

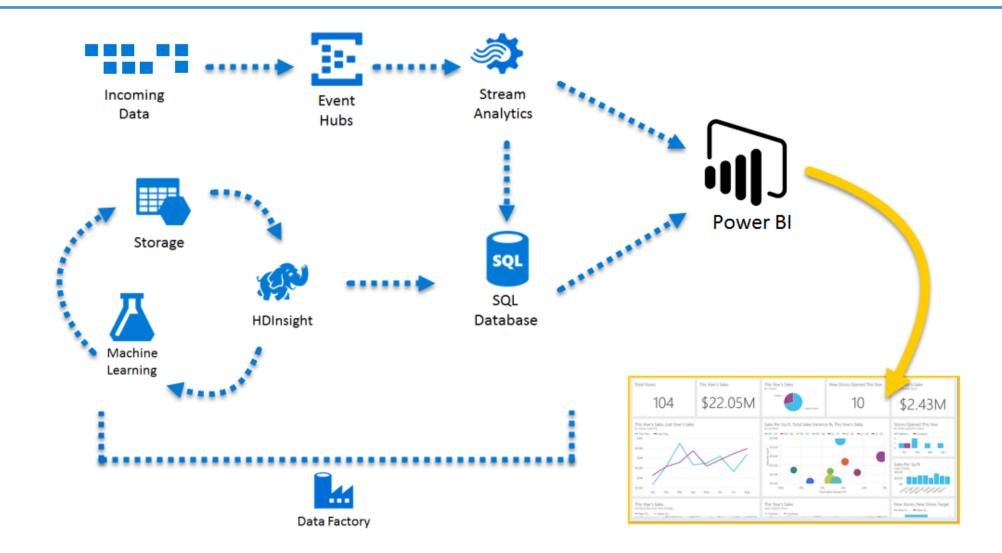
Workshop Demo



Stuart Taylor Sr Data Analytics Consultant

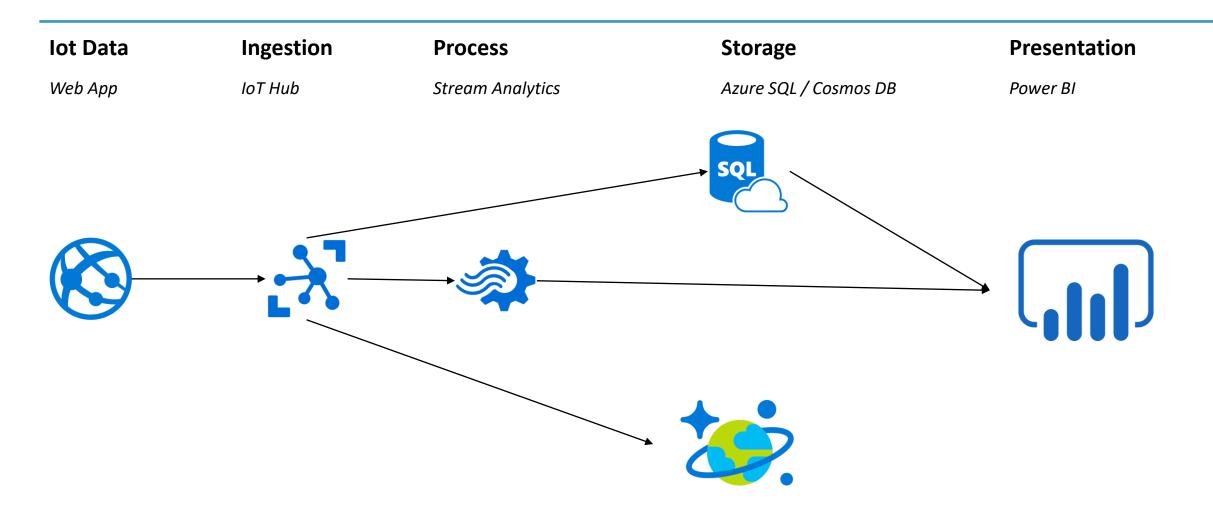


Azure IoT Simple Data Flow Architecture





Workshop Architecture





The Sample Data

"sim01" 73.34 deviceId 34.97 "2018-06-08T17:03:39.3282179Z" Temperature "2018-06-08T17:03:37.3930000Z" {"MessageId":null,"CorrelationId":null,"ConnectionDeviceId":"sim01","ConnectionDeviceGener Humidity ationId":"636640304088516997","EnqueuedTime":"2018-06-08T17:03:37.4180000Z","StreamId":null} EventProcessedUtcTime **PartitionId** "sim19" 62.35 31.6 EventEnqueuedUtcTime "2018-06-08T17:03:39.3282179Z" IoTHub "2018-06-08T17:03:37.3950000Z" {"MessageId":null,"CorrelationId":null,"ConnectionDeviceId":"sim19","ConnectionDeviceGener ationId":"636640305939483891","EnqueuedTime":"2018-06-08T17:03:37.3730000Z","StreamId":null}



