

Alerts for BCM4343W IoT Starter Kit via Bluemix IoT Real-Time Insights

By Bryan Chen

This application takes the previous cloud application AV01 one step further by utilizing IBM Bluemix's IoT services to generate email notifications triggered by board sensor measurements.

Requirements:

- [Avnet BCM4343W IoT Starter Kit](#)
- Cypress WICED Software Development Kit (SDK) version 3.7.0 or later
- A Serial console application (such as TeraTerm or Putty)
- IBM Bluemix Account

Application Description

The main function of the application is to add push notification capability to the previous AV01 application. This is achieved through IBM's Bluemix IoT services and Node RED, an easy to use tool for wiring together various devices, services and API's.

First, this application publishes light sensor data to the cloud periodically, which is rerouted through Node RED to the Bluemix Services. Then, the BCM4343W starter kit board is registered as a device within Bluemix Service with its unique Device ID, briefly used in the last recipe. Once this link is established, the "Rules" services are utilized to establish an IF – THEN condition to trigger email notifications based on a light sensor threshold. These email notifications are sent directly from the Bluemix servers. Alternatively, this rule may be modified to work with other IFTTT events.

Instructions

1. Please Complete Part 1 of this Tutorial if not Already:

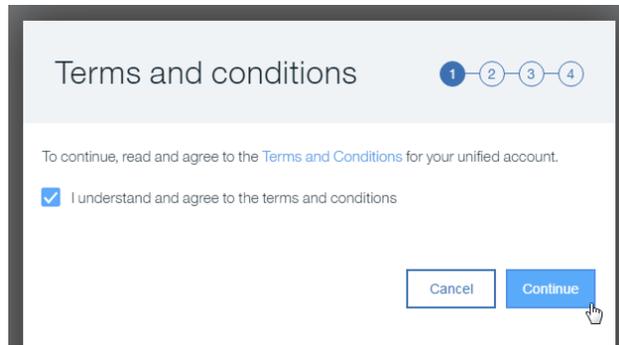
<https://developer.ibm.com/recipes/tutorials/avnet-bcm4343w-iot-starter-kit/>

2. Set up your Bluemix Environment

- a. Register and log on to the IBM Bluemix site:

<https://new-console.ng.bluemix.net/>

- b. If this is your first time logging on, you will be prompted with the following dialogue to set up your Bluemix environment. Accept the terms and conditions.



- c. Make sure the region is selected as “*US South*” and enter a unique organization name.



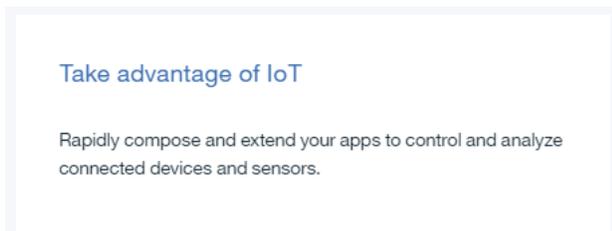
- d. Next, give a unique name for your first space.
- e. When finished, click “*I’m Ready*” and give Bluemix a minute to set things up.

3. Create your Bluemix Application:

- a. You should now be redirected to the console page of IBM Bluemix:

<https://console.ng.bluemix.net/dashboard/apps/>

- b. Scroll down and click on the “*Take Advantage of IoT*” box.



- c. Give your application a unique name, leave the rest of the fields as is, then click “*create*”.



- d. Bluemix will take 2-10 minutes to start your application and you will see the status change to indicate this.

