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Internet of Things (IoT)

# Connecting Raspberry Pi as a Gateway to Watson IoT using Node-RED – Part I

This recipe will help you connect your Raspberry Pi, as a gateway, to the Watson IoT Platform using the easy wiring approach of Node-RED.

Recipes@WatsonIoT

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IBM Watson

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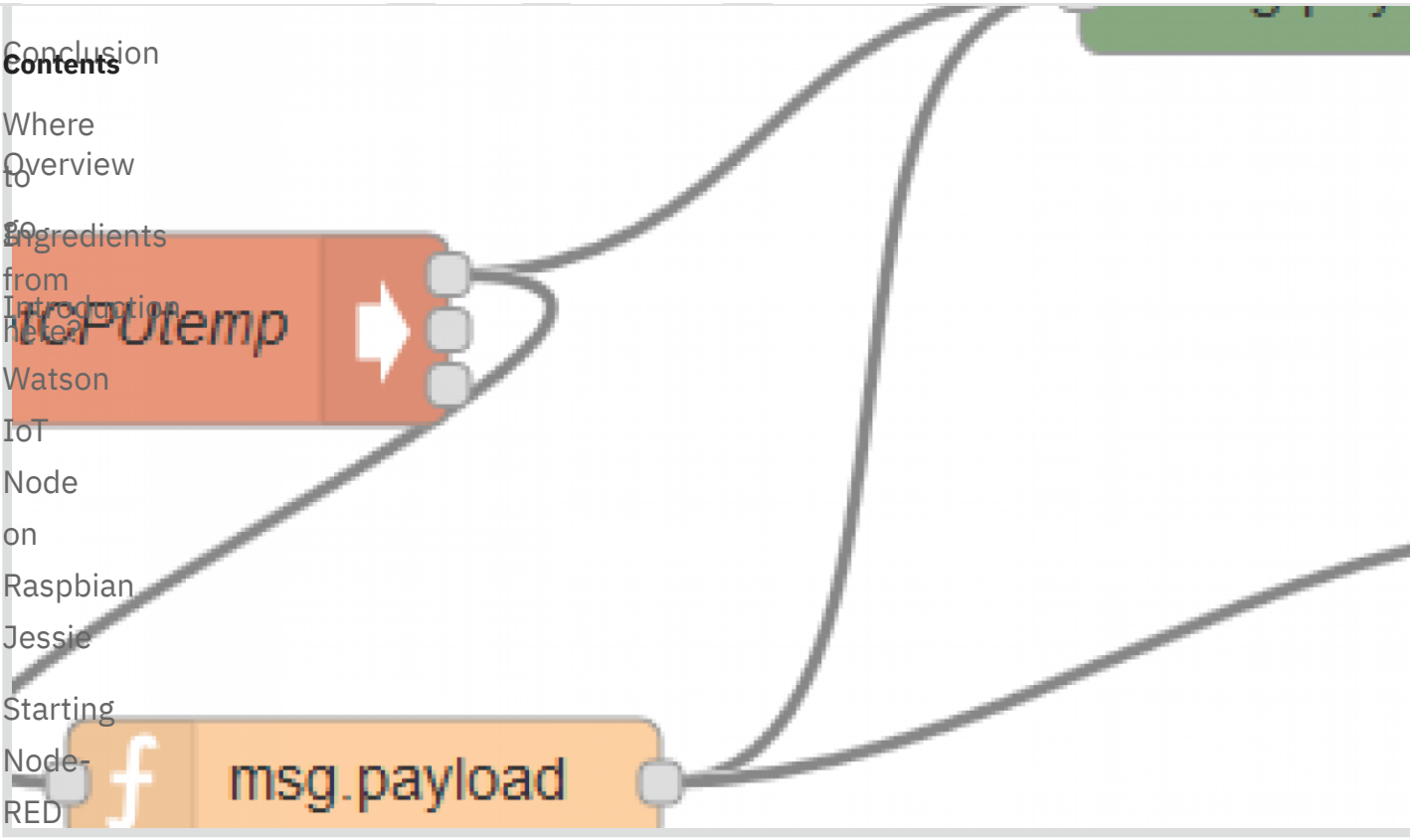





# Overview

Skill Level: Beginner

Beginner

IntroductionThe Watson IoT Node is a pair of Node-RED nodes for connecting your device to the Things Platform as a Device or as a Gateway.The previous recipe showcased how you can use the connect Raspberry Pi, as a device, to the IBM Watson IoT Platform. In this […]

# Ingredients

1. Raspberry Pi Model B/B+/ Pi 2 Model B+ /Pi 3

# Step-by-step

## 1 Introduction

The Watson IoT Node is a pair of Node-RED nodes for connecting your device to the IBM W Platform as a Device or as a Gateway.

