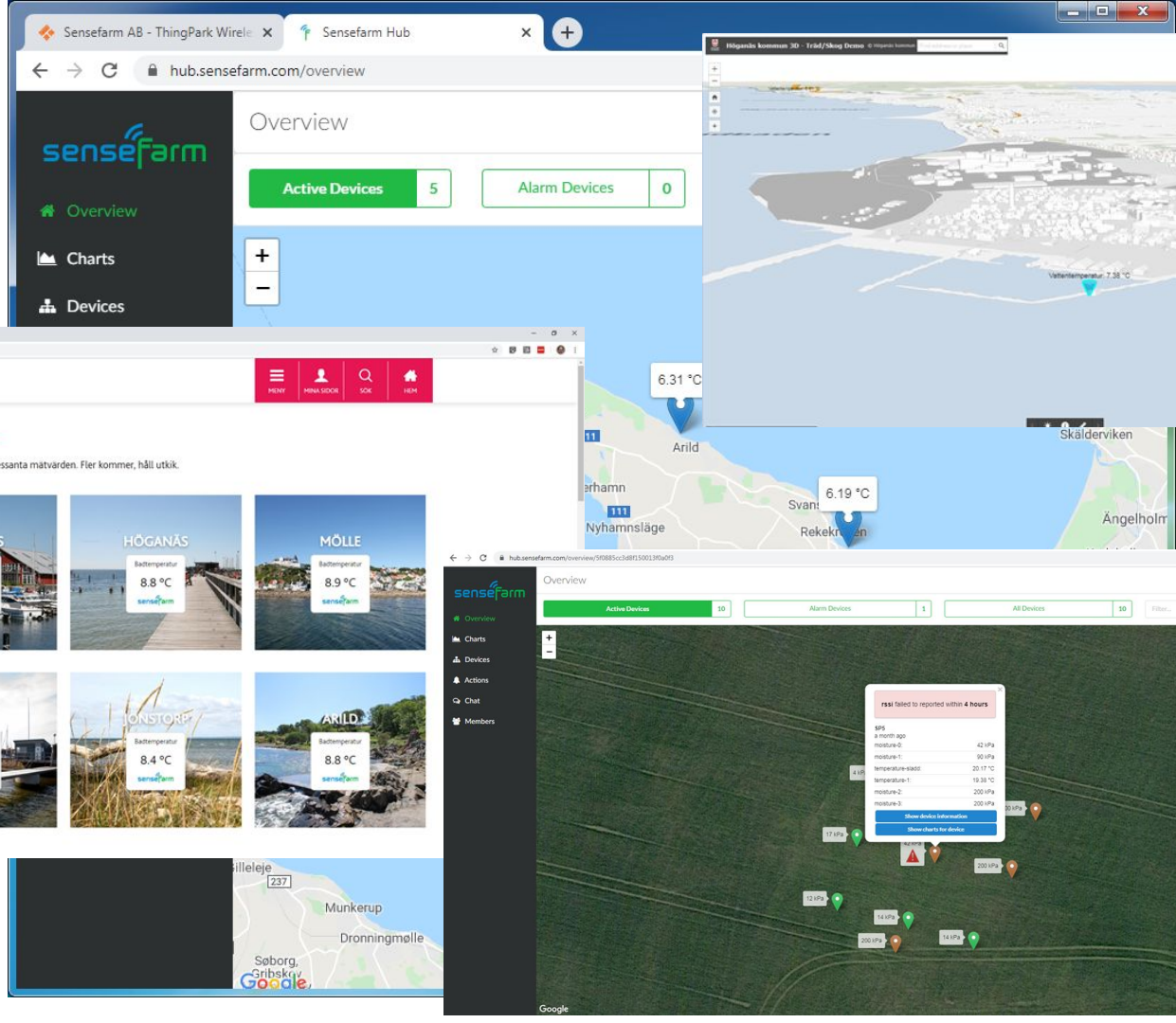
LoRaWAN server configuration

towards hub.sensefarm.com

Example usage of the CUBE02 sensor serie

with different LoRaWAN servers and operators



Content

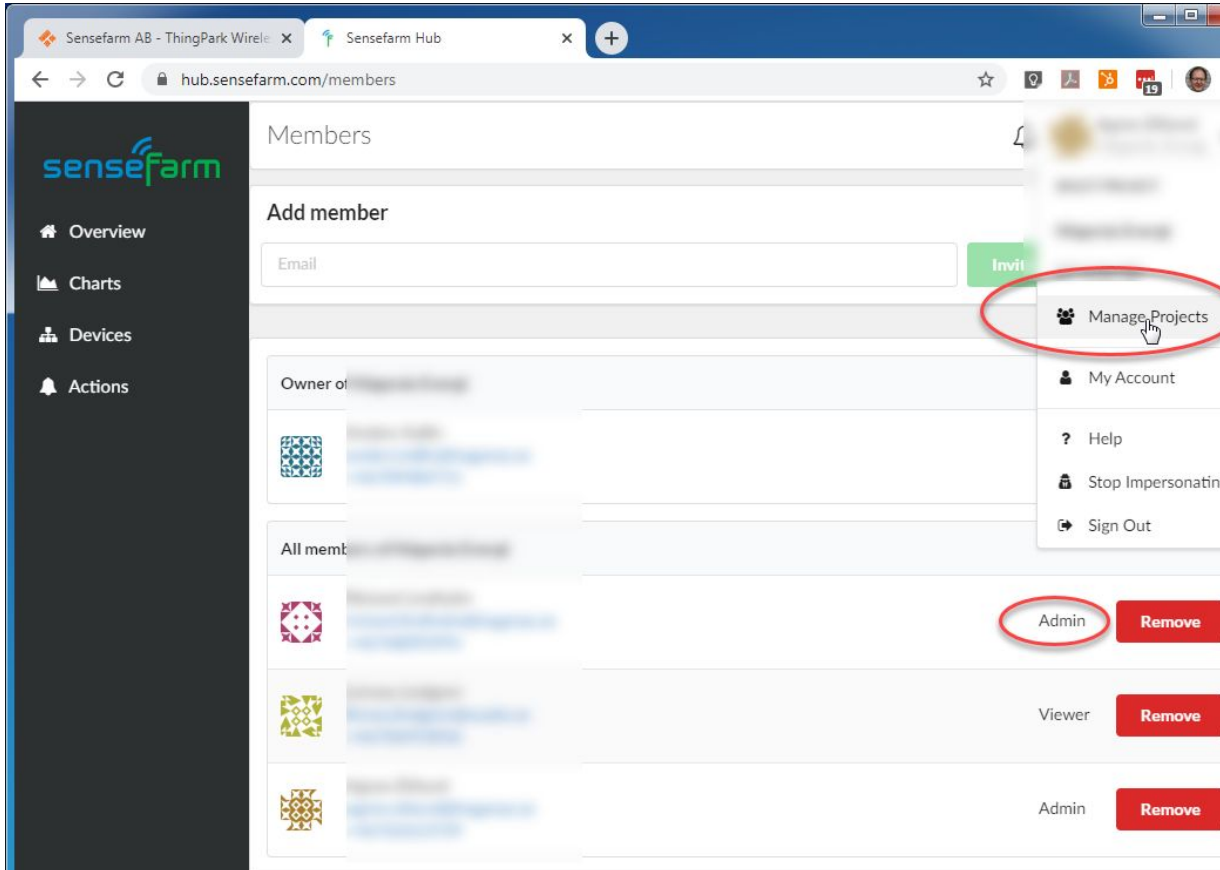
- Locating the encryption keys for Sensefarm products
  - https://hub.sensefarm.com
- Actility
  - https://stadshubb.thingpark.com/portal/web/
- Talkpool
  - https://apps.talkpool.com/
- Netmore
  - https://portal.blink.services/home
- Chirpstack
  - https://www.chirpstack.io/
- Ygg.io (version 2 and 3)
  - https://ygg.io
- The Things Network
  - https://account.thethingsnetwork.org/