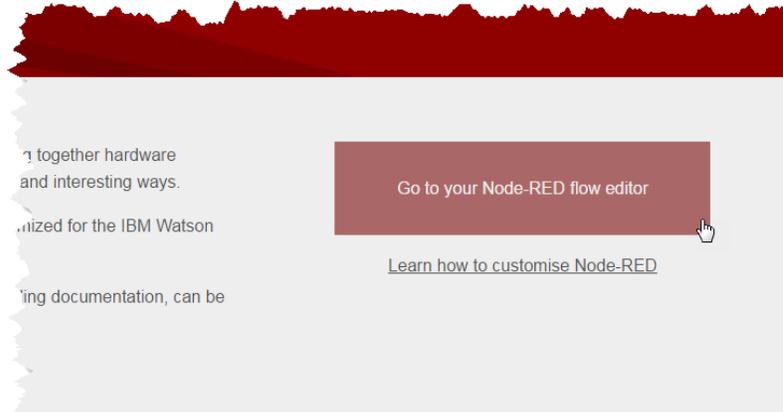


4. Edit via Node RED:

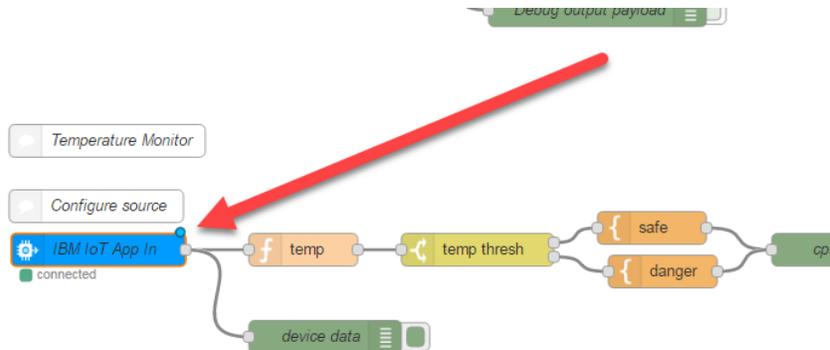
- a. Click on “*Visit App URL*” next to the name to access the Node RED editor home page.



- b. Click through the ‘*Secure your Node-RED editor*’ dialog, based on your preferences.
- c. When complete, click the red “*Go to your Node-RED flow editor*” button.



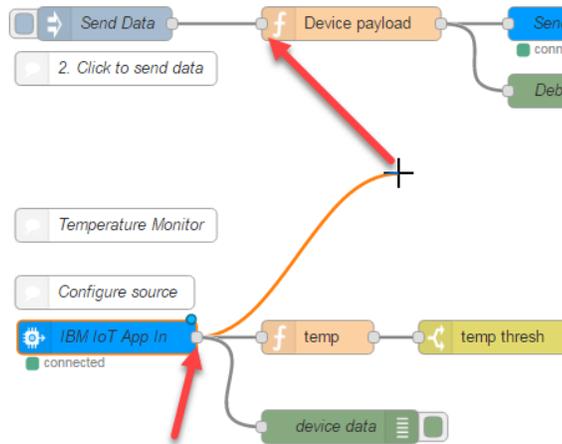
- d. You should now see two default “*flows*”. Double click the node called “*IBM IoT App In*” to edit.



- e. Enter in your device ID to the appropriate box and make sure the Authentication is set to “*Quickstart*”, then click “*Done*”.

Authentication	Quickstart
Input Type	Device Event
Device Id	device id e.g. ab12cd231a21
Name	IBM IoT App In

- f. In your Node RED flow editor, click the tiny box to the right end of the “*IBM IoT App In*” Node to create a wire, then, drag this wire to connect it to the “*Device Payload*” Node.



