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Connecting to the Azure Cloud Using the RSL10 Sense and Control Application

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APPLICATION NOTE

INTRODUCTION

RSL10 Sense and Control, the Bluetooth Low Energy (BLE) based mobile application from ON Semiconductor, enables users to publish and subscribe data from sensors and actuators connected to platforms that feature RSL10, industry's lowest power Bluetooth 5 certified SoC. These platforms include the IDK (IoT Development Kit) and the B–IDK (Bluetooth Low Energy IoT Development Kit).

This document provides step–by–step instructions on setting up the MQTT broker on the IBM Watson cloud and configuring the mobile app to connect to the IBM cloud.

PREREQUISITIES

Users need to download the appropriate platform–specific firmware to enable communication with the mobile app.

IoT Development Kit (IDK)

- Ensure that the BLE–IOT–GEVB board is connected to the IDK baseboard, BB–GEVK
- Download firmware found on BLE–IOT–GEVB web page to the BLE–IOT–GEVB board
- Download the "BLE Custom Service Firmware" example to the IDK baseboard, BB–GEVK
- Detailed instructions on compiling example code and downloading to the IDK baseboard, BB–GEVK, can be found here

Bluetooth Low Energy IoT Development Kit (B–IDK)

- Download the custom service firmware to the B−IDK baseboard, BDK–GEVK
  - Detailed instructions on compiling and downloading the custom service firmware to the B−IDK baseboard, BDK–GEVK, can be found here

Once the firmware is loaded, the mobile application can be used to read sensor values and set actuator values, publish sensor values to an MQTT broker and subscribe actuator settings from the MQTT broker.

Configuring Azure IoT Cloud Instance

1. Create a free Azure Cloud account: https://docs.microsoft.com/en–us/azure/cost–management/activate–subs–accounts

In Windows Browser execute the URL: https://portal.azure.com/ and login to the portal using UserID and password.

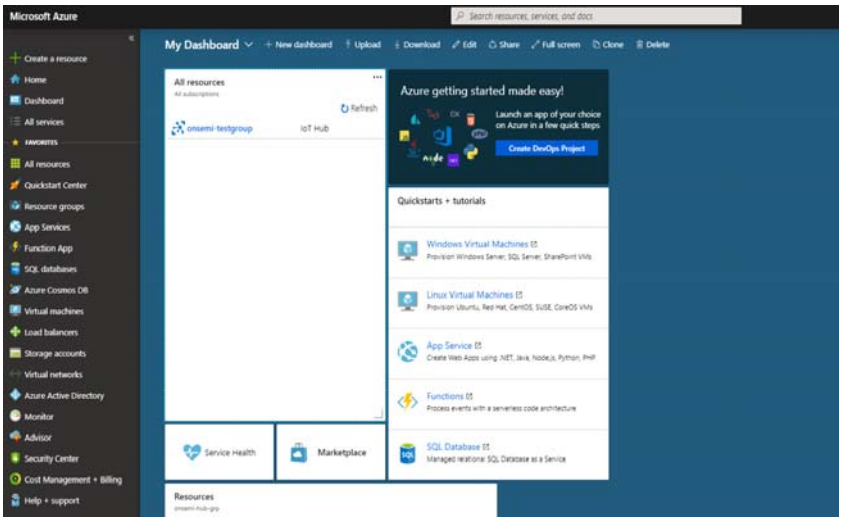

Figure 1. Microsoft Azure Portal Dashboard

2. Download *Device Explorer* from Microsoft or https://github.com/Azure/azure−iot−sdks/releases. Install and run the application; it is used for observation and settings of MQTT communication and SaS keys

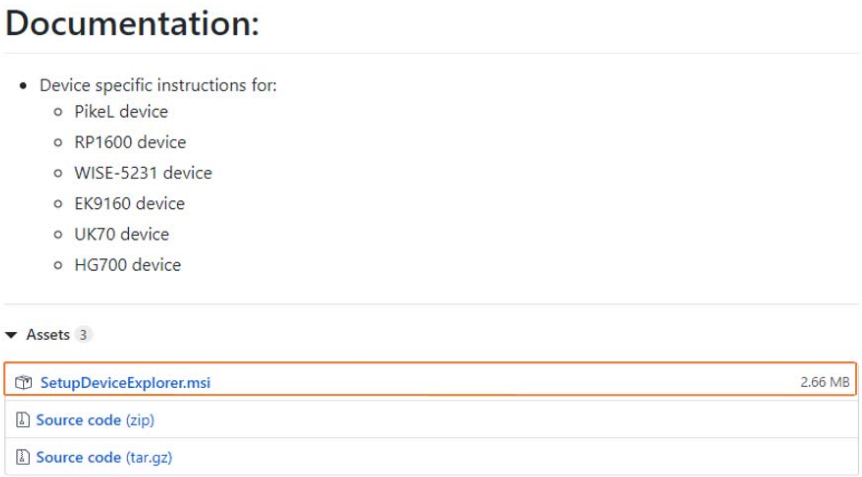

Figure 2.