Login to Azure

https://portal.azure.com



··· IoTworkshop-vnet

			℧ Refresh
?	ostcosmos	Azure Cosmos DB account	Central US
*	StreamAnalytics01	Stream Analytics job	Central US
	ASAuser01	Stream Analytics job	Central US
X	ostlotHubS1	IoT Hub	Central US
*	OSTIoTWorkshop-HighTemp	Stream Analytics job	Central US
QL	iotDB	SQL database	Central US
L ,	ostworkshop	SQL server	Central US
ಶಿ	eventhubs	API Connection	Central US
ව	eventhubs-1	API Connection	Central US
	iotworkshopdiag255	Storage account	East US
	IotWorkshopSim	Virtual machine	East US
3	IotWorkshopSim_OsDisk_1_87dff0e7	Disk	East US
Ġ	iotworkshopsim995	Network interface	East US
	IotWorkshopSim-ip	Public IP address	East US
	IotWorkshopSim-nsg	Network security group	East US

Virtual network

East US

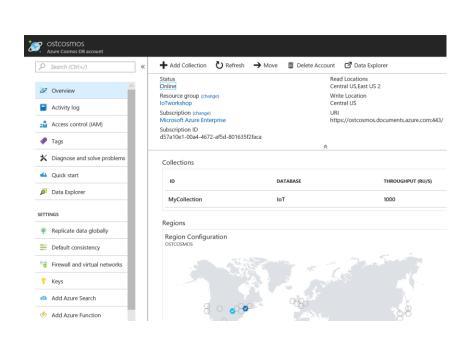


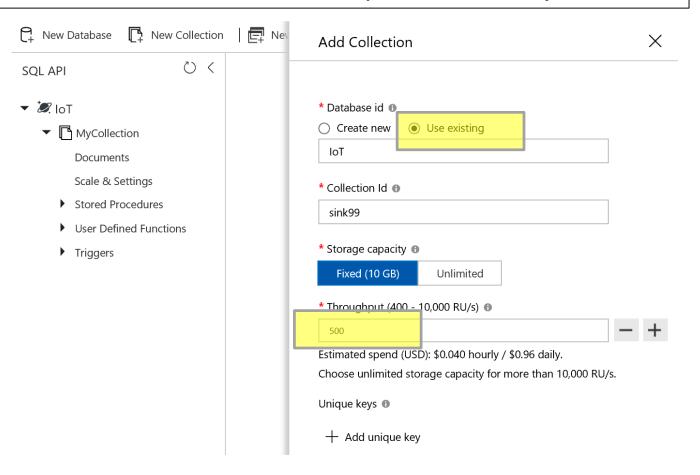
Open Cosmos DB and Add New Collection

Cosmos Resource = ostcosmos

Cosmos DB = IoT

Collection = sinkXX (xx is user number)