The previous recipe showcased how you can use the Watson IoT node to connect Raspberr IBM Watson IoT Platform.

In this recipe, you will learn

1. How to install Watson IoT Node in Raspberry Pi (This is not needed, in case you have al while following the previous recipe),
2. Connect the Raspberry Pi, as a gateway, to the IBM Watson IoT Platform, and
3. Learn how to send gateway events to the platform and receive gateway commands fror

For more information about the Watson IoT Node please **click here**

## 2 Watson IoT Node on Raspbian Jessie

The latest version of **Raspbian Jessie** has both Node-RED and Watson IoT node pre-install IoT node is not the latest. To get the latest version of the Watson IoT node, carry out the fol

- Update Node-RED to the latest version

sudo apt-get update

sudo apt-get install nodered

***At this stage we have installed the latest version of Watson IoT Node in Raspberry Pi.***

***If you intend to use the browser in the PI then the current recommended browser for use w Iceweasel browser. This can be installed by the following:***

```
sudo apt-get install iceweasel
```

## 3 Starting Node-RED

You can start the Node-RED by running the command ***node-red-start*** in the shell prompt. T be displayed in the shell.

---

```
Start Node-RED

Once Node-RED has started, point a browser at http://9.20.202.223:1880

On Pi Node-RED works better with the Iceweasel browser



Use node-red-stop to stop Node-RED

Use node-red-start to start Node-RED again

Use sudo systemctl enable nodered.service to autostart Node-RED at every

Use sudo systemctl disable nodered.service to disable autostart on boot



To find more nodes and example flows - go to http://flows.nodered.

You may also need to install and upgrade npm

sudo apt-get install npm

  sudo npm i -g npm@2.x

Warning: Unit file of nodered.service changed on disk, 'systemctl daemon



Starting Node-RED graphical event wiring tool....

Started Node-RED graphical event wiring tool...

Welcome to Node-RED
```

```
==================
```

```
21 Apr 12:24:57 - [info] Node.js version: v0.10.29

21 Apr 12:24:57 - [info] Linux 4.1.19-v7+ arm LE

21 Apr 12:24:57 - [info] Loading palette nodes

21 Apr 12:25:08 - [info] Settings file : /home/pi/.node-red/settings.js

21 Apr 12:25:08 - [info] User directory : /home/pi/.node-red

21 Apr 12:25:08 - [info] Flows file : /home/pi/.node-red/flows_my-pi.jso
```

You can then access the Node-RED editor by entering http://localhost:1880 in the browser

**To connect to the Node-RED editor via network:**

Once Node-RED is running – open the browser program in the host machine and then brow
ip-address-returned}:1880/. One way to find the IP address of the Pi is to use the comman

```
hostname -I
```

***After this step you will be able to access Node-RED editor, with the Watson IoT Nodes, in it events to the IBM Watson IoT Platform and receive commands from the same.***

## 4 Registering your Gateway In Watson IoT Platform

To explore and make use of the full capabilities of Watson IoT Platform (including bidirectio
and register your gateway in the platform. This section shows how you can setup the same.

Carry out the **steps present in this recipe** to register your gateway in IBM Watson Internet

At this step, we have successfully created the Watson IoT service and registered your gatev

## 5 Sending Gateway Events to Watson IBM IoT Platform

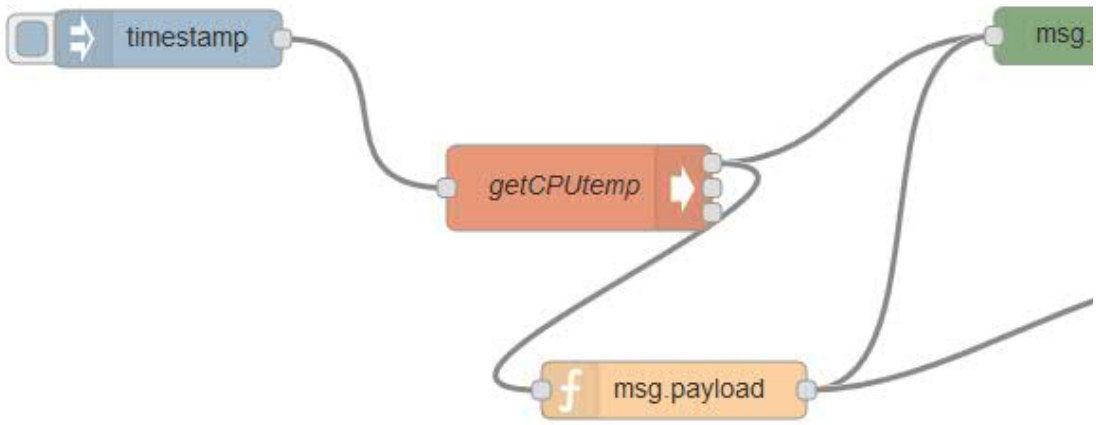
Gateway runs only in the registered flow, which is why there is no Quickstart section in this recipe. In this section you would deploy a Node-RED flow in your Raspberry Pi. The flow do

