webdyn
flexitron group

ExpertLoRaWAN

Application Note 1

Create a LoRa network sending data from LoRa sensors to The Things Network LoRa Server

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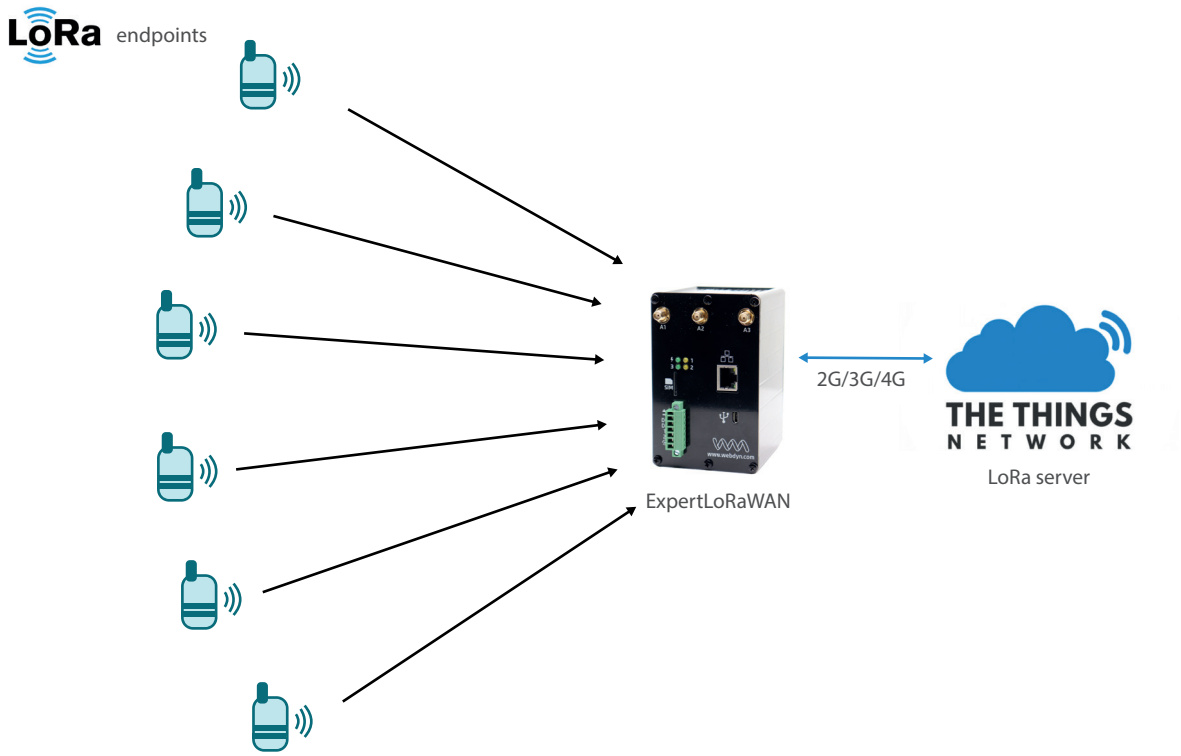
1. Scenario Details

The following picture simulates an example scenario with LoRa sensors distributed in a wide area sending data to The Things Network Platform through the Webdyn ExpertLoRaWAN.



This application note shows, step by step, the necessary configurations to be made in the Webdyn ExpertLoRaWAN and The Things Network LoRa Server.

LORA SENSOR

EM500-UDL: distance LoRa sensor

LORA GATEWAY

Webdyn ExpertLoRaWAN: this 4G router has the LoRa-IP Gateway capability (where IP communications can be routed through Ethernet, Wifi or 2G/3G/4G). In the case of the present example, the routing by 2G/3G/4G will be chosen. The Webdyn ExpertLoRaWAN Gateway will collect the LoRa data emitted by the sensors in its range of action and will forward them to the LoRa server in TTN.

LORA SERVER

TTN: the Things Network is a platform that will carry out the LoRa Server mission to manage the LoRa Network. It will be in charge of collecting the data from the sensors relayed by the Webdyn ExpertLoRaWAN Gateway.

2. Configuration of Webdyn ExpertLoRaWAN as LoRa-2G/3G/4G Gateway

The first thing to do on the Webdyn ExpertLoRaWAN Gateway is to configure 2G/3G/4G connectivity. For this, you must enter into the Webdyn ExpertLoRaWAN Gateway configuration web interface through its default IP address 192.168.1.2 and credentials:

User: admin

Password: admin

To configure Webdyn ExpertLoRaWAN SIM card network APN information go to WAN -> Basic Setting.

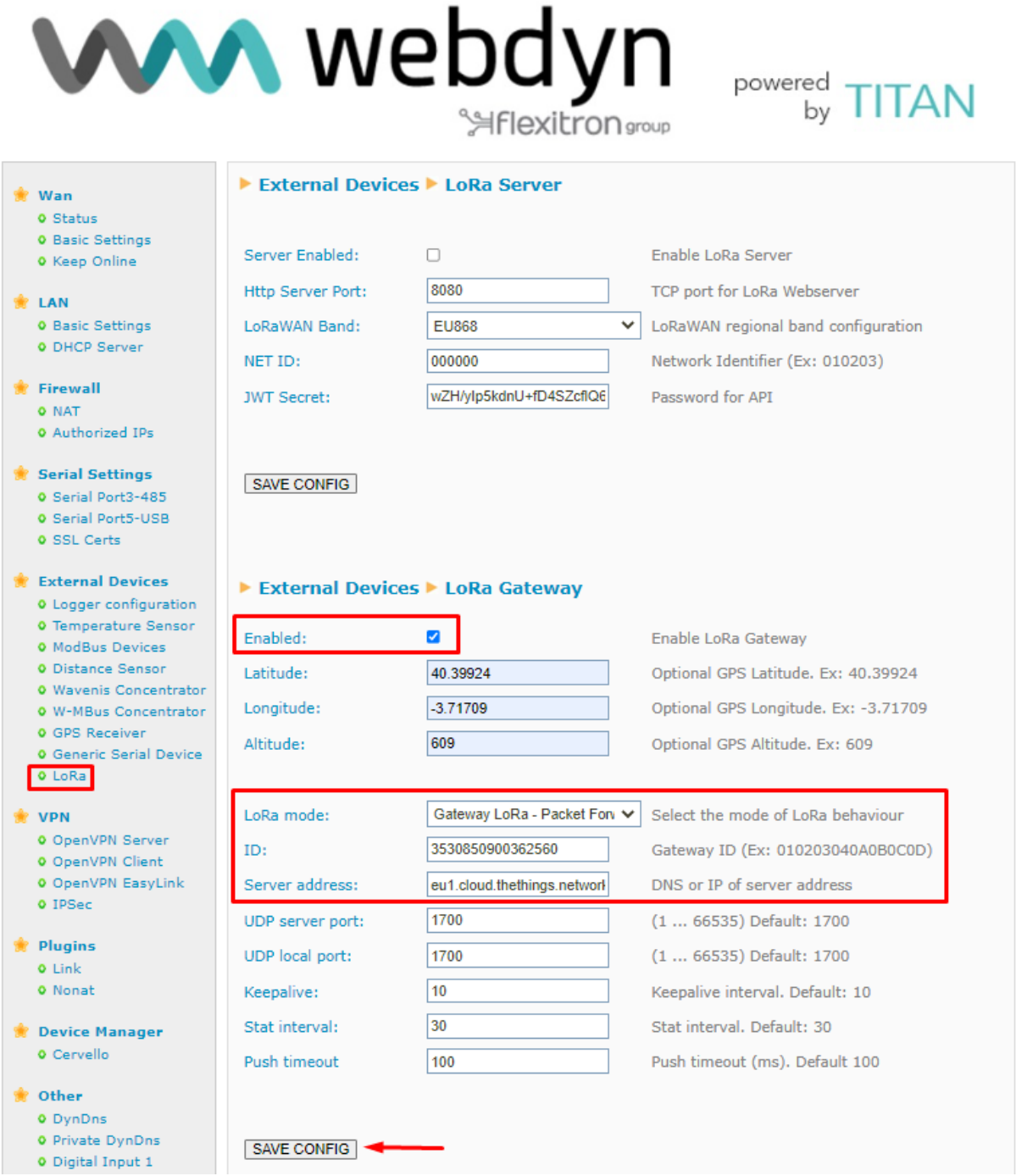
Enable WAN interface and fill the “APN”, “Username” and “Password” fields with the information provided by your Mobile Operator. Please take care about “Sim PIN” (if SIM card is PIN enabled) and keep filled “Call Center” field as showed *99***1#.

Then click on “SAVE CONFIG” button and, important, reboot the router using menu

Other->Reboot to allow the router to restart with the new configuration and be able to connect to the Internet.

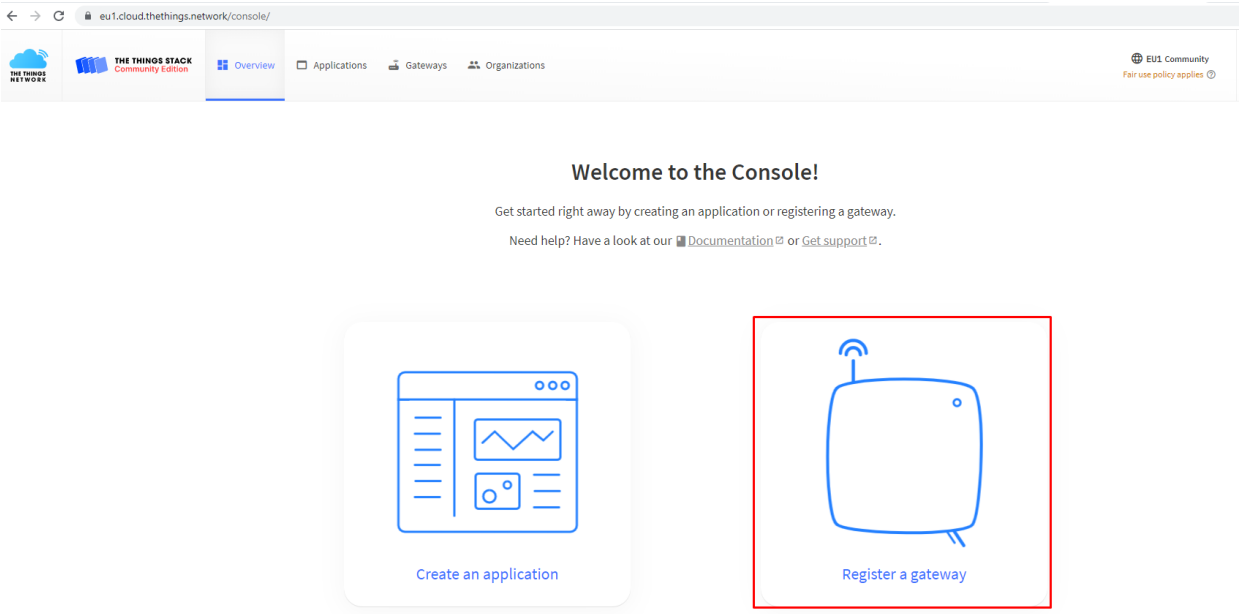
Once connected to the Internet, go to the configuration menu “Other -> LoRa” and enter the configuration as indicated below, enabling LoRa Gateway option and selecting the “Gateway Lora - Packet Forwarder” mode. You can optionally specify the Latitude/Longitude of where the Gateway will be located.

Then, enter a unique ID for the Gateway with 8 hexadecimal characters (in the example we use the IMEI 3530850900362560). In the gap it indicates “Server address”, enter “eu1.cloud.thethings.network” (if your router will not be in Europe, search TTN for the most appropriate DNS). Finally complete the rest of the parameters as shown in the next screen. Once this screen is configured, save the changes and restart the router.



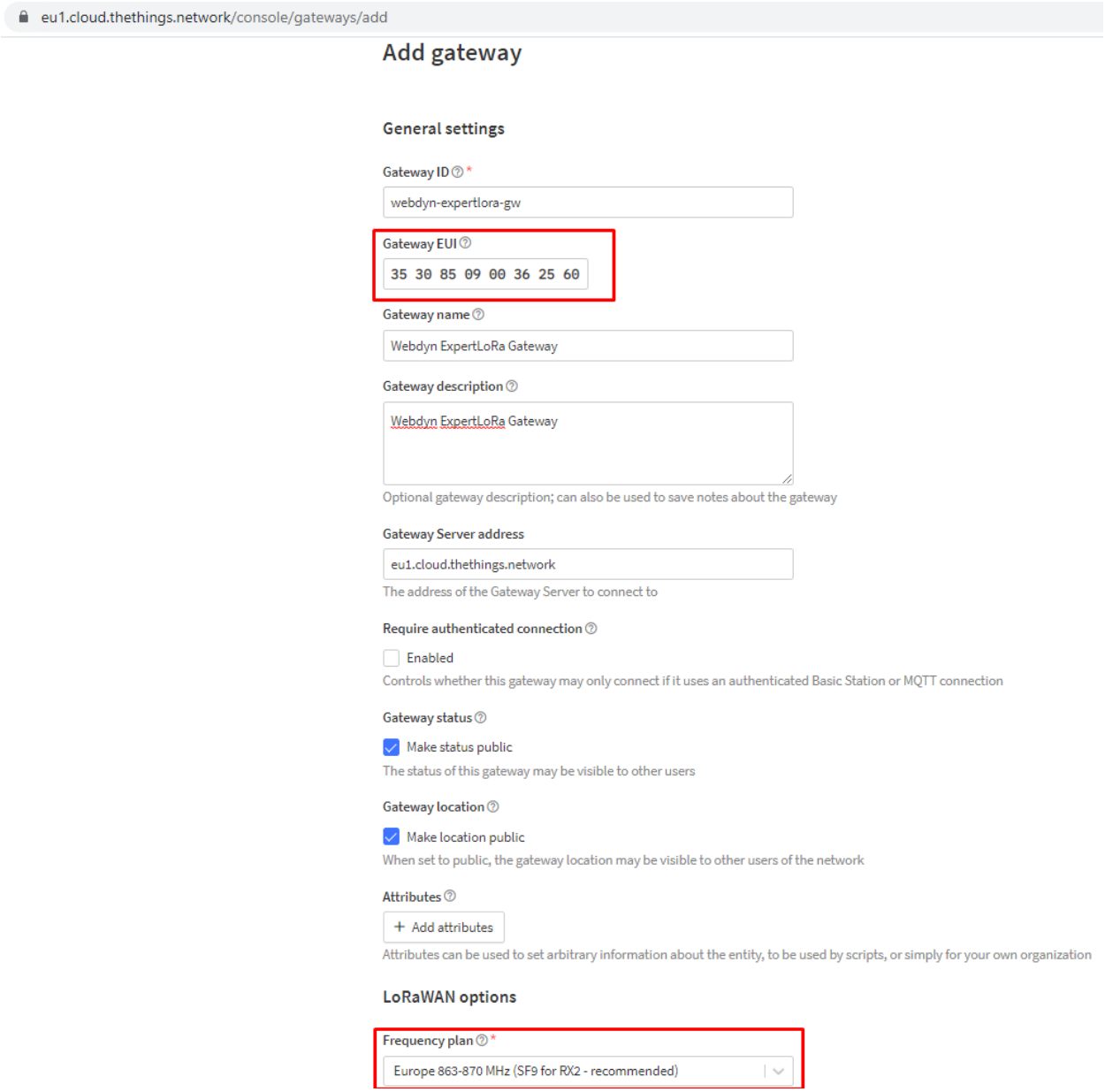
3. Gateway Registration Configuration in TTN platform

This section assumes that the user has registered at https://www.thethingsnetwork.org/. Once registered, you can start building the scenario where the gateways will be added. Choose a cluster in the region you are and then select “Register a gateway” to create one. This will configure the TTN service to accept the connection from our router as a LoRa Gateway.

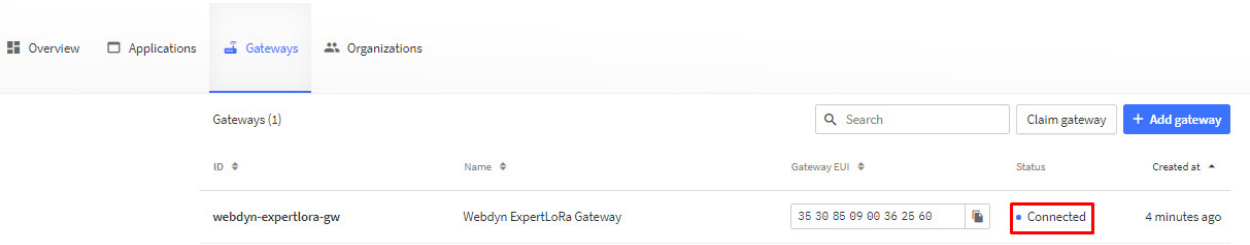


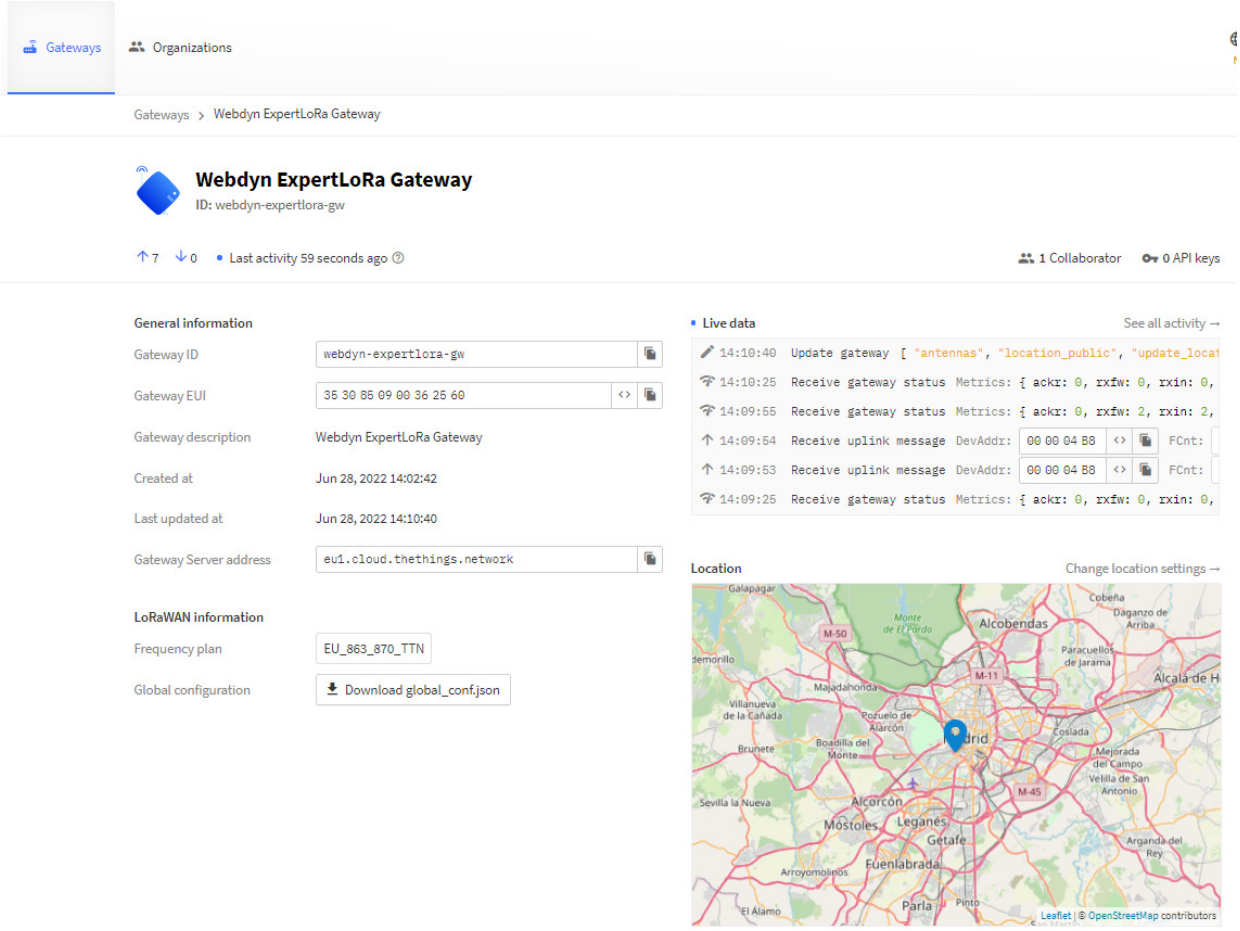
Now we proceed to enter the Webdyn ExpertLoRaWAN Gateway parameters.

In the “Gateway EUI” box, enter the Gateway ID that was defined during the router configuration process (in the example, 3530850900362560). Choose the working frequency of your application (Europe = 868MHz).



Once completed the Gateway registration process, after a few minutes the Gateway should appear as “Connected” as shown in the following figure and you can see its live data. At this point, the Webdyn ExpertLoRaWAN Gateway is already correctly connected with the TTN platform.

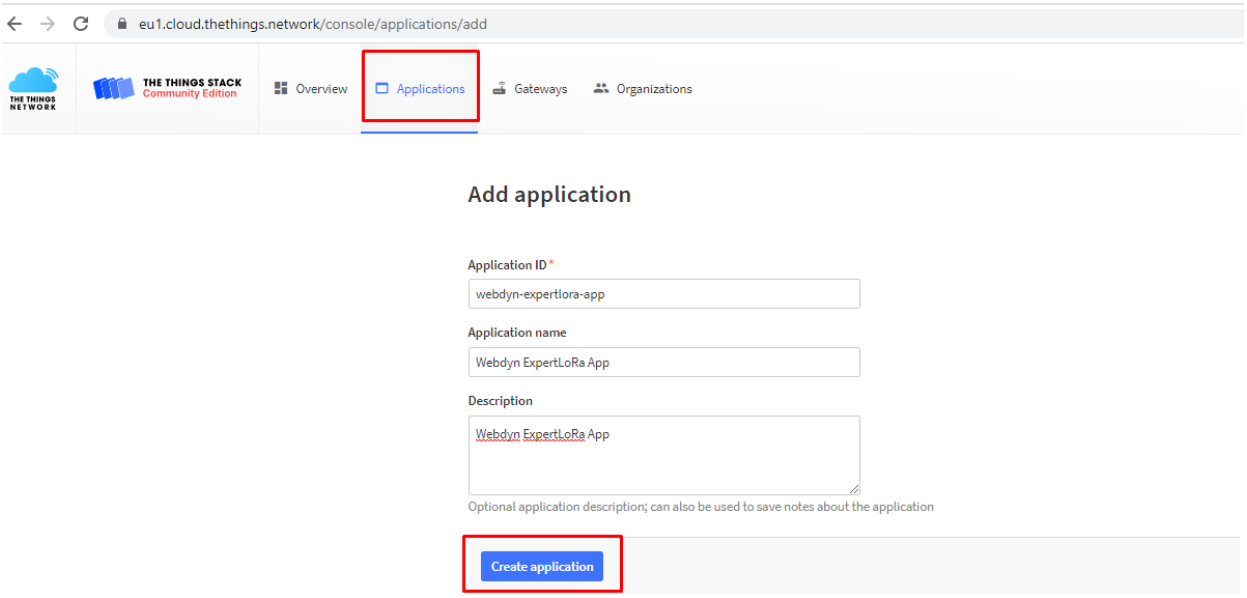



Gateways
Organizations
Gateways > Webdyn ExpertLoRa Gateway
Webdyn ExpertLoRa Gateway
ID: webdyn-expertlora-gw
7 0 Last activity 59 seconds ago
1 Collaborator 0 API keys
General information
Gateway ID webdyn-expertlora-gw
Gateway EUI 35 30 85 09 00 36 25 60
Gateway description Webdyn ExpertLoRa Gateway
Created at Jun 28, 2022 14:02:42
Last updated at Jun 28, 2022 14:10:40
Gateway Server address eu1.cloud.thethings.network
LoRaWAN information
Frequency plan EU_863_870_TTN
Global configuration Download global_conf.json
Live data
See all activity →
14:10:40 Update gateway ["antennas", "location_public", "update_locat
14:10:25 Receive gateway status Metrics: { ackr: 0, rxfw: 0, rxin: 0,
14:09:55 Receive gateway status Metrics: { ackr: 0, rxfw: 2, rxin: 2,
14:09:54 Receive uplink message DevAddr: 00 00 04 B8 FCnt:
14:09:53 Receive uplink message DevAddr: 00 00 04 B8 FCnt:
14:09:25 Receive gateway status Metrics: { ackr: 0, rxfw: 0, rxin: 0,
Location
Change location settings →
Alcobendas
Leganés
Getafe
Fuenlabrada
Móstoles
Alcorcón
Parla
Leaflet | © OpenStreetMap contributors

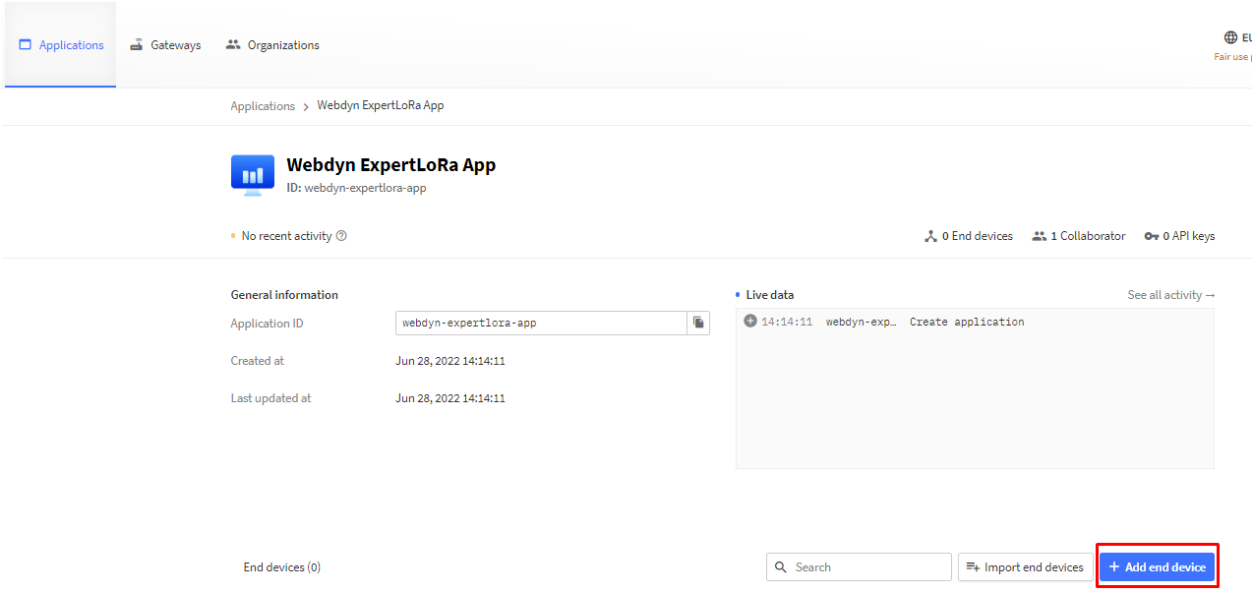
4. Setting Up an Application in TTN

To register the different LoRa sensors, an application must be created in TTN. To do so, in the console, you must go to the “Applications” menu. Once there, click on the button “Add application”. Complete the Application ID fields (write a unique identifier of your choice).

The next screen shows the data to be completed.



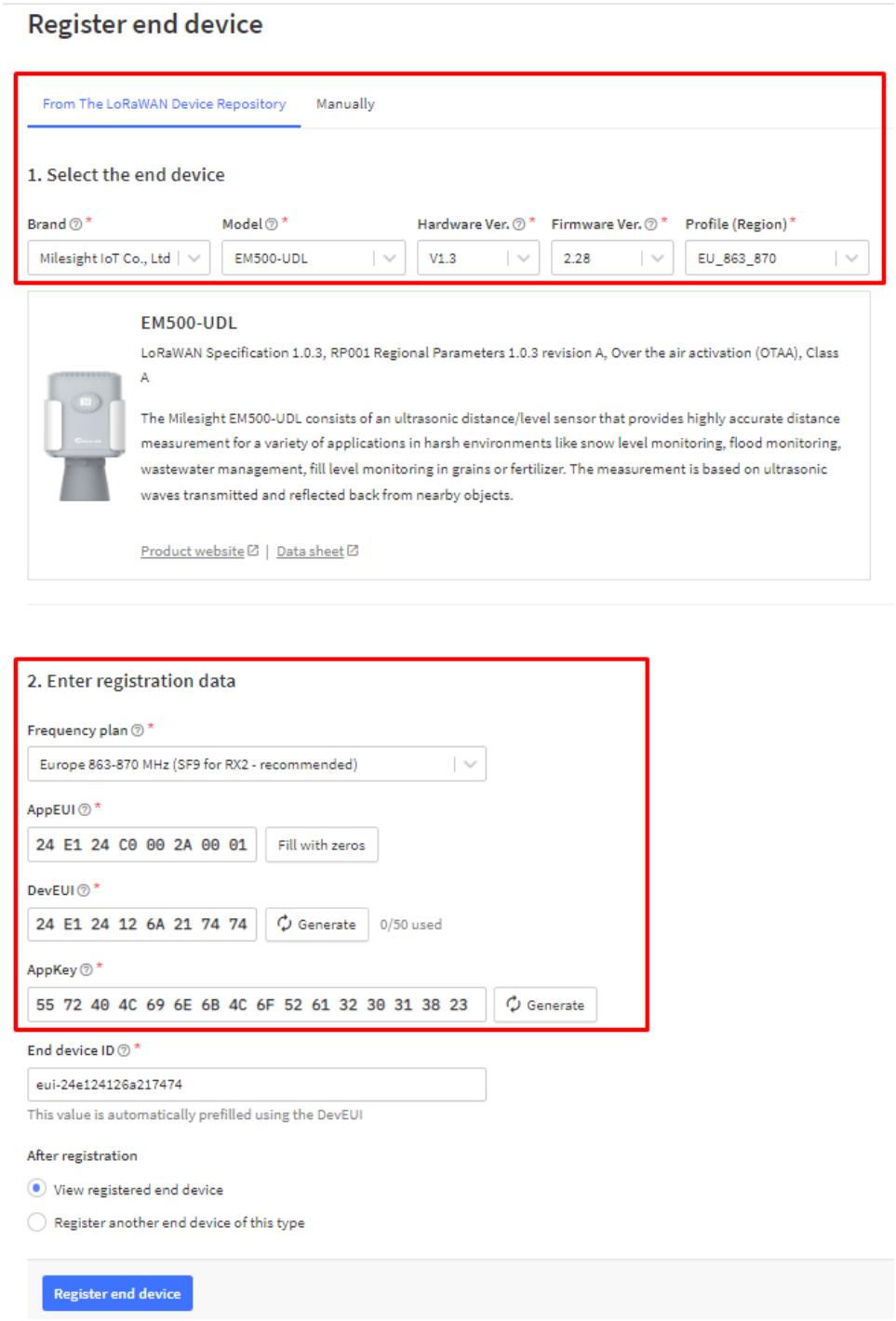
Once the Application is created, we proceed to add a new device.



5. LoRa Sensors Registration in TTN Application

In the same screen above, click on “Add end device” button to register the different LoRa sensors in the newly created application.

You can register the end device from the LoRaWAN device repository or manually if it does not exist there. In this case, for the example, the EM500-UDL sensor is in the repository, so we just need to fill the frequency plan and the DevEUI (identifying number printed on the attached label of each sensor), AppEUI and AppKey parameters. This data is available in the sensor´s user manual and can be configured in the mobile app.



In this case, by creating the Milesight end device from the repository, it already extracts the script to decode the payload data of the LoRa frame, otherwise this can be added in the Payload formatters section. The next picture shows the live data from the sensor. Check the sensor user manual to configure additional settings.