3. Creating a Resource Group
   a. Click *Resource groups* from the left pane. You will see all the resource groups in your subscription listed

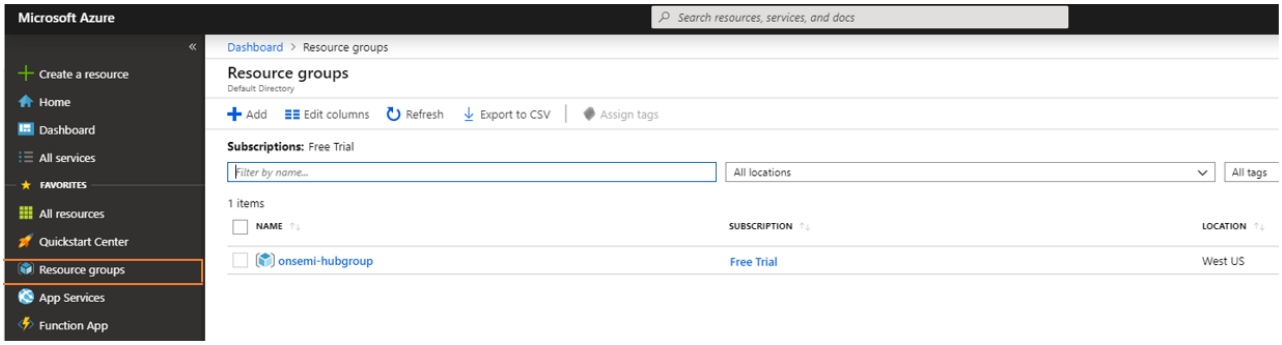

Figure 3.

   b. Click *Add (+)* to create a new resource group. The create Resource Group window appears

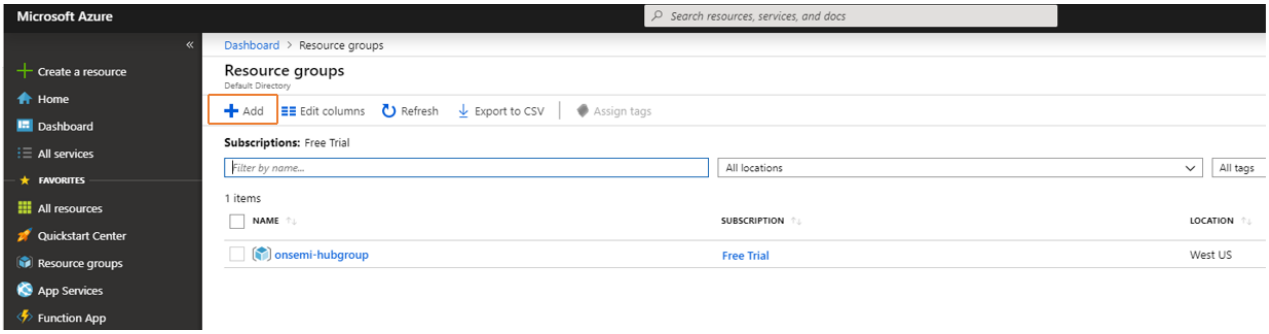

Figure 4.

c. Provide the following information for the new resource group

Table 1.

Parameter	Description
Resource Group Name	Enter a unique name for your new resource group. A resource group name can include alphanumeric characters, periods (.), underscores (_), hyphens(–), and parenthesis (), but the name cannot end with a period
Subscription	Select your Microsoft Azure subscription
Resource Group Location	Select the location of the Microsoft Azure data center. Specify a location where the majority of your resources will reside. Typically, select the location that is closest to your physical location.

