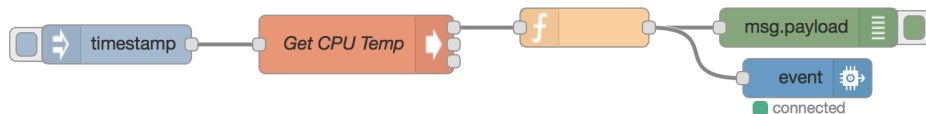
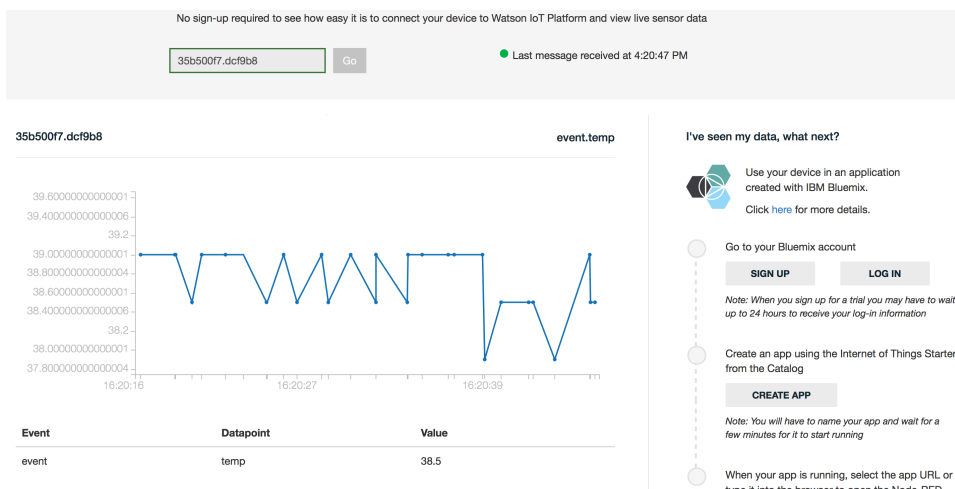


Raspberry Pi Temperature Sensor

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Use Node-RED to read a temperature sensor on the Raspberry Pi.



Use Watson IoT Platform QuickStart to visual incoming sensor data.



A digital copy of this lab and completed flow can be found at:
<http://ibm.biz/node-red-raspberrypi-temperature>



Add Watson IoT to Node-RED

In this tutorial, we will use Node-RED to read the temperature value of the CPU on a Raspberry Pi and emit the value to the IBM Watson IoT Platform where you can use the data in your Cloud application. Before we use Node-RED, we need to install the Watson IoT nodes.

1. SSH into your Raspberry Pi and confirm it is connected to the Internet. You need to be on the same network as the Raspberry Pi.

```
$ ssh raspberry@<<IP ADDRESS>>
```

2. Create a `node_modules` in the directory `~/node-red`

```
$ mkdir -p ~/node-red/node_modules
```

3. Change into the `node_modules` directory

```
$ cd ~/node-red/node_modules
```

Install the Watson IoT Node-RED package (npm not found? Use the commands `sudo apt-get update` and `sudo apt-get install npm` to install)

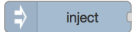
```
$ npm install node-red-contrib-ibm-watson-iot
```

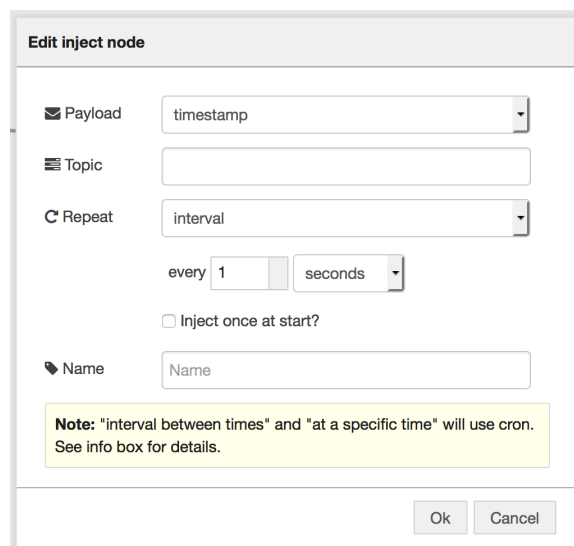
4. Start Node-RED


```
$ node-red
```

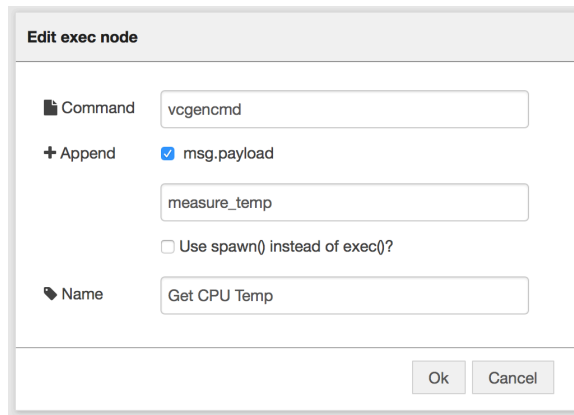
5. Node-RED is a visual editor that makes connecting Internet of Things devices, such as the Raspberry Pi, to the Internet and Cloud platforms such as IBM Bluemix. To access the web-based editor, open a web browser and enter the IP address of the Raspberry Pi, followed by `:1880`.

