Data Migration and SCD Implementation in Azure SQL Database Assignment

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Overview of the Project:

- We need to transfer the tables' data from on-premises SQL server to ADLS G2
- From ADLS G2 csv files, we need to transform the data into SCD type 1 and SCD Type 2 dimension tables.

Technical Requirement:

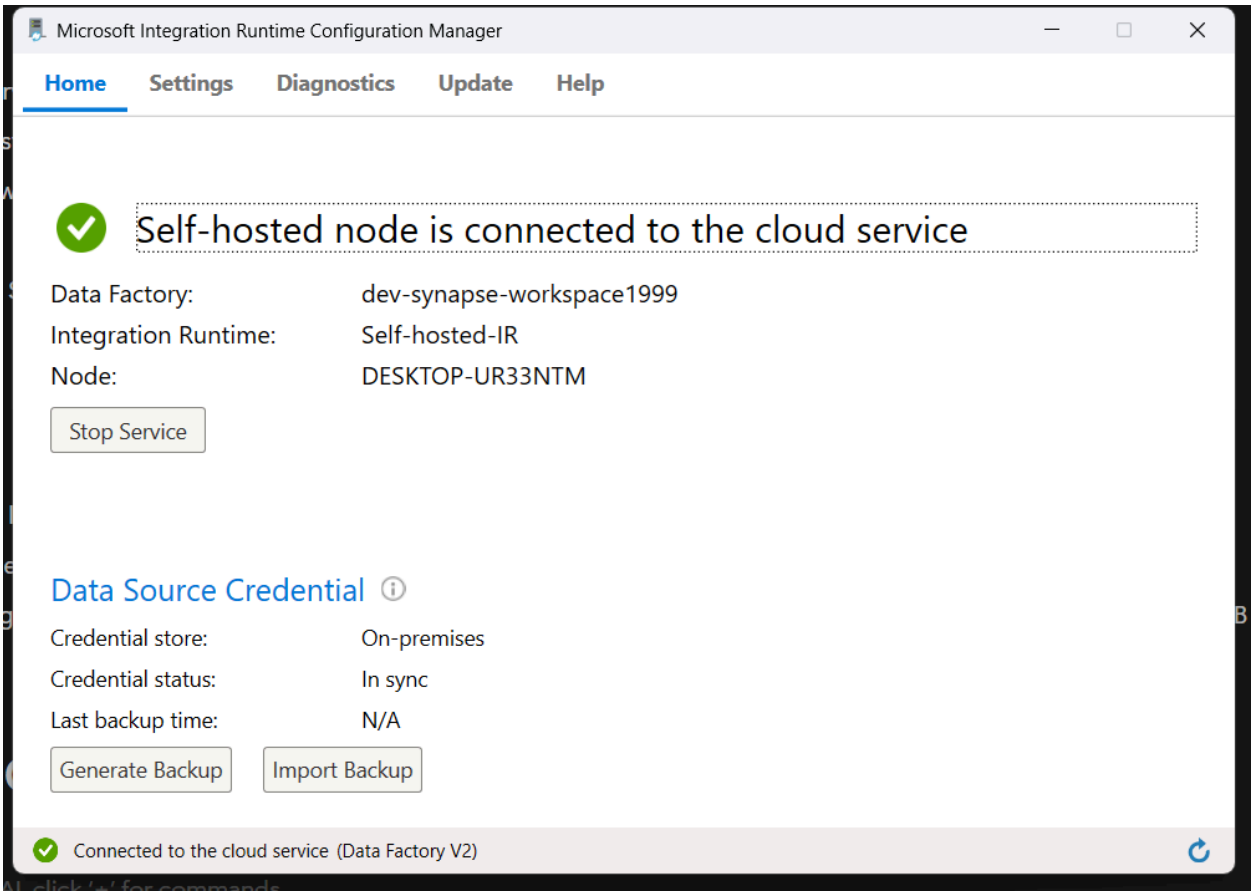
- We need SQL server and SSMS on local system.
- We need self hosted Integration runtime on local system.
- Connection between local SH-IR and Synapse's linked service is required.
- Access to ADLS
- Access to Azure SQL Database