---

2. It reads the CPU temperature in the exec node.
3. Creates a JSON object for the temperature reading in the function node.
4. It posts this CPU temperature, to IBM Watson IoT Platform using the Watson IoT node

Carry out the steps given below

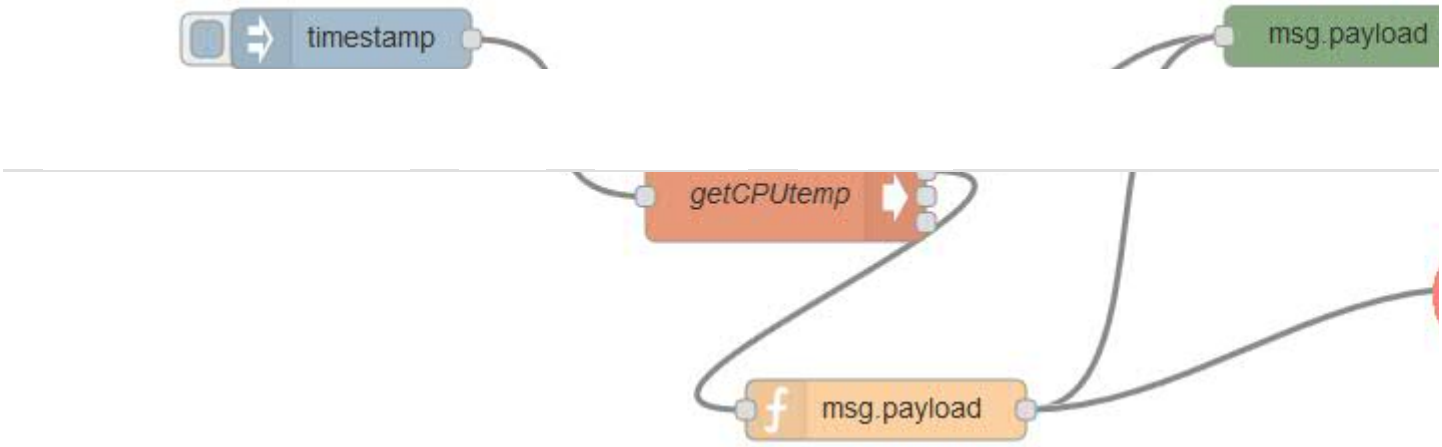
- In the Node-RED editor, which you have opened in the browser (either on Raspberry Pi click on **Menu > Import -> Clipboard**
- Copy the JSON from this **link** and paste it in the clipboard. This code is not yet complet the credentials. That is why you would see a small triangular in the right side of the nod



