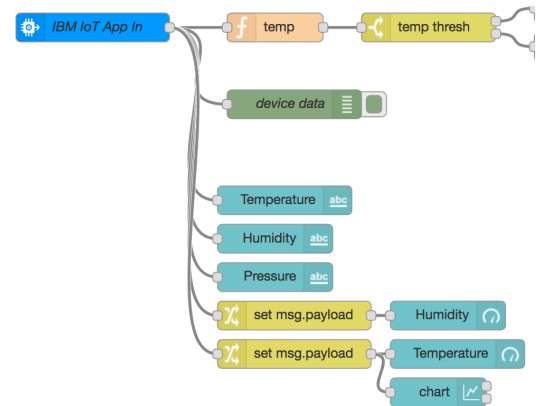
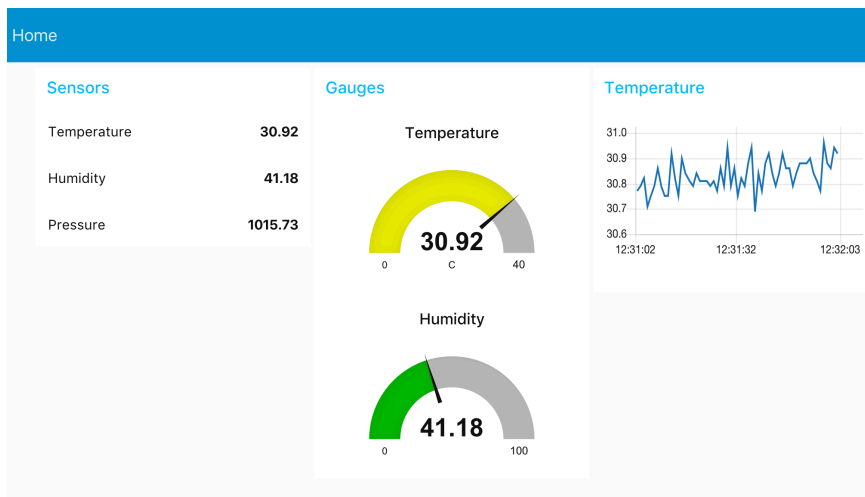
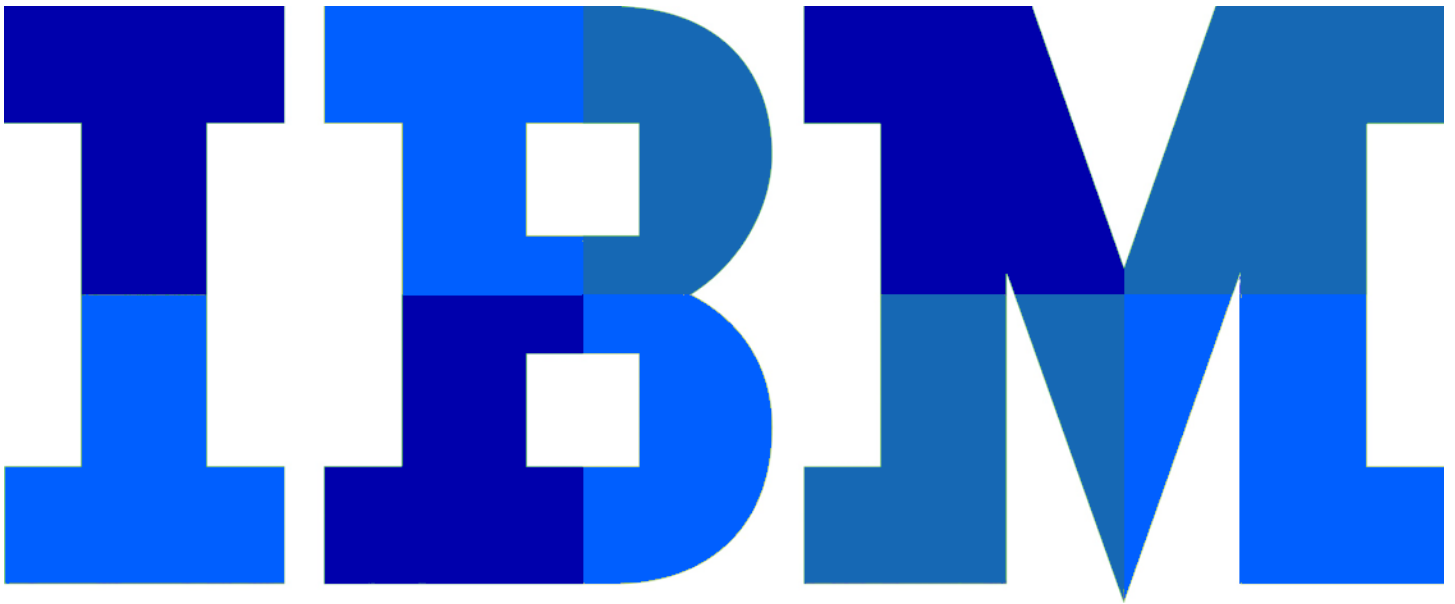