Planning:

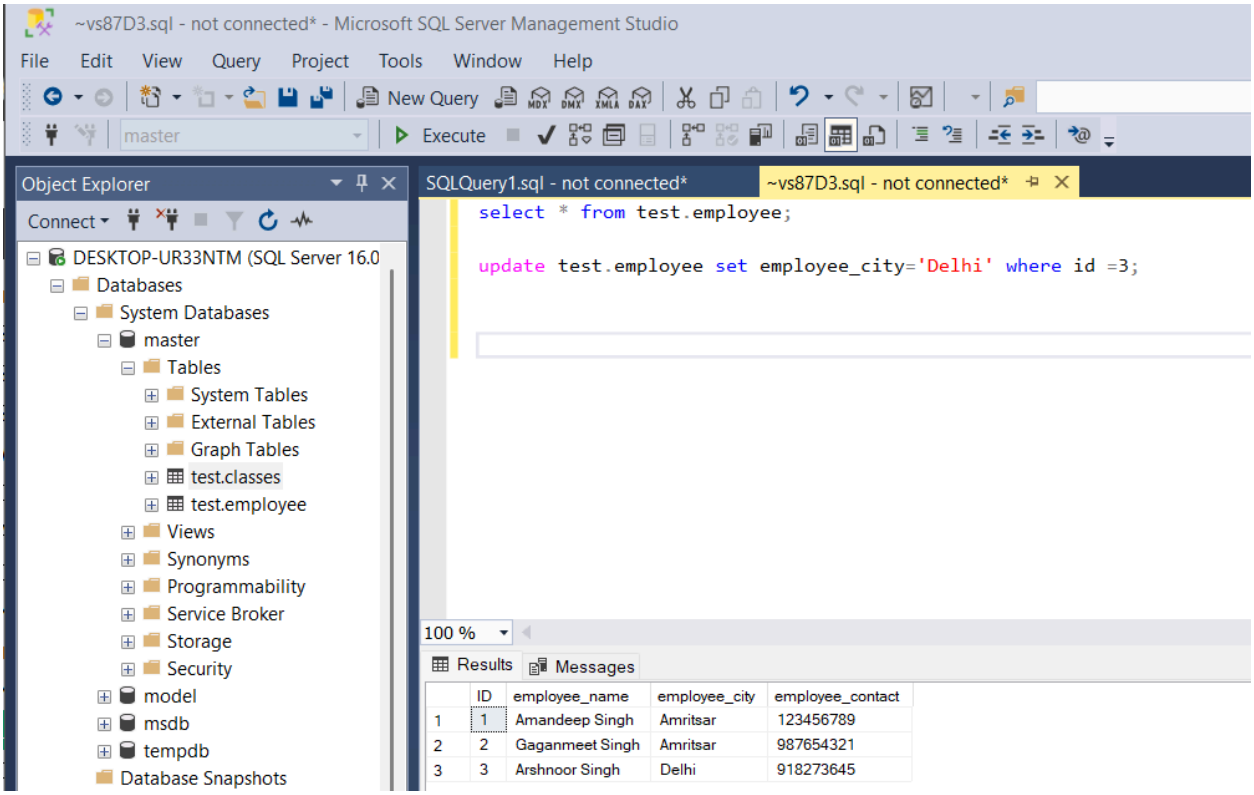
- create tables on local SQL server DB and create connection through self-hosted IR to Azure.

- Through Synapse Pipeline, transfer the SQL tables' data to ADLS.
- With Maintaining the data version, implement SCD type 1 and SCD type 2 Dimension tables for those two csv files on Azure SQL DB through Dataflow.

