Warehouse Units (DWUs) assigned to your SQL pool. This adjusts the loading and query performance linearly as you add more units.

To perform a scale operation, SQL pool first kills all incoming queries and then rolls back transactions to ensure a consistent state. Scaling only occurs once the transaction rollback is complete.

You can scale SQL compute at any time by using this slider. You can also programmatically adjust the Data Warehouse Units, enabling scenarios where you automatically scale your pool based on a schedule or other factors.

4. Cancel the Scale dialog, then select **Apache Spark pools (1)** in the Manage hub left-hand menu. Hover over **SparkPool01** and select the **auto-scale settings** button **(2)**.



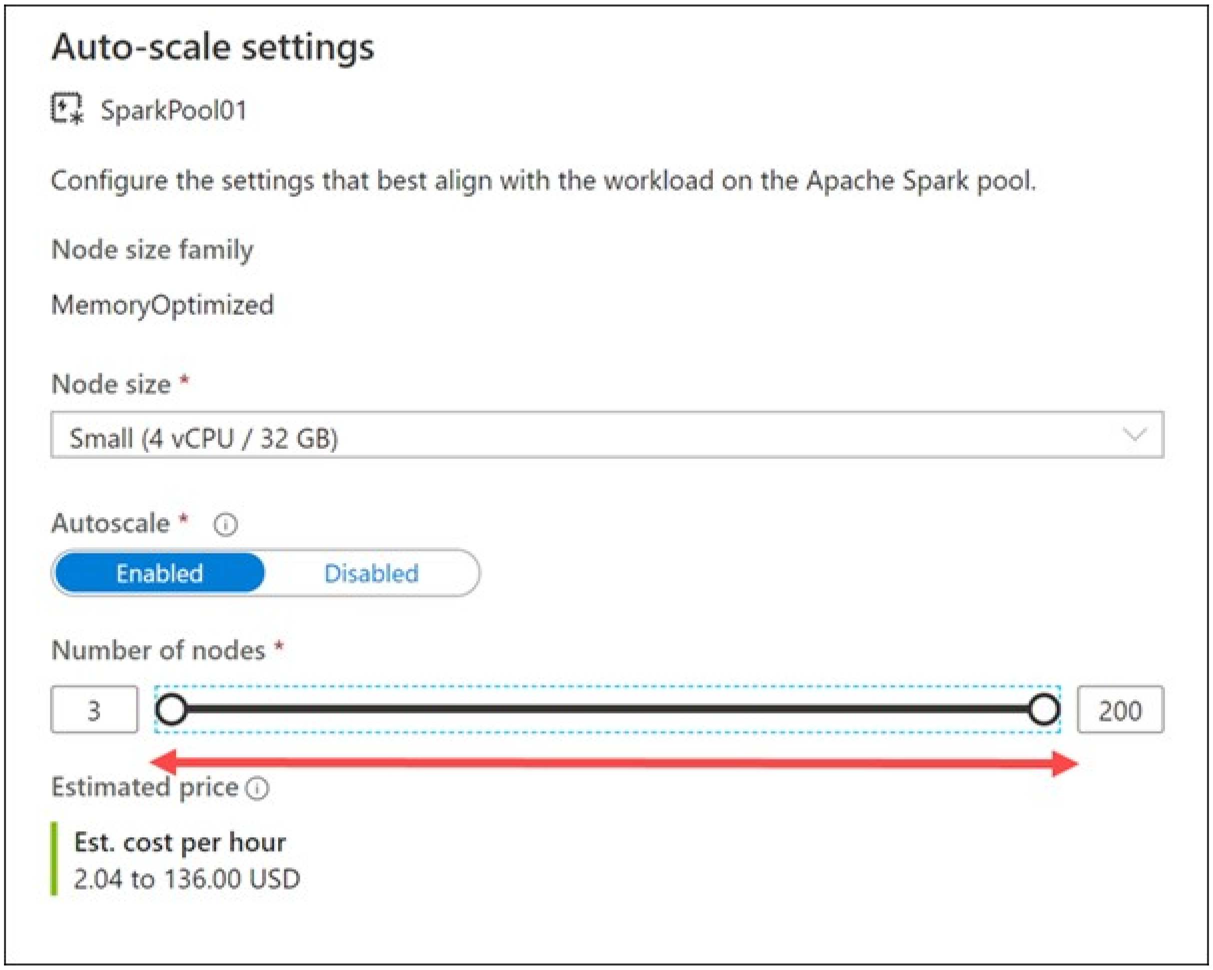
Apache Spark pools

Apache Spark pools can be finely tuned to run different kinds of Apache Spark workloads using specific configuration libraries, permissions, etc. Learn more

Showing 1 of 1 item

Name	Size
SparkPool01	Small (4 vCPU / 32 GB) - 3 to 4 nodes

5. Drag the **Number of nodes** slider right and left.



Auto-scale settings

SparkPool01

Configure the settings that best align with the workload on the Apache Spark pool.

Node size family

MemoryOptimized

Node size *

Small (4 vCPU / 32 GB)

Autoscale *

Enabled | Disabled

Number of nodes *

3 — 200

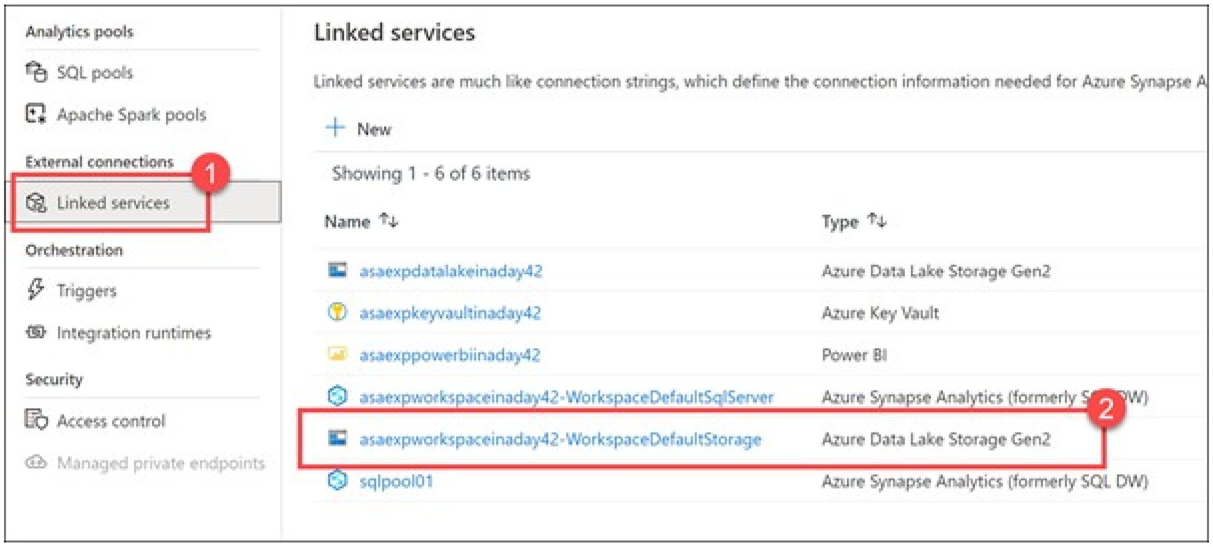
Estimated price

Est. cost per hour
2.04 to 136.00 USD

You can configure the Apache Spark pool to have a fixed size by disabling the autoscale setting. Here we have enabled autoscale and set the minimum and maximum number of nodes to control the amount of scale applied. When you enable autoscale, Synapse Analytics monitors the resource requirements of the load and scales the number of nodes up or down. It does this by continuously monitoring pending CPU, pending memory, free CPU, free memory, and used memory per node metrics. It checks these metrics every 30 seconds and makes scaling decisions based on the values.