Raspberry Pi Sense HAT

Part 3: Node-RED Dashboard

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The Node-RED dashboard can display a variety of charts and UI elements containing data from IoT devices.



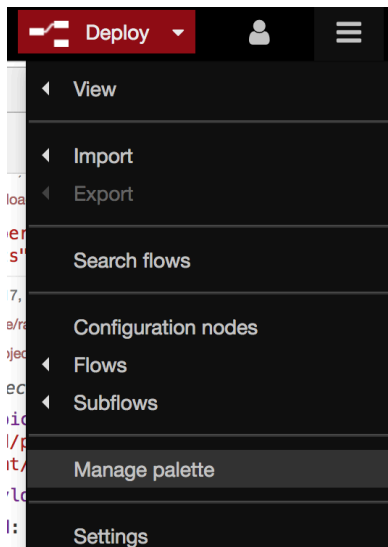
A digital copy of this lab and completed flows can be found at:
<http://ibm.biz/sense-hat-node-red-dashboard>



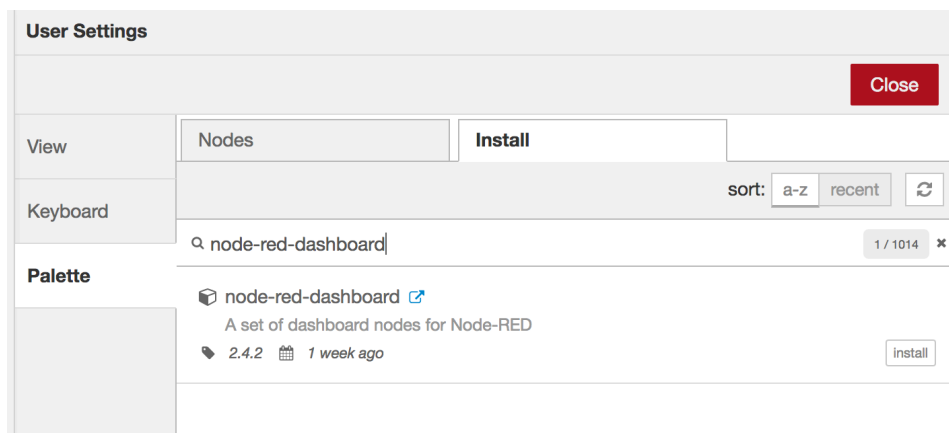
Install Node-RED Dashboard

Node-RED has a strong community of node contributors. In this lab, we'll use a set of nodes that was developed to help visualize data and make building a UI interface in Node-RED easy.

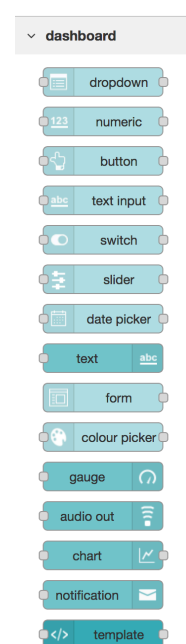
1. Select **Manage palette** from the menu in Node-RED running in IBM Bluemix.



