

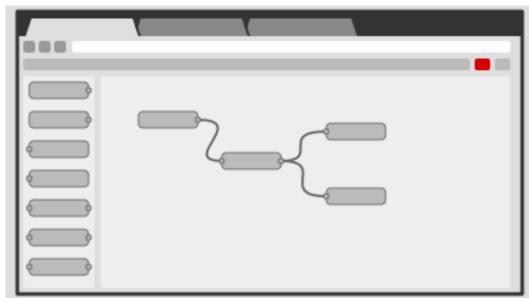
Sprint- 3

Team ID	PNT2022TMID11481
Project Title	Smart Farmer -IoT Enabled Smart Farming Application
Date	15.11.2022

Node-RED

Low-code programming for event-driven applications

Latest version: v3.0.2 (npm)



Browser-based flow editing

Node-RED provides a browser-based flow editor that makes it easy to wire together flows using the wide range of nodes in the palette. Flows can be then deployed to the runtime in a single-click.

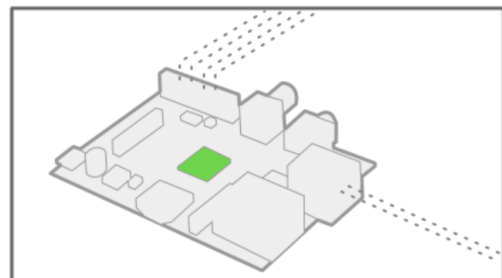
JavaScript functions can be created within the editor using a rich text editor.

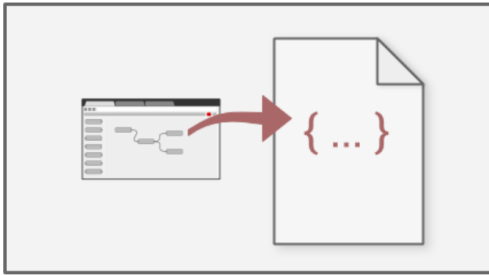
A built-in library allows you to save useful functions, templates or flows for re-use.

Built on Node.js

The light-weight runtime is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.

With over 225,000 modules in Node's package repository, it is easy to extend the range of palette nodes to add new capabilities.