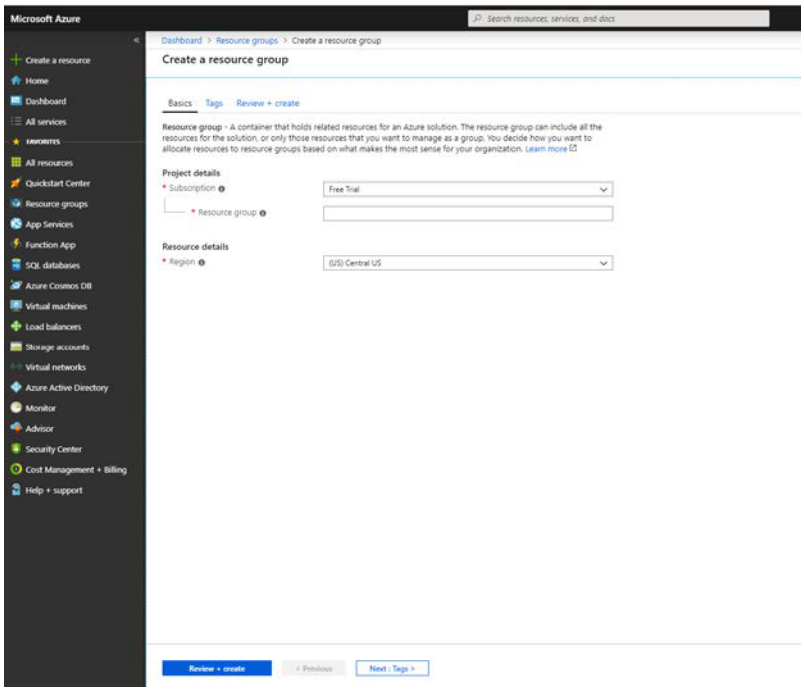

Figure 5.

d. Click *Review + Create*. The resource group might take a few seconds to create

4. Create an IoT hub

This section describes how to create an IoT Hub after creating a resource group

a. Click *Create a resource* from the left pane of the dashboard

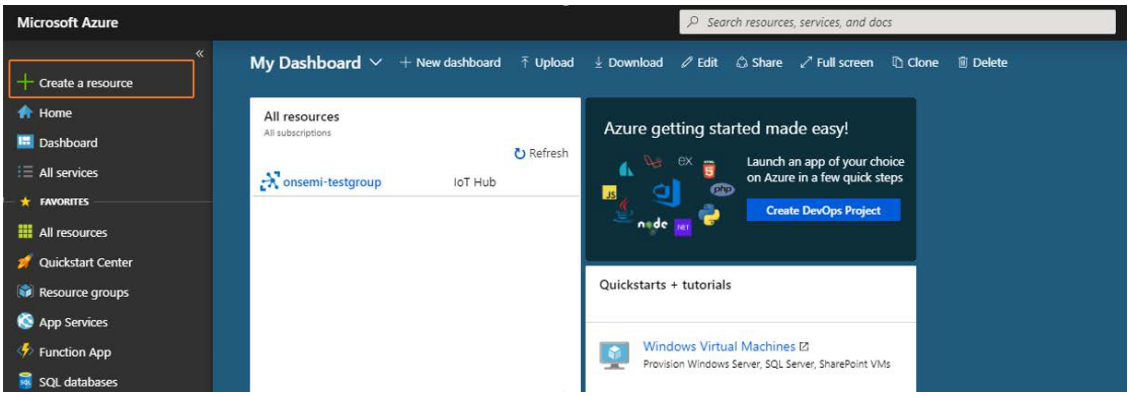

Figure 6.

b. *Search the Marketplace* for the IoT Hub. Select *IoT Hub* and click the *Create* button. The first screen for creating an IoT Hub will appear

c. Provide the following information to create a new resource

Table 2.

Parameters	Description
Subscription	Select the subscription to use for your IoT hub.
Resource Group	You can create a new resource group or use an existing one. To create a new one, click **Create new** and fill in the name you want to use. To use an existing resource group, click **Use existing** and select the resource group from the dropdown list
Region	Select the location of the Microsoft Azure data center. Specify a location where the majority of your resources will reside. Typically, select the location that is closest to your physical location.
IoT Hub Name	Select the location of the Microsoft Azure data center. Specify a location where the majority of your resources will reside. Typically, select the location that is closest to your physical location.