2. Click on the **Install** tab and search for node-red-dashboard. Click **Install**.

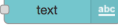


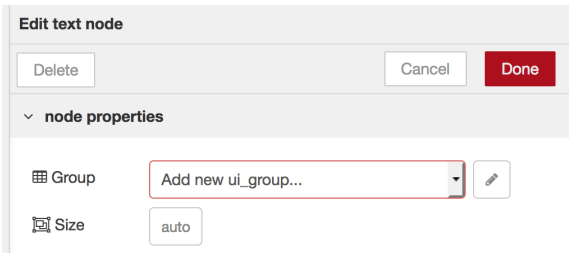
When Node-RED is finished installing the package, the nodes shown to the right will be available in the palette under the **dashboard** category.



Display Sensor Data

One of the nodes available in the dashboard package is a **text** label. In this section, we'll add three text labels to display the current sensor values: temperature, humidity, and pressure.

1. Add a  node.
2. Click on the pencil in the node configuration to create a new ui_group. A ui_group is a box on the page that can contain multiple UI elements.



Edit text node

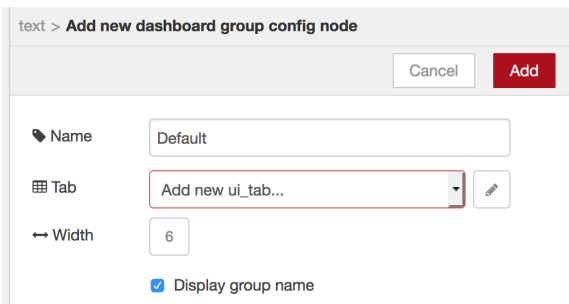
Delete Cancel Done

node properties

Group Add new ui_group...

Size auto

3. A ui_group can belong to a ui_tab. A ui_tab is a page, and only one ui_tab can be displayed at a time. Click on the pencil icon to create a new ui_tab.



text > Add new dashboard group config node

Cancel Add

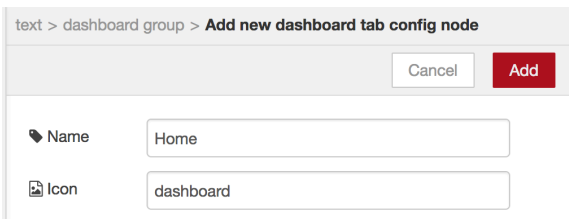
Name Default

Tab Add new ui_tab...

Width 6

☒ Display group name

4. You can customize the name of the page, or leave it as Home. Click **Add**.



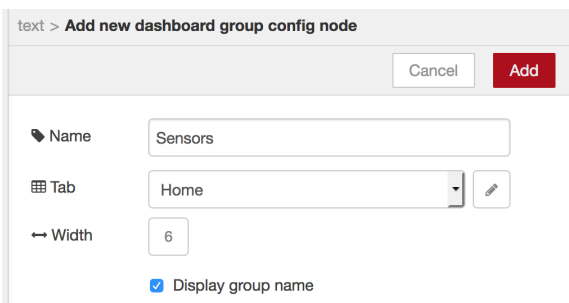
text > dashboard group > Add new dashboard tab config node

Cancel Add

Name Home

Icon dashboard

5. For the group node, change the name to Sensors. This will add a card labeled Sensors. Click **Add**.



text > Add new dashboard group config node

Cancel Add

Name Sensors

Tab Home

Width 6

☒ Display group name

- Back in the first configuration for the text node, change the label and value as shown below. When finished, click **Done**.

Edit text node

Delete Cancel Done

▼ node properties

Group Sensors [Home]

Size auto

Label Temperature

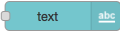
Value format {{msg.payload.d.temp}}

Layout

label value label value label value

label value label value

Name

- Add another  node. This time, the **Group** list contains Sensors, which is the box that already contains the temperature value. For the second node, you only need to change the label and value format fields as shown below. When finished, click **Done**.