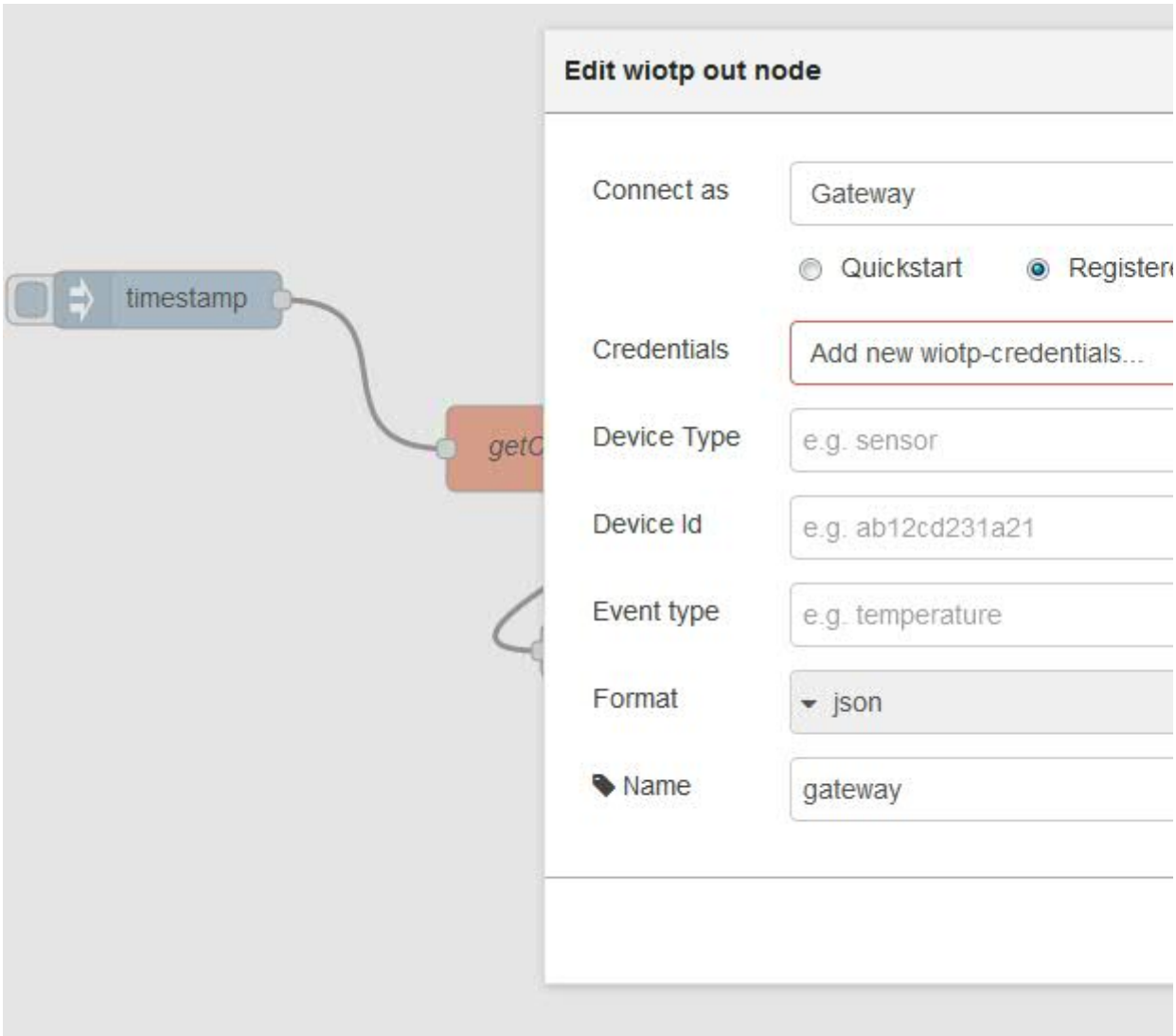

- The four nodes in this flow are

1. Inject node set to repeat every 5 seconds
2. Exec node set to call out to an external program vcgencmd measure_temp – that reads temperature.
3. Function node that extracts the number from the temperature reading and formats it in Watson IOT server.
4. Debug node so you can see this payload
5. WIoTP node that sends the payload to the Watson IOT server in Bluemix.
   Once you have registered your gateway in the Watson IoT organization make the follow the credentials.