Setting up SQL server and Self-hosted IR on local System:



This is status of SH-IR that is connected with linked service in Synapse



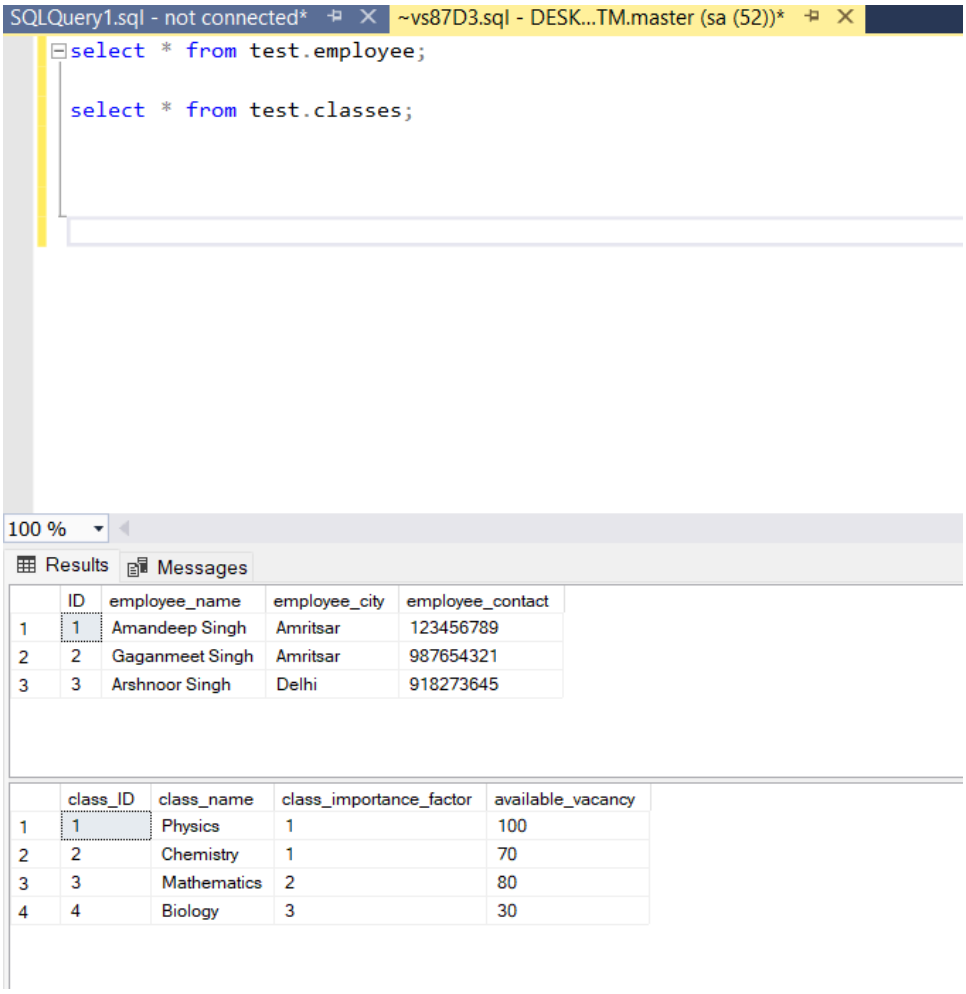
- Here, I have setup the SQL server on local PC and I'm accessing it by SSMS

Creation of Tables and populating them on-premises:

Here are the codes for creation of two tables : employee and classes on on-premises SQL server:

```
create schema test;
--creation of first table
create table test.employee
(
id int identity(1,1),
employee_name varchar(100),
employee_city varchar(100),
employee_contact varchar(100)
```

```
);

--creation of 2nd table
create table test.classes
(
class_id int identity(1,1),
class_name varchar(100),
class_importance_factor int,
available_vacancy int
);

---insert data in first table
insert into test.employee values
('Amandeep Singh','Amritsar','987654321'),
('Gaganmeet Singh','Amritsar','918273644'),
('Arshnoor Singh','Delhi','987654321');

--insert data into second table
insert into test.classes values
('Physics',1,70),
('Chemistry',1,100),
('Mathematics',2,80),
('Biology',3,40);
```