d. Click *Next Size and Scale* to continue creating your IoT Hub

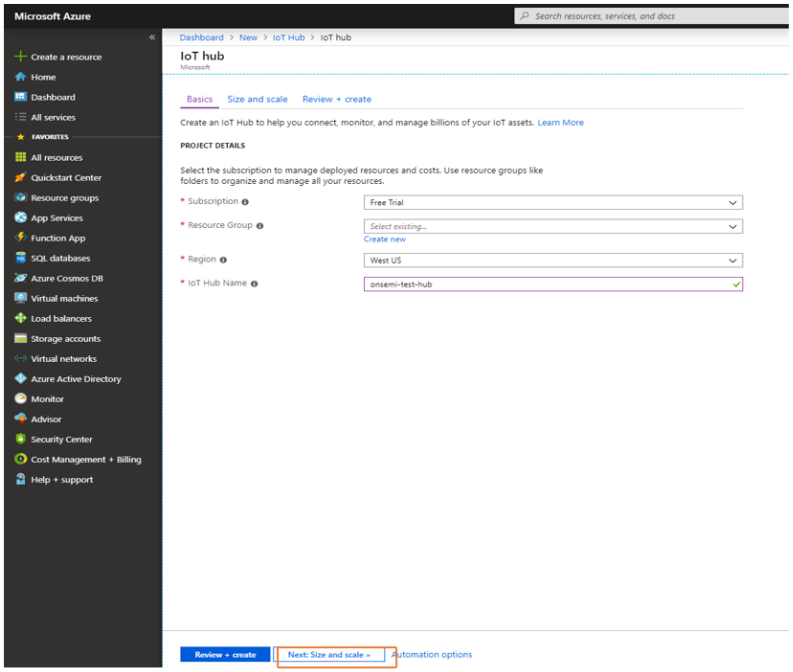

Figure 7.

e. On this screen, take the default and click *create*

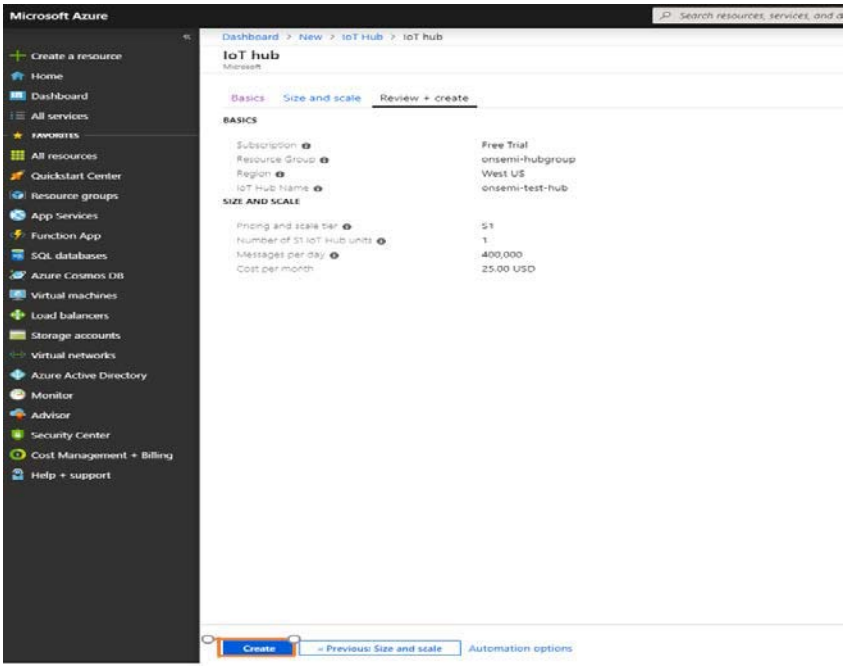

Figure 8.

5. The resource created appears to be reflecting on *My dashboard*. Click on the resource created

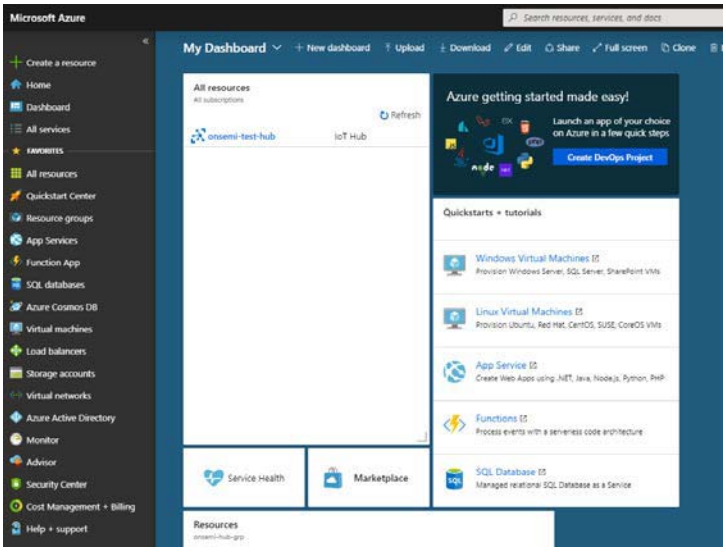

Figure 9.