Locating device encryption keys - 1 of 2

Keys are printed on the lid of the device

They are easier to copy from Hub.sensefarm.com

Project roles needed for access to keys: Owner, Admin



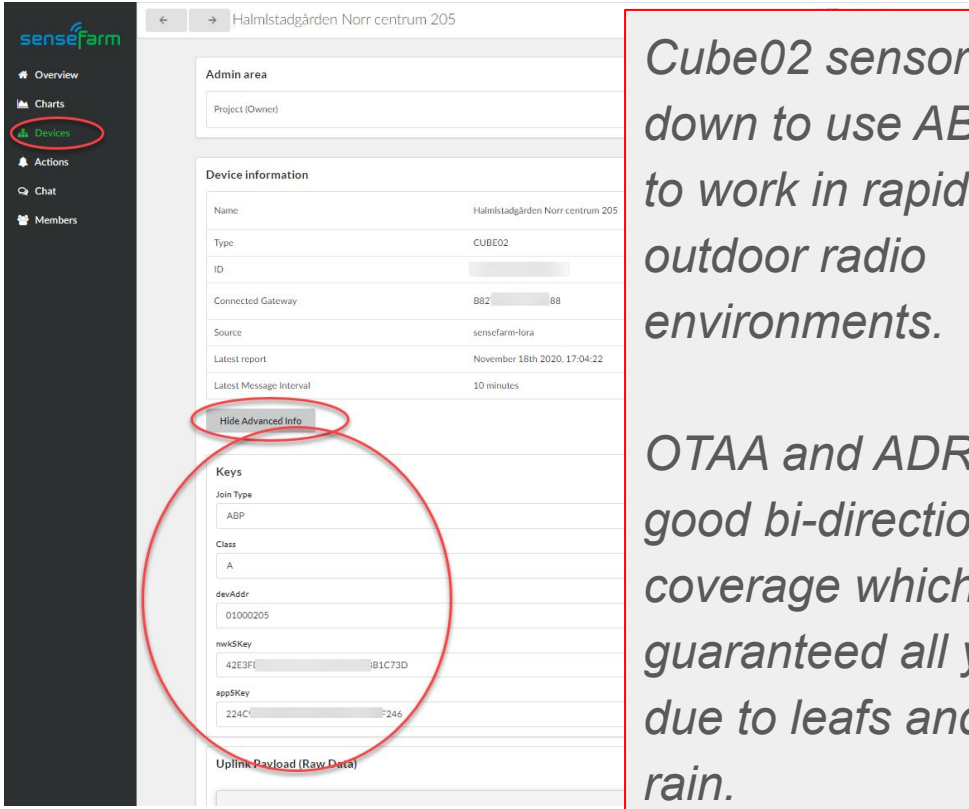
Locating device encryption keys - 2 of 2

Hub.sensefarm.com

Find device
Press Edit

Settings needed for ABP

devEUI
devAddr
appSkey
nwkSkey



Cube02 sensors are locked down to use ABP and SF12 to work in rapidly changing outdoor radio environments.

OTAA and ADR requires good bi-directional radio coverage which can not be guaranteed all year around due to leafs and sudden rain.