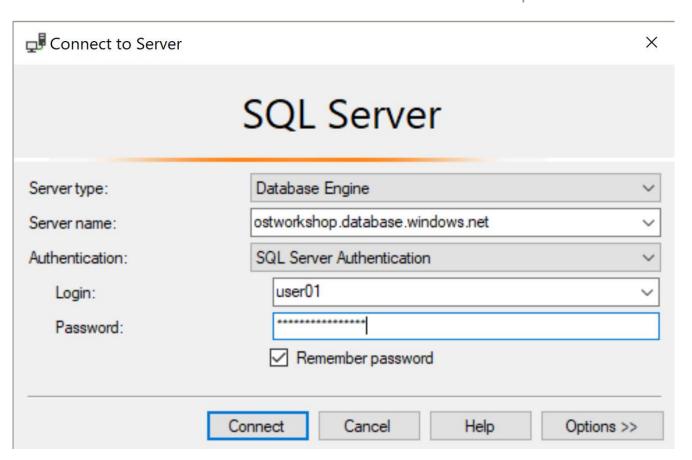






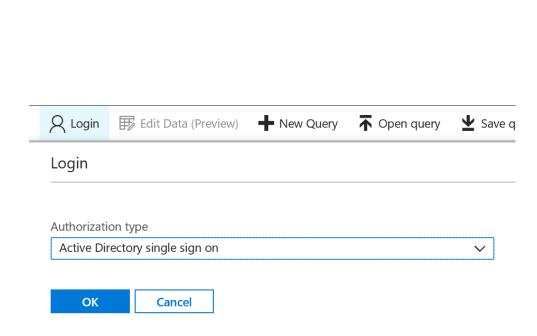
Connect to Azure SQL Database with SSMS

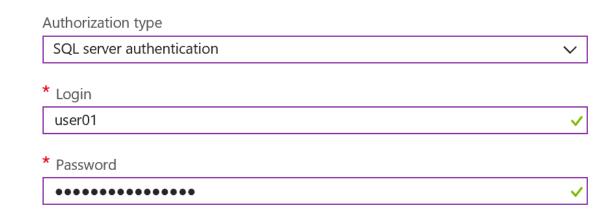
Traditional – but not for workshop





Login Azure SQL Database





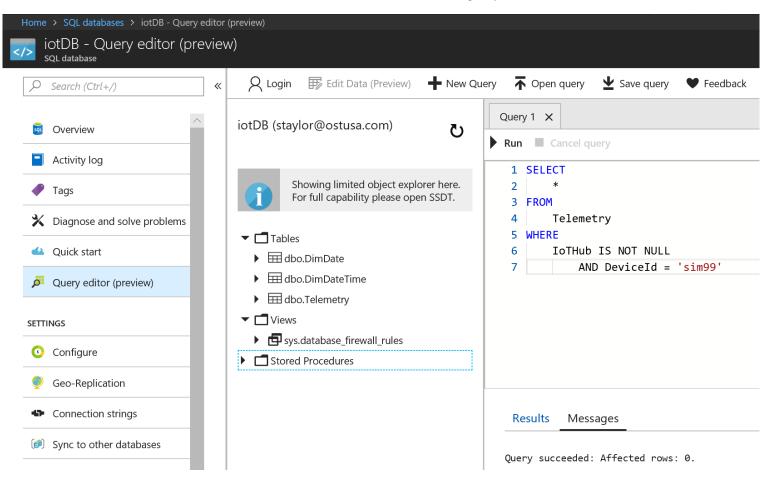
USER user01
PASSWORD

<



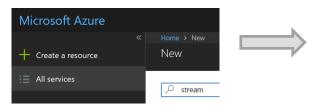
Query Azure SQL Database in Azure Portal

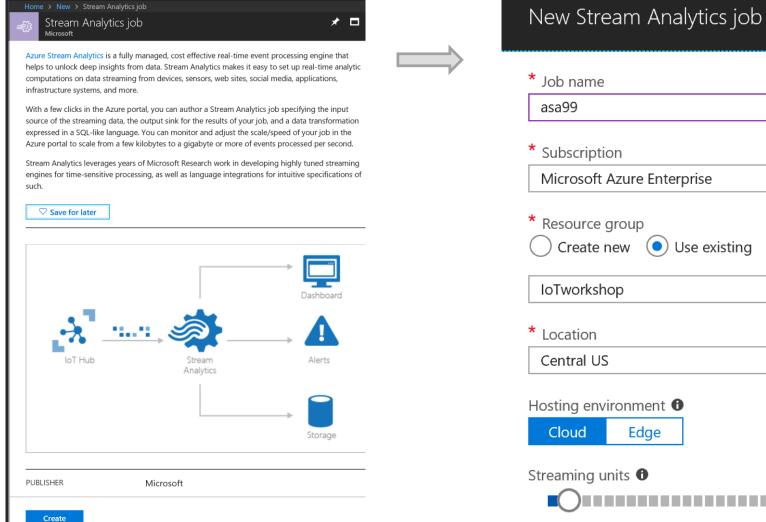
Azure SQL Database Query (preview)





Create Azure Stream Analytics Job







Stream Analytics - Streaming Units

Choose the right number of Streaming Units:

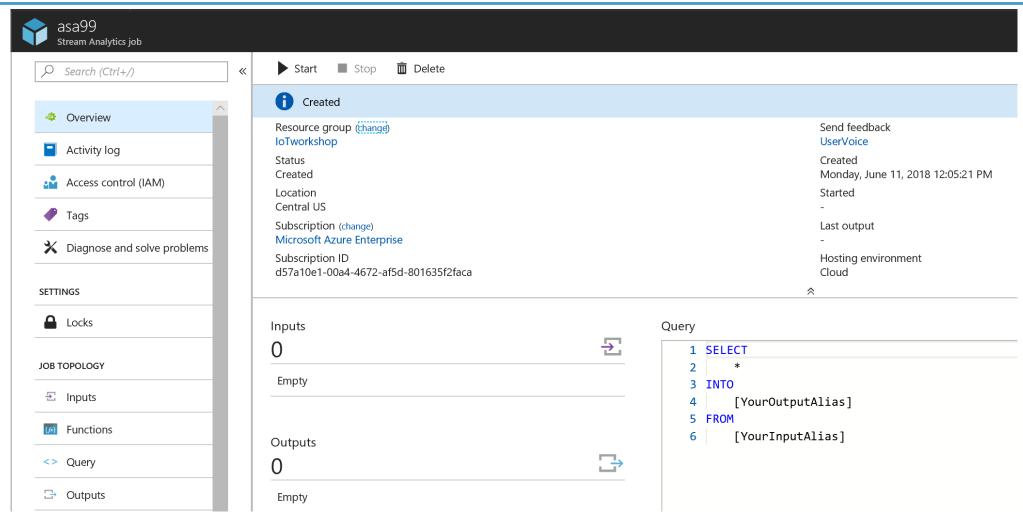
Because Stream Analytics creates a processing node for each 6 SU added, it's best to make the number of nodes a divisor of the number of input partitions, so the partitions can be evenly distributed across the nodes.

For example,

you have measured your 6 SU job can achieve 4 MB/s processing rate, and your input partition count is 4. You can choose to run your job with 12 SU to achieve roughly 8 MB/s processing rate, or 24 SU to achieve 16 MB/s. You can then decide when to increase SU number for the job to what value, as a function of your input rate.

