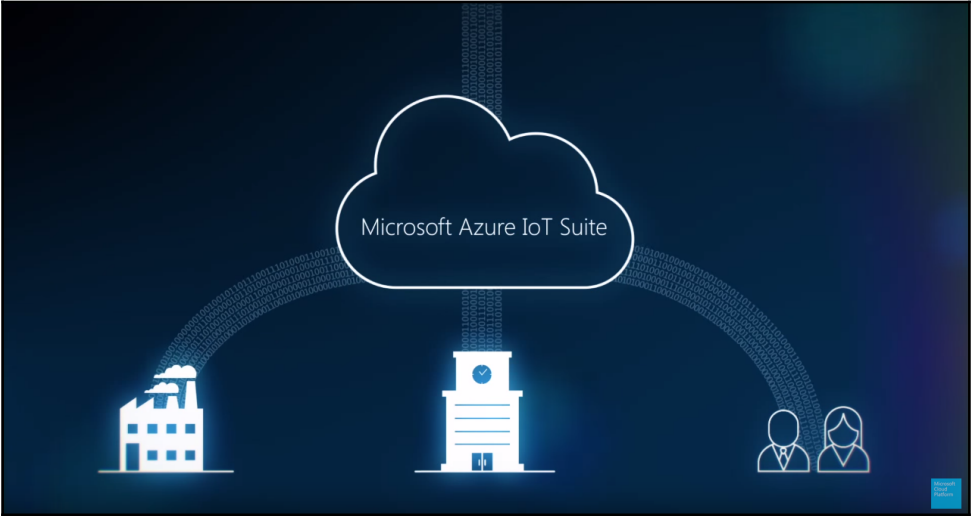
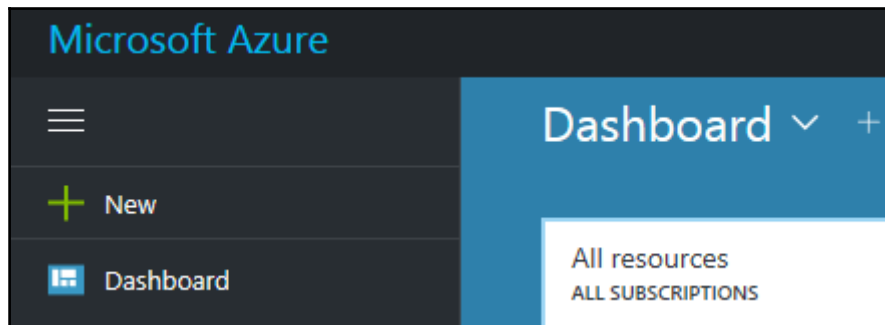
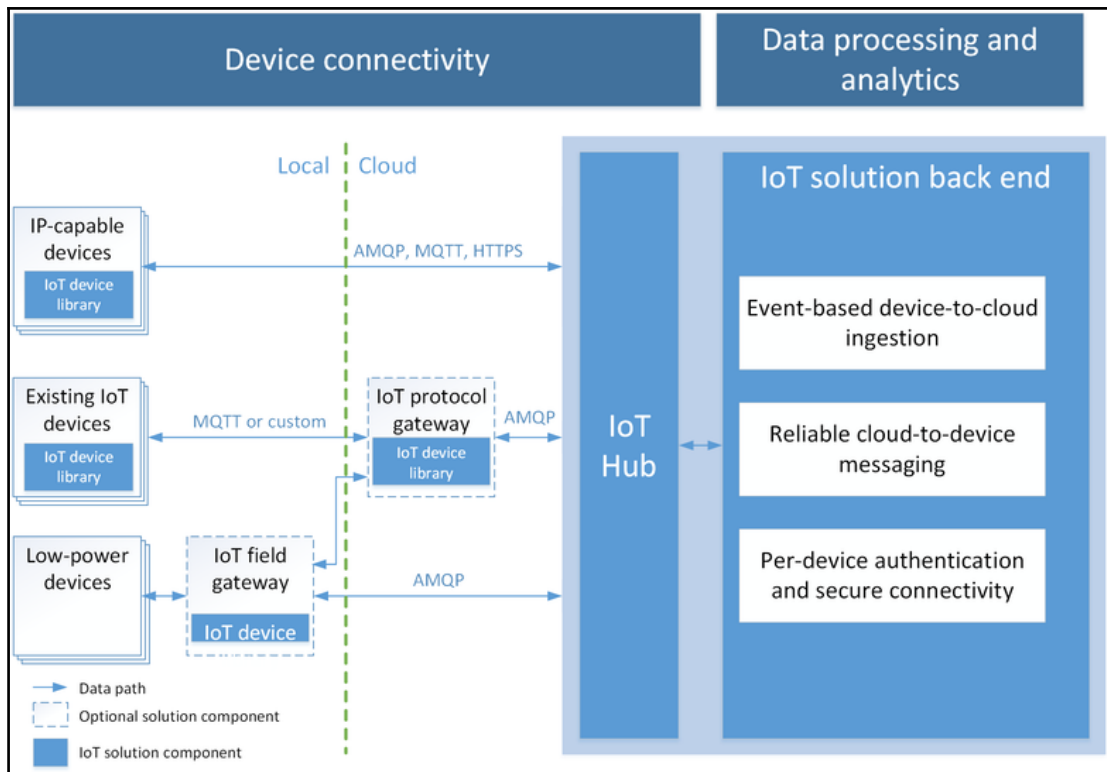
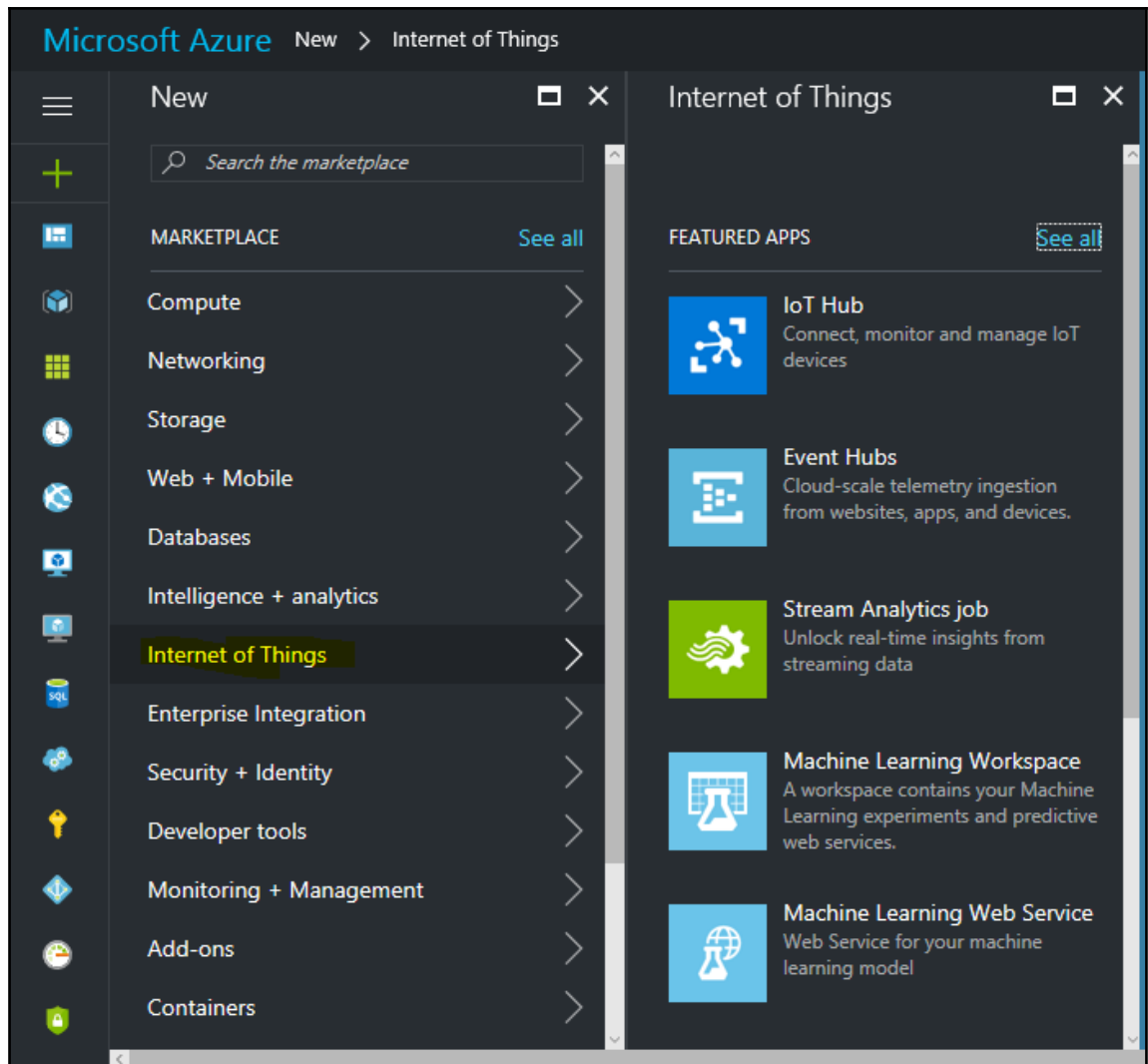
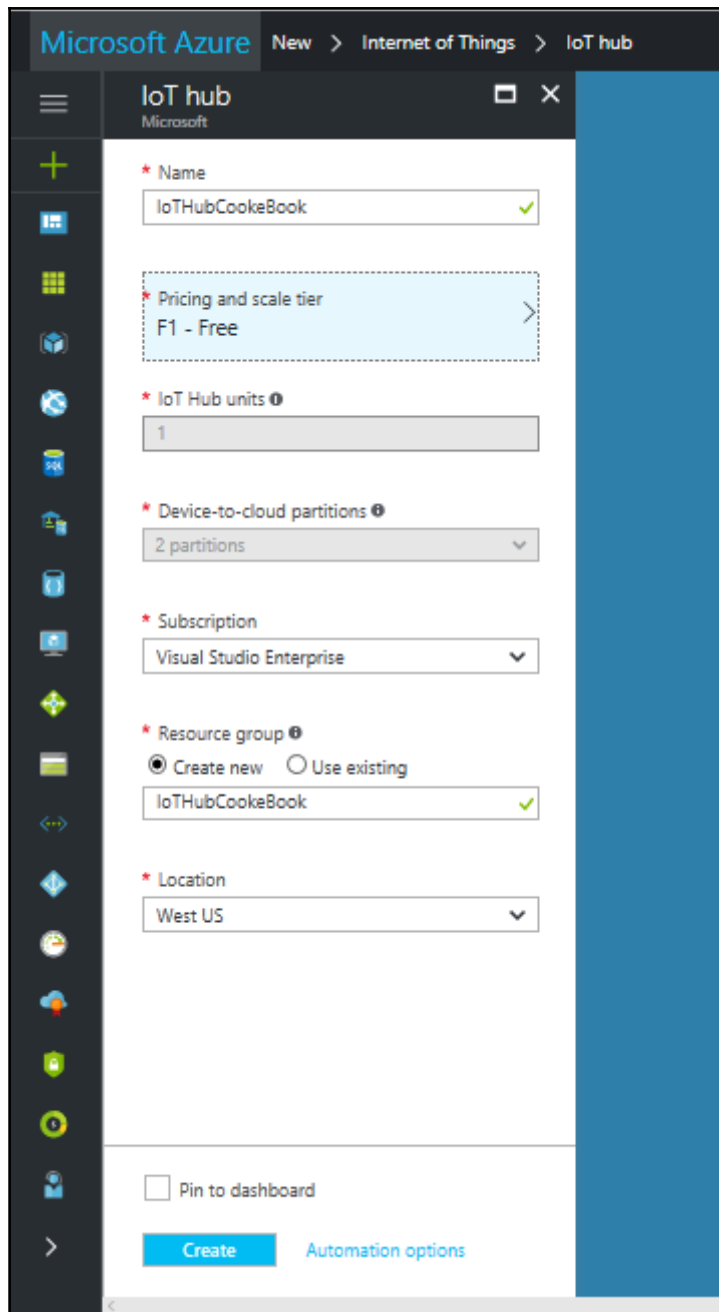


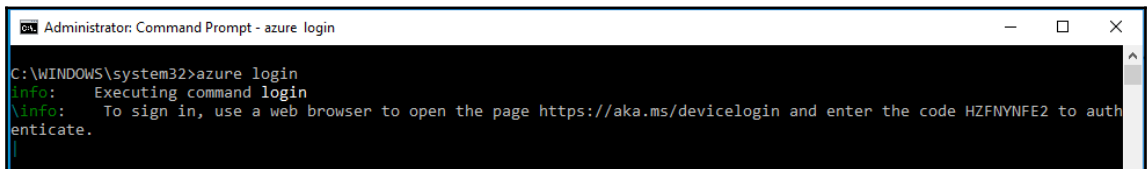
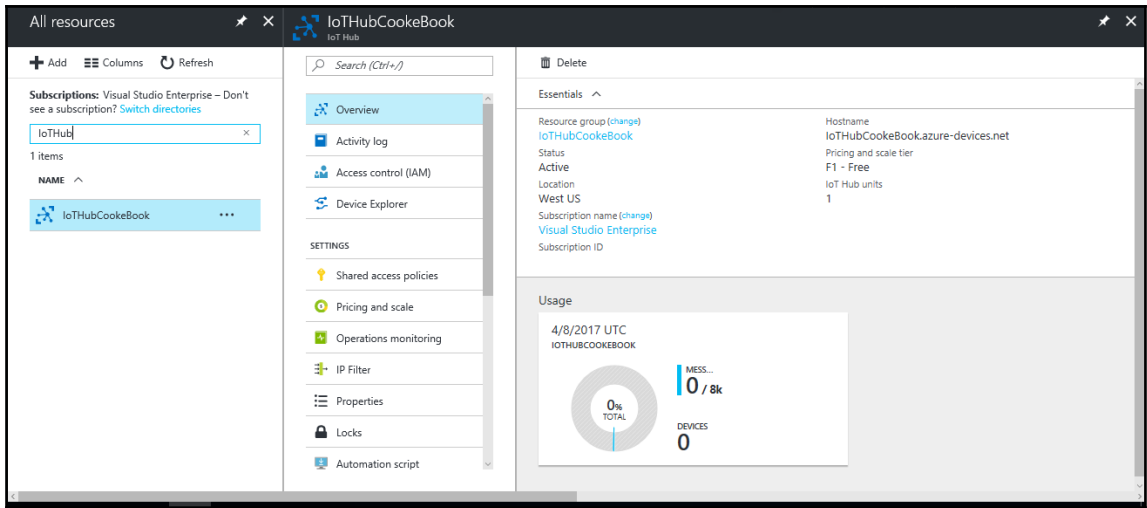
Chapter 1: Getting Started with the Azure IoT Platform











Device Login

Enter the code that you received from the application on your device

Microsoft Azure Cross- platform Command Line Interface

Application publisher:

Click Cancel if this isn't the application you were trying to sign in to on your device.

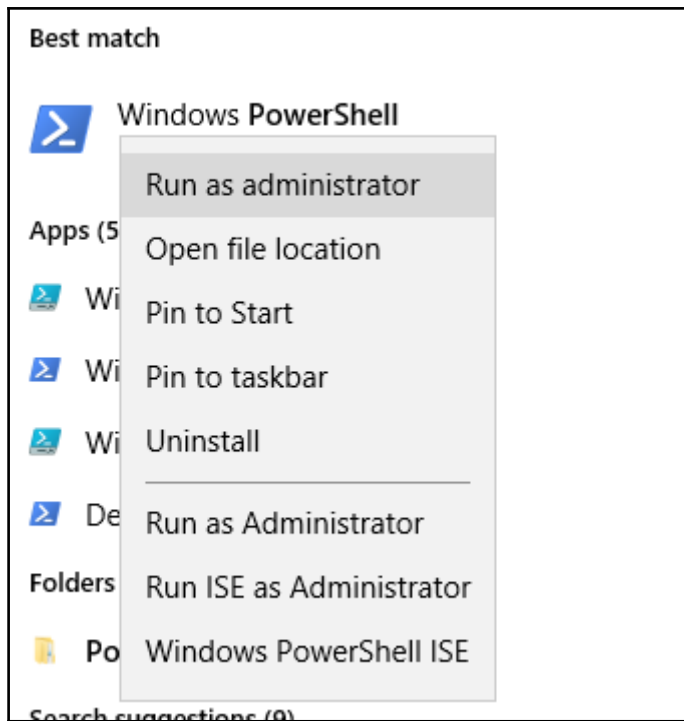
Continue

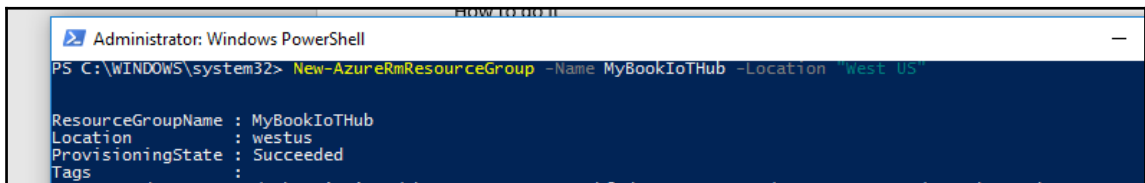
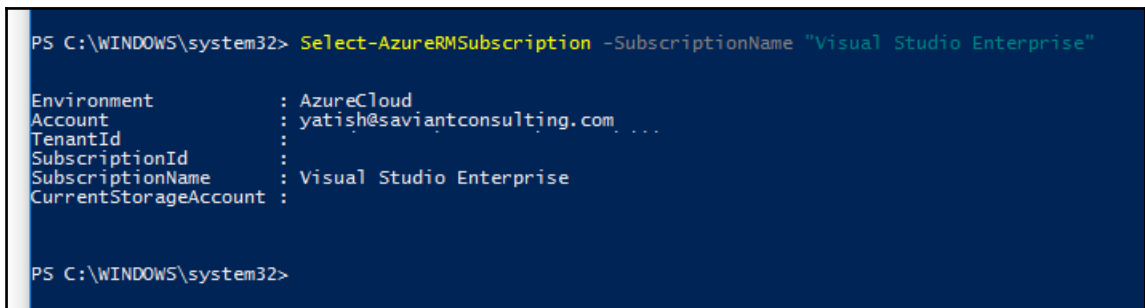
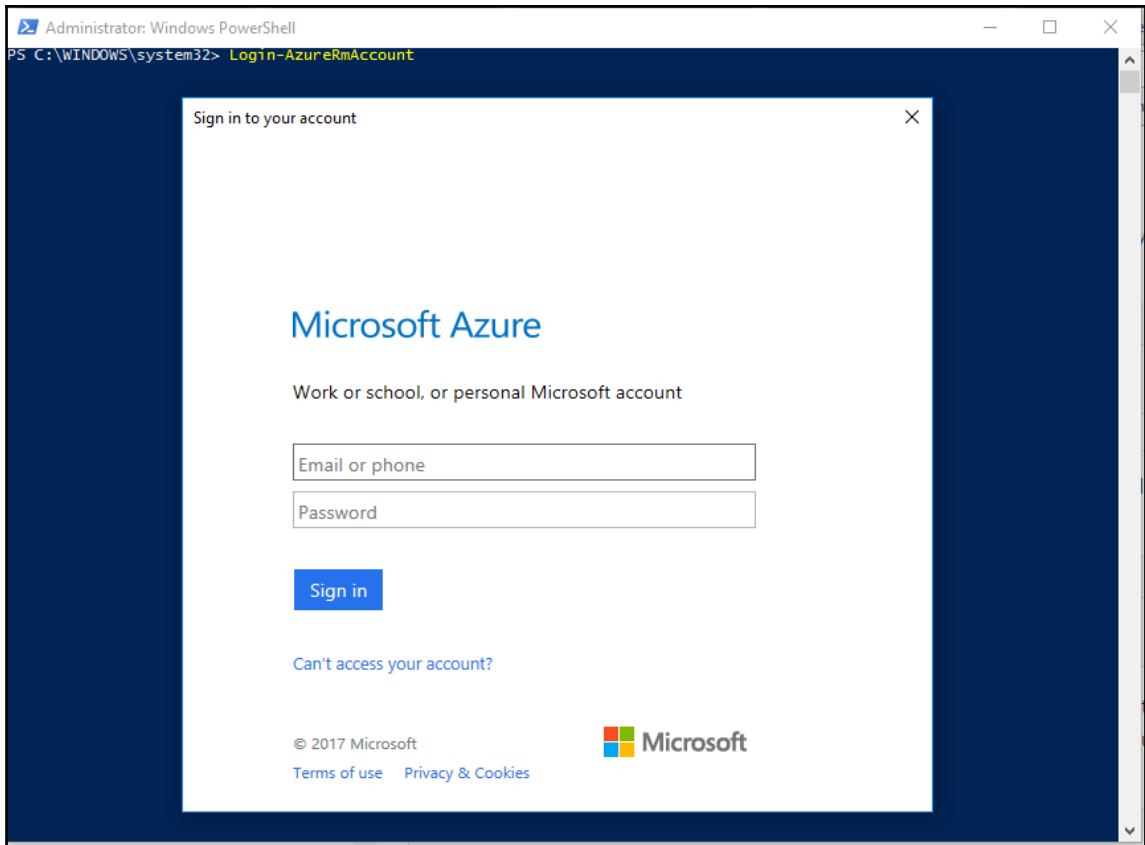
Cancel

Microsoft Azure Cross- platform Command Line Interface

You have signed in to the Microsoft Azure Cross-
platform Command Line Interface application on
your device. You may now close this window.

```
C:\WINDOWS\system32>azure account set "Visual Studio Enterprise"  
info:   Executing command account set  
info:   Setting subscription to "Visual Studio Enterprise" with id  
info:   Changes saved  
info:   account set command OK  
  
C:\WINDOWS\system32>
```





IoT Hub
pankaj.savientconsulting (Default Directory)

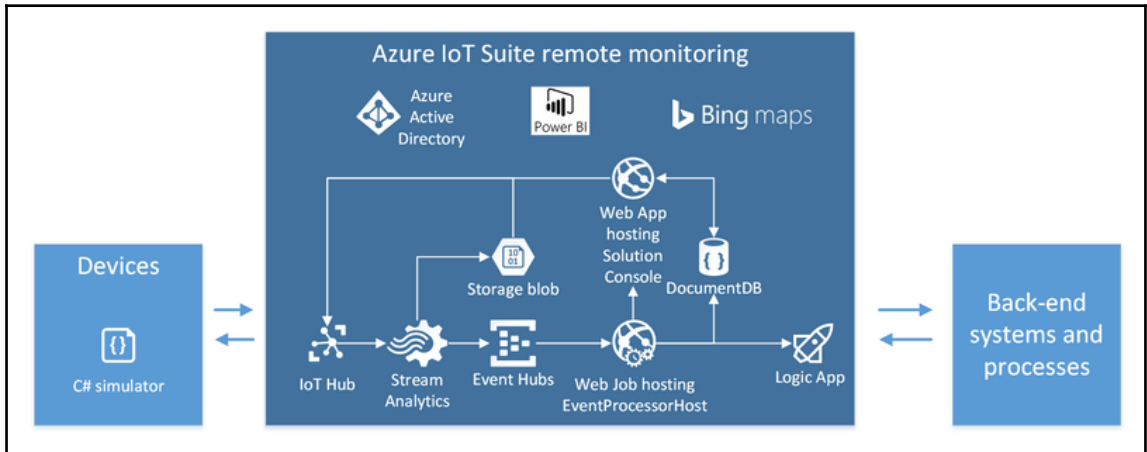
+ Add Columns Refresh

Subscriptions: Visual Studio Enterprise – Don't see a subscription? Switch directories

Filter by name... All locations No grouping

2 items

NAME	TYPE	RESOURCE GROUP	LOCATION	SUBSCRIPTION
IoTHubCookBook	IoT Hub	IoTHubCookBook	West US	Visual Studio Enterprise
MyBookIoTHub	IoT Hub	MyBookIoTHub	West US	Visual Studio Enterprise



```

Administrator: Windows PowerShell

PS C:\WINDOWS\system32> New-AzureRmIoTHub
>> -ResourceGroupName MyBookIoTHub
>> -Name MyBookIoTHub
>> -SkuName S1 -Units 1
>> -Location "West US"

Id      : /subscriptions/.../resourceGroups/MyBookIoTHub/providers/Microsoft.Devices/IotHubs/MyBookIoTHub
Name    : MyBookIoTHub
Type    : Microsoft.Devices/IotHubs
Location : West US
Tags    : {}
SubscriptionId : 3
Resourcegroup : MyBookIoTHub
Properties  : Microsoft.Azure.Commands.Management.IoTHub.Models.PSIoTHubProperties
Sku       : Microsoft.Azure.Commands.Management.IoTHub.Models.PSIoTHubSkuInfo

PS C:\WINDOWS\system32>
PS C:\WINDOWS\system32>
    
```

Products

Select a product to include it in your estimate.