6. Select *IoT devices* from the list

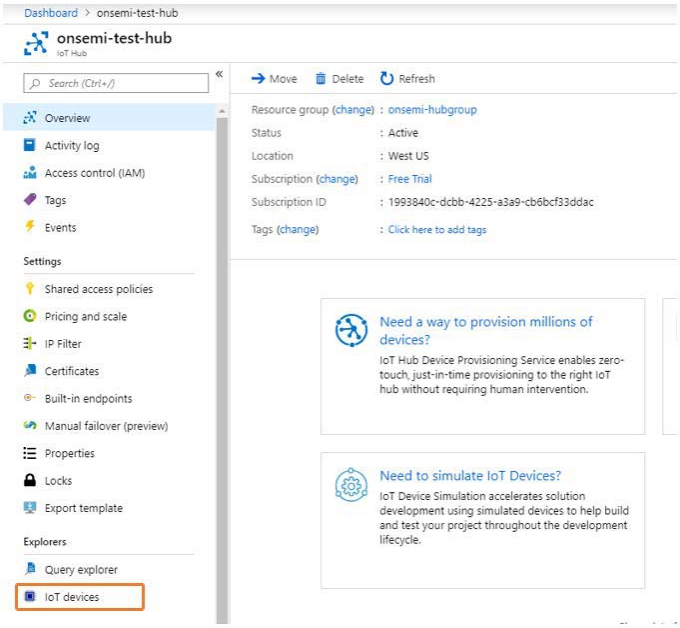

Figure 10.

7. Click *New (+)*. Enter the Device ID and keep the existing field as it is. Click *Save*

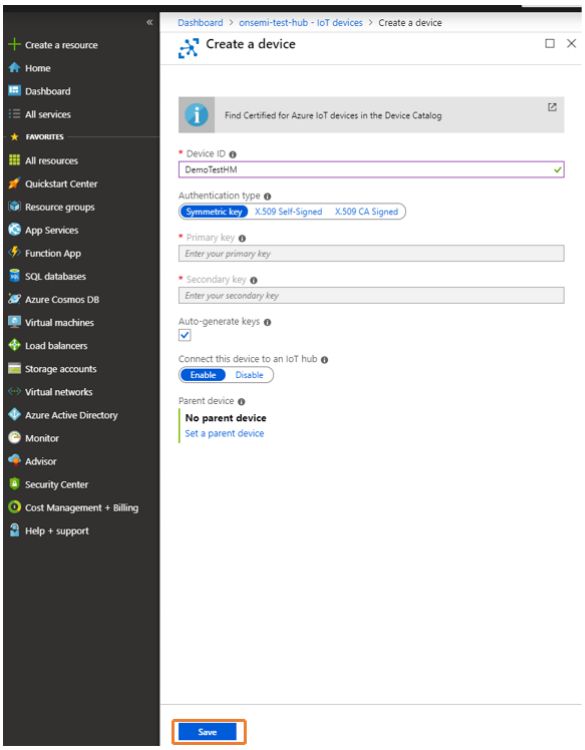

Figure 11.

8. Once the device is created, it will be shown in the IoT Device List

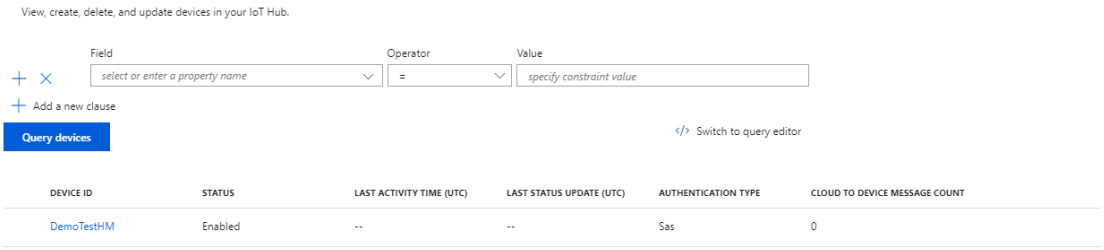

Figure 12.

9. Select *Shared access policies* from the left sub−window list and click *Iothubowner*

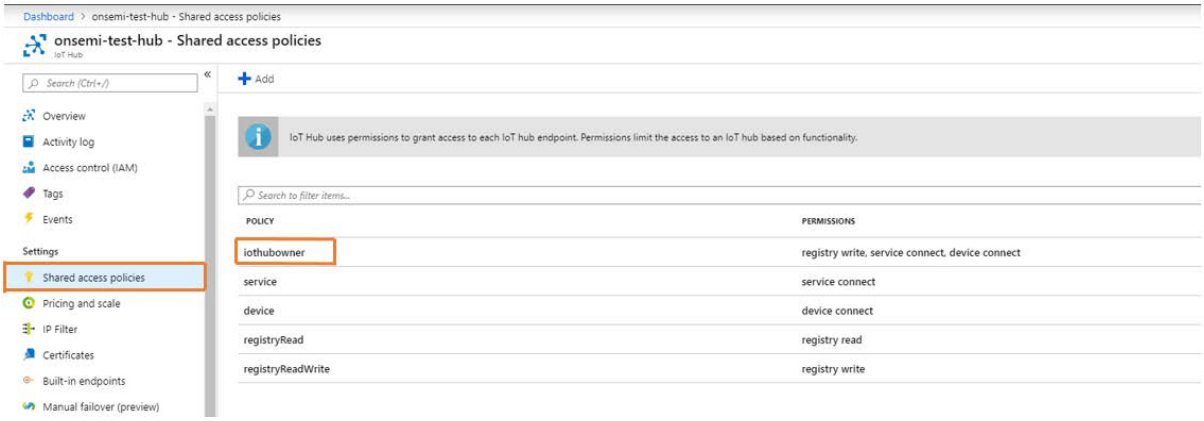

Figure 13.