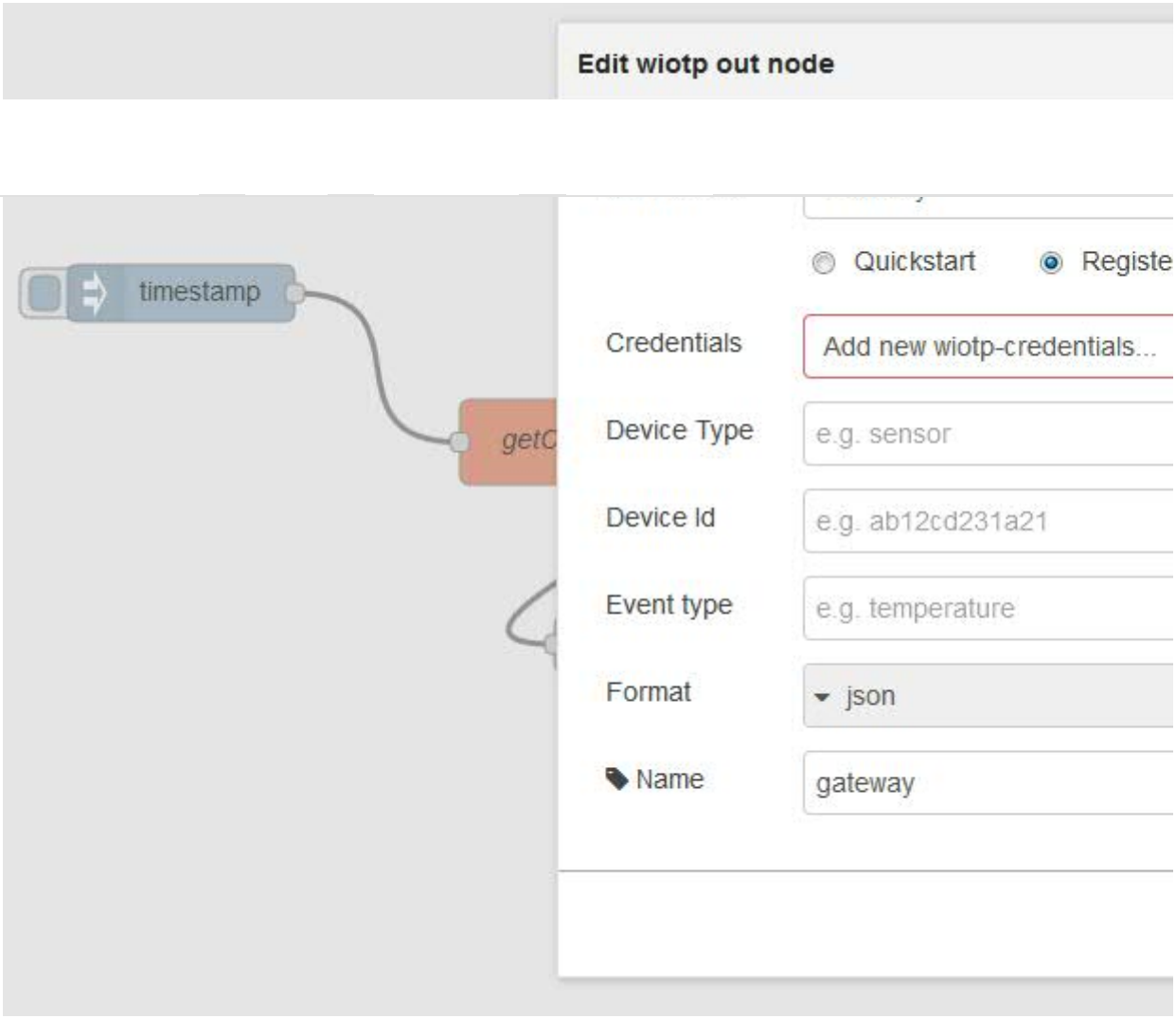
- Double click on the Gateway node.