- Featured
- Compute
- Networking
- Storage
- Web + Mobile
- Containers
- Databases
- Data + Analytics
- AI + Cognitive Services
- Internet of Things**
- Enterprise Integration

IoT Hub
Connect, monitor and control billions of IoT assets

Event Hubs
Receive telemetry from millions of devices

Stream Analytics
Real-time data stream processing from millions of IoT devices

Machine Learning
Easily build, deploy and manage predictive analytics solutions

Notification Hubs
Send push notifications to any platform from any back-end

Time Series Insights
Instantly explore and analyse time-series data

Your Estimate Expand all | Collapse all | Delete all

IoT Hub Free: 500 devices, 8,000 msgs/day, \$0.00/mo US\$0.00

IoT Hub

REGION:
East US

TIER:
Free: 500 devices, 8,000 msgs/day, US\$0.00/month

= US\$0.00

- Clone
- Delete

More info


- Pricing details
- Product details
- Documentation

TIER:

Free: 500 devices, 8,000 msgs/day, US\$0.00/month	▼
Free: 500 devices, 8,000 msgs/day, US\$0.00/month	
S1: Unlimited devices, 400,000 msgs/day, US\$50.00/month	
S2: Unlimited devices, 6,000,000 msgs/day, US\$500.00/month	
S3: Unlimited devices, 300,000,000 msgs/day, US\$5,000.00/month	

Your Estimate [Expand all](#) | [Collapse all](#) | [Delete all](#)

IoT Hub S1: Unlimited devices, 400,000 msgs/day, \$50.00/mo US\$100.00



IoT Hub

[Clone](#)
[Delete](#)

REGION:

TIER:

Units

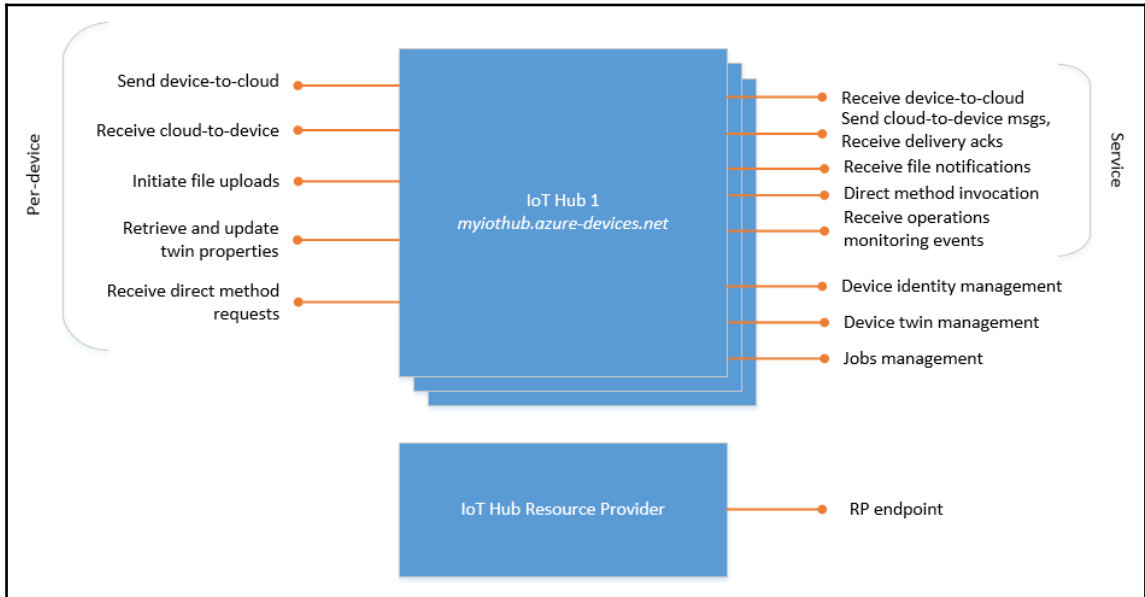
× **US\$50.00**
Per unit

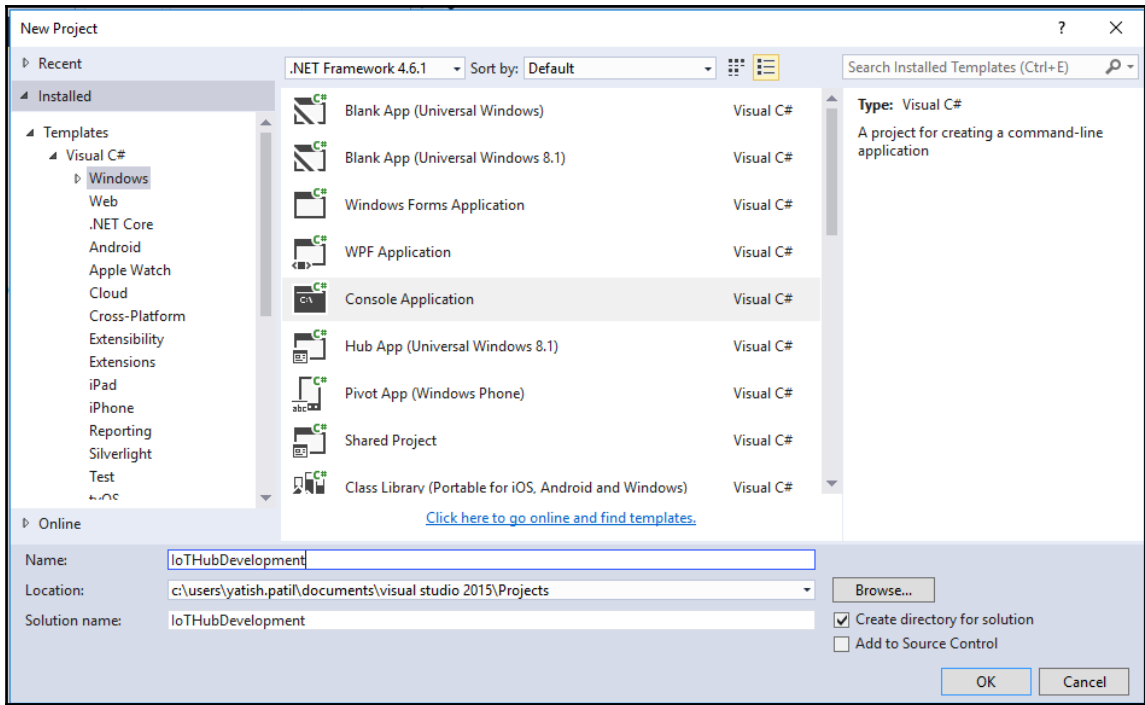
= **US\$100.00**

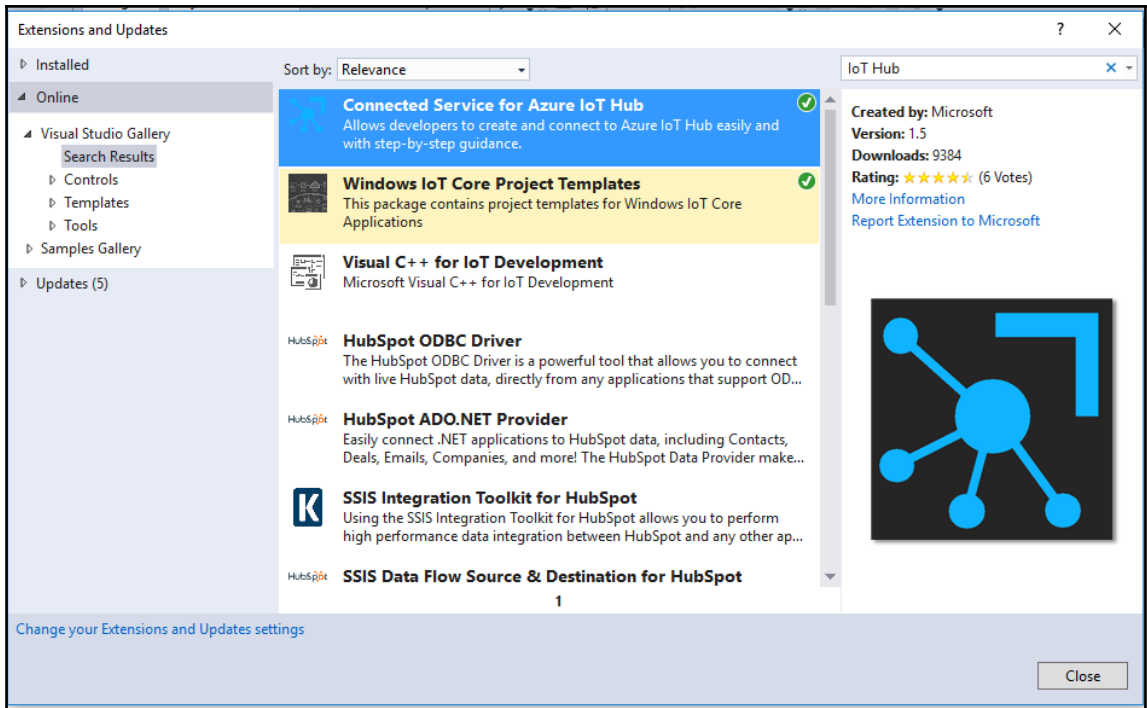
More info

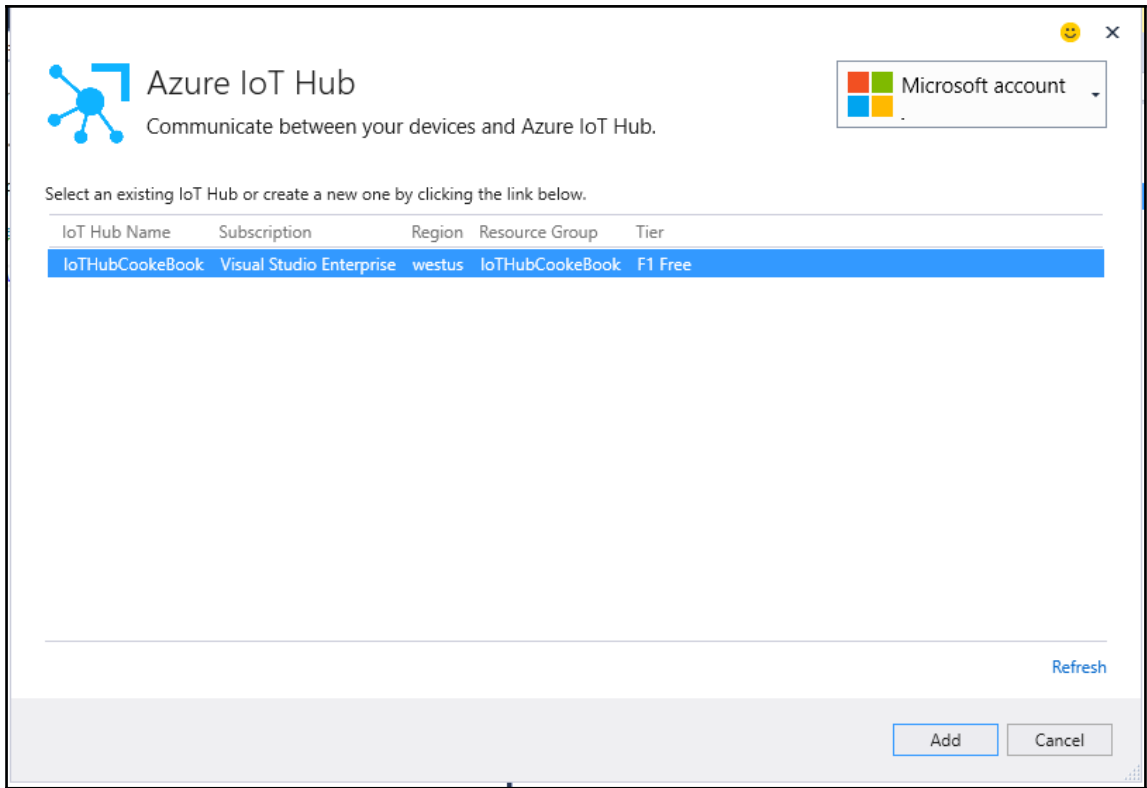
- [Pricing details](#)
- [Product details](#)
- [Documentation](#)

Chapter 2: Introducing Device Management





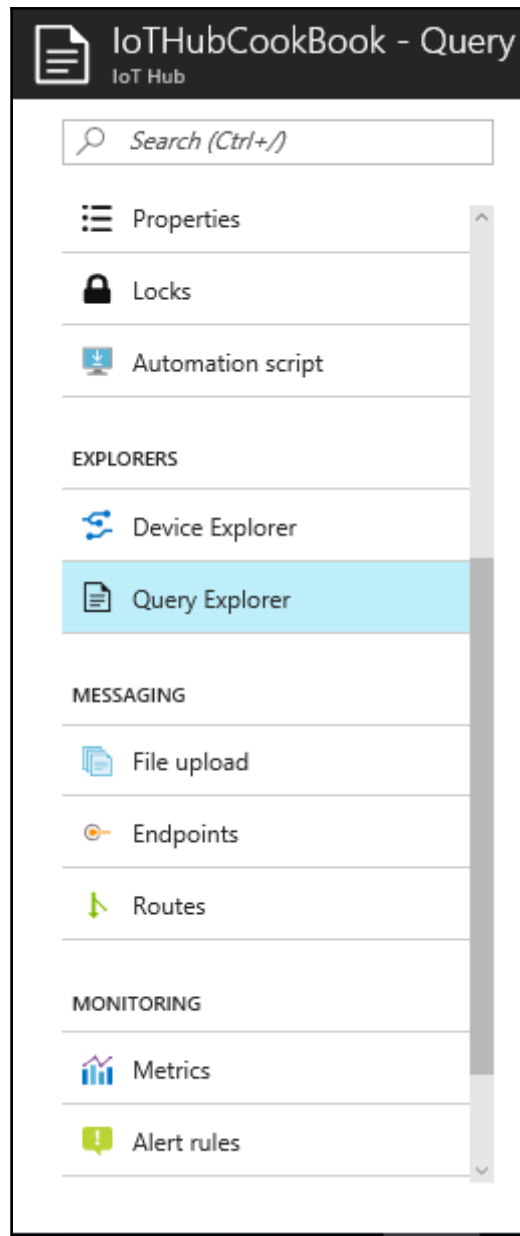






The screenshot shows the Azure IoT Hub management interface. At the top left is the Azure IoT Hub logo and the text "Azure IoT Hub" and "Communicate between your devices and Azure IoT Hub." At the top right is a Microsoft account dropdown menu. Below the header, there is a text prompt: "Select an existing IoT Hub or create a new one by clicking the link below." Underneath is a table with the following data:



IoT Hub Name	Subscription	Region	Resource Group	Tier
IoTHubCookeBook	Visual Studio Enterprise	westus	IoTHubCookeBook	F1 Free


At the bottom right of the table area is a "Refresh" link. At the bottom of the window are "Add" and "Cancel" buttons.



 You can use this tool to retrieve information regarding device twins and jobs, as well as message routing. 



Execute

Collections  Device Twin 

Items Per Page  Custom Unlimited

1000

```
1 SELECT * FROM c
```

Results  

SELECT * FROM c

→ Next Page

```
1 {
2   {
3     "deviceId": "myFirstDevice",
4     "etag": "AAAAAAAAAc=",
5     "tags": {
6       "location": {
7         "region": "US",
8         "plant": "Redmond43"
9       }
10    },
11   "properties": {
12     "desired": {
13       "deviceConfig": {
14         "configId": "6c59959f-fa17-443b-b6dc-5b58aa7f95c6",
15         "DeviceOwner": "yatish",
16         "latitude": "17.5122560",
17         "longitude": "70.7760470"
18       },
19       "$metadata": {
20         "$lastUpdated": "2017-05-15T16:59:43.5822168Z",
21         "$lastUpdatedVersion": 4,
22         "deviceConfig": {
23           "$lastUpdated": "2017-05-15T16:59:43.5822168Z",
24           "$lastUpdatedVersion": 4,
25           "configId": {
```

Chapter 3: IoT Hub Messaging and Commands

Create a new route ✕

[Learn more about setting up a route.](#)

* Name
 ✓

* Data source
 ▼

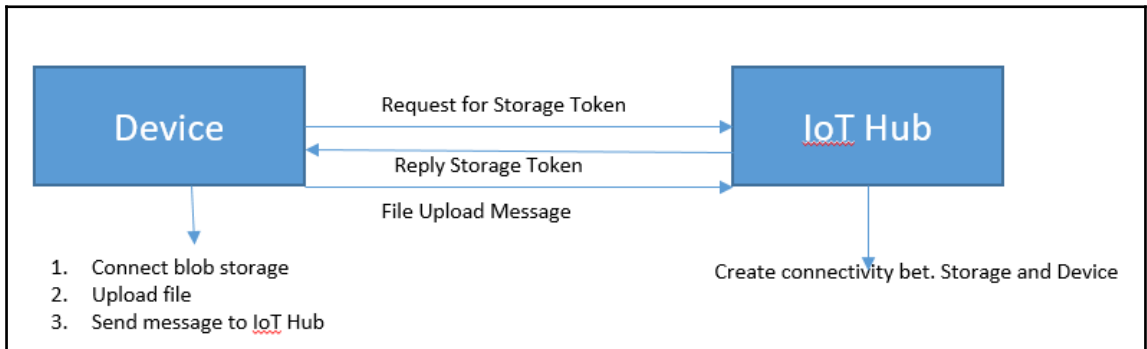
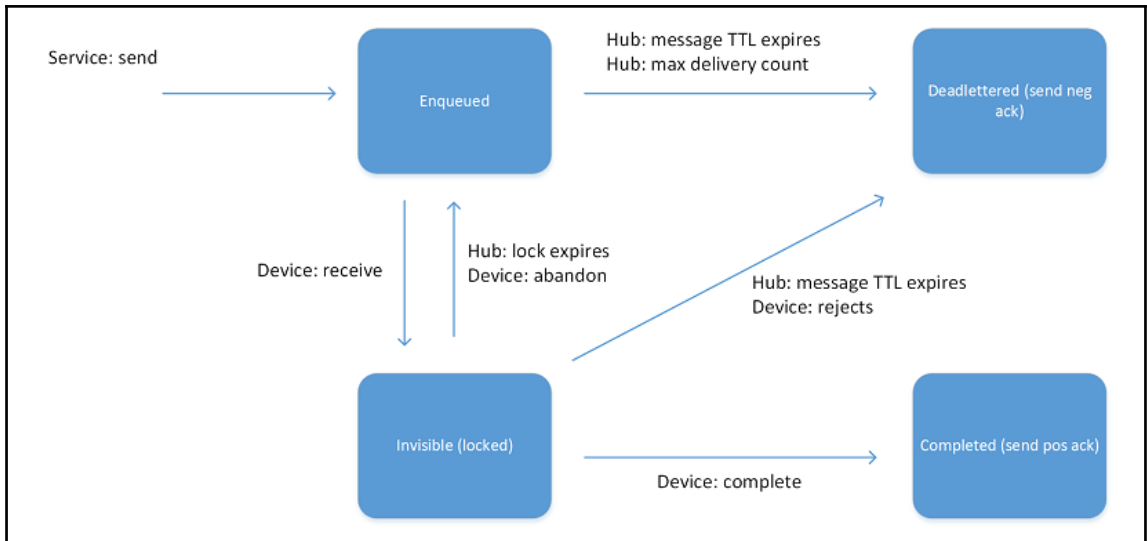
* Endpoint
 ▼

Enable Rule
 On Off

Query string ⓘ

```
1 DeviceStatus = 'Disabled'
```

Test the route (optional)



The screenshot shows a configuration interface with a left sidebar and a main content area. The sidebar contains a search bar and several menu items: IP Filter, Properties, Locks, Automation script, MESSAGING (with sub-items File upload, Endpoints, Routes), MONITORING (with sub-items Metrics, Alert rules), and SUPPORT + TROUBLESHOOTING (with sub-item New support request). The 'File upload' item is selected. The main content area has 'Save' and 'Discard' buttons at the top. Below them, the 'Storage container' is set to 'fileingestion'. A toggle for 'Receive notifications for uploaded files' is set to 'On'. There are three sliders: 'SAS TTL' is set to 1 hr, 'Default TTL' is set to 1 hr, and 'Maximum delivery count' is set to 10. The 'File notification settings' section is highlighted.

Search (Ctrl+/)

Save Discard

Storage container
fileingestion

Receive notifications for uploaded files ⓘ
Off On

SAS TTL ⓘ
1 hr


File notification settings

Default TTL ⓘ
1 hr

Maximum delivery count ⓘ
10

Chapter 4: Azure IoT Communication Protocols

AMQP Include prerelease

 **AMQPNetLite** by xinchen v1.2.3

This is a lightweight AMQP 1.0 library for .Net frameworks (including .Net Framework, .Net Micro Framework, .Net Compact Framework and .Net Core), WinRT (Windows Phone and Windows Store), and Mono. The library includes both a client and list...

Configuration Management **Data** Messages To Device Call Method on Device

Monitoring

Event Hub:

Device ID:

Start Time:

Consumer Group: Enable

Show system properties

Event Hub Data

```
2017-07-10 00:52:48> Device: [myFirstDevice], Data: [{"deviceId":"myFirstDevice","windSpeed":9.79529626564835,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data: [{"deviceId":"myFirstDevice","windSpeed":11.285766027535203,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data: [{"deviceId":"myFirstDevice","windSpeed":10.020043059261536,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data: [{"deviceId":"myFirstDevice","windSpeed":10.804629530201028,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data: [{"deviceId":"myFirstDevice","windSpeed":11.553908323661382,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","longitude":"70.7760470"}]
```

Configuration Management Data Messages To Device Call Method on Device

Send Message to Device:

IoT Hub:

Device ID:

Message:

Add Time Stamp Monitor Feedback Endpoint


Properties:

Key	Value
▶ Name	AMQP.Net Lite
*	

Output

Sent to Device ID: [myFirstDevice], Message:"2017-07-10 00:58:01 - amqp Sample", message Id: 74363257-b659-4bb0-ad9c-e49ca1a3cd32

```
file:///C:/Users/yatish.patil/documents/visual studio 2015/Projects/IoTHubDevelopment/SimulatedDevice/bin/Debug/SimulatedDevice.EXE
Simulated device
2017-07-10 00:58:01 - amqp Sample
```

 **M2Mqtt** by Paolo Patierno v4.3.0

M2Mqtt is a MQTT client available for all .Net platform (.Net Framework, .Net Compact Framework and .Net Micro Framework) and WinRT platform (Windows 8.1 and Windows Phone 8.1) for M2M communication.

Configuration Management **Data** Messages To Device Call Method on Device

Monitoring

Event Hub:

Device ID:

Start Time:

Consumer Group: Enable

Show system properties

Event Hub Data

```
2017-07-09 16:09:22> Device: [myFirstDevice], Data:["Yatish Completed"] Properties:
"telemetry": "
```

Configuration Management Data **Messages To Device** Call Method on Device

Send Message to Device:

IoT Hub:

Device ID:

Message:

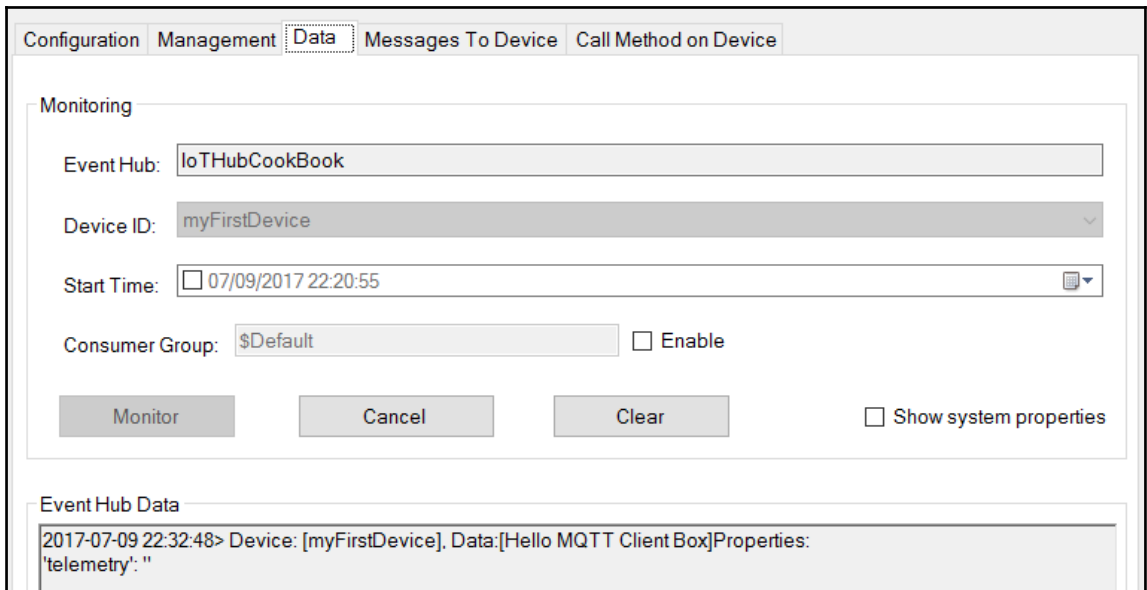
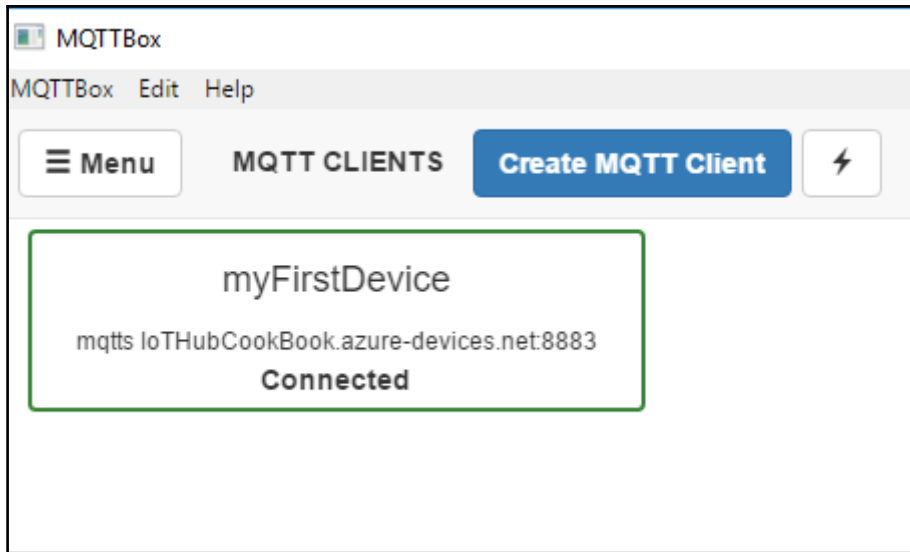
Add Time Stamp Monitor Feedback Endpoint

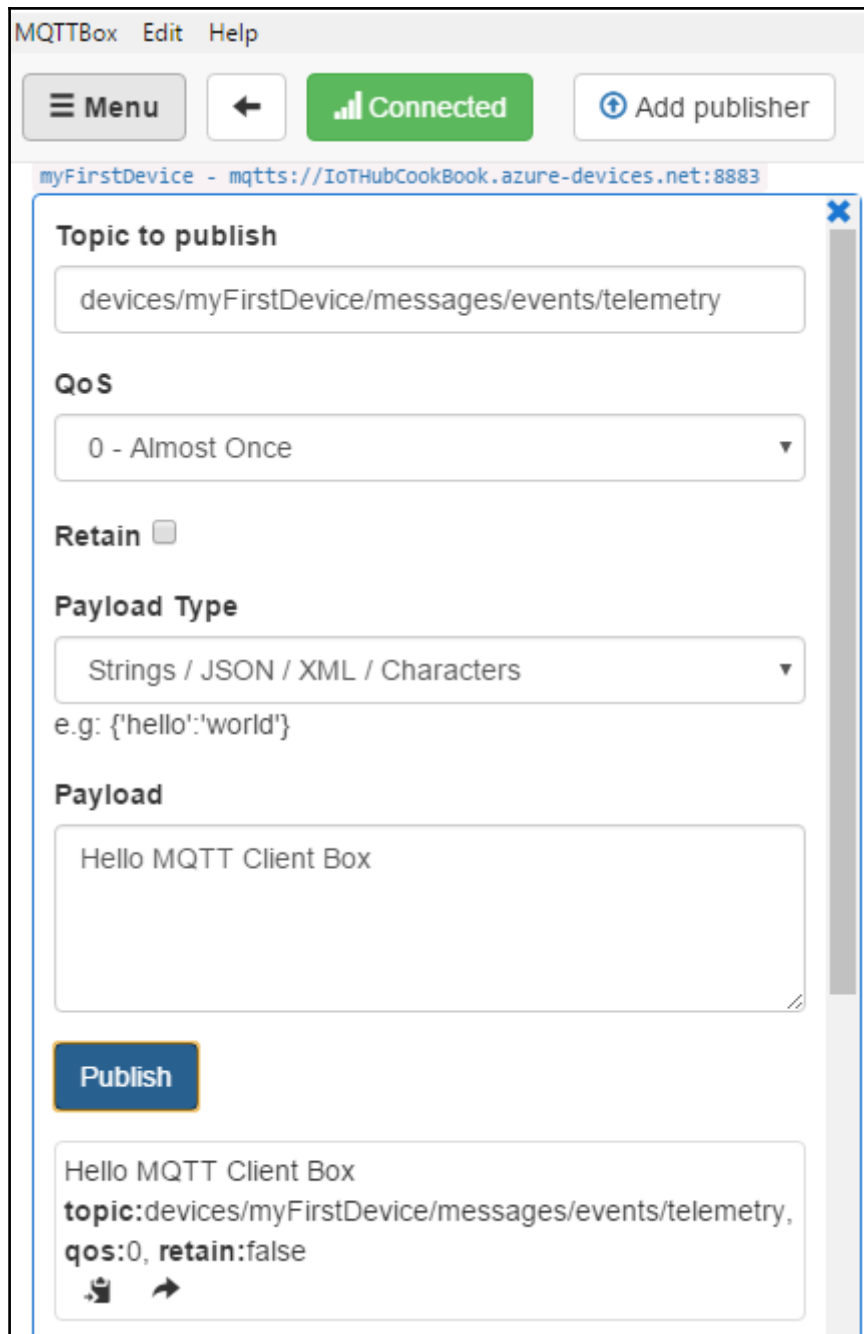
Properties:

Key	Value
Name	Yatish
*	

Output

```
Sent to Device ID: [myFirstDevice], Message:"2017-07-09 16:08:47 - yatish123", message Id: 5febfb6-20bd-4d70-8f41-ab96517093be
```





Topic to subscribe ✕

QoS

Configuration Management Data Messages To Device Call Method on Device

Send Message to Device:

IoT Hub:

Device ID:

Message:

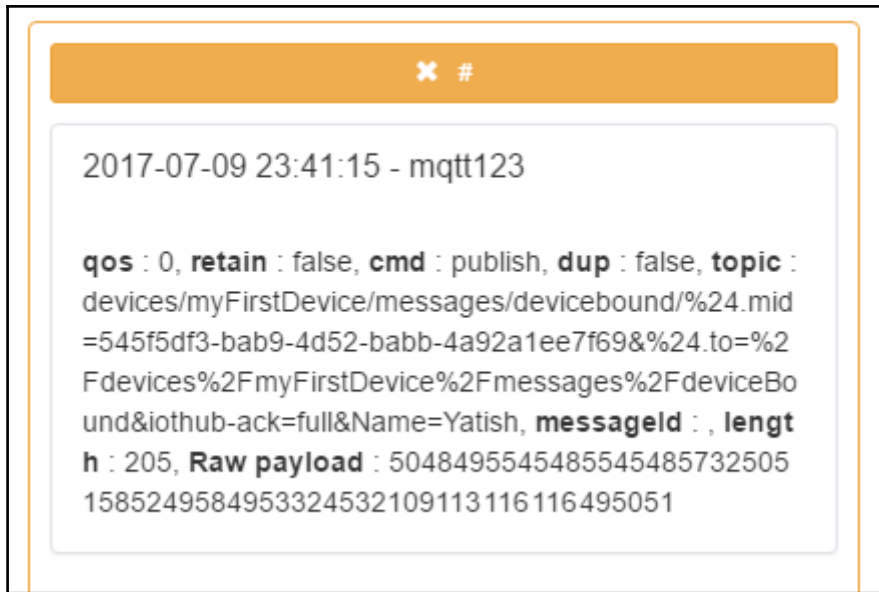
Add Time Stamp Monitor Feedback Endpoint

Properties:

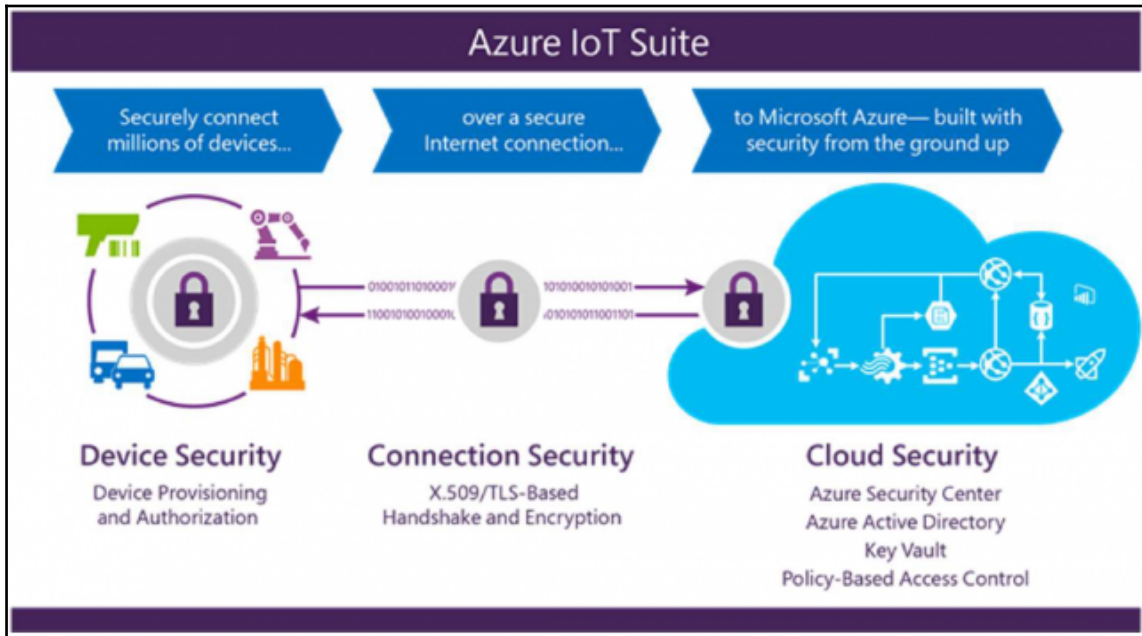
Key	Value
▶ Name	Yatish
*	

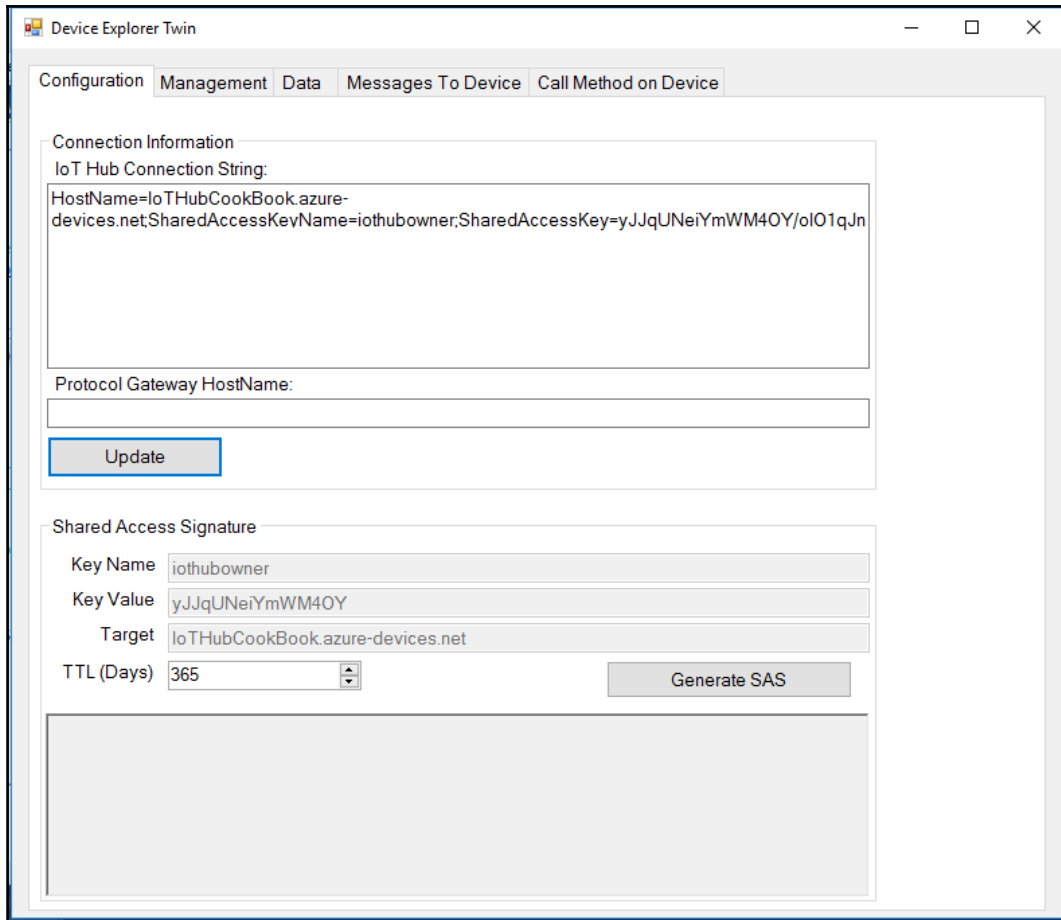
Output

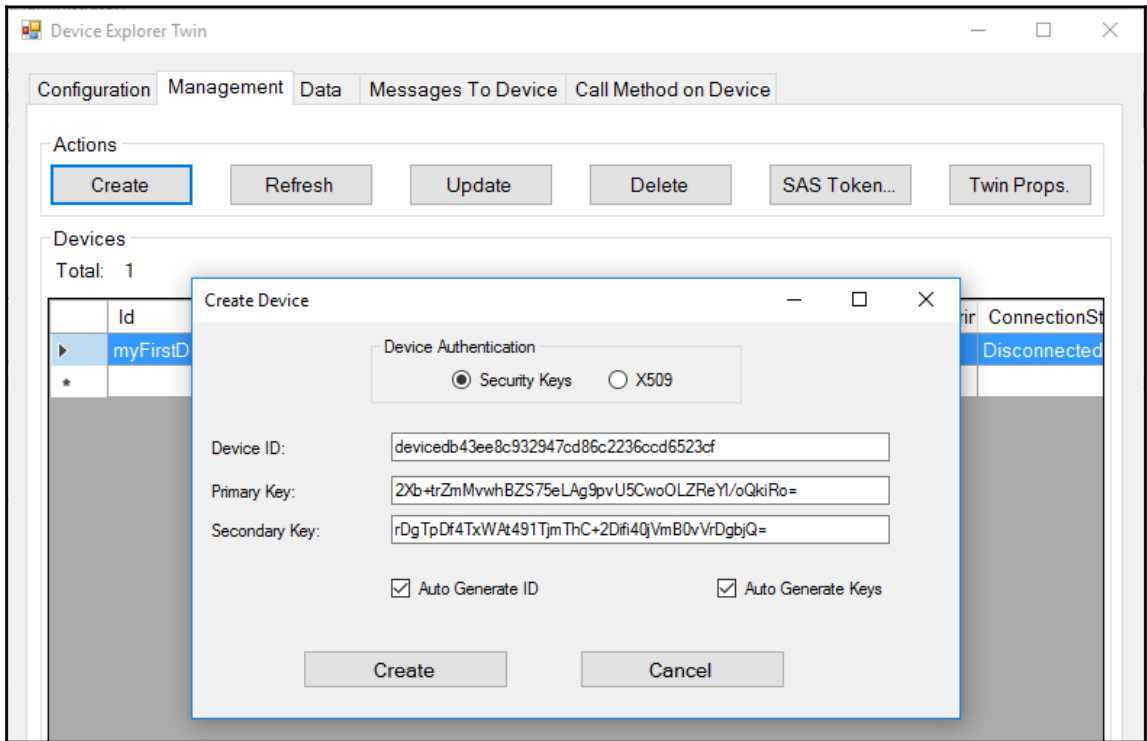
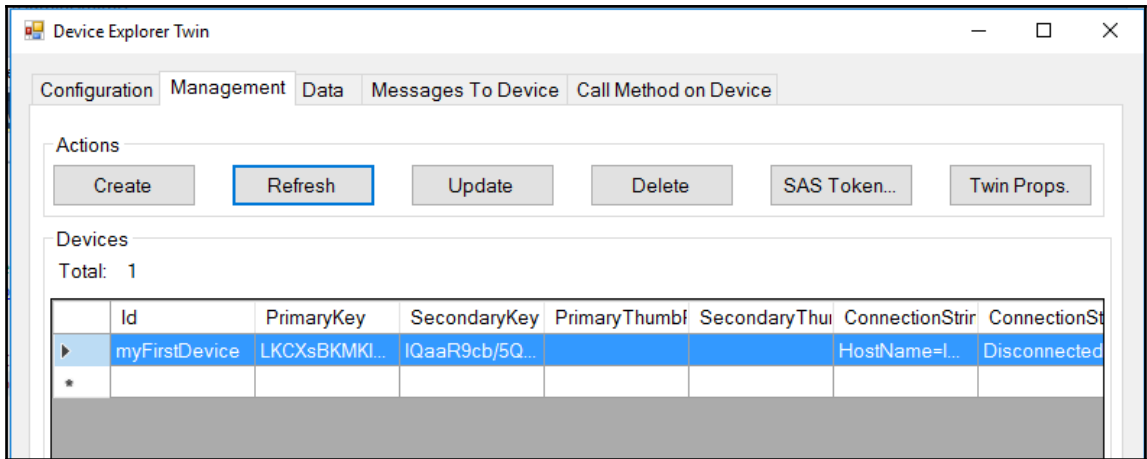
```
Sent to Device ID: [myFirstDevice], Message:"2017-07-09 23:41:15 - mqtt123", message Id: 545f5df3-bab9-4d52-babb-4a92a1ee7f69
```

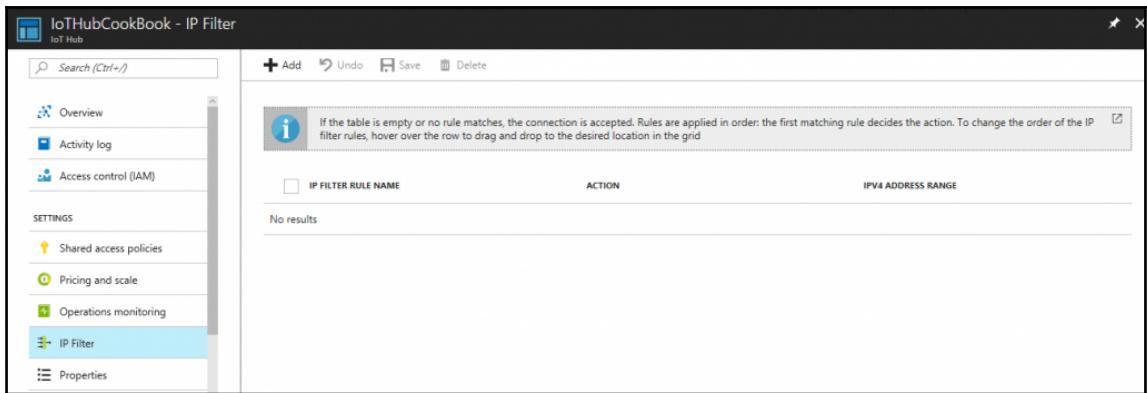
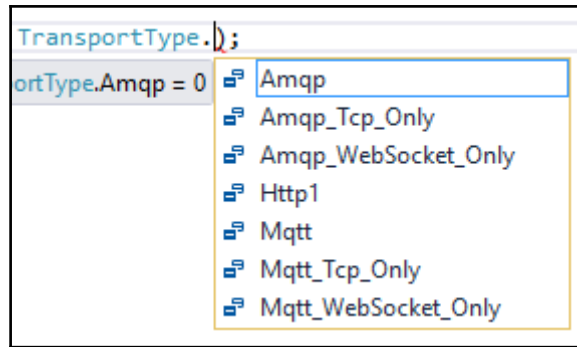


Chapter 5: Azure IoT Hub Security and Best Practices













IP Filter


IoTHubCookBook


 Here you can specify a range of IP addresses that will be accepted or rejected by the IoT Hub


* IP Filter Rule Name 

Office 

Action 


Reject 

* IPv4 Address Range 


202.108.1.1/24 

Effectuated IP range

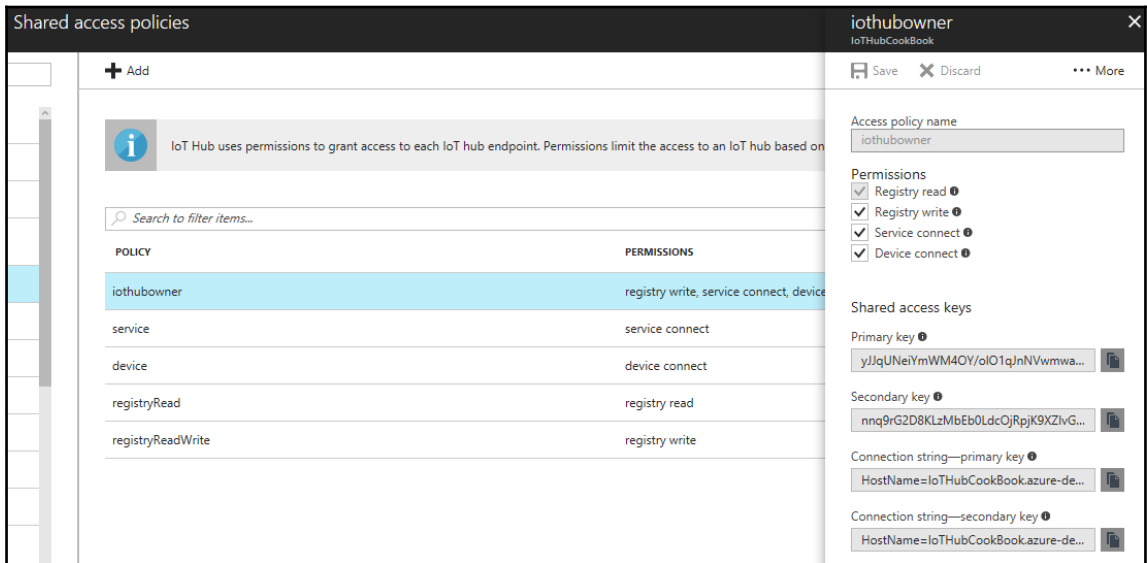
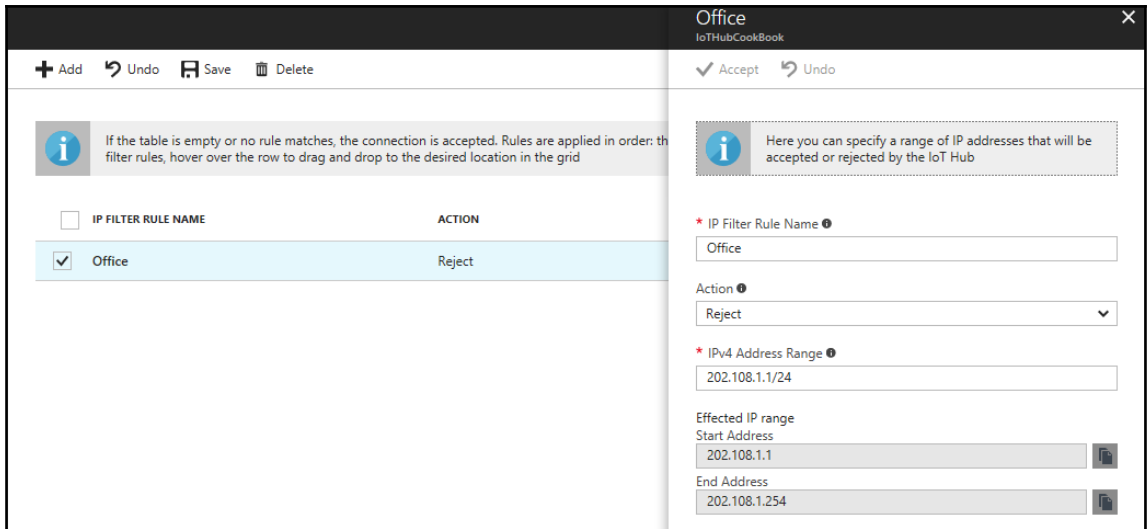
Start Address

202.108.1.1 

End Address

202.108.1.254 

Create



Add a shared access policy ✕

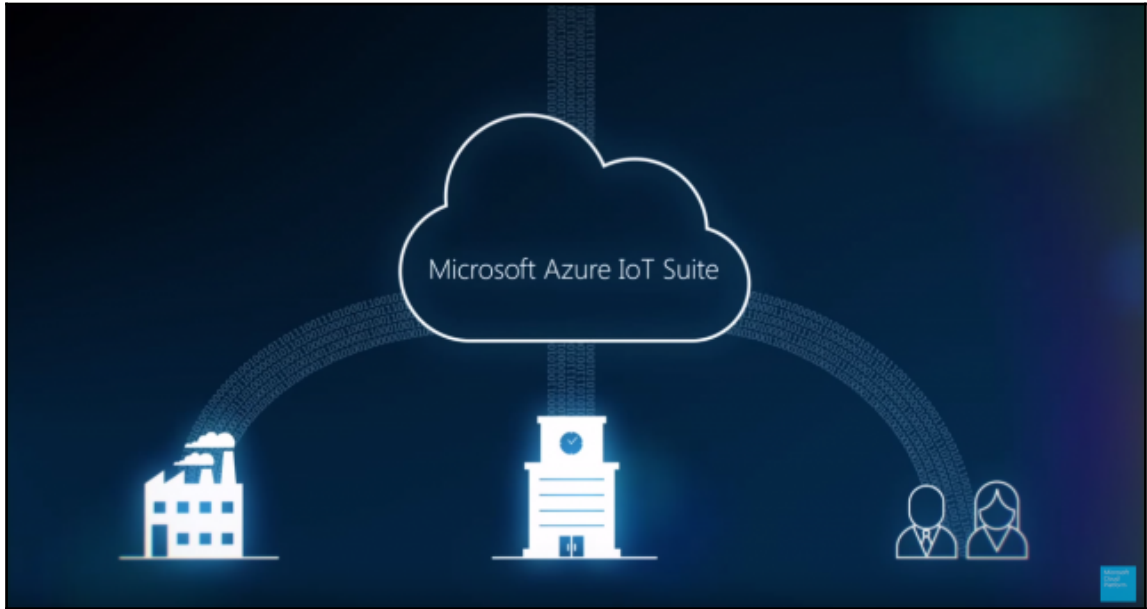
IoTHubCookBook

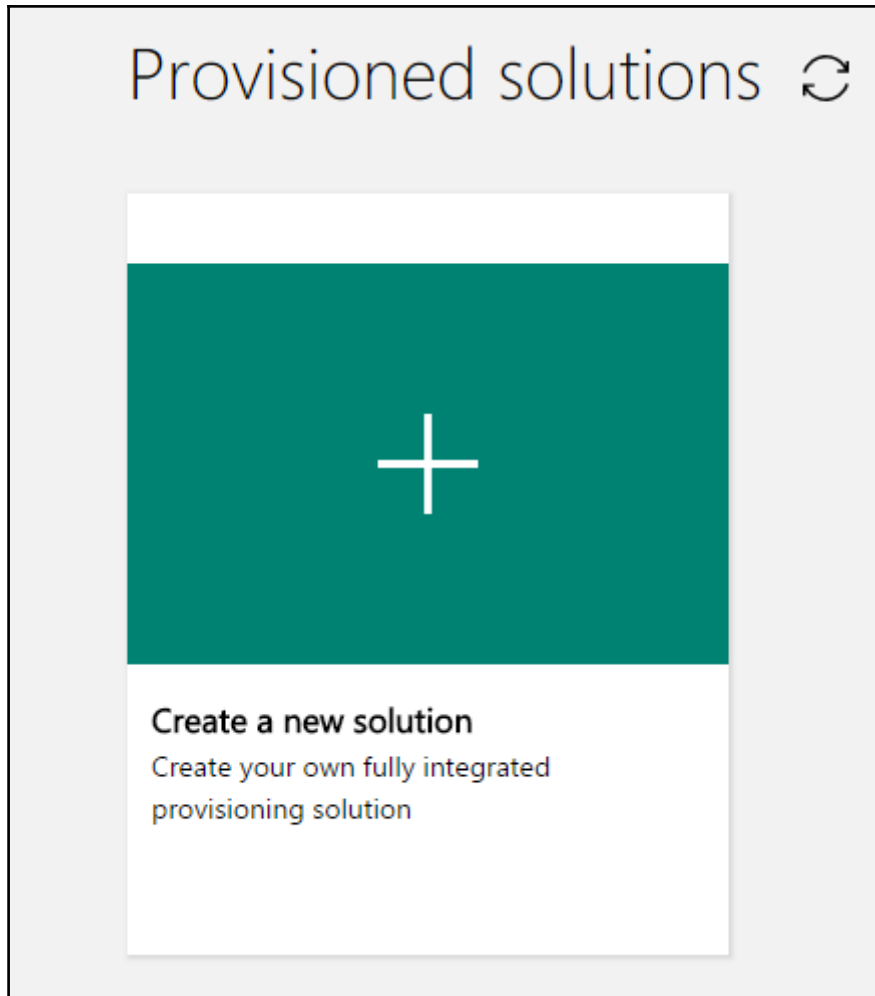
* Access policy name

Permissions

- Registry read ⓘ
- Registry write ⓘ
- Service connect ⓘ
- Device connect ⓘ

Chapter 6: IoT Suite and Pre-Configured Solutions





Solution types



Remote monitoring

Connect and monitor your devices to analyze untapped data and improve business outcomes by automating processes.

Select



Connected factory

Accelerate your journey to Industrie 4.0 – connect, monitor and control industrial devices for insights using OPC UA to drive operational productivity and profitability.


Select




Predictive maintenance

Anticipate maintenance needs and avoid unscheduled downtime by connecting and monitoring your devices for predictive maintenance.

Select



Provisioning...



ConnectedFactory-IoTCookbook
Connect, monitor and control industrial devices using OPC UA.

Details

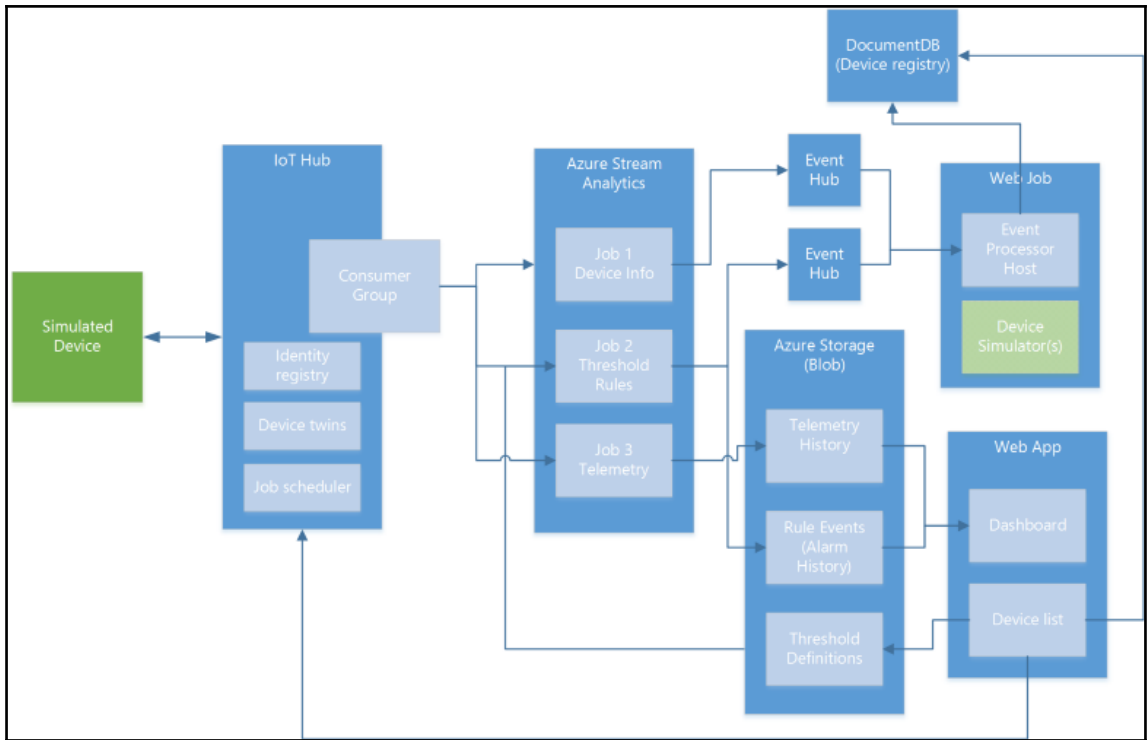
ConnectedFactory-IoTCookbook

- Provisioning

Provisioning your **Connected factory** solution, in **West Europe** region.

Provisioning states

- lotPortal
microsoft.resources/deployments
- connectedfactory-iotcookbookb1616
Microsoft.Devices/Iothubs
- ConnectedFactory-IoTCookbook/DockerExtension
Microsoft.Compute/virtualMachines/extensions
- ✓ ConnectedFactory-IoTCookbook
microsoft.activedirectory/applications
- ✓ ConnectedFa5leibqkup4wtk
Microsoft.KeyVault/vaults
- ✓ ConnectedFa5leibqkup4wtk/UAWebClient-VM
Microsoft.KeyVault/vaults/secrets
- ✓ ConnectedFa5leibqkup4wtk/UAWebClient-Website
Microsoft.KeyVault/vaults/secrets
- ✓ connectedfactoryiotcookb
Microsoft.Storage/storageAccounts
- ✓ ConnectedFactory-IoTCookbook
Microsoft.Network/networkSecurityGroups
- ✓ ConnectedFactory-IoTCookbook
Microsoft.Network/virtualNetworks
- ✓ ConnectedFactory-IoTCookbook
Microsoft.Network/networkInterfaces



Solution types



Remote monitoring

Connect and monitor your devices to analyze untapped data and improve business outcomes by automating processes.

Select



Connected factory

Accelerate your journey to Industrie 4.0 – connect, monitor and control industrial devices for insights using OPC UA to drive operational productivity and profitability.

Select



Predictive maintenance

Anticipate maintenance needs and avoid unscheduled downtime by connecting and monitoring your devices for predictive maintenance.

Select

Create Remote monitoring solution

Solution details


Creating a solution will result in the following Azure services being provisioned in your Azure subscription at cost:

- 1 Azure Active Directory application
- 1 IoT Hub (S2 - Standard tier)
- 1 DocumentDB Account (S1)
- 2 Event Hubs (Basic throughput unit)
- 1 Storage account (Standard-GRS)
- 3 Stream Analytics jobs (1 streaming unit per job)
- 1 Azure App Service Web App for Website (P1 - Premium: 2 small)
- 1 Azure App Service Web App for Web jobs (S1 - Standard: 2 small) running 25 simulated devices by default


Pricing information for these services can be found [here](#). Usage amounts and billing details for your subscription can be found in the [Azure Portal](#).

In addition to the above Azure services, creating a solution will result in your being signed up for a subscription to the following Azure Marketplace offering(s), which are subject to the following terms:

[Bing Maps API for Enterprise \(Internal Website Transactions Level 1\): terms of use and privacy statement.](#)

Solution name 

RemotemonitoringIoTCookBook

Subscription 


Visual Studio Enterprise – MPN

To continue creation, click Accept below. Your solution will have a static map. To add an interactive map, follow guidance in our [FAQ](#).


I Accept.

Region 

West US









RemoteMonitoringIoTCookBook

 Provisioning

Provisioning your **Remote monitoring** solution, in **West US** region.

Provisioning states

-  **lotPortal**
microsoft.resources/deployments
-  **remotemonitoringiotcookb**
Microsoft.Storage/storageAccounts
-  **remotemonitoringiotcookbook**
Microsoft.Eventhub/namespaces
-  **remotemonitoringiot35aab**
Microsoft.DocumentDb/databaseAccounts
-  **remotemonitoringiotcookbook4a032**
Microsoft.Devices/Iothubs
-  **RemoteMonitoringIoTCookBook**
microsoft.activedirectory/applications

Provisioning log

07/24/2017 10:51 pm
Starting resource deployment...

✕

RemoteMonitoringIoTCookBook

✓ Ready

See your pre-configured solution running here:

[Solution dashboard](#)

Region

West US

Subscription ID

Modify your solution

See the provisioned Azure resources that make-up your pre-configured solution in the [Azure Management Portal](#).

View the Source Code for this Pre-Configured Solution on [GitHub](#).

Microsoft Azure IoT Suite - Remote Monitoring Solution ADMINISTRATOR

DASHBOARD

DEVICES

RULES

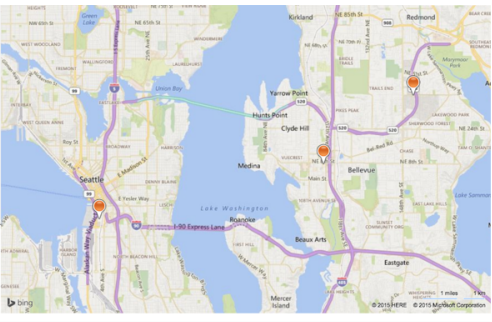
ACTIONS

MANAGEMENT JOBS

ADVANCED

+

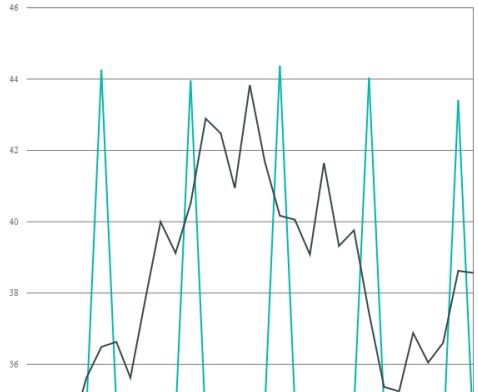
ADD A DEVICE



Device to View: CoolingSampleDevice007_171

Telemetry History

● Temperature ● Humidity



Alarm History

LOCAL TIME	DEVICE ID	RULE OUTPUT	VALUE
07/24/2017 11:07:23 PM	CoolingSampleDevice003_171	AlarmTemp	70.21
07/24/2017 11:07:23 PM	CoolingSampleDevice005_171	AlarmTemp	70.81

All Devices (26) COLUMN EDITOR JOB SCHEDULER

ICON	STATUS	DEVICE ID	MANUFACTURER	FIRMWARE	BUILDING	TEMPERATURE	FWSTATUS
	● Running	CoolingSampleDevice001_171	Contoso Inc.	1.6	Building 40	70	
	● Running	CoolingSampleDevice002_171	Contoso Inc.	1.4	Building 40	70	
	● Running	CoolingSampleDevice003_171	Contoso Inc.	1.8	Building 40	70	
	● Running	CoolingSampleDevice004_171	Contoso Inc.	1.13	Building 43	70	
	● Running	CoolingSampleDevice005_171	Contoso Inc.	1.14	Building 43	70	
	● Running	CoolingSampleDevice006_171	Contoso Inc.	1.8	Building 40	34.5	
	● Running	CoolingSampleDevice007_171	Contoso Inc.	1.2	Building 40	34.5	
	● Running	CoolingSampleDevice008_171	Contoso Inc.	1.7	Building 40	34.5	

> SCHEDULE JOB

JOB NAME

NewJob 2017-07-24 ×

DESIRED PROPERTIES

DESIRED PROPERTY NAME	VALUE	DATA TYPE	DELETE ⓘ
<i>desired.sampleprop</i>		String ▼	<input type="checkbox"/>

TAGS

TAG NAME	VALUE	DATA TYPE	DELETE ⓘ
<i>tags.sampletag</i>		String ▼	<input type="checkbox"/>


JOB TIME

START TIME

July 24, 2017 11:13 PM ▼

MAXIMUM EXECUTION TIME ⓘ Mins

> DEVICE DETAILS



- [Disable Device](#)
- [Add Rule...](#)
- [Commands](#)
- [Methods](#)

Device Twin ⓘ [Download](#)

- > Tags [Edit](#)
- > Desired Properties [Edit](#)
- > Reported Properties

> **Device Properties**

∨ **Recent Jobs**

No Jobs

Rules (50)						
STATUS	RULE ID	DEVICE ID	DATA FIELD	OPERATOR	THRESHOLD	RULE OUTPUT
● Enabled	65c510a7-4a40-489c-8cc3-40a14cdbdacd	CoolingSampleDevice001_171	Temperature	>	60.00	AlarmTemp
● Enabled	f43700f9-25b3-44e0-9873-28718d9e2d21	CoolingSampleDevice001_171	Humidity	>	48.00	AlarmHumidity
● Enabled	9333fb9c-2d0a-47d0-aa41-4e14b7616880	CoolingSampleDevice002_171	Temperature	>	60.00	AlarmTemp
● Enabled	da72c646-0501-4c61-8f72-368a2e4718b8	CoolingSampleDevice002_171	Humidity	>	48.00	AlarmHumidity
● Enabled	173a00fa-96f0-437e-9ad5-466116295b3b	CoolingSampleDevice003_171	Humidity	>	48.00	AlarmHumidity
● Enabled	22c83302-3635-43e5-acb6-2850e821bb31	CoolingSampleDevice003_171	Temperature	>	60.00	AlarmTemp
● Enabled	75ba2a75-c4e4-402f-b55c-90571dd2049c	CoolingSampleDevice004_171	Temperature	>	60.00	AlarmTemp
● Enabled	c403a2fd-1b6e-4d85-adab-074c4a176941	CoolingSampleDevice004_171	Humidity	>	48.00	AlarmHumidity

> Properties

Device Properties

Device ID
CoolingSampleDevice001_171

Rule Status

[Disable Rule](#)

Rule Properties [Edit](#)

Data Field
Temperature

Operator
>

Threshold
60

Rule Output
AlarmTemp

← ADD A DEVICE
STEP 1 of 3

Simulated Device

Software to simulate a device. Easily extensible for arbitrary events and commands; can run in a Windows Azure worker role. To create a simulated device, please follow the cooler sample instructions.

Add New

Custom Device

A physical hardware device.

Add New

Solution dashboard

Region

West US

Subscription ID

Modify your solution

See the provisioned Azure resources that make-up your pre-configured solution in the [Azure Management Portal](#).

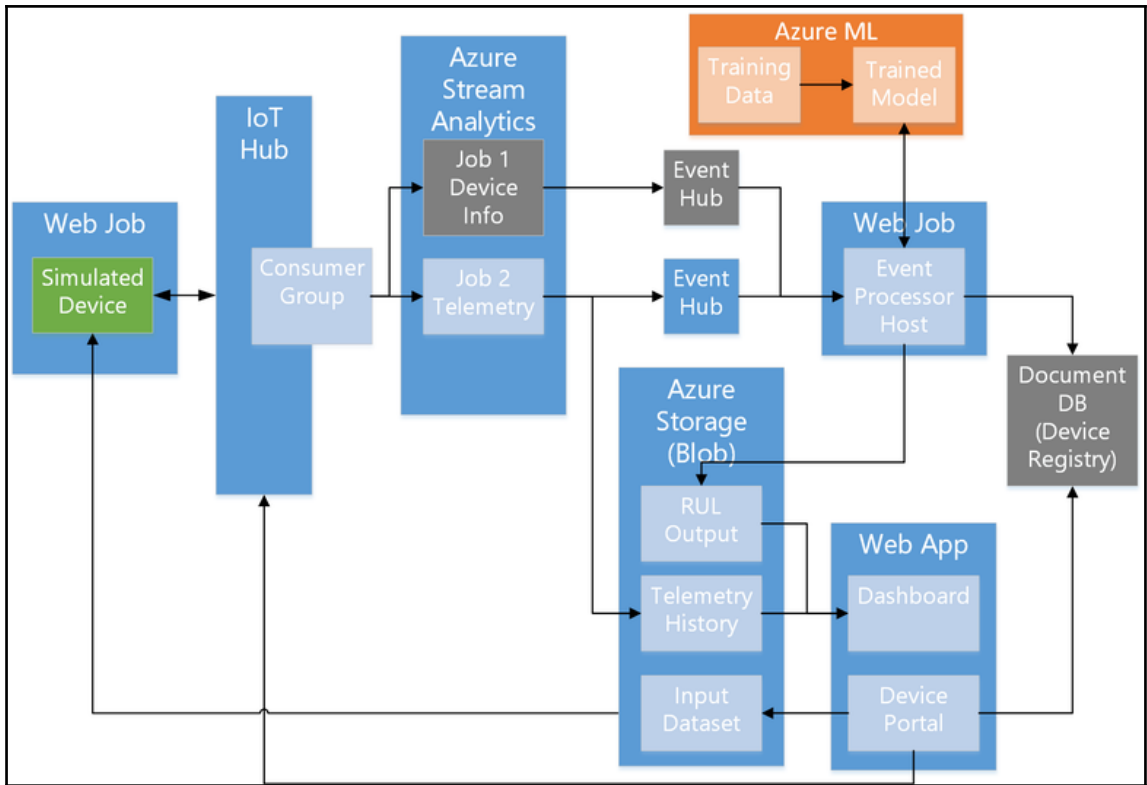
View the Source Code for this Pre-Configured Solution on [GitHub](#).

Resources

[Developer documentation](#)

Actions

Delete Solution



Solution types



Remote monitoring

Connect and monitor your devices to analyze untapped data and improve business outcomes by automating processes.

Select



Connected factory

Accelerate your journey to Industrie 4.0 – connect, monitor and control industrial devices for insights using OPC UA to drive operational productivity and profitability.

Select



Predictive maintenance

Anticipate maintenance needs and avoid unscheduled downtime by connecting and monitoring your devices for predictive maintenance.

Select

Create Predictive maintenance solution

Solution details

Creating a solution will result in the following Azure services being provisioned in your Azure subscription at cost:

- 1 Azure Active Directory application
- 1 IoT Hub (S2 - Standard tier)
- 1 Event Hub (Basic throughput unit)
- 2 Storage accounts (Standard-GRS)
- 1 Stream Analytics job (1 streaming unit)
- 1 App service plans (S1 - Standard: 2 small)
- 1 App service plan (P1 - Premium: 2 small)
- 1 Web app (included in App Service plan)
- 1 Azure App Service Web App for Website (P1 - Premium: 2 small)
- 1 Azure App Service Web App for Web jobs (S1 - Standard: 2 small)

Pricing information for these services can be found [here](#). Usage amounts and billing details for your subscription can be found in the [Azure Portal](#).


Solution name

Subscription


Region

Create solution

Cancel








PredictiveMaintenanceloTcookbook

 Provisioning

Provisioning your **Predictive maintenance** solution, in **West US** region.

Provisioning states

-  **lotPortal**
microsoft.resources/deployments
-  **PredictiveMaintenanceloTcookbook**
microsoft.machinelearning/workspaces
-  **PredictiveMaintenanceloTcookbook**
microsoft.activedirectory/applications
-  **predictivemaintenanceiot**
microsoft.storage/storageaccounts
-  **mlpredictivemaintenancei**
microsoft.storage/storageaccounts

Provisioning log

07/25/2017 02:40 am
Provision Machine Learning:Running:Creating
webservice for Machine Learning workspace
'PredictiveMaintenanceloTcookbook'

✕

PredictiveMaintenanceIoTcookbook

✔ Ready

See your pre-configured solution running here:

[Solution dashboard](#)

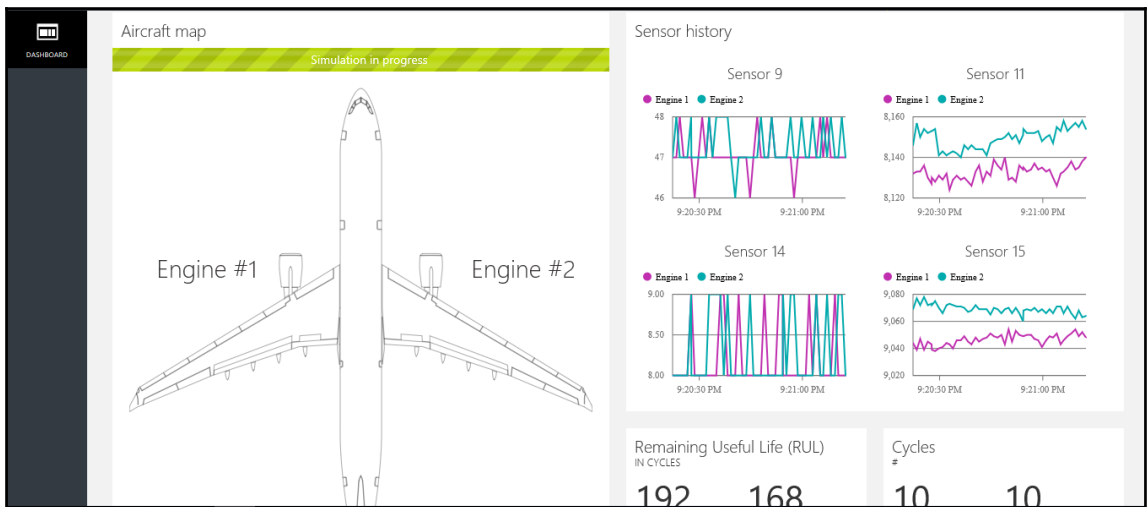
[ML Workspace](#)

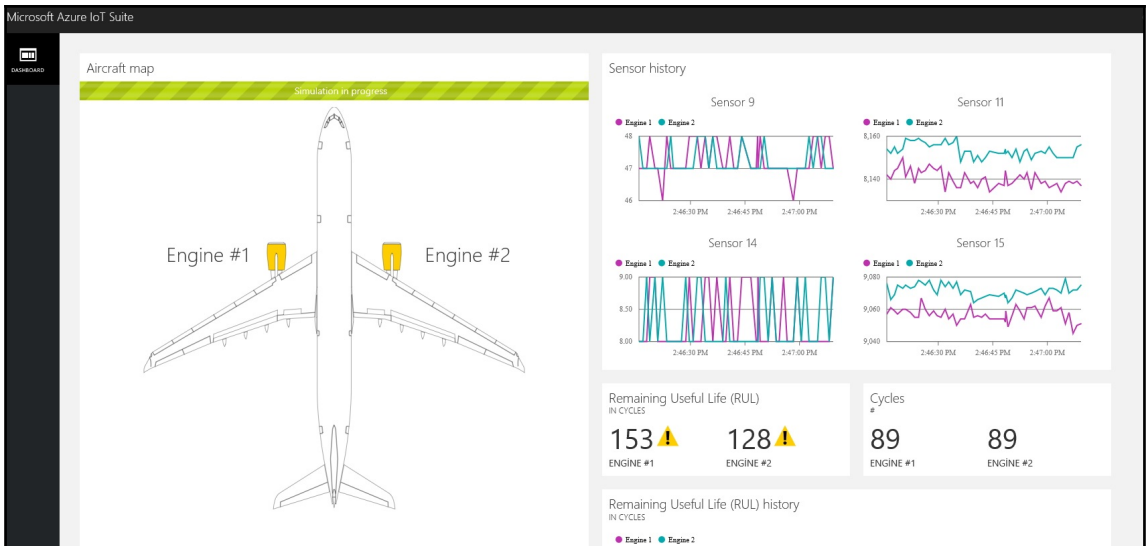
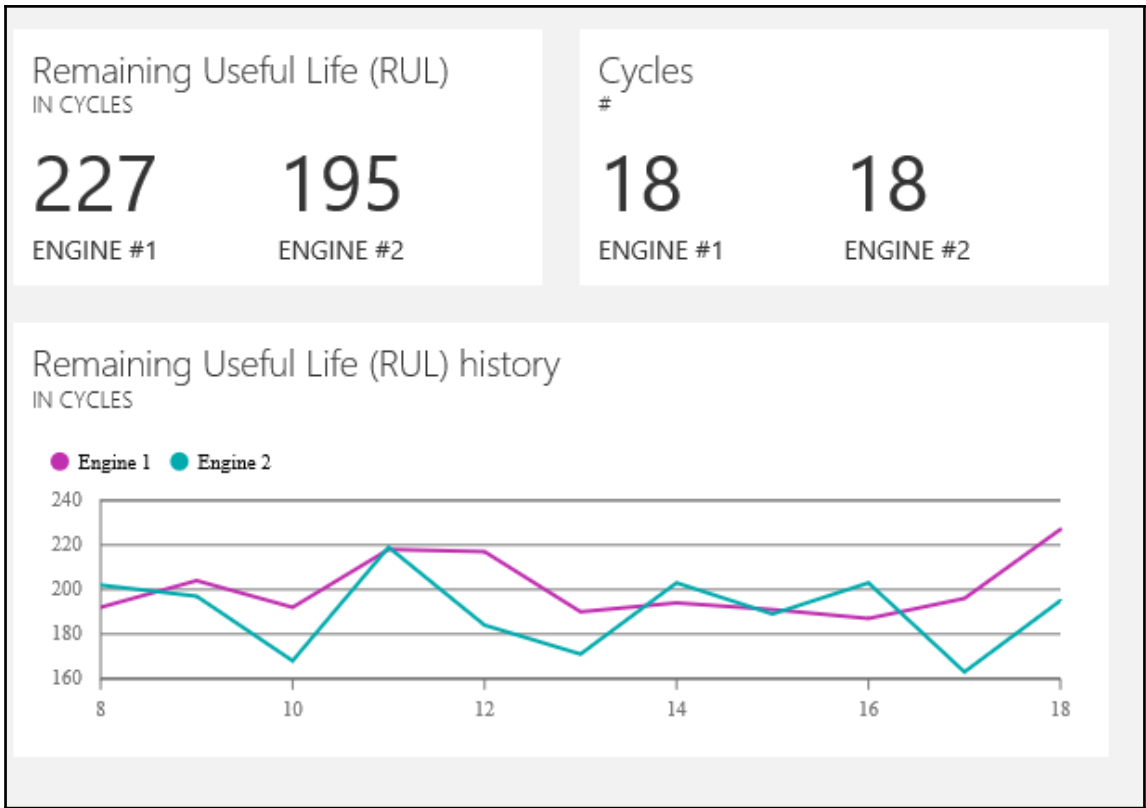
[Cortana Analytics Gallery: Predictive Maintenance Template](#)

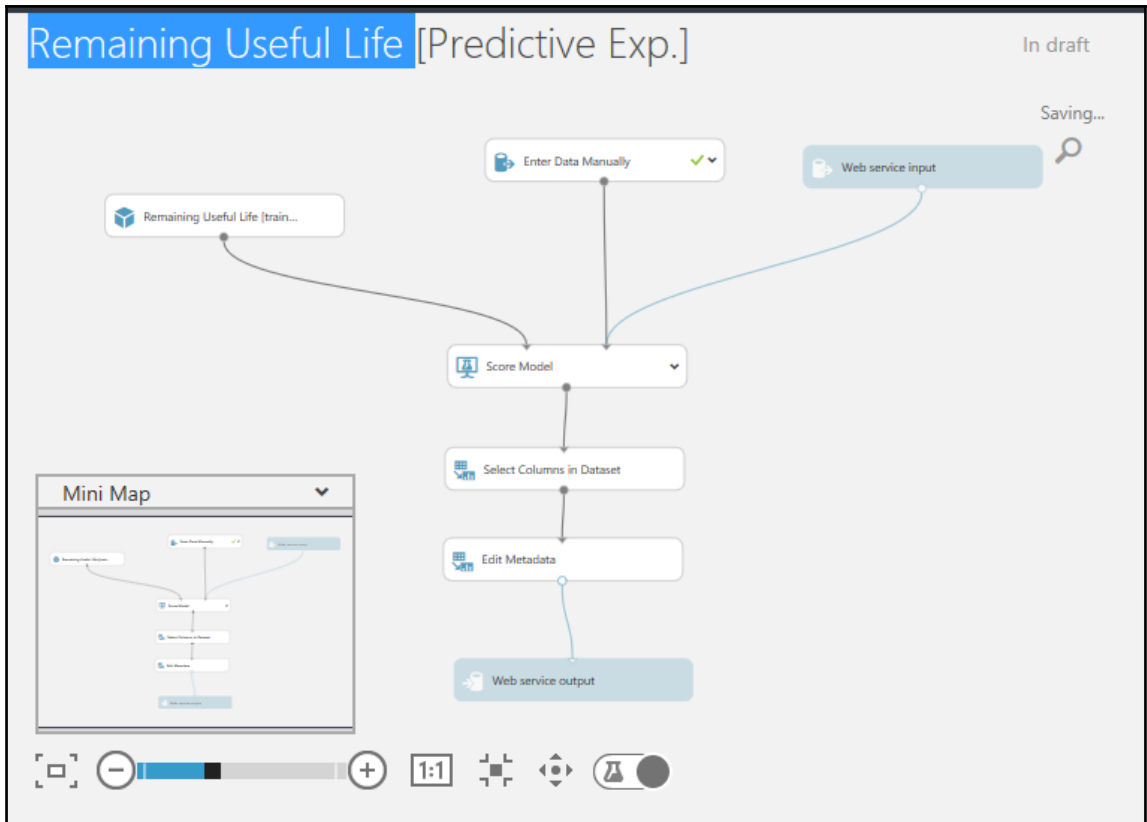
[Remaining Useful Life API Help](#)

Region

West US







Modify your solution

See the provisioned Azure resources that make-up your pre-configured solution in the [Azure Management Portal](#).

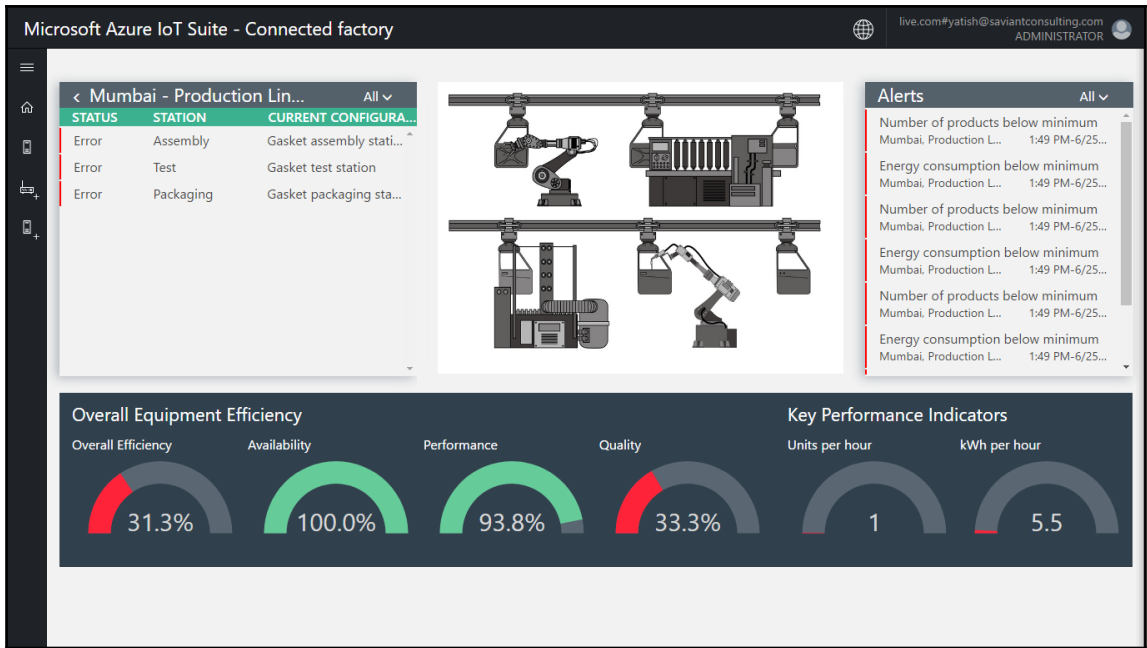
View the Source Code for this Pre-Configured Solution on [GitHub](#).

Resources

[Developer documentation](#)

Actions

Delete Solution



Alert details ×

Description:
Number of products below minimum

Time:
1:49 PM-6/25/2017

Location:
Mumbai, Production Line 1, Assembly

Occurrences:
8

Click on graph to explore in Azure Time Series Insights

LAST HOUR

Last hour (minutes)

Choose action:

Acknowledge alert ▾

Execute action

Filter ×

Alert cause

All
Energy consumption below minimum
Value above maximum
Number of products below minimum
Value below minimum

Station

All ▼

Solution types



Remote monitoring

Connect and monitor your devices to analyze untapped data and improve business outcomes by automating processes.

Select



Connected factory

Accelerate your journey to Industrie 4.0 – connect, monitor and control industrial devices for insights using OPC UA to drive operational productivity and profitability.

Select



Predictive maintenance

Anticipate maintenance needs and avoid unscheduled downtime by connecting and monitoring your devices for predictive maintenance.

Select

Create Connected factory solution

Solution details

Creating a solution will result in the following Azure services being provisioned in your Azure subscription at cost:

- 1 Storage account (Standard-LRS)
- 1 Virtual Machine (Standard D1 v2 (1 core, 3.5 GB memory))
- 1 IoT Hub (Standard S1, 3 units)
- 1 Key vault (Standard)
- 1 Azure Time Series Insights (Standard S1)
- 1 Web App Service (Standard S1)

Solution name

ConnectedFactory-IoTCookbook

Subscription

Visual Studio Enterprise – MPN

To continue creation, click Accept below. Your solution will have a static map. To add an interactive map, follow guidance in our [FAQ](#).

I Accept.

Region

West Europe

Pricing information for these services can be found [here](#). Usage amounts and billing details for your subscription can be found in the [Azure Portal](#).

In addition to the above Azure services, creating a solution will result in your being signed up for a subscription to the following Azure Marketplace offering(s), which are subject to the following terms:

[Bing Maps API for Enterprise \(Internal Website Transactions Level 1\); terms of use and privacy statement.](#)

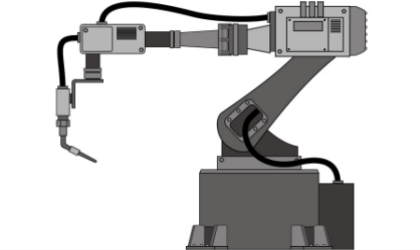
Create solution

Cancel

Connected to OPC server : opc.tcp://scada1634.munich0.corp.contoso:51210/UA/Munich/ProductionLine0/TestStation

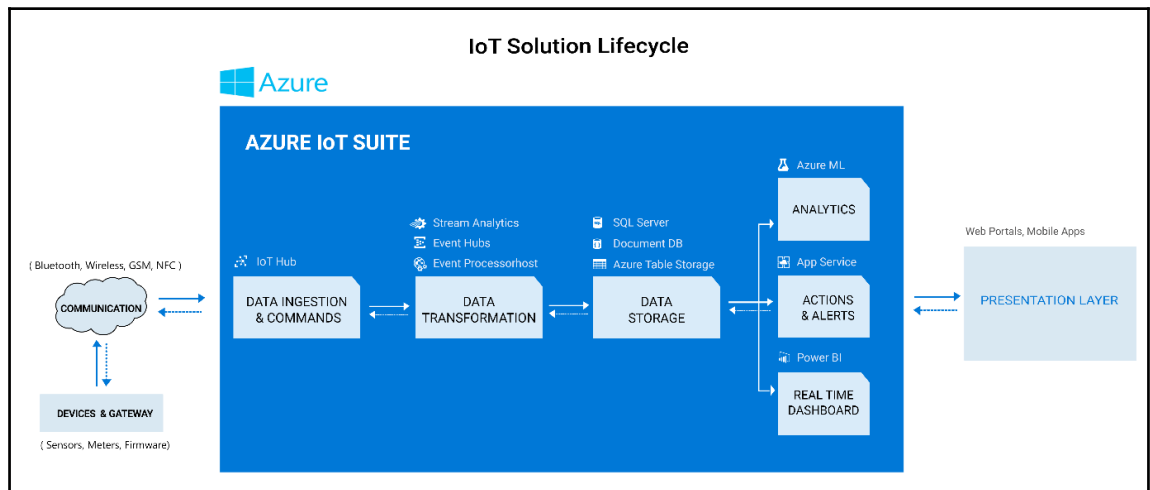
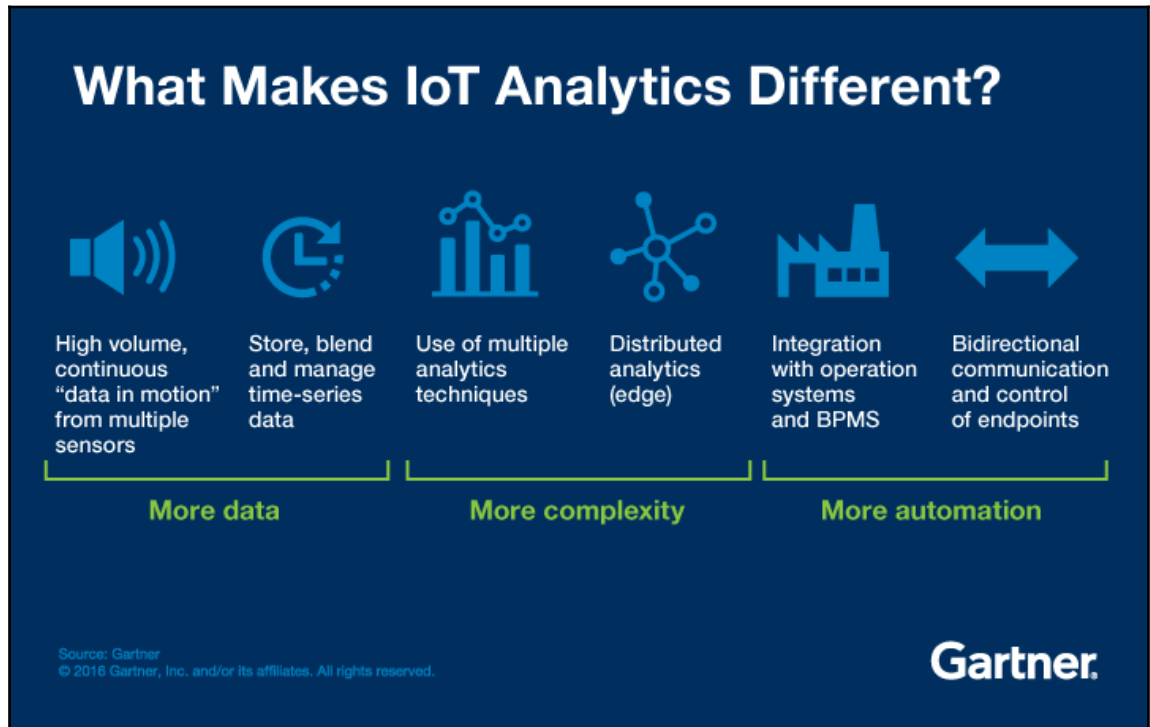
Root	▲
Server	▲
ServerArray	
NamespaceArray	
ServerStatus	▾
ServiceLevel	
Auditing	
EstimatedReturnTime	
ServerCapabilities	▾
ServerDiagnostics	▾
VendorServerInfo	
ServerRedundancy	▾
Namespaces	▾
Roles	▾
GetMonitoredItems	▾
ResendData	▾
SetSubscriptionDurable	▾
RequestServerStateChange	▾
ServerConfiguration	▾
PublishSubscribe	▾
StationInstance	▾

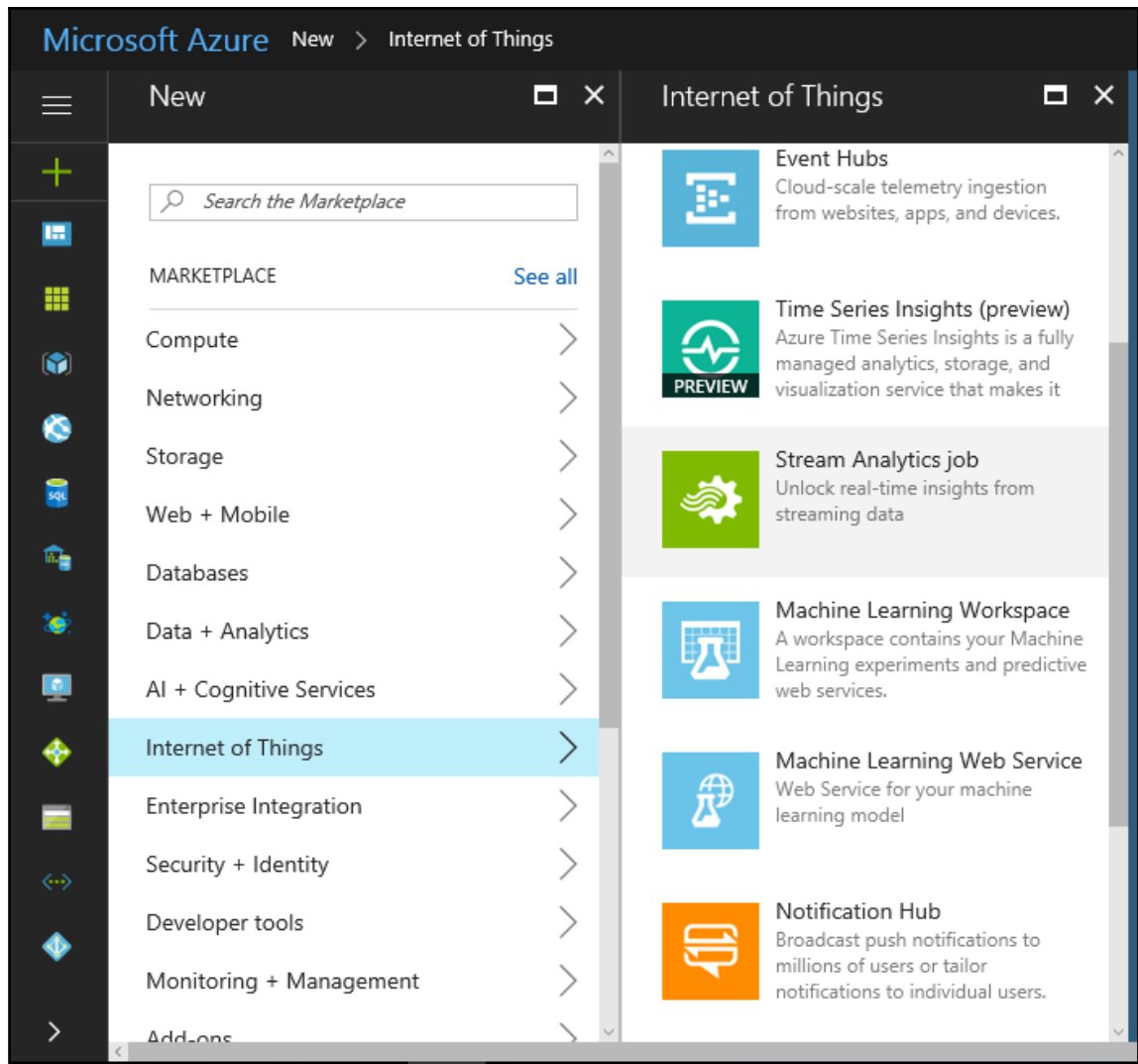
Disconnect

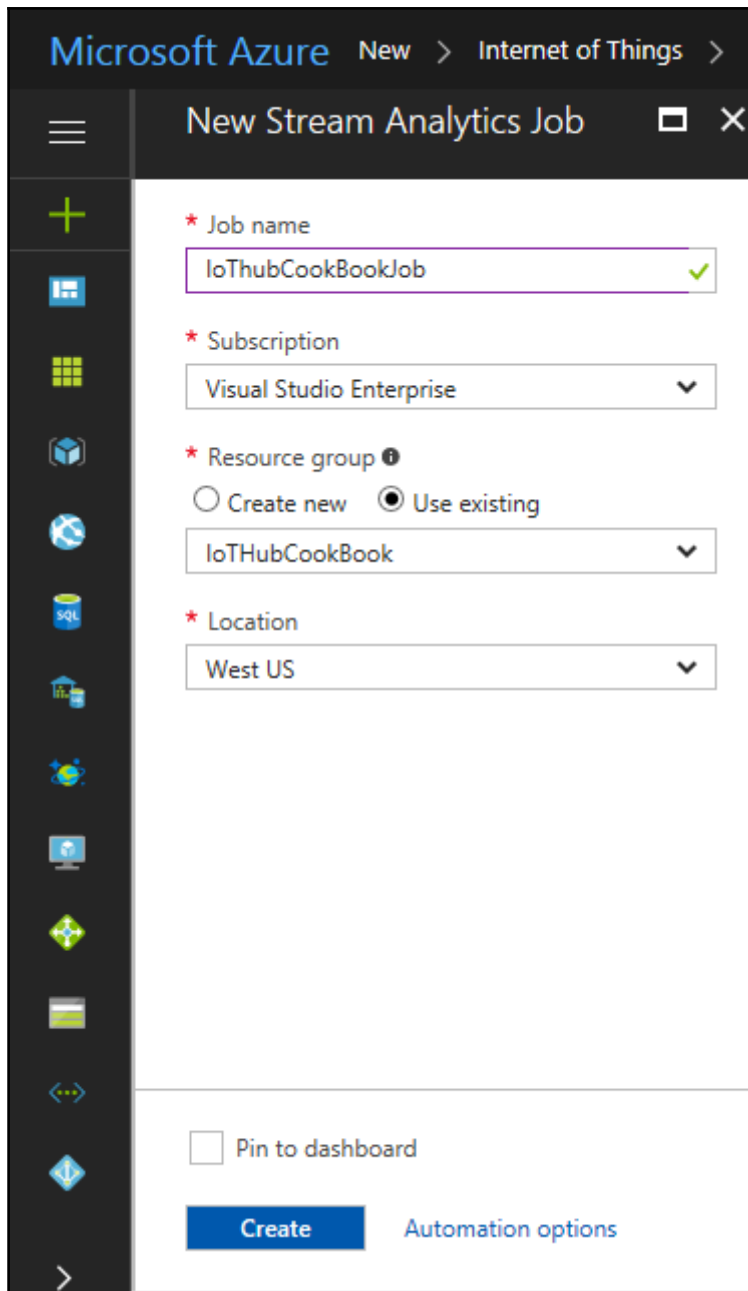


The image shows a 3D rendering of an industrial robotic arm, likely a SCARA or similar type, mounted on a base. It has a grey and black color scheme and is shown in a slightly flexed position. The background is a plain light grey.

Chapter 7: Azure IoT Analytics







IoTHubCookBookJob
Stream Analytics job

Search (Ctrl+/)

Start Stop Delete

Created

Essentials ^

Resource group (change)	Send feedback
IoTHubCookBook	UserVoice
Status	Created
Created	Saturday, 15 July 2017 22:23:53
Location	Started
West US	-
Subscription name (change)	Last output
Visual Studio Enterprise	-
Subscription ID	
3b817606-ee60-4a77-bf4d-375075937344	

Job Topology

Inputs	Query	Outputs
0 ↗	<>	0 ↗
No results.		No results.

IoThubCookBookJob - Inputs
Stream Analytics job

Search (Ctrl+*/*)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

SETTINGS

- Locks

JOB TOPOLOGY

- Inputs**
- Functions
- Query
- Outputs

+ Add

NAME
Empty

New input

* Input alias
IoTCookBook

* Source Type ⓘ
Data stream

* Source ⓘ
IoT hub

* Import option
Use IoT hub from current subscription

IoT hub
IoTHubCookBook

* Endpoint ⓘ
Messaging

Shared access policy name
iothubowner

Shared access policy key
.....

Consumer group

Create

Input details
IoT Cookbook

Test Sample Data Delete

* Import option
Provide IoT hub settings manually

* IoT hub
IoT HubCookBook

* Endpoint
Messaging

* Shared access policy name
iothubowner

Shared access policy key

Consumer group
\$Default

* Event serialization format
JSON

Encoding
UTF-8

Save

New output

- * Output alias: ✓
- * Sink ⓘ: ▼
- Import option: ▼
- Storage account: ▼
- Storage account key:
- Table name: ▼
- * Table name ⓘ:
- * Partition key ⓘ:
- * Row key ⓘ:

Create

The screenshot shows the Stream Analytics Query Editor interface. The title bar reads "IoThubCookBookJob - Query" and "Stream Analytics Job". On the left is a navigation sidebar with sections: "SETTINGS" (Locks), "JOB TOPOLOGY" (Inputs, Functions, Query, Outputs), and "CONFIGURE" (Scale, Locale, Event ordering, Error policy). The "Query" option is selected. The main area has "Save", "Discard", and "Test" buttons. Below these are "Inputs (1)" (IoTCookBook) and "Outputs (1)" (iothubcookbookoutput). A query editor on the right contains the following SQL query:

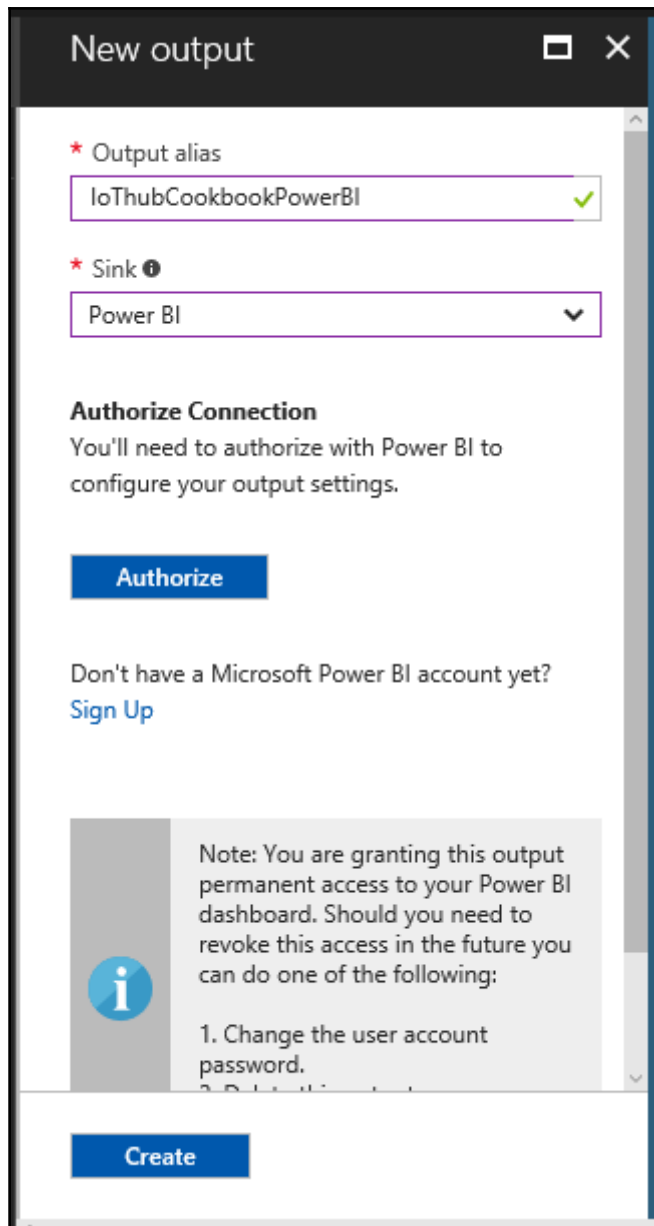
```
1 SELECT
2 *
3 INTO
4 [iothubcookbookoutput]
5 FROM
6 [IoTCookBook]
```

Below the query editor, there is a note: "Your query could be put in logs that are in a potentially different geography. Missing some language constructs? [Let us know!](#) (Powered by UserVoice - Privacy Policy)".

The screenshot shows the Azure IoT Hub interface for a job named "IoThubCookBookJob". The left sidebar contains navigation options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, SETTINGS (Locks), and JOB TOPOLOGY (Inputs, Functions, Query, Outputs), followed by CONFIGURE (Scale, Locale, Event ordering, Error policy). The main area has controls for Start, Stop, and Delete. Below this is a "Created" status bar and an "Essentials" dropdown. The "Job Topology" section displays a flow diagram with an input named "IoTCookBook", a central query icon, and an output named "iothubcookbookT...". The "Monitoring" section features a line graph titled "InputEvents, OutputEvents and one more metric past hour" with a y-axis from 0 to 100 and an x-axis from 00:15 to 01:00. Below the graph are three large counters: INPUT EVENTS (0), OUTPUT EVENTS (0), and RUNTIME ERRORS (0).

The screenshot shows a Windows File Explorer window displaying a file named "0_ae9285c519364ed3984a79d95ff5ea17_1.json" (15.5 KB) with a URL pointing to the IoT Hub output. Below it, a Notepad window shows the JSON content of the file:

```
[{"deviceId": "myFirstDevice", "windSpeed": 11.107612534941925, "highTemp": 0.40953417607095755, "lowTemp": 0.017524613541329566, "latitude": "17.5122566", "longitude": "70.7760470", "EventProcessedUtcTime": "2017-07-15T19:55:10.1630006Z", "PartitionId": 1, "EventEnqueuedUtcTime": "2017-07-15T19:54:58.0710000Z", "IoTHub": {"MessageId": "8c9cb13c-935e-4824-ac82-262e280f89fe", "CorrelationId": null, "ConnectionDeviceId": "myFirstDevice", "ConnectionDeviceGenerationId": "636304194777152752", "EnqueuedTime": "2017-07-15T19:54:58.2700000Z", "StreamId": null}}
```




New output □ ×

* Output alias
 ✓

* Sink ⓘ
 ▼

Group Workspace
 ▼

* Dataset Name
 ✓

 If the dataset or table already exists in yo...
Microsoft Power BI subscription, it will be
overwritten.

* Table Name
 ✕

Currently authorized as Yatish Patil
(yatish@saviantconsulting.com)

+ Add		
NAME	SINK	
iothubcookbookoutput	Blob storage	...
IoThubCookbookPowerBI	Power BI	...

Save Discard Test

Need help with your query? Check out some of the most common Stream Analytics query patterns [here](#).

Inputs (1)
IoT Cookbook

Outputs (2)
iothubcookbookoutput
IoThubCookbookPowerBI

```
1 SELECT
2 *
3 INTO
4 [IoThubCookBookPowerBI]
5 FROM
6 [IoT Cookbook]
7
8
```

Start Stop Delete

Stopped

Essentials ▾

Job Topology

Inputs	Query	Outputs
1 ↗ IoTCookBook	<>	2 ↗ iothubcookbooko... IoThubCookbookP...

+ Create

Search content...

Dashboards Reports Workbooks Datasets Showing 1 item(s) Name (A-Z) ▾

NAME	ACTIONS	OWNER
★ IoTHubCookBook Dashboard	🔗 📄 ⚙️ 🗑️	Yatish Patil

DASHBOARDS
IoTHubCookBook Dashboard

REPORTS
You have no workbooks

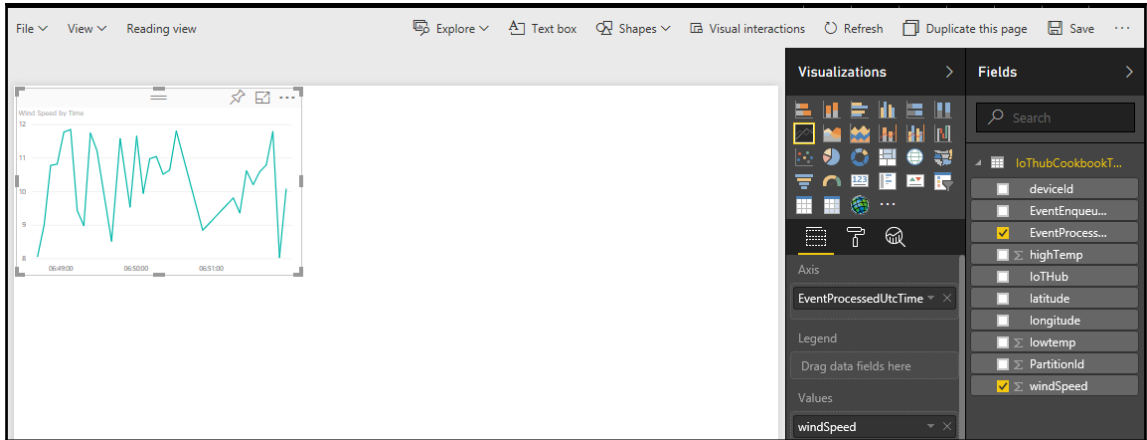
WORKBOOKS
You have no workbooks

DATASETS
IoTHubCookbookDB

Search content...

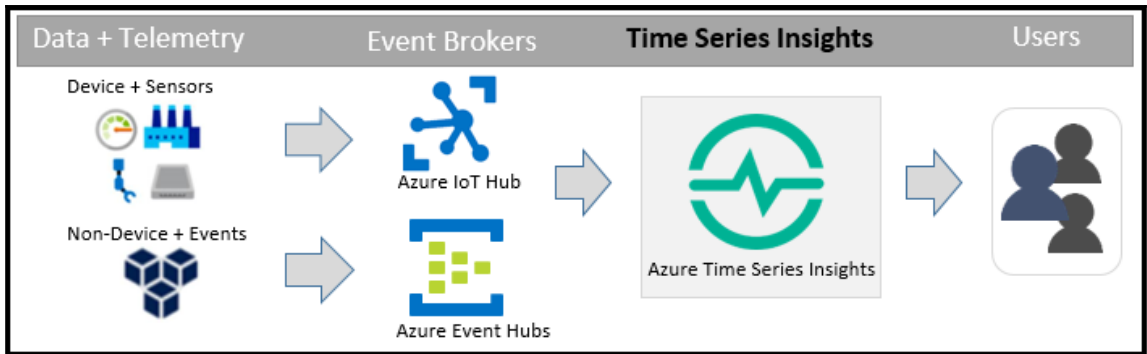
Dashboards Reports Workbooks Datasets Showing 1 item(s) Name (A-Z) ▾

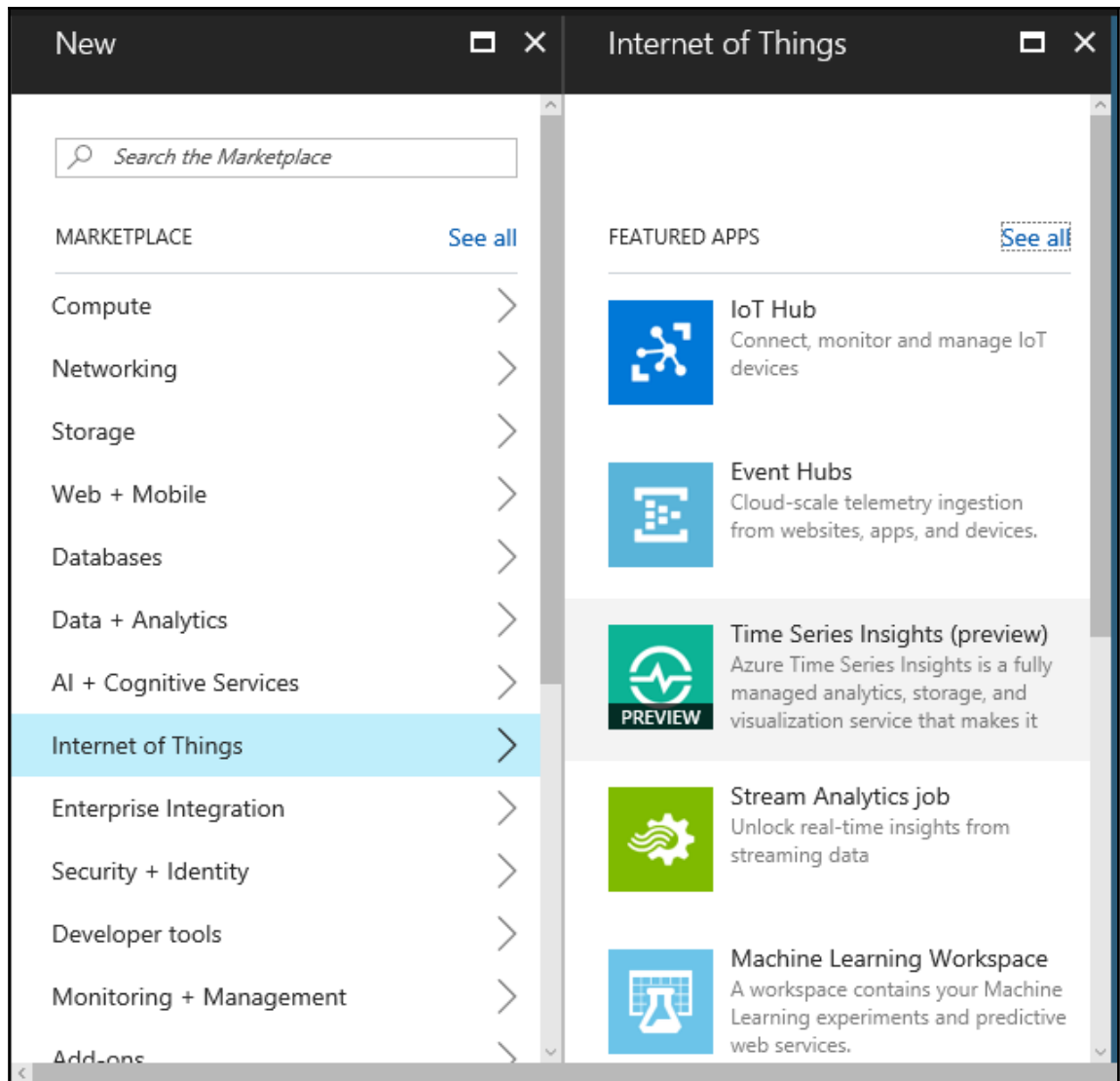
NAME	ACTIONS	LAST REFRESH	NEXT REFRESH	API ACCESS
 IoThubCookbookDB	   	2017-07-16 12:19:32	2017-07-16 12:24:32	Hybrid





This screenshot shows the report viewer interface. The top navigation bar includes 'File', 'View', 'Edit report', 'Explore', 'Refresh', 'Pin Live Page', 'Usage metrics', 'View related', and 'Subscribe'. A sidebar menu on the left provides the following options: 'Save as' (Save a copy of this report), 'Print' (Print current page), 'Publish to web' (Embed this report for public access by anyone on the Internet), 'Embed in SharePoint Online (Preview)' (Get a link to securely embed this report in a SharePoint page), 'Export to PowerPoint (Preview)' (Export this report as a PowerPoint presentation), and 'Download report (Preview)' (Download a .pbix copy). The main content area displays the dashboard from the previous figure, including the '10.34 Average of windSpeed' summary box and the four charts. The bottom status bar shows 'Page 1'.





Time Series Insights environ... ☐ ✕

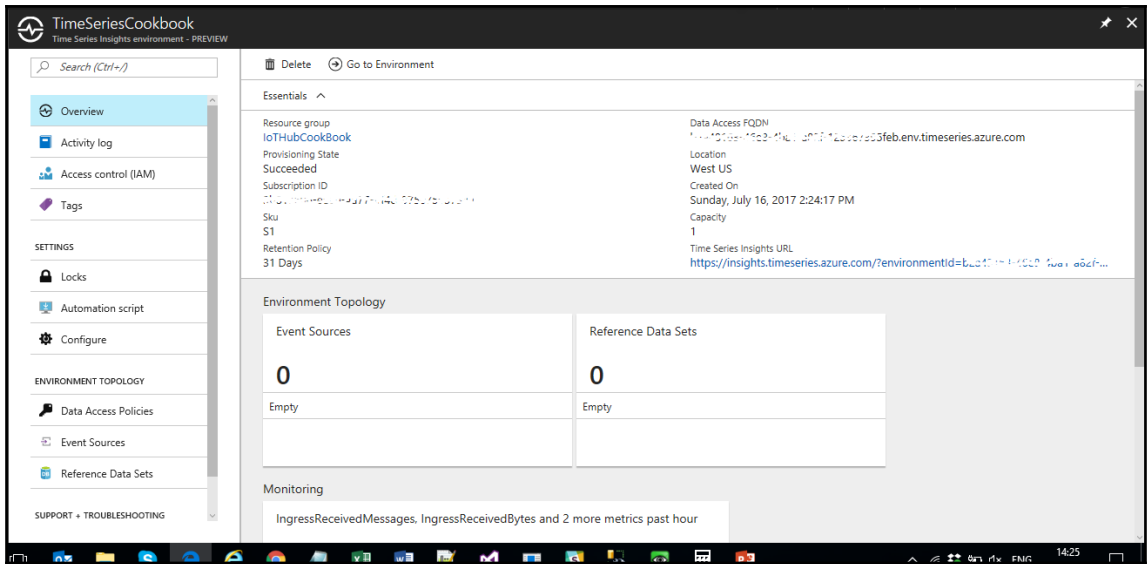
Time Series Insights environment - PREVIEW

- * Environment name
 ✓
- * Subscription
 ▼
- * Resource group ⓘ
 Create new Use existing
 ▼
- * Location
 ▼
- Pricing tier ([View full pricing details](#))
 ▼
- Capacity ⓘ
 1

Ingress rate:	1 M events per day
Storage capacity:	30 M events

Pin to dashboard


[Automation options](#)

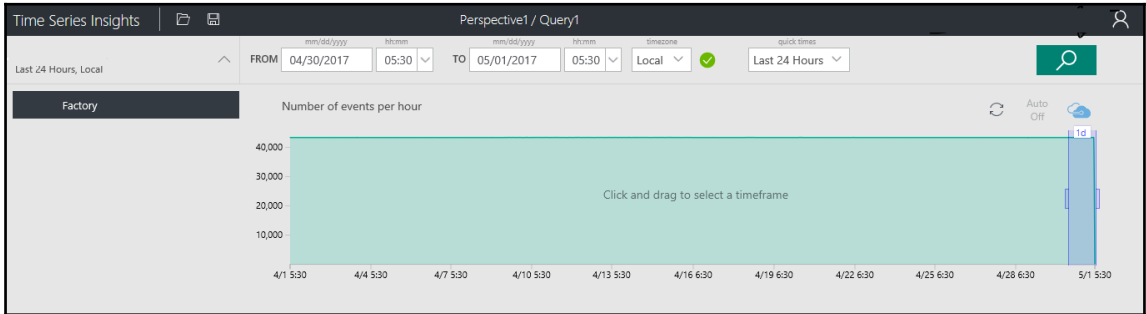


New event source

PREVIEW

- * Event source name
 ✓
- * Source
 ▼
- * Import option
 ▼
- * Subscription Id ⓘ
 ▼
- * Iot hub name ⓘ
 ▼
- * Iot hub policy name ⓘ
 ▼
- * Iot hub policy key ⓘ

+ Add	
NAME	ROLES
 yatish@test.com	Reader, Contributor



```

Developer Command Prompt for VS2015

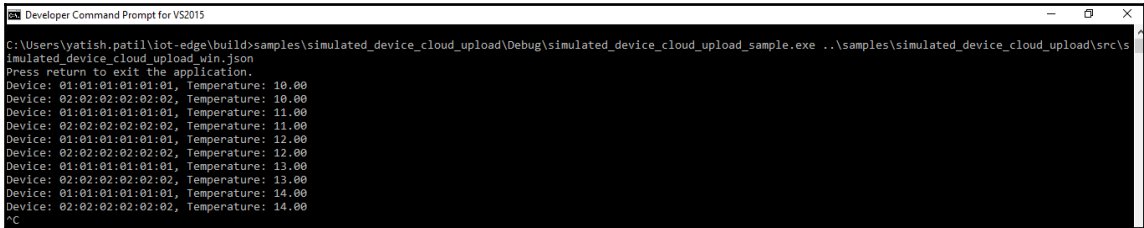
The target "_CollectMdbFiles" listed in a BeforeTargets attribute at "C:\Program Files (x86)\MSBuild\14.0\Microsoft.Common.targets\ImportAfter\Xamarin.Common.targets (41,38)" does not exist in the project, and will be ignored.
The target "_CopyMdbFiles" listed in an AfterTargets attribute at "C:\Program Files (x86)\MSBuild\14.0\Microsoft.Common.targets\ImportAfter\Xamarin.Common.targets (41,71)" does not exist in the project, and will be ignored.
2>Project "C:\Users\yatish.patil\iot-edge\build\ALL_BUILD.vcxproj.metaproj" (2) is building "C:\Users\yatish.patil\iot-edge\build\ALL_BUILD.vcxproj" (54) on node 4 (default targets).
54>PrepareForBuild:
  Creating directory "Win32\Debug\ALL_BUILD\".
  Creating directory "Win32\Debug\ALL_BUILD\ALL_BUILD.tlog\".
InitializeBuildStatus:
  Creating "Win32\Debug\ALL_BUILD\ALL_BUILD.tlog\unsuccessfulbuild" because "AlwaysCreate" was specified.
CustomBuild:
  Building Custom Rule C:/Users/yatish.patil/iot-edge/CMakeLists.txt
  CMake does not need to re-run because C:/Users/yatish.patil/iot-edge/build/CMakeFiles/generate.stamp is up-to-date.
FinalizeBuildStatus:
  Deleting file "Win32\Debug\ALL_BUILD\ALL_BUILD.tlog\unsuccessfulbuild".
  Touching "Win32\Debug\ALL_BUILD\ALL_BUILD.tlog\ALL_BUILD.lastbuildstate".
54>Done Building Project "C:\Users\yatish.patil\iot-edge\build\ALL_BUILD.vcxproj" (default targets).
2>Done Building Project "C:\Users\yatish.patil\iot-edge\build\ALL_BUILD.vcxproj.metaproj" (default targets).
1>Done Building Project "C:\Users\yatish.patil\iot-edge\build\azure_iot_gateway_sdk.sln" (default targets).

Build succeeded.
0 Warning(s)
0 Error(s)

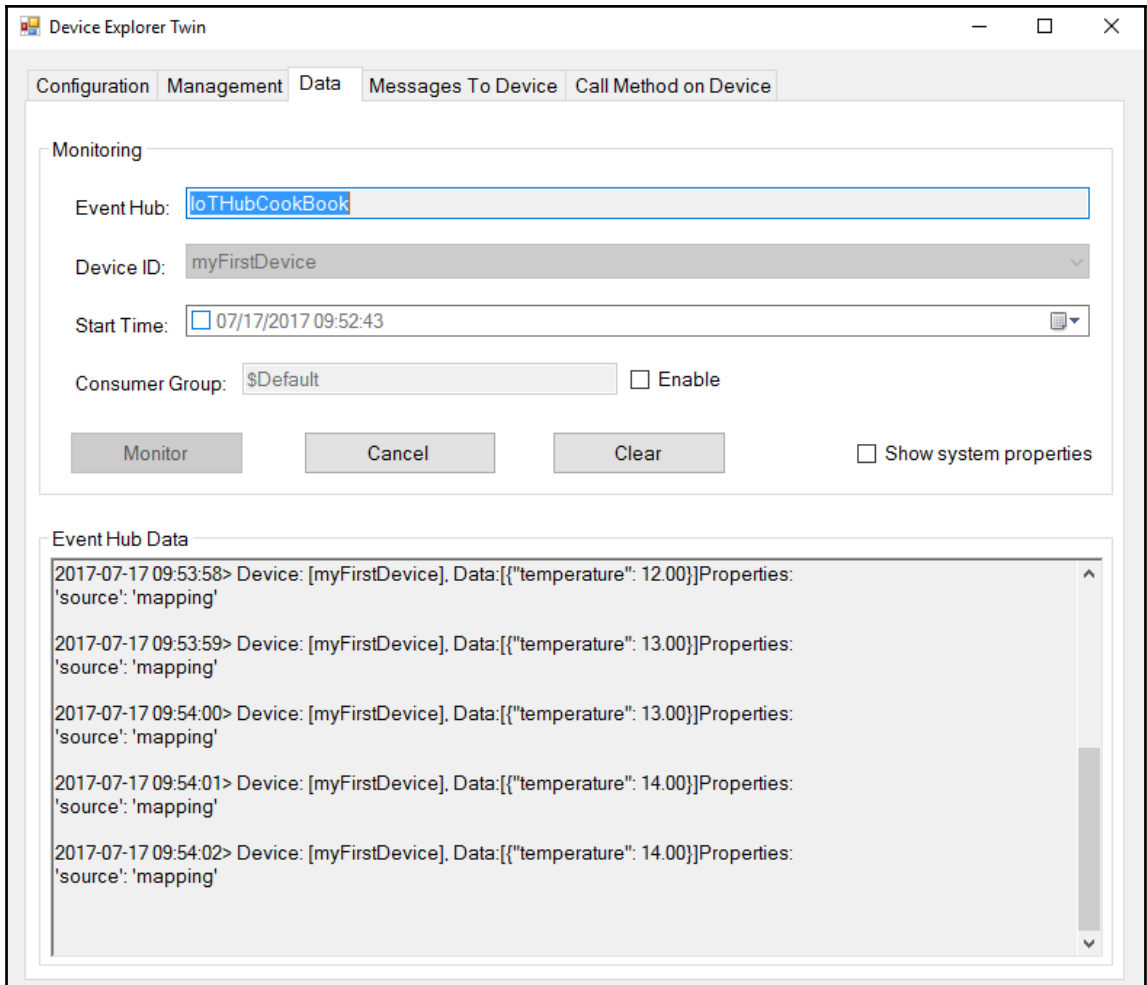
Time Elapsed 00:00:25.27
    
```

```
    },
    "args": {
      "IoTHubName": "IoTHubCookBook",
      "IoTHubSuffix": "azure-devices.net",
      "Transport": "HTTP"
    }
  },
  {
    "name": "mapping",
    "loader": {
      "name": "native",
      "entrypoint": {
        "module.path": "..\\..\\..\\modules\\identitymap\\Debug\\identity_map.dll"
      }
    },
    "args": [
      {
        "macAddress": "01:01:01:01:01:01",
        "deviceId": "myFirstDevice",
        "deviceKey": "LKCXsBKMkISTjr3ii08UXgIpELxy8/38EiMuxNAiqek="
      }
    ],
  },
  {

```



```
Developer Command Prompt for VS2015
C:\Users\yatish.patil\iot-edge\build\samples\simulated_device_cloud_upload\Debug\simulated_device_cloud_upload_sample.exe ..\samples\simulated_device_cloud_upload\src\simulated_device_cloud_upload_win.json
Press return to exit the application.
Device: 01:01:01:01:01:01, Temperature: 10.00
Device: 02:02:02:02:02:02, Temperature: 10.00
Device: 01:01:01:01:01:01, Temperature: 11.00
Device: 02:02:02:02:02:02, Temperature: 11.00
Device: 01:01:01:01:01:01, Temperature: 12.00
Device: 02:02:02:02:02:02, Temperature: 12.00
Device: 01:01:01:01:01:01, Temperature: 13.00
Device: 02:02:02:02:02:02, Temperature: 13.00
Device: 01:01:01:01:01:01, Temperature: 14.00
Device: 02:02:02:02:02:02, Temperature: 14.00
^C
```



Function App
Create

* App name

.azurewebsites.net

* Subscription

* Resource Group ⓘ
 Create new Use existing

* Hosting Plan ⓘ

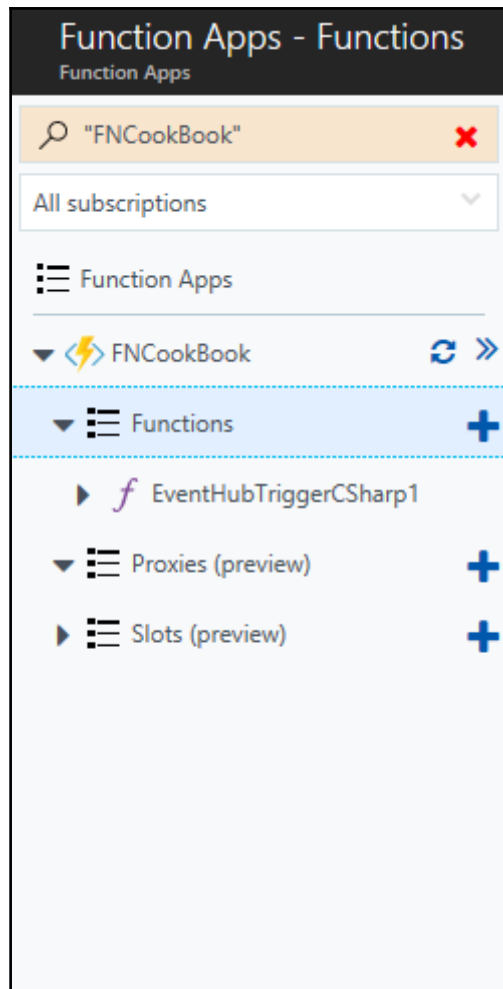
* Location

* Storage ⓘ
 Create New Select Existing

Application Insights ⓘ

Pin to dashboard

[Automation options](#)



Choose a template below or [go to the quickstart](#)

Language: Scenario:

TimerTrigger - C# A C# function that will be run on a specified schedule	QueueTrigger - C# A C# function that will be run whenever a message is added to a specified Azure Queue Storage	BlobTrigger - C# A C# function that will be run whenever a blob is added to a specified container	EventHubTrigger - C# A C# function that will be run whenever an event hub receives a new event	ServiceBusQueueTrigger - C# A C# function that will be run whenever a message is added to a specified Service Bus queue
ServiceBusTopicTrigger - C# A C# function that will be run whenever a message is added to the specified Service Bus topic	SendGrid - C# A C# function that sends a confirmation e-mail when a new item is added to a particular queue	AppInsights Scheduled Analytics - C# A C# function which derives metrics from performing deep analysis of your app telemetry with Application Insights		

Name your function

Azure Event Hub trigger

Event Hub name ⓘ

Event Hub connection ⓘ [show value](#) new

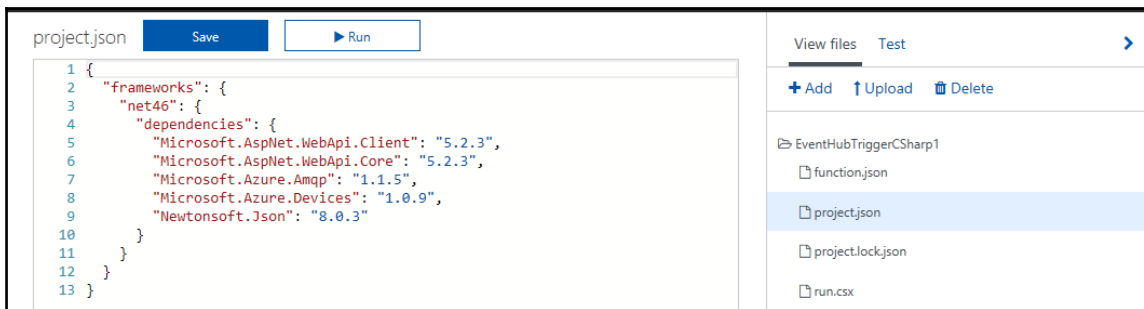
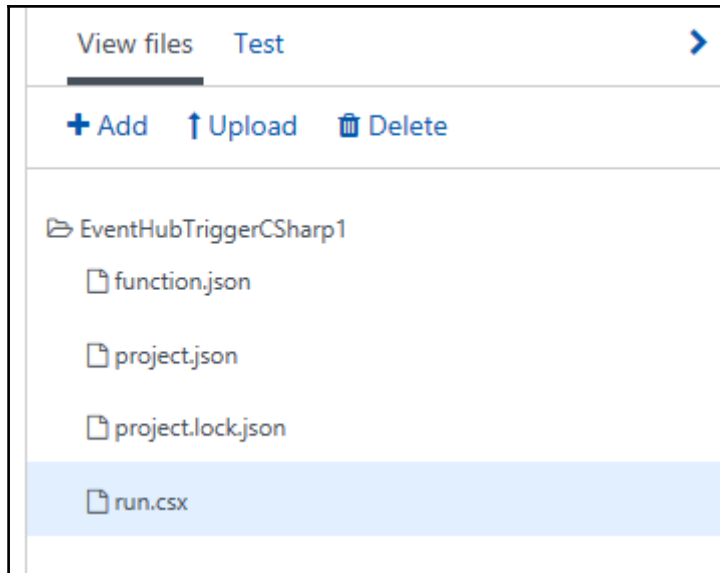
The screenshot shows the 'Overview' tab of an Azure Function App. At the top, there are navigation tabs: 'Overview' (selected), 'Settings', 'Platform features', and 'API definition'. Below the tabs is a toolbar with actions: Stop, Swap, Restart, Download publish profile, Reset publish credentials, Download app content, and Delete. The main content area displays the following information:

Status	Subscription	Resource group	URL
Running	Visual Studio Enterprise	IoTHubCookBook	https://fncookbook.azurewebsites.net
	Subscription ID	Location	App Service plan / pricing tier
	xxxxxxxxxxxx-xxxx-xx-xxxx-xxxxxxxxxxxx	West US	WestUSPlan (Consumption)

Below this information, there is a section titled 'Configured features' with two items: 'Settings' and 'Application settings'.

This screenshot shows a vertical navigation menu for the 'FNCookBook' function app. The menu items are:

- FNCookBook (with a refresh icon and a right-pointing arrow)
- Functions (with a plus icon)
- EventHubTriggerCSharp1 (highlighted in blue)
- Integrate (with a lightning bolt icon)
- Manage (with a gear icon)
- Monitor (with a magnifying glass icon)



```
run.csx Save Run
1 using System;
2 using Newtonsoft.Json;
3 using Microsoft.Azure.Devices;
4 using System.Text;
5
6
7 class IoTHubDevicetoCloud {
8     public string deviceid { get; set; }
9     public DateTime timestamp {get; set;}
10    public float windSpeed {get; set;}
11 }
12
13 public static void Run(string myEventHubMessage, TraceWriter log)
14 {
15     log.Info($"C# Event Hub trigger function processed a message: {myEventHubMe
16
17
18     IoTHubDevicetoCloud eventHubMessage = JsonConvert.DeserializeObject<IoTHu
19
20     //More log messages, just helps you debug this function in the portal
21     log.Info($"deviceid: {eventHubMessage.deviceid}");
22     log.Info($"timestamp: {eventHubMessage.timestamp}");
23     log.Info($"temperature: {eventHubMessage.windSpeed}");
24 }
25
```

```
Logs Pause Clear Copy logs Expand
2017-07-19T18:25:10 No new trace in the past 2 min(s).
2017-07-19T18:26:00.593 Function started (Id=9d1ab090-7f10-456e-9dc8-c59156be126c)
2017-07-19T18:26:00.843 C# Event Hub trigger function processed a message: {"deviceId":"myFirstD
2017-07-19T18:26:00.843 deviceid: myFirstDevice
2017-07-19T18:26:00.843 timestamp: 1/1/0001 12:00:00 AM
2017-07-19T18:26:00.843 temperature: 9.217585
2017-07-19T18:26:00.843 Function completed (Success, Id=9d1ab090-7f10-456e-9dc8-c59156be126c, Du
```

Chapter 8: Using Real Devices to Connect and Implement Azure IoT Hub

Set up a new device

First, let's get Windows 10 IoT Core on your device.

Device type
Raspberry Pi 2 & 3

OS Build
Windows 10 IoT Core (15063)
[Sign in as a Windows Insider.](#)

Drive
G: 14Gb [Generic STORAGE DEVICE USB I

Device name
minwinpc

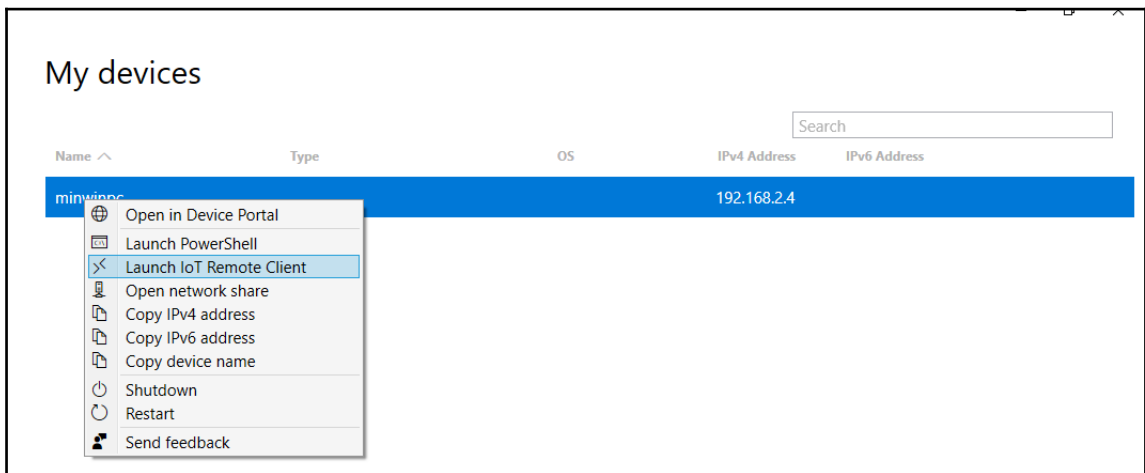
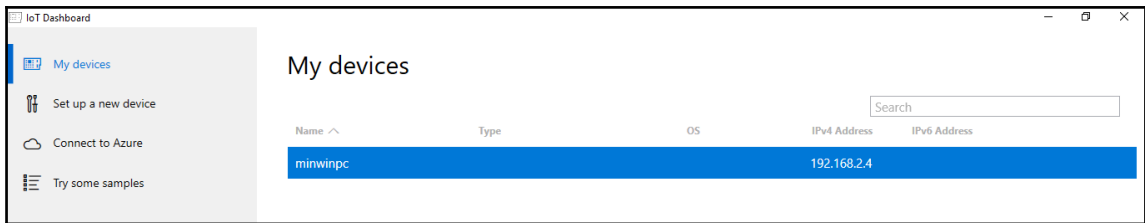
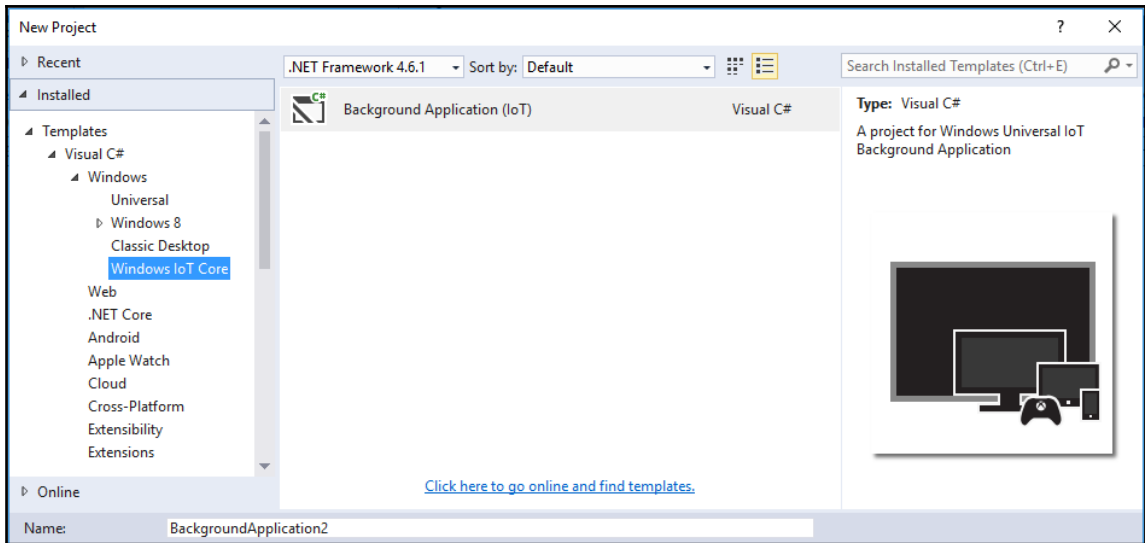
New Administrator password
●●●●●●●●

Confirm Administrator password
●●●●●●●●

Wi-Fi Network Connection
DIGISOL
Only 2.4 Ghz WiFi networks that have already been connected to will appear in this list

I accept the software license terms

[Download and install](#)



The screenshot shows the Windows Home interface. On the left is a navigation pane with 'UTILITIES /' and a list of options: Home, Apps, Processes, Performance, Debugging, ETW, Perf Tracing, Devices, Bluetooth, and Networking. The main area is titled 'Home' and contains 'Device Information' with the following details:

- Device Name: minwinpc
- Device Model: Raspberry Pi 2 Model B
- OS Version: 10.0.10240

At the top right, there are four icons: SHUTDOWN, REBOOT, FEEDBACK, and HELP.

The screenshot shows the 'AppX Manager' interface. At the top right, there are four icons: SHUTDOWN, REBOOT, FEEDBACK, and HELP. The main content is divided into three sections:

- Installed apps:** A dropdown menu shows 'Microsoft.AAD.BrokerPlugin_1000.10240.16384.0_neutral_neutral_cw5n1h2txyev'. Below it are three buttons: 'Uninstall', 'Start', and 'Set Default'.
- Running apps:** A table with columns 'PID' and 'NAME'.

	▲ PID	NAME
✘	1920	ZWaveHeadlessAdapterApp
✘	1988	IoTCoreDefaultApp
- Install app:** Three sections: 'AppX' with a 'Choose file' button and 'No file chosen' text; 'Certificate' with a 'Choose file' button and 'No file chosen' text; and 'Dependencies' with a '+ Add dependency' button.

The screenshot displays the Windows Network settings interface. On the left is a navigation pane with 'Networking' selected. The main area is titled 'Networking' and contains a 'Profiles' section with a dropdown menu, a 'Connect' button, and a 'Delete' button. Below this is the 'Available networks' section, which is currently empty. The 'IP configuration' section is expanded to show details for a network adapter. A refresh icon is visible above the configuration details.

Windows

UTILITIES /
Home
Apps
Processes
Performance
Debugging
ETW
Perf Tracing
Devices
Bluetooth
Networking

Networking

Profiles

Connect Delete

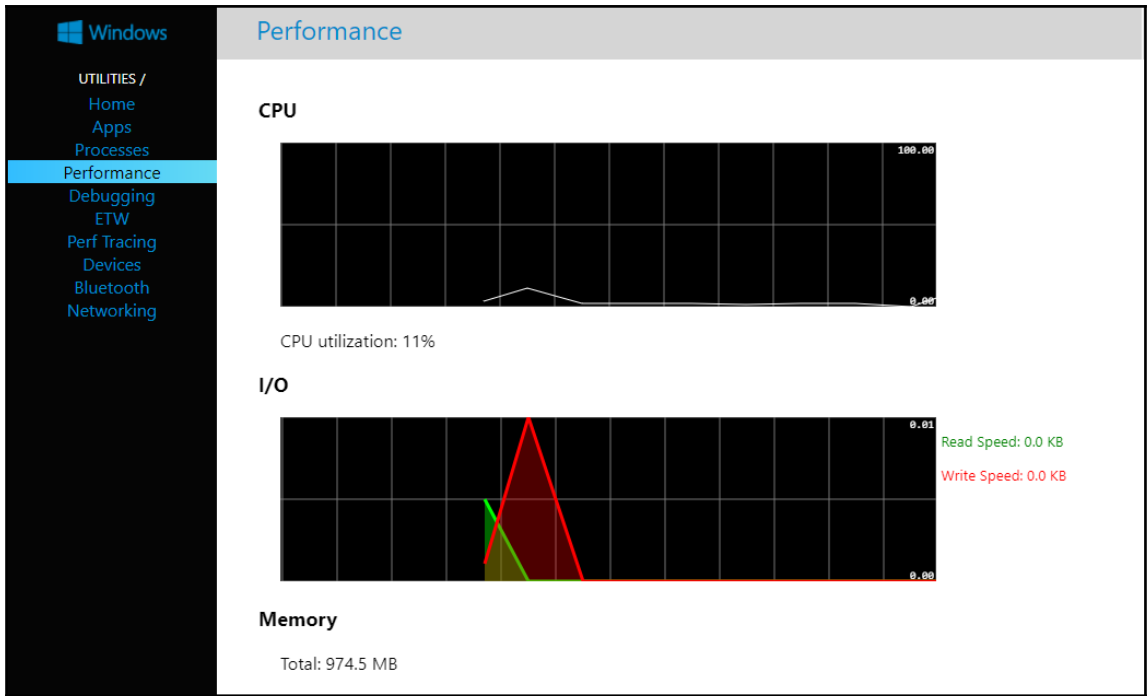
Available networks

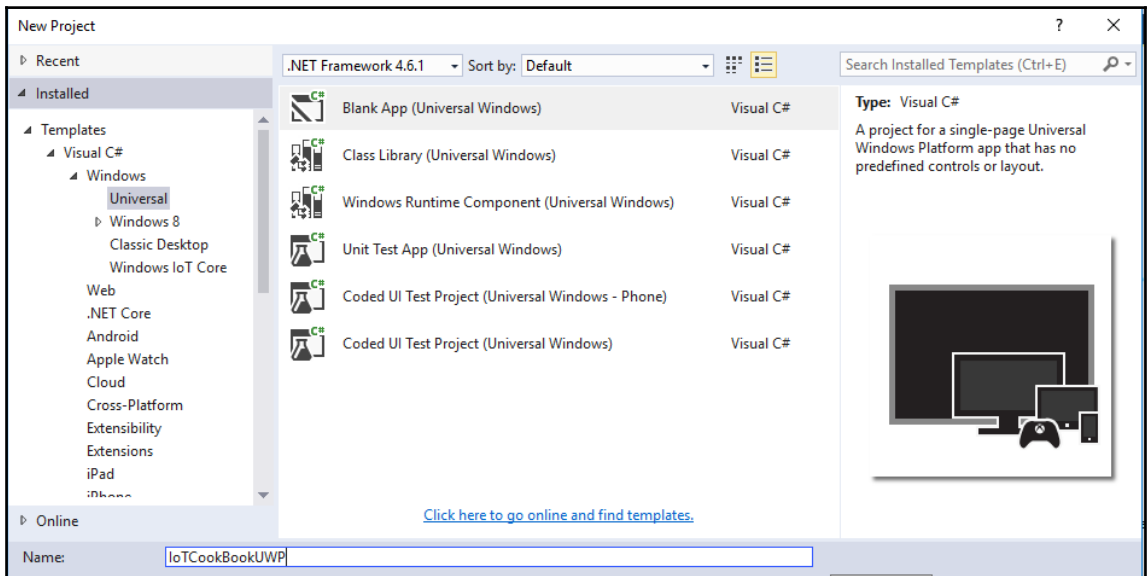
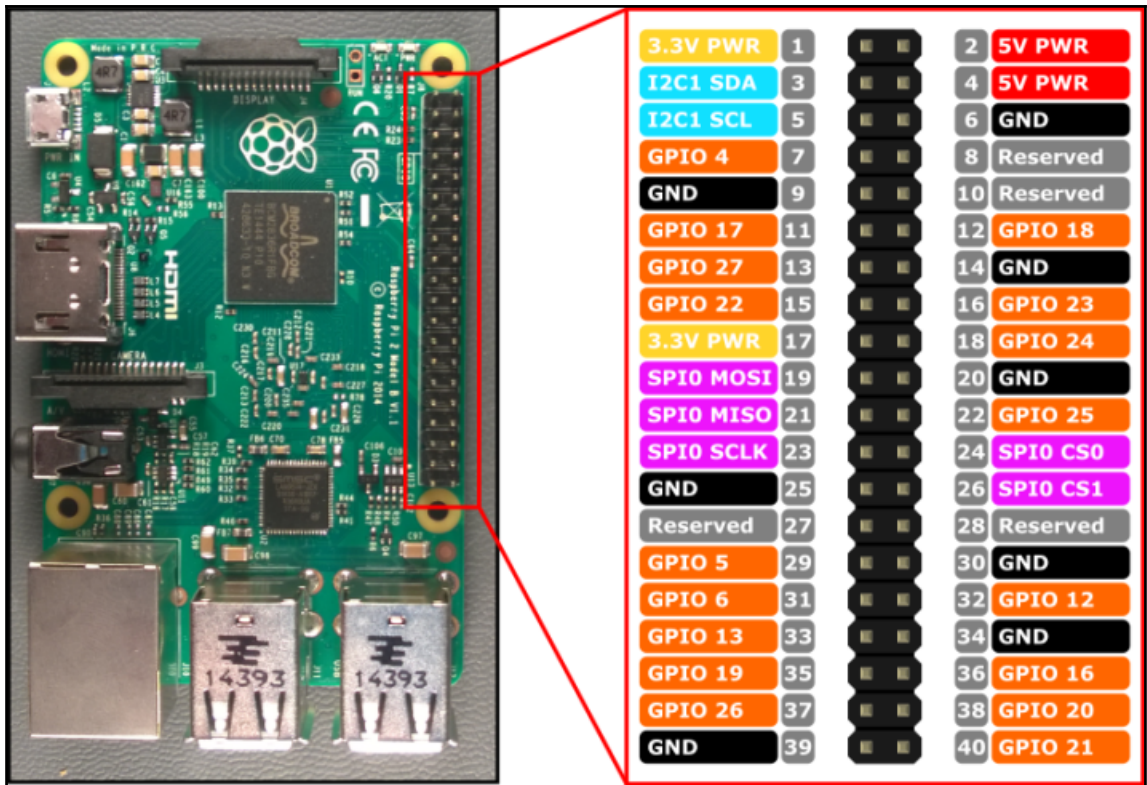
SSID	INFRA	SIG...	SECURITY	ENCRYPTION
------	-------	--------	----------	------------

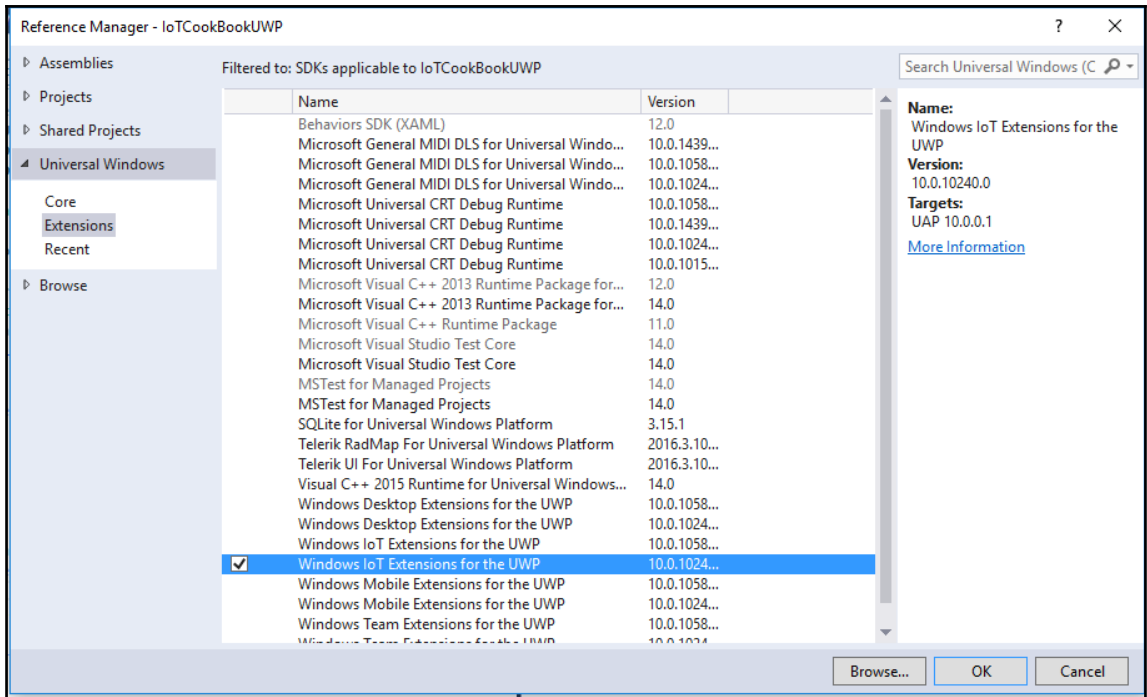
IP configuration

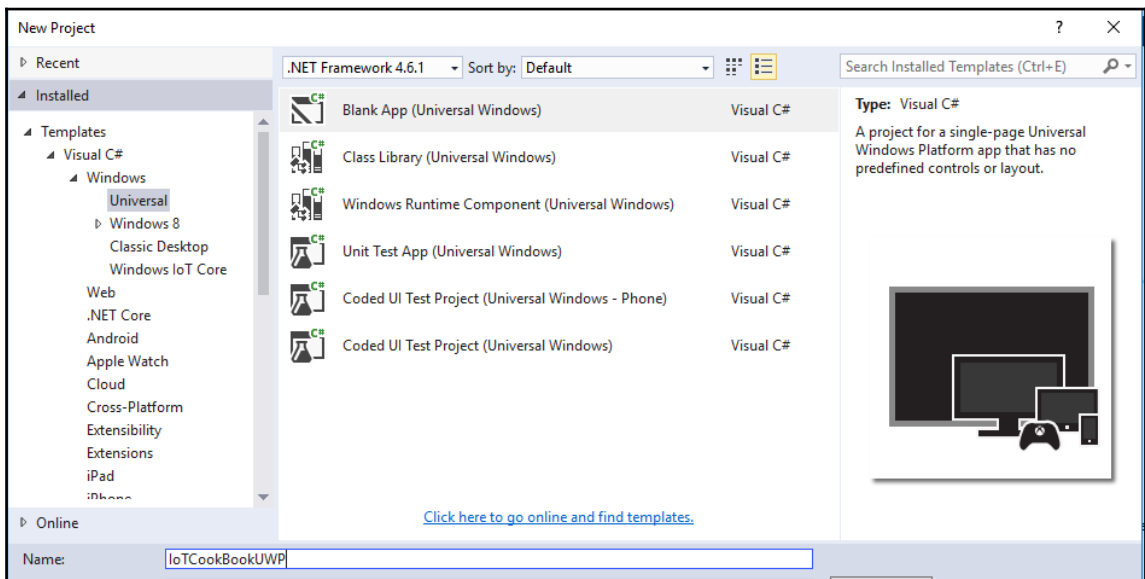
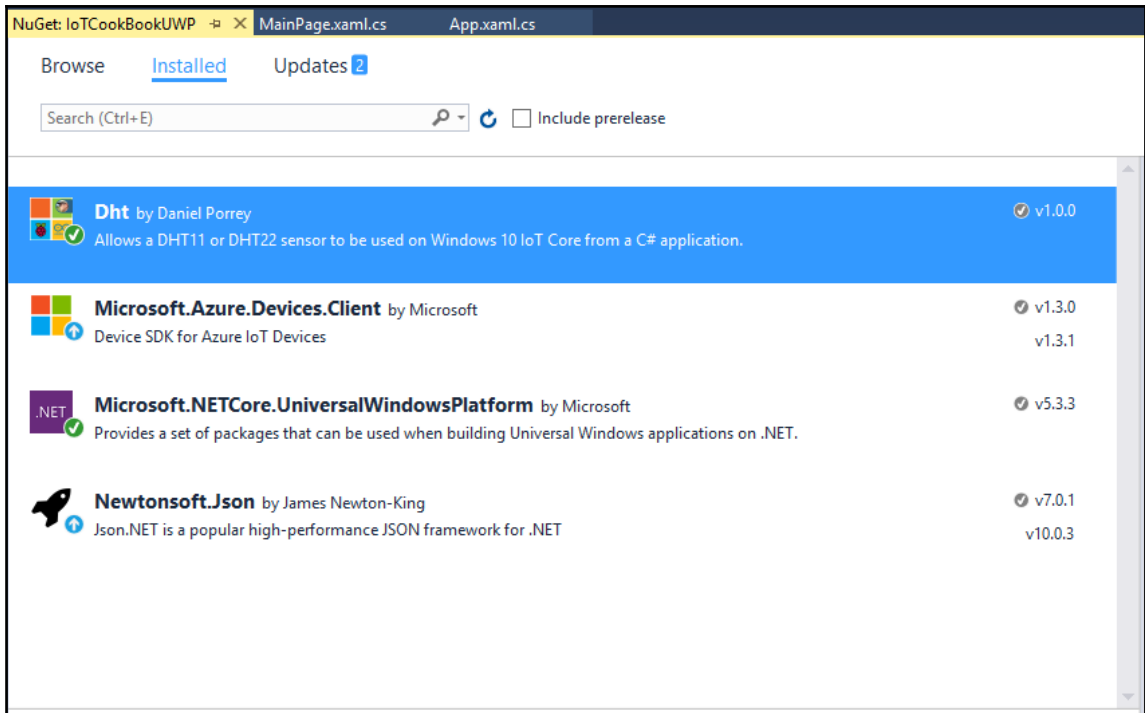
{68B80BEB-26B1-4B65-8631-3BD2C2139D4C}

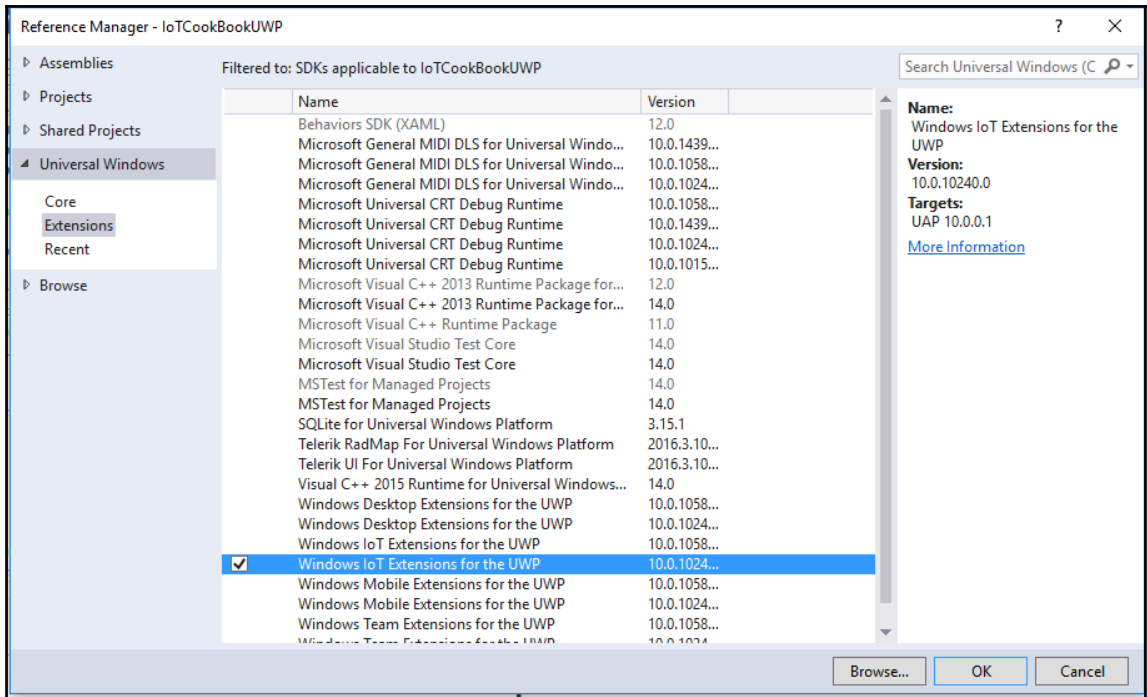
Description: LAN9512/LAN9514 USB 2.0 to Ethernet 10/100 Adapter
Type: Ethernet
Physical address: b8-27-eb-d5-d3-82
IPv4 address: [169.254.78.97](#)
Subnet mask: 255.255.0.0
Gateway address: 0.0.0.0
DHCP server: 0.0.0.0

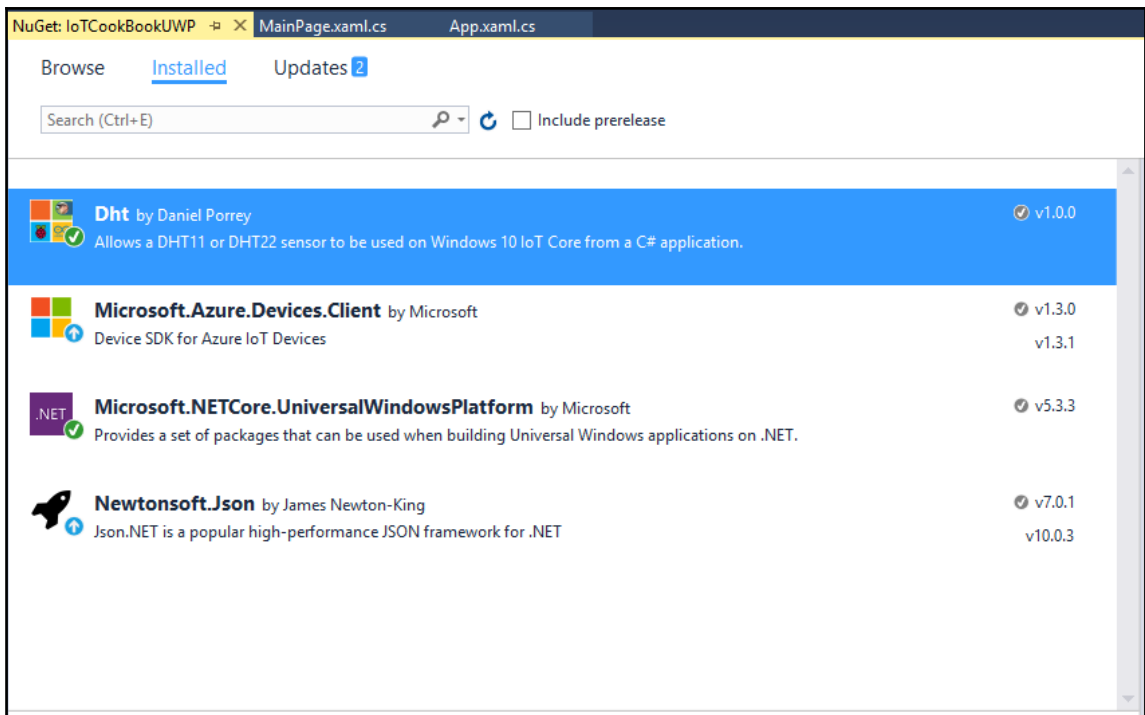


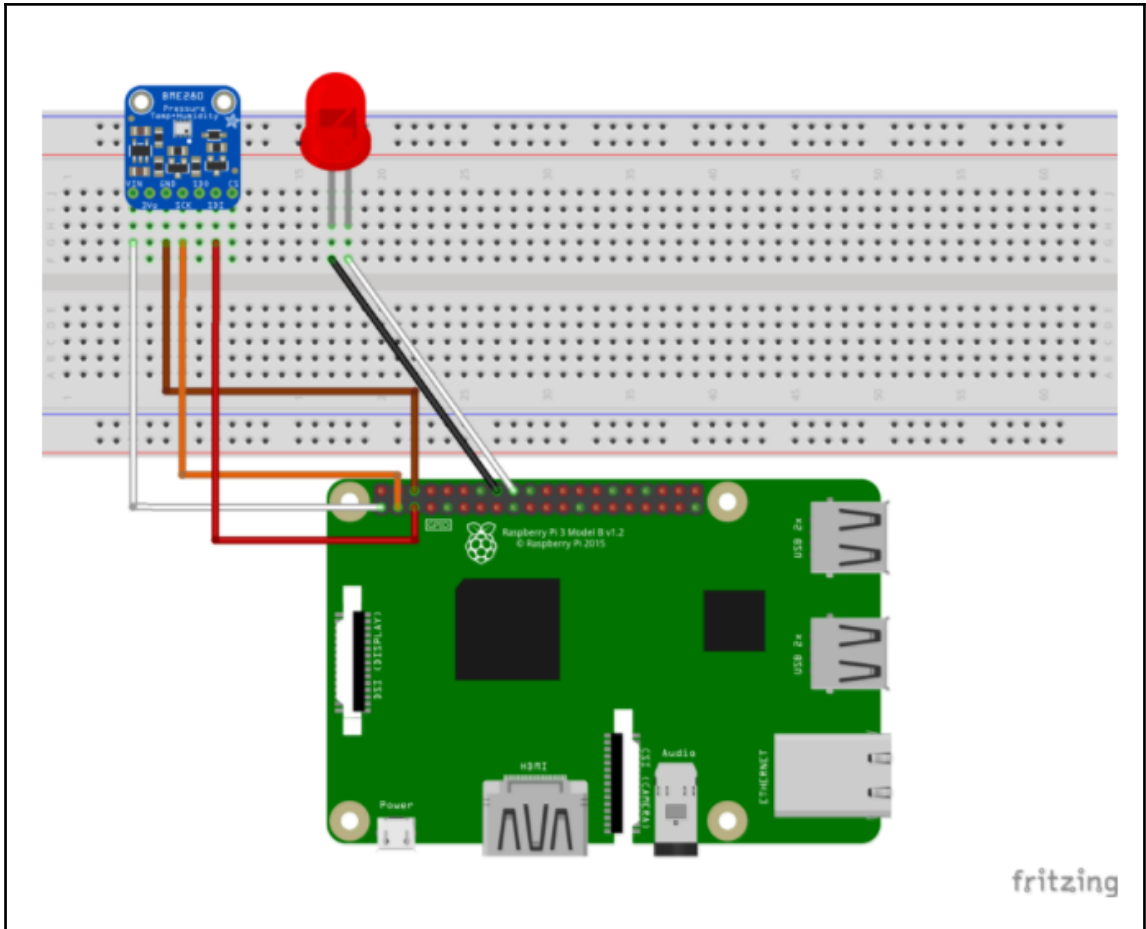






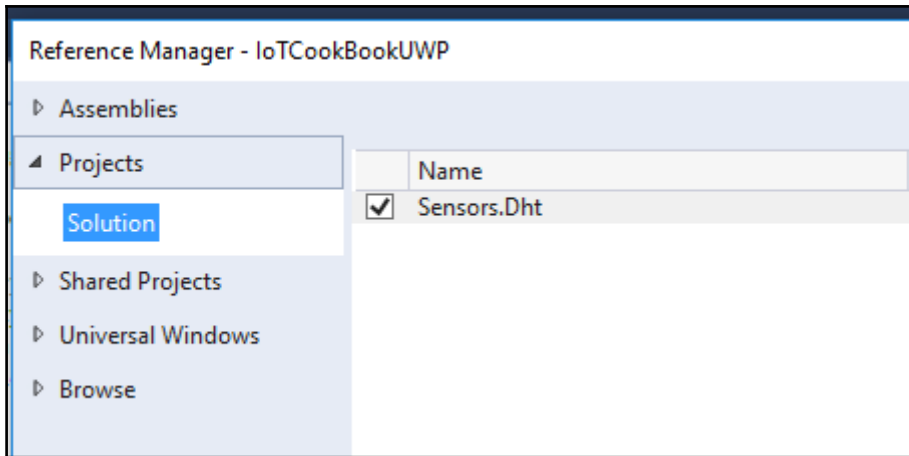




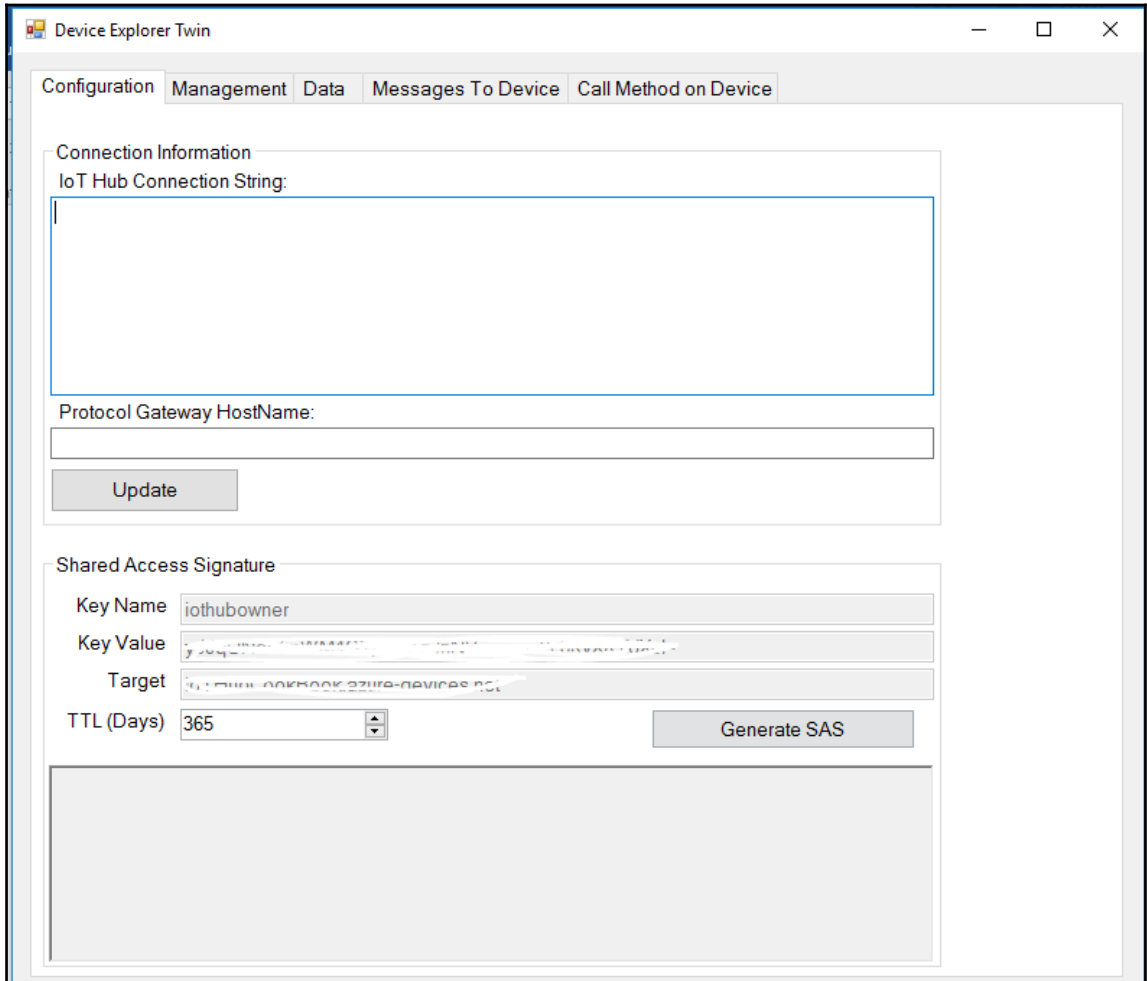


```
11  i2cBusNo: 1, // defaults to 1
12  i2cAddress: BME280.BME280_DEFAULT_I2C_ADDRESS() // defaults to 0x77
13  };
14
15  const connectionString = '[Your IoT hub device connection string]';
16  const LEDPin = 4;
17
18  var sendingMessage = false;
19  var messageId = 0;
20  var client, sensor;
21
22  function getMessage(cb) {
23    messageId++;
24    sensor.readSensorData()
25      .then(function (data) {
26        cb(JSON.stringify({
27          messageId: messageId,
28          deviceId: 'Raspberry Pi Web Client',
29          temperature: data.temperature_C,
30          humidity: data.humidity
31        })), data.temperature_C > 30);
32      });
33  }
```

```
Stop  Reset
Sending message: { messageId :2, deviceId : myFirstDevice , temperature :26.60145522441021, humidid
>
Message sent to Azure IoT Hub
>
Sending message: {"messageId":3,"deviceId":"myFirstDevice","temperature":23.711677246747836,"humid
>
Message sent to Azure IoT Hub
>
Sending message: {"messageId":4,"deviceId":"myFirstDevice","temperature":26.381356864545097,"humid
>
Message sent to Azure IoT Hub
> []
```



Chapter 9: Managing the Azure IoT Hub



IoT Hub uses permissions to grant access to each IoT hub endpoint. Permissions limit the access to an IoT hub based on

POLICY	PERMISSIONS
iothubowner	registry write, service connect, device connect
service	service connect
device	device connect
registryRead	registry read
registryReadWrite	registry write

Access policy name: iothubowner

Permissions:

- Registry read
- Registry write
- Service connect
- Device connect

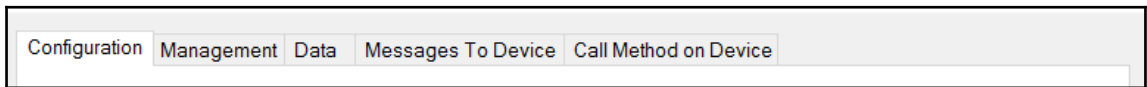
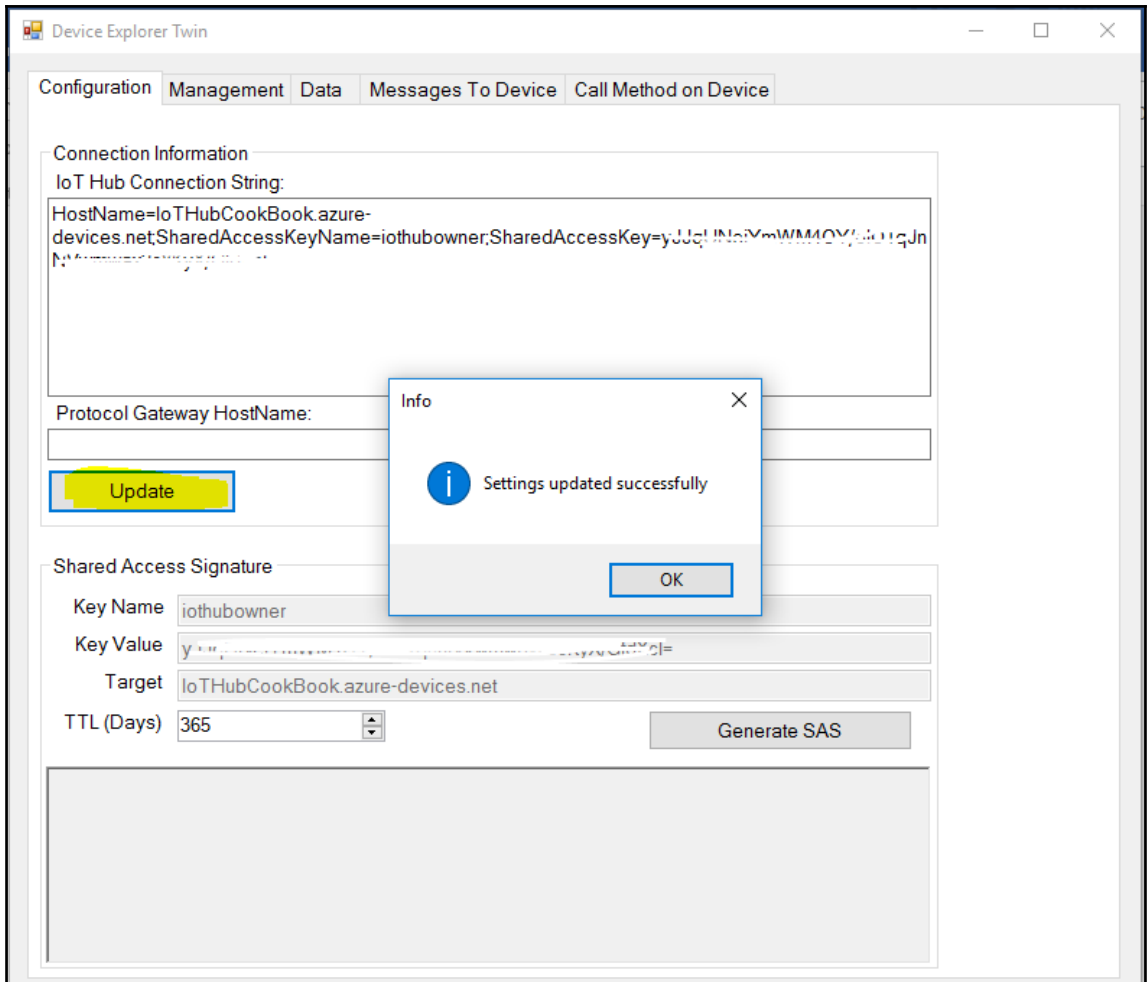
Shared access keys:

Primary key: yJlqUNeiYmWM4OY/olIO1qJnNVwmwa...

Secondary key: nnq9rG2D8KLzMbEb0LdcOjRpjK9XZlvG...

Connection string—primary key: HostName=IoTHubCookBook.azure-de...

Connection string—secondary key: HostName=IoTHubCookBook.azure-de...



Shared Access Signature

Key Name:

Key Value:

Target:

TTL (Days):

SharedAccessSignature sr=ioTHubCookBook.azure-devices.net&sig=dxvYMXx84uX7OoPwuO5kv1E%2BxeQxbfdzdNH1iB6PRs%3D&se=1531483669&skn=iothubowner

Device Explorer Twin

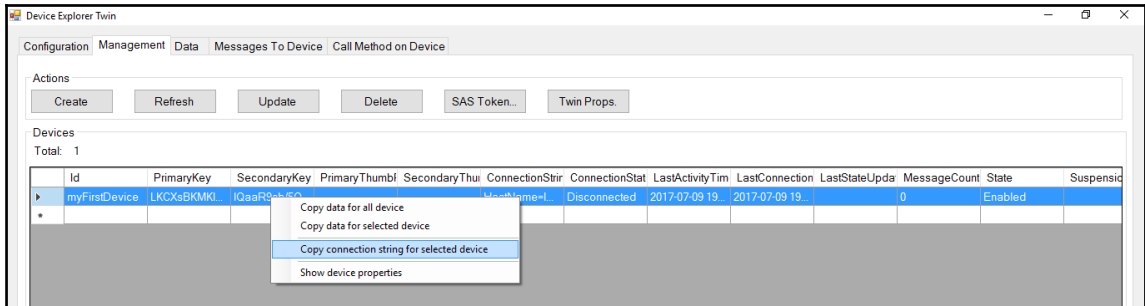
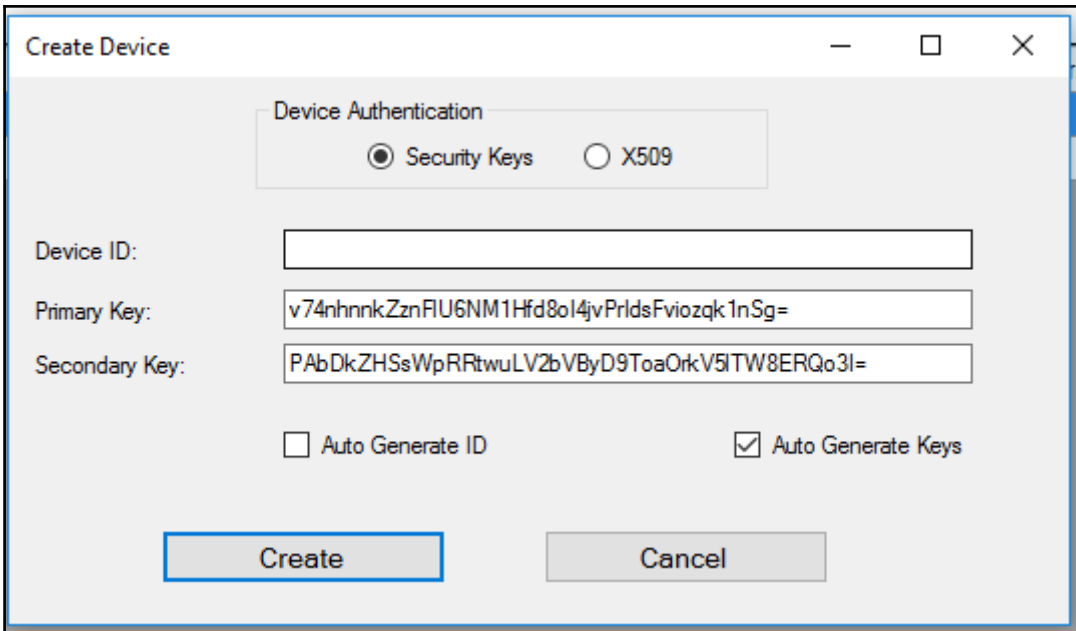
Configuration | Management | Data | Messages To Device | Call Method on Device

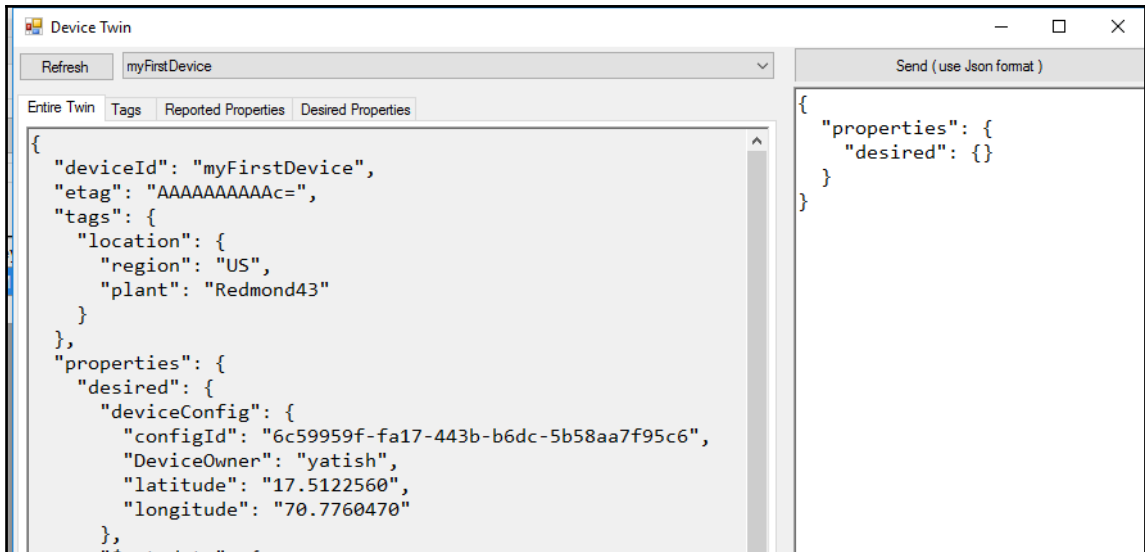
Actions:

Devices

Total: 1

Id	PrimaryKey	SecondaryKey	PrimaryThumbf	SecondaryThui	ConnectionStrir	ConnectionStat	LastActivityTim	LastConnection	LastStateUpda	MessageCount	State	Suspensid
myFirstDevice	LKCxSBKMKL	IQaaR9cb/5Q...			HostName=L...	Disconnected	2017-07-09 19...	2017-07-09 19...		0	Enabled	
*												





Configuration Management **Data** Messages To Device Call Method on Device

Monitoring

Event Hub:

Device ID:

Start Time:

Consumer Group: Enable

Show system properties

Event Hub Data

```
2017-07-10 00:52:48> Device: [myFirstDevice], Data:
[{"deviceId":"myFirstDevice","windSpeed":9.79529626564835,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560","lon
gitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data:
[{"deviceId":"myFirstDevice","windSpeed":11.285766027535203,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560"
,"longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data:
[{"deviceId":"myFirstDevice","windSpeed":10.020043059261536,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560"
,"longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data:
[{"deviceId":"myFirstDevice","windSpeed":10.804629530201028,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560"
,"longitude":"70.7760470"}]
2017-07-10 00:52:49> Device: [myFirstDevice], Data:
[{"deviceId":"myFirstDevice","windSpeed":11.553908323661382,"highTemp":72.3,"lowtemp":11.2,"latitude":"17.5122560"
,"longitude":"70.7760470"}]
```

Configuration Management Data Messages To Device Call Method on Device

Send Message to Device:

IoT Hub: IoTHubCookBook

Device ID: myFirstDevice

Message: amqp Sample

Add Time Stamp Monitor Feedback Endpoint

Properties:

Key	Value
Name	AMQP.Net Lite
*	

Send Clear

Output

Sent to Device ID: [myFirstDevice], Message:"2017-07-10 00:58:01 - amqp Sample", message Id: 74363257-b659-4bb0-ad9c-e49ca1a3cd32

Configuration Management Data Messages To Device Call Method on Device

Call Method on Device

IoT Hub: IoTHubCookBook

Device ID: myFirstDevice

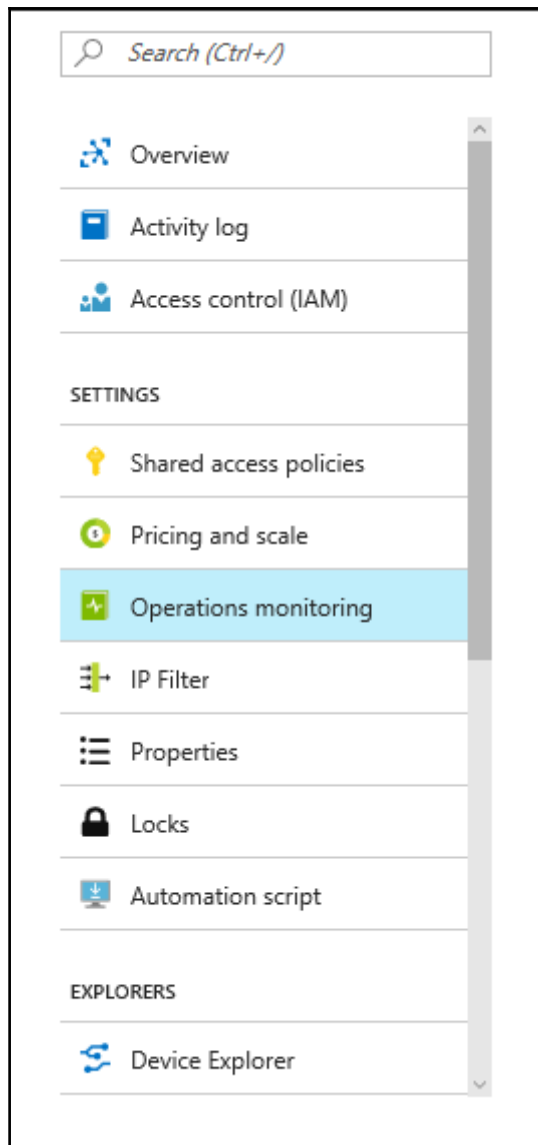
Method name: MethodName

Method payload: {"MethodPayload": "Payload"}

Timeout(seconds): 60 Call Method Cancel

Return status:

Return payload:



Monitoring categories

Log events related to operations on the device identity registry

None Error Verbose

Log events related to device-to-cloud messages

None Error Verbose

Log events related to cloud-to-device messages

None Error Verbose

Log events when a device connects or disconnects from the IoT hub.

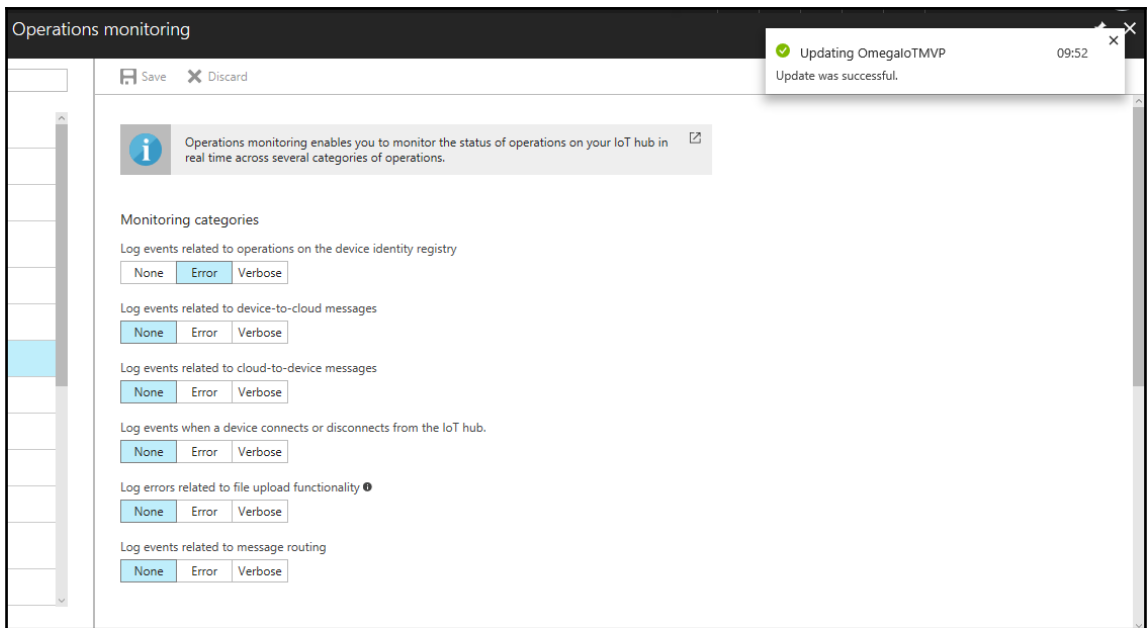
None Error Verbose

Log errors related to file upload functionality ⓘ

None Error Verbose


Log events related to message routing

None Error Verbose




Monitoring settings


Partitions ⓘ

4 

Event Hub-compatible name ⓘ

...-operationmonitoring 

Event Hub-compatible endpoint ⓘ

Endpoint=sb://iothub-ns-...-177413-6a2c1b21bb.servicebus.windows.net;/SharedAccess... 

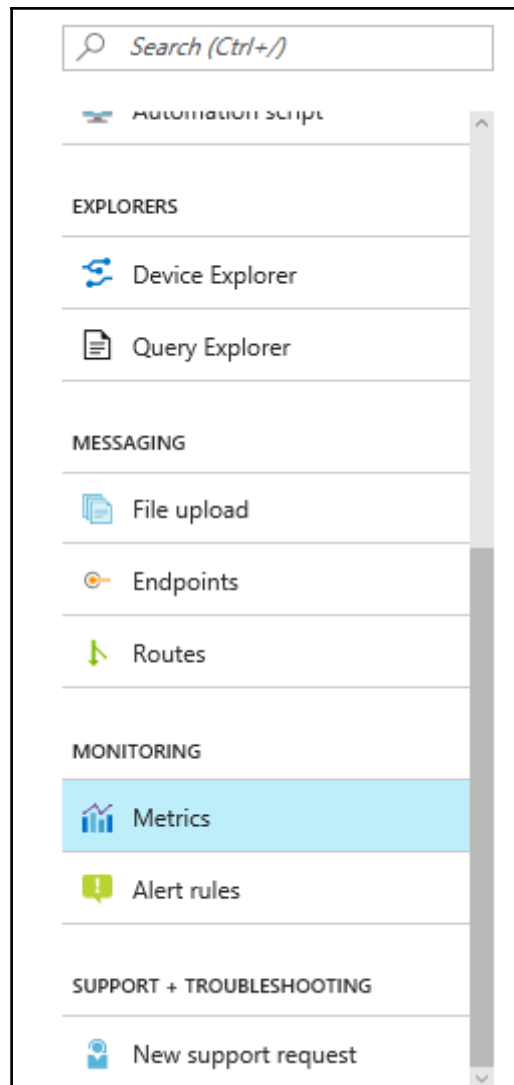
Retention time ⓘ

1 days

Consumer groups ⓘ

\$Default

...

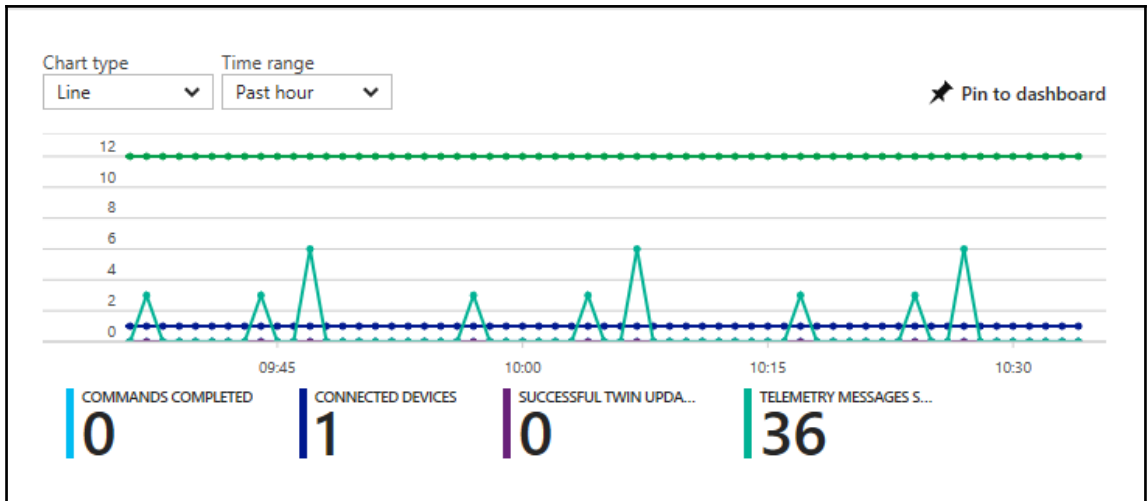


Available metrics

Filter metrics...

i You can only select metrics of the same unit (Count)

- Commands abandoned
- Commands completed
- Commands rejected
- Completed jobs
- Connected devices
- Dropped messages
- Failed calls to list jobs
- Failed creations of method invocation jobs
- Failed creations of twin update jobs
- Failed direct method invocations
- Failed job cancellations
- Failed job queries
- Failed jobs
- Failed twin queries












Alerts

Filter alerts...

NAME	STATUS	CONDITION	LAST FIRED
------	--------	-----------	------------

Choose your pricing and scale tier

 Loading pricing...Click here to open pricing calculator

S1 Standard	S2 Standard	S3 Standard	F1 Free
400k messages/unit/day	6M messages/unit/day	300M messages/unit/day	8k messages/unit/day
 Device-to-cloud telemetry	 Device-to-cloud telemetry	 Device-to-cloud telemetry	 Device-to-cloud telemetry
 Cloud-to-device messaging	 Cloud-to-device messaging	 Cloud-to-device messaging	 Cloud-to-device messaging
200 units maximum	200 units maximum	10 units maximum	1 unit
IoT hub cannot transition between free and paid tiers.			
Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...