10. Copy the *Connection string−primary key*. This is a crucial step for the Device Explorer login access

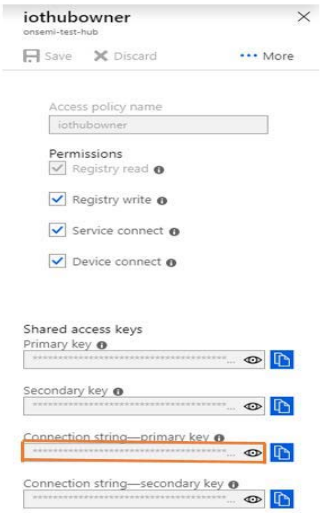

Figure 14.

11. Configuring the Device Explorer
    a. Open the *Device Explorer Twin* which was installed previously
    b. Paste the *Connection string−primary key* in the field *IoT Hub Connection String* and click *Update* as shown

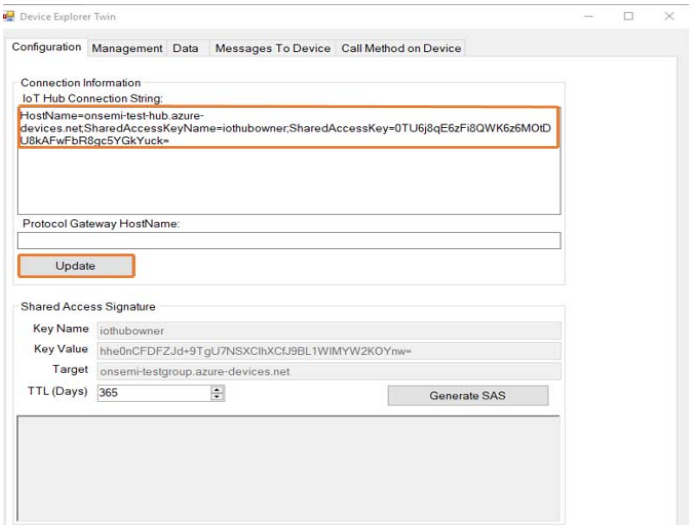

Figure 15.

c. Click *Generate SAS* as shown

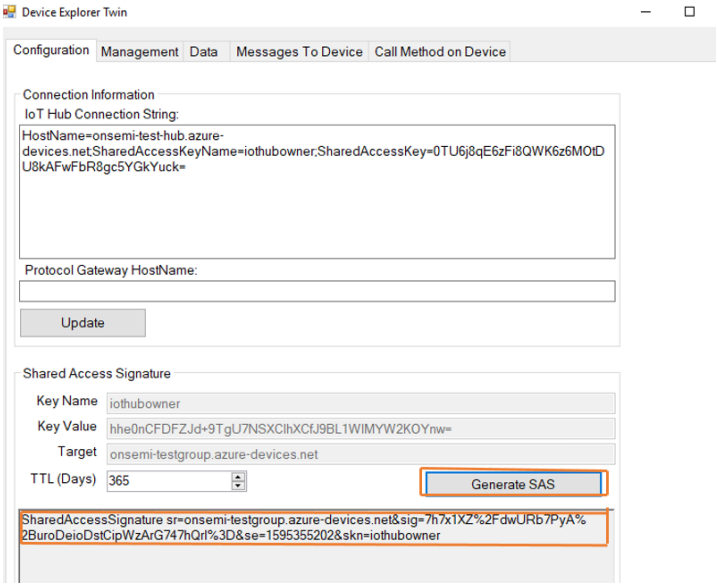

Figure 16.