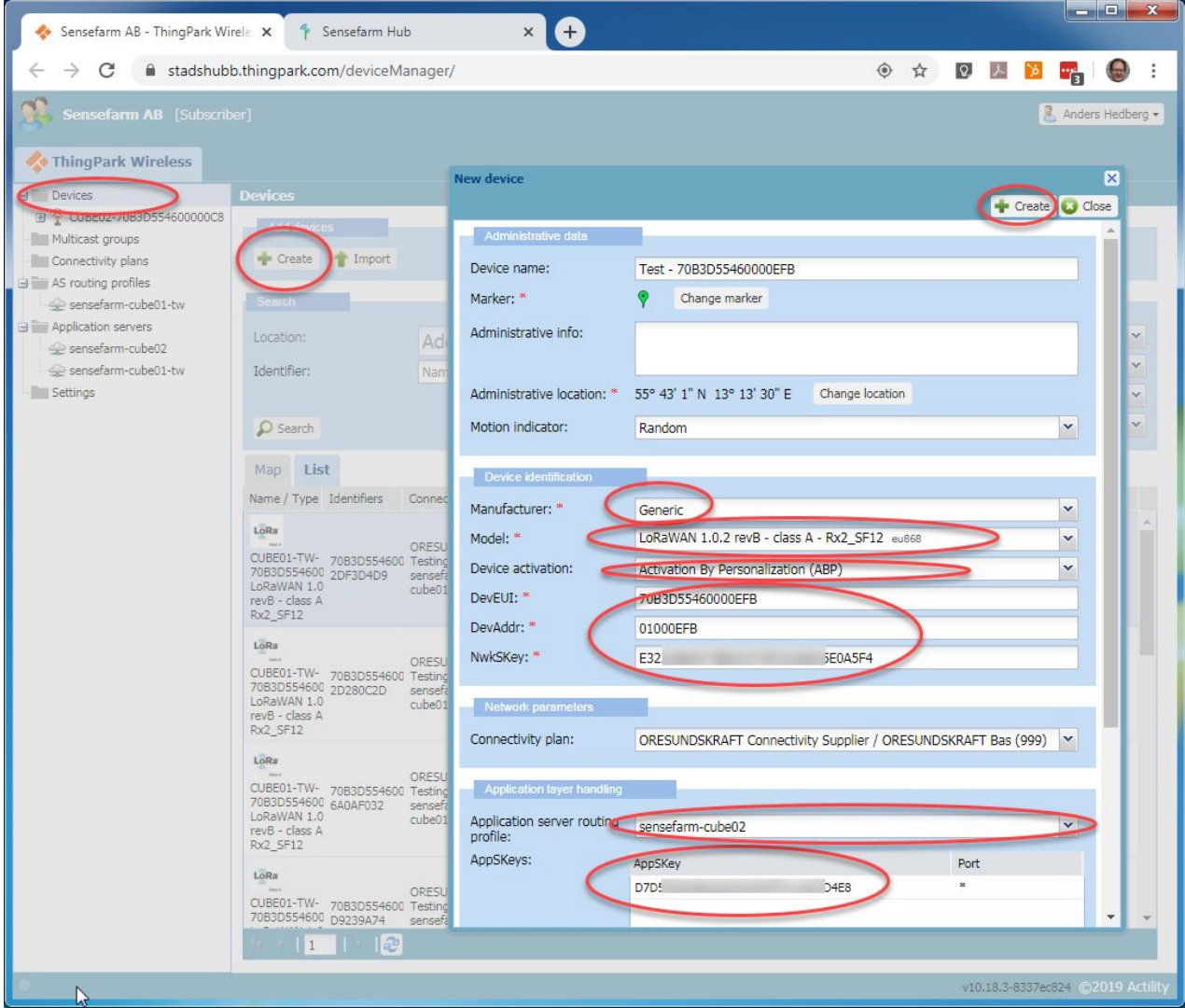
Actility configuration

https://stadshubb.thingpark.com/portal/web/

Adding a device

Manufacturer - Generic
Model - very important to get correct, many similar variants:

LoRaWAN 1.0.2 rev B
Class A
Rx2_SF12
eu868

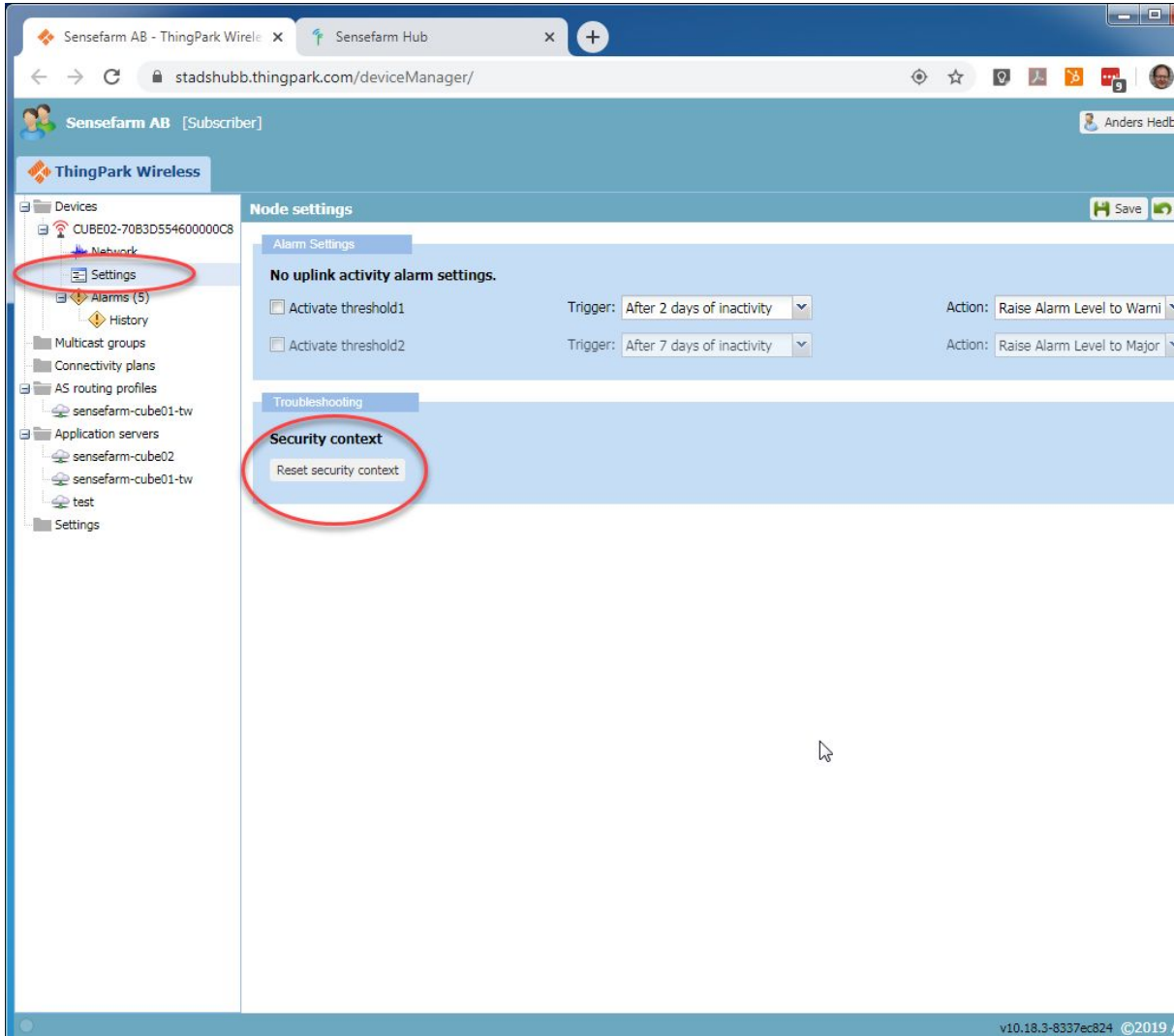


Security

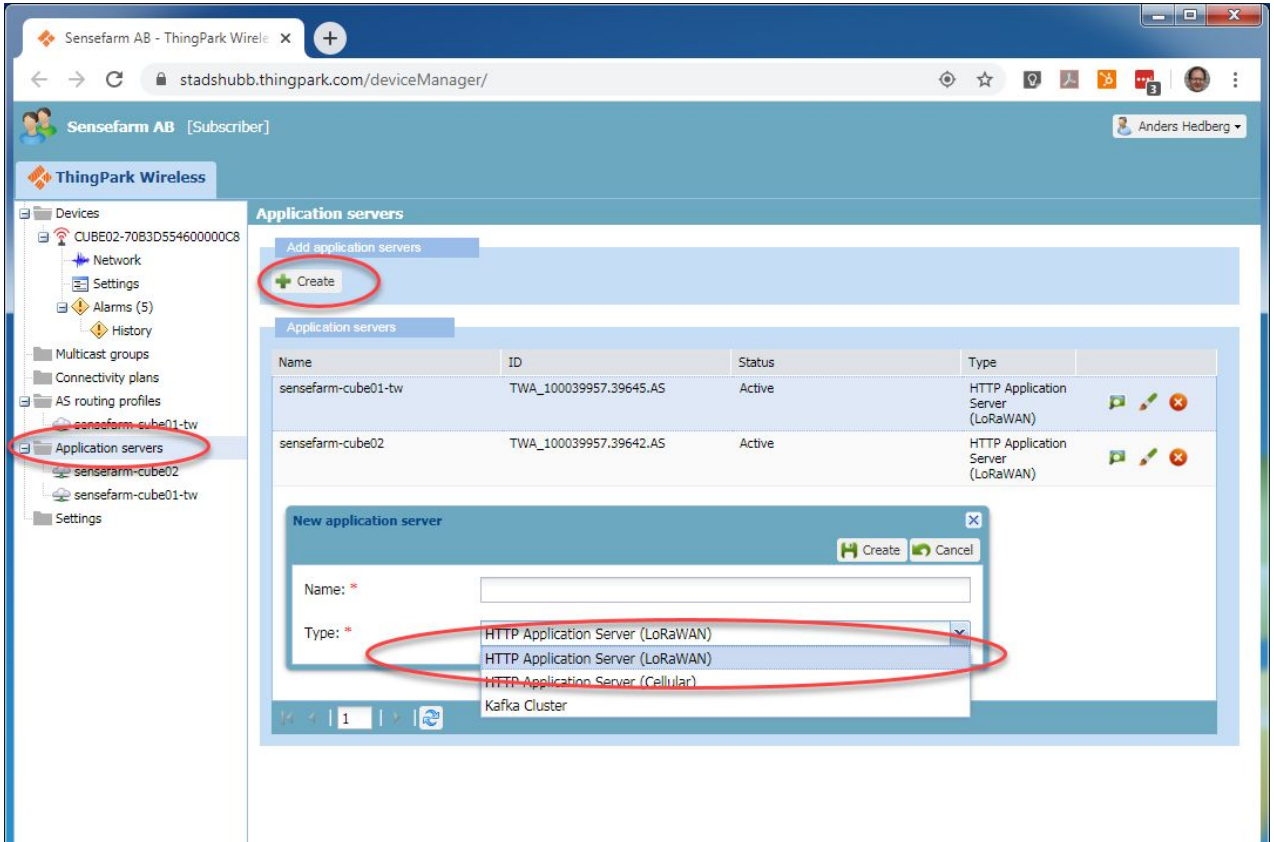
The device frame counter used by the crypto inside the device is reset to Zero upon reset (press internal black button) of CUBE01 and CUBE02
(Should be done when battery is changed)

Thus options such as “Disable frame-counter validation” should be set on all LoRa-WAN servers for easy operation.

Actility has a button called “Reset security context” for this.



Set up connection to hub.sensefarm.com - 1 of 2



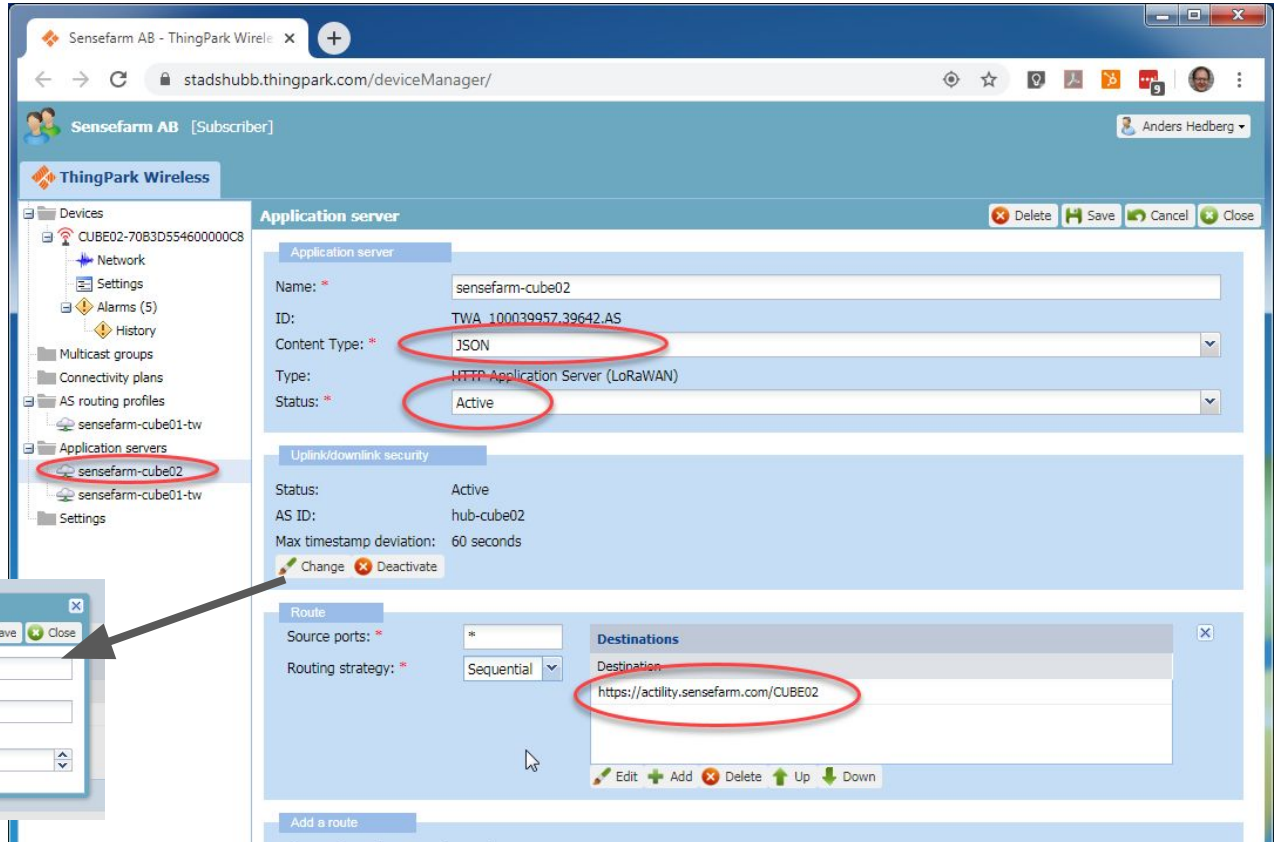
Set up connection to hub.sensefarm.com - 2 of 2

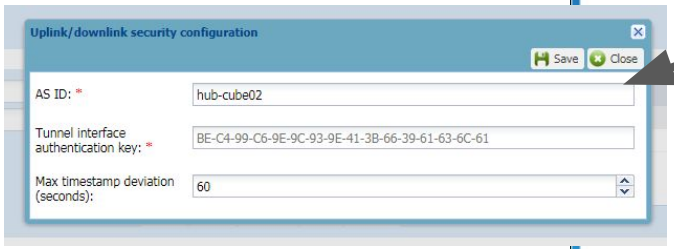
Currently implemented API's -

https://actility.sensefarm.com/CUBE02
https://actility.sensefarm.com/CUBE01-TW

Use the correct one for the devices you have. CUBE version is printed on device label and available on hub.sensefarm.com device page under "Factory defaults".

The "Tunnel interface authentication key" is Available for customers upon request, but turned off by default.