It can take 1-5 minutes for a scaling operation to complete.

6. Cancel the auto-scale dialog, then select **Linked services (1)** in the Manage hub left-hand menu. Make note of the **WorkspaceDefaultStorage** ADLS Gen2 storage account **(2)**.



Linked services

Linked services are much like connection strings, which define the connection information needed for Azure Synapse A

+ New

Showing 1 - 6 of 6 items

Name	Type
asaexpdatalakeinaday42	Azure Data Lake Storage Gen2
asaexpkeyvaultinaday42	Azure Key Vault
asaexppowerbiinaday42	Power BI
asaexpworkspaceinaday42-WorkspaceDefaultSqlServer	Azure Synapse Analytics (formerly S DW)
asaexpworkspaceinaday42-WorkspaceDefaultStorage	Azure Data Lake Storage Gen2
sqlpool01	Azure Synapse Analytics (formerly SQL DW)

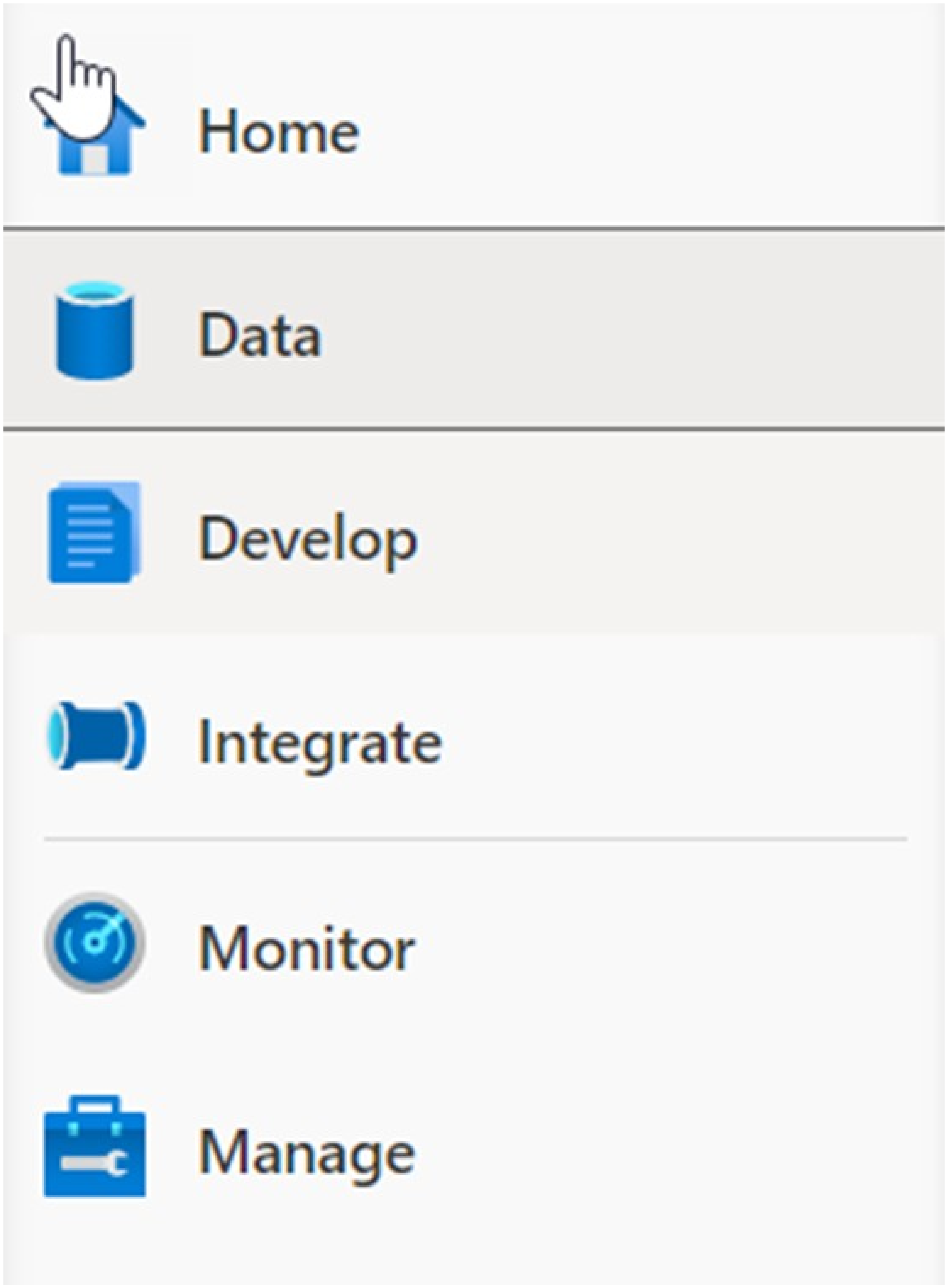
When you provision a new Azure Synapse Analytics workspace, you define the default storage Azure Data Lake Storage Gen2 account. Data Lake Storage Gen2 makes Azure Storage the foundation for building enterprise data lakes on Azure. Designed from the start to service multiple petabytes of information while sustaining hundreds of gigabits of throughput, Data Lake Storage Gen2 allows you to easily manage massive amounts of data.

Its hierarchical namespace organizes files into a hierarchy of directories for efficient access and more granular security, down to the file-level.

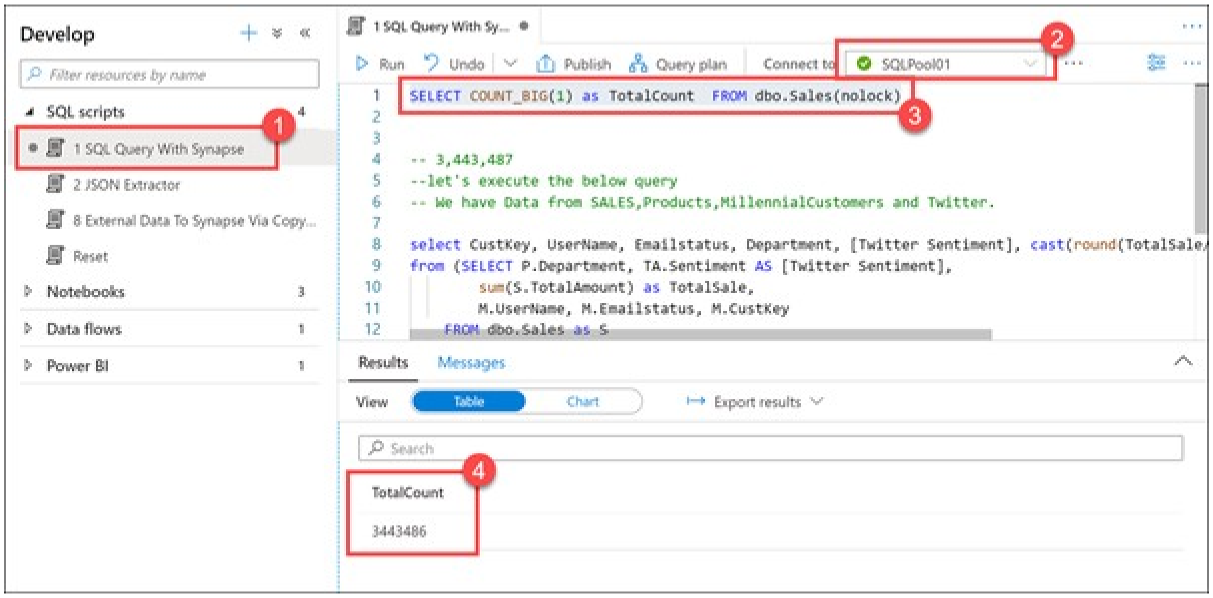
ADLS Gen2 provides virtually limitless scale for your data lake. You can attach additional ADLS Gen2 accounts for greater scale and flexibility as needed.

