Pervasive Nation Platform v1.1 User Guide

Revision History

Version	Date	Author	Description
0.1	11/05/17	Brian Murphy	Initial Draft
0.2	31/07/17	Brian Murphy	Update to v1.1

Contents

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Release Notes

New Features:

- New Navigation Paradigm inserted
- Login Page rebranded to ConnecThing
- User admin + API token mgmt ported to new UI
- CRUD for new application
- Control to add pages to application
- Create application tile list landing page
- Styling and branding controls for application
- LoRa device admin, Device type admin and DSL functions admin ported to new UI
- Global query filter bar allows users to select a device and timerange
- Create a widget browser/selector pane.
- Create a metric selector listing.
- Create application view/read only mode
- Add line charts, Area Charts and column charts to the widget catalogue.
- Edit + delete widgets.
- Page layout + dragging, dropping and resizing widgets.
- UI switch to switch between old UI and new UI.
- Add export and annotation to charts.

Limitations:

- IE 10: Not supported.
- Mobile phone view not supported.
- More optimisation needed for experience on regular 3G.
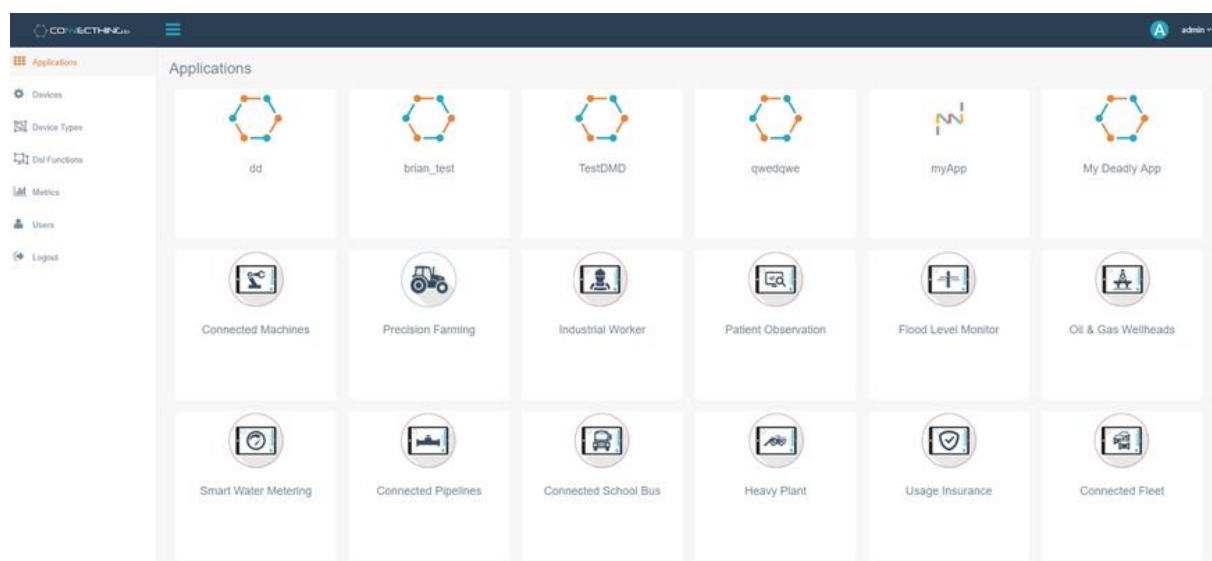
Known Issues:

- Creating devices with ABP, the user must provide DevAddr prefixed with '0x' or the HEX value will be converted to decimal.

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1 Login

Navigate to the *url* provided to you for your specific tenant. i.e. tcd.pervasivenation.com and enter your credentials.
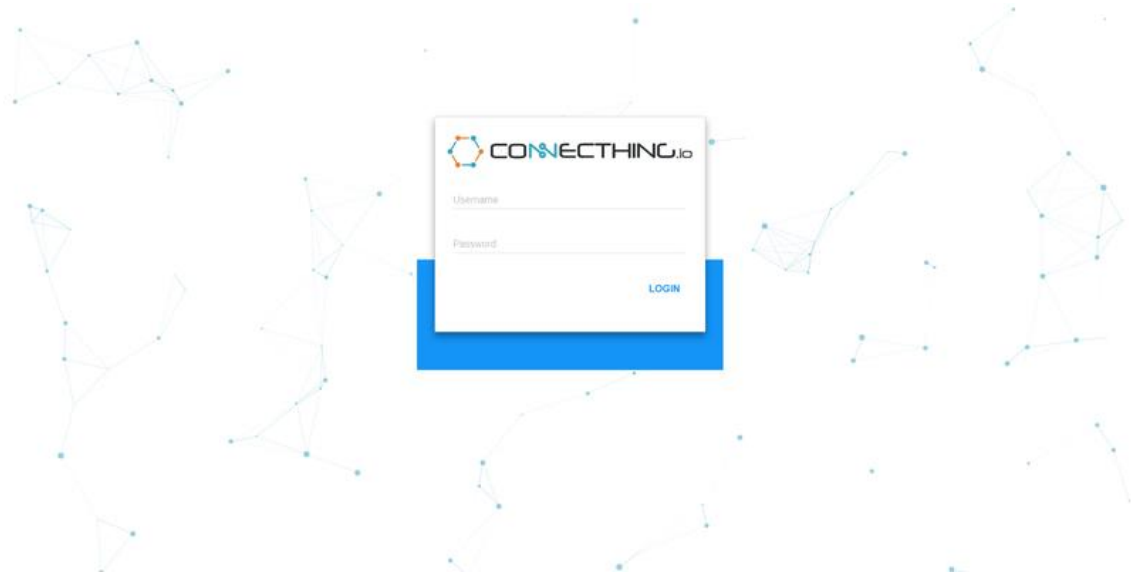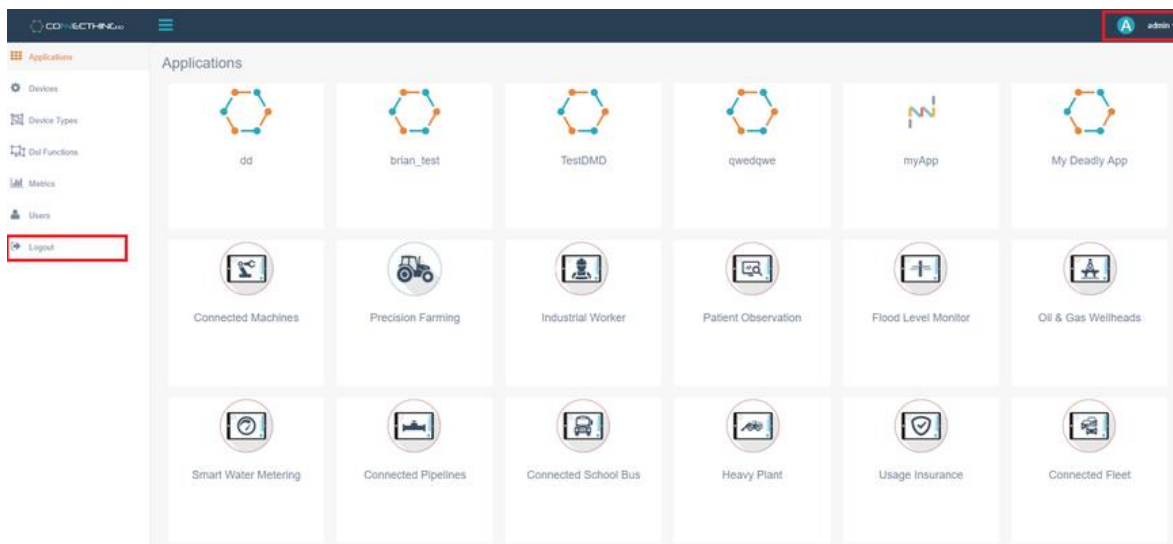

Once logged in successfully, you should be brought to this landing page.

Should you have any issues with logging in, please contact support@pervasivenation.freshdesk.com

To logout of your account, simply click logout in the left-side menu or the user drop-down in the upper right-hand side.

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2 Administration

Administration for the Connecthing platform is available on the left-hand side of the page.
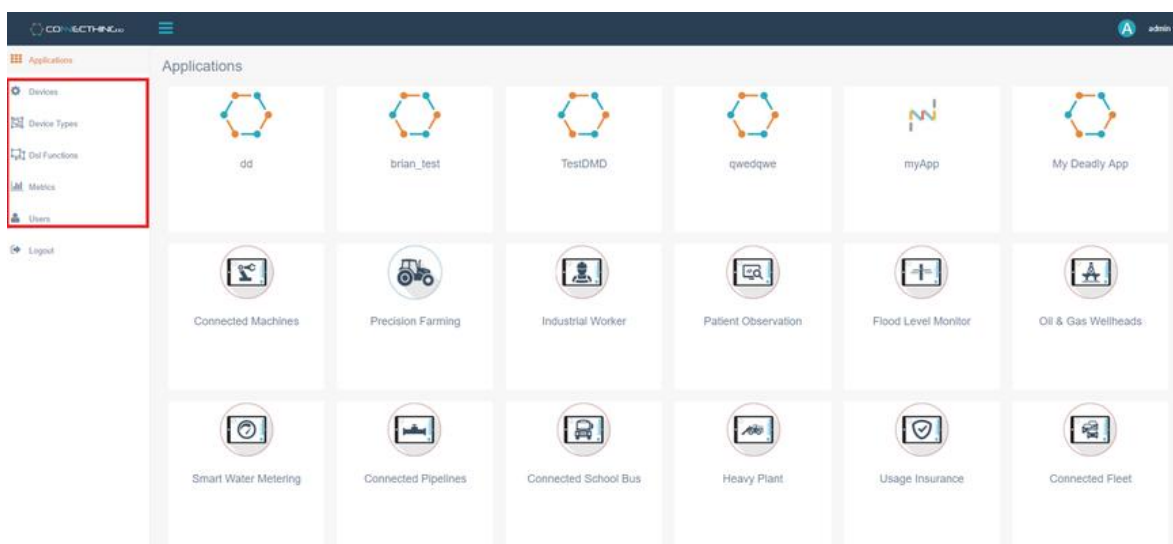
Menu items include:

Devices - Create and delete devices on the network

Device Types - Create payload decoders for specific devices

**DSL Functions** - (Domain Specific Language) Functions for use in payload decoders

Metrics - Configure the metrics that are specified in the payload decoders for devices

Users - Creation of users with admin or operator permission rights, as well as API Token creation for API usage

**Logout** - Logout of your account

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3 Users

Users allows an administrator to add, delete, reset passwords and generate API tokens for users.
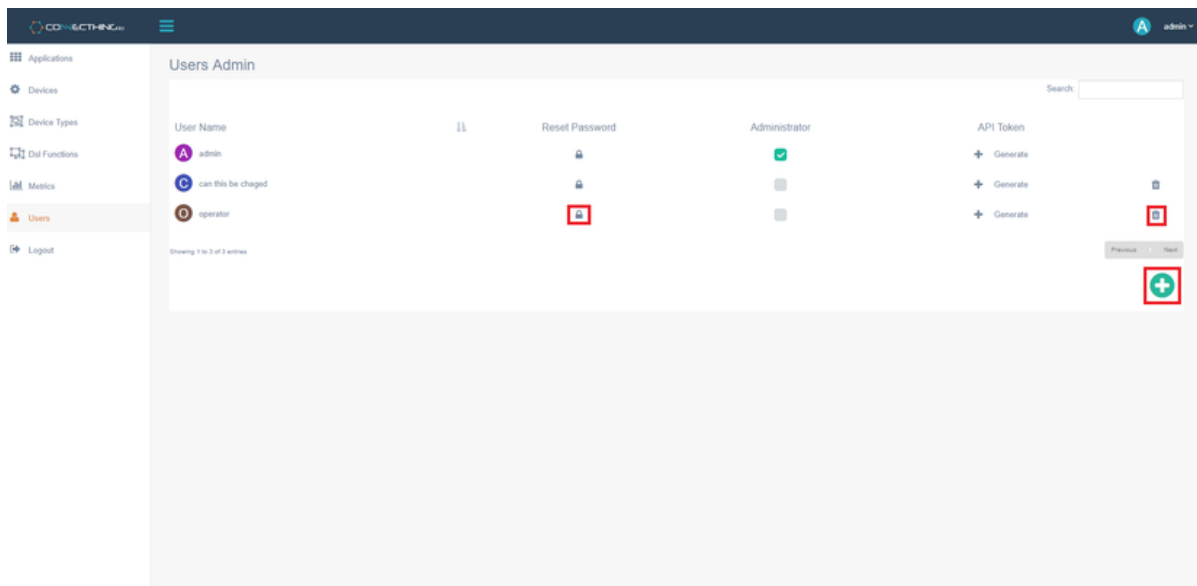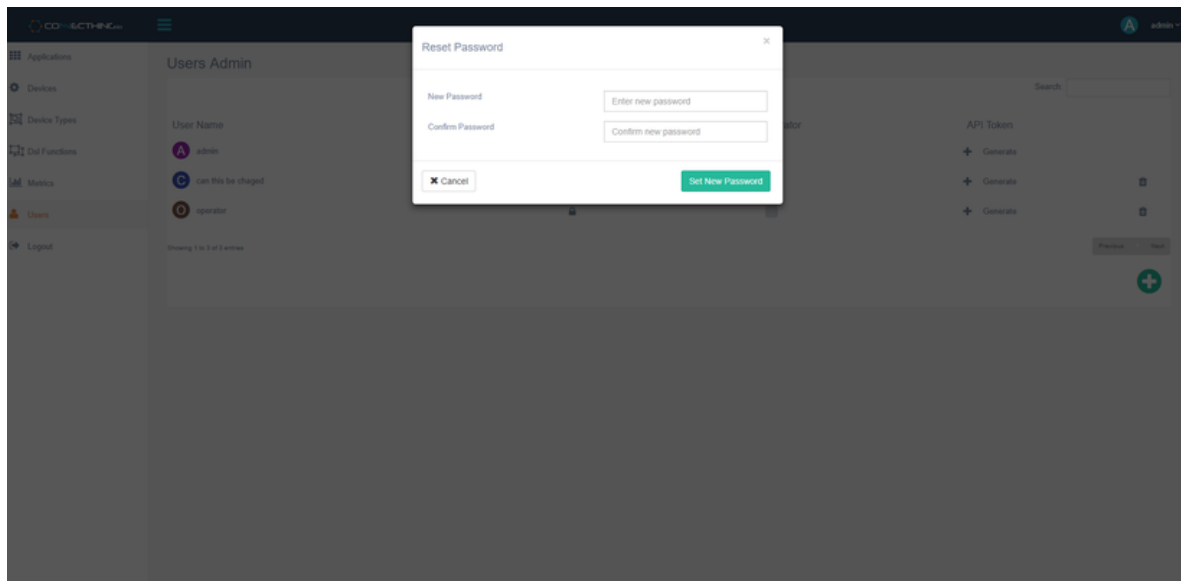

As seen above, we can create a new user by clicking on the green **+** icon to bring up the create a new user modal.
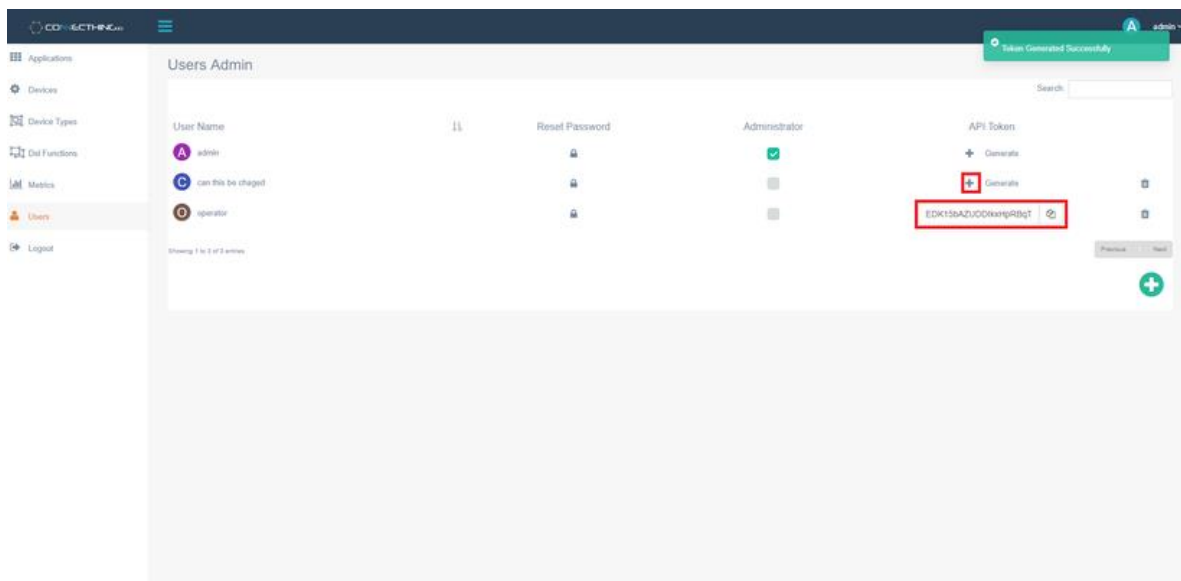
Fill in the username and password for the new user. Click on the checkbox to make that user an administrator if required and then hit Create.
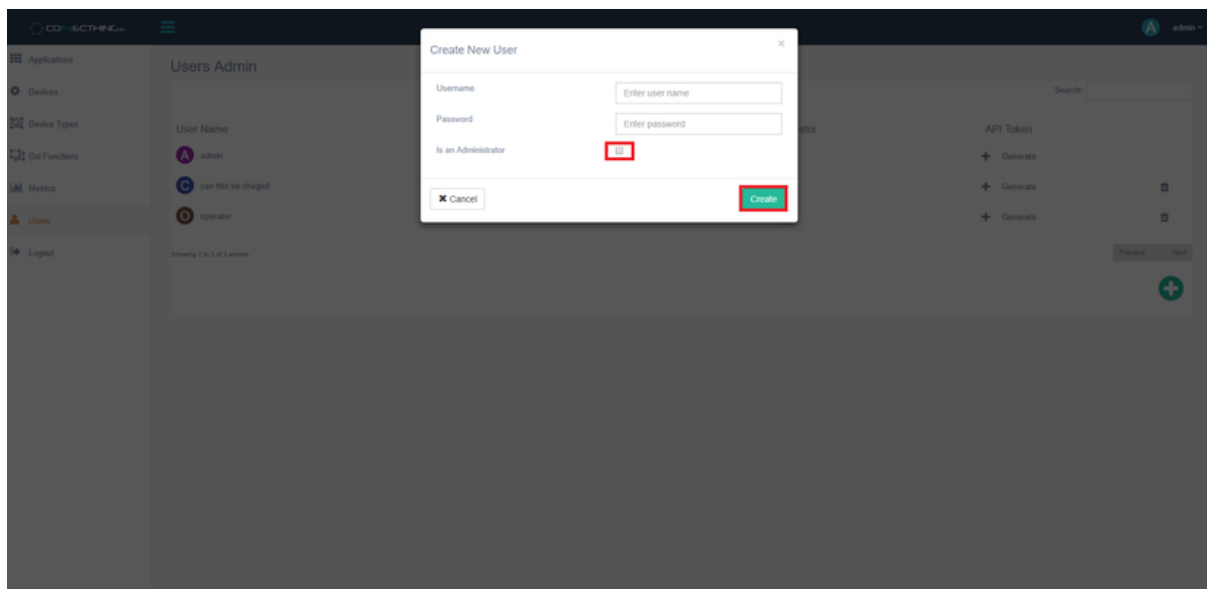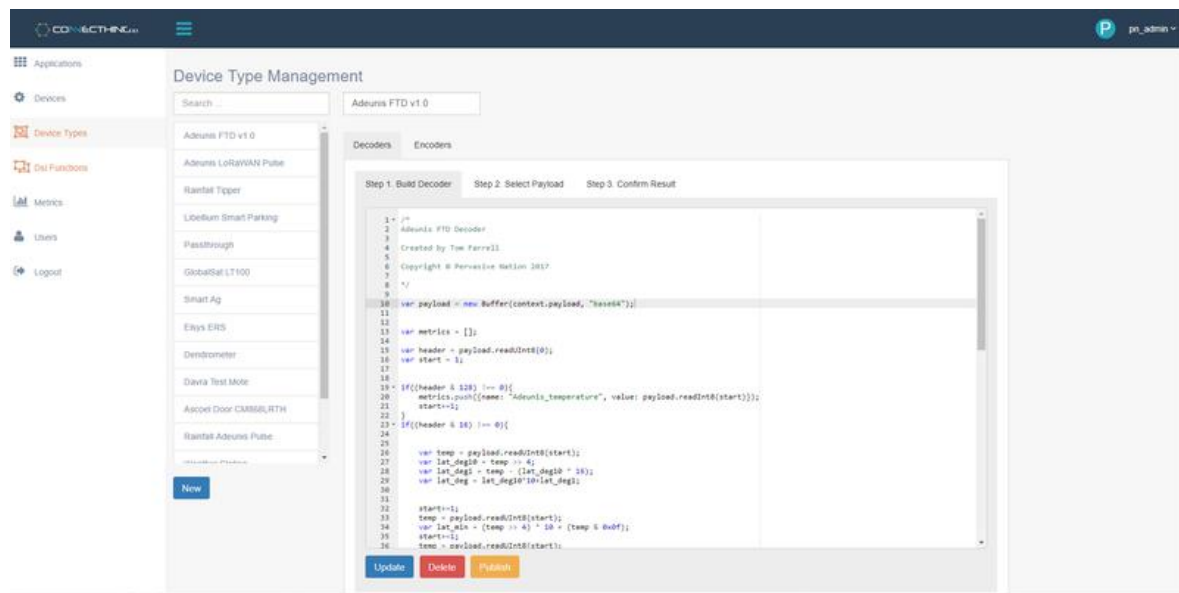

You can reset the password of a user.

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Or generate an API token for them which can be used to access the Connecthing API which is discussed in 8 Connecthing API & API Tokens

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4 Device Types & DSL Functions

Device Types:

Proceed to the **Device Types** page.

Here you can create your own decoder for any device that you wish to add to the network and returns its values.

Click on **New** to create a new decoder. This also provides the ability to Select the payload for your device in the **Device Type Management** page

There will be example decoders already present in the **Device Type Management** page. These are built using JavaScript, not the JSON type that will populate a new decoder like the screenshot below. So when creating a new decoder, just discard the pre-populated code.

Here is an example decoder for a Rainfall Sensor.

```javascript
//Example payload for this device would be a 7 byte message:
//01 0d ff 00 0c 01 02

//Declare payload variable and load the payload into a buffer converting from //base64
var payload = new Buffer(context.payload, "base64");

//Declare an array to store the metrics
var metrics = [];

//Decode Status Byte, present in all messages

var header = payload.readUInt8(0); //Select first byte = 01
var battery = payload.readUInt16BE(1); //2 bytes Big Endian at byte 1 = 0d ff
var tip_counter = payload.readUInt16BE(3); //2 bytes Big Endian at byte 3 = 00 0c
var tip_occurances = payload.readUInt8(5); //1 byte at byte 5 = 01
var tipper_type = payload.readUInt8(6); //1 byte at byte 6 = 02
var rainfall;

//Tipper Type: 0x01 0.1mm Low Cost light rainfall gauge 0x02 0.2mm Casella Moderate
Rainfall Gauge 0x03 0.3mm Heavy Rainfall Gauge

if (tipper_type == 1) {
    rainfall = tip_occurances / 10;
} else if (tipper_type == 2) {
    rainfall = tip_occurances / 5;
} else if (tipper_type == 3) {
    rainfall = tip_occurances / 2;
}

//Push the variable values to the array with the metric name
metrics.push({ name: "battery", value: battery });
// battery = 3583
metrics.push({ name: "tip_counter", value: tip_counter });
// tip_counter = 12
metrics.push({ name: "tip_occurances", value: tip_occurances });
// tip_occurances = 1
metrics.push({ name: "rainfall", value: rainfall });
// rainfall = tip_occurances/5; (1/5) = 0.2
metrics.push({ name: "tipper_type", value: tipper_type });
// tipper_type = 02


//Output the context value, with metrics equal to the metrics array

context.value = {
    metrics: metrics,
    gps: {
        latitude: null,
        longitude: null
    }
};
```
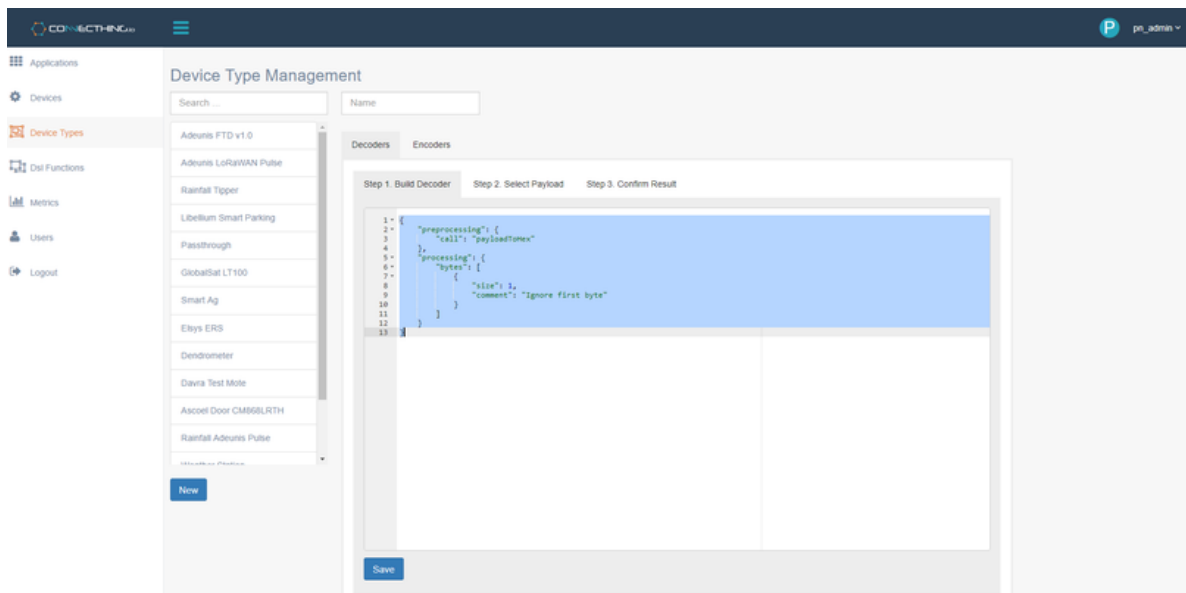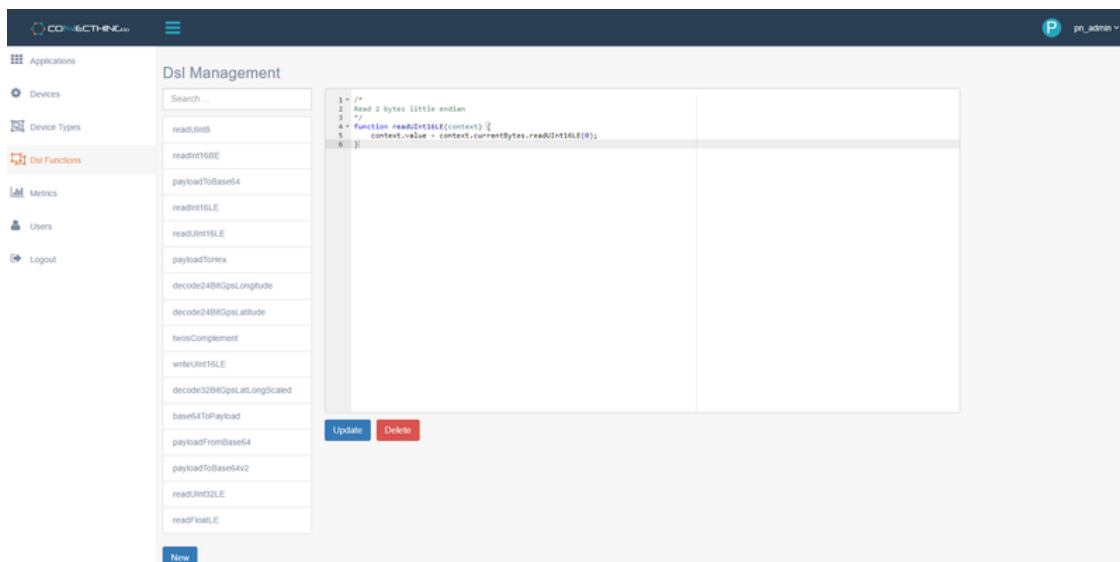
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Please view a list of decoders for various device types at help.pervasivenartion.com Decoders

DSL Functions:

Domain Specific Language (DSL) functions are functions created for use in the device type decoders. For example, the received payload is stored in a Node JS buffer. Create a function to read 2 bytes Little Endian of the payload.

A full list of buffer properties and methods can be viewed here.
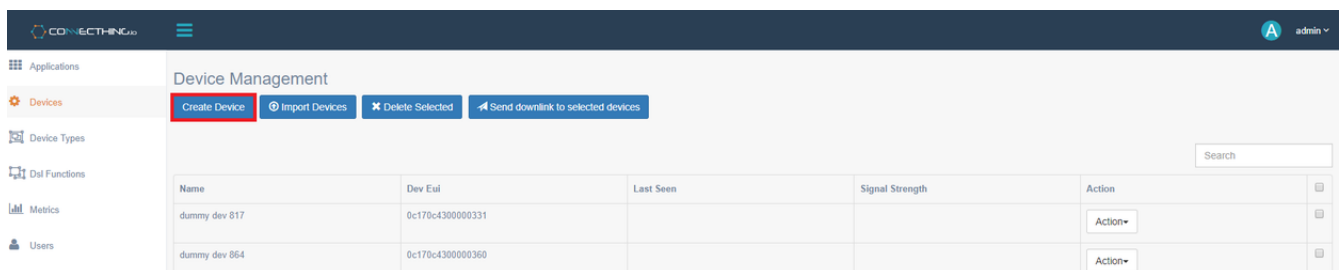
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5 Devices

Enter the **Device** page and you will see options to create, bulk import, delete, edit and send downlinks to all devices. You will also see a list of all devices present on your tenant. This were you will manage all device creation and editing.
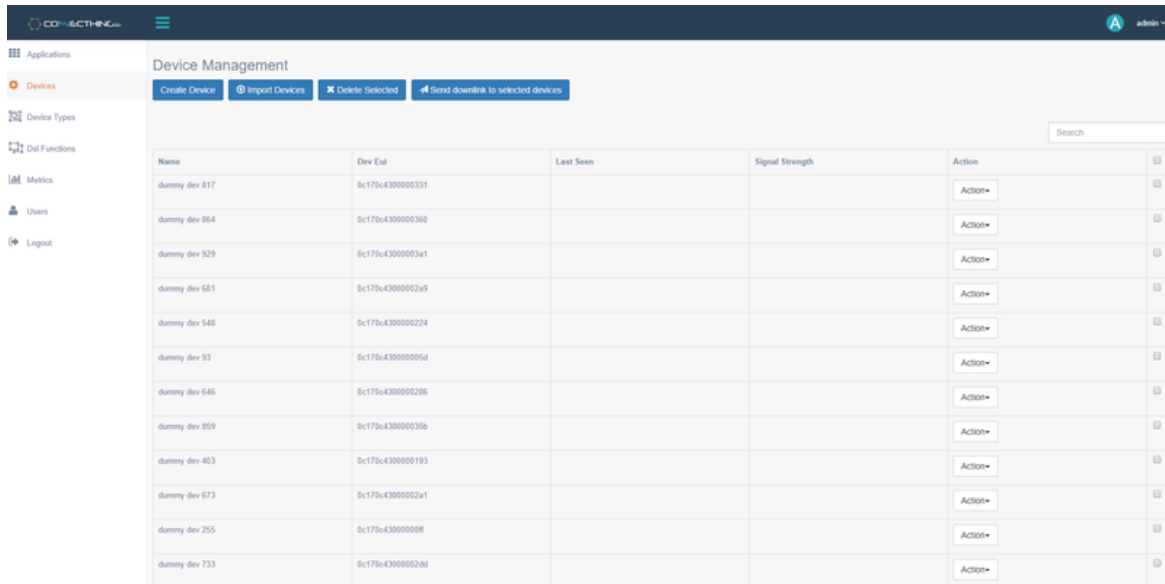
Create Device:

Click on **Create Device**

A modal should appear. Fill in the appropriate information for the device. Here you must enter the **Name**, **Dev EUI** and **Device Type**. **Device type** refers to the decoder used for that device. You can read more about Device Type in section 4 Device Types & DSL Functions. Then choose whether the device is using **Over-The-Air Activation** (**OTAA**) or **Activation by Personalization** (**ABP**).

For **OTAA** devices, choose the **OTAA** tab and provide the **App Key**.

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Create Device

Name	Network Policy	Device Class:
	Standard ▾	◉ A ○ B ○ C

Dev EUI	RX Slot 2	Device Properties:
	SF12 ▾	Not Specified ▾

Expected Duty Cycle

Device Type

OTAA | ABP

App Key

Create | Cancel

For **ABP** devices, choose the **ABP** tab and provide the **NetSKey**, **AppSKey** and the **Dev Addr***.

***Please note that the DevAddr must be converted to HEX otherwise the system will interpret the DevAddr as decimal if the are no letters in the DevAddr and will not work. To do this, simply prefix your DevAddr with '0x'.*

For example, 03ff8123 will become 0x03ff8123

Create Device

Name	Network Policy	Device Class:
	Standard ▾	◉ A ○ B ○ C

Dev EUI	RX Slot 2	Device Properties:
	SF12 ▾	Not Specified ▾

Expected Duty Cycle

Device Type

OTAA | ABP

AppSKey

NwkSKey

Dev Addr

Downlink Slot Delay

1s ▾

Create | Cancel

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Once the all details have been entered, click **Create**

The created device should now be listed on the **Device Management** page
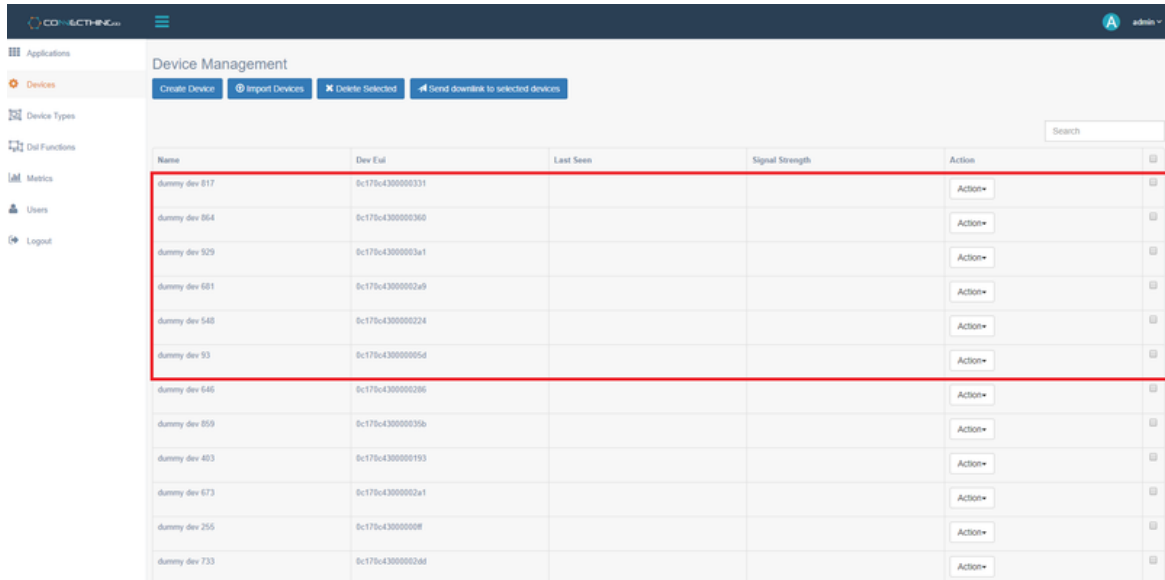
Import Devices:

You can import bulk devices using a CSV file. The format of which is:

| deveui	appkey	comment	lora_device_class	lora_rx2_sf	lora_fcnt_32bit
<deveui>	<appkey>	dummy dev 0	0	sf12	TRUE

6 Metrics

Metric configuration allows the user to configure the metrics that are available to the user from the decoded devices. Here you can alter the **Label**, **Description** and **Units** payload decoders from the user created devices.

Proceed to the **Metrics** page. There should be a listing of your created device's output parameters. To edit any of the information, simply click on the pencil icon.

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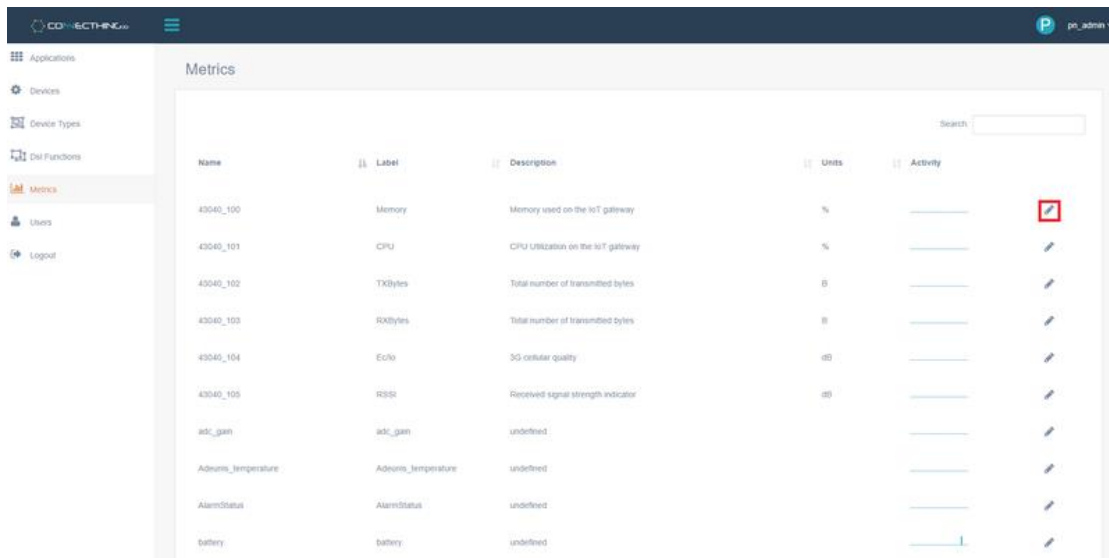
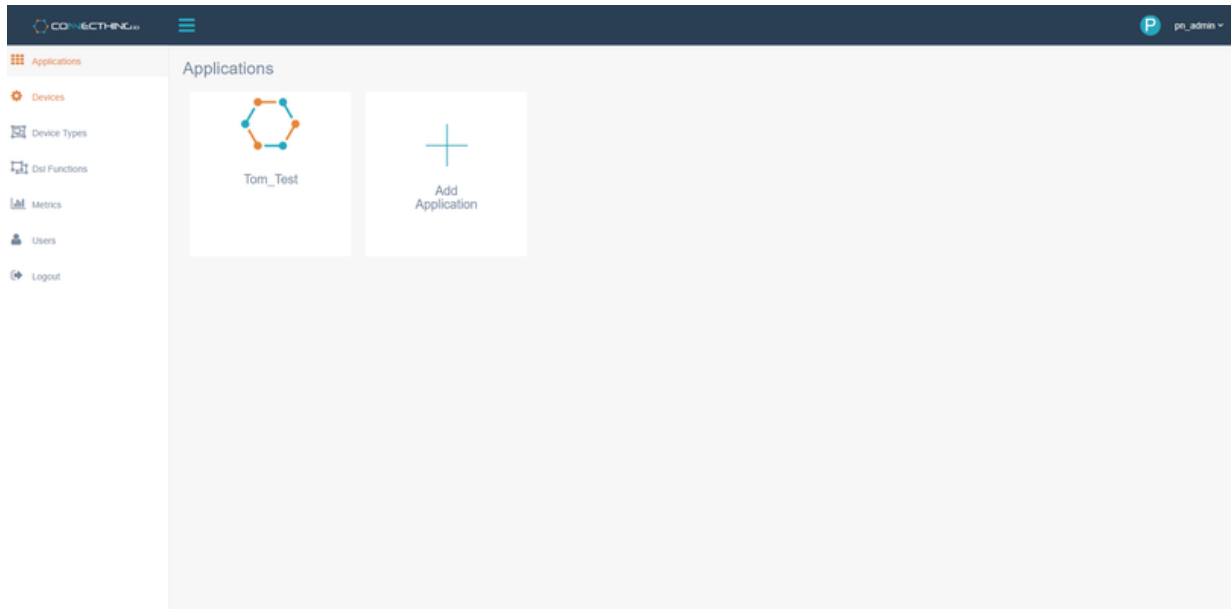Fill in the **Label**, **Description** or **Units** fields in the modal and press Update.
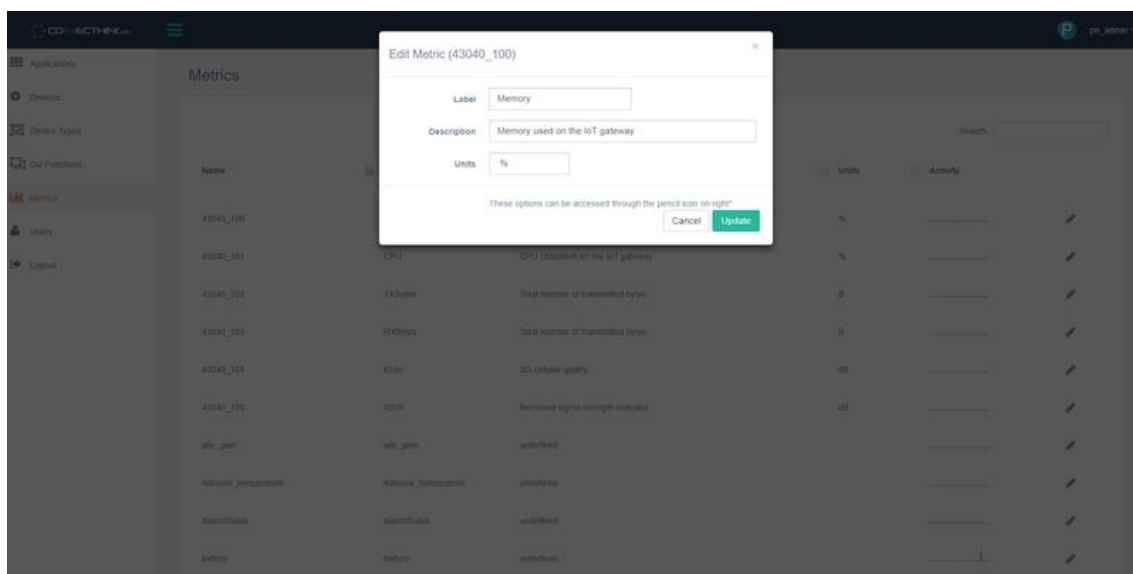
Editing the **Label** parameter will help distinguish the metrics when creating applications or forwarding any data.

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7 Applications

Click on the Applications tab on the Menu. It will display all apps that have been created and allow the user to create apps.

Please note that in this release, you must have administrator rights to create and application.
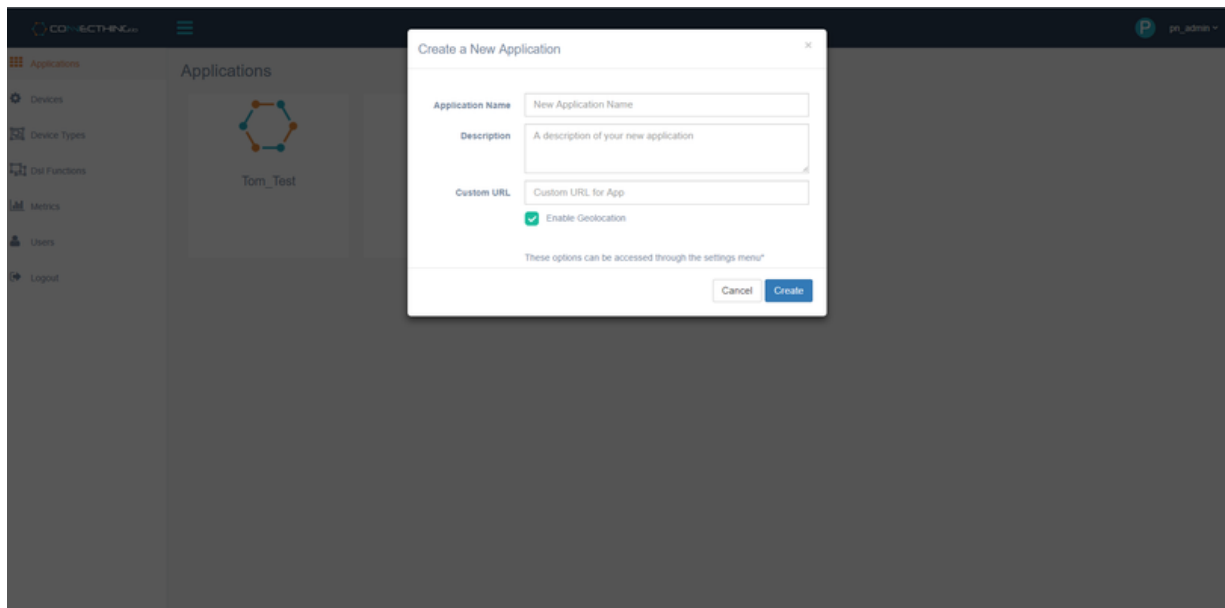

Create an application

Click on the 'Add Application' tab and you will be presented with options to create your application.

**Application Name:** Enter a name for your application

Description: Describe your application

Custom URL: Will provide you with a url for yor specific application. If you enter 'test' as a name here, it will autofill the url to https://<yourtenant>/apps/test. This can be copied here or via the 'Share app' button.

Enable Geolocation: If active, the application will have a mapping function to replay GPS data from GPS enabled devices only.

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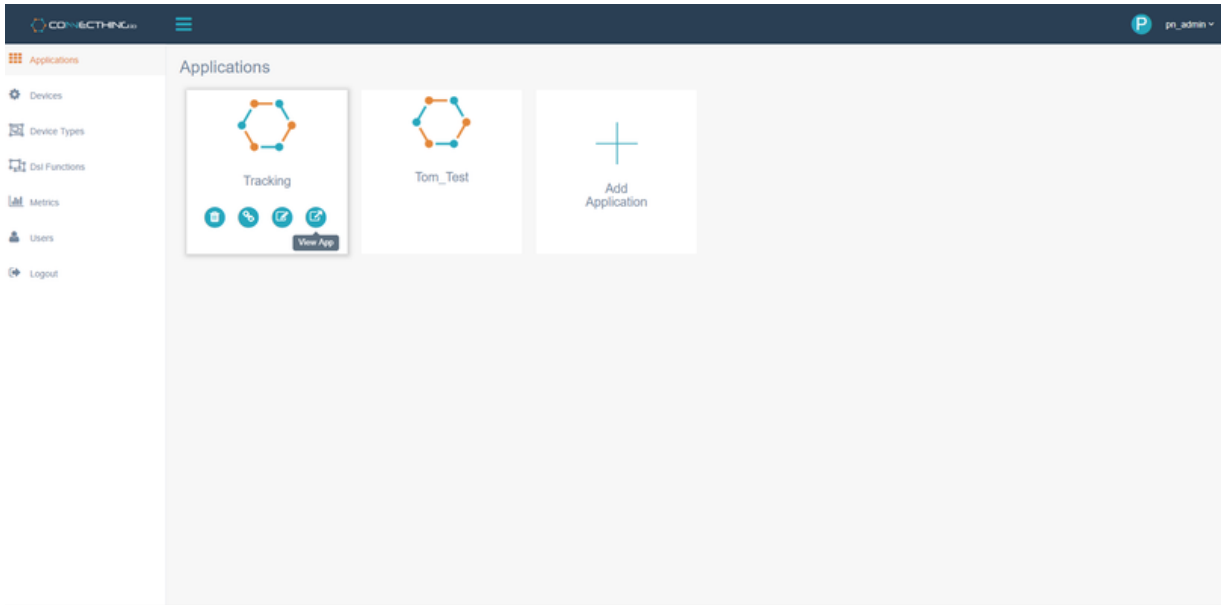Once created, the application will appear on the Application Menu.
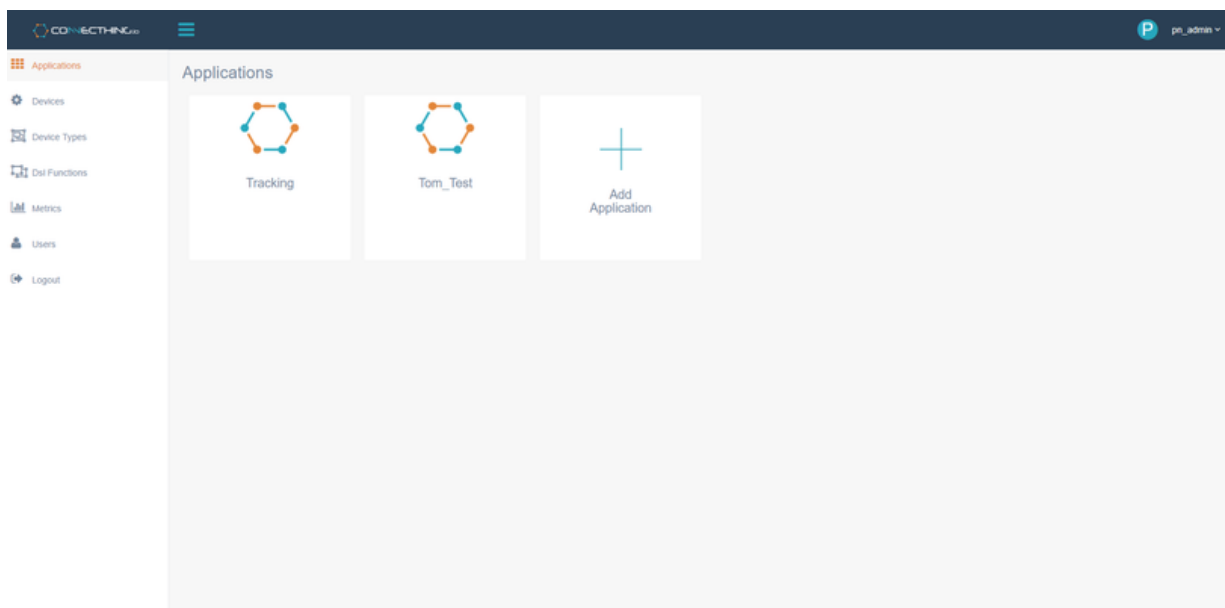
View an application:

To view an application, simply click on the right most icon of the application. If you are an administrator, you have options to:

From left to right: **Delete App, Share App, Edit App, View App**

An operator will only have the option to 'View App'.

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Once inside the application, one can view the components of the application as it was designed. In this case, we have a simple application with a table view.

All components will default with sample data unless they are specifically tied to a device. To view your data, simply click on the 'All Devices' dropdown, find your device either by scrolling or using the search function. Once the device is selected the table will update with values.

You can then choose a time range from the datepicker dropdown on the far right and the table will update again.

There are options on the table itself to export to Excel, CSV, PDF, etc.

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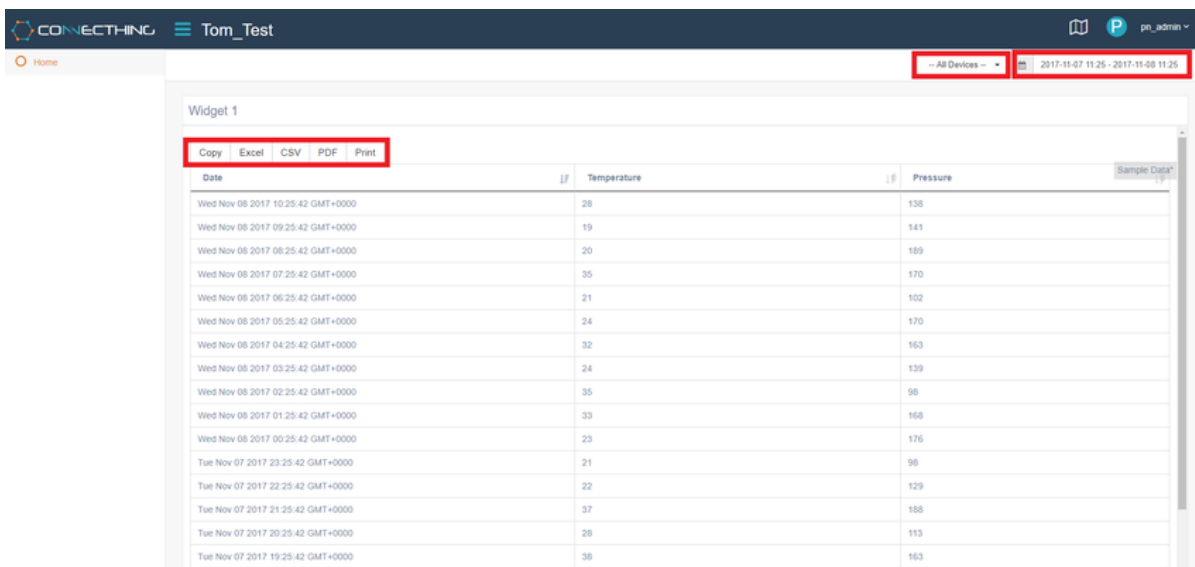
8 Connecthing API & API Tokens

If you wish to access the Connecthing API or forward any data to another application, you must first need to create an API Token. Navigate to the **Users** page and click **+ Generate** button that will create an API token for that user.

You can highlight to select the token or click on the file icon to the right to copy to the clipboard
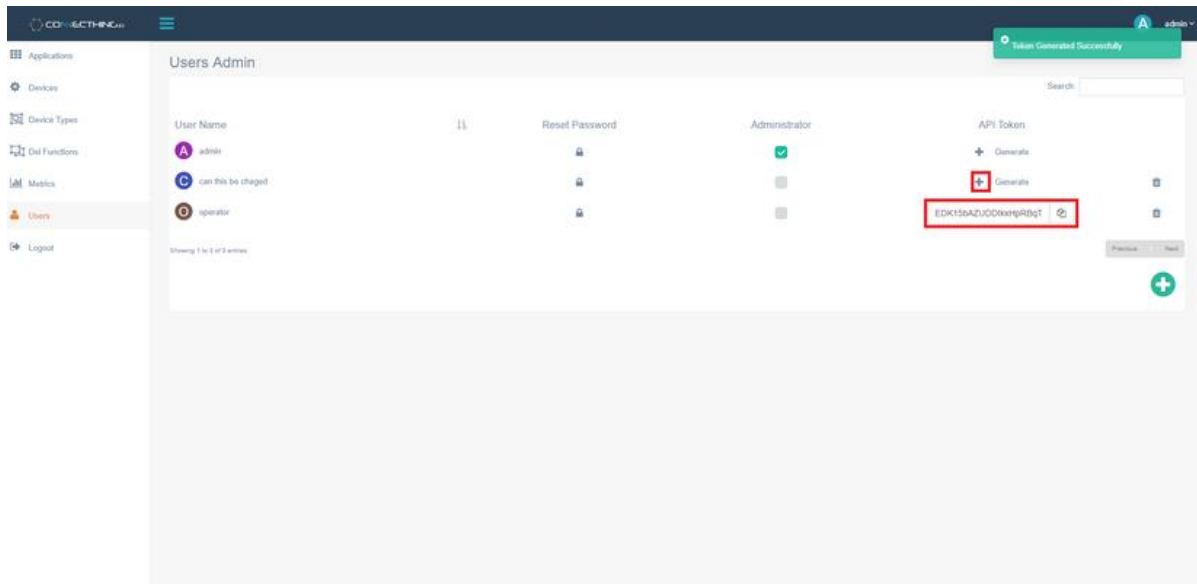
Davra Networks API:

You can use the existing API documentation available here.

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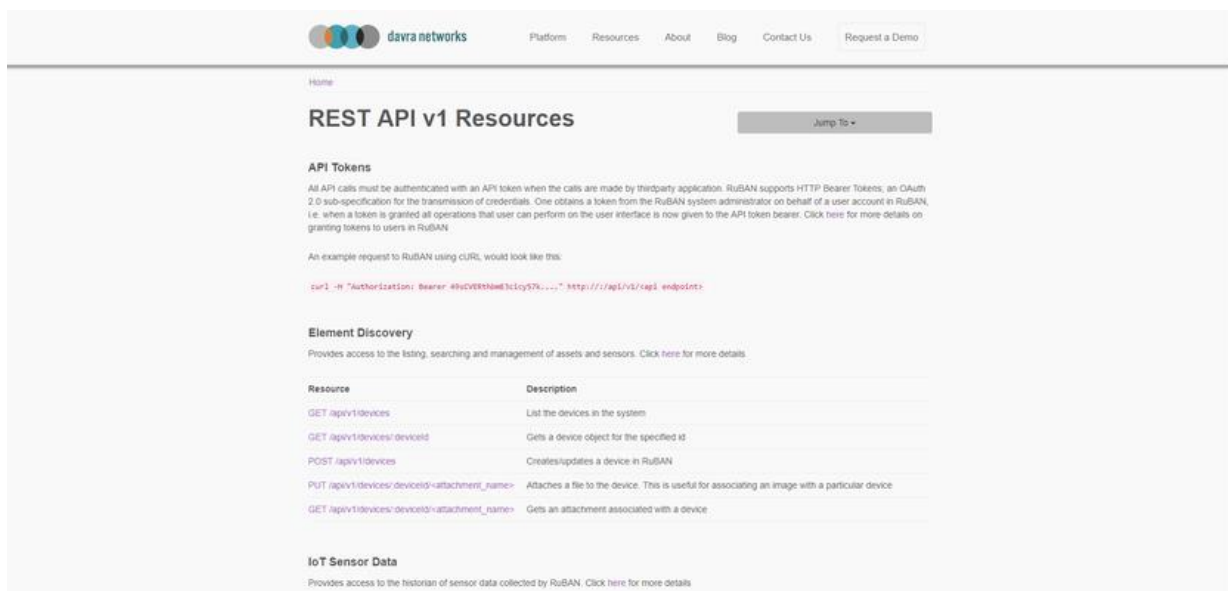
You can then use something like [Postman](#) to query the API calls you wish to make.

For example:

- Use **GET**
- http://***<yourtenantaddress>***/api/v1/devices
- In the header use ***Key = Authorization*** with the ***Value = Bearer <generatedAPIToken>***
- Should return a list of all the devices on your system

10 Help

As well as the Pervasive Nation Resource pages for any help and support that you need, you can also contact us at support@pervasivenation.freshdesk.com should you wish to report any bugs with the platform

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