Edit text node

Delete Cancel Done

▼ node properties

Group Sensors [Home]

Size auto

Label Humidity

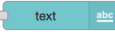
Value format {{msg.payload.d.humidity}}

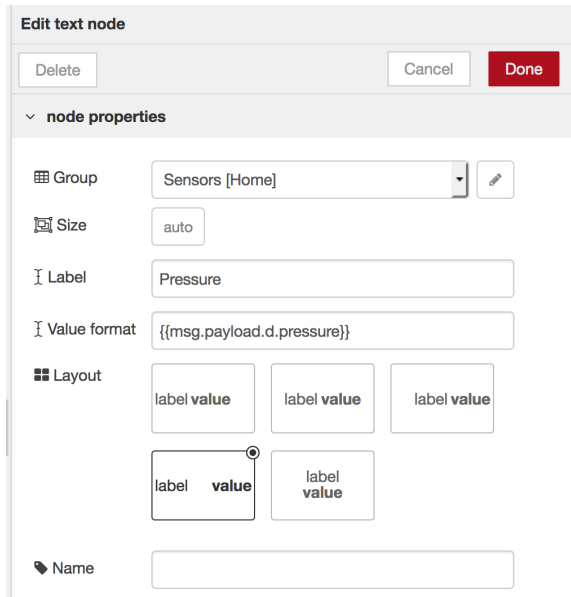
Layout

label value label value label value

label value label value

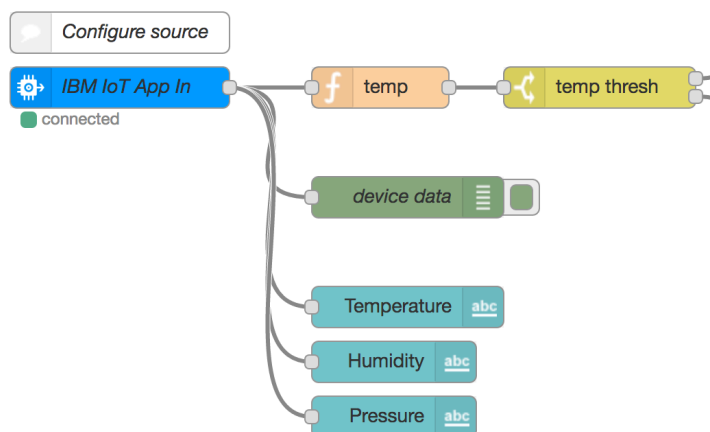
Name

8. Add a third  node with the pressure value, as shown below. When finished, click **Done**.




The 'Edit text node' dialog is shown. It has a 'Delete' button, 'Cancel' and 'Done' buttons. Under 'node properties', the 'Group' is 'Sensors [Home]', 'Size' is 'auto', 'Label' is 'Pressure', and 'Value format' is '{{msg.payload.d.pressure}}'. The 'Layout' section shows a grid of 'label value' boxes, with one box selected. The 'Name' field is empty.

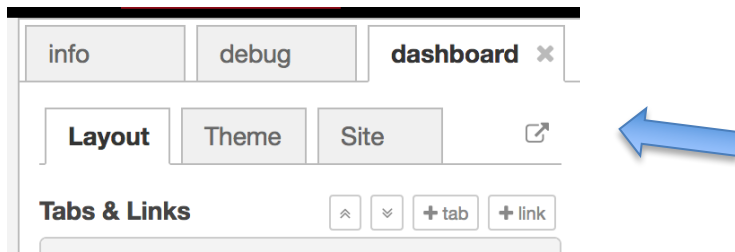
9. Connect the three nodes to the **IBM IoT App In** node as shown below.



Get the code:
ibm.biz/BdiWpU

10. Click on the  **Deploy** button in the top right of the screen to save and deploy your changes.

11. Click on the dashboard tab in the panel on the right. Click on the square icon with an arrow pointing to the top-right corner. This will launch the dashboard.



