

MAXIMO MONITOR

HANDS-ON LAB

In this Exercise, you will learn how to setup Monitor to receive data from a Node-Red simulator to devices in Monitor.

Step 1: Create a device type and setup metrics in Monitor

Step 2: Create a device in Monitor to send event data from Node-Red simulator

Note : Add your initials in Device type name and Device name e.g. (XX_Devicetype_Lrng) replace XX with your initials.

Create a device type

1. Go to Setup in Monitor
2. Go to Devices tab
3. Click on + button to create a device type
4. Choose Basic template
5. Next
6. Enter a Device type name, e.g. Devicetype_Lrng
Take note of the name you give as you will need this in the Node-RED flow config
7. Create.

MAS Monitor Connect Lab » Exercises » 1. Setup mobile device in Monitor

The screenshot shows the 'Setup / Create a device type' interface. On the left, a sidebar contains two items: 'Device type templ...' with a checkmark icon and 'Identity' with a question mark icon. The main area is titled 'Identity' and contains two input fields. The first field, 'Device type name', has the text 'Devicetype_Lrng' entered. Below it, a note states: 'Specify a unique name that describes the device type or data that the device type manages. The name can't be changed later.' The second field, 'Description (optional)', has the text 'Device Type created for Learning' entered.

Create Metrics in the device type

Select “Add metric +” again and add the metrics below. These data points will be coming from our Node-RED flow. It is important to label the event and metrics exactly how the data gets sent from the payload. Note: The metrics and event type payload will be configured in the Node-RED flow which we will set up later.

1. Under Metrics section click Add metric
2. Click Add metric
 - a. Enter InputTemp for Metric
 - b. Enter InputTemp for Display name
 - c. Enter event1 for Event
 - d. Choose NUMBER for Type
 - e. Optionally you can enter Unit
3. Similar way we can add two more metrics as shown below. (Temp_X, InputVoltage)
4. Click Save

Setup /

Devicetype_Lrng Device type ⓘ

Devicetype_Lrng

Data Identity Dashboards

Device type name Number of devices Identify devices by ⓘ

Devicetype_Lrng 2 Device ID ⓘ

Metrics ⓘ [Add metric +](#)

Metric	Display name	Type	Unit	Settings
^ Voltage				
Temp_X	TempX	NUMBER		
InputTemp	InputTemp	NUMBER		
InputVoltage	InputVoltage	NUMBER		

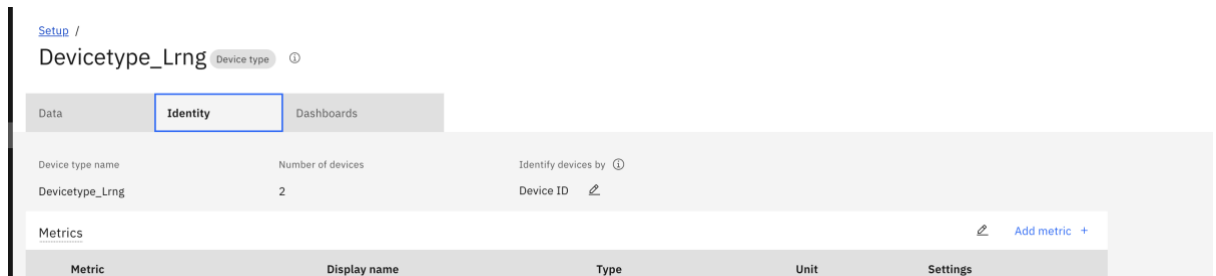
Dimensions ⓘ [Add dimension +](#)

Dimensions are applied to all devices of this type by default, but you can override values for individual devices. [Learn more about dimensions](#)

Dimension	Type	Default value (optional)
You don't have any dimensions yet		
The dimensions are applied to all devices of this type, but you can override their values for individual devices.		

Create a device in Monitor

1. Click the blue Setup link in the top left which will take you to the device types list

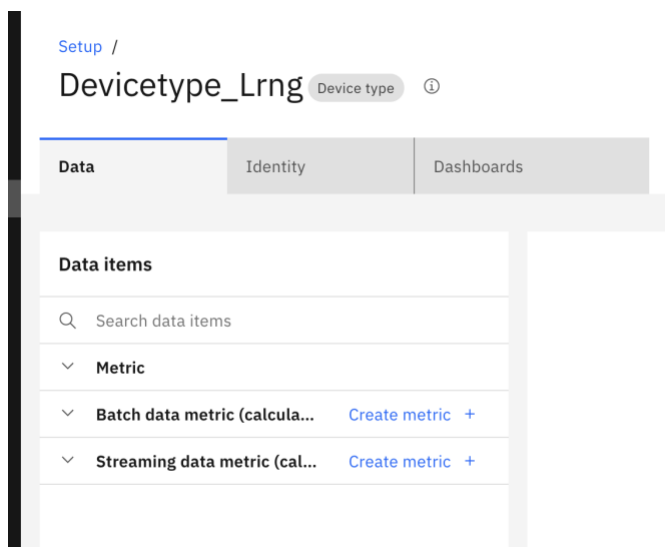


2. The device type you created should be selected
3. Click on Add device +
4. Enter Lrng_Device1 for name
5. Choose Custom token
6. Enter Pasword1!
7. Click Add and Close

Add Calculations & Alerts

The "Alerts" function allows you to be notified when anomalies are detected.

1. Click setup menu. Search on DeviceType_Lrng
2. Click on Setup Device type button
3. Click on the + icon under Batch Data metric section to create new metric



4. Select AlertOutOfRange

Create batch data metric

×

Select the function to use to calculate the batch data metrics.

[Learn more about built-in functions](#)

×

AlertExpression
 Create alerts that are triggered when data values reach a particular range.

AlertExpressionWithFilter
 Create alerts that are triggered when data values the expression is True

AlertHighValue
 Fire alert when metric exceeds an upper threshold.

AlertLowValue
 Fire alert when metric goes below a threshold.