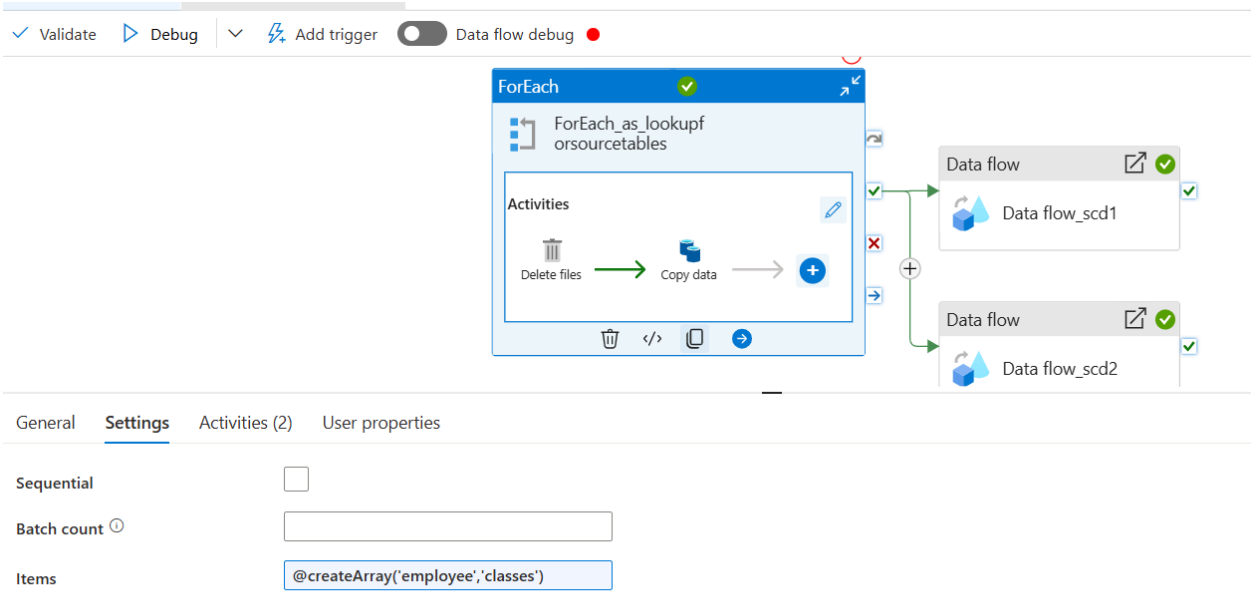


	ID	employee_name	employee_city	employee_contact
1	1	Amandeep Singh	Amritsar	123456789
2	2	Gaganmeet Singh	Amritsar	987654321
3	3	Arshnoor Singh	Delhi	918273645