You can also access the dashboard via the IBM Bluemix application's URL, appended with /ui:

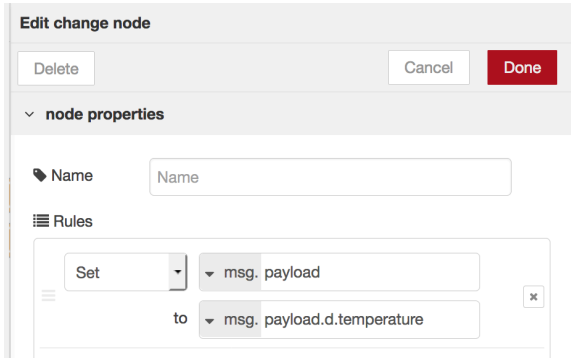
`http://<<APPLICATION-HOST-NAME>>.mybluemix.net/ui`

Home		
Sensors		
Temperature		30.02
Humidity		41.67
Pressure		1016.03

Display Temperature and Humidity Gauge

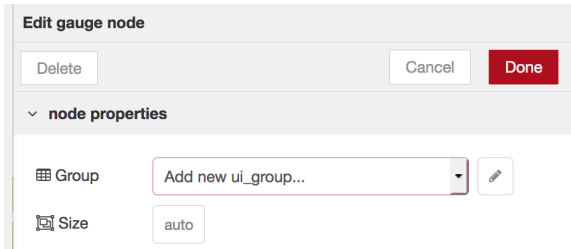
Another type of node available in the dashboard package is a **gauge**. In this section, we'll add two gauges to display the current sensor values.

1. Add a  node as shown below.



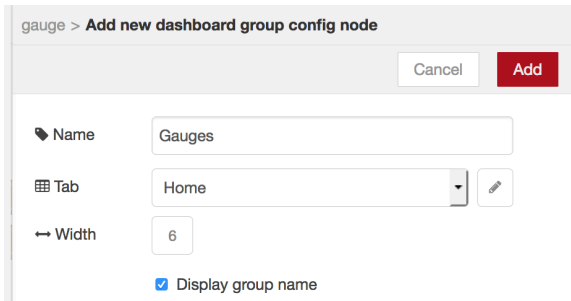
Dialog box titled "Edit change node" with buttons "Delete", "Cancel", and "Done". Under "node properties", there is a "Name" field. Below it, under "Rules", there is a "Set" dropdown, a "msg. payload" field, and a "to" field with "msg. payload.d.temperature".

2. Add a  node as shown below. Select **Add new ui_group...** from the **Group** drop-down menu. Click on the pencil icon to create new group.



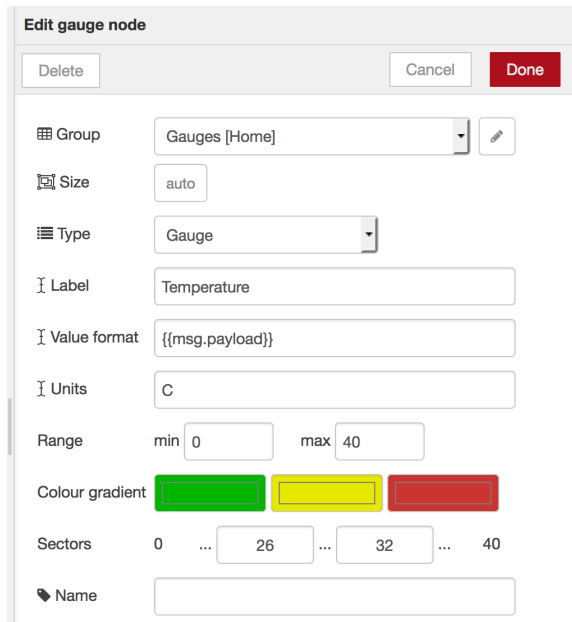
Dialog box titled "Edit gauge node" with buttons "Delete", "Cancel", and "Done". Under "node properties", there is a "Group" dropdown menu with "Add new ui_group..." selected, and a "Size" field set to "auto".

3. Name the new dashboard group Gauges as shown below. Click **Add**.



Dialog box titled "gauge > Add new dashboard group config node" with buttons "Cancel" and "Add". Under "Name", the field is "Gauges". Under "Tab", the dropdown is "Home". Under "Width", the field is "6". The "Display group name" checkbox is checked.