- g. Double click the “*Device payload*” Node to edit its properties and overwrite all of the pre-existing code with the following:

```
msg = {payload: JSON.stringify(msg.payload)};
return msg;
```

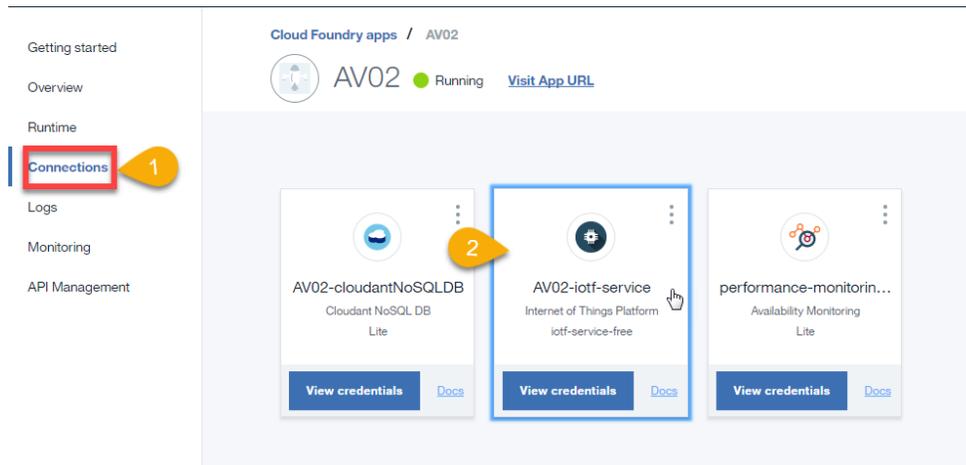
- h. Edit the “*Send to IBM IoT Platform*” node and make the highlighted changes (add your own unique Device Id).

Authentication	Bluemix Service
Output Type	Device Event
Device Type	WICED_DEVICE
Device Id	device id e.g. ab12cd231a21
Event Type	update
Format	json
Data	data
QoS	
Name	Send to IBM IoT Platform

- i. Click on “*Deploy*” in the upper right hand corner to save your changes.



5. Register your Device in Bluemix
 - a. Click the *'Connections'* tab on the left and then on the *iotf-service* for your app.



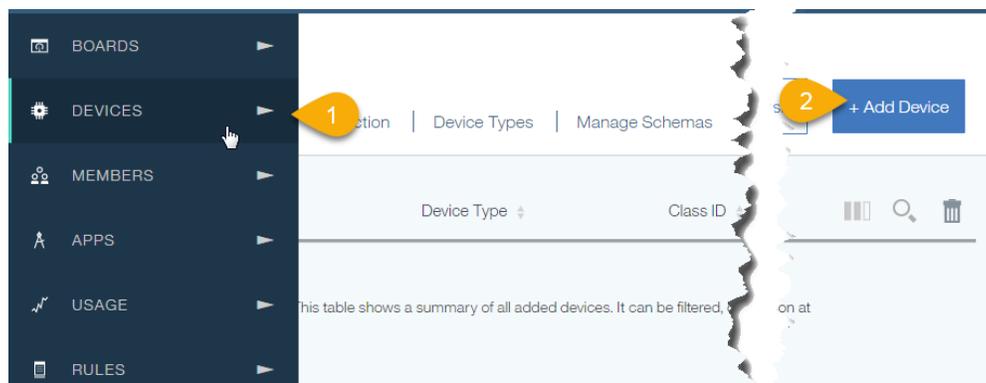
- b. Click on *"Launch"* to access your Bluemix Services dashboard.

Welcome to Watson IoT Platform

Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.



- c. Hover your mouse over the icons to the left to open up the pop-out menu, then select *"Devices"*. Click *"Add Device"* in the top right corner of the screen.



- d. Click on *"Create device type"*, then click *"Create device type"* again.



- e. Enter "WICED_DEVICE" for the Name and add an optional description and click next to skip through rest of the windows until you reach the last page - Metadata. Click "Create" and you should now see a "WICED_DEVICE" device type.



- f. Click "Next" and enter in your device ID from earlier. Skip through the remaining windows and click the "X" when finished.

