

LORA / LORAWAN TUTORIAL 55

Migrate The Things Gateway from V2 to V3



INTRO

- In this tutorial I will explain how to migrate The Things Gateway from The Things Network (V2) to The Things Stack Community Edition network (V3).

PRESENTATION

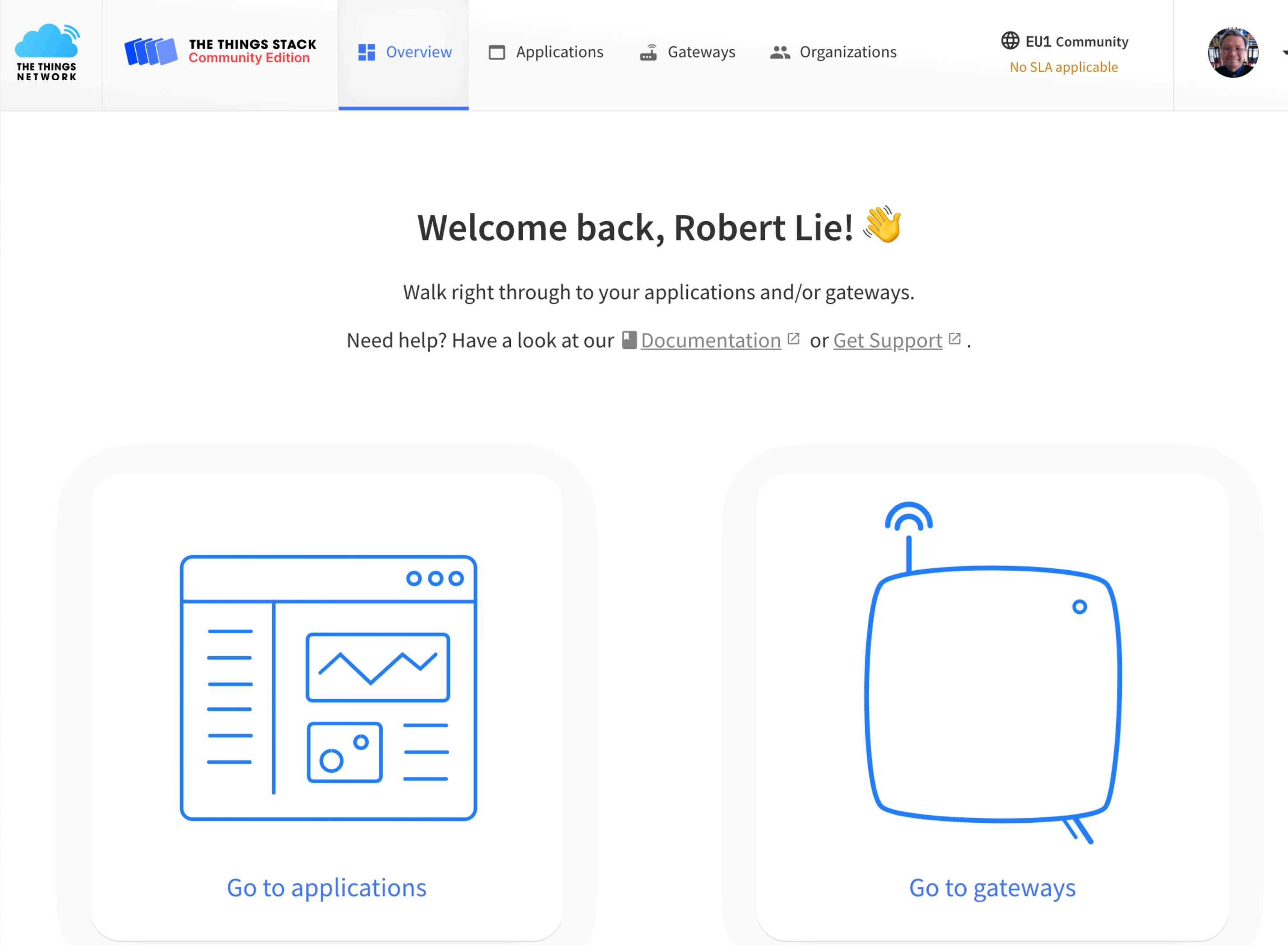
- This presentation can be found at:
https://www.mobilefish.com/download/lora/lora_part55.pdf
- All my LoRa/LoRaWAN tutorials and presentations can be found at:
https://www.mobilefish.com/developer/lorawan/lorawan_quickguide_tutorial.html
- In this video when V2 is mentioned, V2 refers to The Things Network and when V3 is mentioned, V3 refers to The Things Stack Community Edition.

MORE INFORMATION ABOUT THE THINGS GATEWAY

- More information about The Things Gateway:
 - <https://www.thethingsnetwork.org/docs/gateways/gateway/>
 - <https://www.thethingsindustries.com/docs/gateways/thethingskickstartergateway/>

REGISTRATION PROCEDURE | / | 4

- In this tutorial I will assume you have an account and can access the V3 console.
<https://console.cloud.thethings.network/>
- Select Go to gateways



The screenshot shows the top navigation bar of the The Things Stack Community Edition console. The navigation bar includes the The Things Network logo, the product name 'THE THINGS STACK Community Edition', and several menu items: 'Overview' (highlighted), 'Applications', 'Gateways', and 'Organizations'. On the right side of the navigation bar, there is a user profile section for 'EU1 Community' with the text 'No SLA applicable' and a user profile picture.

Welcome back, Robert Lie! 🙌

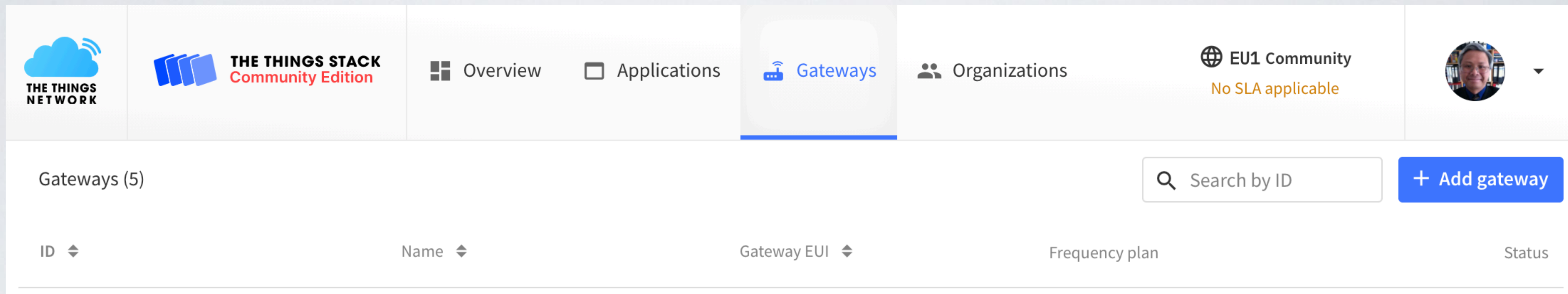
Walk right through to your applications and/or gateways.

Need help? Have a look at our [Documentation](#) or [Get Support](#).

Below the navigation bar, there are two large, rounded rectangular buttons. The first button contains a blue line-art icon of a computer monitor displaying a dashboard with a line graph and a circular gauge. Below this icon is the text 'Go to applications'. The second button contains a blue line-art icon of a gateway device with an antenna. Below this icon is the text 'Go to gateways'.

REGISTRATION PROCEDURE 2 / 14

- Select Add gateway

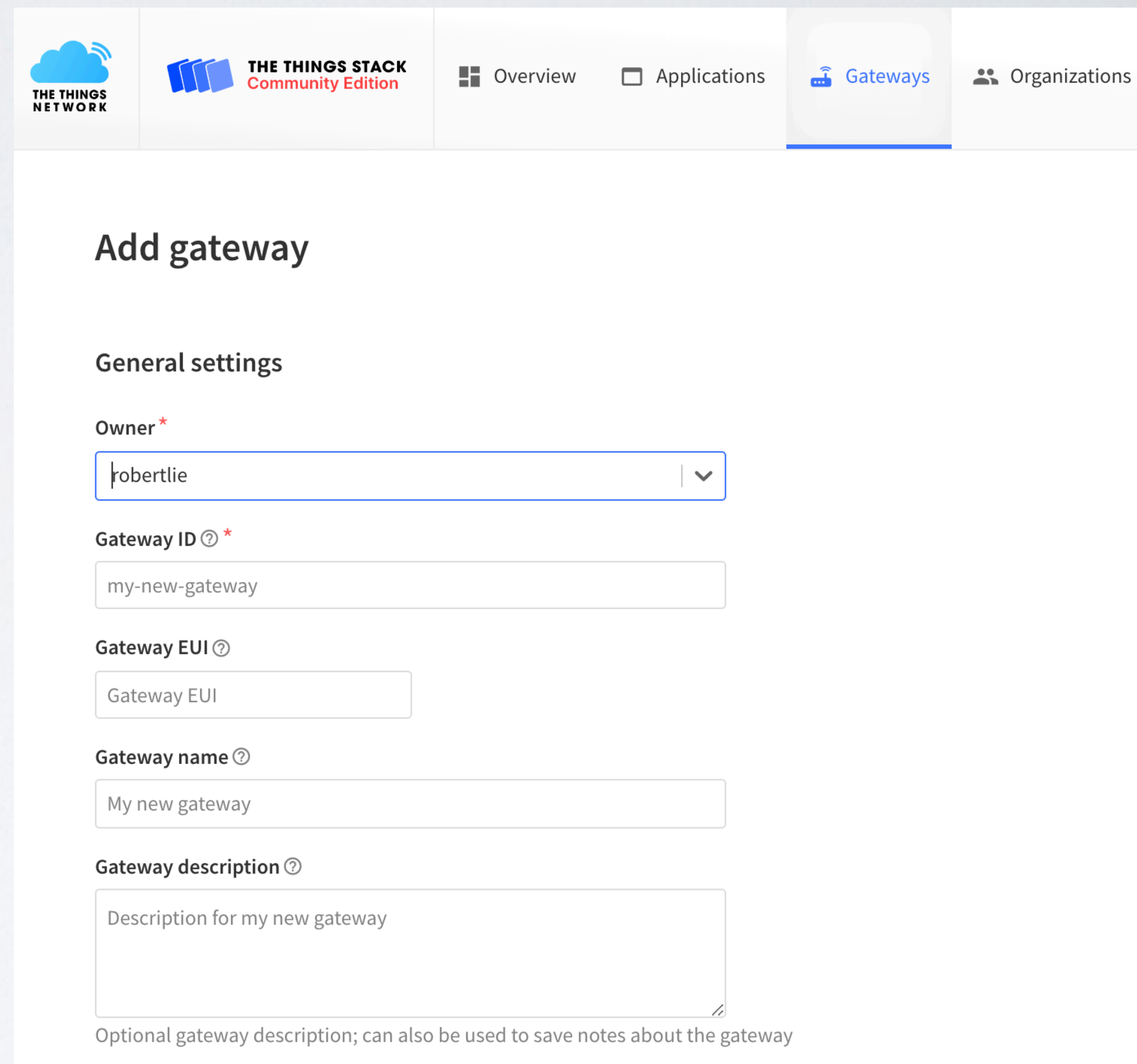


The screenshot displays the 'Gateways' management page in The Things Stack Community Edition. The top navigation bar includes the logo, product name, and menu items for Overview, Applications, Gateways (selected), and Organizations. The user is logged in as 'EU1 Community' with 'No SLA applicable'. A search bar and a '+ Add gateway' button are visible. Below the navigation is a table header with columns for ID, Name, Gateway EUI, Frequency plan, and Status.

| ID | Name | Gateway EUI | Frequency plan | Status |
|----|------|-------------|----------------|--------|
|----|------|-------------|----------------|--------|

REGISTRATION PROCEDURE 3 / 14

- Enter your gateway information:
- **Gateway ID:**
mobilefish-gateway
Write this down, you will need it later.
- **Gateway-EUI:**
The Things Gateway has no Gateway EUI. Leave this field empty.
- **Gateway name:**
mobilefish-gateway



The screenshot shows the 'Add gateway' form in the Things Stack Community Edition. The navigation bar at the top includes the Things Network logo, the product name 'THE THINGS STACK Community Edition', and menu items for 'Overview', 'Applications', 'Gateways' (which is active), and 'Organizations'. The form itself is titled 'Add gateway' and is divided into 'General settings'. It contains several input fields: 'Owner' (a dropdown menu with 'robertlie' selected), 'Gateway ID' (a text field containing 'my-new-gateway'), 'Gateway EUI' (an empty text field), 'Gateway name' (a text field containing 'My new gateway'), and 'Gateway description' (a larger text area containing 'Description for my new gateway'). A note at the bottom of the form states: 'Optional gateway description; can also be used to save notes about the gateway'.

THE THINGS NETWORK **THE THINGS STACK Community Edition** Overview Applications **Gateways** Organizations

Add gateway

General settings

Owner *

robertlie

Gateway ID * ?

my-new-gateway

Gateway EUI ?

Gateway EUI

Gateway name ?

My new gateway

Gateway description ?

Description for my new gateway

Optional gateway description; can also be used to save notes about the gateway

REGISTRATION PROCEDURE 4 / 14

- **Gateway Server address**
- Depending on your selected region: eu1 (Europe), nam1 (North America), au1 (Australia) the Gateway Server Address is already filled in: `<region>.cloud.thethings.network`
- My gateway is located in the Netherlands (Europe), the Gateway Server Address should be: **eu1.cloud.thethings.network**
Write this down, you will need it later.

Gateway Server address

The address of the Gateway Server to connect to

Require authenticated connection ⓘ

 Enabled
Controls whether this gateway may only connect if it uses an authenticated Basic Station or MQTT connection

Gateway status ⓘ

 Public
The status of this gateway may be publicly displayed

Attributes ⓘ

[+ Add attributes](#)

Attributes can be used to set arbitrary information about the entity, to be used by scripts, or simply for your own organization

LoRaWAN options

Frequency plan ⓘ

 | v

Schedule downlink late ⓘ

 Enabled
Enable server-side buffer of downlink messages

Enforce duty cycle ⓘ

 Enabled
Recommended for all gateways in order to respect spectrum regulations

Schedule any time delay ⓘ *

 | | v

Configure gateway delay (minimum: 130ms, default: 530ms)

REGISTRATION PROCEDURE 5 / 14

• Frequency plan

- My gateway is located in the Netherlands (Europe), my selected Frequency plan is: Europe 863-870 MHz (SF9 for RX2 - recommended)

Gateway Server address

The address of the Gateway Server to connect to

Require authenticated connection ⓘ

 Enabled
Controls whether this gateway may only connect if it uses an authentication token

Gateway status ⓘ

 Public
The status of this gateway may be publicly displayed

Attributes ⓘ

+ Add attributes

Attributes can be used to set arbitrary information about this gateway

LoRaWAN options

Frequency plan ⓘ

Europe 863-870 MHz (SF12 for RX2)
Europe 863-870 MHz (SF9 for RX2 - recommended)
Europe 863-870 MHz, 6 channels for roaming (Draft)
Europe 433 MHz (ITU region 1)
United States 902-928 MHz, FSB 1
United States 902-928 MHz, FSB 2 (used by TTN)
United States 902-928 MHz, FSB 3
United States 902-928 MHz, FSB 4

Select...

Schedule downlink late ⓘ

 Enabled
Enable server-side buffer of downlink messages

Enforce duty cycle ⓘ

 Enabled
Recommended for all gateways in order to respect spectrum regulations

Schedule any time delay ⓘ *

 milliseconds | v
Configure gateway delay (minimum: 130ms, default: 530ms)

REGISTRATION PROCEDURE 6 / 14

- All other fields are not changed.
- Select Create gateway

Gateway updates

Automatic updates

Enabled

Gateway can be updated automatically

Channel

Stable

Channel for gateway automatic updates

Create gateway

REGISTRATION PROCEDURE 7 / 14

- In the Gateways overview screen you can see your gateway.

The screenshot shows the 'Gateways' overview screen in The Things Stack Community Edition. The navigation bar includes 'Overview', 'Applications', 'Gateways' (selected), and 'Organizations'. The user is logged in as 'EU1 Community' with 'No SLA applicable'. A search bar labeled 'Search by ID' and a '+ Add gateway' button are present. The gateway table has the following data:

| ID | Name | Gateway EUI | Frequency plan | Status |
|--------------------|--------------------|-------------|----------------|--------------|
| mobilefish-gateway | mobilefish-gateway | | EU_863_870_TTN | Disconnected |

- Select the gateway, by clicking on it.

REGISTRATION PROCEDURE 8 / 14

- You can change the gateway location settings but I will not demonstrate this.
- Select API keys.

The screenshot shows the 'mobilefish-gateway' configuration page in The Things Stack Community Edition. The page is divided into several sections:

- Navigation:** Overview, Applications, Gateways (selected), Organizations.
- User:** EU1 Community, No SLA applicable, profile picture.
- Gateway Overview:** mobilefish-gateway, ID: mobilefish-gateway, Disconnected, 1 Collaborator, 0 API keys, Created 21 hours ago.
- General information:**
 - Gateway ID: mobilefish-gateway
 - Gateway EUI: n/a
 - Gateway description: None
 - Created at: Jun 29, 2021 12:42:13
 - Last updated at: Jun 29, 2021 13:49:54
 - 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 →. A message box says "Waiting for events from mobilefish-gateway...".
- Location:** Change location settings →. A map of Europe is shown.

REGISTRATION PROCEDURE 9 / 14

- **Name**

mf-key1


- **Rights**


- Select Grand individual rights
- Select Link as Gateway to Gateway Server for traffic exchange, i.e. write uplink and read downlink


The screenshot displays the 'Add API key' configuration page in The Things Stack Community Edition. The interface includes a top navigation bar with the 'THE THINGS NETWORK' logo, 'THE THINGS STACK Community Edition' branding, and navigation links for 'Overview', 'Applications', 'Gateways', and 'Organizations'. The 'Gateways' tab is active. Below the navigation bar, the breadcrumb path is 'Gateways > fdsdfsdfsfsf > API keys > Add'. The main content area is titled 'Add API key' and contains a 'Name' input field with the value 'My new API key'. Under the 'Rights*' section, there are three radio button options: 'Grant all current and future rights', 'Grant individual rights' (which is selected), and 'Select all'. Below these are several checkboxes for permissions, with 'Link as Gateway to a Gateway Server for traffic exchange, i.e. write uplink and read downlink' being checked. Other permissions include 'Delete gateway', 'View gateway information', 'View gateway location', 'Retrieve secrets associated with a gateway', 'View and edit gateway API keys', 'Edit basic gateway settings', 'View and edit gateway collaborators', 'View gateway status', and 'Write downlink gateway traffic'. A 'Hide sidebar' button is located at the bottom left of the interface.

REGISTRATION PROCEDURE 10 / 14

- Select Create API key

 API keys

 General settings

 Hide sidebar

- View gateway information
- Link as Gateway to a Gateway Server for traffic exchange, i.e. write uplink and read downlink
- View gateway location
- Retrieve secrets associated with a gateway
- View and edit gateway API keys
- Edit basic gateway settings
- View and edit gateway collaborators
- View gateway status
- Write downlink gateway traffic
- Read gateway traffic
- Store secrets for a gateway

[Create API key](#)

REGISTRATION PROCEDURE | | / | 4

- Copy and save the newly created API key, you will need this key later.
- You won't be able to view the key afterwards.
- You can delete this key or add new keys but I will not demonstrate this.
- Select I have copied the key.

Please copy newly created API key

You won't be able to view the key afterward

Granted rights

- ✓ Link as Gateway to a Gateway Server for traffic exchange, i.e. write uplink and read downlink

Your API key has been created successfully. Note: After closing this window, the value of the key secret will not be accessible anymore. Make sure to copy and store it in a safe place now.

API key

NNSXS.LRDFXJJT...



✓ I have copied the key

REGISTRATION PROCEDURE 12 / 14

- In the API keys overview screen you can see your created API key.
- You can make changes to this API key, by selecting Gateway Link.

The screenshot shows the mobilefish.com user interface. At the top, there is a navigation bar with the following elements from left to right: 'THE THINGS NETWORK' logo, 'THE THINGS STACK Community Edition' logo, a menu with 'Overview', 'Applications', 'Gateways' (highlighted), and 'Organizations', 'EU1 Community' with a 'Fair use policy applies' note, and a user profile icon. Below the navigation bar, the breadcrumb path is 'Gateways > mobilefish-gateway > API keys'. On the left side, there is a sidebar menu for 'mobilefish-gateway' with options: Overview, Live data, Location, Collaborators, API keys (highlighted), and General settings. The main content area displays 'API keys (1)' with a '+ Add API key' button. Below this is a table with columns 'Key ID', 'Name', and 'Granted Rights'. One row is visible with 'Key ID' 'NUJE[REDACTED]..', 'Name' 'mf-key1', and a 'Gateway Link' button. The 'Granted Rights' column is currently empty.

| Key ID | Name | Granted Rights |
|------------------|---------|----------------|
| NUJE[REDACTED].. | mf-key1 | Gateway Link |

REGISTRATION PROCEDURE 13 / 14

- If you made a mistake you can make changes to your gateway settings:

- Select your gateway

- In the left menu bar select General settings

The screenshot shows the 'mobilefish-gateway' configuration page in The Things Stack Community Edition. The page is divided into a left sidebar and a main content area. The sidebar contains navigation options: Overview, Live data, Location, Collaborators, API keys, and General settings. The main content area displays the gateway's status as 'Disconnected', 1 collaborator, and 0 API keys. It also shows the gateway's ID, EUI, description, creation and update timestamps, and server address. The 'General information' section includes fields for Gateway ID, Gateway EUI, Gateway description, Created at, Last updated at, and Gateway Server address. The 'LoRaWAN information' section includes Frequency plan (EU_863_870_TTN) and a button to download the global configuration file. The 'Live data' section shows a message 'Waiting for events from mobilefish-gateway...'. The 'Location' section shows a map of Europe with a 'Change location settings' link.

THE THINGS NETWORK | **THE THINGS STACK Community Edition** | Overview | Applications | **Gateways** | Organizations | EU1 Community | No SLA applicable |

Gateways > mobilefish-gateway

mobilefish-gateway
ID: mobilefish-gateway

• Disconnected | 1 Collaborator | 0 API keys | Created 21 hours ago

General information

Gateway ID: mobilefish-gateway

Gateway EUI: n/a

Gateway description: None

Created at: Jun 29, 2021 12:42:13

Last updated at: Jun 29, 2021 13:49:54

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 →

Waiting for events from mobilefish-gateway...

Location | Change location settings →

GATEWAY PROCEDURE 1 / 8

- Now you will make changes to the gateway itself.
- The Things Gateway will later communicate with your router, select one of these options:
 - Ethernet cable
If you select this option, connect The Things Gateway to your router using an ethernet cable.
 - WIFI
If you select this option, The Things Gateway requires your router SSID and password. Keep this information at hand you will need it later.



GATEWAY PROCEDURE 2 / 8

- Remove the white plastic cover.
- Make sure the antenna is connected.
- Power up the Things Gateway.
- Press the pink reset button in the middle for 5 seconds until each of the 5 LEDs illuminates.



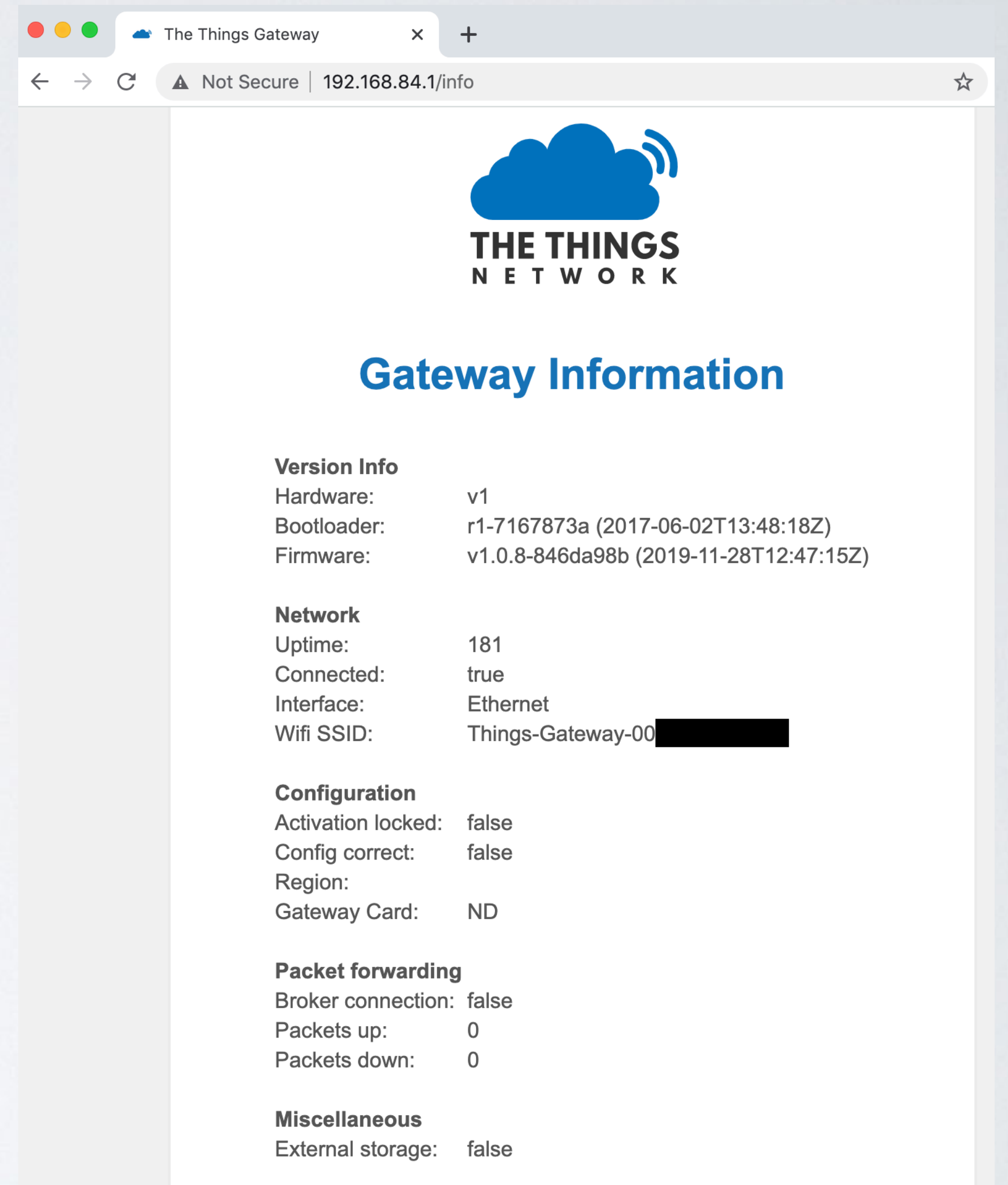
GATEWAY PROCEDURE 3 / 8

- The Things Gateway now provides a WIFI access point.
 - The Things Gateway SSID:
Things-Gateway-xxxxx
 - Password:
thethings
Note: I never had to enter a password.
- On your computer connect to this WIFI access point.



GATEWAY PROCEDURE 4 / 8

- To view The Things Gateway information, open a browser and navigate to:
<http://192.168.84.1/info>
- The Firmware version should be at least 1.0.8



The screenshot shows a web browser window with the title "The Things Gateway" and the URL "192.168.84.1/info". The page content includes the The Things Network logo and a section titled "Gateway Information".

THE THINGS NETWORK

Gateway Information

Version Info

| | |
|-------------|--|
| Hardware: | v1 |
| Bootloader: | r1-7167873a (2017-06-02T13:48:18Z) |
| Firmware: | v1.0.8-846da98b (2019-11-28T12:47:15Z) |

Network

| | |
|------------|------------------------------|
| Uptime: | 181 |
| Connected: | true |
| Interface: | Ethernet |
| Wifi SSID: | Things-Gateway-00 [REDACTED] |

Configuration

| | |
|--------------------|-------|
| Activation locked: | false |
| Config correct: | false |
| Region: | |
| Gateway Card: | ND |

Packet forwarding

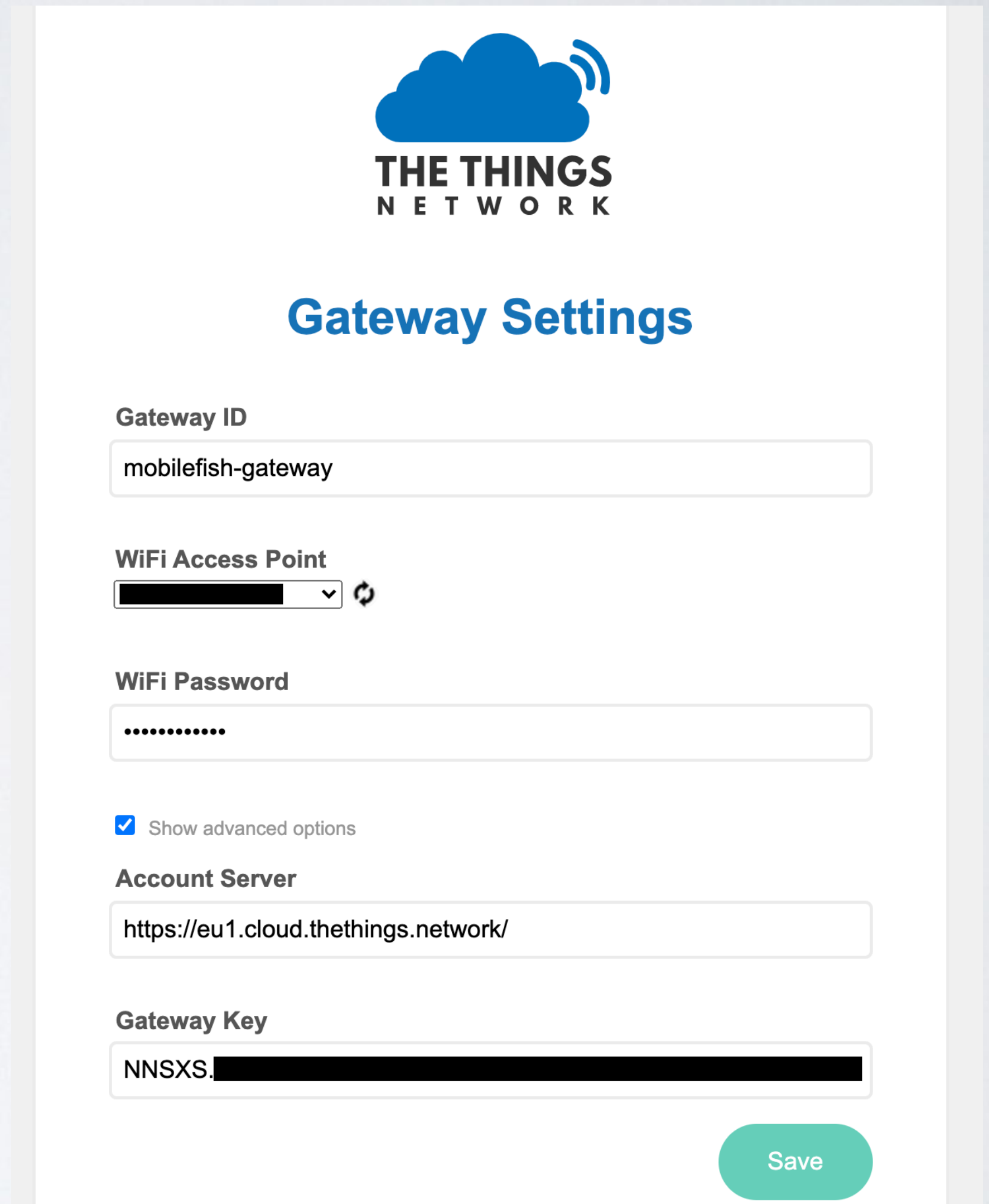
| | |
|--------------------|-------|
| Broker connection: | false |
| Packets up: | 0 |
| Packets down: | 0 |

Miscellaneous

| | |
|-------------------|-------|
| External storage: | false |
|-------------------|-------|

GATEWAY PROCEDURE 5 / 8

- To change The Things Gateway configuration, open a browser and navigate to:
http://192.168.84.1
- Enter your Gateway ID.
- Select your WIFI router SSID and enter its password, if you opted for this option. Otherwise leave these two fields empty.
- Select Show advanced options.



The screenshot shows the 'Gateway Settings' page for The Things Network. At the top is the logo, which consists of a blue cloud with a Wi-Fi signal icon and the text 'THE THINGS NETWORK'. Below the logo is the title 'Gateway Settings' in blue. The form contains several fields: 'Gateway ID' with the value 'mobilefish-gateway'; 'WiFi Access Point' with a dropdown menu showing a blacked-out SSID and a refresh icon; 'WiFi Password' with a field of dots; a checked checkbox for 'Show advanced options'; 'Account Server' with the URL 'https://eu1.cloud.thethings.network/'; and 'Gateway Key' with the value 'NNSXS.' followed by a blacked-out key. A green 'Save' button is located at the bottom right.

THE THINGS NETWORK

Gateway Settings

Gateway ID
mobilefish-gateway

WiFi Access Point
[Redacted] ▾ ↻

WiFi Password
.....

Show advanced options

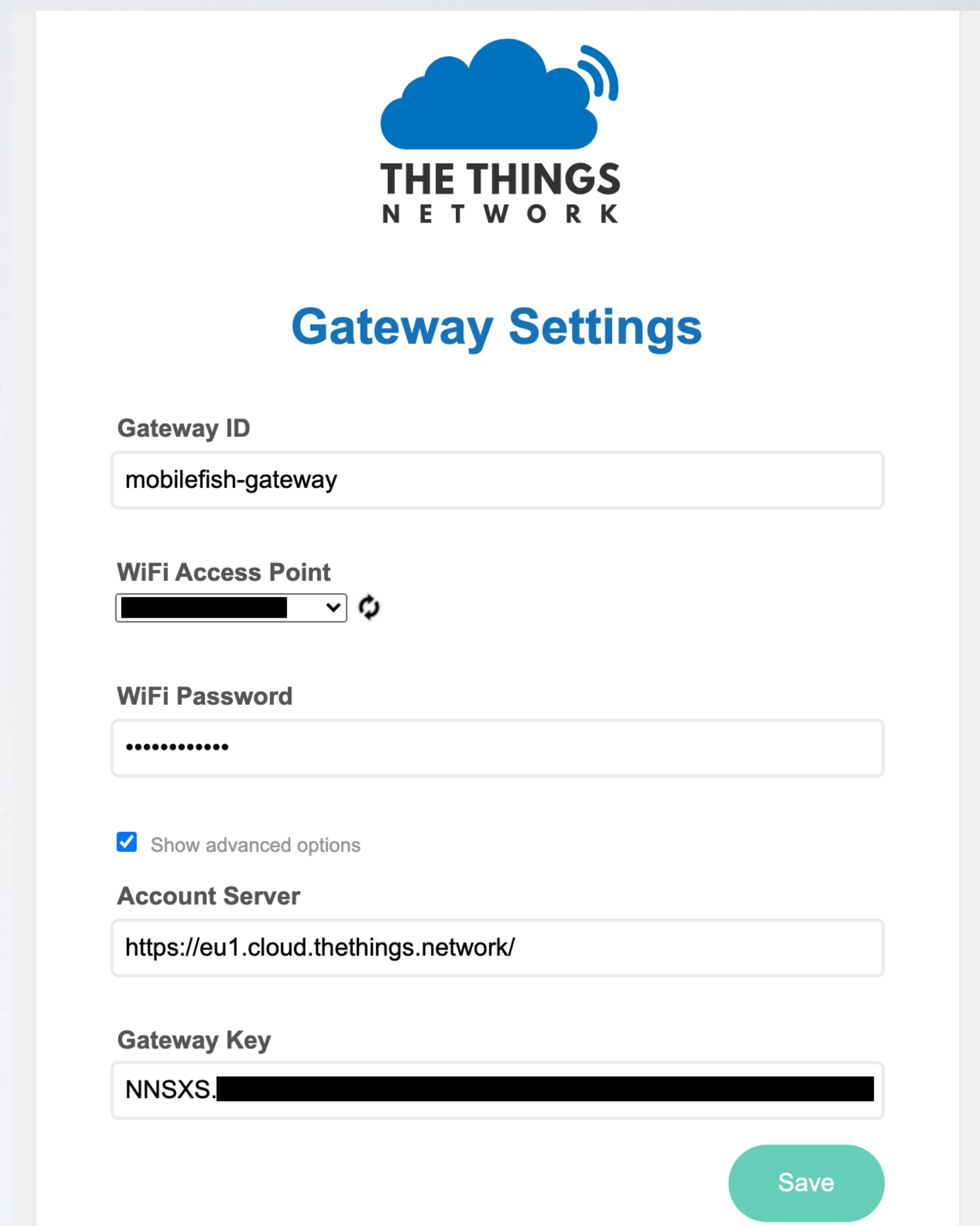
Account Server
https://eu1.cloud.thethings.network/

Gateway Key
NNSXS. [Redacted]

Save

GATEWAY PROCEDURE 6 / 8

- Enter the Account Server address.
This is the same as the Gateway Server address.
- Enter the Gateway Key.
This is the same as the API Key you have saved.
- Select Save.



The screenshot shows the 'Gateway Settings' page for The Things Network. At the top is the logo, which consists of a blue cloud with a signal icon and the text 'THE THINGS NETWORK'. Below the logo is the title 'Gateway Settings' in a bold blue font. The form contains several fields: 'Gateway ID' with the value 'mobilefish-gateway'; 'WiFi Access Point' with a dropdown menu and a refresh icon; 'WiFi Password' with a masked input field; a checked checkbox for 'Show advanced options'; 'Account Server' with the value 'https://eu1.cloud.thethings.network/'; and 'Gateway Key' with the value 'NNSXS.' followed by a masked input field. A green 'Save' button is located at the bottom right of the form.

THE THINGS NETWORK

Gateway Settings

Gateway ID
mobilefish-gateway

WiFi Access Point
[Redacted] ▾ ↻

WiFi Password
[Redacted]

Show advanced options

Account Server
https://eu1.cloud.thethings.network/

Gateway Key
NNSXS. [Redacted]

Save

GATEWAY PROCEDURE 7 / 8

- The Things Gateway is now configured.
- Now you should connect your computer WIFI to your router SSID.



Reconnecting Gateway

Please connect your computer wifi to: (" **router SSID** ")

As a reminder, this is the network the gateway was on:

- **SSID:** "Things-Gateway-00 [REDACTED]"
- **WLAN Type:** Soft AP (BSS)

This is the network that your gateway will be going to:

- **SSID:** " **router SSID** "
- **WLAN Type:** Infrastructure (BSS)

GATEWAY PROCEDURE 8 / 8

- Login to The Things Stack Community Edition console.
- Go to gateways and in the gateways overview screen, select your gateway.
- After a few minutes you will see received gateway information in the Live data window.
- The Things Gateway is correctly setup.

The screenshot displays the 'mobilefish-gateway' configuration page in the The Things Stack Community Edition console. The page is divided into several sections:

- Header:** Includes the 'THE THINGS NETWORK' logo, 'THE THINGS STACK Community Edition' branding, navigation tabs for Overview, Applications, Gateways (selected), and Organizations, and a user profile for 'EU1 Community'.
- Left Sidebar:** Contains navigation options for mobilefish-gateway, Overview, Live data, Location, Collaborators, API keys, and General settings.
- Main Content Area:**
 - Gateway Overview:** Shows the gateway name 'mobilefish-gateway', ID 'mobilefish-gateway', and status 'Last seen 8 seconds ago' with up/down arrows (7/0), 1 Collaborator, and 1 API key. It also indicates 'Created yesterday'.
 - General information:** A table listing gateway details:

| | |
|------------------------|-----------------------------|
| Gateway ID | mobilefish-gateway |
| Gateway EUI | n/a |
| Gateway description | None |
| Created at | Jun 29, 2021 12:42:13 |
| Last updated at | Jun 29, 2021 13:49:54 |
| Gateway Server address | eu1.cloud.thethings.network |
 - Live data:** A list of recent events with timestamps and descriptions:

| | | |
|----------|------------------------|--------------------|
| 13:58:11 | Receive uplink message | DevAddr: 02 0C D0 |
| 13:58:07 | Receive uplink message | DevAddr: 02 0C D1 |
| 13:58:06 | Receive gateway status | Metrics: { cpu_pe: |
| 13:57:36 | Receive gateway status | Metrics: { cpu_pe: |
| 13:57:21 | Receive uplink message | DevAddr: 26 01 42 |
| 13:57:19 | Receive uplink message | DevAddr: 02 0C D0 |
 - Location:** A section with a 'Change location settings' link.