Android Application Configuration

12. Start the Android App
    a. On the main page of the App, tap on the Setting icon as shown below
    b. On the setting page tap on the Manage Brokers setting
    c. Tap on the “+” symbol on the bottom of the screen
    d. Tap on the add broker setting denoted by “+”
    e. Select Azure and tap Next

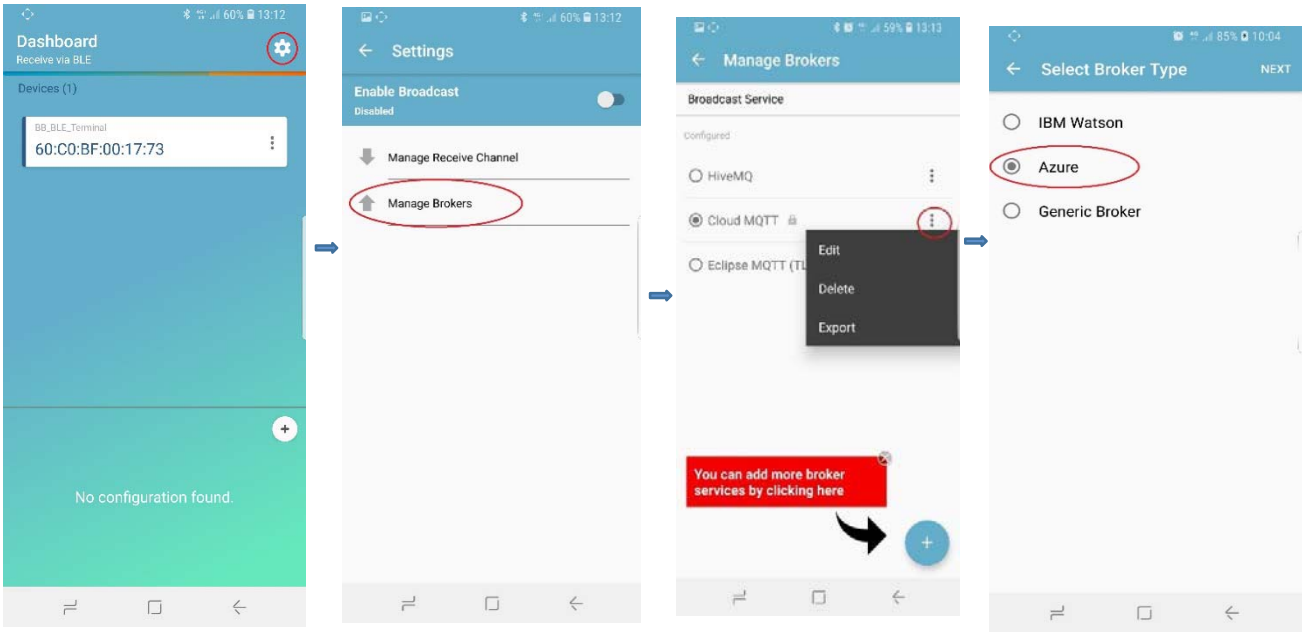

Figure 17.

13. Populate the Fields with the values shown below
    a. Client Name: *Any text string*
    b. Device ID: Enter the *Device ID* which was provided while creating a device
    c. Protocol: SSL
    d. URL : Enter the Hostname

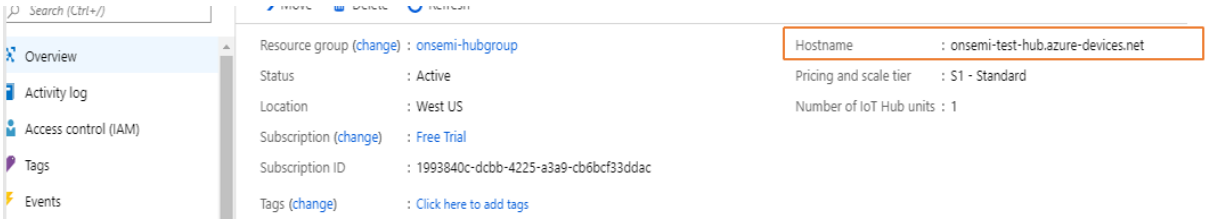

Figure 18.

    e. Port No: 8883
    f. Username: <Hostname>/<Device ID configured in the Azure Portal>/api−version= <Current Date in YYYY−M−D>
    g. Password: Generated SAS key from Device Explorer
    h. Click Save and validate the connection

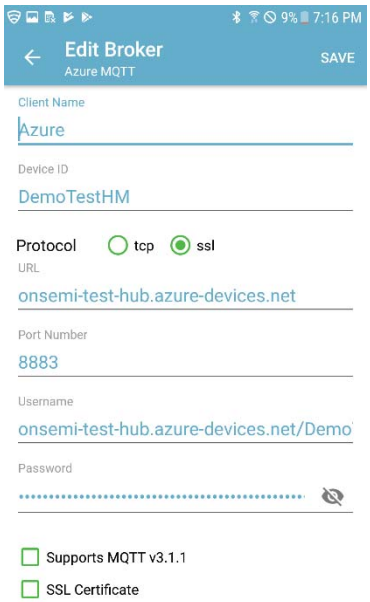

Figure 19.