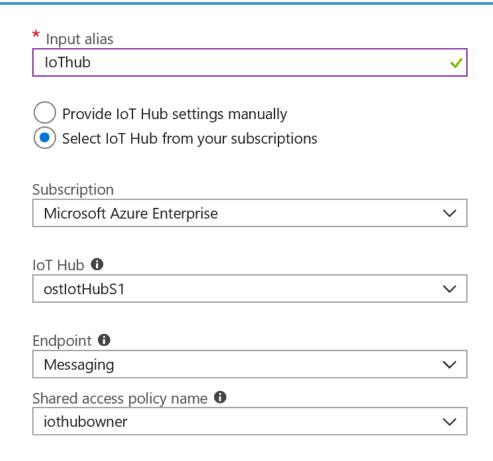


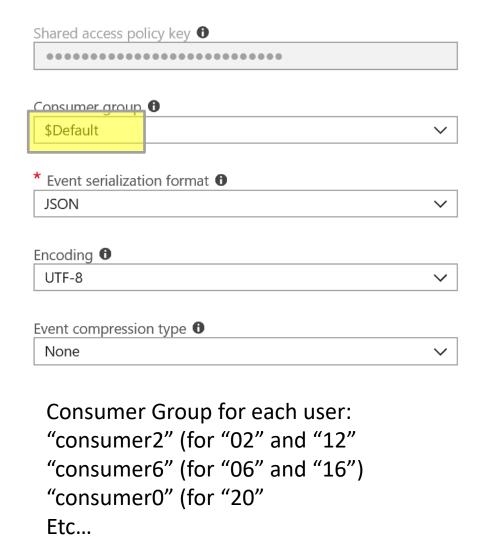
Stream Analytics - Configure Job





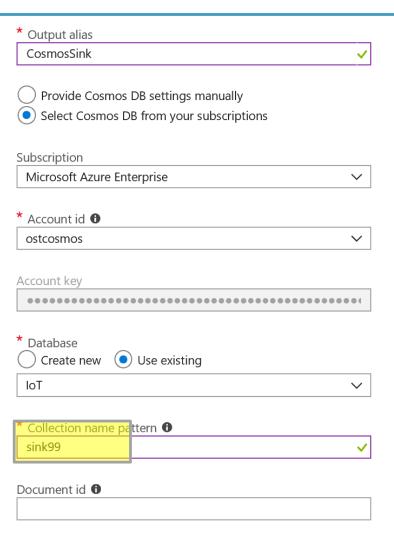
Stream Analytics - Create IoT Hub INPUT





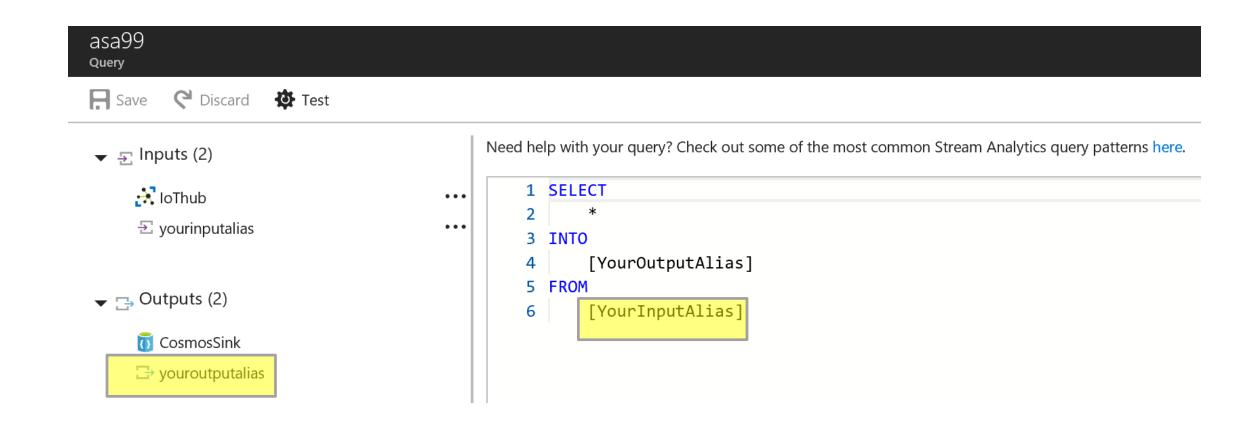


Stream Analytics - Create Cosmos DB SINK





Stream Analytics - Query





Stream Analytics – Query pt.2

...

→ ∃ Inputs (1)

ioThub

▼ □ Outputs (1)

TosmosSink

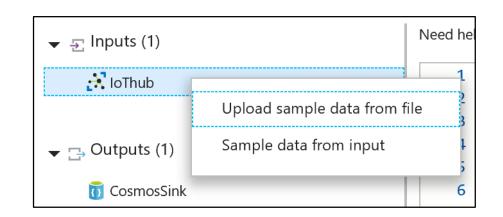
Need help with your query? Check out some of the n

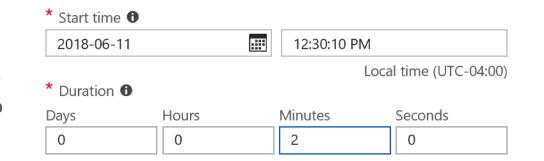
```
1 SELECT
2 *
3 INTO
4 CosmosSink
5 FROM
6 IoThub
7 WHERE
8 DeviceId = 'sim12'
```



Stream Analytics - Create Sample Data

1





Notifications

Dismiss: Informational Completed All



Sampling input 'IoThub' of Stream Ana... Running Sampling input 'IoThub' of Stream Analytics job 'asa99'.



Successful connection test

12:23 PM

Connection to output 'CosmosSink' succeeded.

Generated the Following:

• cosmossink with 10 rows.