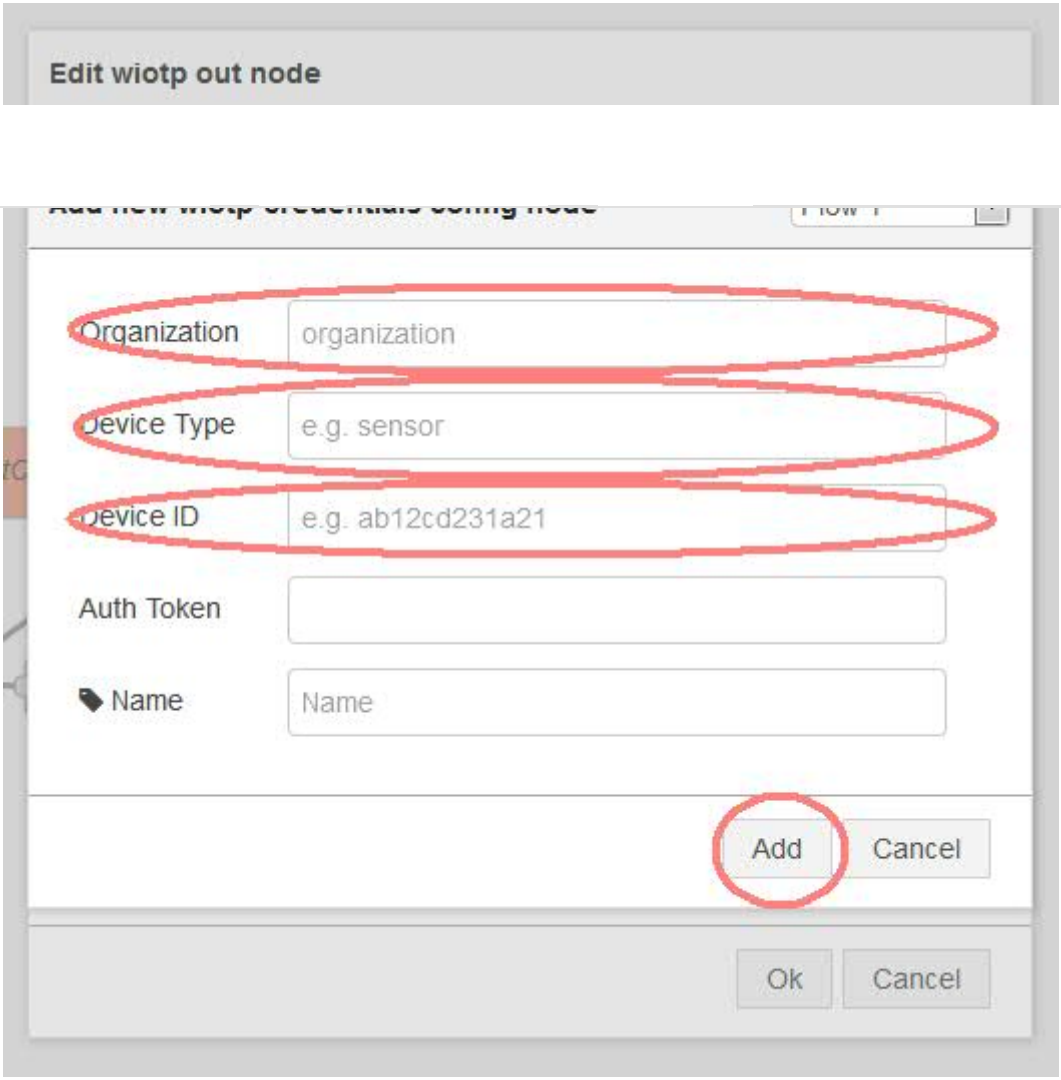

- Select connection as Registered .



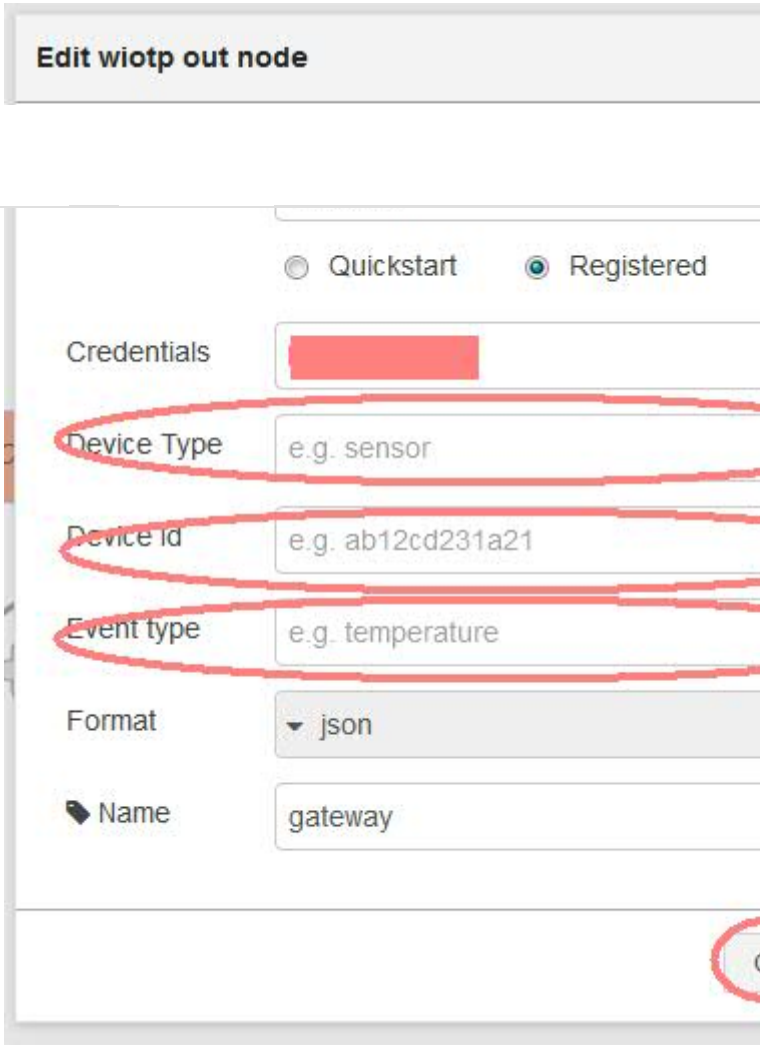

- Select edit button in Credentials.




- Fill the Organization, Device Type, Device ID, Auth Token and then click on the ***Add*** butt




- Fill in the Device Type with the Gateway type Id and Device Id with the Gateway Id onc Provide the exact gateway event type publishing




- Click on the ***Ok*** Button.
- Click on deploy button to start.