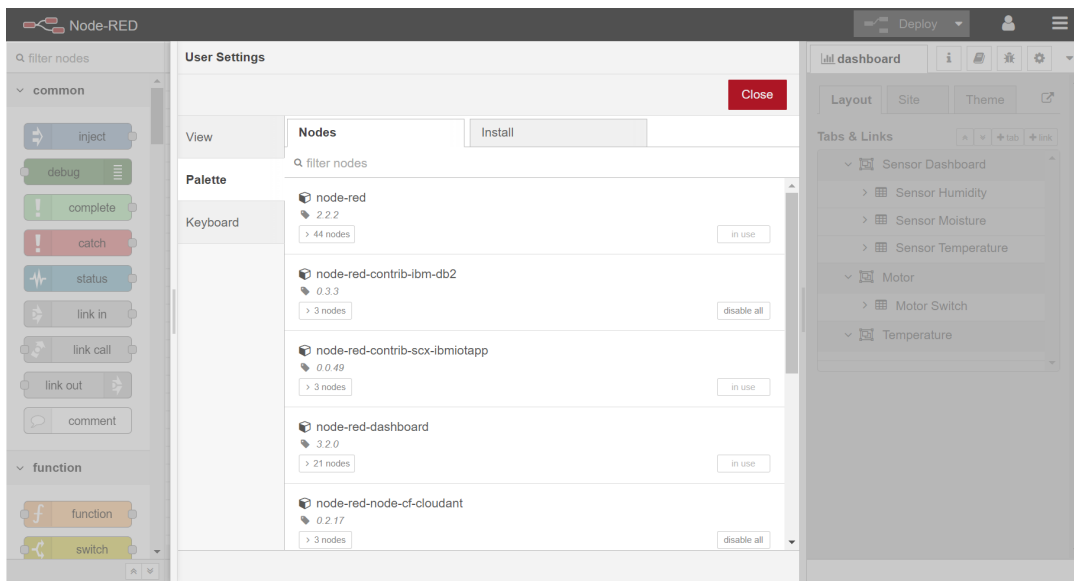


Social Development

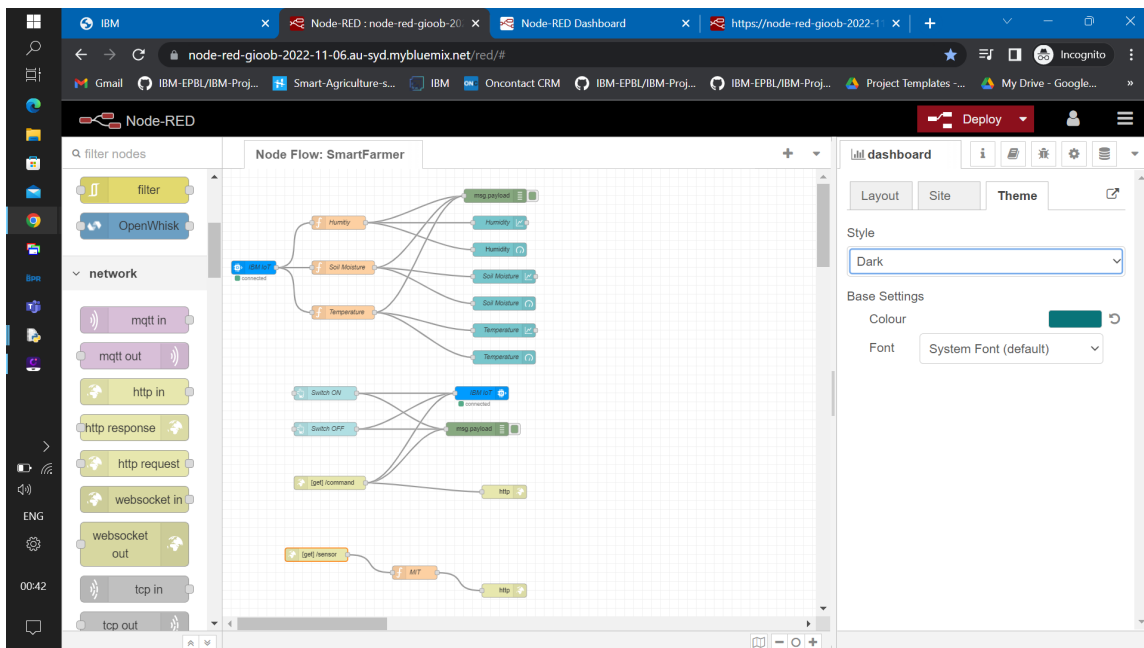
The flows created in Node-RED are stored using JSON which can be easily imported and exported for sharing with others.