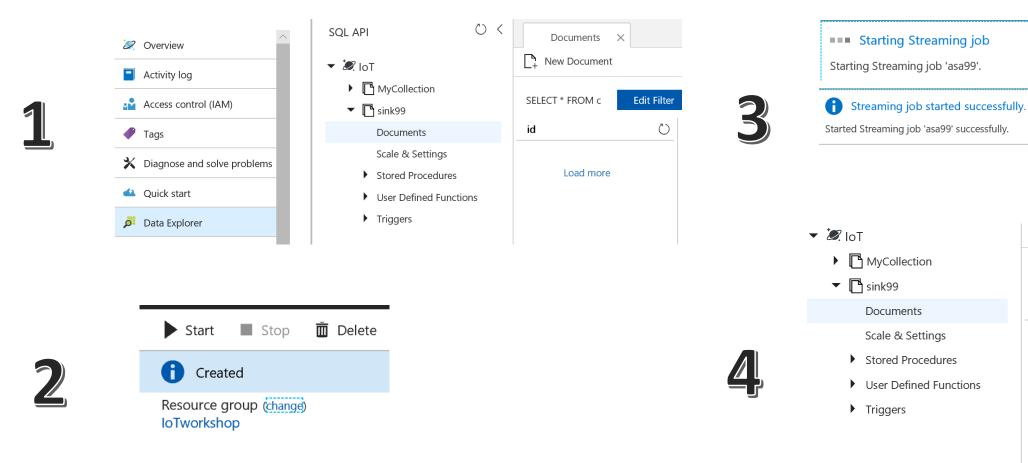


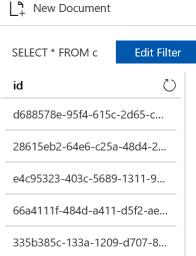
Download results

DEVICEID	TEMPERATURE	HUMIDITY	
"sim12"	81.27	34.46	



Stream Analytics – Send Data to Cosmos SINK



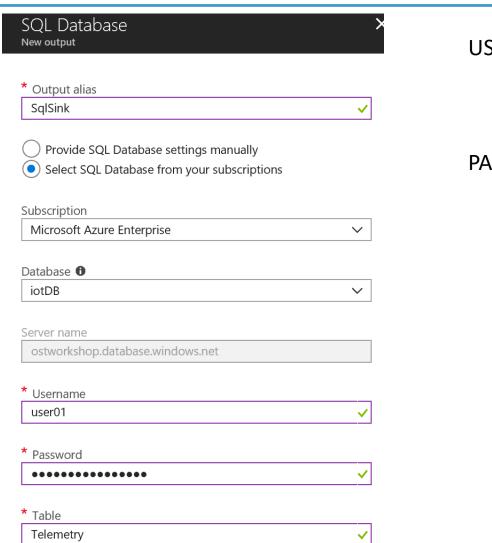


Running

12:43 PM



Stream Analytics – Send Data to SQL DB





user01

PASSWORD

<Your Password>



Stream Analytics – SQL DB SINK Query

```
SELECT
   CAST(DeviceId as nvarchar(max)) as DeviceId,
    CAST(temperature AS float) as Temperature,
    CAST(humidity AS float) as Humidity,
    CAST(EventProcessedUtcTime AS datetime) as EventProcessedUtcTime,
    CAST(EventEnqueuedUtcTime AS datetime) as EventEnqueuedUtcTime,
    DATEADD(hour, -5, CAST(EventProcessedUtcTime AS datetime)) as EventProcessedTimeInEst,
    DATEADD(hour, -5, CAST(EventEngueuedUtcTime AS datetime)) as EventEngueuedTimeInEst,
    CAST(PartitionId AS bigint) as PartitionId,
    CAST(iothub.ConnectionDeviceGenerationId as nvarchar(max)) as ConnectionDeviceGenerationId,
    iothub
INTO
    SalSink
FROM
    IoTHub Partition
WHERE
    DeviceId = 'sim12'
```



Stream Analytics – Query Data Types

Data type	Description
bigint	Integers in the range -2^63 (-9,223,372,036,854,775,808) to 2^63-1 (9,223,372,036,854,775,807).
float	Floating point numbers in the range - 1.79E+308 to -2.23E-308, 0, and 2.23E-308 to 1.79E+308.
nvarchar(max)	Text values, comprised of Unicode characters. Note: A value other than max is not supported.
datetime	Defines a date that is combined with a time of day with fractional seconds that is based on a 24-hour clock and relative to UTC (time zone offset 0).
record	Set of name/value pairs. Values must be of supported data type.
array	Ordered collection of values. Values must be of supported data type.



Stream Analytics – Test Query

Load sample data from file...

sqlsink

Generated the Following:

• sqlsink with 5 rows.

Download results

DEVICEID	TEMPERATURE	HUMIDITY	EVENTPROCESSED	EVENTENQUEUEDU	EVENTPROCESSEDT	EVENTENQUEUEDTI	PARTITIONID
"sim12"	87.61	33.57	"2018-06-08T17:	"2018-06-08T17:	"2018-06-08T12:	"2018-06-08T12:	3
"sim12"	62.35	31.6	"2018-06-08T17:	"2018-06-08T17:	"2018-06-08T12:	"2018-06-08T12:	3
"sim12"	64.58	33.87	"2018-06-08T17:	"2018-06-08T17:	"2018-06-08T12:	"2018-06-08T12:	3



Stream Analytics - Check SQL DB for Streaming Data

While waiting for job to start...



Query succeeded: Affected rows: 0.

After job starts...

Results Messages					
∠ Search to filter items					
DEVICEID	TEMPERATURE	HUMIDITY			
sim12	72.41	32.94			
sim12	64.6	33.35			
sim12	86.88	34.58			
sim12	79.38	30.7			
sim12	74.97	33.6			



