Developer Journey Map

Energy Demand Forecasting in Cortana Intelligence Suite

1 Create a New Azure Resource Group

- Navigate to portal.azure.com and create a new Azure Resource group

2 Azure Storage Account

- Azure Storage Account is used for storage of smart meter readings through Azure Event Hub and Azure Stream Analytics
- The storage account is also used to hold HIVE scripts that will be executed from Azure Data Factory

3 Azure Event Hub

- It is a highly scalable service that can ingest millions of records per second. This act as the ingestion point for the smart meter reading data

4 Azure Stream Analytics Jobs

- It allows you to create near real-time insights from devices, sensors, infrastructure and applications
- Azure Stream Analytics is used to create two jobs that read smart meter data from the Azure Event Hub

5 Configure Data Generator and test Event Hub/ Stream Analytics

- Data generator can be configured after event hub & stream analytics are configured to test that the flow to this point is working
- This process requires the generator running for about 15 minutes. First event hub is validated followed by validation of stream analytics job
- Data generator is needed again when the whole system is brought online after the remaining services are configured

6 Azure SQL Server & Database

- Creation of Azure SQL Database to store "actual" demand data generated by the data generator and forecast demand data generated by Azure Machine Learning experiment

7 Create Azure Studio ML Workspace & Experiment

- This is based on the assumption that customer has not set up any workspaces for Studio ML but that has an account at studio.azureml.net
- Workspace is also tied to a storage account for intermediate results during experiment processing
- Once the workspace is created required experiment can be copied from the Gallery

8 Azure Data Factory

- The data factory uses an on-demand HDInsights cluster to read from the raw data being streamed in through the event hub & stream analytics jobs
- Data factory, linked services, datasets, pipelines are created

9 Get it all running

- It is time to start up the system to have the data flow through the services.
- Navigate to the folder Demand Forecasting Data Generator in the solution package and start the Generator.exe application.
- Then it starts the stream analytics jobs

10 Power BI Dashboard

- Power BI is used to visualize the demand forecast results and the forecasting accuracy. We will first use Power BI Desktop to prepare the report. The report can also be viewed via Power BI online.
- Real time streaming data visualization (Hot Path, optional)

11 Validation and Results

- It takes about 2 hours to generate the first batch demand forecast results.
- To ensure that the system is functioning as expected, database tables DemandRealHourly and DemandForecastHourly should be checked to verify that data are being added to these tables hourly