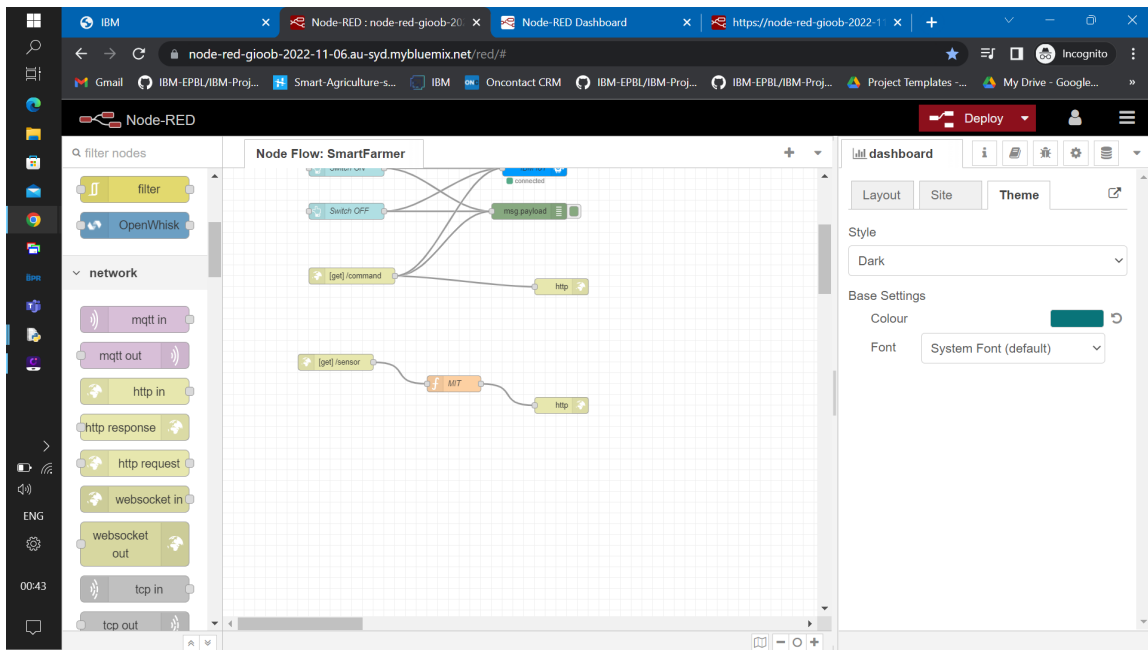
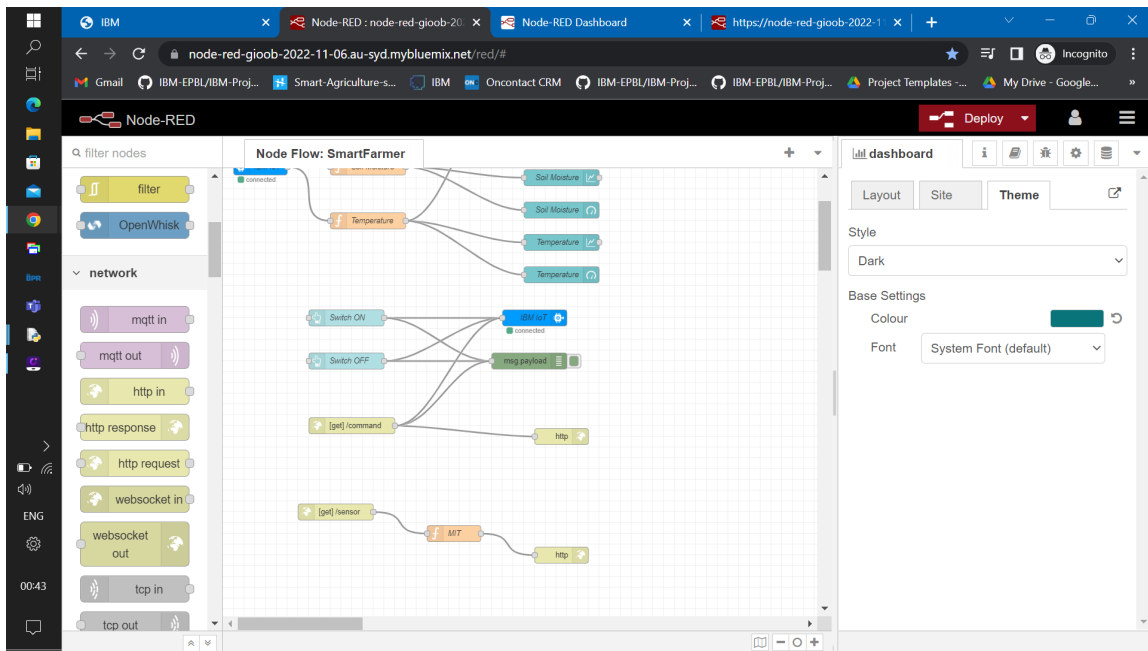
An online flow library allows you to share your best flows with the world.

Node flow:



Firstly install these packages





The Interior parts/values/codes of the nodes:

This screenshot shows the Node-RED web interface in a browser. The main workspace displays a flow with several nodes, including 'filter', 'OpenWhisk', and various network nodes like 'mqtt in', 'http in', and 'websocket in'. The 'Edit function node' dialog is open, showing the configuration for a function node named 'Humidity'. The 'On Message' tab is selected, and the following JavaScript code is entered in the editor:

```
1 msg.payload=msg.payload.Humid
2 global.set("h",msg.payload)
3 return msg;
```

The right sidebar shows the 'dashboard' settings, including 'Layout', 'Site', and 'Theme' options. The 'Style' section is set to 'Dark', and the 'Base Settings' section shows 'Colour' and 'Font' options.

This screenshot shows the Node-RED web interface with the 'Edit ibmiot in node' dialog open. The 'Properties' tab is selected, and the following configuration is shown:

- Authentication: API Key
- API Key: IBM IOT API KEY
- Input Type: Device Event
- Device Type: All or +
- Device Id: All or device id e.g. ab12cd231a21
- Logical Interface: All or Logical Interface e.g. ITempSensor
- Rule Id: All or Rule Id e.g. ab03efffb45cf66
- Event: All or +
- Format: All or json

The 'Enabled' checkbox is checked. The right sidebar shows the 'dashboard' settings, including 'Layout', 'Site', and 'Theme' options. The 'Style' section is set to 'Dark', and the 'Base Settings' section shows 'Colour' and 'Font' options.

Node-RED interface showing the configuration of a Bar chart node.

Node Flow: SmartFa

filter nodes: filter, OpenWhisk

network: mqtt in, mqtt out, http in, http response, http request, websocket in, websocket out, tcp in, tcp out

Edit chart node:

- Group: [Sensor Dashboard] Sensor Humidity
- Size: auto
- Label: Humidity
- Type: Bar chart
- Y-axis: min 1, max 150
- Legend: None
- Use first colour for all bars: ☐
- Series Colours: [Blue, Green, Red, Orange, Purple, Yellow]

dashboard: Layout, Site, Theme

Style: Dark

Base Settings: Colour, Font (System Font (default))

Node-RED interface showing the configuration of a Gauge node.