`http://<<IP ADDRESS>>:1880`

6. On the left sidebar are nodes you can drag into the middle pane to create flows. Drag a  node into the middle pane. Double click on the node, and change the values as shown below. Click **Ok** when finished.



7. Add a  node as shown below. Click **Ok** when finished.



Edit exec node

Command:

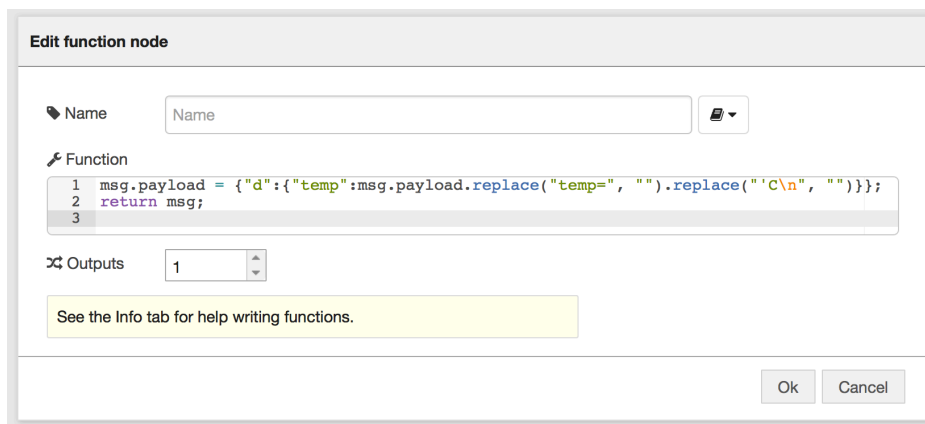
+ Append: ☒ msg.payload

☐ Use spawn() instead of exec()?

Name:

Ok Cancel

8. Add a  node as shown below. Click **Ok** when finished.



Edit function node

Name:

Function

```
1 msg.payload = {"d":{"temp":msg.payload.replace("temp=", "").replace("'C\\n", "")}};
```

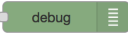
```
2 return msg;
```

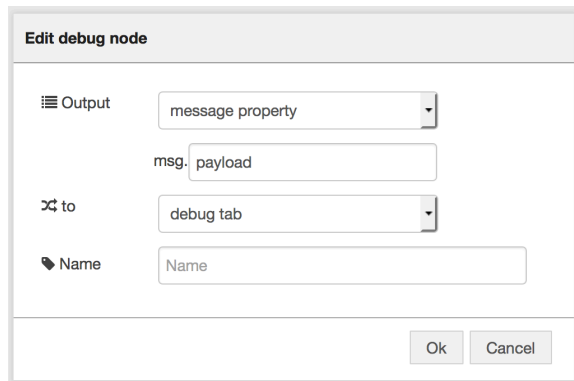
```
3
```

Outputs: 1

See the Info tab for help writing functions.

Ok Cancel

9. Add a  node as shown below. Click **Ok** when finished.



Edit debug node

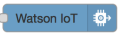
Output:

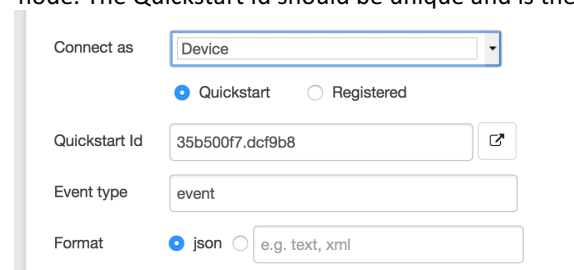
msg.

to:

Name:

Ok Cancel

10. Add a  node. The Quickstart Id should be unique and is the ID which data is sent to Watson IoT under.



Connect as:

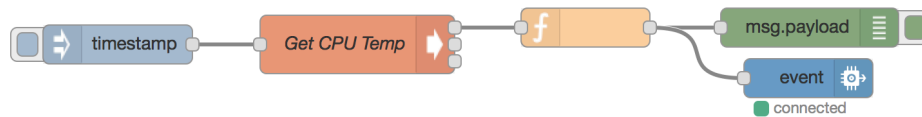
☒ Quickstart ☐ Registered

Quickstart Id:

Event type:

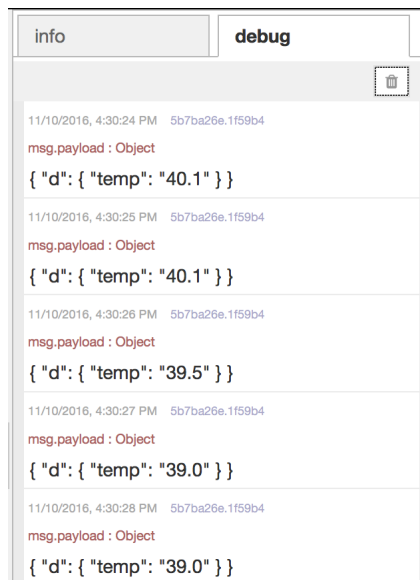
Format: ☒ json ☐ e.g. text, xml


11. Connect the nodes together as shown below.

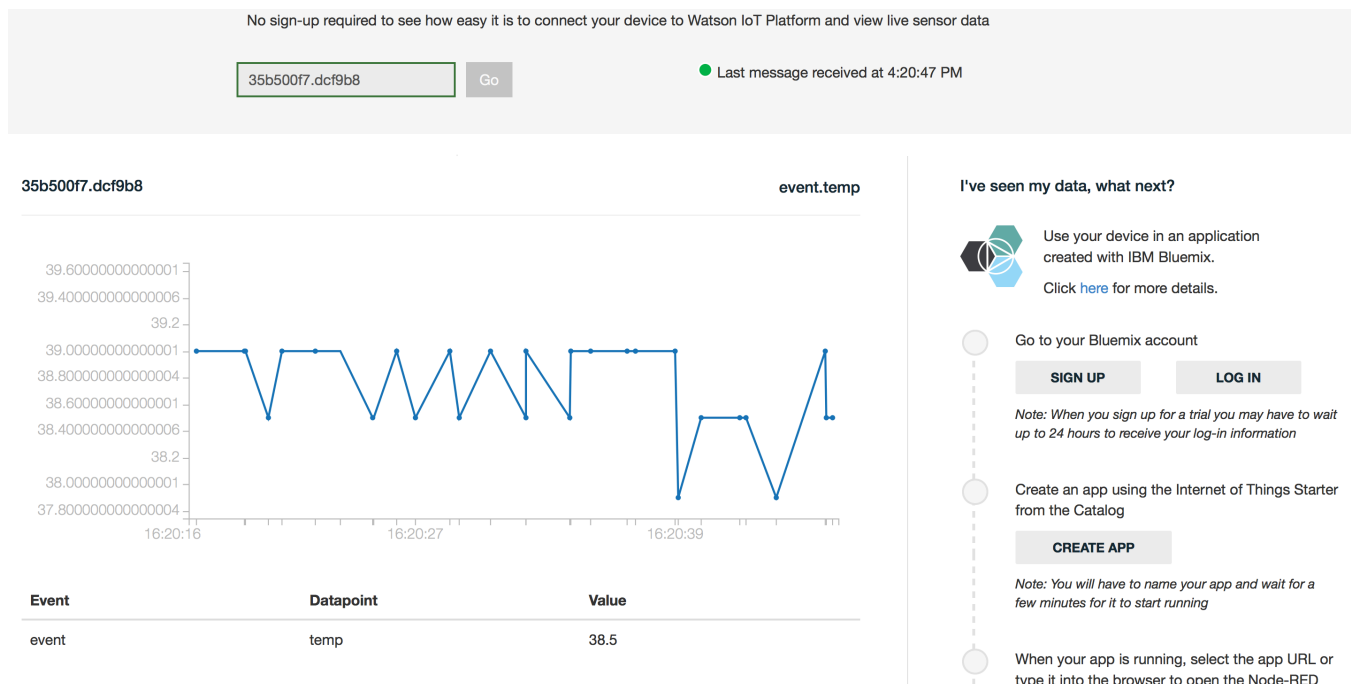


12. Click on the **Deploy** button in the top-right corner to save and deploy your changes.

13. In the **Debug** tab in the right sidebar, you should see the temperature data outputted every second.



14. Double click on the Watson IoT node again. Click on the  icon. This launches the QuickStart page which displays the incoming data.



Now that you have the temperature data in the Cloud, you may choose to create a Node-RED application in IBM Bluemix and respond to temperature events, including sending a text message via Twilio. For other Node-RED labs showing how to use IBM Watson, please visit ibm.biz/node-red-labs.