Developer Journey Map

1 Create a New Azure Resource Group

- Many different Cortana Intelligence Suite services are created with the end result of replicating the customer requirements
- These services can be grouped under a single Azure Resource Group

2 Azure Storage Account

- Azure Storage Account is used for storage of incoming aircraft sensor readings through Azure Event Hub & 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 a second
- The connection string & event hub name information are needed to configure the desktop data generation tool that simulates aircraft sensor readings being sent to the event hub
- While running the demo one can also validate the event hub created is receiving messages, which can be a useful debugging step

4 Configure Desktop Application & Test Event Hub/ Stream Analytics

- Event 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

5 Azure Stream Analytics Jobs

- It allows one to create near real-time insights from devices, sensors, infrastructure & apps
- It is used to create different jobs that read data from Event Hubs having different stream queries & different outputs
- While running the demo one can validate if the stream jobs are operating as expected

6 Azure SQL Server & Database

- After completion of ingestion path, one can start building the data processing paths
- Data processing is done through Azure Data Factory. Azure SQL DB is to be set up to hold remaining useful life predictions that are the result of running the Azure ML 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
- HIVE script is run against the raw data using the cluster to create the required aggregates for the ML experiment
- Another HIVE script is executed to feed the ML experiments batch execution endpoint
- The results of the experiment are put in another blob which is then copied to the Azure SQL DB

9 Setting Up Power BI

- Power BI is used to create visualizations for monitoring the live data stream (hot path) as well as to show the prediction results of remaining useful life of engine components (cold path)
- Data is available on the Power BI website under Datasets as the stream analytics jobs as Aircraftalert, Aircraftmonitor and Flightsbyhour

10 Getting it All Running

- After all of the parts are in place system is started to have the data flow through the services & produce results for the Power BI dashboard
- This takes a little time for the data to seed the blob storage, & the data factory, and, is scheduled to run every three hours
- This setup will also take care to limit the amount of time that the demo will run, and consequently, not adding cost to customer's subscription