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Connecting to the IBM Cloud Using the RSL10 Sense and Control Mobile Application

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



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APPLICATION NOTE

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.

1

Configuring IBM Watson Cloud

- 1. Create a free IBM Cloud account https://console.bluemix.net/docs/services/watson/i ndex.html#free-account
- 2. Go to
 - https://console.bluemix.net/dashboard/apps_(login using credentials from step 1)
- 3. Click Create Resource

Dashboard						
RESOURCE GROUP All Resources ~	CLOUD FOUNDRY ORG All Organizations ~	CLOUD FOUNDRY SPACE All Spaces ~	LOCATION All Locations ~	CATEGORY All Categories ~	Filter by resource name	Create resource



3. a. Select Internet of Things from the left pane



Figure 2.

3. b. Once the resource is created, click Launch

	Let's get started with IBM Watson IoT Platform Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.
UU	Launch Docs

Figure 3.

This will launch the Service and take you to the IBM Watson IoT Platform page

4. Click on Add Device

IBN	i Watson IoT Platform	0		8
	Browse Action Device Types		+ Add Device	
۲				
00 00	Browse Devices	Type the Device ID to search for	Q	



- 4. a. Enter MobileApp as Device Type as shown below
- 4. b. Enter any string (Ex: **MyONDevice**) as Device ID as shown below

Add Device	Identity	Device Information	Security	Summary
Select a device t	ype for the dev	vice that you are adding a	and give the dev	ice a unique ID.
Device Type	Device Type MobileApp			
Device ID	Му	ONDevice		

Figure 5.

- 4. c. Click Next till you get to the Summary screen
- 4. d. Click Done
- 5. Click *Apps* to launch the API key generation screen



Figure 6.

5. a. Click Generate API Key

IBM W	atson IoT Platform	0 8
	Browse IBM Cloud Apps	+ Generate API Key
್ಲಿ	Browse API Keys	Type the app description to search for Q
Å	This table shows a summary of the API keys that have been added for the organization. It can be filtered, organized, and search on using different criteria. To get started, you can add API keys by clicking Generate API Key,	
-	or by using the API. For more information about adding API keys, see <u>API key connection</u> .	

Figure 7.

5. b. On the next screen, enter Description (Optional) and click *Next*

Generate AP	Key Information Permissions			×
Description	1			
API Key Expires	off 💽 on Choose date			
			Cance	el Next

Figure 8.

5. c. Select "Standard Application" for Role and click *Generate Key*

Generate API Ke	y Information Permissions			×
The application will	have access for the following role: Standard Application	Ū	For more information about roles, see <u>User, application, and gateway roles</u> .	
				G enerate Key



6. Save the API Key and the Authentication token displayed on the screen after API key generation

The	e API ke	ey has been added.				
Authe	ntication tokens ate a new authe	s are non-recoverable. If you misplace this ntication token.	s token, you will	need to re-register the API key t	0	
Gen	erated De	etails	API Ke	y Information		
API Ke	у	a-v1h4gm-6rx6wkkdwi	Description			
Auther	tication Token	E&Xz091xe2D_FTt8-M	Role	Standard Application		
			Expires	Never		
\wedge	Make a note Lost authen you lose the generate a r	of the generated authentication token. tication tokens cannot be recovered. If token, you must reregister the API to new token.				



Please Note that this step is crucial since the token cannot be recovered at a later stage. So, it's important to note down the two values before navigating away from this page. 7. After copying and saving the API Key and the the dashboard page should display the newly created device as shown below

Authentication Token, clicking the Devices from

Brows	se Devices				Type the Devic	e ID to
 All Devic 	es Diagnose					
This table show using different	ws a summary of all devices that h criteria. To get started, you can a	lave been added. It can be filtered dd devices by using the Add Devic	l, organized, and searched on e button, or by using API.			
	Device ID 🗘	Device Type 💲	Class ID 🗘	Date Added	Descriptive Location	\$
			1 result			
	MyONDevice	MobileApp	Device	Nov 29, 2018 4:56 PM		

Figure 11.

The device is now setup. Clicking on the device will display device details. Once the mobile app is configured, the published data can be seen on the "State" tab.

	Device ID 🗘	Device Type	Class ID 🗘	Date Added	Descriptive Location	Ē	\mathbb{A}	ш
			1 result					
	MyONDevice	MobileApp	Device	Nov 29, 2018 4:56 PM				
Identi	ity Device Information	Recent Events State	Logs			÷		×
-∿-	Showing Raw Data No Interfac	es Available						

Figure 12.

8. Org Id: Make a note of the Organization ID which can be found under Settings as shown below. You'll need the Org Id when configuring the mobile app

	Device Simulator	Identity
0	SECURITY	The organization ID and friendly name are the global identifiers of your organization. Administrators can modify the
ŝ	Connection Security	global name.
Ø	CA Certificates Messaging Server	Organization ID wyk71m
	Certificates	Friendly Name wyk71m
	Group Access beta	

Figure 13.

