

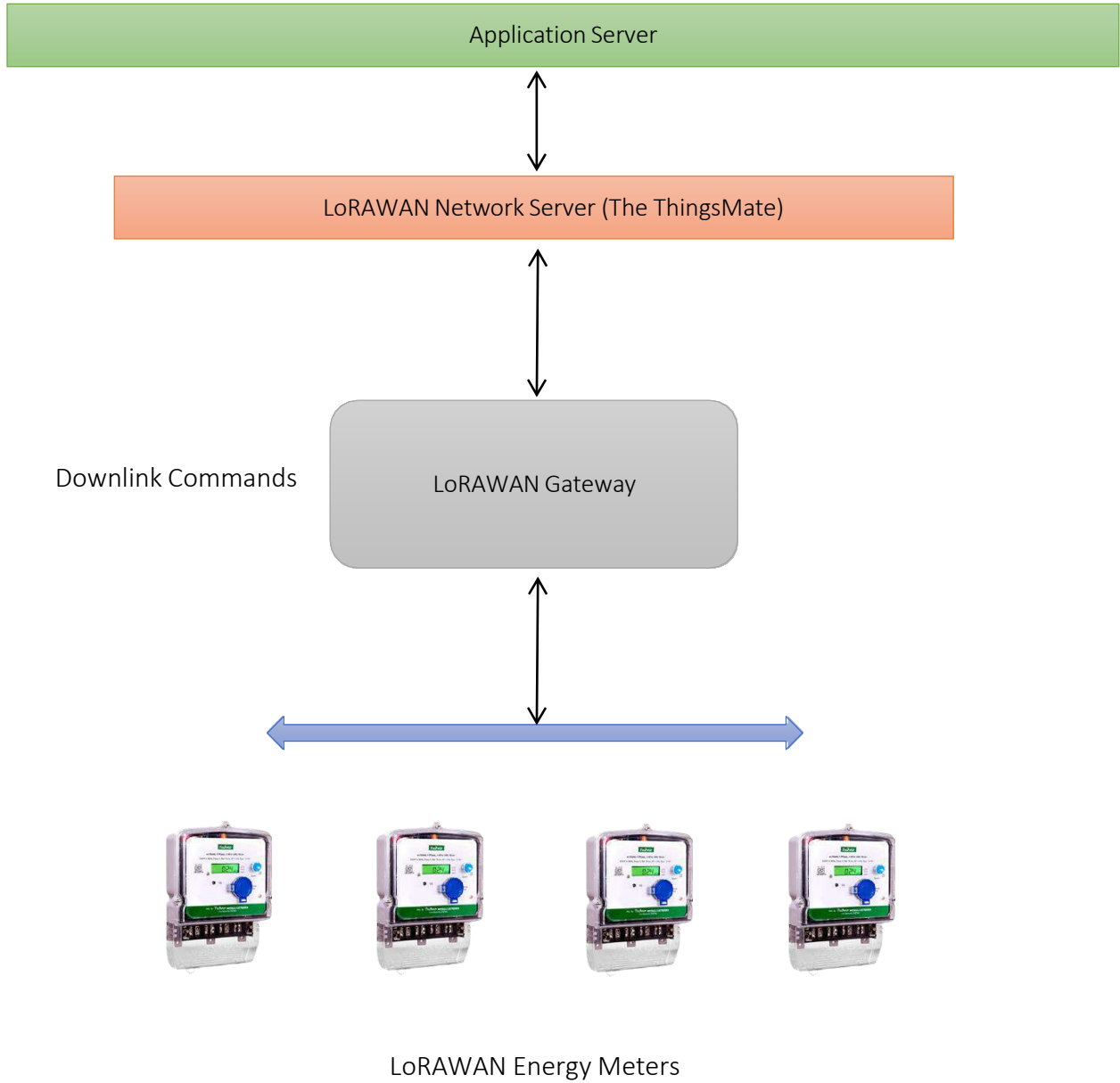
# USER MANUAL FOR LORAWAN ENERGY METER



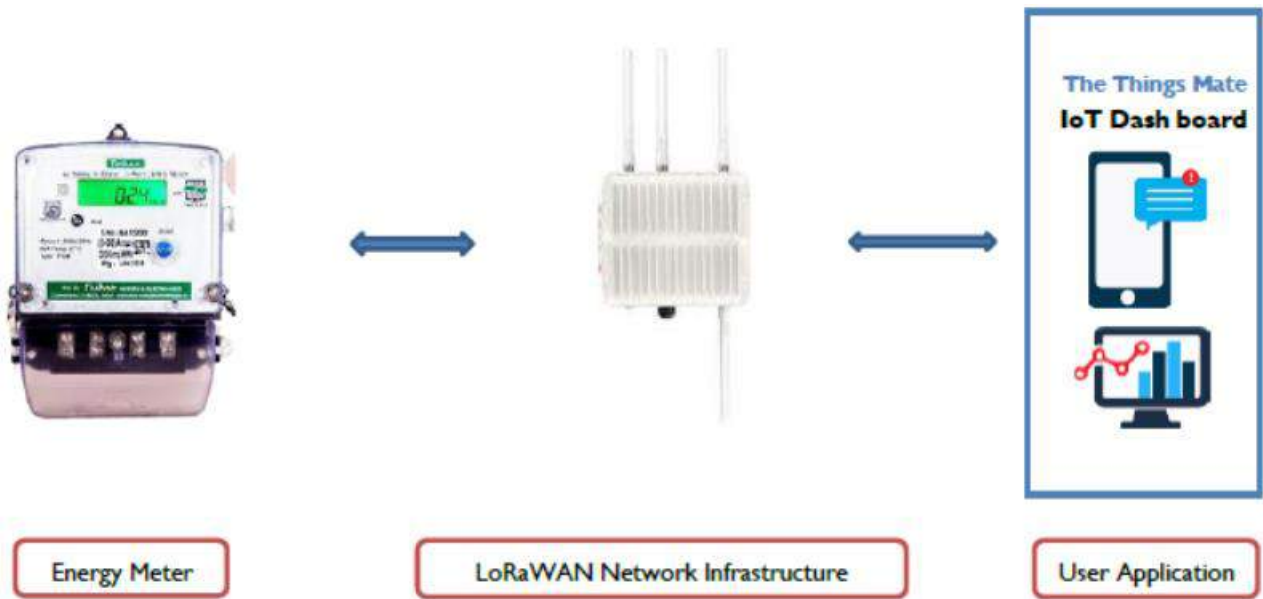
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## System Overview



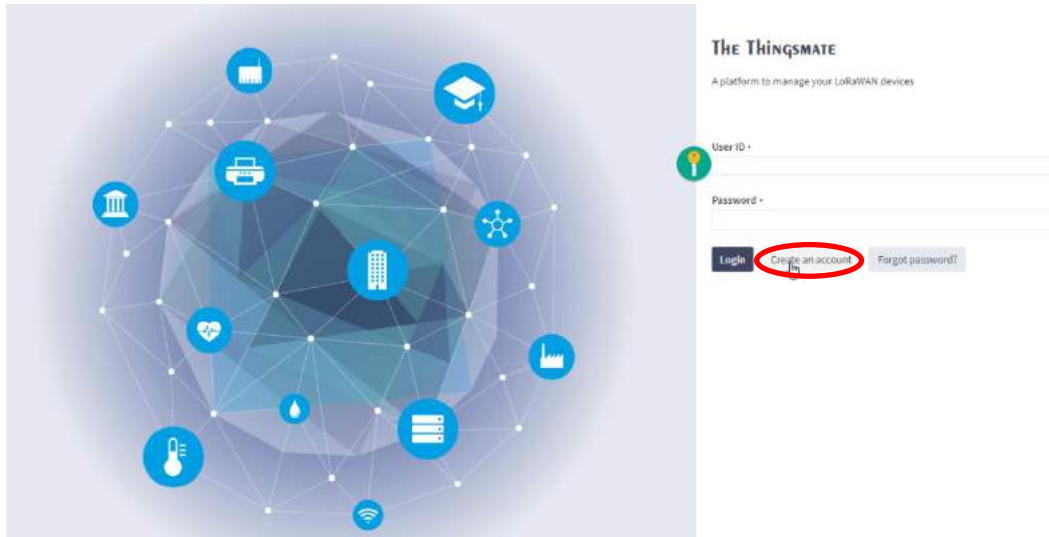
*End to End Communication*



## Annexure I - Creating an Account in ThingsMate

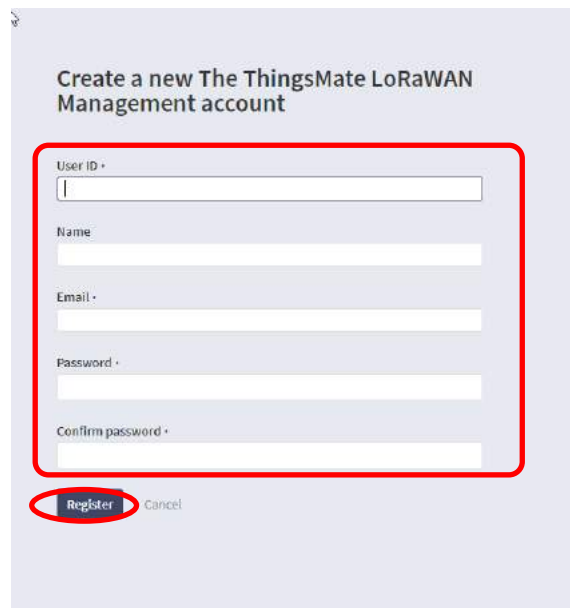
### PROCEDURE:

Using the URL ThingsMate network server <https://beta.thethingsmate.com/oauth/login> in that click the create an account



### \*\* Note:

- User ID & Name should be same
- Password should have at least one Uppercase letter, one Lowercase letter, one Special character, and Numbers



Create a new The ThingsMate LoRaWAN Management account

User ID \*

Name

Email \*

Password \*

Confirm password \*

Register Cancel

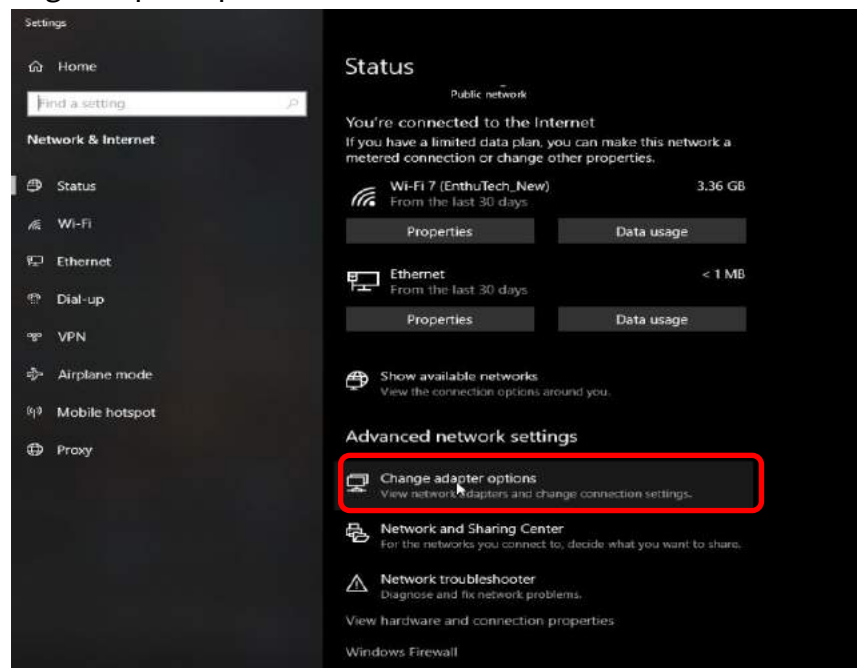
## Annexure II - GATEWAY REGISTRATION

### Procedure:

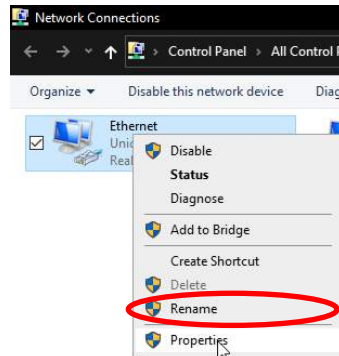
- Connect the gateway to your computer through Ethernet cable
- Select the Network & Internet Setting



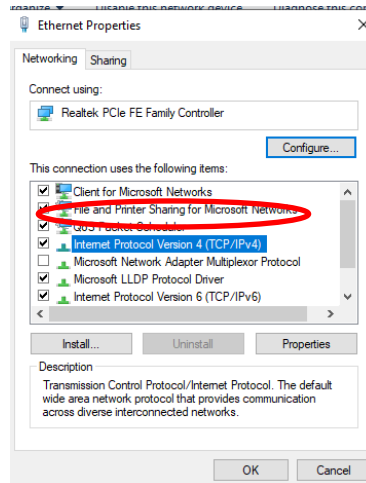
- Select Change adaptor options



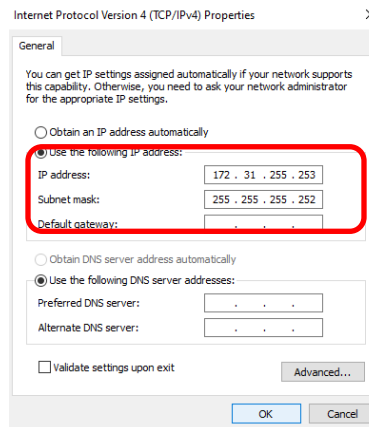
- Right click in Ethernet and Select Properties



- Select Internet protocol Version 4(TCP/IP) and click Properties



- Select Use the following IP address and set the IP address as 172.31.255.253 and subnet mask as 255.255.255.252
- Click ok



- After this open the google chrome and type [172.31.255.254:8000](http://172.31.255.254:8000) and click enter

- Sign in User name as root and password as dragino the gateway page is open

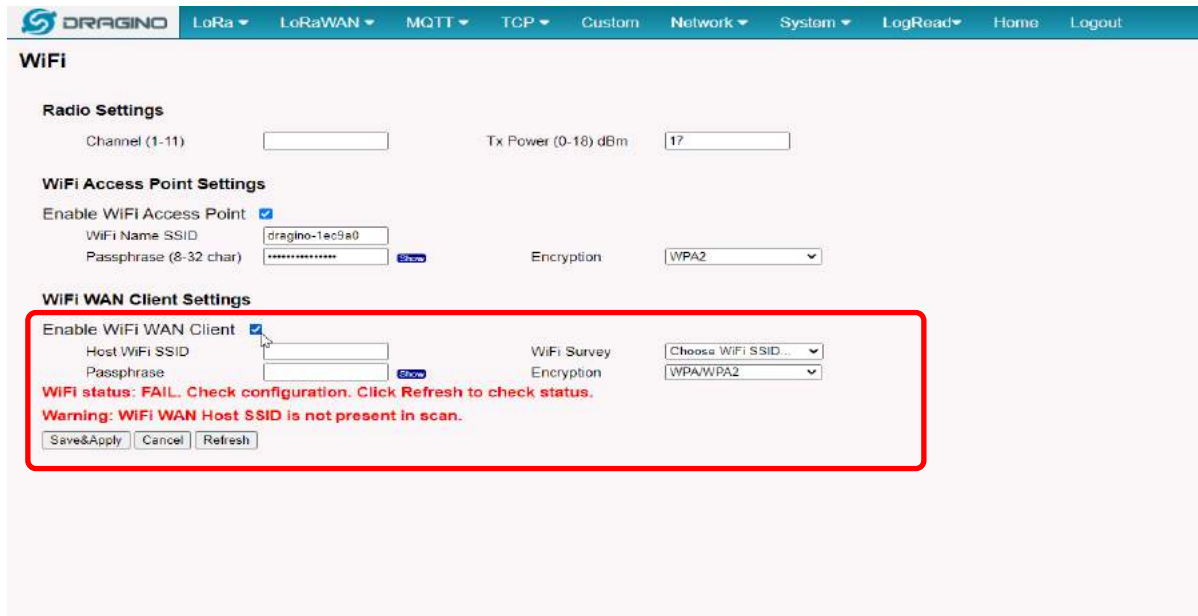


- In this there is nothing is connected except Ethernet
- Select network ->Wifi





- Click Enable Wifi WAN Client in Wifi WAN client settings
- Enter the Wifi SSID and Wifi password Click save & apply



- After this except lorawan all are connected
- Select LoraWAN -> LoraWAN



- Select the LoRaWAN sever Provider as custom/Private LoRaWAN and Server address as [beta.thethingsmate.com](http://beta.thethingsmate.com)

**LoRaWAN Configuration**

**General Settings**

Email:   
Gateway ID:

**Primary LoRaWAN Server**

Service Provider:  **Server Address:**   
Uplink Port:  Downlink Port:

**Packet Filter**

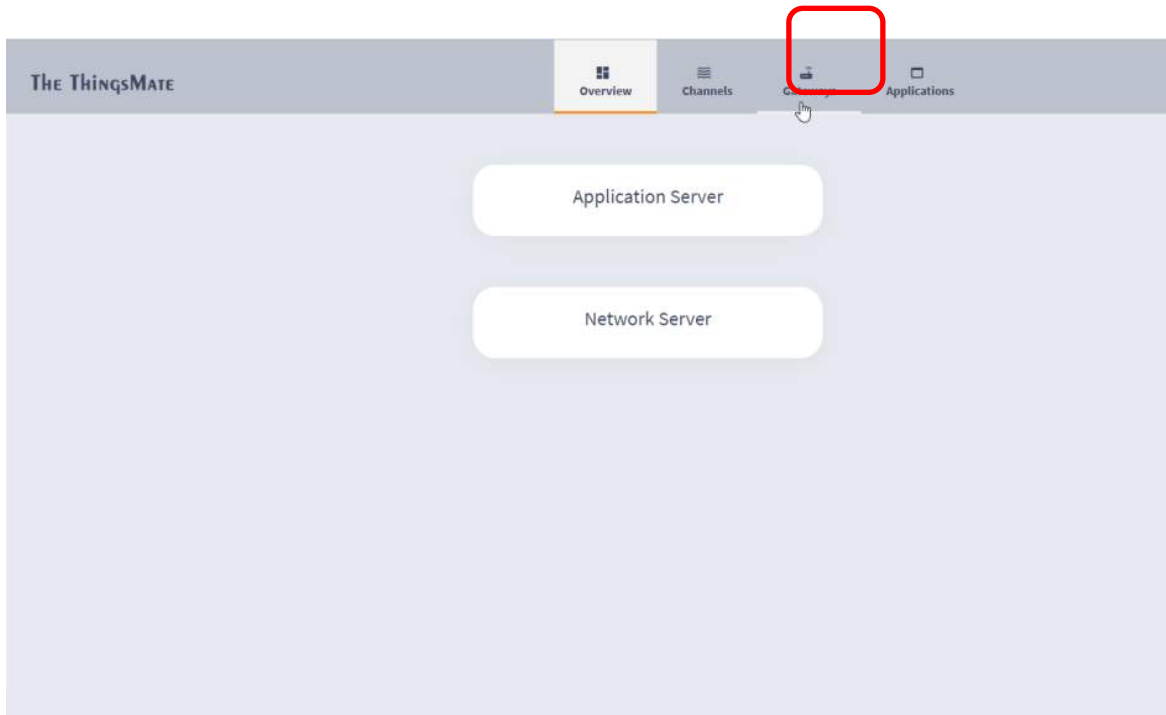
Fport Filter ?  DevAddr Filter ?

- Click save & apply

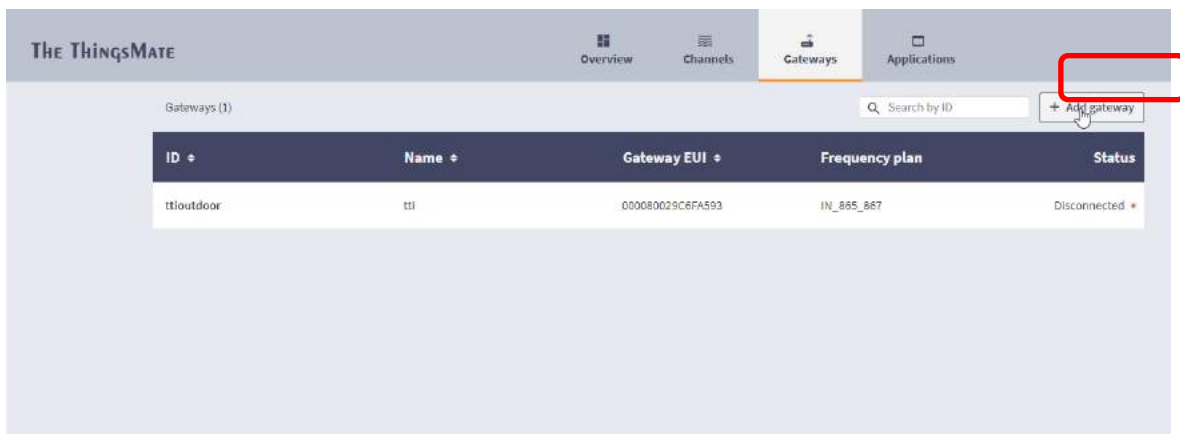


- Check all the Connections are connected

- Open the Network server and select Gateways



- Click add gateway



- Fill the following required columns

The screenshot shows the 'Add gateway' form in The ThingsMATE interface. The form includes the following fields and options:

- Owner:** mohan
- Gateway ID:** my-new-gateway (highlighted with a red box)
- Gateway EUI:** AB 40 41 1E C9 A0 41 49
- Gateway name:** My new gateway
- Gateway description:** Description for my new gateway
- Gateway Server address:** beta.thingsmate.com
- Gateway status:**  Public
- Attributes:** + Add attributes

- Get the gateway eui from gateway's LoRaWAN Configuration page

The screenshot shows the 'LoRaWAN Configuration' page in the DRAGINO interface. The page includes the following sections and fields:

- General Settings:**
  - Email:** dragino-1ec9a0@dragino.com (highlighted with a red box)
  - Gateway ID:** 5240411ec9a04149 (highlighted with a red box)
- Primary LoRaWAN Server:**
  - Service Provider:** Custom / Private LoR
  - Uplink Port:** 1700
  - Server Address:** beta.thingsmate.com
  - Downlink Port:** 1700
- Packet Filter:**
  - Fport Filter:** 0
  - DevAddr Filter:** 0
- Buttons:** Save&Apply, Cancel

➤ Make your gateway as Public

Gateway ID

Gateway EUI

Gateway name

Gateway description

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

Gateway Server address

The address of the Gateway Server to connect to

Gateway status  Public  
TTN status of this gateway may be publicly displayed

Attributes

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

➤ Fill the frequency plan as EU 863-870MHz (SF9 for RX2-recommended)

Gateway Server address

Europe 863-870 MHz (SF9 for RX2 - recommended)

Gateway status  United States 902-928 MHz, FSB 1

United States 902-928 MHz, FSB 2 (used by TTN)

Attributes  United States 902-928 MHz, FSB 3

United States 902-928 MHz, FSB 4

United States 902-928 MHz, FSB 5

LoRaWAN options  United States 902-928 MHz, FSB 6

Frequency plan

The frequency plan used by the end device

Schedule downlink late  Enabled  
Enable server-side buffer of downlink messages

Duty cycle  Enforced

➤ Here is the gateway traffic is shown below

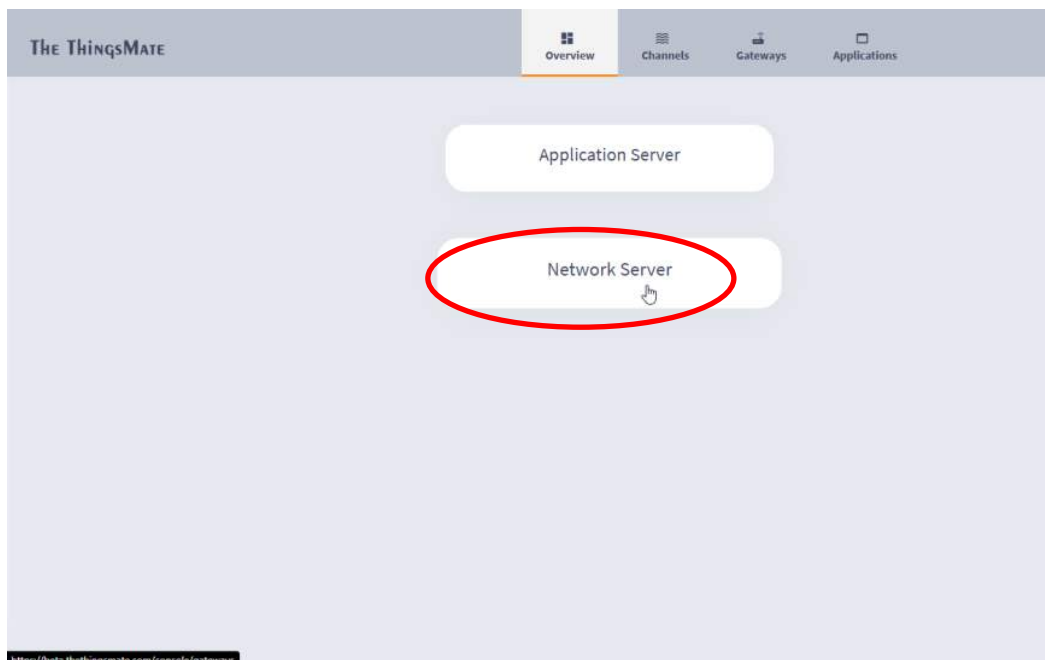
The screenshot displays the gateway management interface with the following sections:

- General information:** Gateway ID: 1a9b-9, Gateway EUI: DP4444674140400, Gateway description: None, Created at: Jan 8, 2021 16:17:50, Last updated at: Jan 8, 2021 16:17:50, Gateway Server address: beta.thethingsmate.com.
- LoRaWAN information:** Frequency plan: EU\_863\_870\_TTN, Global configuration: download global\_conf.json.
- Live data:** A log of gateway status and message events, including 'Forward gateway status Metrics' and 'Receive uplink message'.
- Location:** A world map with the text 'No location information available'.

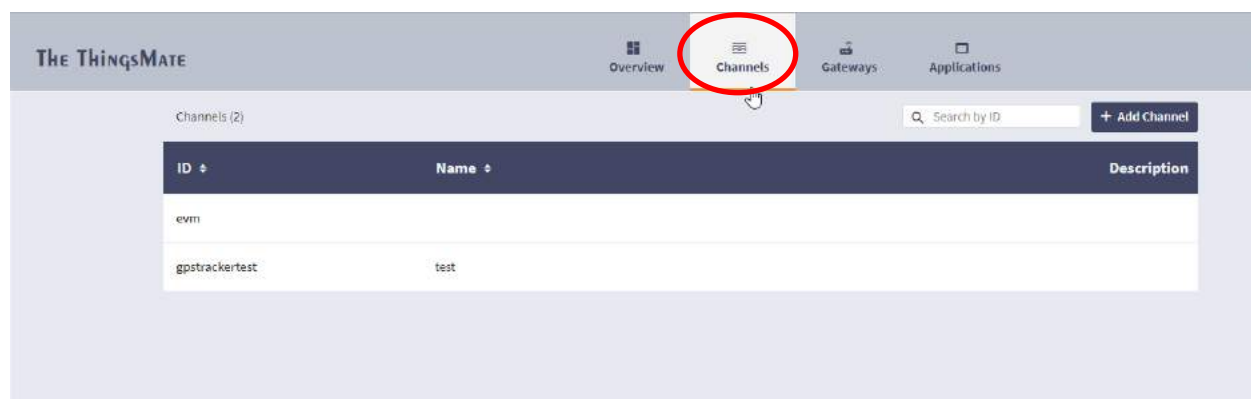
## Annexure III A – Procedure for OTAA Mode

### PROCEDURE:

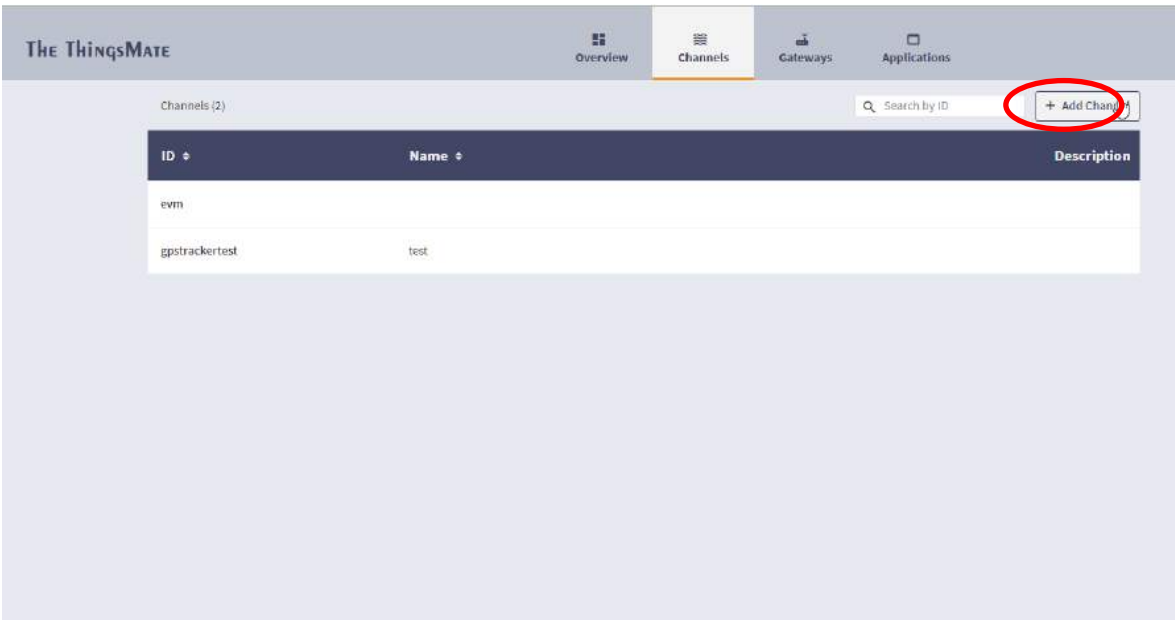
- Logging into the Network server with device address, Network session key and App session key
- Select the Network server



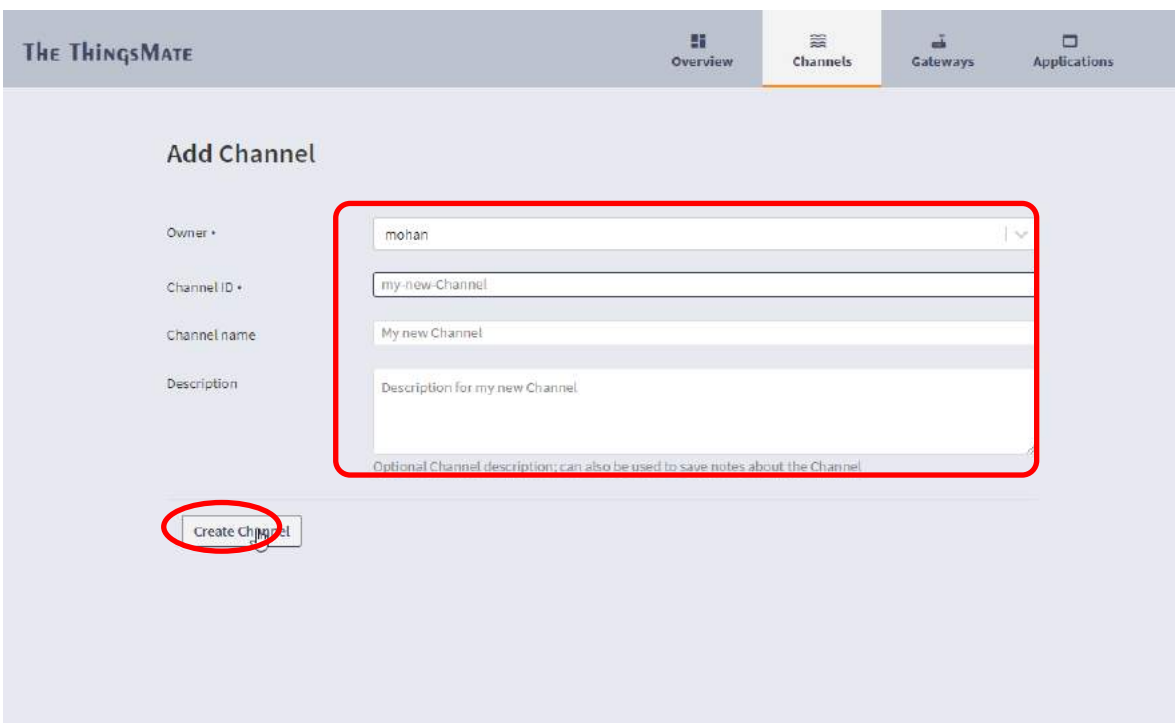
- Select the channel in the network server



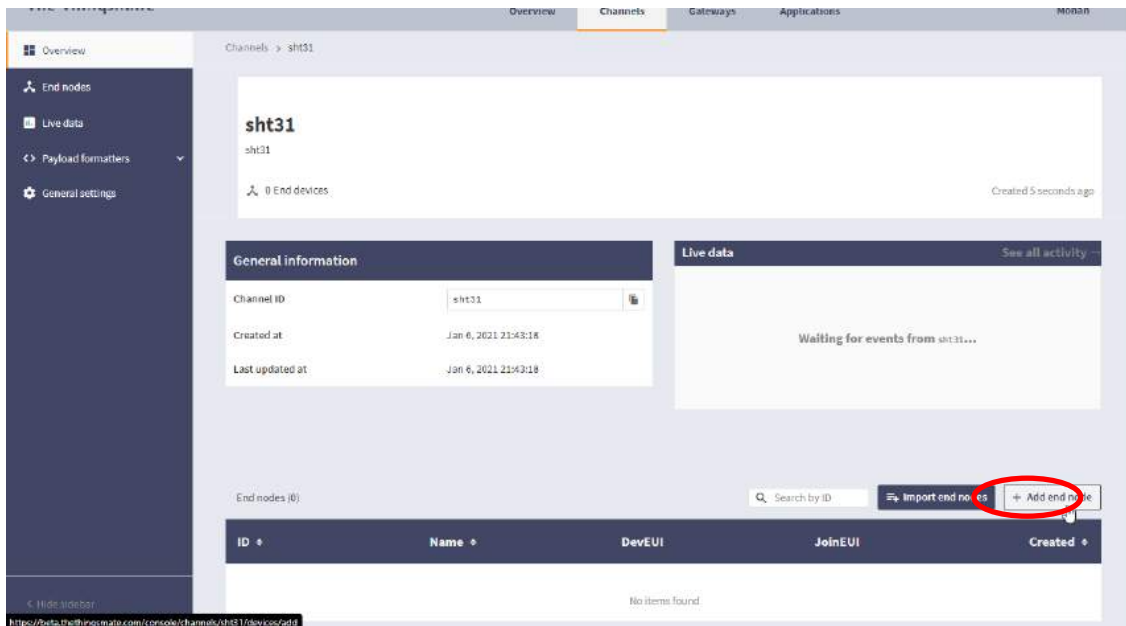
- Add channel, to add the device



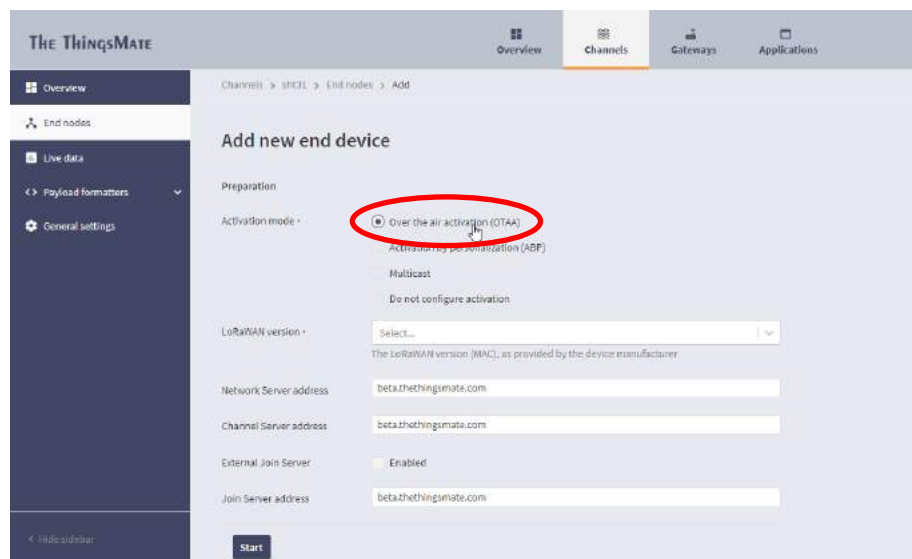
- Fill the require content to create a channel
- Channel ID and Channel name should be same



- After creating a Channel, Create a End Node in that channel



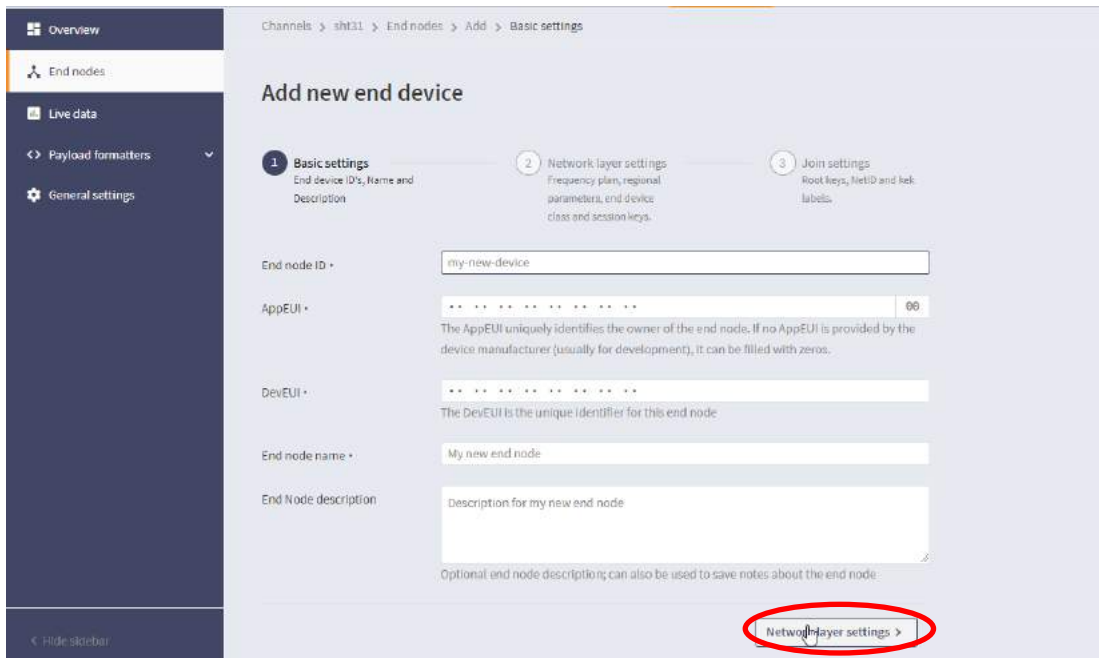
- In the end node creation select the activation mode as Over the Air Activation (OTAA)
- And select the LoRa Version as Mac V1.0.3



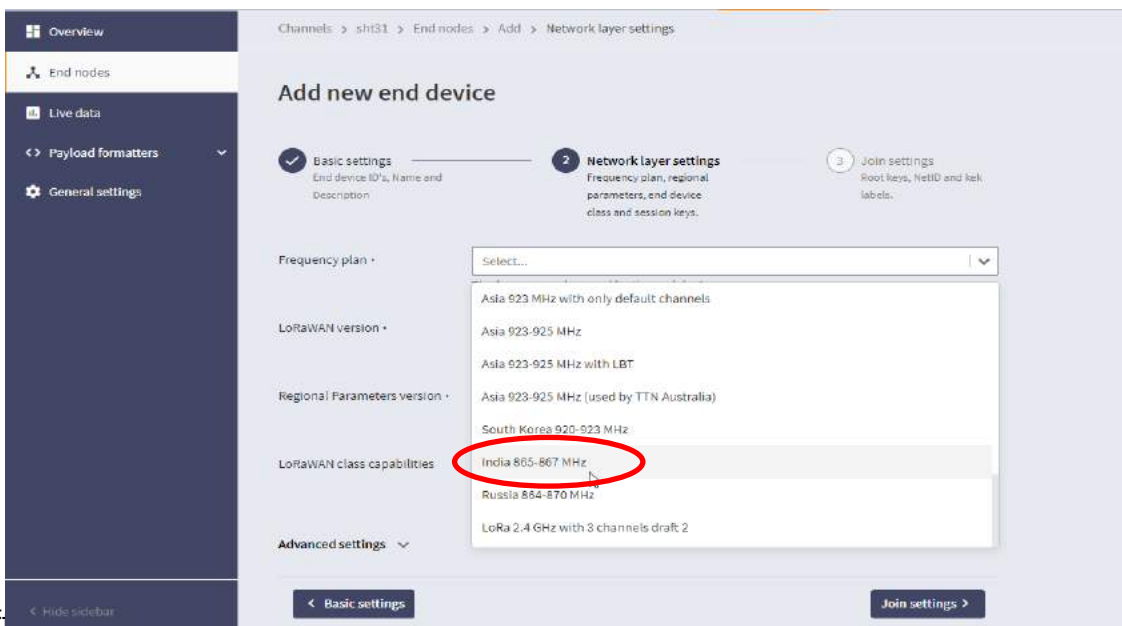
- Click Start Enter the required columns



- In that End node ID and End node name must should be same

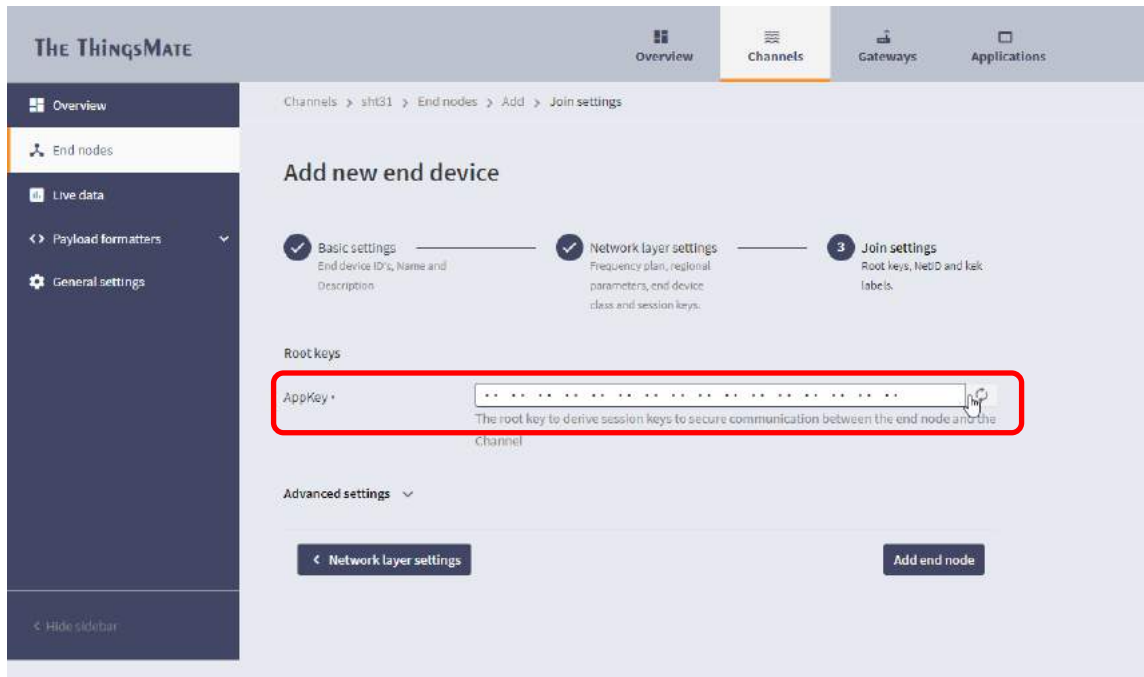


- In the Network layer setting set the frequency plan as Indian frequency 865-870MHz
- Select the device is a Class B device or Class C device don't select any of those two the device is acting as a Class A
- In this if you fill the App EUI and Device EUI or the keys are automatically generated by the Network server

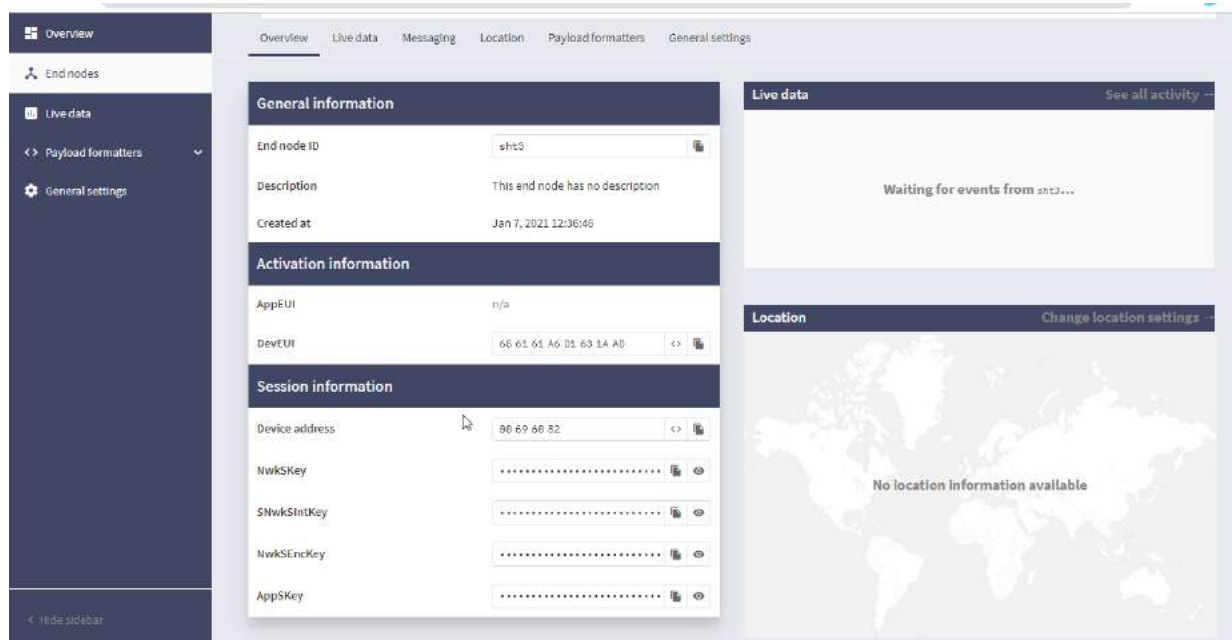


- Af...

- In that fill the required fields and click add node ,Here the OTAA has the Application key rather than Application Session Key



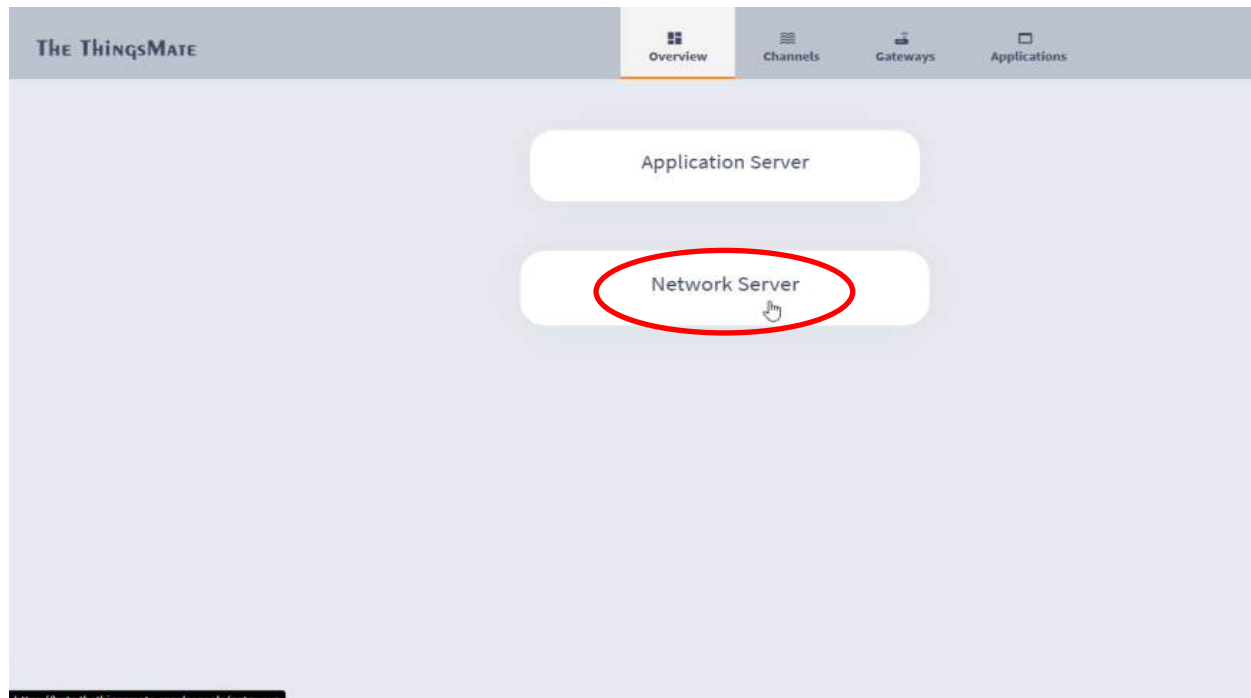
- After creating the end node the server will wait for the data receiving from the node which have the Keys like Application Key, APP EUI, and Device EUI is same as node



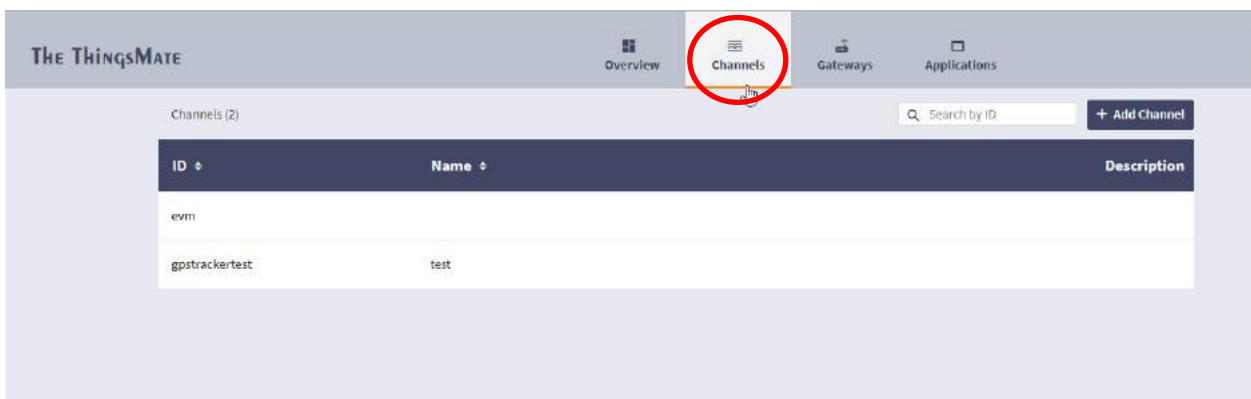
## Annexure III B - Procedure for ABP Mode

### PROCEDURE:

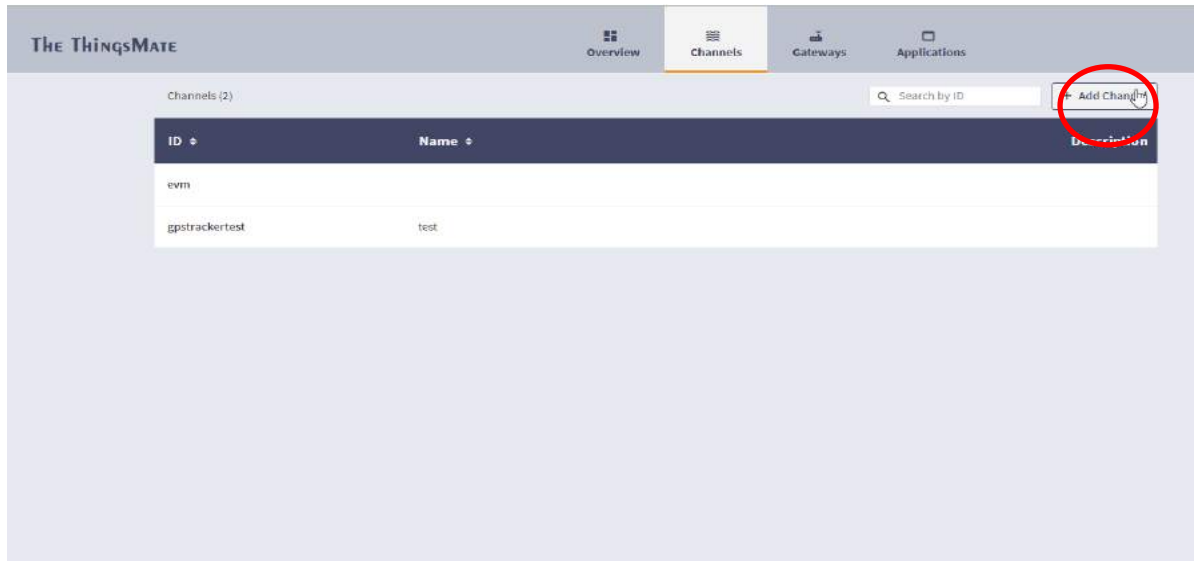
- Logging into the Network server with device address, Network session key and App session key
- Select the Network server



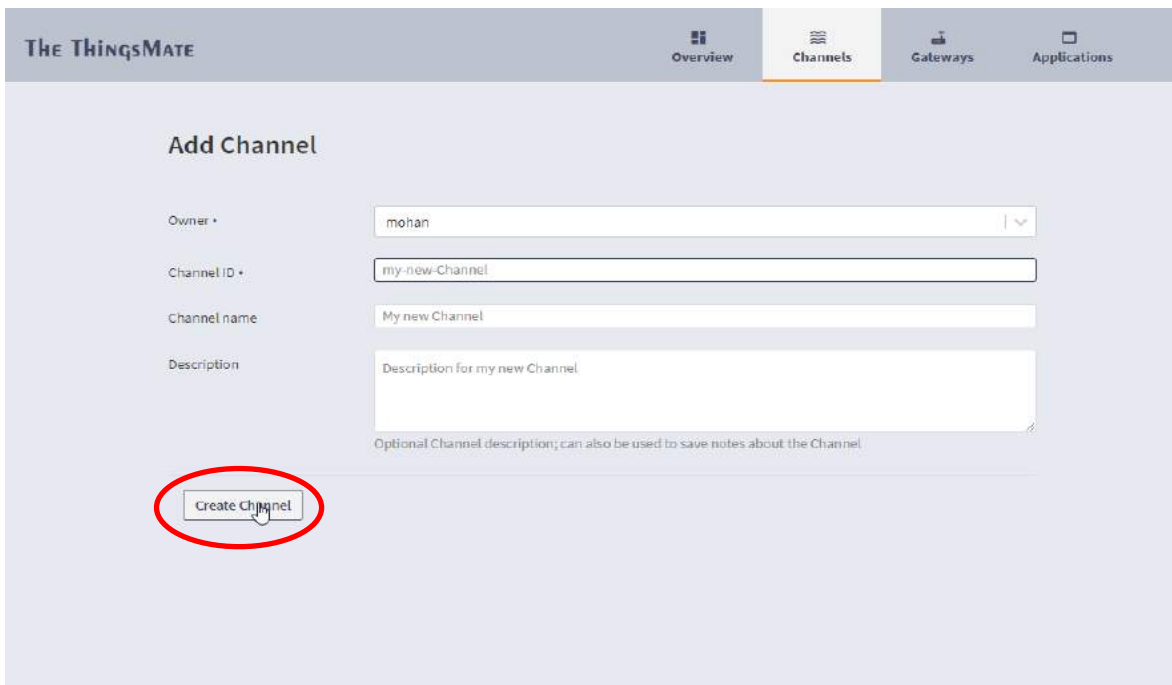
- Select the channel in the network server



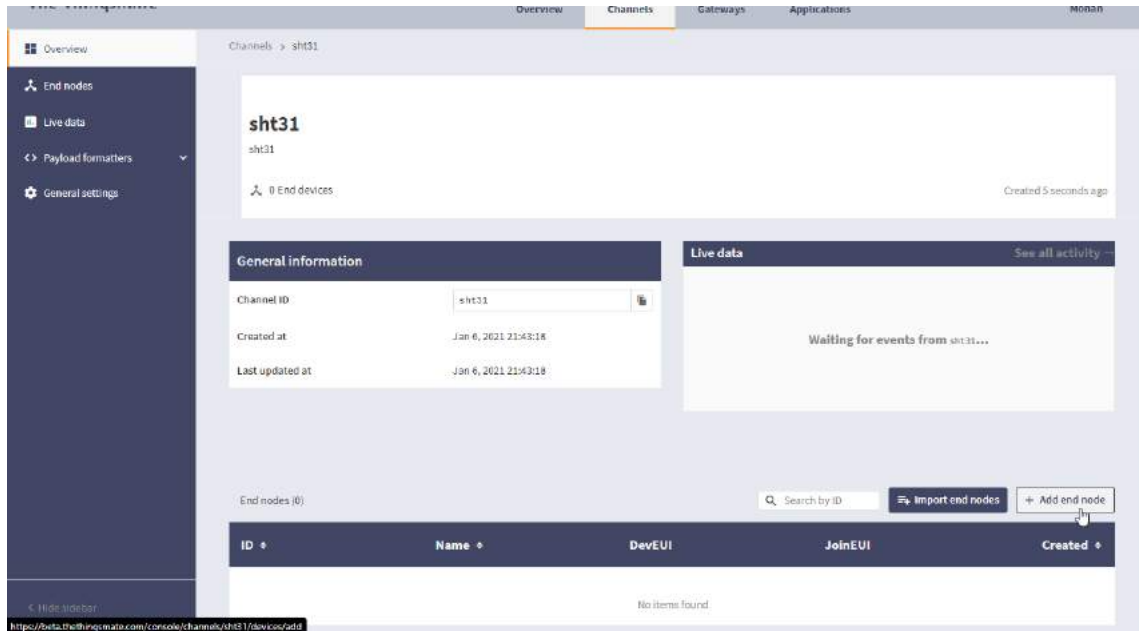
- Add channel, to add the device



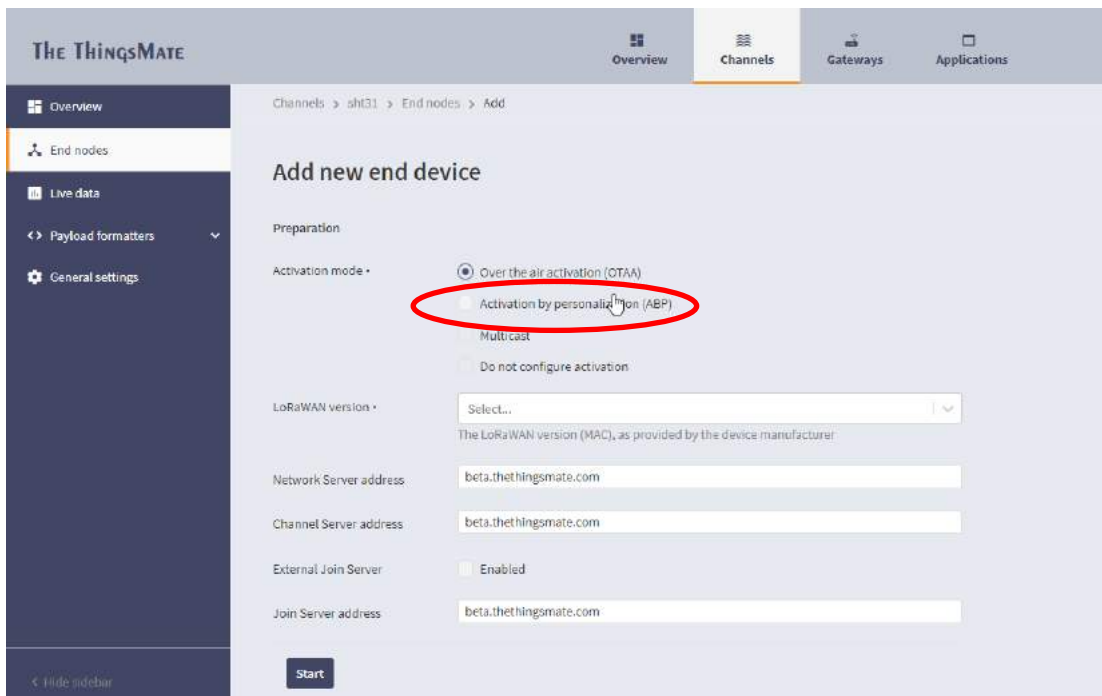
- Fill the require content to create a channel
- Channel ID and Channel name should be same



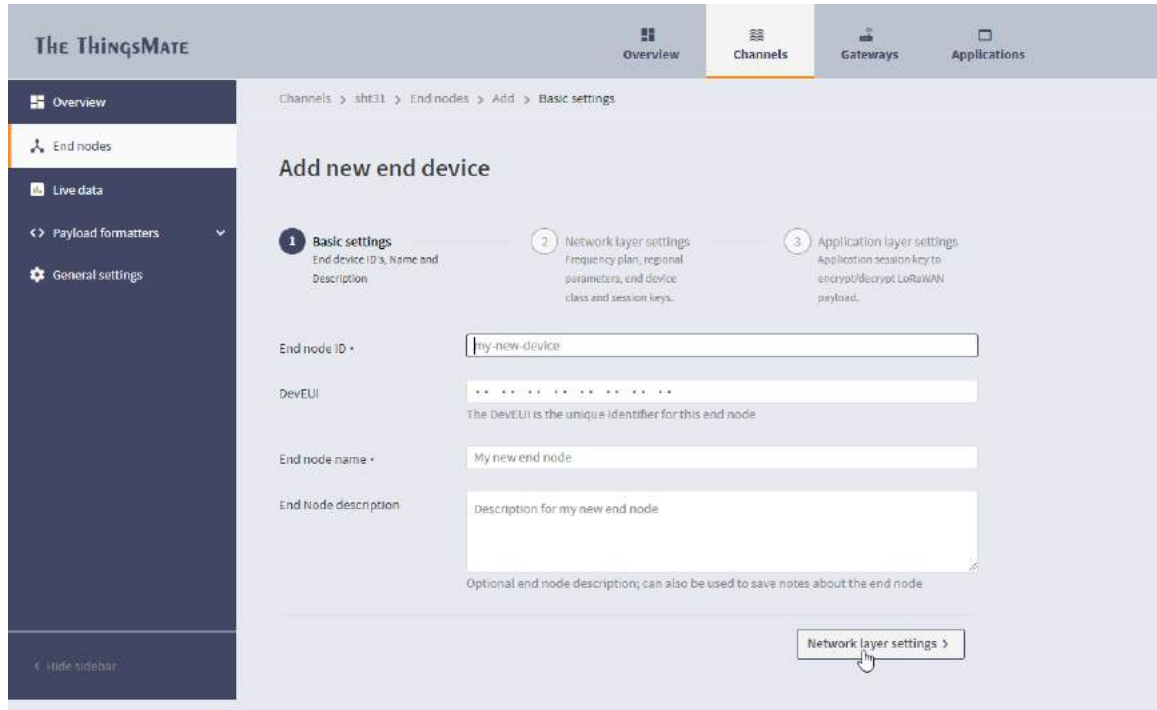
- After creating a Channel, Create an End Node in that channel



- In the end node creation select the activation mode as Activation by personalization (ABP)
- And select the LoRa Version as Mac V1.0.3



- Click Start Enter the required columns

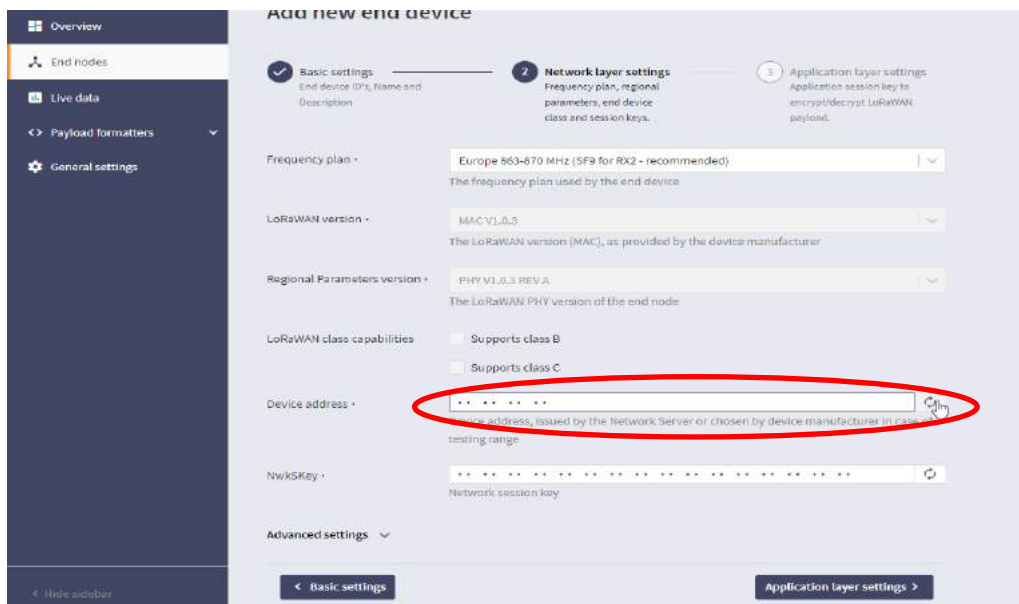


➤ In that End node ID and End node name must should be same

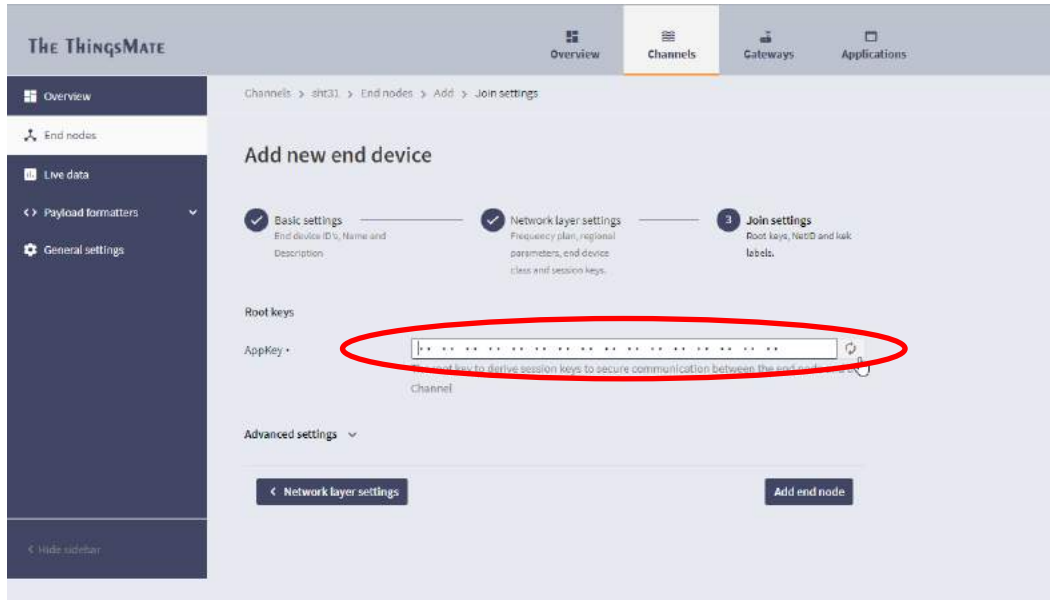
In the Network layer setting set the frequency plan as Indian frequency 865-870MHz

➤ Select the device is a Class B device or Class C device don't select any of those two the device is acting as a Class A

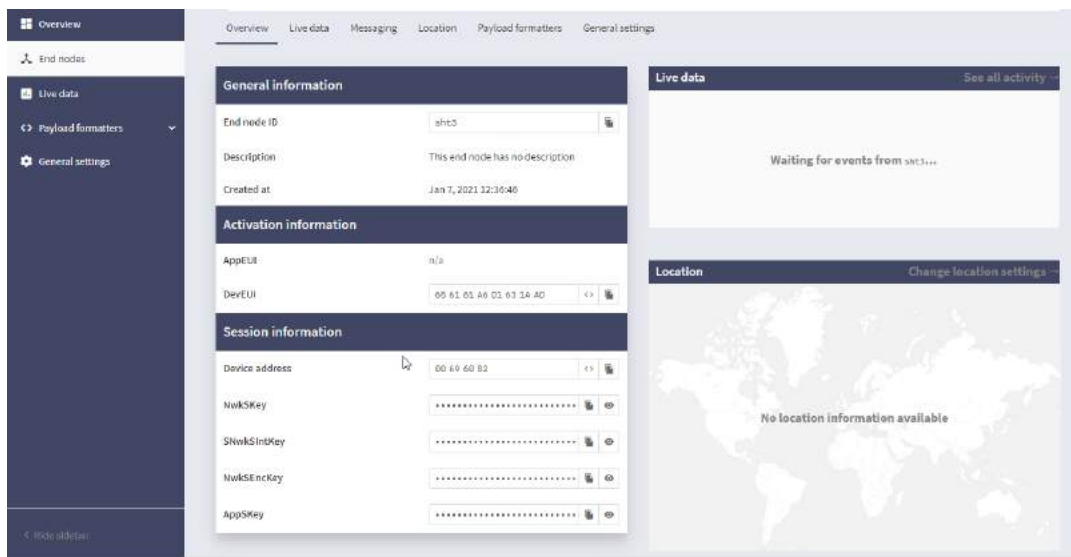
➤ In this if you fill the device address and Network Session key or the keys are automatically generated by the Network server



- After the Network layer settings, go to the Application layer settings
- In that fill the required fields and click add node



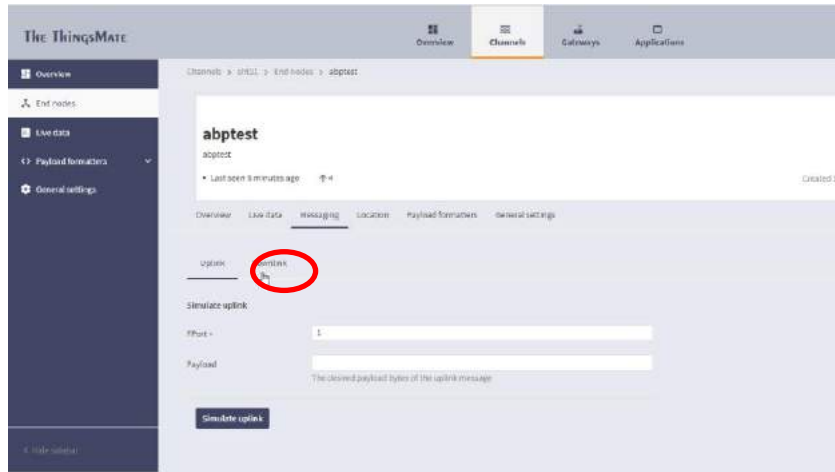
- After creating the end node the server will wait for the data receiving from the node which have the Keys like Application Session Key, Network Session Key, and Device address is same as node



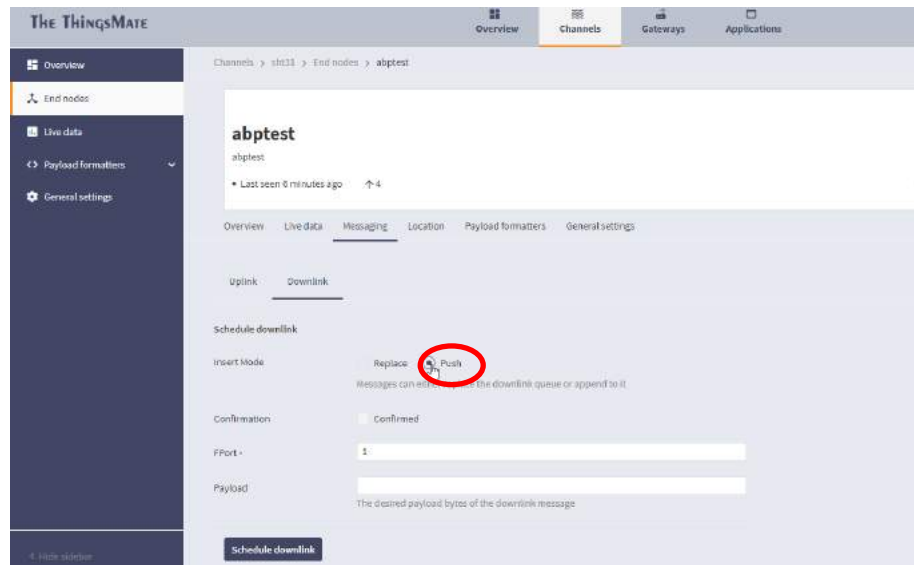
## Annexure IV - DOWNLINK PROCEDURE

### Procedure:

- If the uplink data is received from the node to the Network server after that if you want to control the device with the downlink
- Go to the message->downlink

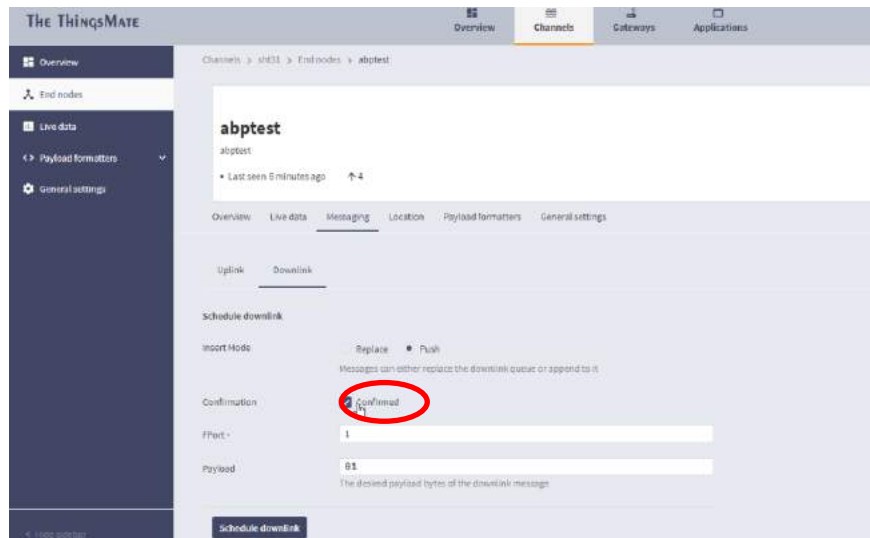


- Select the **push** to send the downlink to the node
- Otherwise, if you want to change the downlink message you select the **Replace** to change the downlink message

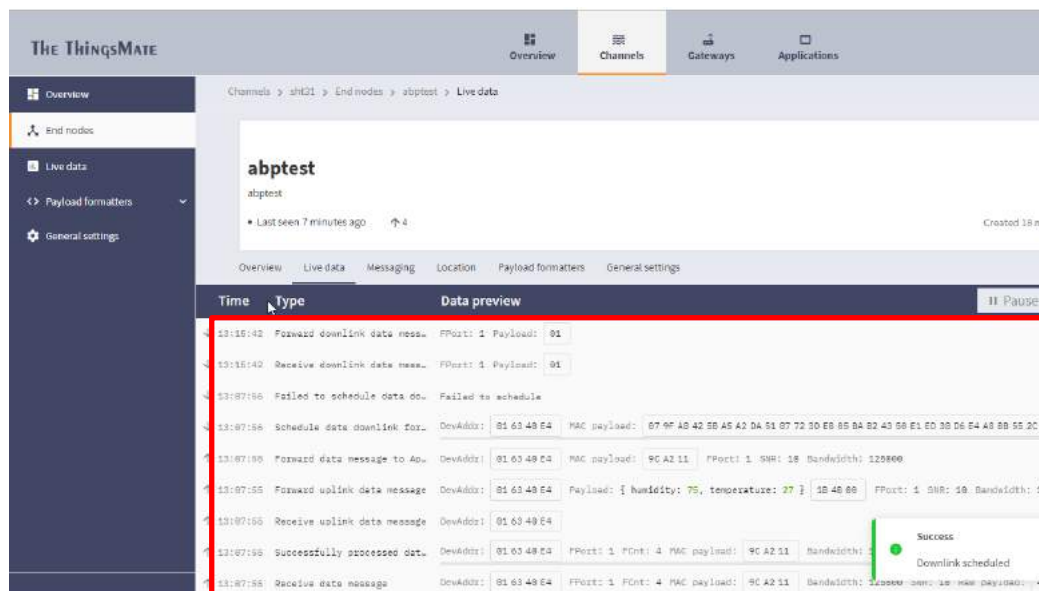




- Always select the **Confirmation** to know that the downlink data is successfully reached the node by responding uplink from the node



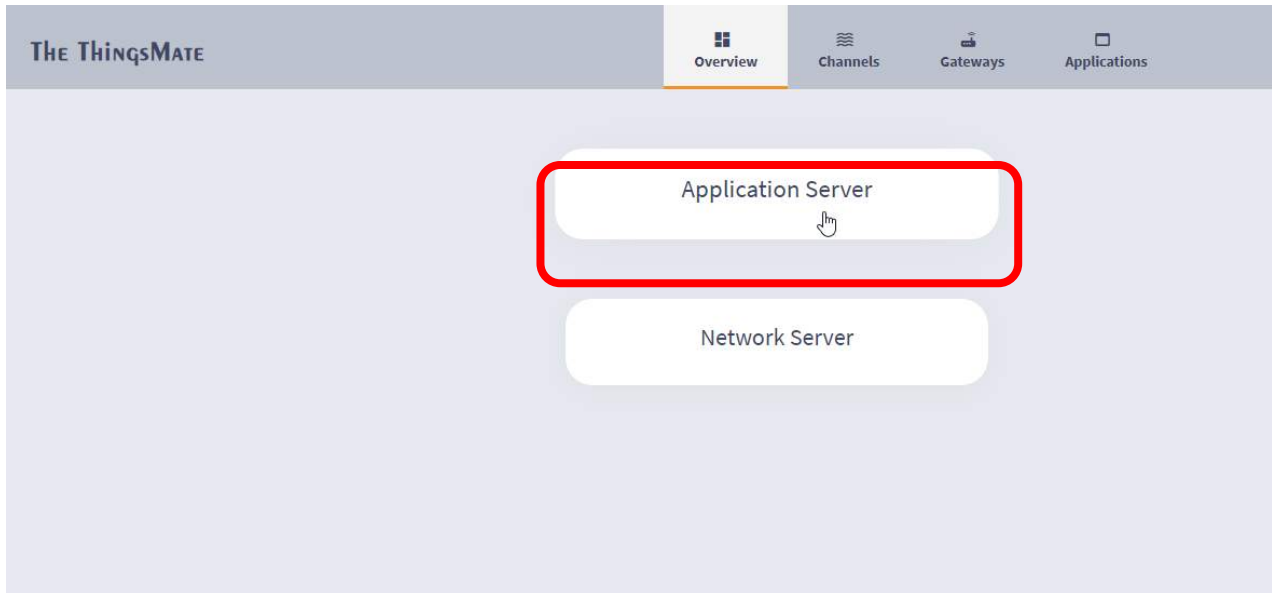
- If the downlink message is received to the node it will send the acknowledgement to the network sever by sending the changed data to the network server



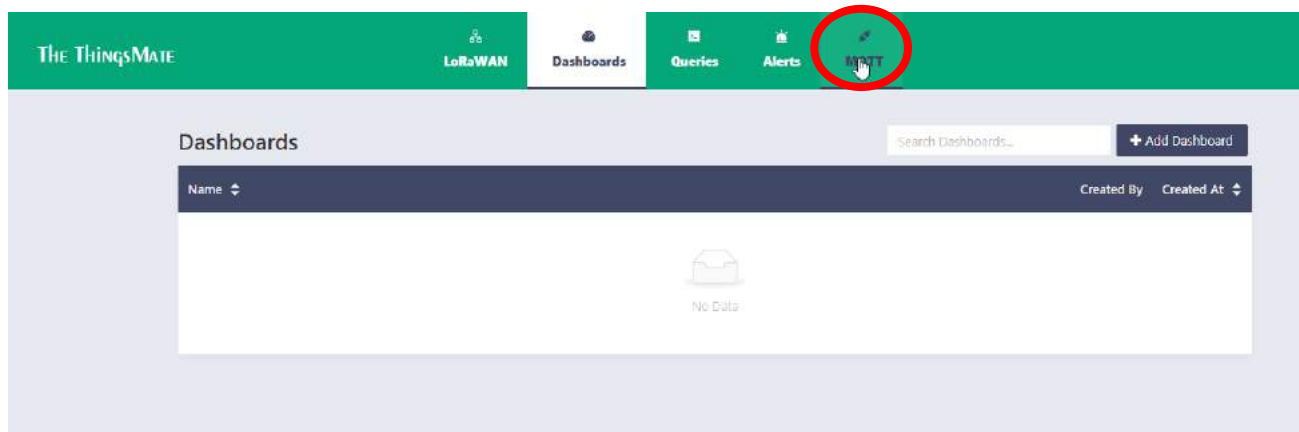
## Annexure V - MQTT

### PROCEDURE:

- Login to the TheThingsMate server Choose Application Server



- Select the MQTT to create a MQTT dashboard



- Create channel to view the MQTT node publishing data in the MQTT dashboard

The screenshot shows a 'New Channel' form. The form has two input fields: '\* Channel ID:' and '\* Channel Name:'. Both fields contain placeholder text: 'Channel ID' and 'Channel Name'. At the bottom right of the form, there are two buttons: 'Close' and 'Save'.

- After creating a Channel you to add the device to register the particular device to view the data in the device dashboard

The screenshot shows a 'New Device' modal window. It contains two input fields: 'Device ID:' with a placeholder 'Device Id' and '\* Device Name:' with a placeholder 'Device Name'. A mouse cursor is positioned over the 'Device Name' field. At the bottom right, there are two buttons: 'Close' and 'Save'.

- The data, downlink and general settings are displayed in the window
- Data is used to view the Publishing data
- Downlink is the message send to node

The screenshot shows the 'light\_control' device dashboard in The ThingsMate. The top navigation bar includes 'LoRaWAN', 'Dashboards', 'Queries', 'Alerts', and 'MQTT'. Below the device name, there are three tabs: 'Downlink', 'Data', and 'General settings'. The 'Downlink' tab is active, showing a 'payload:' input field with the placeholder 'Enter the payload' and a 'Schedule downlink' button.

- General Setting is used to get the User name, Password (as App Key), Publishing Topic, and Subscribe Topic

Downlink   Data   **General settings**

device Id:

Device Name:

API Key:

Publish Topic:

Subscribe Topic:

Device Created At:

- Note: The Publishing Topic and Subscribe Topic in MQTT dashboard and Coding are must be same