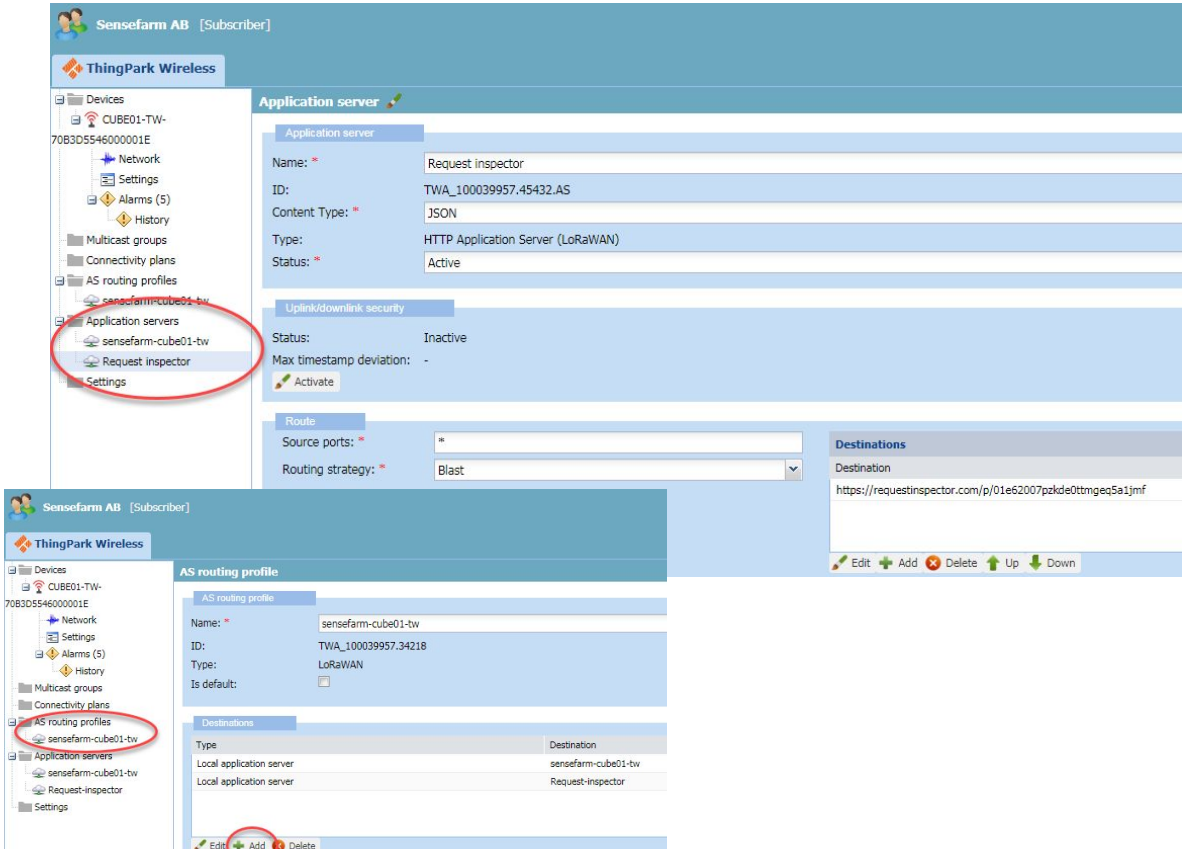


Feeding sensor data to multiple applications from Actility

Only needed if sensor packets should be sent to more services than hub.sensefarm.com (requestinspector.com is a nice debugging tool as an example)

Add an extra application server.

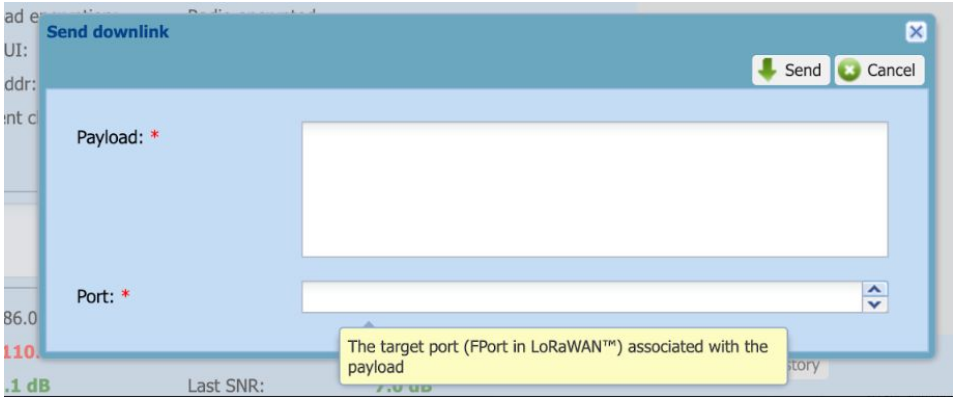
Add the application to the routing profile used.



Sendind downlink data

Downlink messages can change the update interval. Some pre-defined values can be found on this link - https://github.com/Sensefarm/protocols/blob/master/Sensefarm-LPP.md#downlink-pre-defined-example-messages

Cube02 does not care about Fport, so set it to 1.



