Data Movement: Data Lake Store to Azure SQL DB

Updated on: 1/13/2017

Introduction

You will learn how to setup a recurring job to run and how to copy the output of that job in a recurring format from the Data Lake Store to SQL DW. This is a common pattern employed to move transformed data to a database for reporting/analytics on aggregated data scenarios.

Prerequisites

For this lab, you will need:

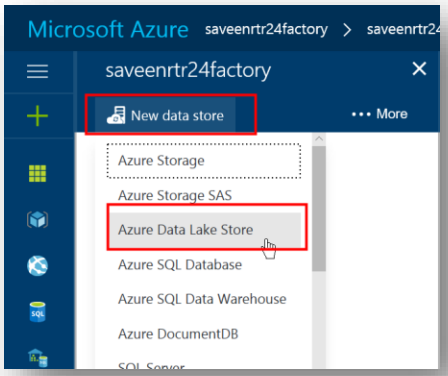
- Access to a Data Lake Store account that you can write to (MyStoreAccount)
- Access to a Data Lake Analytics account that you can submit jobs to (MyStoreAccount)
- Access to the **adltrainingsampledata** Data Lake Store account that you can read from
    - All Microsoft FTE already have this
    - If you are a not a Microsoft FTE request access to the aldsandbox security group.
- Access to a Data Factory account (MyFactory)
- Access to a Data Warehouse DB
- Access to an Azure SQL Server

Exercise 1: Setup a recurring job

- Create a new ADF account or reuse an existing one
- Go to the Azure Portal http://portal.azure.com
- Navigate to your ADF account
- Click **Author and deploy**

Linking the Data Lake Store Account

- Click **New data store > Azure Data Lake Store**



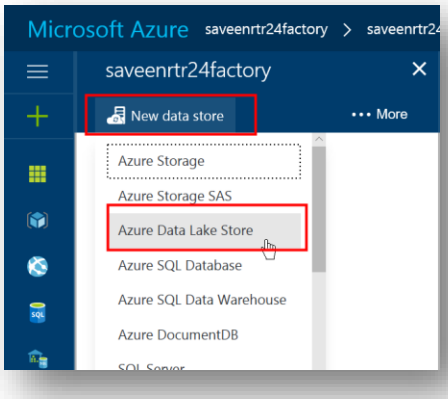
- You'll see a draft of some JSON Text. Modify it as indicated below
  - Remove the properties marked "[Optional]"
  - Set **name** to **ADLTrainingSampleData**
  - Set **dataLakeStoreUri** to **https://adltrainingsampledata.azuredatalakestore.net/webhdfs/v1**
  -
- Click on **Authorize** and login
- The JSON will look like this:

```
{
    "name": "ADLTrainingSampleData",
    "properties": {
        "type": "AzureDataLakeStore",
        "description": "",
        "typeProperties": {
            "authorization": "*** a very long https url ***",
            "dataLakeStoreUri": "https://adltrainingsampledata.azuredatalakestore.net/webhdfs/v1",
            "sessionId": "*** a very long string ***",
        }
    }
}
```

- Click **Deploy**

Linking the Data Lake Store Account (2)

- Click **New data store > Azure Data Lake Store**



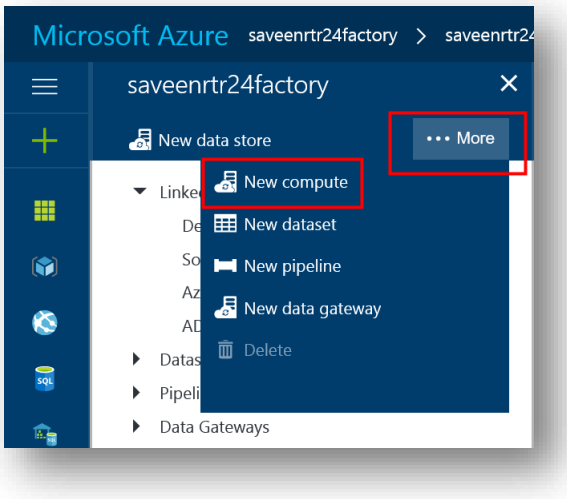
- You'll see a draft of some JSON Text. Modify it as indicated below
    - Remove the properties marked "[Optional]"
    - Set **name** to **MyADLS**
    - Set **dataLakeStoreUri** to **https://saveenrtr24store.azuredatalakestore.net/webhdfs/v1**
- Click on **Authorize** and login
- The JSON will look like this:

```
{
    "name": "MyADLS",
    "properties": {
        "type": "AzureDataLakeStore",
        "description": "",
        "typeProperties": {
            "authorization": "long string",
            "dataLakeStoreUri": "adl://saveenrtr24store.azuredatalakestore.net",
            "sessionId": "long string"
        }
    }
}
```

- Click **Deploy**

Linking the Data Lake Analytics Account

- Click the ellipses button (…)
- Click **New Compute**



- Select **Azure Data Lake Analytics**

- You'll see a draft of some JSON Text. Modify it as indicated below
- Remove the properties marked "[Optional]"
- Set **name** to **ADLACompute**
- Set **accountName** to your ADLA Account's name (**MyAnalytics**)
- Click on **Authorize** and login
- The JSON will look like this:

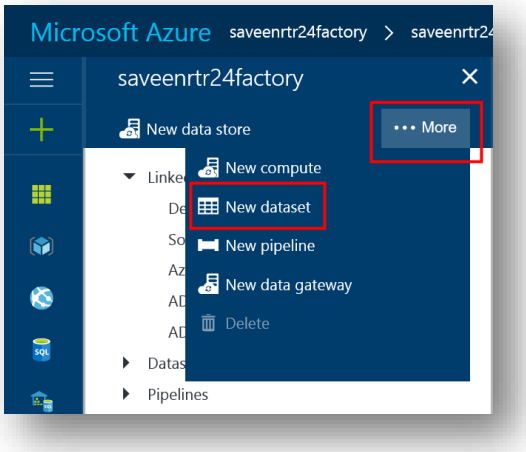
```
{
    "name": "ADLACompute",
    "properties": {
```

```
        "type": "AzureDataLakeAnalytics",
        "description": "",
        "typeProperties": {
            "authorization": "a very long https url",
            "accountName": "saveenrtr24analytics",
            "sessionId": "a very long string"
        }
    }
}
```

- Click **Deploy**

Define where our data is stored.

- Click the ellipses button (...)
- Click **New dataset**



- Click **Azure Data Lake Store**
- NOTE: Our job takes in 3 input Datasets and writes 1 output Dataset so we need to define 4 Datasets in total
- Input Dataset 1: GithubProjectMembers

```
{
    "name": "GithubProjectMembers",
    "properties": {
        "published": false,
        "type": "AzureDataLakeStore",
        "linkedServiceName": "ADLTrainingSampleData",
        "typeProperties": {
            "fileName": "ProjectMembers_large.csv",
            "folderPath": "/GHData/",
            "format": {
                "type": "TextFormat",
                "rowDelimiter": "\n",
                "columnDelimiter": ","
            }
        },
        "availability": {
            "frequency": "Day",
            "interval": 1
        },
        "external":true
    }
}
```

- Dataset 2: GithubProjects

```
{
    "name": "GithubProjects",
    "properties": {
```

```
        "published": false,
        "type": "AzureDataLakeStore",
        "linkedServiceName": "ADLTrainingSampleData",
        "typeProperties": {
            "fileName": "Projects.csv",
            "folderPath": "/GHData/",
            "format": {
                "type": "TextFormat",
                "rowDelimiter": "\n",
                "columnDelimiter": ","
            }
        },
        "availability": {
            "frequency": "Day",
            "interval": 1
        },
        "external":true
    }
}
```