IOS Application Configuration

14.
   a. Start the iOS App
   b. On the main page of the App, tap on the Settings icon as shown below
   c. On the settings page tap on the Manage Brokers settings
   d. Tap on the “+” symbol on the bottom of the screen
   e. Tap on the add broker setting denoted by “+”
   f. Select Azure and tap Next

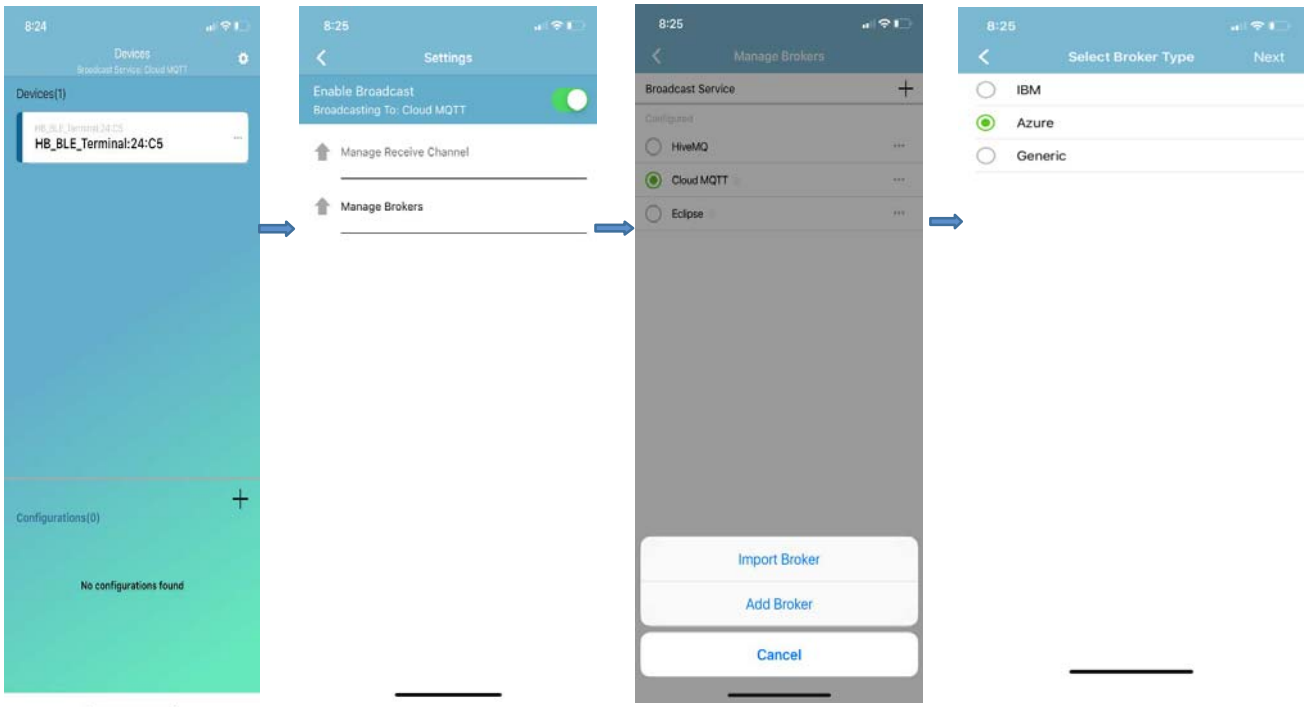

Figure 20.

15. Populate the Fields with the values shown below
   a. Client Name: *Any text string*
   b. Device ID: Enter the *Device ID* which was provided while creating a device
   c. Protocol: SSL
   d. URL: Enter the Hostname

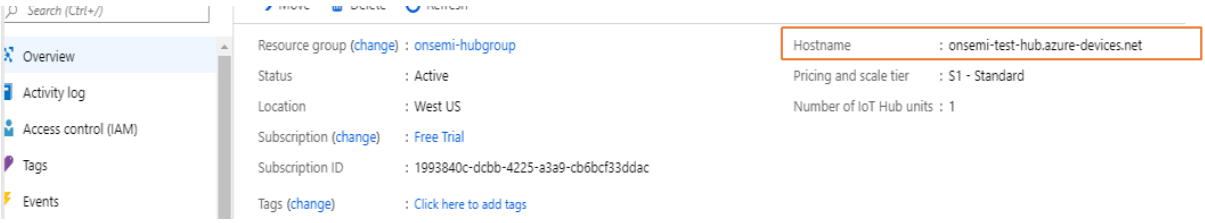

Figure 21.

e. Port No: 8883
f. Username: <Hostname>/<Device ID configured in the Azure Portal>/api−version= <Current Date in YYYY−M−D>
g. Password: Generated SAS key from Device Explorer
h. Click Save and validate the connection

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