**Challenge 1**

**Real Time Analytics Using Synapse and Cosmos Db**

**Business Objective**

**Technical Objective**

**Technologies**

* + Synapse
  + CosmosDb
  + PowerBI

# Step 0 - Before you start (Pre-requisites)

These are the key pre-requisites to deploy this solution:

* You need a Microsoft Azure account to create the services used in this solution. You can create a [free account](https://azure.microsoft.com/en-us/free/), use your MSDN account, or any other subscription where you have permission to create Azure services.
* PowerShell: The one-command deployment process uses PowerShell to execute all the required activities to get the solution up and running. If you don't have PowerShell, install it from [here](https://docs.microsoft.com/en-us/powershell/scripting/samples/managing-current-location?view=powershell-7.1). Direct link to [MSI download](https://github.com/PowerShell/PowerShell/releases/download/v7.1.4/PowerShell-7.1.4-win-x64.msi). If you have an older version of PowerShell, you will have to update to the latest version.
* Go to the github repo for the hack <https://github.com/shkumar64/msbankinghack>

Click on code and download Zip. Create a folder on your PC and unzip the contents

# Step 1 - Environment Setup

Follow these steps to prepare the deployment:

* Run the PowerShell terminal as an Administrator
* Set the priorities running (every time you restart the PowerShell)

*Set-ExecutionPolicy -ExecutionPolicy unrestricted*

(Choose "A", to change the policy to Yes to All)

# Step 2 – Provision Cosmos Db

# Long in to Azure portal with your credentials – ms.portal.azure.com

# Create a resource group and name FSIBankinghack

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1. Click on the resource group and click on “create a resource” and search for cosmosDb on the search bar, select and then click on create Text

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2. Select the CoreSql API from the list

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1. Choose a name and select provisioned throughput do not select apply free tier discount

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1. Select Review and Create and then select Create after validation is passed
2. After deployment is successful click on “go to resource” which will navigate you to menu page of the provisioned cosmosDb. Under settings go to “Features” . Enable the Synapse link feature

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1. On the cosmosDb Homepage click on Data Explorer and select New Container

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1. Use
   1. DatabaseId - fsi-marketdata
   2. Throughput – Autoscale
   3. ContainerId – fintransactions
   4. PartitionKey - /TransactionType
   5. Analytical Store – On

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# Step 3 – Simulate Transactional Data

# 

# We will use a powershell script to simulate ongoing transactions

# Navigate to the github folder downloaded in step 0. Open Challenge1 folder and open cosmosDbSubscript on any text editor, navigate to line 39 or search for “replaceMe” and replace the $cosmos\_account\_name with the name of your cosmos Db account. Save and close the script

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# Open powershell as admin and navigate to Challenge1 Folder

# Run .\cosmosDbSubscript.ps1 , it will ask you to authenticate twice.

# 

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1. If the correct subscription is selected press enter else copy and paste the name of the subscription from the list

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1. The script will generate transactions in realtime and upload it to cosmosDb It will take 3-4 minutes to complete.

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1. One transactions have been uploaded you can see them on the data explorer on cosmos db page on Azure portal.

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# Step 4 – Provision Synapse Workspace

# 

1. Go to the resource group on Azure portal

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1. Go to Security and choose a password .. recommended password P@ssw0rd

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1. Select review and create and wait for workspace to provisioned, once ready go to synapse workspace and click on open Synapse studio

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1. On synapse studio jump to Data tab and click on the plus icon and create a new sql database. Select serverless and choose a name.

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1. After the database is provisioned go to views and right click and select new sql script, new view

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1. From the github folder copy contents of createview script and copy into the new script pane. Replace the cosmos account name and key with details of your cosmos account

CREATE VIEW [dbo].[finalreport]

    AS SELECT \* FROM

     OPENROWSET(

       'CosmosDB',

       'Account=<yourcosmosaccountname>;Database=fsi-marketdata;Key=<Yourcosmosaccountkey>',

       fintransactions) with (TransactionAmount BIGINT, isFraud INT, OFACviolation INT, State VARCHAR(200), TransactionType VARCHAR(200), date VARCHAR(200), time VARCHAR(200) ) as rows

Copy your primary key

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1. Execute the script and then refresh the view and the create view should appear

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1. On the view select new sql script Select top 100 rows
2. Graphical user interface, text, application

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Observe the content from Cosmos Db, you can also chart this data

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Chart, line chart

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# Step 4 – Integrate with powerBI