Stream Analytics - Create Power BI Output

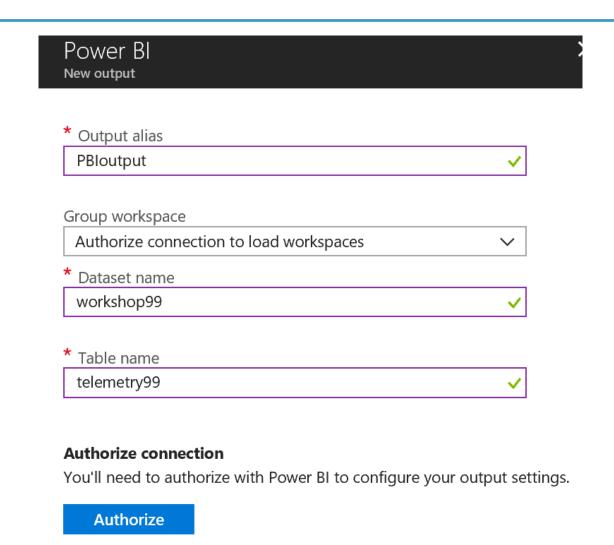
1 - STOP JOB

2 – Open Outputs

3 – Add New (Power BI)

4 – Configure

5 – Authorize (sign in)





Stream Analytics - Power BI Query

```
1 – Comment out other queries
```

2 – Write new query with Power BI output

3 – Test Query

4 – Restart Job

```
SELECT
DeviceId,
    Temperature,
    Humidity,
    EventProcessedUtcTime
INTO
    PBIoutput
FROM
    IoThub
WHERE DeviceId = 'sim01'
```



Stream Analytics - Power BI Dataset

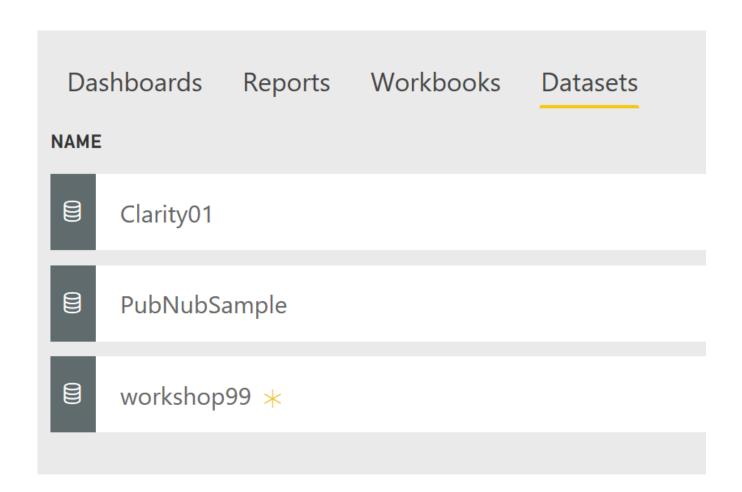
Go to Power BI website:

https://powerbi.microsoft.com/en-us/

Sign in

Go to My Workspace on left panel

Check for new Dataset





Power BI - Create Sample Dashboard

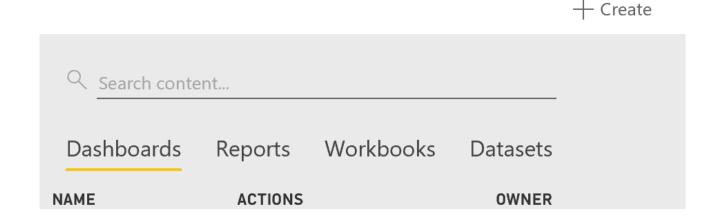
From My Workspace....
Click on Dashboards
(should be empty)

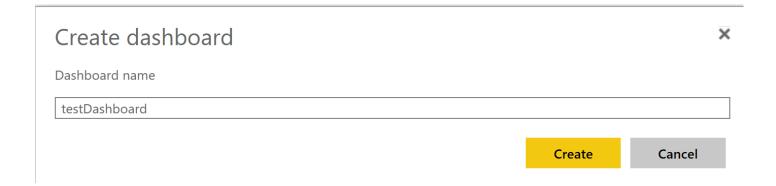
Click on Create (top left)

Choose Dashboard

Name...

Create....







Power BI – Create Streaming Dashboard (tiles)

Add Tile

Real-Time Data

Choose your dataset

Visualization Type = Card

Value = Temperature

Title = Temperature

Subtitle = F

Repeat = Humidity







Power BI – Create Streaming Dashboard (Charts)