Talkpool configuration with hub.sensefarm.com

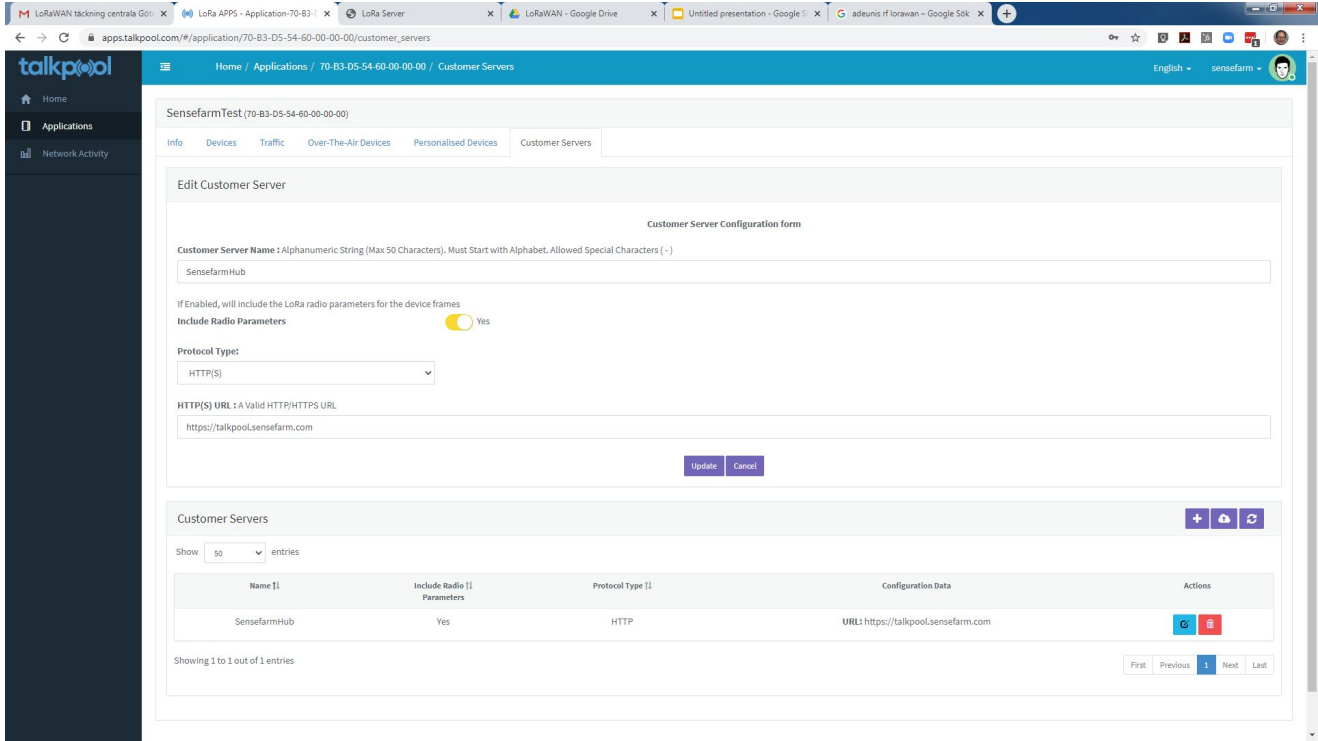
https://apps.talkpool.com/

Talkpool

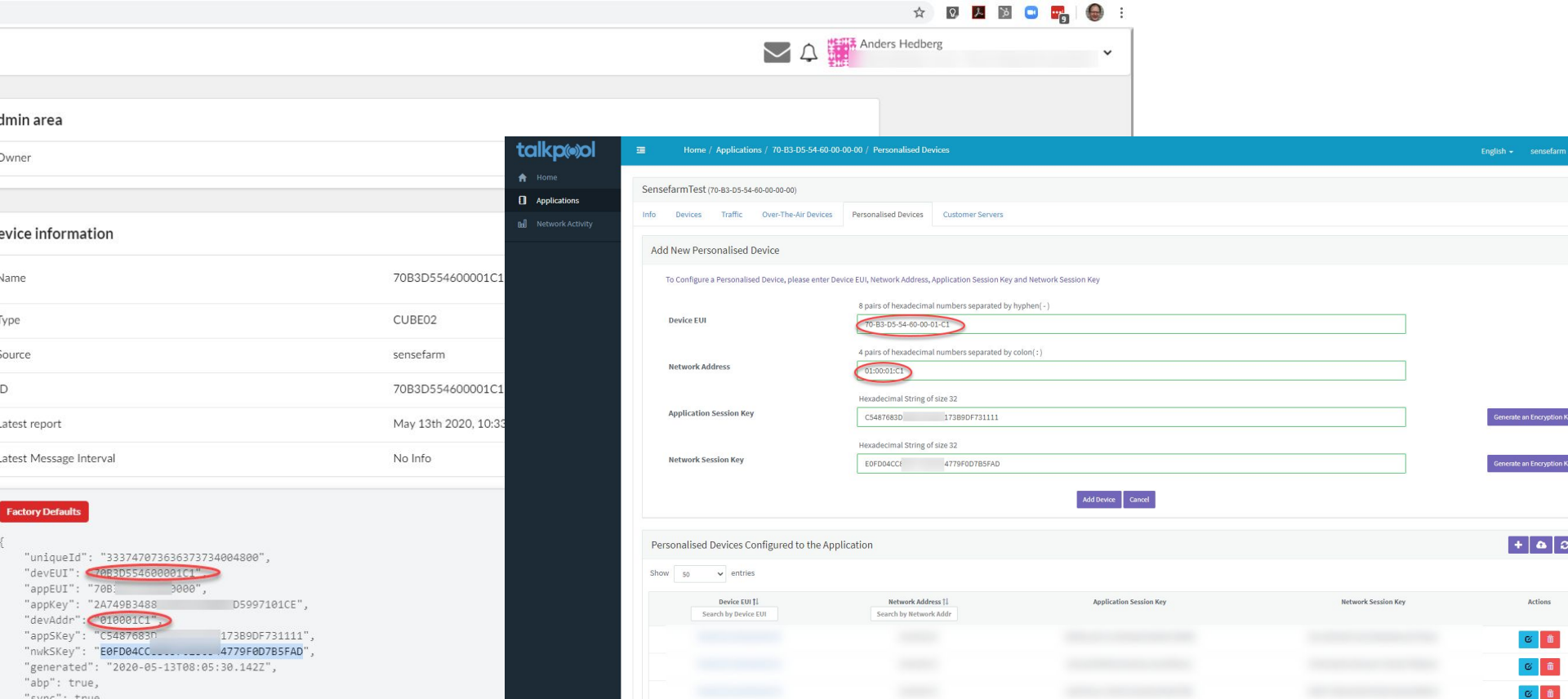
apps.talkpool.com

Https URL:
https://talkpool.sensefarm.com

Include radio parameters = Yes

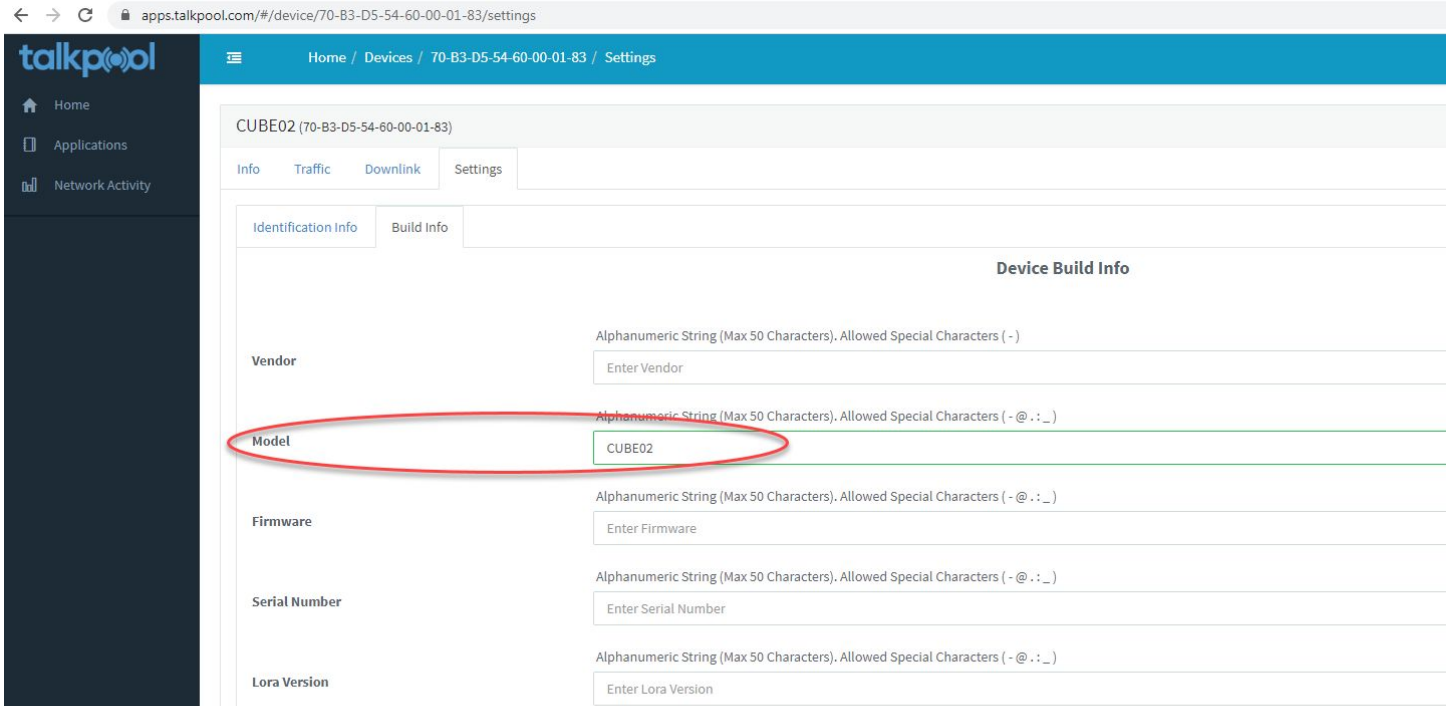


Talkpool - Adding a device.
":" "-" must be inserted into EUI and Address fields



Talkpool