- Dataset 3: GithubUsers

```
{
    "name": "GithubUsers",
    "properties": {
        "published": false,
        "type": "AzureDataLakeStore",
        "linkedServiceName": "ADLTrainingSampleData",
        "typeProperties": {
            "fileName": "Users.csv",
            "folderPath": "/GHData/",
            "format": {
                "type": "TextFormat",
                "rowDelimiter": "\n",
                "columnDelimiter": ","
            }
        },
        "availability": {
            "frequency": "Day",
            "interval": 1
        },
        "external":true
    }
}
```

- Dataset 4: UsersPerProject

```
{
    "name": "UsersPerProject",
    "properties": {
        "structure": [
            {
                "name": "ProjectName",
                "type": "String"
            },
            {
                "name": "CountryCode",
                "type": "String"
            },
            {
                "name": "NumberOfUsers",
                "type": "Int32"
            }
        ],
        "published": false,
        "type": "AzureDataLakeStore",
        "linkedServiceName": "MyADLS",
        "typeProperties": {
            "fileName": "CountofProjectUsers.csv",
            "folderPath": "/output/",
            "format": {
                "type": "TextFormat",
                "rowDelimiter": "\n",
                "columnDelimiter": ","
            }
        },
        "availability": {
```

```
            "frequency": "Day",
            "interval": 1
        }
    }
}
```

Create a Pipeline

- Click “New Pipeline”
- Note that we’ve simplified the configuration of this pipeline for this exercise. ADF supports many additional parameters and options.

```
{
    "name": "ComputeNumberOfUsersPerProject",
    "properties": {
        "description": "This is a pipeline that computes the number of users per project",
        "activities": [
            {
                "type": "DataLakeAnalyticsU-SQL",
                "typeProperties": {
                    "script": "@projects = EXTRACT id int, url string, owner_id int?, name string, descriptor
string, language string, created_a DateTime?, forked_from int?, deleted int?, updated_a DateTime? FROM
\"adl://adltrainingsampledata.azuredatalakestore.net/GHData/Projects.csv\" USING Extractors.Csv();
@projectmembers = EXTRACT repo_id int, user_id int, created DateTime?, ext_ref_id string FROM
\"adl://adltrainingsampledata.azuredatalakestore.net/GHData/ProjectMembers_large.csv\" USING Extractors.Csv();
@users = EXTRACT id int, login string, name string, company string, city_country string, email string, created
DateTime?, type string, fake int?, deleted int?, longitude decimal?, latitude decimal?, country_code string,
state string, city string FROM \"adl://adltrainingsampledata.azuredatalakestore.net/GHData/Users.csv\" USING
Extractors.Csv(); @result_set = SELECT p.name, u.country_code, COUNT(DISTINCT u.id) AS NumberOfUsers FROM
@projects AS p INNER JOIN @projectmembers AS pm ON p.id == pm.repo_id INNER JOIN @users AS u ON u.id ==
pm.user_id GROUP BY p.name, u.country_code; OUTPUT @result_set TO \"/output/CountofProjectUsers.csv\" ORDER BY
NumberOfUsers DESC USING Outputters.Csv();",
                    "degreeOfParallelism": 3,
                    "priority": 100,
                    "parameters": {}
                },
                "inputs": [
                    {
                        "name": "GithubProjectMembers"
                    },
                    {
                        "name": "GithubProjects"
                    },
                    {
                        "name": "GithubUsers"
                    }
                ],
                "outputs": [
                    {
                        "name": "UsersPerProject"
                    }
                ],
                "policy": {
                    "timeout": "06:00:00",
                    "concurrency": 1,
                    "executionPriorityOrder": "NewestFirst",
                    "retry": 1
                },
                "scheduler": {
                    "frequency": "Day",
                    "interval": 1
                },
                "name": "ComputeNumberOfUsersPerProject",
                "linkedServiceName": "ADLACompute"
            }
        ],
        "start": "2016-07-12T00:00:00Z",
        "end": "2019-08-08T01:00:00Z",
        "isPaused": false,
        "hubName": "saveenrtr24factory_hub",
        "pipelineMode": "Scheduled"
    }
}
```

- Click Deploy