6. Create a Device Schema

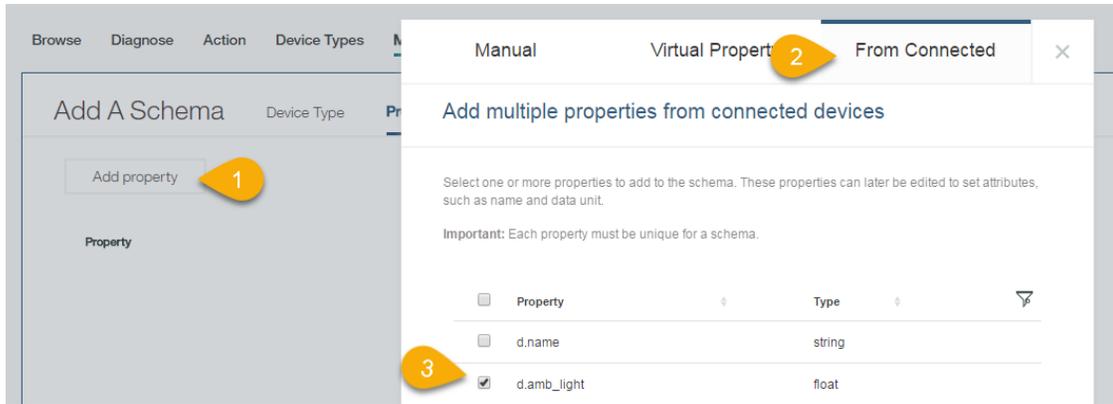
- a. Select the "Manage Schemas" tab on the top menu to create a device schema.



- b. Click "Add Schema" In the top right corner, select "WICED_DEVICE" for your device type and press "next".



- c. Now you will need to select properties of your device for the email notification rule. Click on "Add Property" and then select the "From Connected" tab, which will automatically import published properties. Check the box next to the "amb_light" property.



d. You should now see a schema listed as “WICED_DEVICE” back in the Schemas menu.

7. Create a Device Rule

- a. Hover your cursor over the icons to the left of the page to open the pop-up menu again. Select “Rules” and then click on “Create Cloud Rule”.



- b. Enter a name for your rule, an optional description and select the “WICED_DEVICE” schema in the “Applies to:” box.

* Name:

Description:

* Applies to: 

- c. Click next when complete and you should see an “IF/THEN” Diagram. Under the IF condition, click on the “New Condition” box to edit it. Click “Select Property” to choose the property for the IF condition, then click on the *triangle icon* next to “d” to open up a drop-down list of additional nested properties – select the “amb_light” property.





- d. Leave the operator as “>” and enter a reasonable value for the “Value:” box to compare whether the light is on or off. For this example, the value 200 is used. Click “OK”.

Set The Condition

* Property:

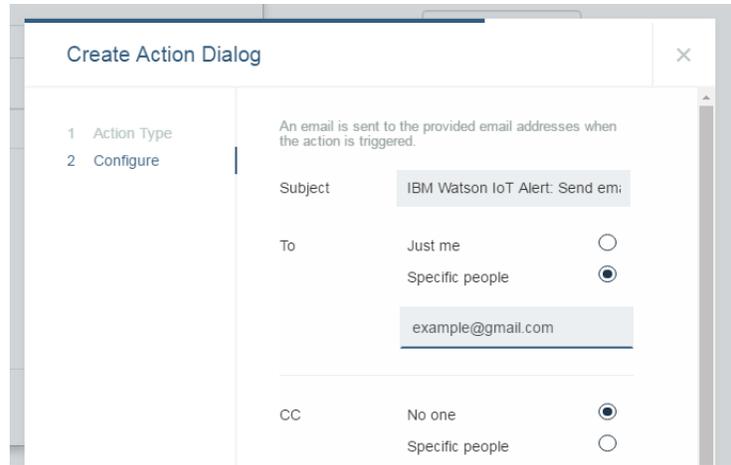
Operator:

Compare with: Static value Property

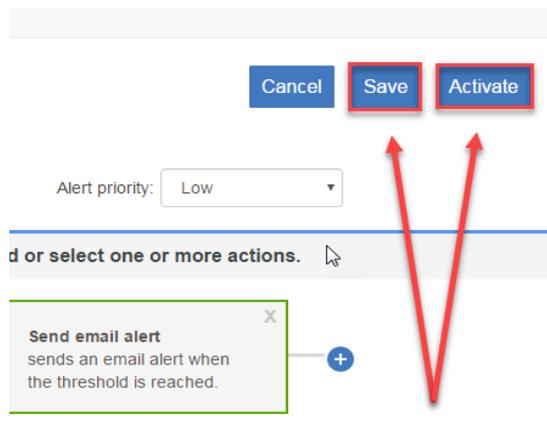
* Value:

- e. Now select the “New action” box to create a response to the IF condition. Click on “Add Action” and give your action a unique name and description, then select “send email” for “Type”. Press “Next” when complete.

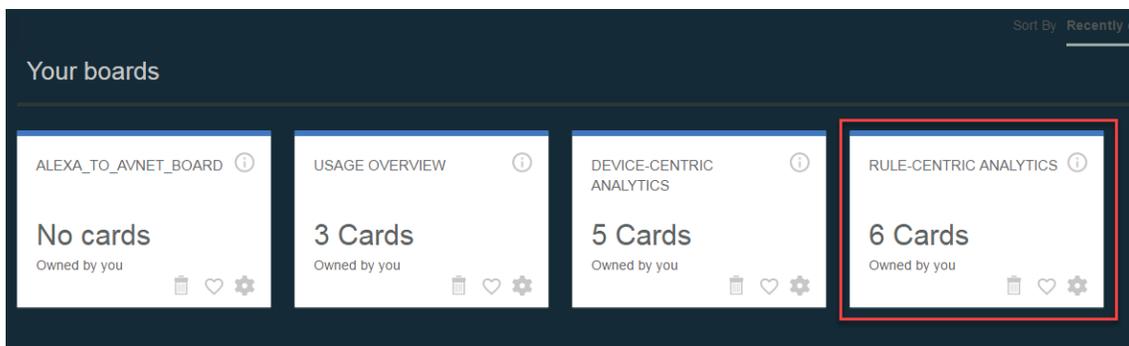
- f. Edit the subject line if you wish, and select “Specific People” under the “To” header. Enter the email address(es) you wish the notification to be sent to. You can also include emails for CC.



- g. Press finish and click on “*save*” and “*activate*” on the top right corner of the main rule menu to start your email notification application. Make sure the ‘*then*’ box has your rule.



8. Test your Email Notification Alerts!
 - a. Hover your cursor over the left pop-out bar and select “*Boards*”. Then click on the “*Rule-Centric Analytics*” board.



- b. You will now see several “*cards*” that display rule-related information. Try shining a light on the light sensor to trigger the email notification and see how these cards react.

c. Check your *email* to see the notification. If you don't see it, try checking your spam folder.

9. Extend this application!

Once you have successfully built this application, feel free to experiment with different IF conditions and THEN actions. There are many other actions that can be implemented with rules, such as triggering a Node-RED flow, IFTTT, etc.

LINKS:

Avnet BCM4343W IoT Starter Kit:

<http://cloudconnectkits.org>

Cypress WICED Studio SDK:

<https://community.cypress.com/community/wiced-wifi>

IBM Bluemix Console Page

<https://new-console.ng.bluemix.net/>

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With a passion for robotics and home automation, Bryan is a part-time EE/CS intern within Avnet's engineering team, while busy with full-time final year UCLA Electrical Engineering studies, focused on signals and systems.

He is a key contributor of reference designs, having published multiple applications using Avnet's versatile BCM4343W Wi-Fi & BT/BLE SoC module, taking-on challenging connectivity designs with BLE, cloud platforms and Alexa voice interfacing.

Revision History

Date	Version	Revision
20 June 17	01	Initial Release