Devices must be tagged “CUBE02” for hub.sensefarm.com to accept them.



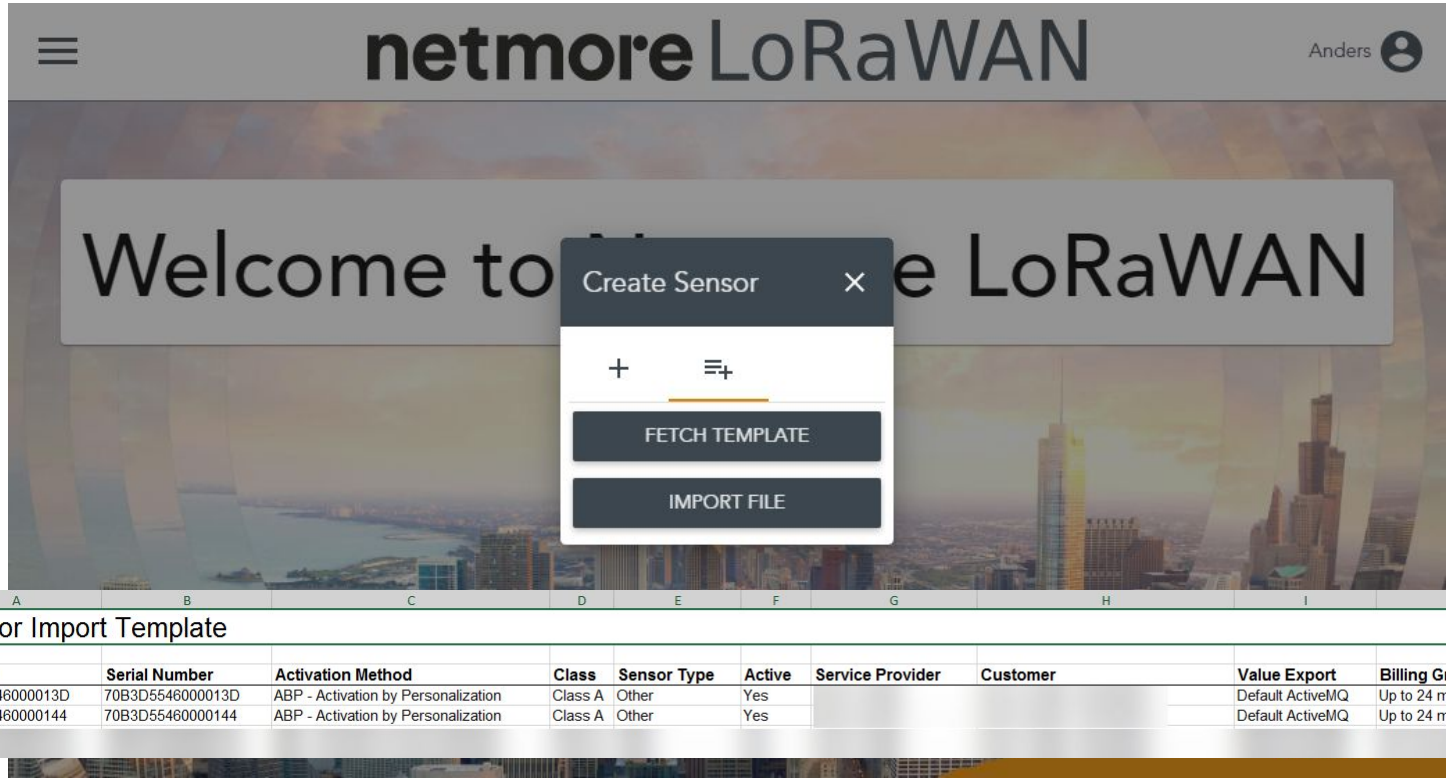
Netmore configuration with hub.sensefarm.com

https://portal.blink.services/home

We really recommend the batch creation

Do one sensor manually, check that it works. ***Some hidden values can only be set by Netmore support!***

Then do the batch creation:
Create Sensor, Select batch, Fetch the template, Open it in excel, Fill it with values, re-import