Familiar tools and ecosystem

1. Select the **Develop** hub.



2. Expand **SQL scripts** and select **1 SQL Query With Synapse (1)**. Make sure you are connected to **SQLPool01 (2)**. **Highlight (3)** the first line of the script and execute. Observe that the number of records in the Sales table is 3,443,486 **(4)**.

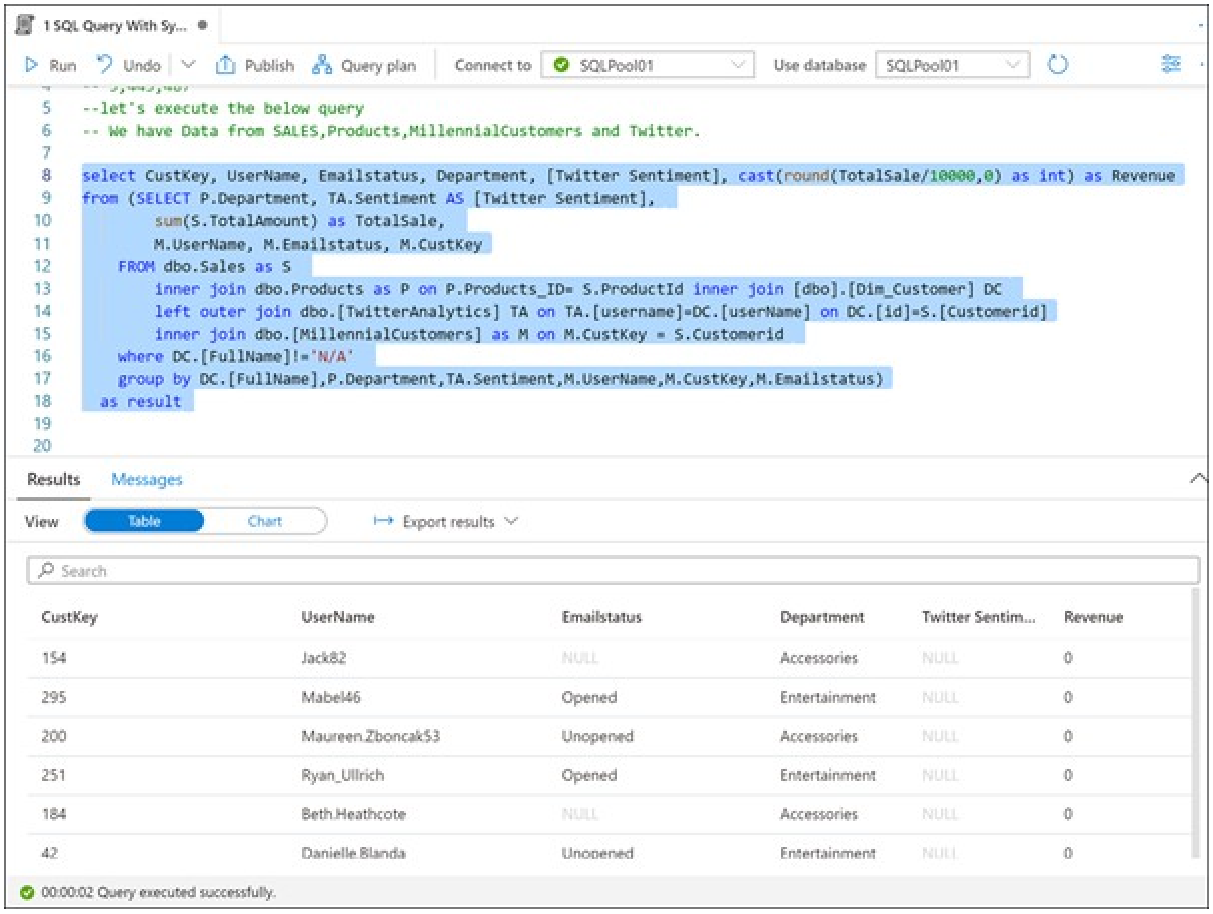


```
1  SELECT COUNT_BIG(1) as TotalCount  FROM dbo.Sales(nolock)
2
3
4  -- 3,443,487
5  --let's execute the below query
6  -- We have Data from SALES,Products,MillennialCustomers and Twitter.
7
8  select CustKey, UserName, Emailstatus, Department, [Twitter Sentiment], cast(round(TotalSale/
9  from (SELECT P.Department, TA.Sentiment AS [Twitter Sentiment],
10         sum(S.TotalAmount) as TotalSale,
11         M.UserName, M.Emailstatus, M.CustKey
12     FROM dbo.Sales as S
```

TotalCount
3443486

If we execute the first line in this SQL script, we can see that we have almost 3.5 million rows contained within.

3. **Highlight** the rest of the script (lines 8 - 18) and execute.



