Getting Started with TTIG

Salient Features

- An 8 channel LoRaWAN indoor gateway
- One of the first gateways to support the state-of-the-art Basic station Protocol
- Supports LBT.
- Simple setup steps taking lesser than 5 mins.
- Can connect to any network backend of choice.
- Setup and Connectivity over WiFi.
- Can be powered up via a USB-C cable or via an elegant connector to the power outlet.
- Built-in omnidirectional antenna for indoor use.
- EU868, US915, AS923 and CN470 versions available.
- Security via a range of modes.

Activate your gateway in less than 5 mins

- Press the reset button (small button at the back of the gateway next to the USB-C port) for 5 seconds until the LED blinks rapidly GREEN<->RED for a couple of times.
- Hold the SETUP (button at the top of the gateway, next to the LED) for 10 seconds until the LED blinks rapidly in RED.
- The gateway now exposes a WiFi AP whose SSID is MINIHUB-xxxxxx where xxxxxx is the last 6 digits of the gateway ID.
- The password for this network is printed on the back panel of the device under WiFi PW.
- After connecting to this network go to 192.168.4.1 using a web browser to access the WiFi config page.

- Select the WiFi network and enter the password if it's a closed network.
- Select the "Save and Reboot" option.
- If your config is right,
  - The gateway will blink GREEN for a few seconds while it connects to this network.
  - Then, it will blink GREEN<->RED for a few seconds while it connects to the CUPS endpoint and fetches the necessary information to connect to the LNS traffic endpoint.
- If your configuration was successful, the LED will be solid GREEN which means that the gateway is connected to the LoRaWAN network and is ready to handle packets.

Connection to the The Things Network Backend

- To connect this gateway to the The Things Network console, register the gateway using the I'm using the Legacy Packet Forwarder option.
- The EUI of the gateway is NOT the WiFi MAC address printed on the back of the gateway but is derived from the first number on the top of the sticker below the QR code.
    - This number can also be obtained from the WiFi Setup Page

- To derive this take the code for example *5BA0CB80042B* and insert *FFFE* to after the first 6 characters to make it a 64bit EUI such as *5BA0CBFFFE80042B*
- This is the value to be entered in the Gateway ID field on the console.
- Enter in other details such as location, frequency plan and router.
- If your configuration was successful, you should start receiving packets (if there are LoRaWAN nodes transmitting nearby).

Operating Modes

Configuration Mode (CONF)

• In this mode, the device acts as a WiFi AP to which users can connect and configure a WiFi network(s) to which the gateway will connect to during normal operation. The device cannot route LoRaWAN packets in this mode.

Gateway Mode (GW)

• In this mode, the device acts as a gateway to route traffic between the LoRaWAN Device and the Network. The WiFi AP for configuration is not available in this mode.

LED states

Color(s)	Illuminating Pattern	Operating Mode	Meaning
GREEN	Blinking (freq 1 sec)	GW	WiFi not connected (or trying to connect)
GREEN	Blinking (freq 1/4 sec)	GW	Connected to WiFi, establishing connection to LNS/Configuring radio
GREEN	Solid	GW	Connected to WiFi, connected to LNS backend, listening for Packets
GREEN/RED	Alternate Blinking (freq 1/4 sec)	CONF	Scanning WiFi networks, setting up Config AP
RED	Blinking (freq 1/4 sec)	CONF	Config AP Active

Button Actions

There are three possible button actions on the TTIG

- SETUP Button pressed for 10s:
    - Switch to CONF mode if in GW mode.

- SETUP Button pressed for 5s:
    - Reboot if in CONF mode, do nothing in GW mode.

- RESET Button pressed for 5s:
    - Factory reset (wipe out WiFi and LNS credentials, though CUPS credentials are retained).

Getting Started with AWS

This integration brings LoRaWAN to AWS IoT: sync thing registry, sync thing shadows, act on uplink messages and send downlink messages.

Syncing the thing registry allows you to manage LoRaWAN devices in AWS IoT: devices are created and updated in The Things Network. Syncing thing shadows enables reporting shadow state from uplink messages and sending downlink messages from shadow delta updates. Finally, uplink and downlink messages are available on AWS IoT MQTT so you can store messages in DynamoDB, invoke Lambda functions and many more.

This integration runs in your AWS account and security context and can connect to The Things Network public community network and private networks.

Quick Start

This guide will walk you through setting up the AWS IoT integration using CloudFormation: an easy process to configure one of the most advanced integrations for The Things Network.

1. Log in to the AWS Management Console
2. Click on your region to create a new stack in that region: 🇺🇸 us-west-2, 🇪🇺 eu-west-1, 🇸🇬 ap-southeast-1

- Enter a **Stack name**, for example `ttn-app`
- Enter the **App ID** and an **App Access Key** of your application in The Things Network
- Enter an **Environment Name** for Elastic Beanstalk, for example `ttn-app`
- If you are using a private network, change the **Account Server** and **Discovery Server** to the endpoints of your private network
- Select an existing EC2 KeyPair in **SSH Key** to access the EC2 instance.

*Note: The **App Access Key** that you enter should at least have the messages and devices rights.*

Example parameter:

Details

Stack name	ttn-integration

Parameters

The Things Network Settings

App ID	johan-dev	App ID
App Access Key	ttn-account-v2.ey5eQ4cqS4dCVSMsELtz4G3	App Access Key
Account Server	https://account.thethingsnetwork.org	Account Server address
Discovery Server	discovery.thethings.network:1900	Discovery Server address

AWS Elastic Beanstalk Settings

Environment Name	johan-dev-demo	Elastic Beanstalk environment name
Instance Type	t2.micro	EC2 instance type
SSH Key	johan@thethingsnetwork.org	
	Name of an existing EC2 KeyPair to enable SSH access to the instance	

AWS IoT Settings

Enable Syncing Things	true	Enables AWS IoT things synchronization and thing shadow deltas
Sync Interval	10m	Interval for AWS IoT things synchronization
Thing Type Name	lorawan	AWS IoT thing type name. Requires AWS IoT things synchronization
LoRaWAN FPort	1	LoRaWAN FPort for thing shadow delta downlink messages. Requires AWS IoT things synchronization

3. Review your settings and check the **I acknowledge** box to acknowledge that resources for the integration may be created in your AWS account.

4. Click **Create** to initiate the creation of the stack

5. After a coffee break of about six minutes, you will see two new stacks:

Filter: Active ▾	By Stack Name	
Stack Name	**Created Time**	**Status**
☑ awseb-e-cgdc5kp6pr-stack	2018-01-10 21:30:02 UTC+0100	CREATE_COMPLETE
☐ ttn-johan-dev	2018-01-10 21:27:26 UTC+0100	CREATE_COMPLETE

The `awseb-...` stack is an AWS Elastic Beanstalk stack that is created as part of the stack of the integration process.

🎉 You have now successfully configured the AWS IoT integration!