Node Flow: SmartFa

filter nodes: filter, OpenWhisk

network: mqtt in, mqtt out, http in, http response, http request, websocket in, websocket out, tcp in, tcp out

Edit gauge node:

- Group: [Sensor Dashboard] Sensor Humidity
- Size: auto
- Type: Gauge
- Label: Humidity
- Value format: {{value}}
- Units: units
- Range: min 0, max 100
- Colour gradient: [Green, Yellow, Red]
- Sectors: 0, optional, optional, 100

dashboard: Layout, Site, Theme

Style: Dark

Base Settings: Colour, Font (System Font (default))

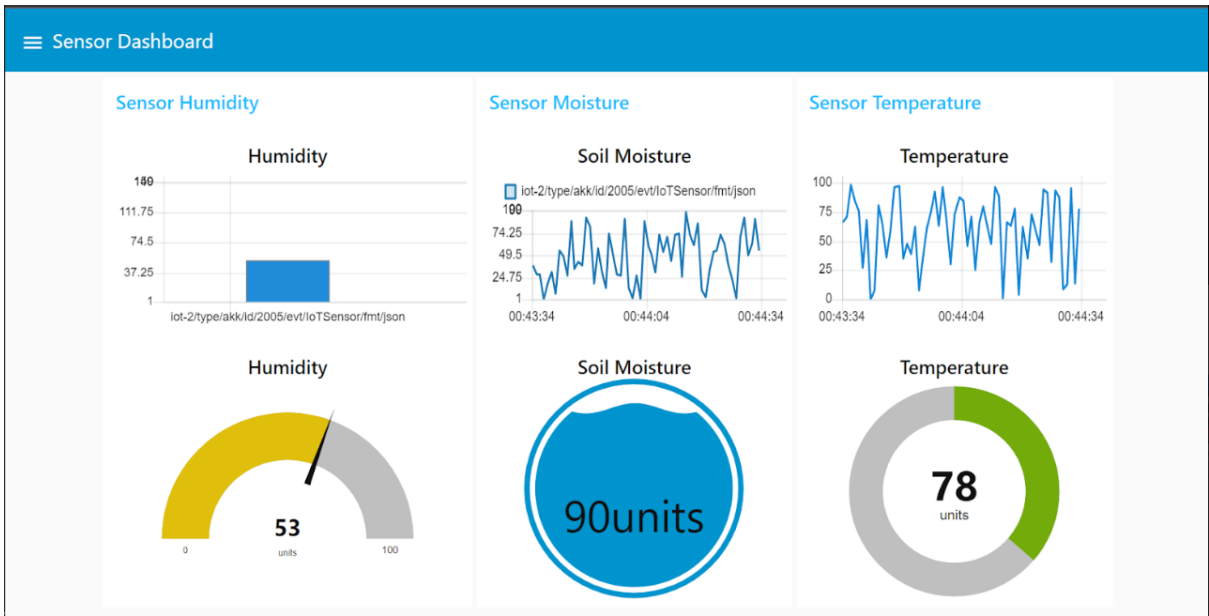
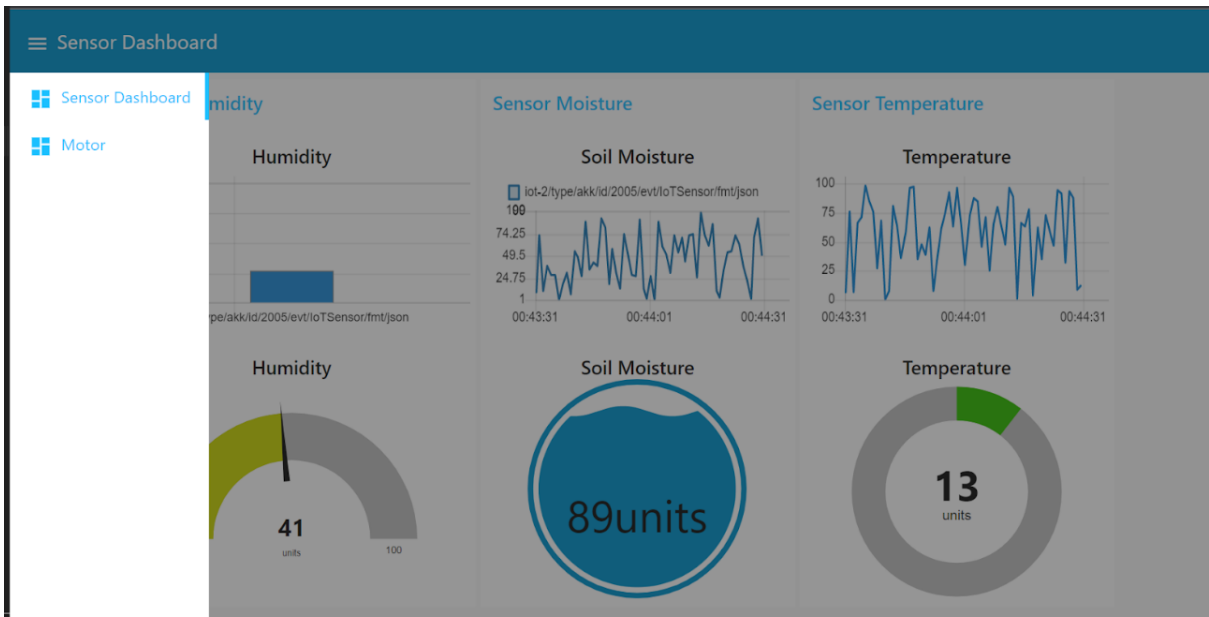
Node-RED interface showing a flow named "SmartFarmer". The flow includes nodes for Temperature, Soil Moisture, and Humidity sensors, connected to a "msg payload" node. It also features a "Switch ON" node connected to an "IBM IoT" node, and a "Switch OFF" node connected to an "IBM IoT" node. The flow is deployed to a dashboard.