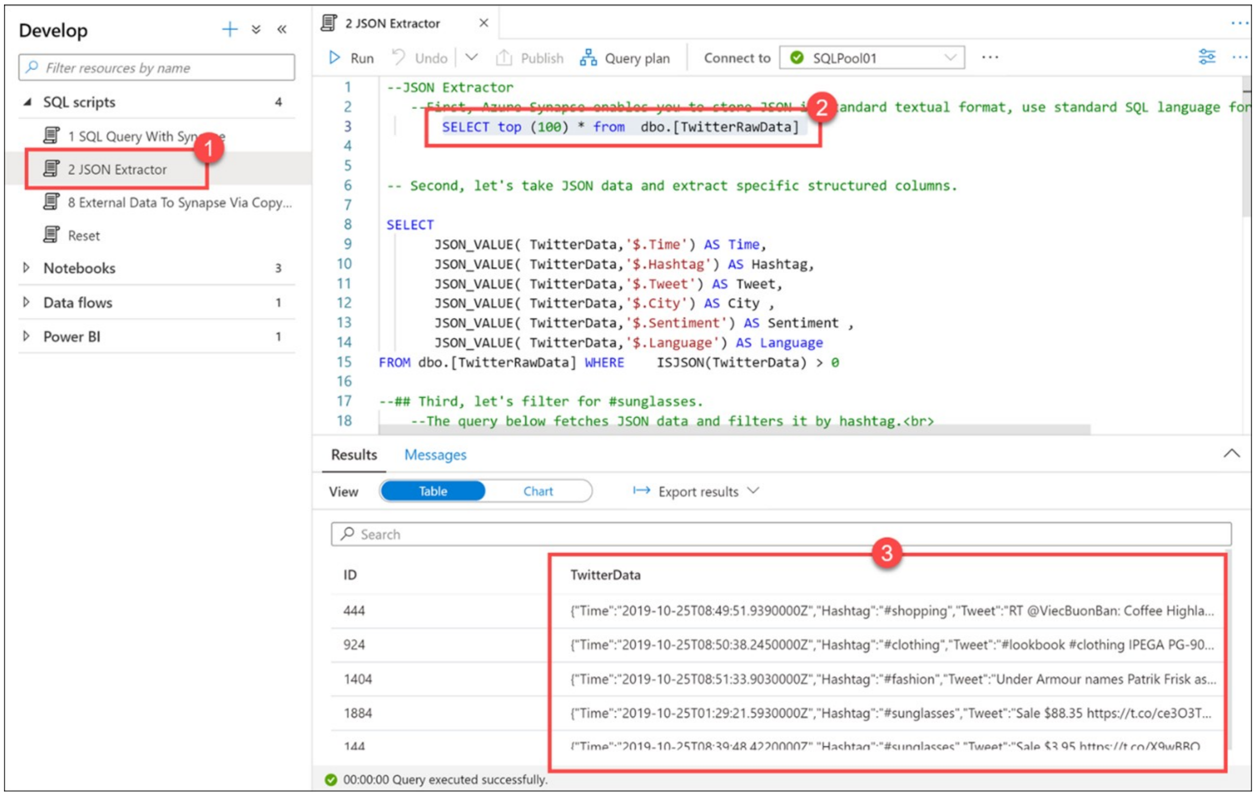
```
5   --let's execute the below query
6   -- We have Data from SALES,Products,MillennialCustomers and Twitter.
7
8   select CustKey, UserName, Emailstatus, Department, [Twitter Sentiment], cast(round(TotalSale/10000,0) as int) as Revenue
9   from (SELECT P.Department, TA.Sentiment AS [Twitter Sentiment],
10          sum(S.TotalAmount) as TotalSale,
11          M.UserName, M.Emailstatus, M.CustKey
12      FROM dbo.Sales as S
13          inner join dbo.Products as P on P.Products_ID= S.ProductId inner join [dbo].[Dim_Customer] DC
14          left outer join dbo.[TwitterAnalytics] TA on TA.[username]=DC.[userName] on DC.[id]=S.[Customerid]
15          inner join dbo.[MillennialCustomers] as M on M.CustKey = S.Customerid
16      where DC.[FullName]!='N/A'
17      group by DC.[FullName],P.Department,TA.Sentiment,M.UserName,M.CustKey,M.Emailstatus)
18    as result
19
20
```

CustKey	UserName	Emailstatus	Department	Twitter Sentim...	Revenue
154	Jack82	NULL	Accessories	NULL	0
295	Mabel46	Opened	Entertainment	NULL	0
200	Maureen.Zboncak53	Unopened	Accessories	NULL	0
251	Ryan_Ullrich	Opened	Entertainment	NULL	0
184	Beth.Heathcote	NULL	Accessories	NULL	0
42	Danielle.Blanda	Unopened	Entertainment	NULL	0

00:00:02 Query executed successfully.

One of the benefits of using a modern data warehouse like Synapse Analytics is that you can combine all your data in one place. The script we just executed joins data from a sales database, product catalog, millennial customers extracted from demographics data, and twitter.

4. Select the **2 JSON Extractor (1)** script and make sure you're still connected to **SQLPool01**. Highlight the **first select statement (2)** (line 3). Observe that the data stored in the **TwitterData** column **(3)** is in JSON format.



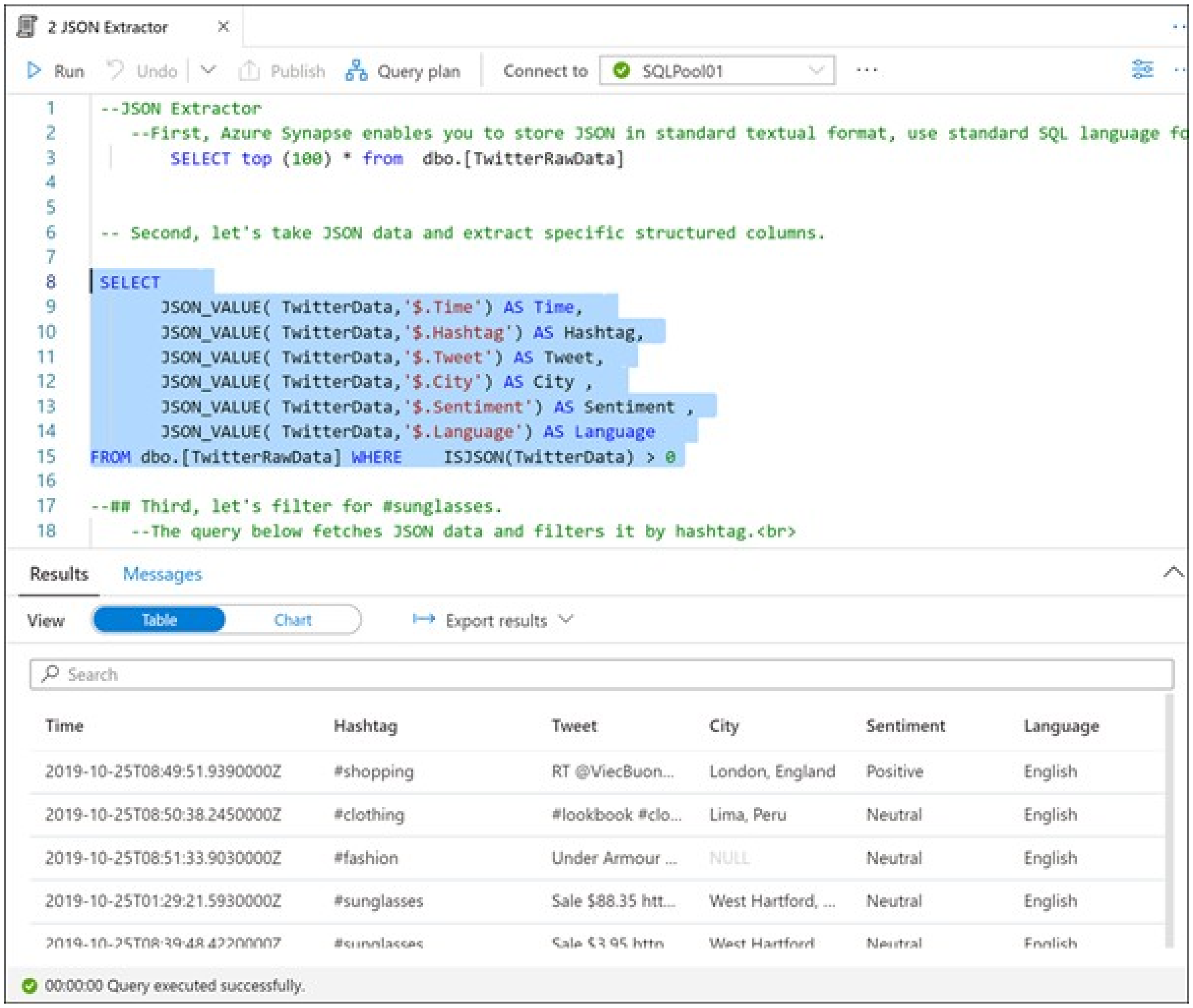
```
1   --JSON Extractor
2      --First, Azure Synapse enables you to store JSON i tandard textual format, use standard SQL language for
3         SELECT top (100) * from  dbo.[TwitterRawData]
4
5
6   -- Second, let's take JSON data and extract specific structured columns.
7
8   SELECT
9         JSON_VALUE( TwitterData,'$.Time') AS Time,
10        JSON_VALUE( TwitterData,'$.Hashtag') AS Hashtag,
11        JSON_VALUE( TwitterData,'$.Tweet') AS Tweet,
12        JSON_VALUE( TwitterData,'$.City') AS City ,
13        JSON_VALUE( TwitterData,'$.Sentiment') AS Sentiment ,
14        JSON_VALUE( TwitterData,'$.Language') AS Language
15  FROM dbo.[TwitterRawData] WHERE    ISJSON(TwitterData) > 0
16
17  --## Third, let's filter for #sunglasses.
18     --The query below fetches JSON data and filters it by hashtag.<br>
```

