# Project Title: Data Engineering in Azure

Project Description: This script forms the basis of the Data Engineering in Azure Presentation and Demo sets

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# Overview

This set of demonstrations that help support the Data Engineering in Azure presentation. The following labs are included

1. Azure Data Factory import to Data Lake of SQL Server Data using an Sliding Window pattern.
2. Data Virtualization using SQL 2019
3. Azure Synapse External Tables

# Demo Environment Element Listing

The demo environment is located in Azure and has the following components located in the resource group, rgSQL2019vm. The VM is used as the demo machine as this will provide the ability to move from machine to machine and keep the setup complete.

| Resources | Particulars |
| --- | --- |
|  | * **Azure Data factory** – used in the ETL processes |
|  | * **SQL2019** – This VM houses an on-premises style SQL server install. It is used for many different demos and is the source for these demonstrations. |
|  | * **Use Azure Storage Explorer –** Contains the Blob Containers sqlsynapselabs * This storage account has the source files for the Polybase labs * The windowtrigger blob has the lab content exporting using azure data factory |
|  | * **AdvetureworksLT** – this is the Azure SQL database used for various demos. Has the base AdventureworksLT database plus other tables etc * This is hosted on the **SQL2019labssey** sql logical server |
|  |  |

# Asset Listing

| Asset# | Asset File Name | Description | Length | Notes |
| --- | --- | --- | --- | --- |
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# Required resources

| Scene | Resource Name | Description | Notes |
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# Script and Actions

## Setup and Startup for Lab

The demo environment is located in Azure and has the following components located in the resource group, rgSQL2019vm. The VM is used as the demo machine as this will provide the ability to move from machine to machine and keep the setup complete.

| Step | | Resources | Particulars |
| --- | --- | --- | --- |
|  |  | | * Open up <http://portal.azure.com>, login and go to the resource group, [rgSQL2019VM](https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/96c25bbf-7d5a-452e-8434-941b825c1ee0/resourceGroups/rgSQL2019VM/overview) * Select the element listed below and start them up. |
|  |  | | * Start the SQL 2019 VM * Connect to the VM and open a remote desktop session * Once connected, the next few steps will show you what to get connected to and started in the VM * Remember that the auto shutdown is set to 10pm EST |
|  |  | | * Remember to change your domain, this is a local sign on the machine is not on the Azure AD * PW is the demo password A7!! |
|  |  | | * SQL 2019 VM Start Ups * The SQL 2019 VM has Github, and other software that allows code to be transferred and brought into this environment. * The machine is setup as a developer machine |
|  |  | | * First Setup is to get/update the latest version of the code from github. * Log into Github and clode the repository * <https://github.com/steveyoungca/DataEngineeringInAzure> * Should be public at the time of the session |
|  |  | | * Call up SQL Server Management Studio and log into the local SQL instance * Log into the Azure SQL instance * SSMS Log into Local SQL 2019 instance * PW is the same as the local administrator |
|  |  | | * Listing of local databases |
|  |  | | * Log into * From the VM, as we can have the one interface for the demo rather than jumping back and forth. * Log into the Azure Portal and start up the Azure SQL DW (Azure Synapse) |
|  |  | | * Once Started, bring up the server in SSMS * sql2019labssey.database.windows.net * A7!! |
|  |  | | * Also connect with the Azure SQL DB * sql2019labssey.database.windows.net * A7!! * This was done in the previous step as both the DW and the DB are on the same server. May need to log in using different IDS for some of the demo scripts. |
|  |  | | * This also allows you to connect to Azure Synapse (SQL DW) * Note all the external resources. * For any Demo, change the object names to DEMO\_ as that will keep the other demo objects, where you do not create the new objects, untouched. |
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## Scene 1 - Introduction the environment and use case

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| --- | --- |
| Product: |  |
| Date: | December 15. 2020 |
| Author: | Steve Young |

Purpose:

1. Overview of the Use case
2. Overview of the environment
3. Overview of the Labs

| # | Notes | Action on Screen | Audio |
| --- | --- | --- | --- |
|  | Use slide deck for showing this | Show the Demo Architecture slide | * Good day. We are going to use the following architecture for our use case. * Our use case is for the Smith and Smit retail company. They are based in Canada and provide retail and online shopping for various household products. They are currently in Azure and have some on-prem databases. * They want to expand their use of their data to forecast and provide insights into their business. * This is an old school BI project, but in Azure. * They have files and SQL Databases as sources, they want to be able to keep history and also leverage azue for reporting form their operational databases |
|  |  |  | * Features * They need an hourly process to migrate data to Azure blob storage * This blob store will be the source for all of their Azure working systems |
|  |  |  | * **Azure Data factory** – used in the ETL processes |
|  |  |  | * **SQL2019** – This VM houses an on-premises style SQL server install. It is used for many different demos and is the source for these demonstrations. |
|  |  |  | * **Use Azure Storage Explorer –** Contains the Blob Containers sqlsynapselabs * This storage account has the source files for the Polybase labs * The windowtrigger blob has the lab content exporting using azure data factory |
|  |  |  | * **AdvetureworksLT** – this is the Azure SQL database used for various demos. Has the base AdventureworksLT database plus other tables etc   This is hosted on the **SQL2019labssey** sql logical server |
|  |  |  | * Listing of local databases |
|  |  |  | * This also allows you to connect to Azure Synapse (SQL DW) * Note all the external resources. * For any Demo, change the object names to DEMO\_ as that will keep the other demo objects, where you do not create the new objects, untouched. |
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# Script and Actions