Node-RED interface showing a flow named "SmartFarmer". The flow includes nodes for Temperature, Soil Moisture, and Humidity sensors, connected to a "msg payload" node. It also features a "Switch ON" node connected to an "IBM IoT" node, and a "Switch OFF" node connected to an "IBM IoT" node. The flow is deployed to a dashboard.

Node-RED interface showing a command endpoint. The URL is `node-red-gioob-2022-11-06.au-syd.mybluemix.net/command?command=switchoff`. The response is a JSON object: `{"command": "switchoff"}`.

```
{ "command": "switchoff" }
```

Dashboard created using Node:



Motor

Motor Switch

SWITCH ON

SWITCH OFF

Testing:

```
File Edit Shell Debug Options Window Help
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\araol\Desktop\IBMSmartFarmer.py =====
2022-11-14 00:45:30,852 ibmiotf.device.Client INFO Connected successfully: d:4712i8:akk:2005
Published Temperature = 97 C Humidity = 23 % SoilMoisture = 80 % to IBM Watson
Published Temperature = 25 C Humidity = 2 % SoilMoisture = 24 % to IBM Watson
Published Temperature = 45 C Humidity = 42 % SoilMoisture = 34 % to IBM Watson
Published Temperature = 35 C Humidity = 20 % SoilMoisture = 31 % to IBM Watson
Published Temperature = 92 C Humidity = 98 % SoilMoisture = 25 % to IBM Watson
Published Temperature = 29 C Humidity = 26 % SoilMoisture = 98 % to IBM Watson
Published Temperature = 74 C Humidity = 12 % SoilMoisture = 24 % to IBM Watson
Published Temperature = 62 C Humidity = 23 % SoilMoisture = 68 % to IBM Watson
Published Temperature = 10 C Humidity = 43 % SoilMoisture = 57 % to IBM Watson
Published Temperature = 95 C Humidity = 88 % SoilMoisture = 55 % to IBM Watson
Published Temperature = 53 C Humidity = 72 % SoilMoisture = 44 % to IBM Watson
Published Temperature = 30 C Humidity = 33 % SoilMoisture = 41 % to IBM Watson
Published Temperature = 3 C Humidity = 49 % SoilMoisture = 93 % to IBM Watson
Published Temperature = 39 C Humidity = 90 % SoilMoisture = 3 % to IBM Watson
Published Temperature = 22 C Humidity = 50 % SoilMoisture = 78 % to IBM Watson
Published Temperature = 28 C Humidity = 87 % SoilMoisture = 22 % to IBM Watson
Published Temperature = 79 C Humidity = 71 % SoilMoisture = 11 % to IBM Watson
Command received: switchon
Switch is on
Command received: switchon
Switch is on
Published Temperature = 89 C Humidity = 76 % SoilMoisture = 58 % to IBM Watson
Published Temperature = 15 C Humidity = 77 % SoilMoisture = 22 % to IBM Watson
Published Temperature = 7 C Humidity = 19 % SoilMoisture = 38 % to IBM Watson
```