4. Customize the gauge node as shown below. When finished, click **Done**.



Edit gauge node

Delete Cancel Done

Group Gauges [Home]

Size auto

Type Gauge

Label Temperature

Value format {{msg.payload}}

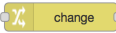
Units C

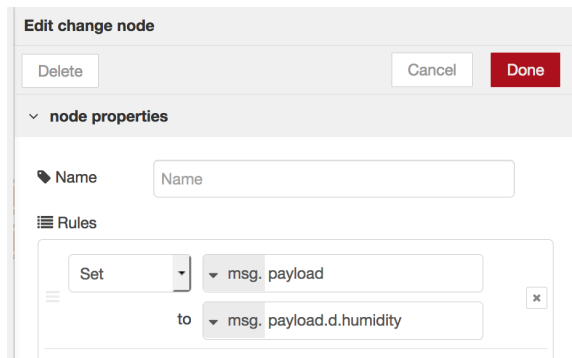
Range min 0 max 40

Colour gradient

Sectors 0 ... 26 ... 32 ... 40

Name

5. Add another  change node , this time for the humidity gauge, as shown below.



Edit change node

Delete Cancel Done

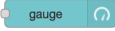
node properties

Name Name

Rules

Set msg. payload

to msg. payload.d.humidity

6. Add a  node as shown below. Select the **Sensors [Home]** group you created in **Step #3**. Customize the node as shown below.

Edit gauge node

Delete Cancel Done

node properties

Group Sensors [Home]

Size auto




Type Gauge

Label Humidity

Value format {{msg.payload}}

Units optional sub-label

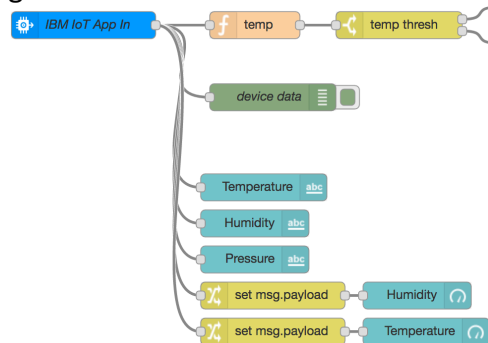
Range min 0 max 100

Colour gradient   


Sectors 0 ... 60 ... 80 ... 100

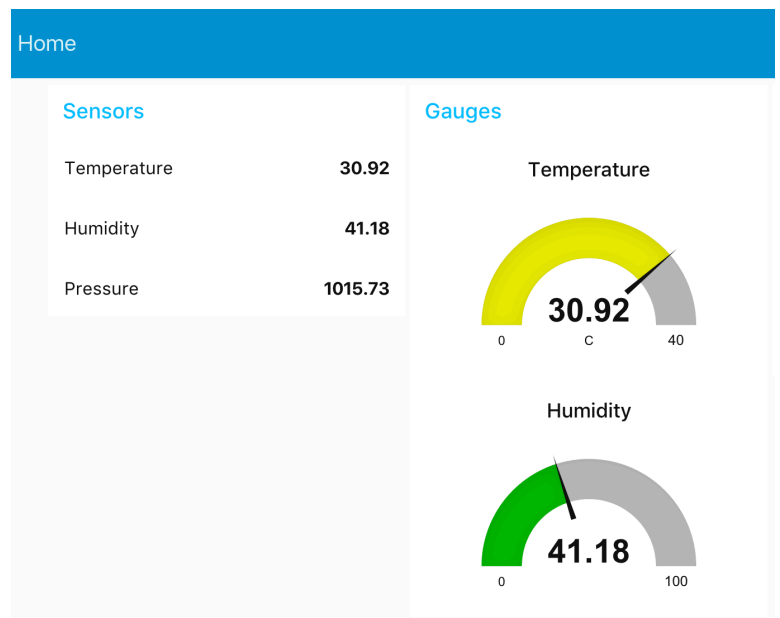
Name

7. Connect the nodes together as shown below.



Get the code:
ibm.biz/BdiWp5

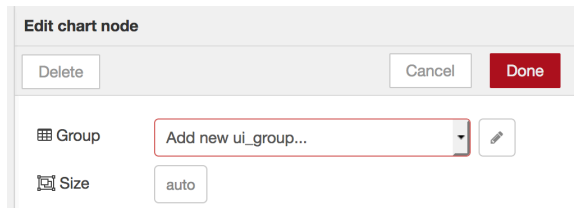
8. Click on  to save and deploy your changes. The dashboard now displays the temperature and humidity values as gauges.