ID	TwitterData
444	{"Time":"2019-10-25T08:49:51.9390000Z","Hashtag":"#shopping","Tweet":"RT @ViecBuonBan: Coffee Highla...
924	{"Time":"2019-10-25T08:50:38.2450000Z","Hashtag":"#clothing","Tweet":"#lookbook #clothing IPEGA PG-90...
1404	{"Time":"2019-10-25T08:51:33.9030000Z","Hashtag":"#fashion","Tweet":"Under Armour names Patrik Frisk as...
1884	{"Time":"2019-10-25T01:29:21.5930000Z","Hashtag":"#sunglasses","Tweet":"Sale $88.35 https://t.co/ce3O3T...
144	{"Time":"2019-10-25T08:39:48.4220000Z","Hashtag":"#sunglasses","Tweet":"Sale $3.95 https://t.co/X9wBBO

00:00:00 Query executed successfully.

Azure Synapse enables you to store JSON in standard textual format. Use standard SQL language for querying JSON data.

5. Highlight the next SQL statement (**lines 8 - 15**) and execute.



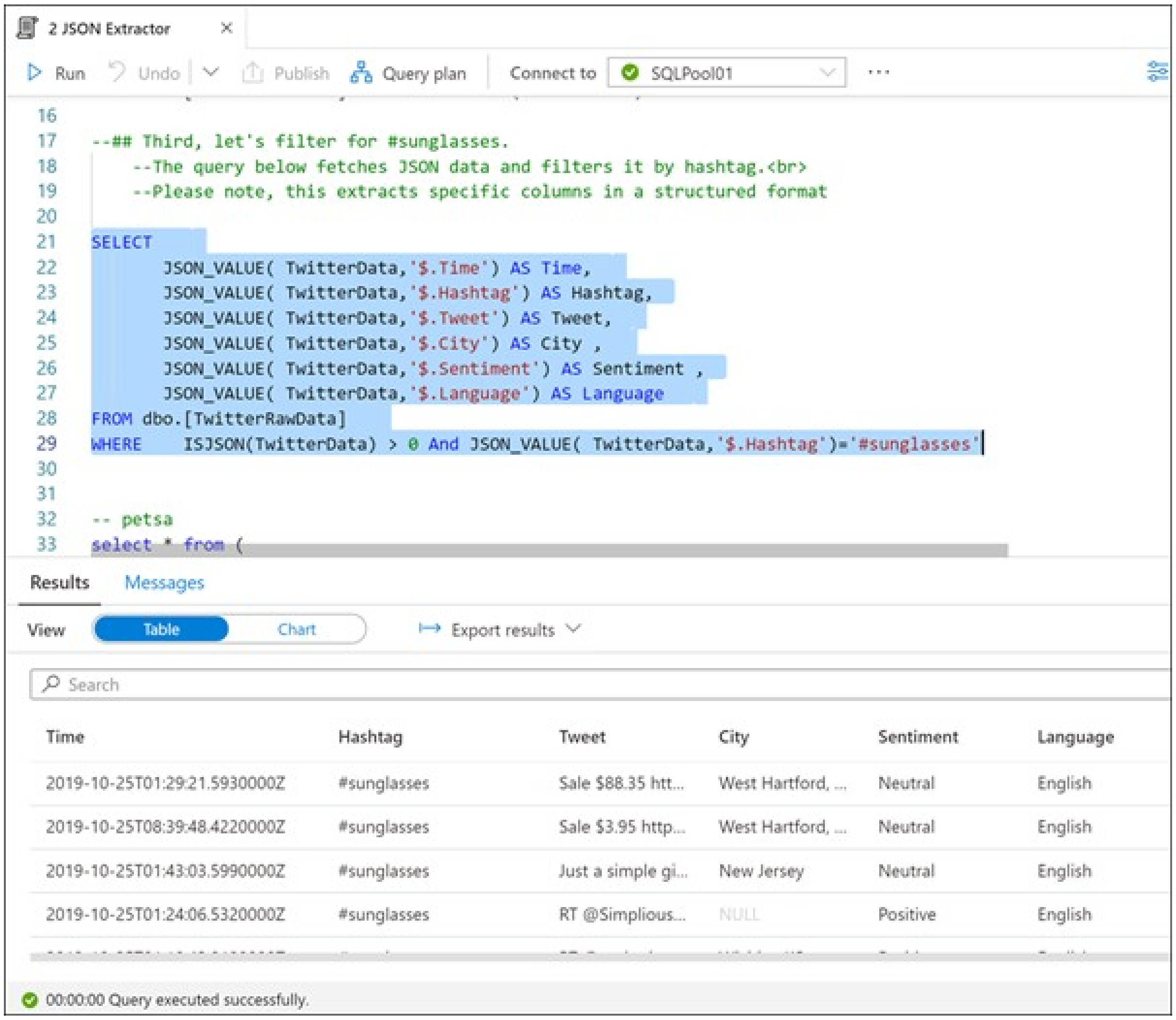
```
--JSON Extractor
   --First, Azure Synapse enables you to store JSON in standard textual format, use standard SQL language fo
       SELECT top (100) * from  dbo.[TwitterRawData]


-- Second, let's take JSON data and extract specific structured columns.

SELECT
      JSON_VALUE( TwitterData,'$.Time') AS Time,
      JSON_VALUE( TwitterData,'$.Hashtag') AS Hashtag,
      JSON_VALUE( TwitterData,'$.Tweet') AS Tweet,
      JSON_VALUE( TwitterData,'$.City') AS City ,
      JSON_VALUE( TwitterData,'$.Sentiment') AS Sentiment ,
      JSON_VALUE( TwitterData,'$.Language') AS Language
FROM dbo.[TwitterRawData] WHERE    ISJSON(TwitterData) > 0

--## Third, let's filter for #sunglasses.
   --The query below fetches JSON data and filters it by hashtag.<br>
```

Time	Hashtag	Tweet	City	Sentiment	Language
2019-10-25T08:49:51.9390000Z	#shopping	RT @ViecBuon...	London, England	Positive	English
2019-10-25T08:50:38.2450000Z	#clothing	#lookbook #clo...	Lima, Peru	Neutral	English
2019-10-25T08:51:33.9030000Z	#fashion	Under Armour ...	NULL	Neutral	English
2019-10-25T01:29:21.5930000Z	#sunglasses	Sale $88.35 htt...	West Hartford, ...	Neutral	English
2019-10-25T08:39:48.4220000Z	#sunglasses	Sale $3.95 http	West Hartford	Neutral	English

00:00:00 Query executed successfully.