Android Application Configuration

9. Start the Android App

- 9. a. On the main page of the App, tap on the Settings icon as shown below
- 9. b. On the settings page tap on the Manage Brokers settings
- 9. c. Tap on the '+' symbol on the bottom of the screen
- 9. d. Tap on the add broker setting denoted by '+'
- 9. e. Select IBM Watson and tap Next





10. Populate the Fields with the values shown below

- IBM client name: Any text string
- App ID: Enter the API Key (generated in step 6)
- IBM Client ID: Skip this field. (Auto populated as per the entry in App ID field)
- Device Type: *MobileApp* (as per step 4 a)
- Device ID: *The Device ID created on the IBM cloud* (as per step 4 b)
- Protocol : Choose TCP or SSL
- URL:

<orgid>.messaging.internetofthings.ibmcloud.com (replace <orgid> with your organization ID as per step 8)

- Port No: 1883
- Username : Enter the API Key (generated in step 4)
- Password : Enter the Authentication Token (generated in step 4)
- Leave "Supports MQTT v3.1.1" & "SSL Certificate" boxes unchecked

Click Save to save settings and to validate the connection.

Once the broker is successfully verified, the app is ready to communicate with the IBM Watson cloud.

2 12 📼	1 20	* *** *** **		:30 PM
	Edit Broker			
IBM clie	ent name			
ONSe	emilBM			
App Id				
a-fbtj	b7-6scpg4dm	k0		
IBM clie	ent id			
a:fbtjl	b7:6scpg4dm	k0		
Device t	type			
Mobil	leApp			
Device I	NDevice			
Protoc	col 💿 tcp	🔿 ssl		
fbtjb7	7.messaging.i	nternetof	things.ibr	nclo
Port Nu	mber			0
1883				
Usernar	me			
a-fbtj	b7-6scpg4dm	k0		
Passwo	ord			
				9
🗌 Su	pports MQTT v3.	1.1		
ss	SL Certificate			

Figure 15.

Editing an Existing Broker

In order to edit a previously saved broker, click edit on the broker entry as shown below.



Figure 16.

iOS Application Configuration

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



Figure 17.

- 12. Populate the Fields with the values shown below
- IBM client name: Any text string
- App ID: Enter the API Key (generated in step 6)
- IBM Client ID: Skip this field. (Auto populated as per the entry in App ID field)
- Device Type: *MobileApp* (as per step 4 a)
- Device ID: *The Device ID created on the IBM cloud* (as per step 4 b)
- Protocol : Choose TCP or SSL
- URL:
 <orgid>.messaging.internetofthings.ibmcloud.com (replace <orgid> with your organization ID as per step 8)
- Port No: 1883
- Username : Enter the API Key (generated in step 4)
- Password : Enter the Authentication Token (generated in step 4)
- Leave "Supports MQTT v3.1.1" & "SSL Certificate" boxes unchecked

Click Save to save settings and to validate the connection.

Once the broker is successfully verified, the app is ready to communicate with the IBM Watson cloud.

			🗢 👀
<			
	Generic Mc	(1)	
IBMClient			
a-v1h4gm-qo	3el1wrwt		
a:v1h4gm:qo3	del1wrwt		
MobileApp			
Gate4444			
Protocol	🔵 tcp	i ssl	
v1h4gm.mess	aging.internetof	hings.ibmcl	oud.com
1883			
a-v1h4gm-qo	3el1wrwt		
•••••	•••••		Ø
Supports	MQTT v3.1.1		
SSL Certi	ficate		

Figure 18.

Editing an Existing Broker

In order to edit a previously saved broker, click edit on the broker entry as shown below.

10	52	? 🗗
<	Manage Brokers	
Broa	dcast Service	+
Conf		
0	HiveMQ	
0		
0	Eclipse	
\odot	IBMClient	(…)
	Edit	
	Delete	
	Export	
	Cancel	

Figure 19.

Once the Device is Setup and the Mobile App is Configured, View the Published Data

13. Go to *Resource List* from the left pane



Figure 20.

14. Go to Cloud Foundry Services and select the resource created (IoT Platform)

Name 🔺				
Q	Filter by name or IP address			
>	Devices (0)			
>	VPC Infrastructure (0)			
>	Kubernetes Clusters (0)			
>	Cloud Foundry Apps (0)			
\sim	Cloud Foundry Services (1)			
	Internet of Things Platform-1k			
>	Services (0)			
>	Storage (0)			
>	Cloud Foundry Enterprise Environments (0)			
>	Functions Namespaces (0)			
>	Apps (0)			
>	Developer Tools (0)			

Figure 21.

15. Click Launch

0

Figure 22.

This will launch the Service and take you to the IBM Watson IoT Platform page

16. Select the Device created and view the description by clicking the right arrow

> ✓ MyONDevice NobileApp Device → •••		~	Device ID	Status	Device Type	Class ID	Device Class
	>	~	MyONDevice	Disconnected	MobileApp	Device	→ ···



17. View the *Recent Events* and select the latest live stream of data that is coming from the device. a. For example to view the temperature data of the HB BLE Device

Eve	Event Payload					
Event N	lame	from_56295c0	from_56295c0c436125bc			
Time Re	eceived	Jul 10, 2019 1:	46 PM			
1 * 2 3 4 5 6 7 8 9	<pre>"token": " "event": " "mac_id": "cmd_id": "cmdVal": "Temperatu "Source_60" }</pre>	OSGatewayActivity", /updates/", "60:C0:8F:10:24:C5" "6", "26.74", re_6": "26.74", _C0_8F_10_24_C5_Ter	, ', nperature":	"26.74"		
9	300102_00		iperacure :	20.74		



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