Display Temperature as a Chart

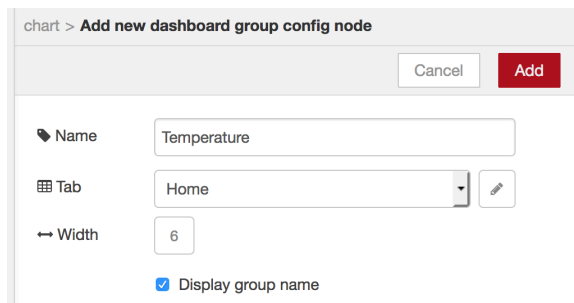
The last type of node available in the dashboard package that we will cover is a **chart**. In this section, we'll add a chart to display the temperature change over a time period of a minute.

1. Add a  node as shown below. Select **Add new ui_group...** from the **Group** drop-down menu. Click on the pencil icon to create new group.



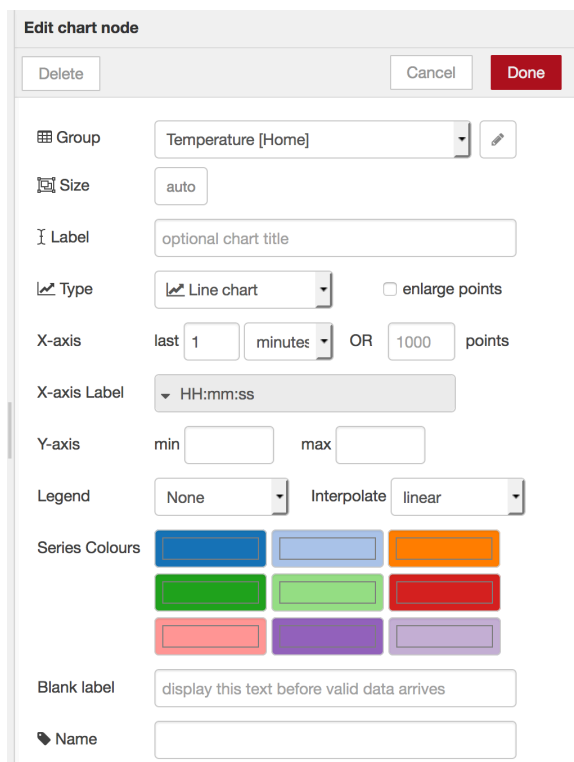
The 'Edit chart node' dialog box is shown. It has a title bar 'Edit chart node' and three buttons: 'Delete', 'Cancel', and 'Done'. Below the buttons, there are two settings: 'Group' with a dropdown menu showing 'Add new ui_group...' and a pencil icon, and 'Size' with a button labeled 'auto'.

2. Name the new dashboard group **Temperature** as shown below. Click **Add**.



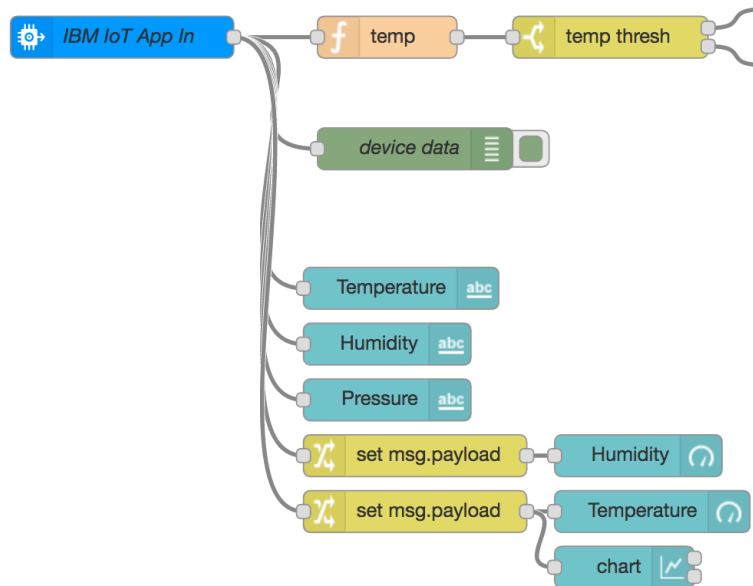
The 'Add new dashboard group config node' dialog box is shown. It has a title bar 'chart > Add new dashboard group config node' and two buttons: 'Cancel' and 'Add'. Below the buttons, there are four settings: 'Name' with a text input field containing 'Temperature', 'Tab' with a dropdown menu showing 'Home' and a pencil icon, 'Width' with a text input field containing '6', and a checked checkbox labeled 'Display group name'.