Add Tile

Visualization Type = Line Chart

Value = Temperature

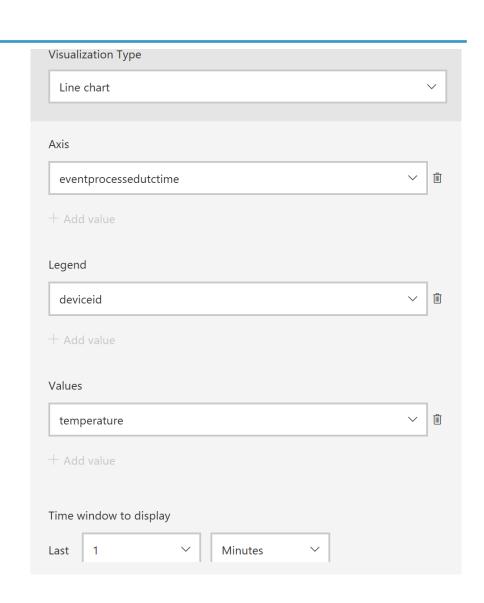
Axis = Time field

Legend = DeviceId

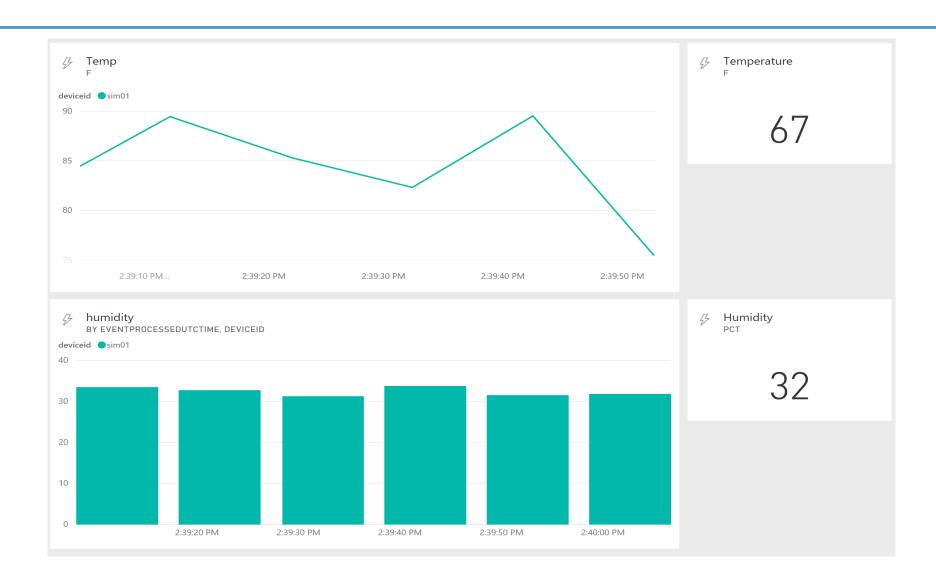
Time window = 1 Minute

Repeat = Clustered Column Chart for Humidity



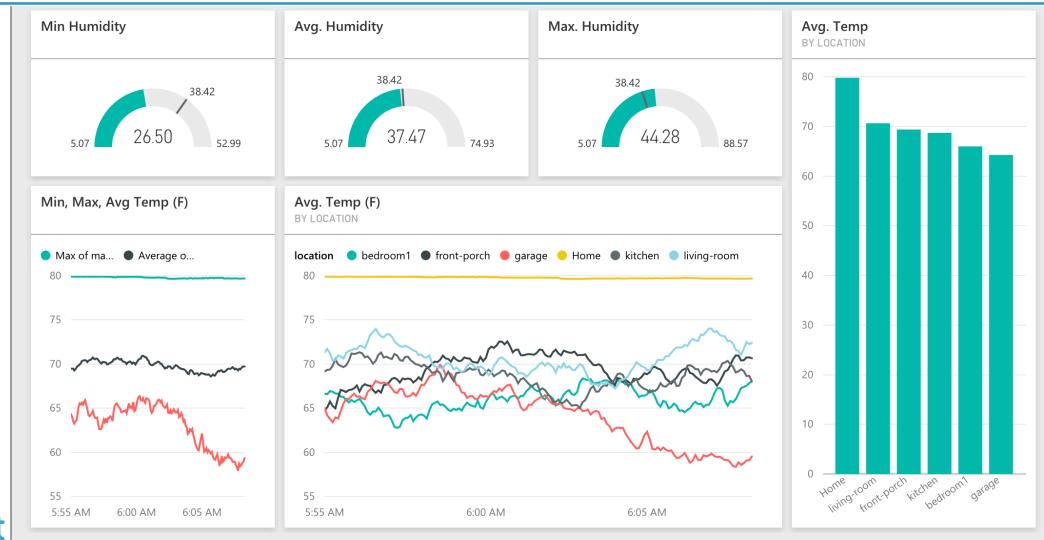


Power BI –Streaming Dashboard (finish)





Power BI Stream Analytics (Dashboard)





Workshop – Get Started