We can use JSON functions, such as JSON_VALUE and ISJSON to extract the JSON data and extract it to specific structured columns.

6. Highlight the next SQL statement (**lines 21 - 29**) and execute.



```
--## Third, let's filter for #sunglasses.
    --The query below fetches JSON data and filters it by hashtag.<br>
    --Please note, this extracts specific columns in a structured format

SELECT
       JSON_VALUE( TwitterData,'$.Time') AS Time,
       JSON_VALUE( TwitterData,'$.Hashtag') AS Hashtag,
       JSON_VALUE( TwitterData,'$.Tweet') AS Tweet,
       JSON_VALUE( TwitterData,'$.City') AS City ,
       JSON_VALUE( TwitterData,'$.Sentiment') AS Sentiment ,
       JSON_VALUE( TwitterData,'$.Language') AS Language
FROM dbo.[TwitterRawData]
WHERE    ISJSON(TwitterData) > 0 And JSON_VALUE( TwitterData,'$.Hashtag')='#sunglasses'


-- petsa
select * from (
```

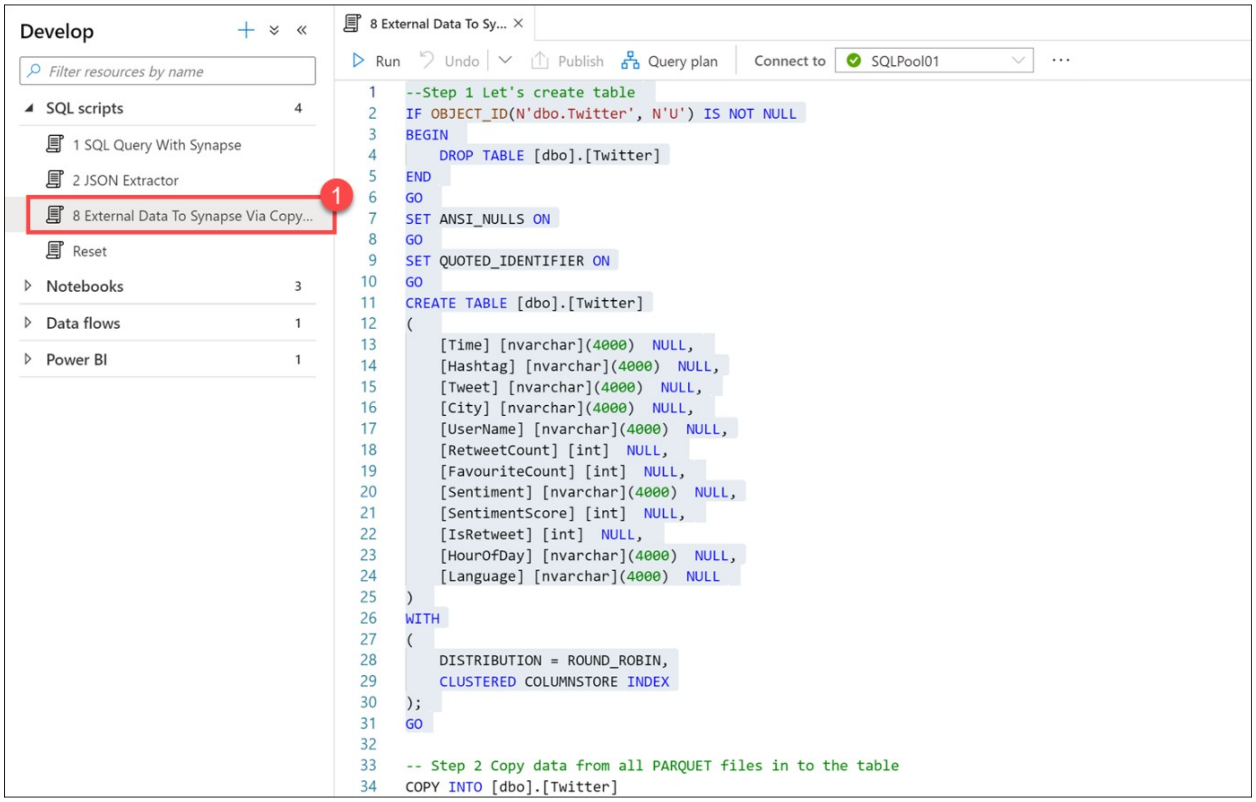
Time	Hashtag	Tweet	City	Sentiment	Language
2019-10-25T01:29:21.5930000Z	#sunglasses	Sale $88.35 htt...	West Hartford, ...	Neutral	English
2019-10-25T08:39:48.4220000Z	#sunglasses	Sale $3.95 http...	West Hartford, ...	Neutral	English
2019-10-25T01:43:03.5990000Z	#sunglasses	Just a simple gi...	New Jersey	Neutral	English
2019-10-25T01:24:06.5320000Z	#sunglasses	RT @Simplious...	NULL	Positive	English

00:00:00 Query executed successfully.

We want to filter for the **#sunglassess** hashtag. This query fetches and extracts the JSON data into structured columns, then filters on the derived Hashtag column.

The last script does the same thing, but just using a subquery format.

7. Select the **8 External Data To Synapse Via Copy Into (1)** script. **DO NOT EXECUTE**. Scroll through the script file, using the commentary below to explain what it does.