Now the CPU temperature from your Raspberry Pi is sent to the Watson IoT Platform once gateway event. You can also verify that in the debug tab.

***Now Node-RED flow will start sending events to your organization.***

## 6 Receiving Gateway Commands From IBM Watson IoT Plat

In this section we would make the Raspberry Pi accept commands published over Watson nodes

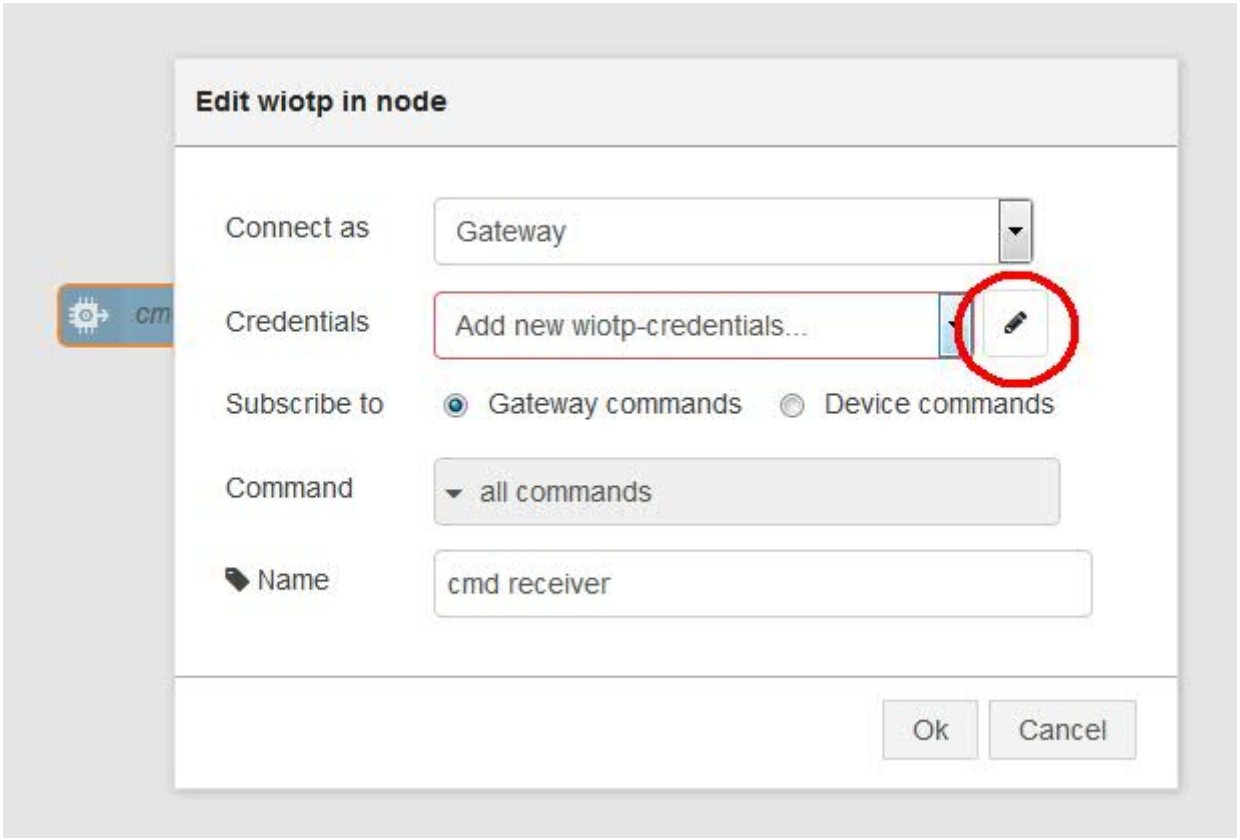
1. Watson IoT node which subscribes to commands (either all or specific command)
2. Debug node which prints the commands it received.

Please follow the step Registering your Gateway in Watson IoT Platform given above, in cas your device.

