webdyn
flexitron group


# ExpertLoRaWAN

## Application Note 3

Create a LoRa network with a LoRa slave gateway

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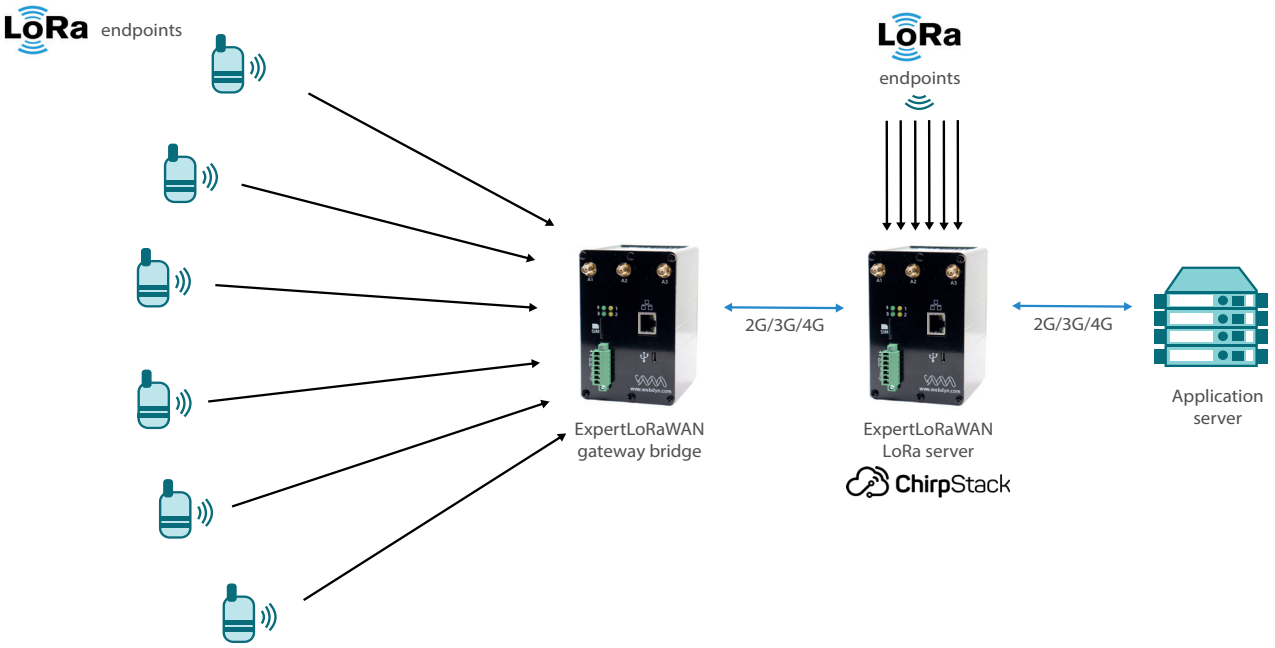
## 1. Introduction

This application note is a continuation of application note “AN2 - Create a LoRa network and send LoRa sensor data to Internal LoRa Server” and shows step by step how to extend a LoRa network by adding more Webdyn ExpertLoRaWAN Gateways.

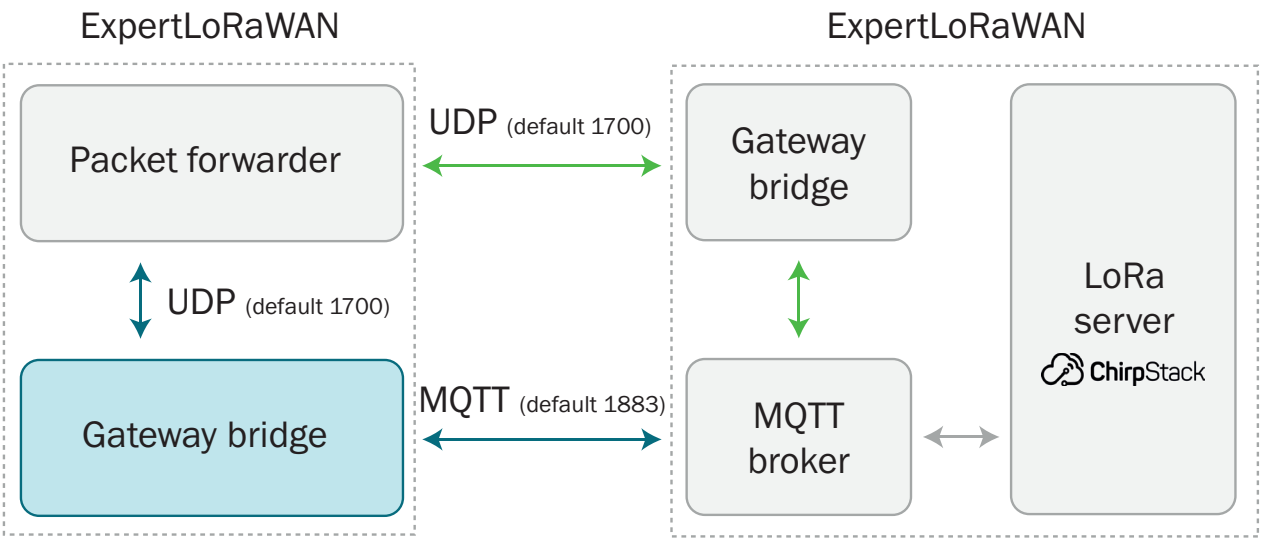
## 2. Scenario Details

This scenario simulates two Webdyn ExpertLoRaWAN Gateways, both receiving data from the LoRa sensors in their RF range.

- One of them receives LoRa packets from end nodes at its range and sends it to its internal LoRa server (ChirpStack). It is acting as a master.
- The other one forwards LoRa packets from end devices at its range to the ChirpStack LoRa server of the other Gateway. It is acting as a packet forwarder (Gateway Bridge).



There are two possible communication options shown in the next scheme.




Option 1 (green): Slave Webdyn ExpertLoRaWAN uses packet forwarding to send the data to the Master. Packet forwarder sends raw packets using UDP to the Gateway Bridge on the other side.

Option 2 (blue): Slave Webdyn ExpertLoRaWAN uses MQTT transmission to send the data to the Master. Slave gateway bridge converts raw UDP packets into MQTT and sends to the MQTT Broker on the other side.

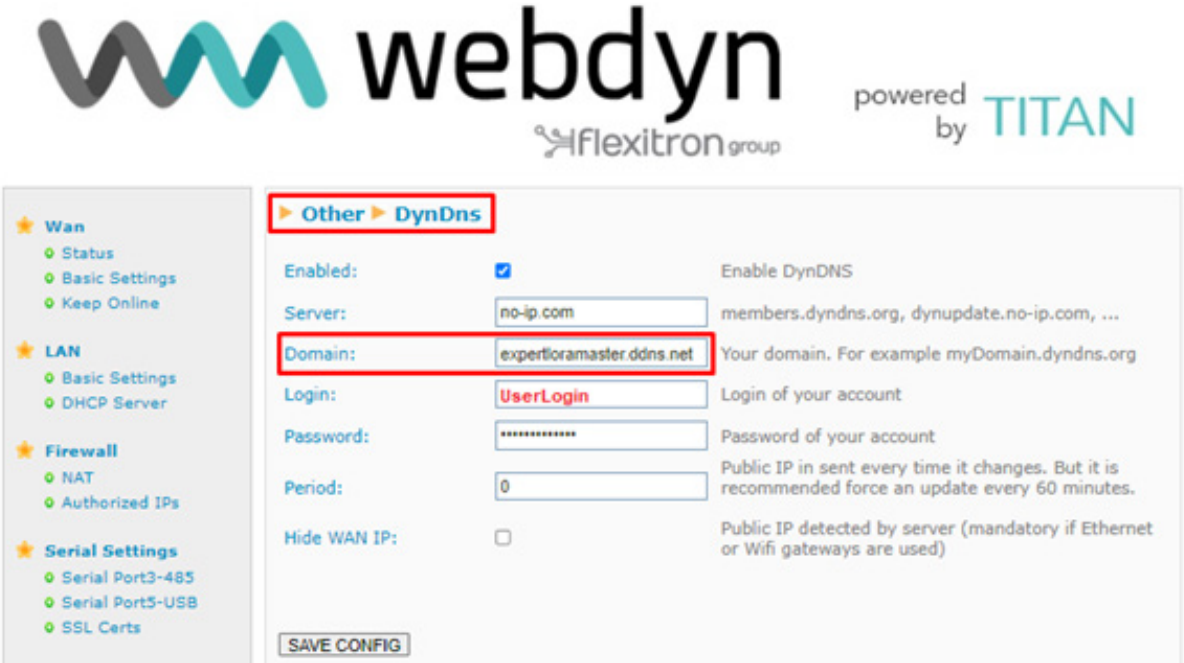
The MQTT Broker is the connection point for the MQTT clients, used for both, the Gateway Bridge and the ChirpStack LoRa Server.

This application note explains the configuration for option 2.

## 2.1 Webdyn ExpertLoRaWAN Configuration

First step is to configure WAN section in both devices.

If your Mobile Operator provides you a dynamic public IP, it is recommended to configure the DynDNS service in the Master Webdyn ExpertLoRaWAN, otherwise you will need a static IP address.




## 2.2 Lora Configuration

**Master Configuration**

Enable the MQTT Broker service with default listening port 1883 and, optionally, add user and password.

Enable Lora Server and configure LoRa Gateway as follows:

- LoRa mode: Gateway Lora—Bridge (MQTT)
- ID: Define a unique ID for the gateway with 16 digits
- MQTT Broker: Internal

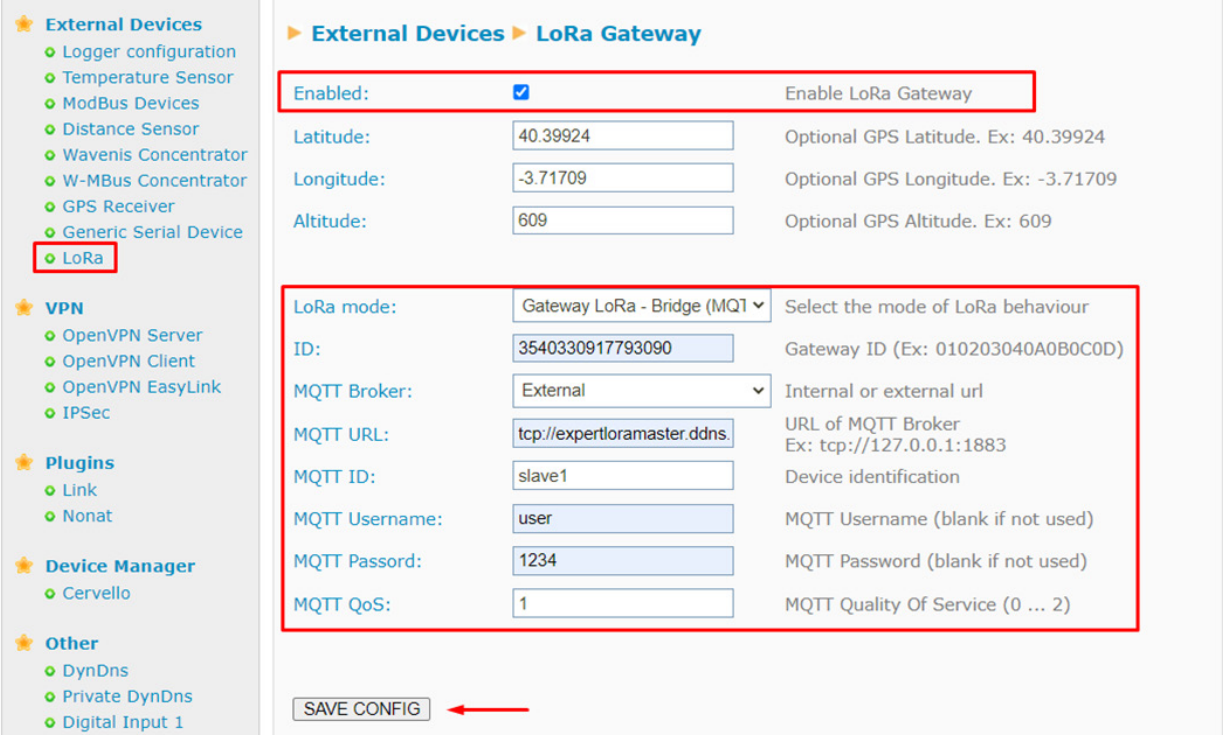

Remember to click on “SAVE CONFIG” button and, important, reboot the router using menu Other->Reboot to allow the router to restart with the new configuration and be able to connect to the Internet.

### Slave Configuration

Configure the LoRa gateway section in Bridge (MQTT) mode and set an ID for the gateway.

Fill the information of the external MQTT broker with the settings previously configured in the Master, including the MQTT username and password defined.

- ID: Define a unique ID for the slave gateway with 16 digits
- MQTT URL: tcp://<Master DynDNS address>:1883
- MQTT ID: Define a MQTT ID for the slave gateway




Save this configuration and reboot the device.

### ChirpStack LoRa Server configuration

Go to the Master and open the LoRa Webserver to configure Chirpstack settings. You can also access it by the Master DynDNS address:port8080 (in this case, http://ExpertLoRaWANmaster.ddns.net:8080/)

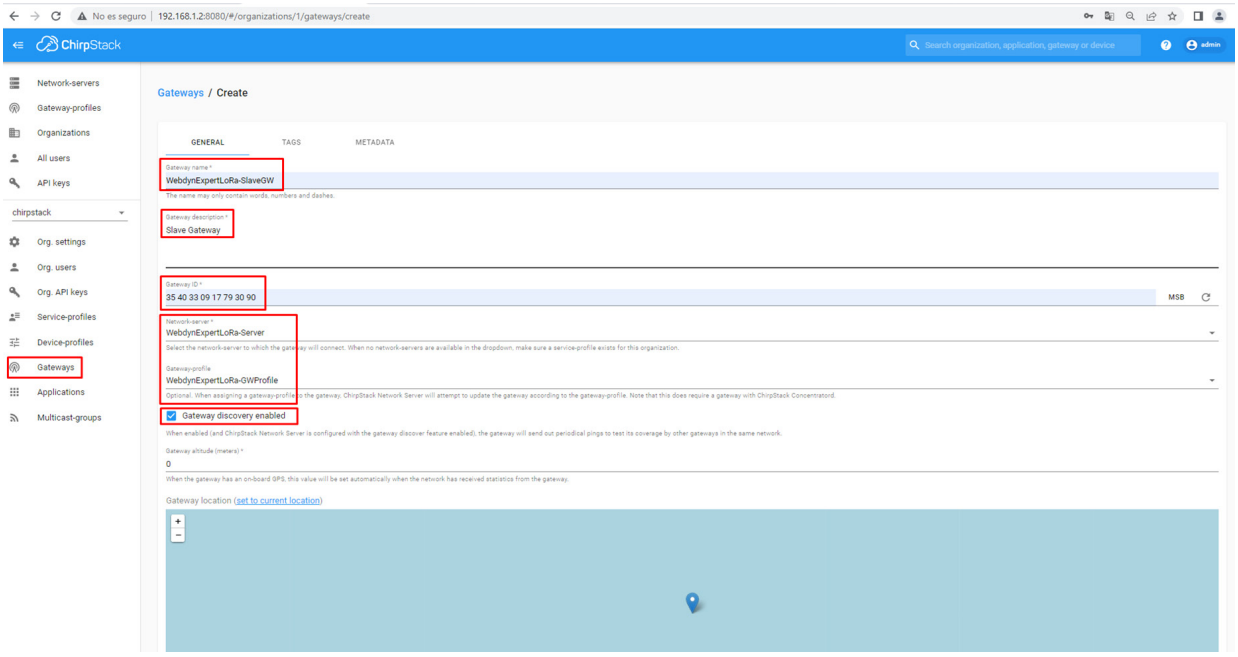
In the application note “AN2 - Create a LoRa network and send LoRa sensor data to Internal LoRa Server” it is explained the necessary configuration steps to create a LoRa Network in ChirpStack. Once all steps have been followed, just repeat step 5 to add the slave gateway and repeat step 7 to add remote end devices.

- Add a Server
- Add/create a Gateway profile ---- connected to 1) Server
- Add/create a Service profile --- must be connected to 1) Server
- Add/create a Device profile – must be connected to 1) Server

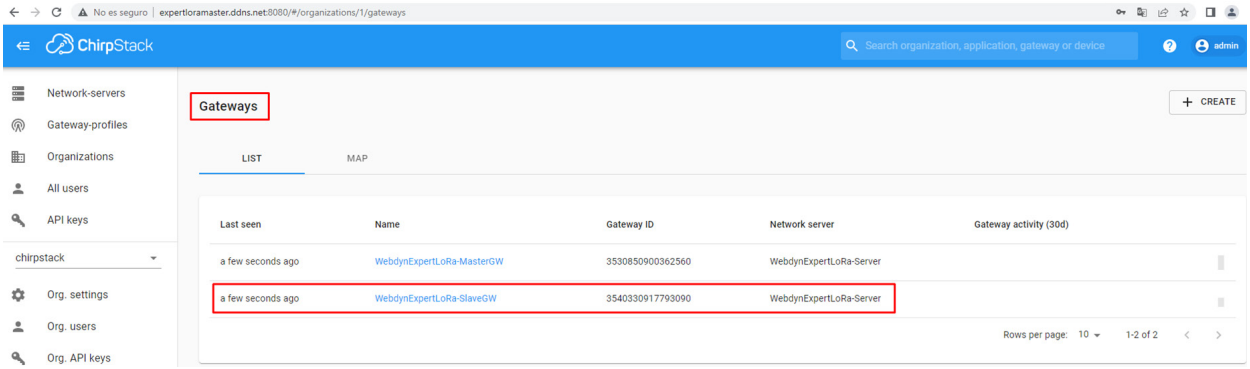
- Add/create a Gateway – must be connected to 1) Server and 2) Gateway profile
- Add/create an Application -- must be connected to 3) Service Profile
- Add Devices – must be connected to 4) Device Profile
    - Repeat step 7 to add more end devices

### Adding the Slave Gateway

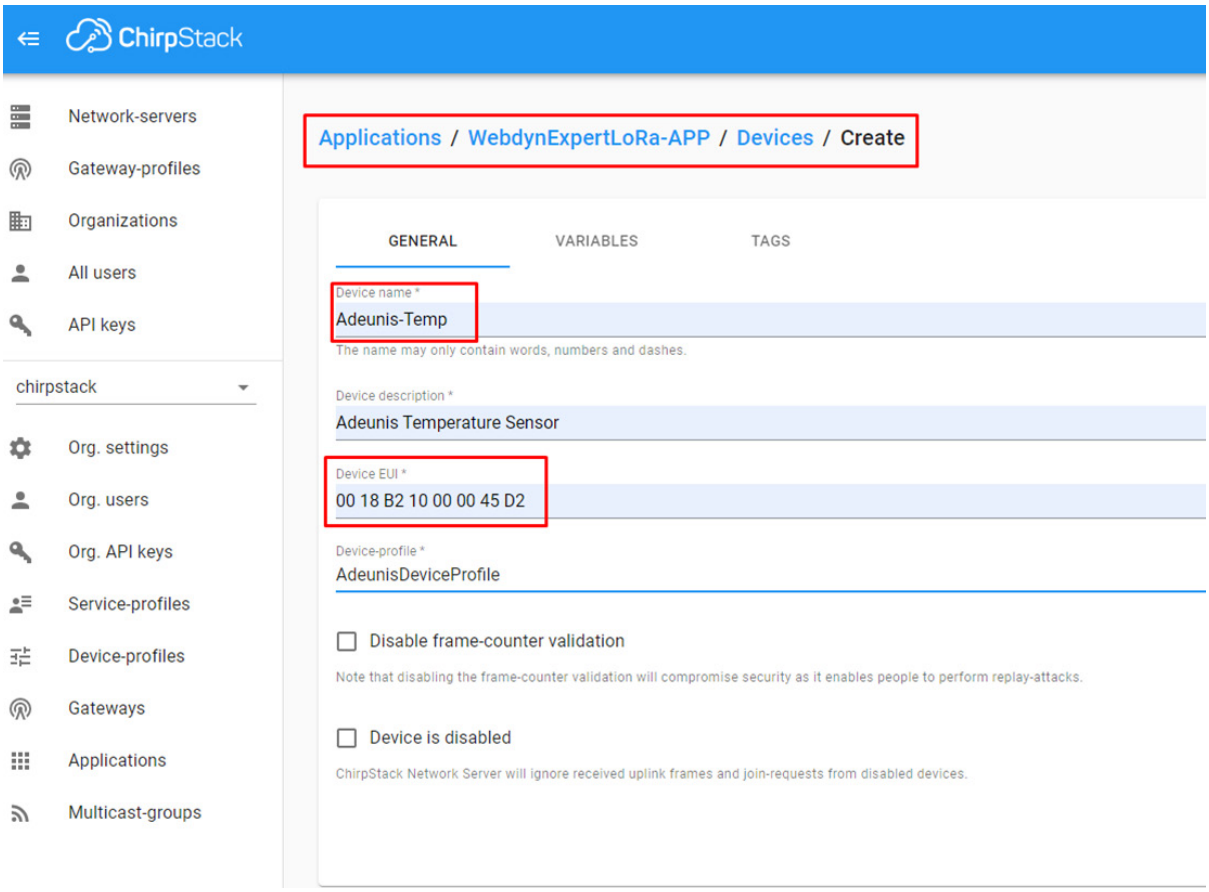
Fill with a name, description and the defined Slave Gateway ID. Use LoRa Server and Gateway profile already created.

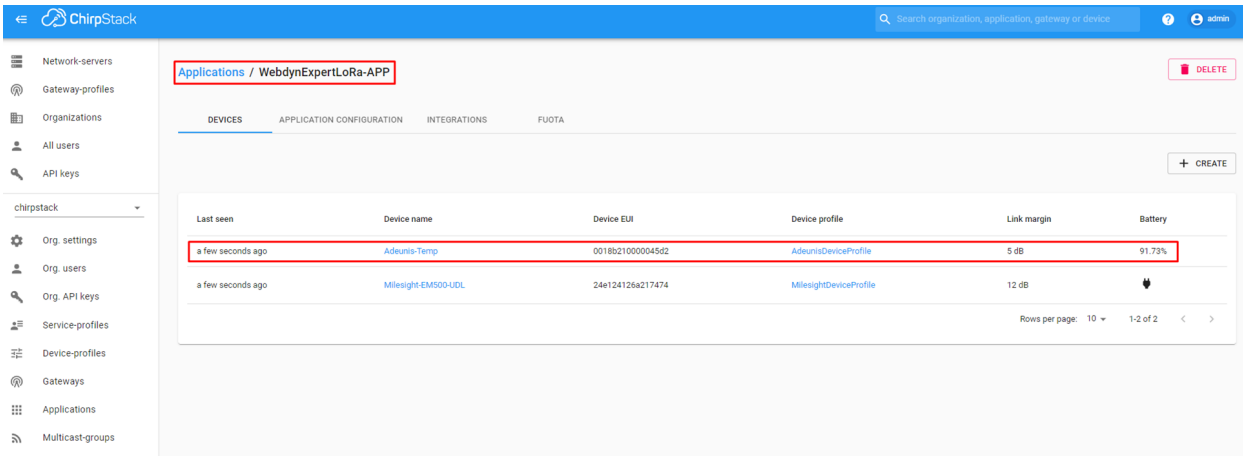



Please check slave Gateway is connected (it might take a few minutes).



Next, add the LoRaWAN nodes in the RF range of Slave device to the same application. Please check application note “AN2 - Create a LoRa network and send LoRa sensor data to Internal LoRa Server” if you need any help. You will need Device EUI and LoRa APP KEY. In this case we used an Adeunis Temperature sensor.



You can check the LoRa frames to see the received gateway device information.