## Scene 2 – Sliding window in Azure Data Factory

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| --- | --- |
| Demo: | Sliding window in Azure Data Factory |
| Date: | Dec 14, 2019 |
| Author: | Steve Young |

Purpose:

1. Show being able to capture new events and populate an Azure Data Lake
2. Show how to organize a data lake

Need

* SQL 2019 VM – SQL2019
* Azure Data Factory V2 - adfSQL2019Labs
* Azure Data Lake - sqlsynapselabs
* Show the SQL DB which is the source for the data - AdventureworksLT (sql2019labssey/AdventureworksLT)
* Load the SQL

| # | Notes | Action on Screen | Audio |
| --- | --- | --- | --- |
|  | Setup |  | Load up the SQL |
|  | Setup |  | Load Up the azure data factory and show the 5 minuteBI article that shows the How to. |
|  |  |  | <https://5minutebi.com/2018/06/03/how-to-use-azure-data-factory-v2-sliding-windows-for-sql-exports-to-azure-data-lake/> |
|  |  | Start on the Azure Portal | Good day. Our first demo is going to show you how to design and implement an hourly capture of sales facts from Azure SQL DB to Azure Data Lake. |
|  |  |  | Based on the introduction above, the Azure SQL database has the AdventureWorksLT database installed. |

# Sample Script and Actions

This script was used for a video tutorial backup for a demo.

## Scene 1

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| --- | --- |
| Product: |  |
| Date: |  |
| Author: |  |

Purpose:

1. Introduce main controls
2. Show ways to navigate and find information

| # | Notes | Action on Screen | Audio |
| --- | --- | --- | --- |
|  |  | Start on the BING home screen | Good day. This is a quick walk through of Azure Mobile Services. This view will allow you to get a feel for creating a mobile service and connecting up a web page from the sample that is provided after the creation process is finished. |
|  | Step 1 create Azure Data Lake repo | * In the SQL VM, create a Container to house the data by using Azure Data Studio |  |
|  |  | Zoom to screen location and highlight | On the menu bar on the left, you will see the various services available to you in Azure. We will concentrate on the Mobile Services.  Click on the mobile services tab, you will see all the mobile services that are currently setup. Yours might be empty, but any you create will display in the main window |
|  |  | Zoom to the screen size | It is important to note 3 of the columns on the screen. The Backend for this example will be Javascript as this will be an HTML5 application.  You can select either a .Net or Javascript backend, just that this example will be HTML5.  The Location will be the data centre closest to you.  The URL is important as this is the URL for you service. |
|  |  |  | At the bottom of the screen, you will see the NEW and Manage Keys.  The Manage keys is important, but will be assigned automatically when we create the service.  Lets start by clicking the “NEW” service |
|  |  |  | The next step in creating our service is fairly straight forward.  We select Compute, Movile Service, then Create.  This will start the multi step wizard. |
|  |  | Stoping Point? | Now we have to enter the first part of the url. What ever you select as your Something.azure-mobile.net has to be unique and will really become the name of your mobile service.  You have 3 selections in the drop down box for the database. If this is the first service you are creating, you can create a Free 20mb database. If not, you can use your existing SQL Database or create a new DB Instance.  Our example here will be to create a new database instance, but on a SQL Server I already have.    For my site, I will select Eastern US as my data center. Yours should be closer to you, or really your client activity.  Select your backend, Really, Javascript or .Net, we will use Javascript as our example. |
|  |  |  | For our example, I already have a DB Server setup, and have chosen to create a new db instance.  The Name will prepopulate with the name of the service url you created in the previous step with a \_DB attached to it.  We will select the server which will then ask me to log on.  We don’t have to, but we will select the advance setting just to take a look.  Lets move onto the next step |
|  |  |  | The advanced settings allow you to select the service tiers, size, collation and performance level.  The settings are beyond the quick walkthrough, however the MSDN site under mobile services has the explanations.  Click on the check mark to start the creation process. |
|  |  |  | The site will now be created. The status will change as the process goes on, however when “Ready” appears we will be ready for the next step. |
|  |  | Zoom in | Now that we have our service, click on the service name to bring up the details screen. |
|  |  |  | This is the main dashboard for the service. There are many features and setting available along the top screen. Hitting the “Cloud” will bring you back to this screen.  There are a number of platforms you can chose for your application. Since the RestAPIs are created, you can use any of the platforms listed for you application. We will use the “HTML/JavaScript” for our example.  Make sure the “HTML/JavaScript” is selected, and under the Get Started, click on the Create a New HTML APP. |
|  |  |  | There are 3 selections.  We first need to create the table to house our sample data.    We then download the application it will prompt us to save the application. This will save to the download directory.    Lets select the Configure a list of host names. |
|  |  |  | This is mainly so that the site will accept requests from the domain your application is running from. The list already has the LocalHost setup as this is where the site sample code will run from. |
|  |  |  | Now that we have everything ready, lets unzip the download file. |
|  |  |  | Once downloaded, going into the server directory will list the files that get the IIS Server running on this local machine.  There are other files that will do the same on Linux and the MAC. Depending on what machine you are on, start the server.  Note that this cannot be started from a file share. |
|  |  |  | We now have IIS Express running. Open up a browser and open the pate http://localhost:8080 |
|  |  |  | This will bring up the mobile service.  Add in some tasks,  Close it, then open, they are still there. |
|  |  |  | We have used the Mobile Service wizards to create our RestApi services, and downloaded the sample code and have our local server communicating and writing our data to our new services.  I encourage you to find out more at  http://azure.microsoft.com/en-us/documentation/services/mobile-services/ |
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