AlertOutOfRange
 Fire alert when metric exceeds an upper threshold or drops below a lower_theshold.
 Specify at least one threshold.

MergeByFirstValid
 Create alerts that are triggered when data values reach a particular range.

Cancel

Select

5. Select the Scope All Device of this type.
6. Select fields as below
 - a. Input Item : InputTemp
 - b. Upper_threshold : 30
 - c. Lower_threshold : 20
 - d. Severity : High
 - e. Status : New

Data items

Search data items

Metric

Batch data metric (calcula...
Create metric +

Hourly_Sum_Temp
Aggregator

New data item

Streaming data metric (cal...
Create metric +

AlertOutOfRange

Fire alert when metric exceeds an upper threshold or drops below a lower_theshold. Specify at least one threshold.

☒ Scope
☒ Input
☐ Output

input_item

InputTemp

Because this metric is a batch data metric, only batch data metric inputs are available

upper_threshold

30
-
+

lower_threshold

20
-
+

Severity

High

Status

New

Back

Next

7. Click Next
8. Click on Create

Setup /

Devicetype_Lrng

Device type

?

Data

Identity

Dashboards

Data items

Search data items

Metric

Batch data metric (calcula...
Create metric +

Hourly_Sum_Temp
Aggregator

output_alert_lower
Alert

output_alert_upper
Alert

Streaming data metric (cal...
Create metric +

output

Tren

Install Node-RED locally

This is a fairly easy step, as you just have to follow this guide: [Running Node-RED locally](#)

Once installed and started open the browser and start the Node-Red editor.

Add required additional nodes

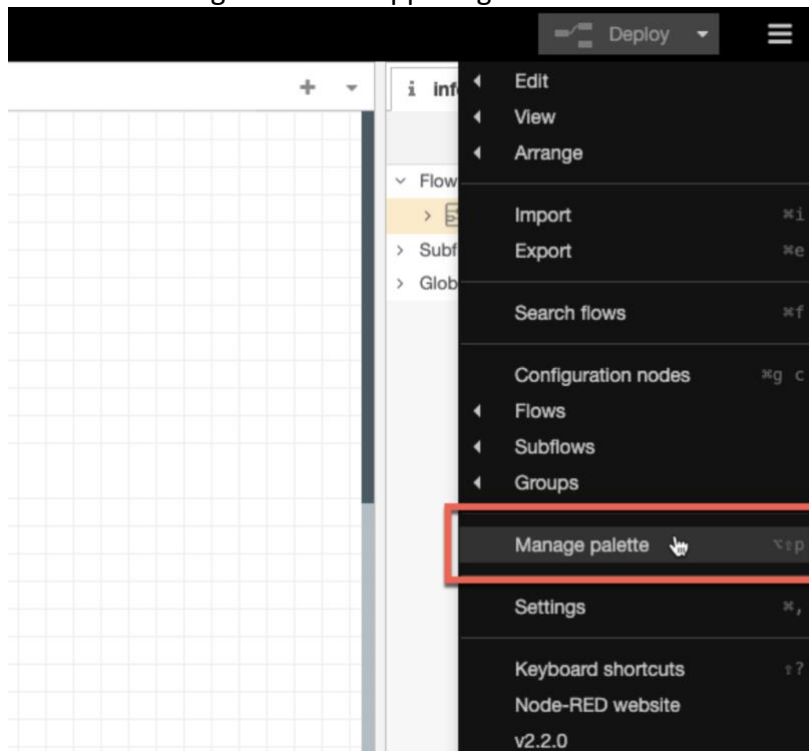
Before loading the Node-RED script you need to add the required additional node libraries.

Node-RED library dependencies:

- node-red-dashboard
- node-red-contrib-ui-upload
- node-red-contrib-chunks-to-lines

- node-red-node-random

1. Click on the burger menu in upper right hand corner and select Manage Palette

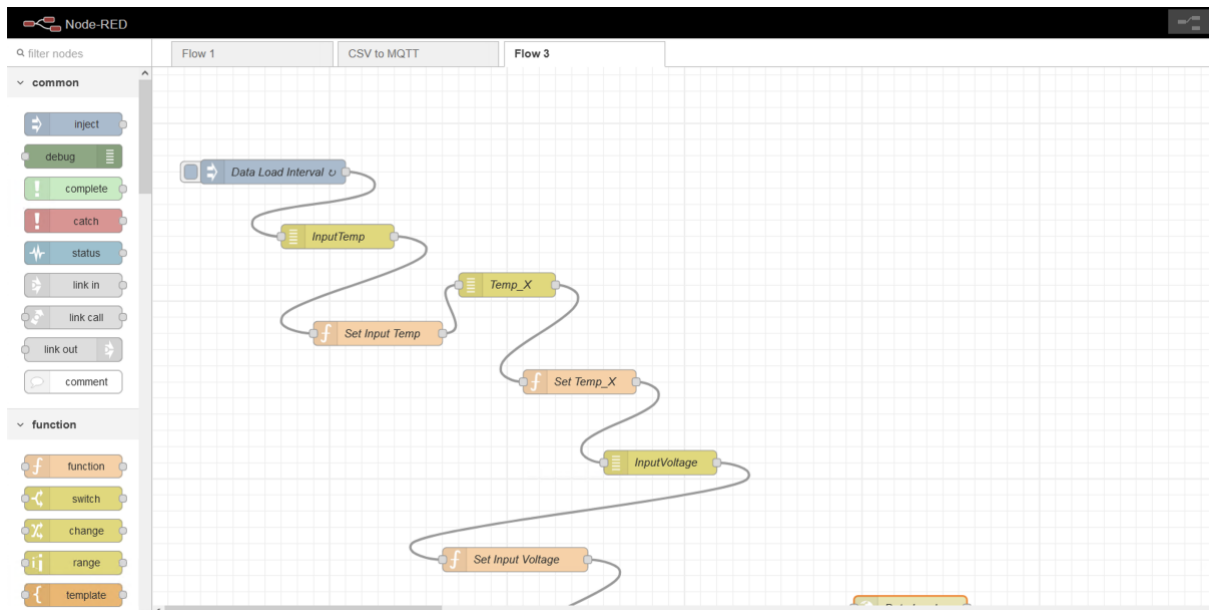


2. Click on Install and write node-red-dashboard in the search field and click on Install.
3. Click on Install again.
4. Repeat the above step for other libraries.

Import Node-RED flow

1. Download the flow from git-hub
2. Launch Node-RED

3. Click on the burger menu and choose Import
4. Click on select a file to import
5. Choose the file downloaded in step 1.
6. Click Import



Modify Node-Red flow to ingest data in Monitor

1. Click on Data Load node to configure it
2. Update the URL e.g.

<https://masdev.messaging.iot.indlabs.masindialabs-d0e546ee009fc97340f232abe59937ef-0000.ausyd.containers.appdomain.cloud/api/v0002/application/types/<<DEVICETYPE>>/devices/<<DEVICEID>>/events/event1>

3. Open IoT application for Username & password
 - a. Click on Apps

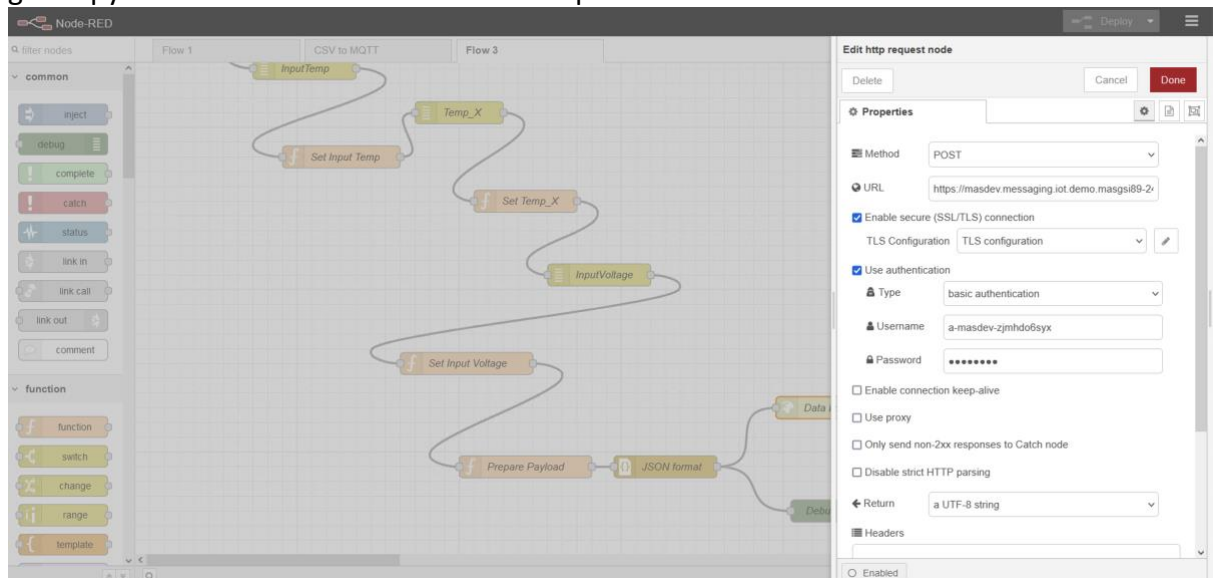
IBM Watson IoT Platform

API Keys

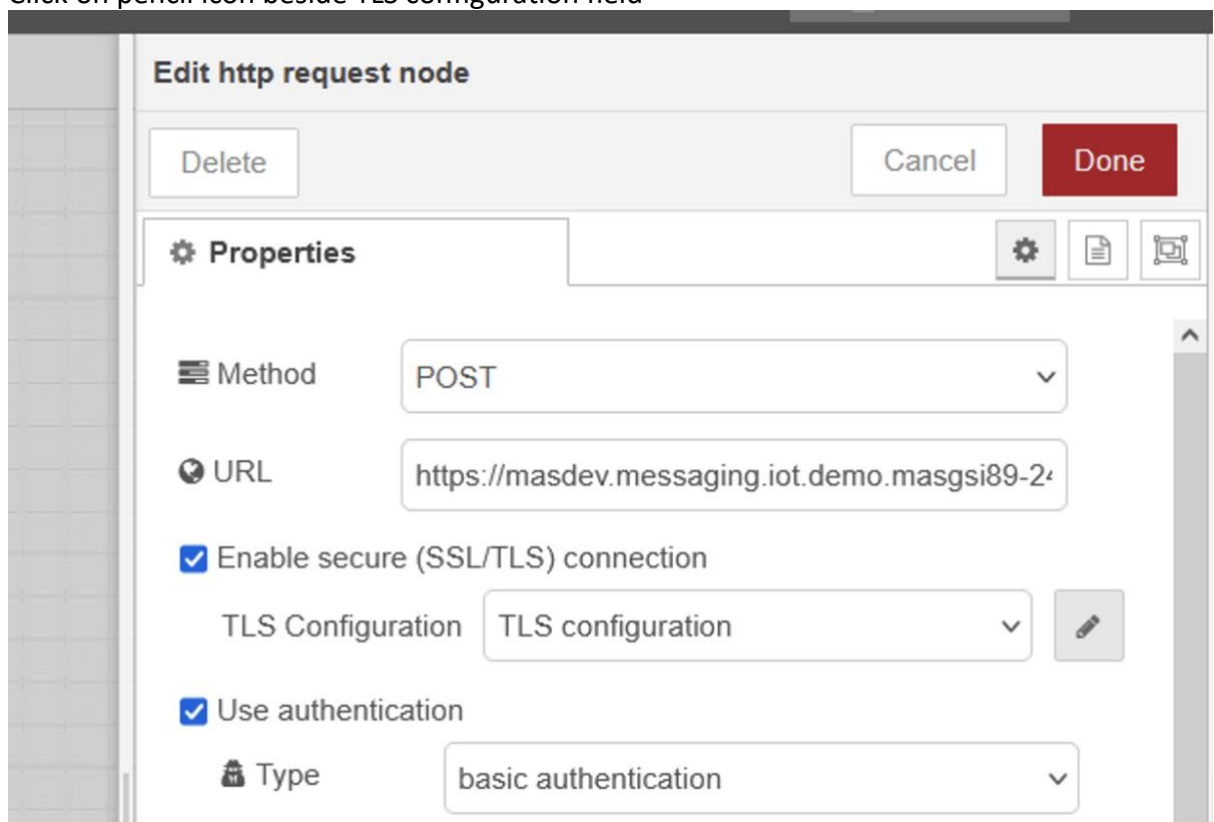
Summary of the API keys that have been added for the organization. It can be filtered, sorted, and searched on using different criteria. To get started, you can add API keys by clicking Generate API Key. For more information about adding API keys, see [API key connection](#).

Description	Role	Expires
apikey	Standard Application	-
test	Standard Application	-
Azure IoT to Maximo integration	Standard Application	-
API Key for the device simulator	Standard Application	-
API Key for the device simulator	Standard Application	-
API Key for the device simulator	Standard Application	-

- b. Click on Generate API Key
- c. Provide Description and click Next
- d. Select role Standard Application
- e. Click on Generate Key.
- f. Copy API key to Node-red Username field
- g. Copy Authentication token to Node-red password field



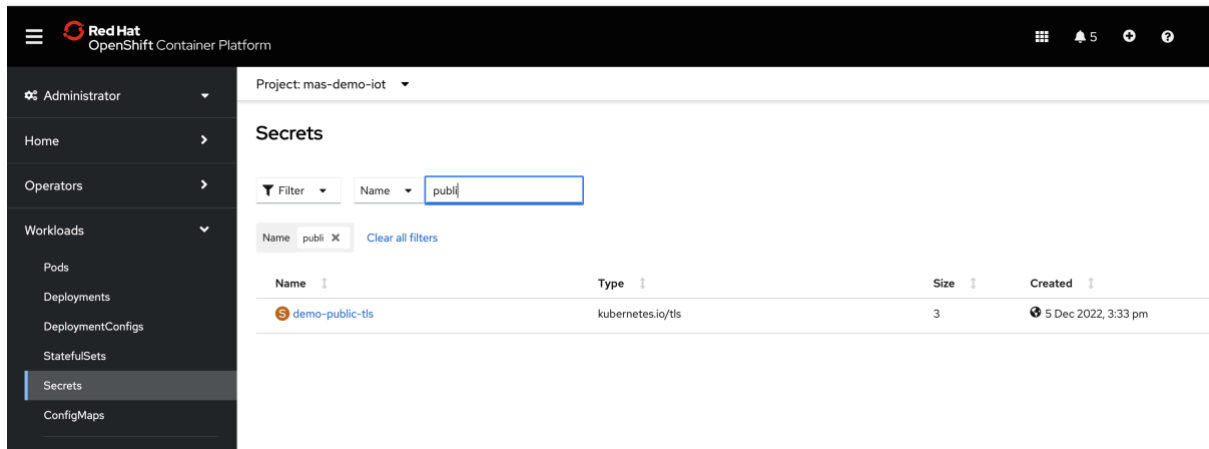
4. To configure TLS configuration
 - a. Click on pencil icon beside TLS configuration field



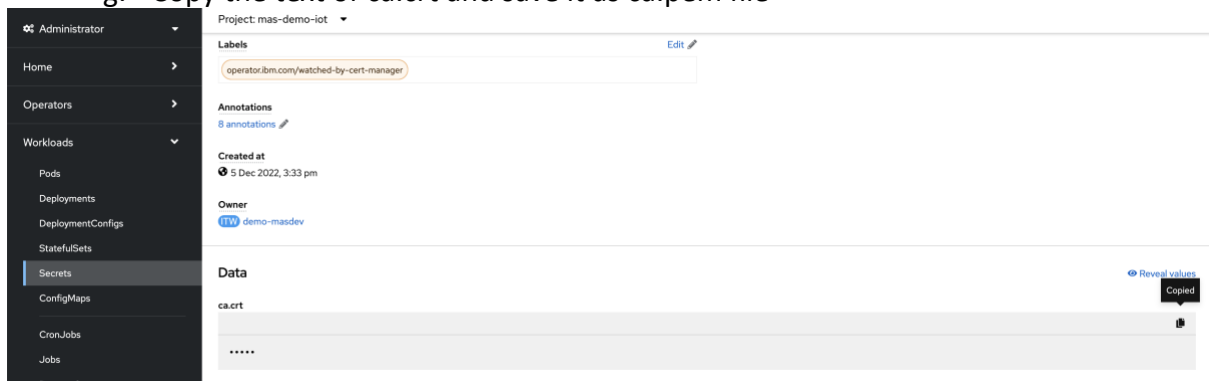
b.

If you have access to OCP, you can get the ca certificate by following the below steps
However for this lab you can download the ca.pem file from github

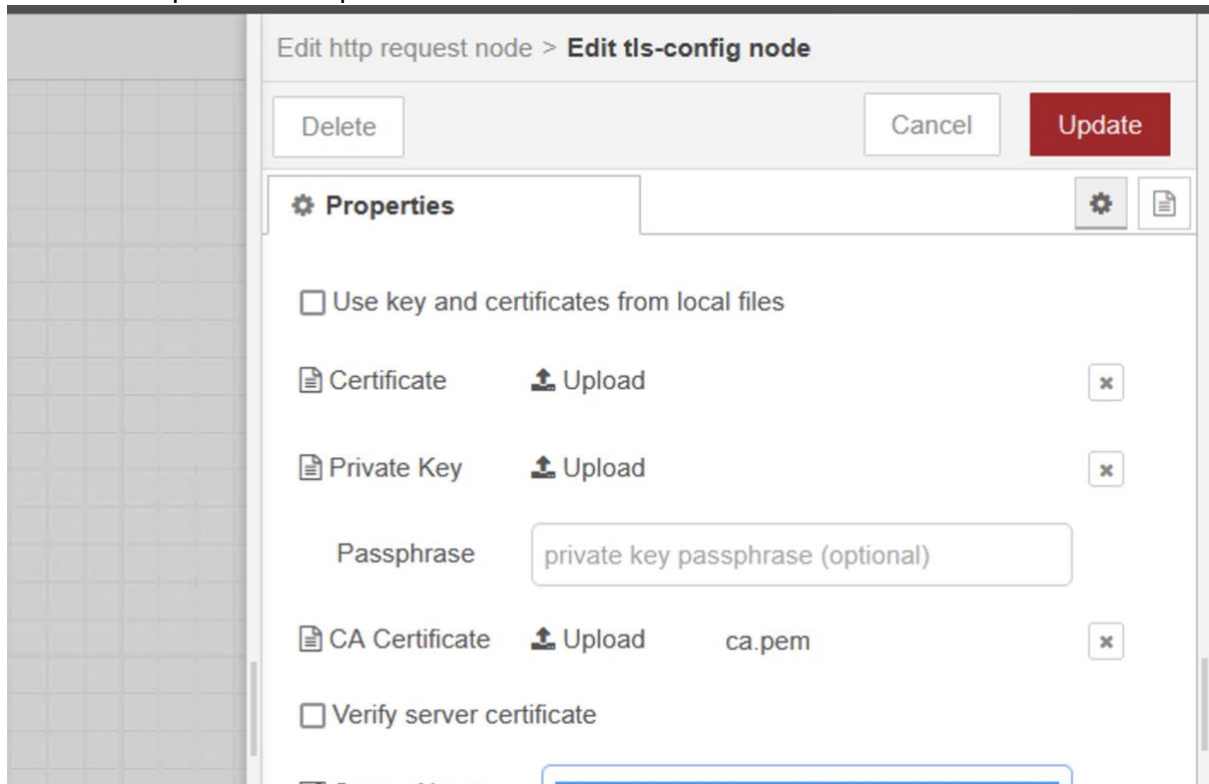
- c. For CA certificate login to OCP console
- d. Select Workload -> Secrets and choose IoT project e.g mas-demo-IoT
- e. Search with Public-tls word



- f. Open the secret
- g. Copy the text of ca.crt and save it as ca.pem file



- h. Upload the ca.pem file to CA certificate



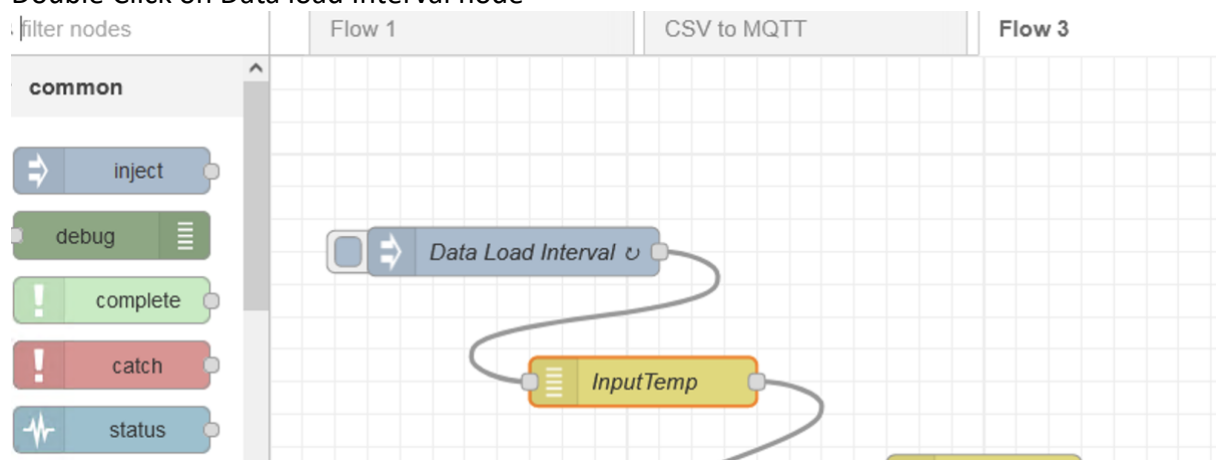
5. Provide server name as below

masdev.messaging.iot.indlabs.masindialabs-d0e546ee009fc97340f232abe59937ef-0000.au-syd.containers.appdomain.cloud

6. Click on Update
7. Click on Done
8. Click on Deploy

Ingest data from Node-Red to Monitor device

1. Double Click on Data load Interval node



2. Set the Repeat property as below

Edit inject node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

🏷 Name

Data Load Interval

≡ msg. payload = ▼ timestamp

×

≡ msg. topic = ▼ a_z

×

+ add

inject now

☐ Inject once after 0.1 seconds, then

🔄 Repeat

interval ▼

every 30

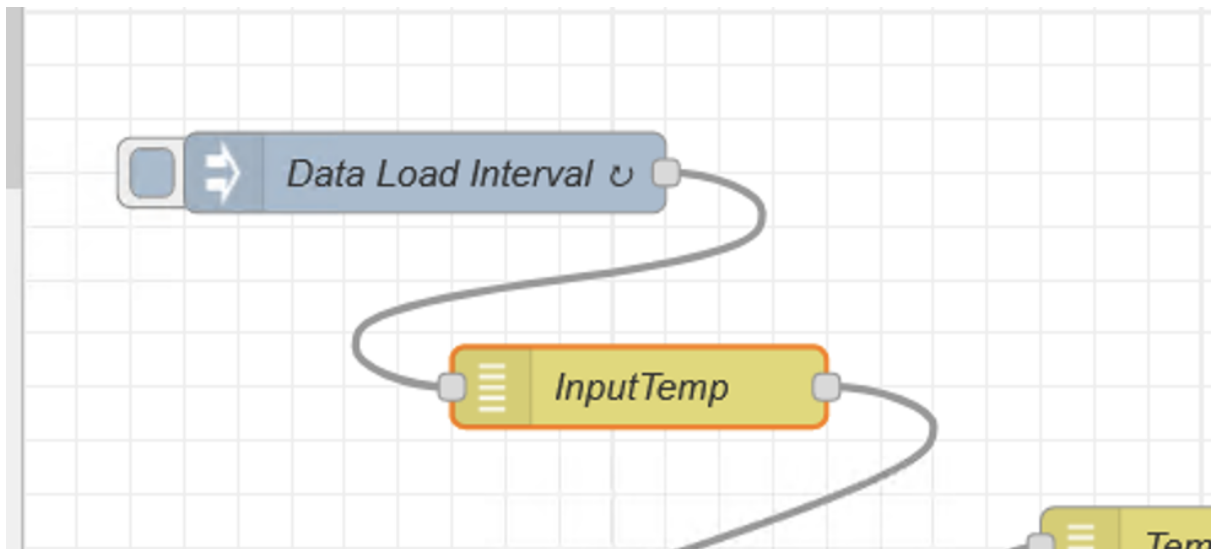
↑ ↓

minutes ▼

3. Click on Done
4. Click on Deploy

Send Anomaly data to monitor

1. Double click on Input temp flow



2. Modify the From and To property as below

Edit random node

Delete Cancel Done

Properties

Property msg. payload

Generate a real number - floating point

From 40

To 60

Name InputTemp

3. Click on Done and Deploy the flow
4. Click on blue button on Data Load Interval node to ingest one record manually.



5. Go back to Monitor application and select Monitor tab
6. Click on Devices tab
7. Select the Device type and device name
8. Alert will be displayed on Alert table as shown below

Monitor / Device type: Devicetype_Lrng / Devicetype_Lrng: Lrng_Device1

Alerts

Last updated on: 06/07/2023 16:18:31

Alerts by status

Time	Name	Source	Owner	Severity	Status	Service Request
06/07/2023 15:47:52	output_alert_upper	Lrng_Device1	Select owner	High	New	Create service request

Raise Service Request from Alert Table

Note: Create an asset in Manage application with the same name as device in monitor before creating service request.

1. Click on Create service request link

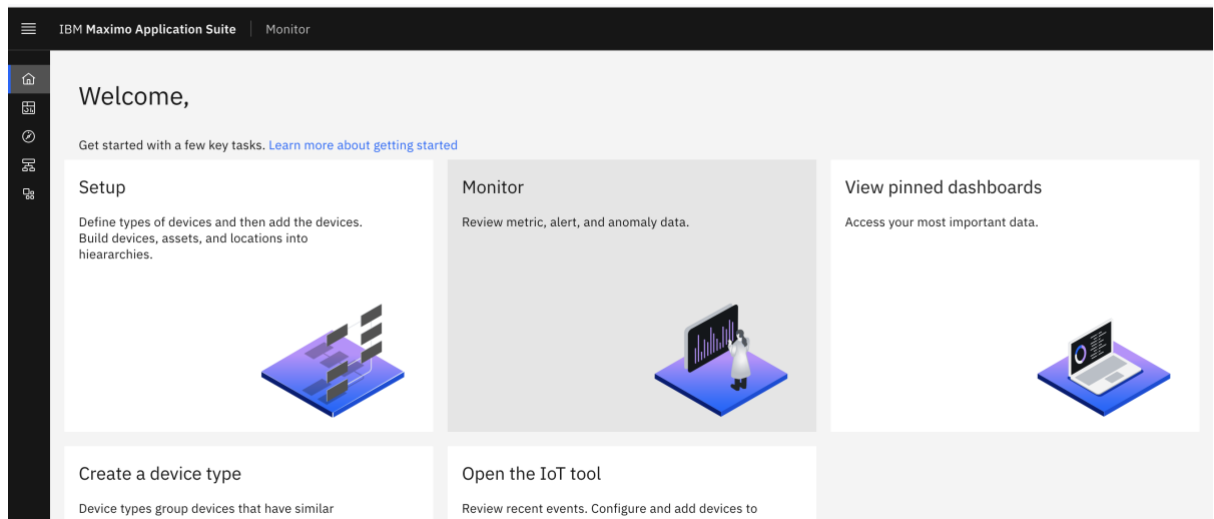
Time	Name	Source	Owner	Severity	Status	Service Request
06/07/2023 15:47:52	output_alert_upper	Lrng_Device1	Select owner	High	New	Create service request

2. Enter the Reported by field
3. Click on create button.

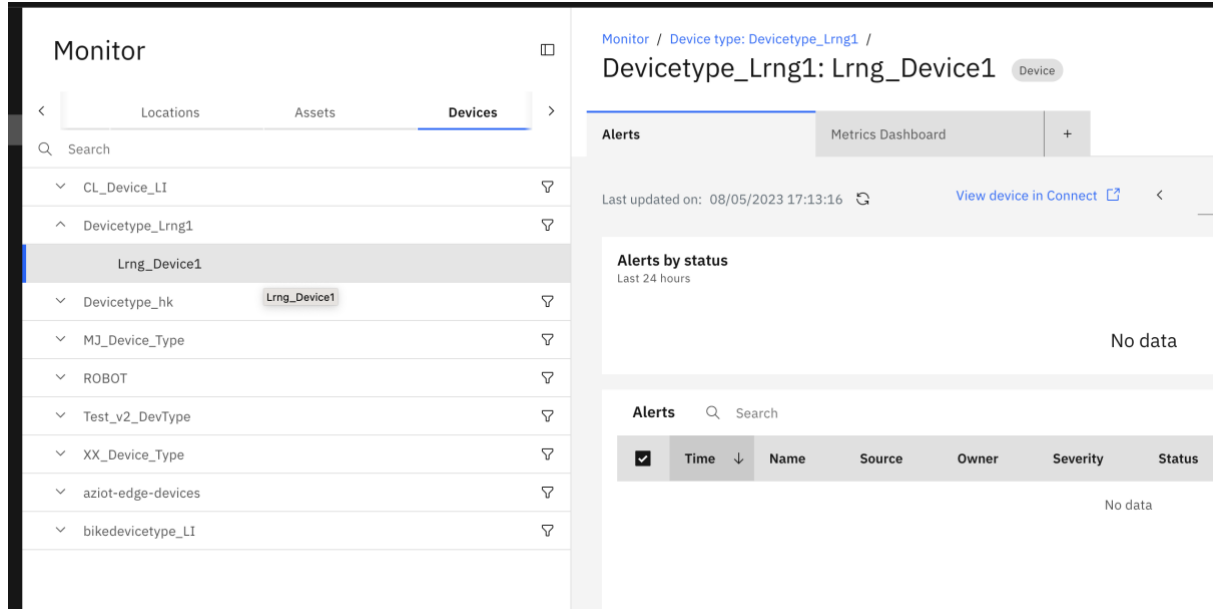
Create Dashboard

There are a variety of ways you can set up dashboards in Monitor.

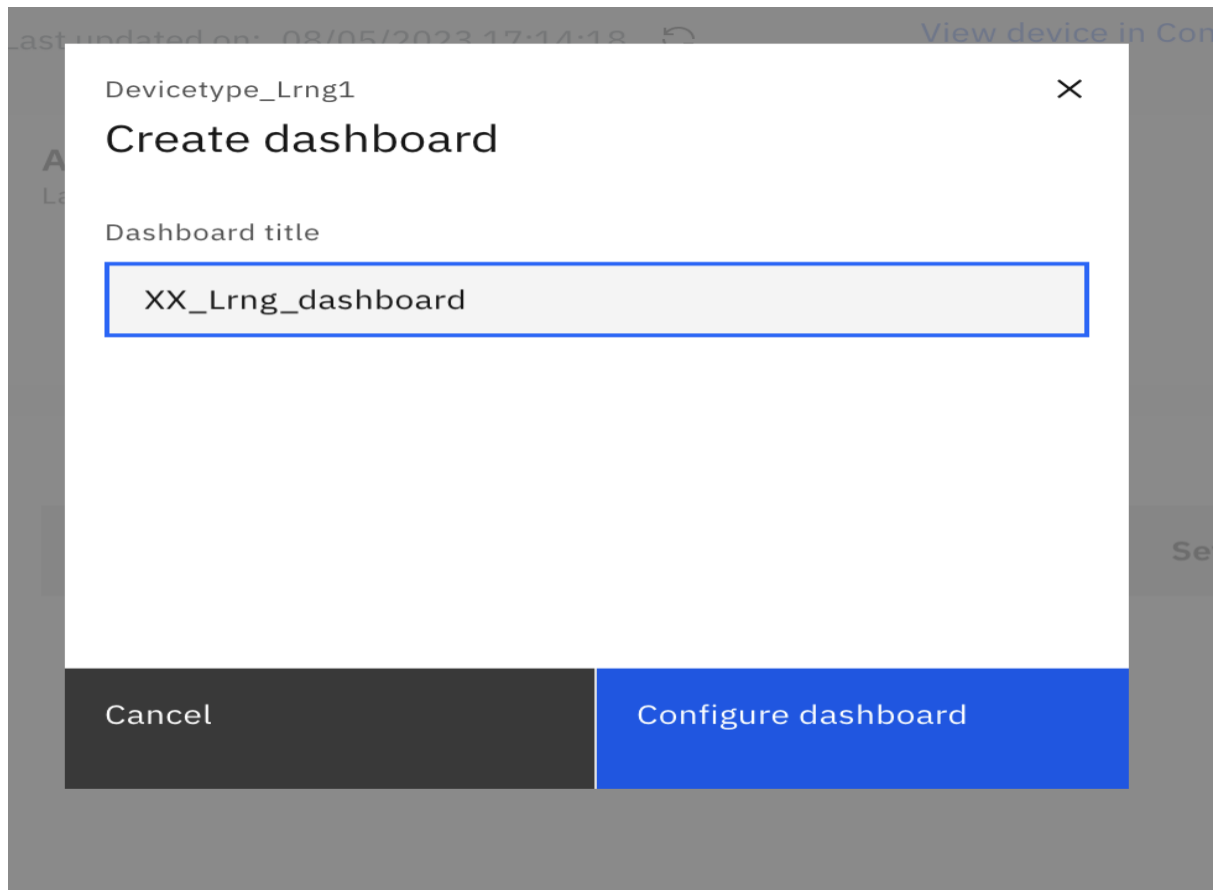
1. From the monitor home page, select "Monitor"



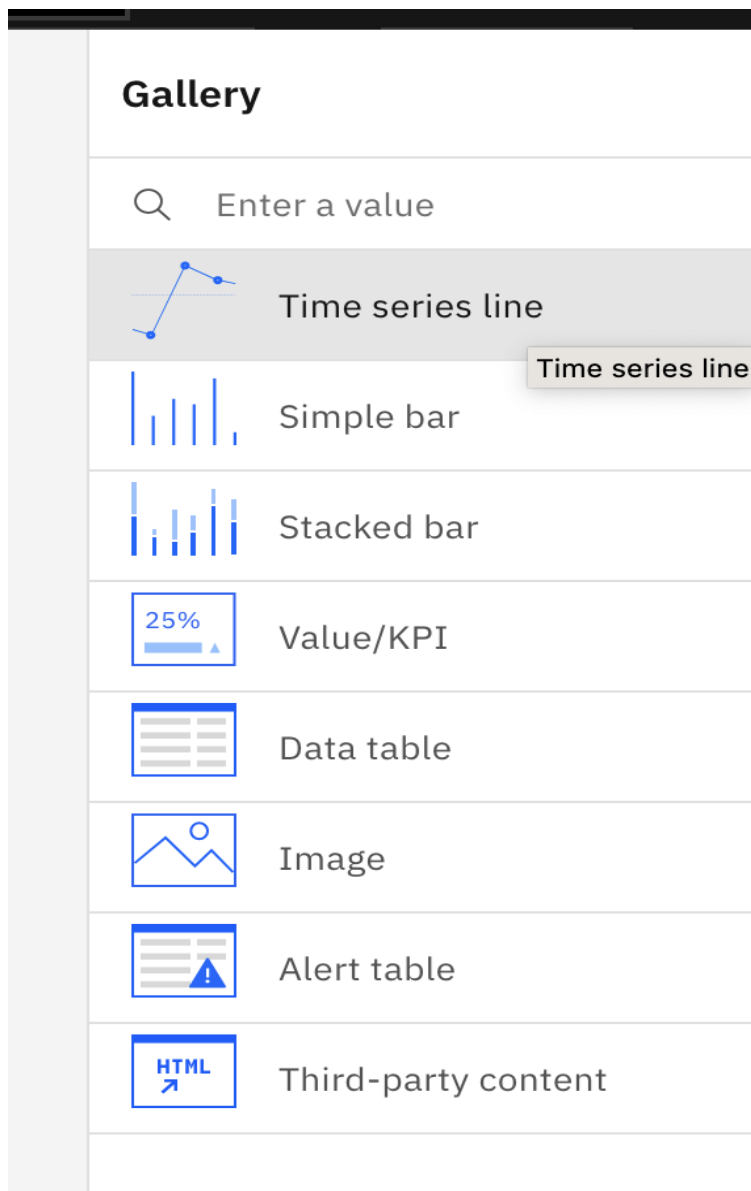
2. Select the device from device type list.



3. Click on the “+” icon beside Metrics Dashboard to create new dashboard and provide the dashboard title as “XX_Lrng_Dashboard”



4. Click on Blue Configure dashboard button.
If shows and empty dashboard
5. The first card we are going to select is the Time Series Line. Click on it.



6. Then give the card a title, time range, and add a data item.

Monitor / Device type: Devicetype_Lrng1 /

XX_Lrng_dashboard

This is a preview of the dashboard using sample data. You can edit the dashboard. The dashboard will be saved after you click Save and close.

Temperature

Time

InputTemp

Content Settings

Title: Temperature

Description:

Size: Medium (8x2)

Time range: Last month

Data

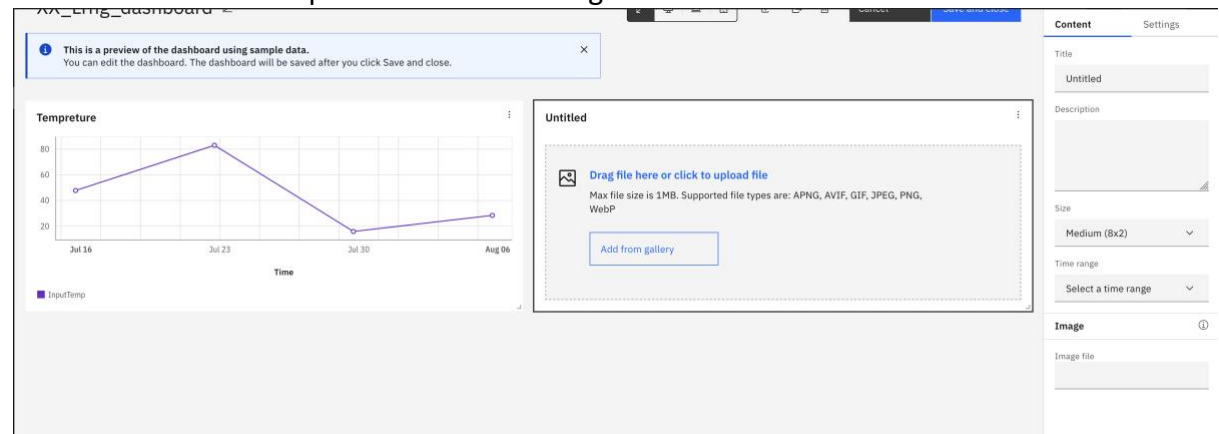
Data item: Filter

InputTemp

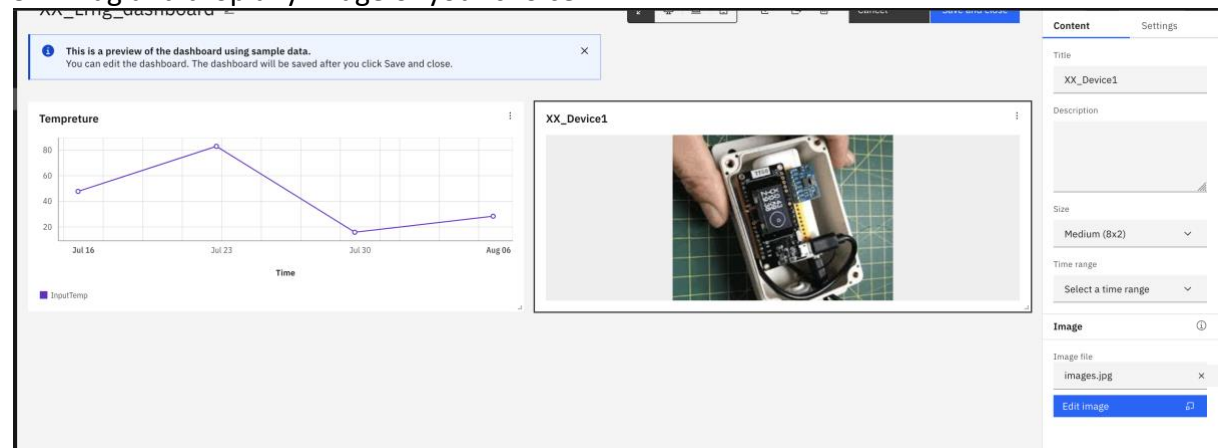
Alerts

Overlay with alerts

7. Add an image card
8. Click on Add card option and choose Image card



9. Drag and drop any image of your choice



10. Similarly you can add other card to your dashboard.
11. Click on Save and close.
12. It should render the dashboard.
13. Feel free to edit the arrangement of each card by dragging them around. Also, customize the size and settings of each card however you like.

Document History

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