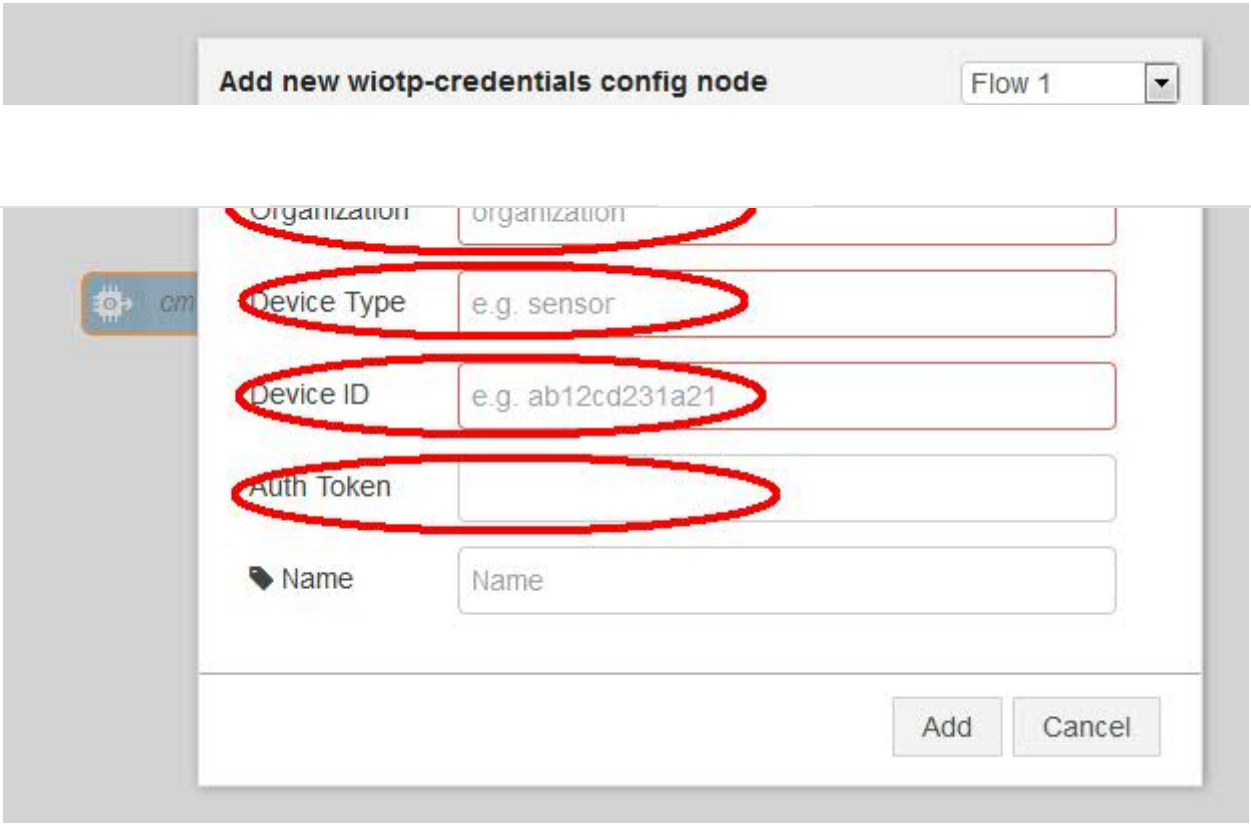
- In the Node-RED editor, which you have opened in the browser (either on Raspberry Pi click on **Menu-> Import – >Clipboard**.

- The flow is not yet complete as you need to provide credentials. That is why you can se triangle at the right side on the top of the node.
- Double click on cmd receiver.


- In case you have already provided the credentials in the Node-RED flow (by following t need not carry out the below steps and can straight click ***Ok*** button and ***deploy***, else pl
- Select edit button in Credentials.




- Fill the Organization, Device Type, Device ID, Auth Token and then click on add button.




- Click on the ***Ok*** Button.
- Click on the deploy button to start the flow.

**Note :** You will need an external application that is sending commands to this Raspberry Pi

***Now you can receive the commands from Watson IoT Platform which will be displayed in t***

## 7 Conclusion

We have seen how to deploy Watson IoT Node in the Raspberry Pi as a gateway and send g Watson IoT Platform and receive gateway commands from the Platform using Node-RED w

## 8 Where to go from here?

The *next part of the recipe* will show how to use the Raspberry Pi, as a gateway, to send eve device and subscribe to commands, on the behalf of a device.

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**TAGS** ARDUINO, CLOUD, DEVICE, GATEWAY, IBM WATSON IOT PLATFORM, IOTF, NODE-RED, NODE.JS, NODEJS, RASPBERRY PI WATSON IOT

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*by Recipes@WatsonIoT*

# 2 comments on"Connecting Raspberry Pi as a Gateway to Watso RED – Part I"

**jvda** • September 17, 2018

The link [https://raw.githubusercontent.com/ibm-messaging/iot-gateway-samples/master/node-red/gate samples/gatewayevents.json] in section 5 is no longer working.

Log in to Reply

**jvda** • September 17, 2018

The Watson IoT nodes support more fields that can be configured – it would be good to update this to co the other fields. I am especially asking this as I could not manage to get a working connection from local orginazation.

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