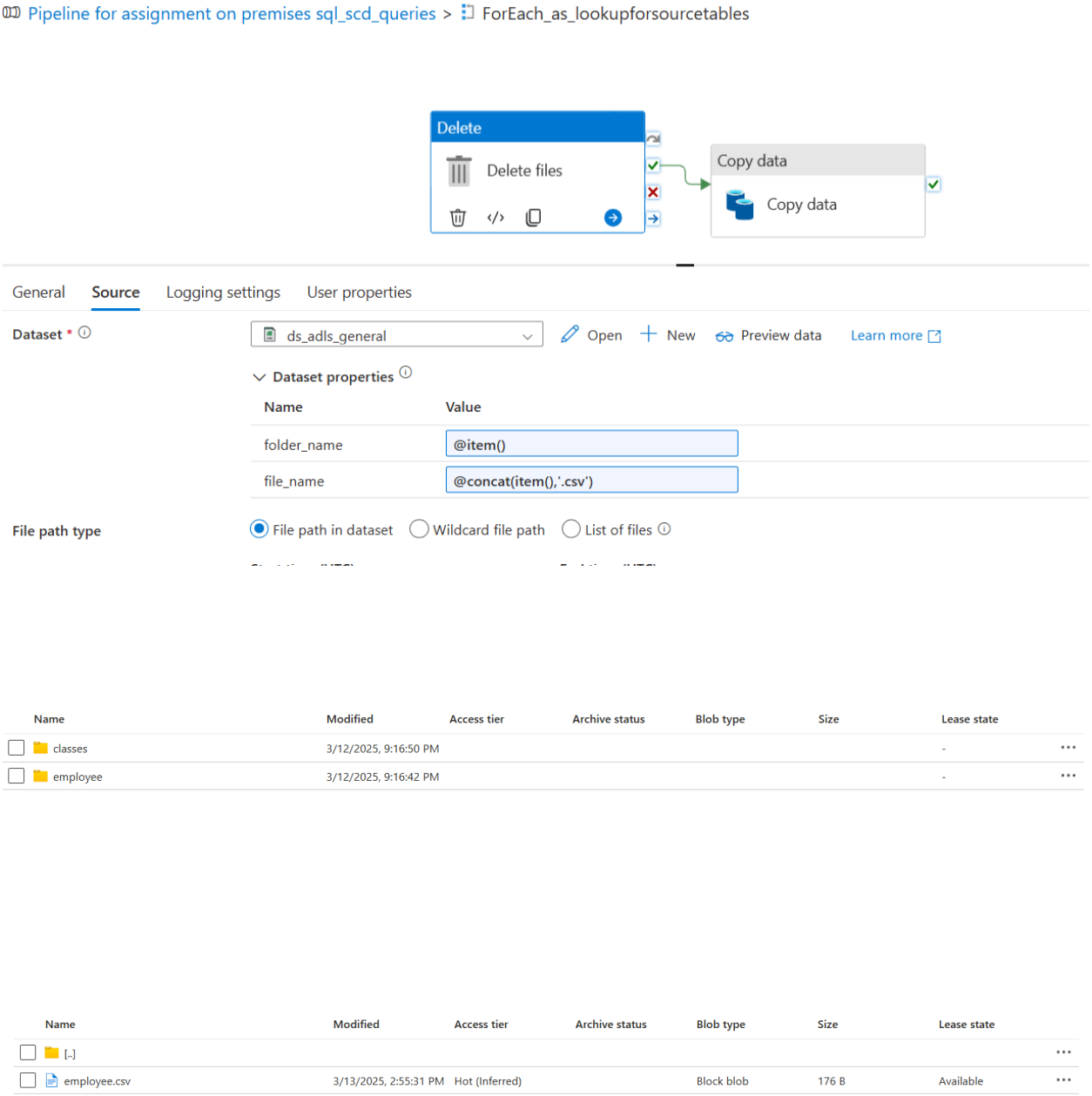
	class_ID	class_name	class_importance_factor	available_vacancy
1	1	Physics	1	100
2	2	Chemistry	1	70
3	3	Mathematics	2	80
4	4	Biology	3	30

Transferring the data from Local server to ADLS by Pipeline in Synapse:

- Here I'm using for-each loop in synapse pipeline and using custom array, I'm transferring the data from local SQL server to ADLS:



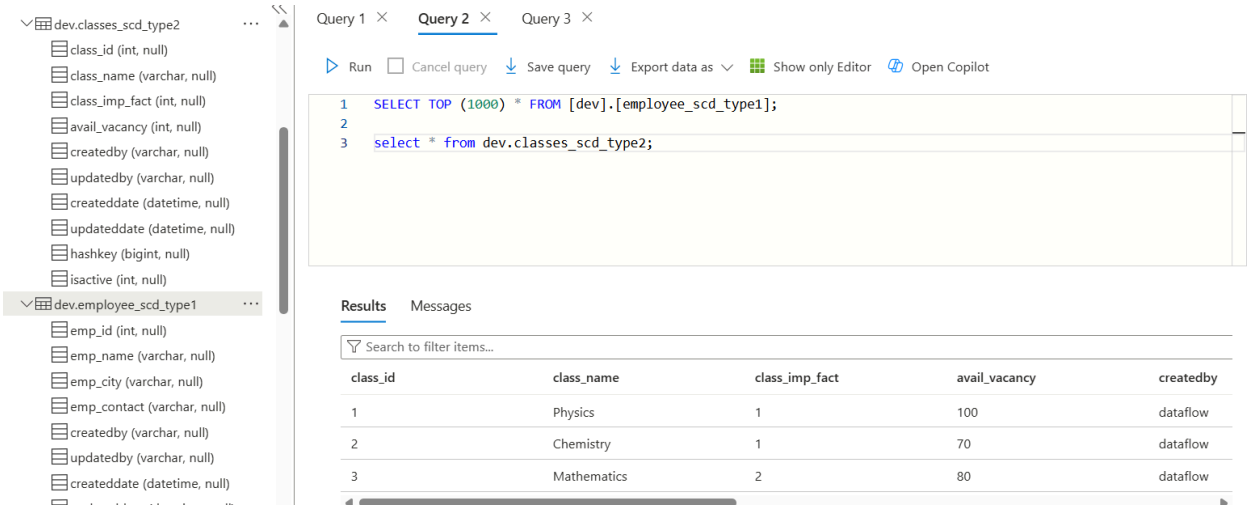
- Here you can see, I've used for each loop and it iterates over each item of array → ['employee','classes']
- Inside the for-each loop, first I'm deleting the previous files that have been copied before by ***'Delete files'*** activity and then transfer the SQL tables data to ADLS container by ***'copy data'*** activity.



Creation of SCD type 1 and SCD Type 2 Dimension Tables in Azure SQL DB

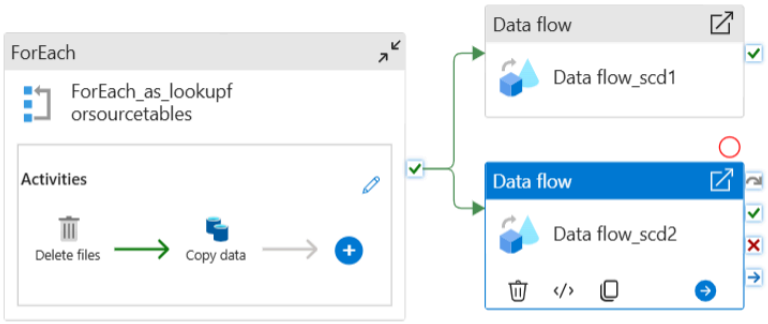
These are the SQL queries of tables creation in Azure SQL DB:

```
-- use first table employee for storing data in SCD type 1 format
create table dev.employee_scd_type1
(
emp_id int,
emp_name varchar(100),
emp_city varchar(100),
emp_contact varchar(100),
createdby varchar(50),
updatedby varchar(50),
createddate datetime,
updateddate datetime,
hashkey bigint
);

--use second table classes for storing data in SCD TYPE 2 format

create table dev.classes_scd_type2
(
class_id int,
class_name varchar(100),
class_imp_fact int,
avail_vacancy int,
createdby varchar(50),
updatedby varchar(50),
createddate datetime,
updateddate datetime,
hashkey bigint,
isactive int
);
```



Implementing SCD Type 1 and SCD Type 2 Conversion with help of Dataflows:

- After on-success of for-each loop, I start the both dataflow activities, which transform both tables' data into SCD type 1 and SCD type 2:



Self-Host Integration Runtime used :

- Here is the SH-IR that I used to make connection b/w azure and local SQL DB: