

# LESSON 4.5 – SETTING UP CHIRPSTACK

by Pycom



ChirpStack

# LESSON OBJECTIVES

- Understand what ChirpStack is
- Set up ChirpStack in Pybytes

# WHAT IS CHIRPSTACK?

- [ChirpStack](#) is an open-source LoRaWAN Network Server stack. It was previously known as the LoRa Server and was renamed ChirpStack.
- It's a solution that works out of the box, and as it has a modular structure, it neatly integrates with existing infrastructures.
- As part of our Pybytes platform, you'll be able to get started with ChirpStack.

# WHAT FEATURES DOES IT HAVE?

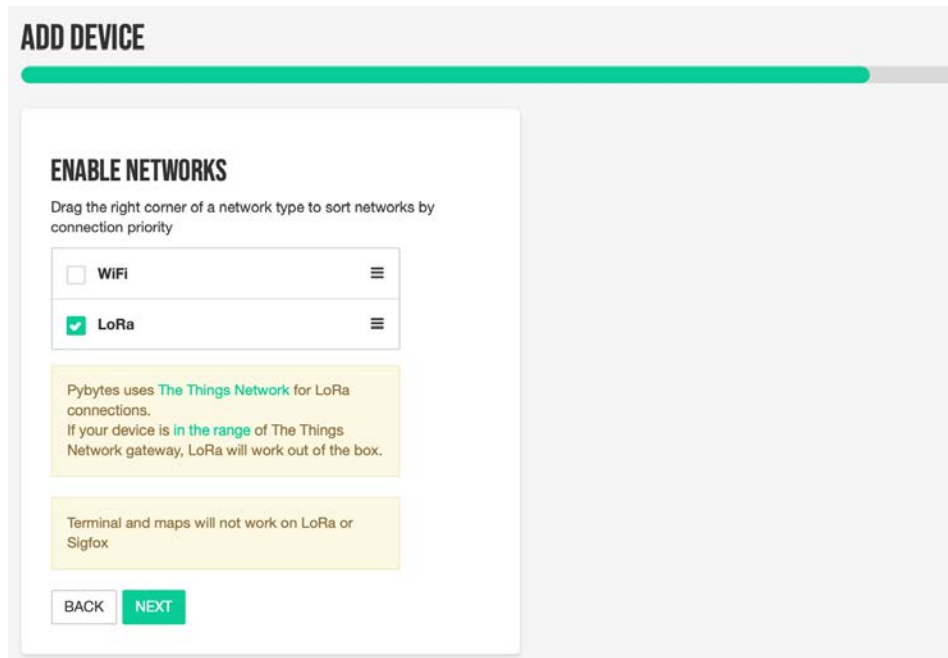
ChirpStack has a large number of features, such as:

- **Class A support:** Supports Class-A end-devices that allows for bi-directional communications. Each end-device's uplink transmission is followed by two short down-link receive windows.
- **Class B support:** Supports Class-B end-devices. ChirpStack allows for Class-B devices to open extra receive windows at scheduled times.
- **Class C support:** Supports Class-C end-devices. Class C devices have almost continuously open receive windows.
- **Adaptive data-rate:** If the end-device has ADR enabled, the ChirpStack server ensures that the device operates using the most efficient data-rate and tx-power.

Find out more on the ChirpStack documentation: <https://www.chirpstack.io/overview/>

# GETTING STARTED

1. Head to Add Device and select the LoRa option



**ADD DEVICE**

**ENABLE NETWORKS**  
Drag the right corner of a network type to sort networks by connection priority

<input type="checkbox"/>	WiFi	☰
<input checked="" type="checkbox"/>	LoRa	☰

Pybytes uses [The Things Network](#) for LoRa connections.  
If your device is **in the range** of The Things Network gateway, LoRa will work out of the box.

Terminal and maps will not work on LoRa or Sigfox

BACK NEXT

2. From the drop-down option, select 'Pycom ChirpStack Server'

## CUSTOMISE YOUR DEVICE

Name

Precious-order-5769

LoRa server

Pycom ChirpStack Server ▼

LoRa activation type

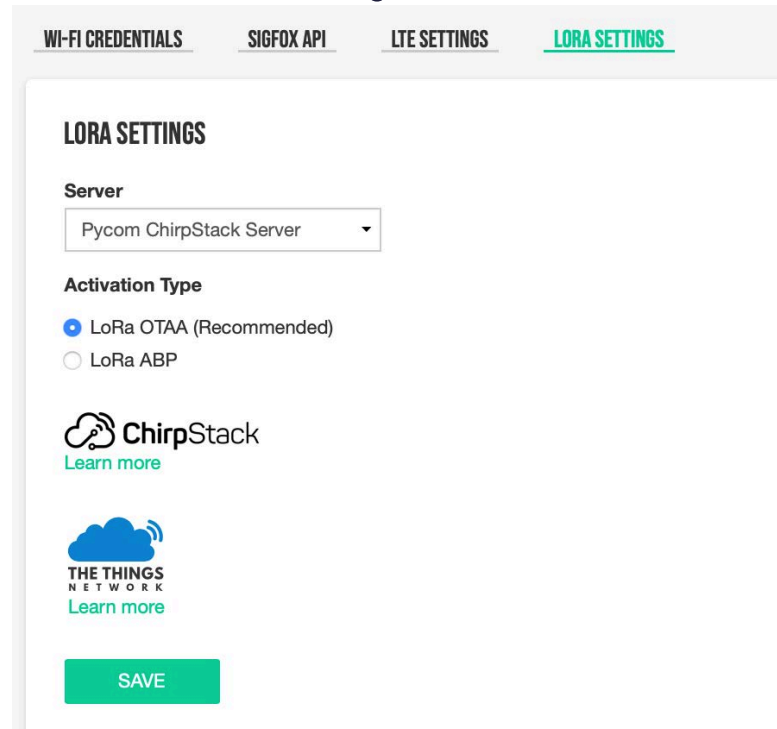
- LoRa OTAA (Recommended)
- LoRa ABP

BACK

SAVE

# GETTING STARTED

- 3. After creating the device, a ChirpStack profile will be automatically created



The screenshot shows the 'LORA SETTINGS' page in a web interface. At the top, there are four tabs: 'WI-FI CREDENTIALS', 'SIGFOX API', 'LTE SETTINGS', and 'LORA SETTINGS' (which is highlighted). Below the tabs, the page title is 'LORA SETTINGS'. Underneath, there is a 'Server' dropdown menu with 'Pycom ChirpStack Server' selected. Below that is the 'Activation Type' section with two radio buttons: 'LoRa OTAA (Recommended)' (which is selected) and 'LoRa ABP'. At the bottom of the settings area, there are two logos: 'ChirpStack' with a 'Learn more' link and 'THE THINGS NETWORK' with a 'Learn more' link. A green 'SAVE' button is located at the bottom of the page.

- 4. You will receive an email with the ChirpStack username and password.

Your profile was successfully created at Pycom Lora Server.

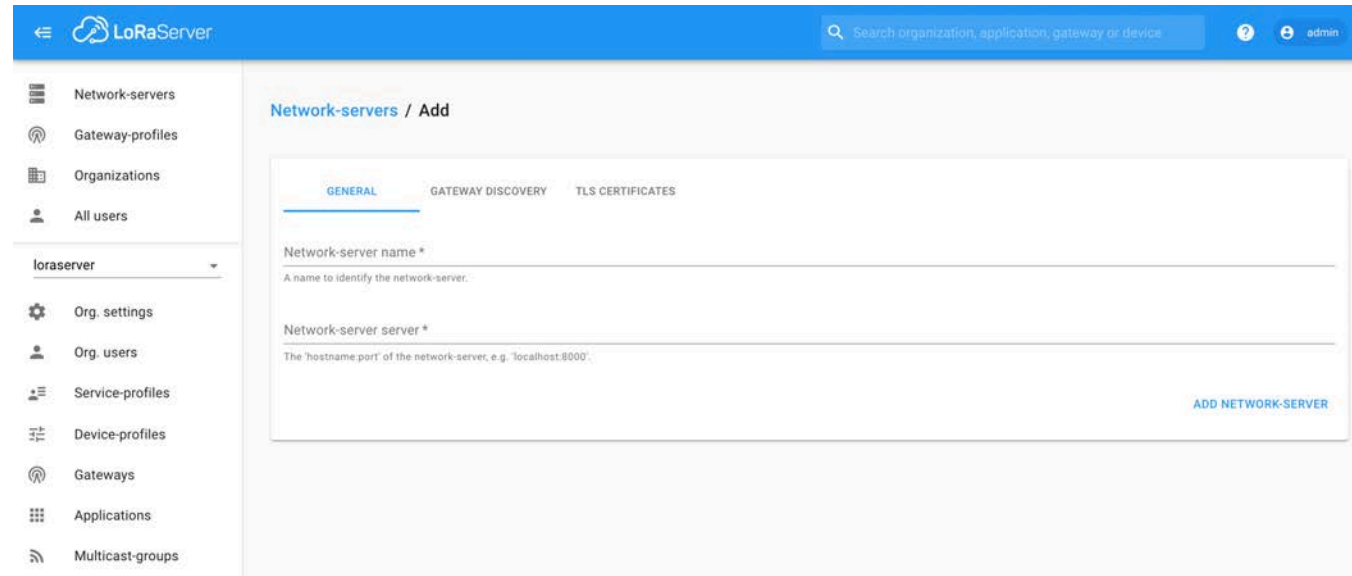
Username:

Password:

Pybytes team

# BASIC CHIRPSTACK SETTINGS IN PYBYTES

Once logged on, you can add your own server in the 'Network Servers' section.



The screenshot shows the LoRaServer web interface. The top navigation bar is blue with the LoRaServer logo and a search bar. The left sidebar contains a menu with items: Network-servers, Gateway-profiles, Organizations, All users, loraserver (selected), Org. settings, Org. users, Service-profiles, Device-profiles, Gateways, Applications, and Multicast-groups. The main content area is titled 'Network-servers / Add' and has three tabs: GENERAL (selected), GATEWAY DISCOVERY, and TLS CERTIFICATES. The form contains two required fields: 'Network-server name \*' with a subtext 'A name to identify the network-server.' and 'Network-server server \*' with a subtext 'The 'hostname:port' of the network-server, e.g. 'localhost:8000''. An 'ADD NETWORK-SERVER' button is located at the bottom right of the form.

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK SETTINGS IN PYBYTES

## **User – Value**

- Created with the same credentials that are used in Pybytes. This, as well as the Admin status of the user, can be managed in the Org > Users section.

## **Organisation – Value (By default)**

- The Organization Value will be created, based on the same credentials used in Pybytes. This can be changed in the section Org > Settings.

## **Service Profile – (Default)**

- The Service Profile Name is connected to the Organization's name.

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>



# BASIC CHIRPSTACK SETTINGS IN PYBYTES

## Device Profile – OTAA or ABP

- There are two different devices profiles, OTAA or ABP. Select which one you prefer.

## Applications – (Default)

- All LoRa devices that have been created in Pybytes and linked to the ChirpStack server will be connected to the ChirpStack app.

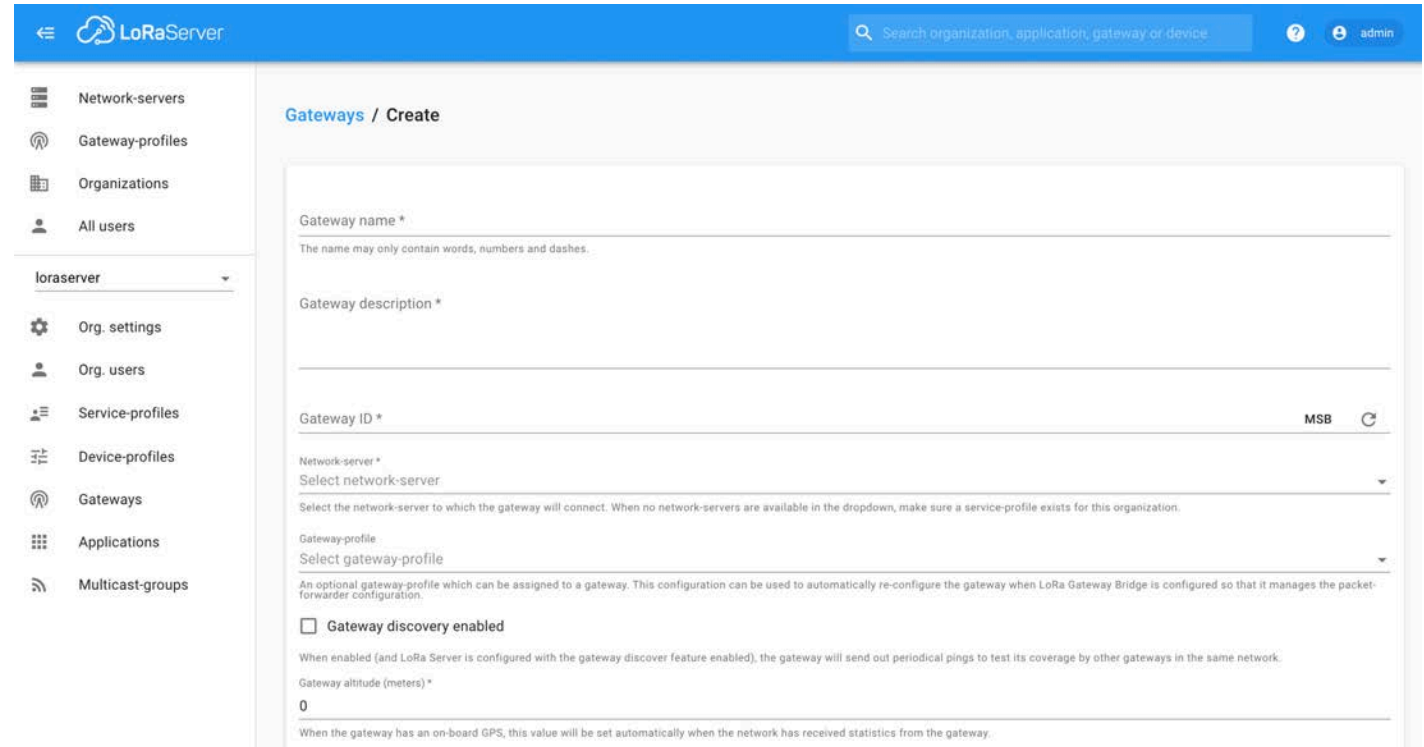
## Devices

- All LoRa devices that have been created in Pybytes

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK - GATEWAYS

You must set up your own gateway in order to communicate with ChirpStack.



The screenshot displays the LoRaServer web interface for creating a new gateway. The interface includes a navigation menu on the left with options like Network-servers, Gateway-profiles, Organizations, All users, Org. settings, Org. users, Service-profiles, Device-profiles, Gateways, Applications, and Multicast-groups. The main content area is titled 'Gateways / Create' and contains the following form fields:

- Gateway name \***: A text input field with a note: 'The name may only contain words, numbers and dashes.'
- Gateway description \***: A text input field.
- Gateway ID \***: A text input field with a 'MSB' icon and a refresh icon.
- Network-server \***: A dropdown menu labeled 'Select network-server' with a note: 'Select the network-server to which the gateway will connect. When no network-servers are available in the dropdown, make sure a service-profile exists for this organization.'
- Gateway-profile**: A dropdown menu labeled 'Select gateway-profile' with a note: 'An optional gateway-profile which can be assigned to a gateway. This configuration can be used to automatically re-configure the gateway when LoRa Gateway Bridge is configured so that it manages the packet-forwarder configuration.'
- Gateway discovery enabled**: A checkbox with a note: 'When enabled (and LoRa Server is configured with the gateway discover feature enabled), the gateway will send out periodical pings to test its coverage by other gateways in the same network.'
- Gateway altitude (meters) \***: A text input field with the value '0' and a note: 'When the gateway has an on-board GPS, this value will be set automatically when the network has received statistics from the gateway.'

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK - GATEWAYS

How to set up a gateway:

1. Login to ChirpStack (<https://loraserver.pycom.io/>)
2. Click on the Gateway on the main sidebar
3. Click on the Create button
4. Fill in the form

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK - GATEWAYS

Fill in the form with the following information:

## **Gateway name**

The name may only contain words, numbers and dashes.

## **Gateway description**

A description of the gateway

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK - GATEWAYS

## Gateway ID

The gateway ID

## Network Server

Select the network server that the gateway will connect to. Make sure a service-profile exists for the network.

## Gateway profile

The optional gateway profile that can be assigned to a gateway. This can be used to automatically re-configure the gateway when the LoRa Gateway Bridge is set up so that it manages the packet-forwarder settings

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

# BASIC CHIRPSTACK - GATEWAYS

## **Gateway Discovery Enabled**

When enabled (and the LoRa server is configured with the 'gateway discover' feature enabled), the gateway will send out periodical pings to test its coverage by other gateways in the same network.

## **Gateway Altitude (meters)**

When the gateway has an on-board GPS, this value will be set automatically when the network has received statistics from the gateway.

## **Gateway location (set to current location)**

Source: <https://docs.pycom.io/pybytes/networks/lora/chirpstack/>

**AND YOU'RE FINISHED SETTING UP WITH CHIRPSTACK!**