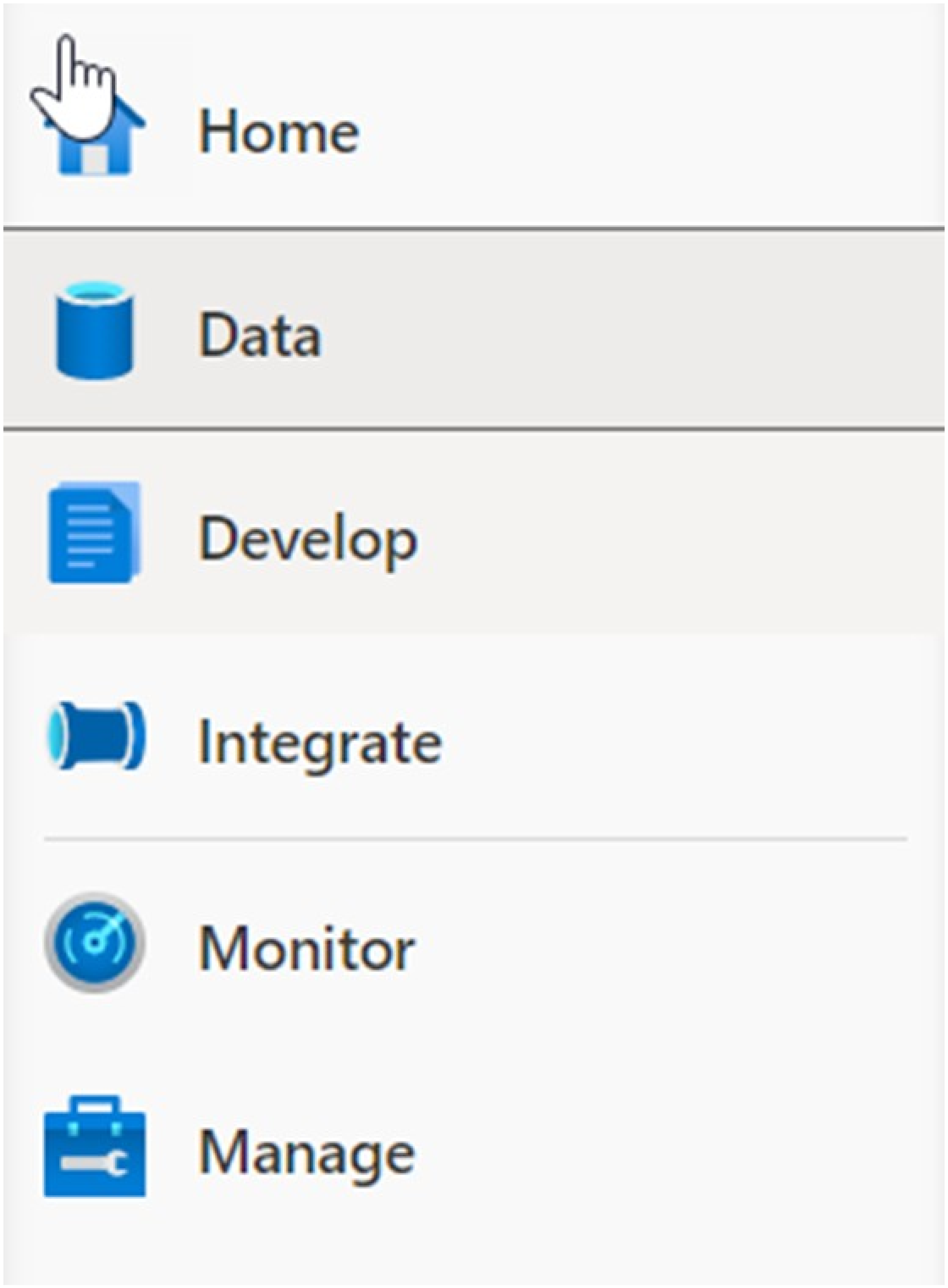
```sql
--Step 1 Let's create table
IF OBJECT_ID(N'dbo.Twitter', N'U') IS NOT NULL
BEGIN
    DROP TABLE [dbo].[Twitter]
END
GO
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[Twitter]
(
    [Time] [nvarchar](4000)  NULL,
    [Hashtag] [nvarchar](4000)  NULL,
    [Tweet] [nvarchar](4000)  NULL,
    [City] [nvarchar](4000)  NULL,
    [UserName] [nvarchar](4000)  NULL,
    [RetweetCount] [int]  NULL,
    [FavouriteCount] [int]  NULL,
    [Sentiment] [nvarchar](4000)  NULL,
    [SentimentScore] [int]  NULL,
    [IsRetweet] [int]  NULL,
    [HourOfDay] [nvarchar](4000)  NULL,
    [Language] [nvarchar](4000)  NULL
)
WITH
(
    DISTRIBUTION = ROUND_ROBIN,
    CLUSTERED COLUMNSTORE INDEX
);
GO

-- Step 2 Copy data from all PARQUET files in to the table
COPY INTO [dbo].[Twitter]
```

In this script, we create a table to store Twitter data stored in Parquet files. We use the **COPY** command to quickly and efficiently load all data stored in Parquet files into the new table.

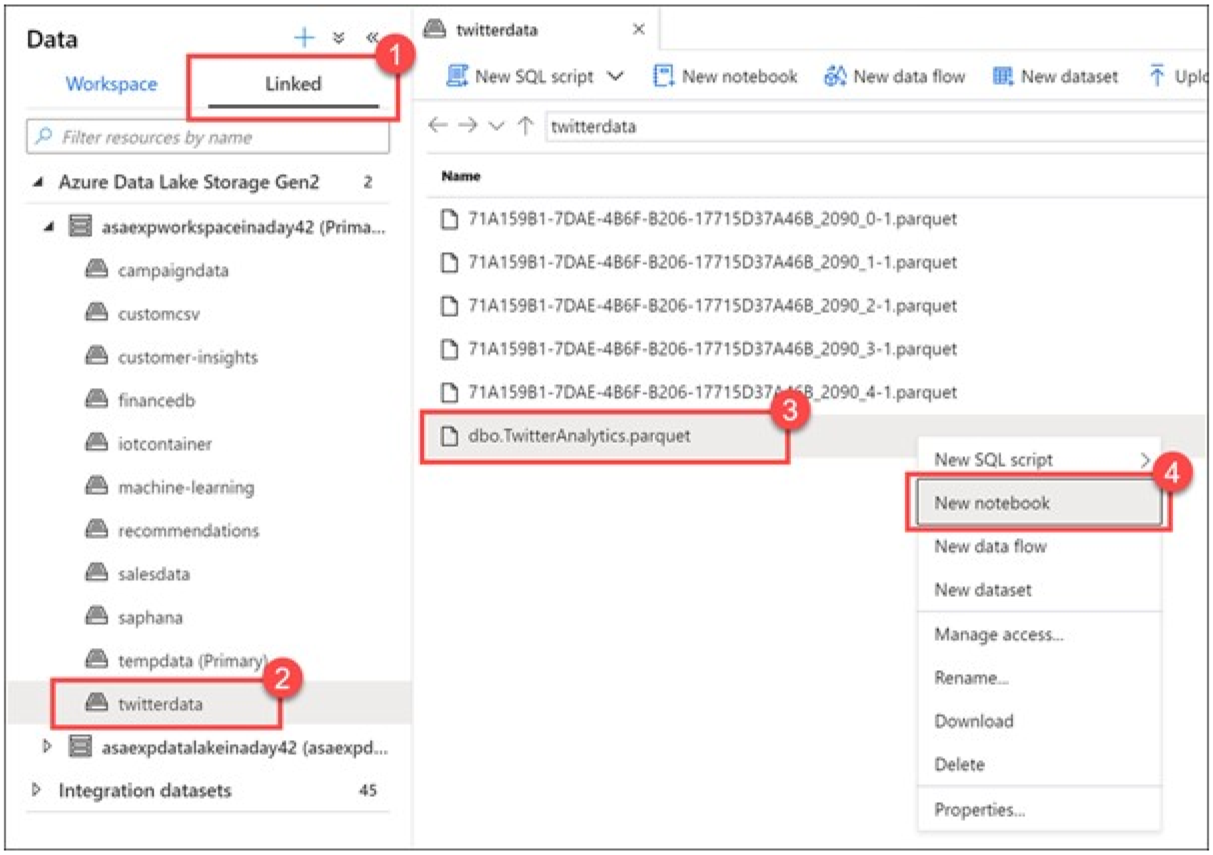
Finally, we select the first 10 rows to verify the data load.

The COPY command and PolyBase can be used to import data from various formats into the SQL pool, either through T-SQL scripts like we see here, or from orchestration pipelines.

8. Select the **Data** hub.



9. Select the **Linked tab (1)**, expand the Azure Data Lake Storage Gen2 group, expand the Primary storage account, then select the **twitterdata** container **(2)**. Right-click on the **dbo.TwitterAnalytics.parquet** file (3), then select **New notebook (4)**.