3. Customize the chart node as shown below. When finished, click **Done**.




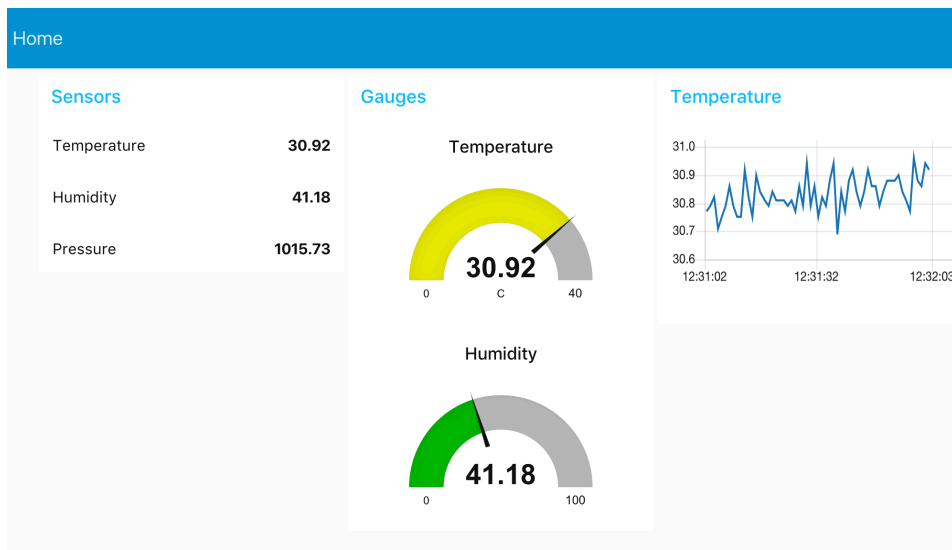
The 'Edit chart node' dialog box is shown. It has a title bar 'Edit chart node' and three buttons: 'Delete', 'Cancel', and 'Done'. Below the buttons, there are several settings: 'Group' with a dropdown menu showing 'Temperature [Home]' and a pencil icon, 'Size' with a button labeled 'auto', 'Label' with a text input field containing 'optional chart title', 'Type' with a dropdown menu showing 'Line chart' and a checkbox labeled 'enlarge points', 'X-axis' with a dropdown menu showing 'last', a text input field containing '1', a dropdown menu showing 'minutes', and a text input field containing '1000', followed by 'OR' and a text input field containing 'points', 'X-axis Label' with a dropdown menu showing 'HH:mm:ss', 'Y-axis' with 'min' and 'max' text input fields, 'Legend' with a dropdown menu showing 'None' and a dropdown menu showing 'Interpolate' with a sub-dropdown menu showing 'linear', 'Series Colours' with a grid of nine color swatches, 'Blank label' with a text input field containing 'display this text before valid data arrives', and 'Name' with a text input field.

4. Connect the node to the change node created in **Step #1** of the previous section.



Get the code:
ibm.biz/BdiWp7

5. Click on the  Deploy button in the top right of the screen to save and deploy your changes. The Node-RED dashboard now displays three groups, the last being the temperature chart.



Explore the other nodes available in the dashboard category and see how you could use them to display the IoT data.