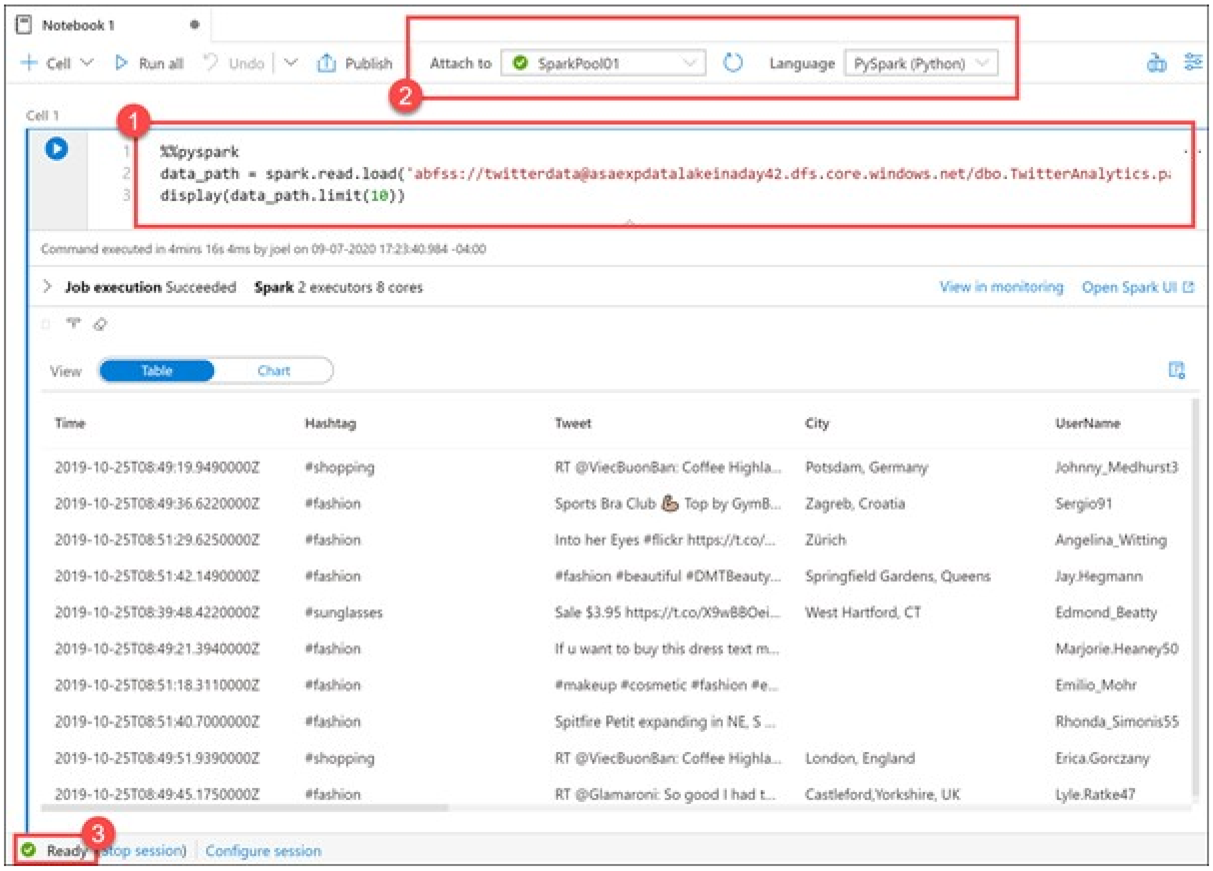

Data
Workspace
Linked
1
Filter resources by name
Azure Data Lake Storage Gen2 2
asaexpworkspaceinaday42 (Prima...
campaigndata
customcsv
customer-insights
financedb
iotcontainer
machine-learning
recommendations
salesdata
saphana
tempdata (Primary)
twitterdata
2
asaexpdatalakeinaday42 (asaexpd...
Integration datasets 45
twitterdata
New SQL script
New notebook
New data flow
New dataset
Upl
twitterdata
Name
71A159B1-7DAE-4B6F-B206-17715D37A46B_2090_0-1.parquet
71A159B1-7DAE-4B6F-B206-17715D37A46B_2090_1-1.parquet
71A159B1-7DAE-4B6F-B206-17715D37A46B_2090_2-1.parquet
71A159B1-7DAE-4B6F-B206-17715D37A46B_2090_3-1.parquet
71A159B1-7DAE-4B6F-B206-17715D37A46B_2090_4-1.parquet
3
dbo.TwitterAnalytics.parquet
New SQL script
4
New notebook
New data flow
New dataset
Manage access...
Rename...
Download
Delete
Properties...

Synapse Studio provides several options to work with files stored in attached storage accounts, such as creating a new SQL script, a notebook, data flow, or new dataset.

Synapse Notebooks enable you to harness the power of Apache Spark to explore and analyze data, conduct data engineering tasks, and do data science. Authentication and authorization with linked services, such as the primary data lake storage account, are fully integrated, allowing you to immediately start working with files without dealing with account credentials.

Here we see a new notebook that loads a Spark DataFrame **(1)** with the Parquet file that we right-clicked on in the Data hub. We can immediately start exploring the file contents in just a couple simple steps. At the top of the notebook, we see that it is attached to **SparkPool01**, our Spark pool, and the notebook language is set to **Python (2)**.

Do not execute the notebook unless the Spark pool is ready **(3)**. It can take up to 5 minutes to start the pool if it is idle. Alternatively, you can execute the notebook, then come back to it later to view the results.



```
%%pyspark
data_path = spark.read.load('abfss://twitterdata@asaexpdatalakeinaday42.dfs.core.windows.net/dbo.TwitterAnalytics.p
display(data_path.limit(10))
```

Command executed in 4mins 16s 4ms by joel on 09-07-2020 17:23:40.984 -04:00

Job execution Succeeded **Spark** 2 executors 8 cores

Time	Hashtag	Tweet	City	UserName
2019-10-25T08:49:19.9490000Z	#shopping	RT @ViecBuonBan: Coffee Highla...	Potsdam, Germany	Johnny_Medhurst3
2019-10-25T08:49:36.6220000Z	#fashion	Sports Bra Club 💪 Top by GymB...	Zagreb, Croatia	Sergio91
2019-10-25T08:51:29.6250000Z	#fashion	Into her Eyes #flickr https://t.co/...	Zürich	Angelina_Witting
2019-10-25T08:51:42.1490000Z	#fashion	#fashion #beautiful #DMTBeauty...	Springfield Gardens, Queens	Jay.Hegmann
2019-10-25T08:39:48.4220000Z	#sunglasses	Sale $3.95 https://t.co/X9wBBOei...	West Hartford, CT	Edmond_Beatty
2019-10-25T08:49:21.3940000Z	#fashion	If u want to buy this dress text m...		Marjorie.Heaney50
2019-10-25T08:51:18.3110000Z	#fashion	#makeup #cosmetic #fashion #e...		Emilio_Mohr
2019-10-25T08:51:40.7000000Z	#fashion	Spitfire Petit expanding in NE, S ...		Rhonda_Simonis55
2019-10-25T08:49:51.9390000Z	#shopping	RT @ViecBuonBan: Coffee Highla...	London, England	Erica.Gorczany
2019-10-25T08:49:45.1750000Z	#fashion	RT @Glamaroni: So good I had t...	Castleford,Yorkshire, UK	Lyle.Ratke47