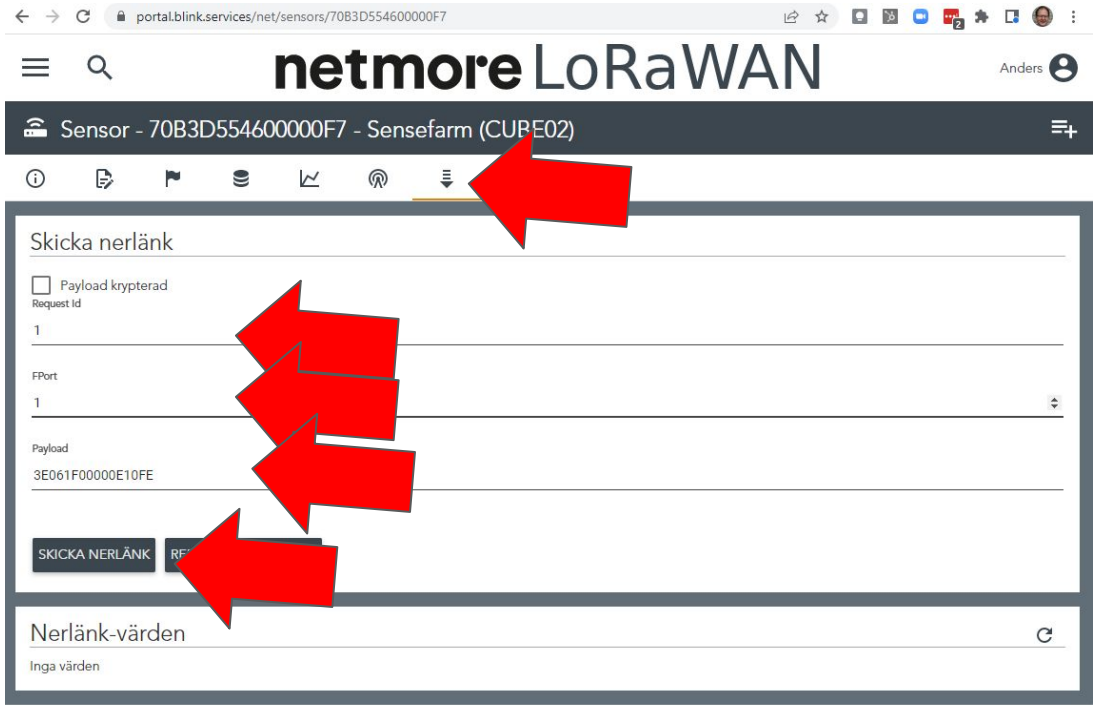


	A	B	C	D	E	F	G	H	I
1	Sensor Import Template								
2									
3	DevEUI	Serial Number	Activation Method	Class	Sensor Type	Active	Service Provider	Customer	Value Export
4	70B3D5546000013D	70B3D5546000013D	ABP - Activation by Personalization	Class A	Other	Yes			Default ActiveMQ
5	70B3D55460000144	70B3D55460000144	ABP - Activation by Personalization	Class A	Other	Yes			Default ActiveMQ
6									

Downlink changes of timing

Downlink messages can change the update interval. Some pre-defined values can be found on this link - https://github.com/Sensefarm/protocols/blob/master/Sensefarm-LPP.md#downlink-pre-defined-example-messages

Cube02 does not care about Fport, so set it to 1.



Transfering data to hub.sensefarm.com

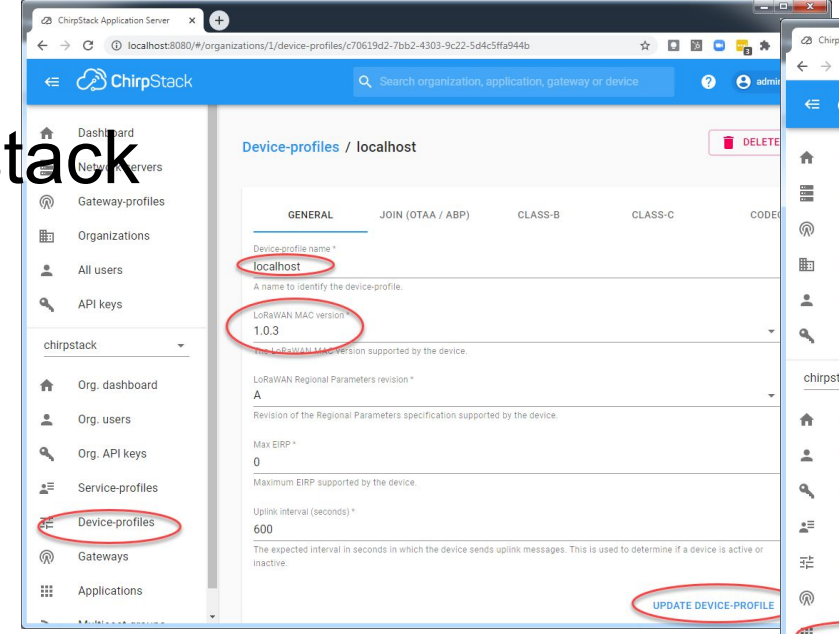
For a new customer that wish to use hub.sensefarm.com with their own account at the Netmore Lorawan portal, a new MQTT topic must be set up by the Netmore support team.

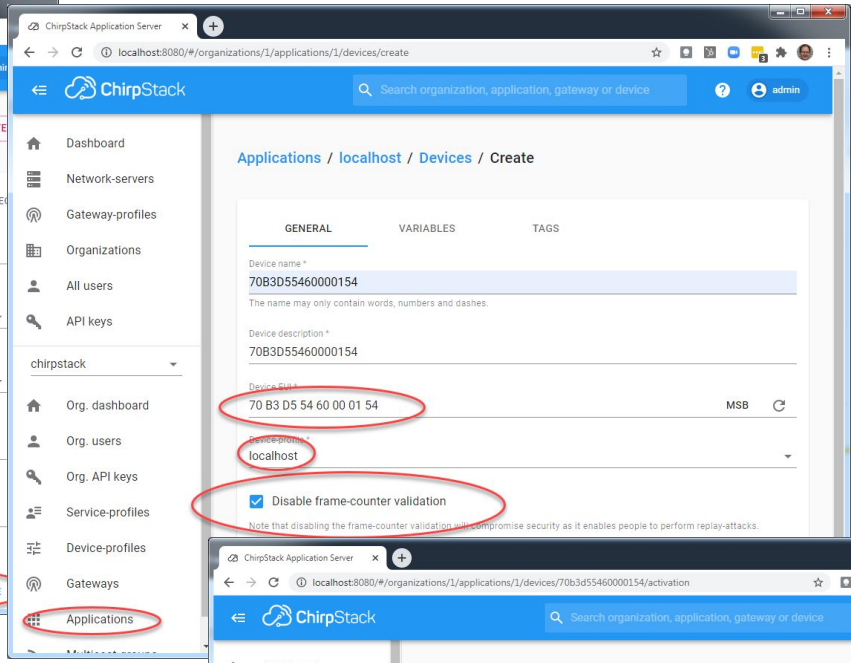
Sensefarms mqtt-data-account must also be allowed to listen to the new topic, so please contact Sensefarm to work this out with the Netmore Support.

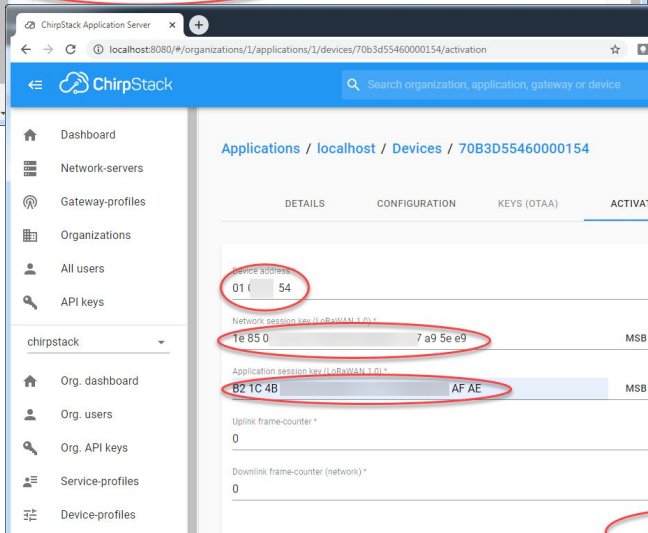
Chirpstack

https://www.chirpstack.io/

Chirpstack







Create a device profile

1.0.3 protocol (or less)

Application

Mark “Disable frame-counter-validation” !

Activation-tab will show for ABP keys entering

Yggio

https://ygg.io

Yggio version 2

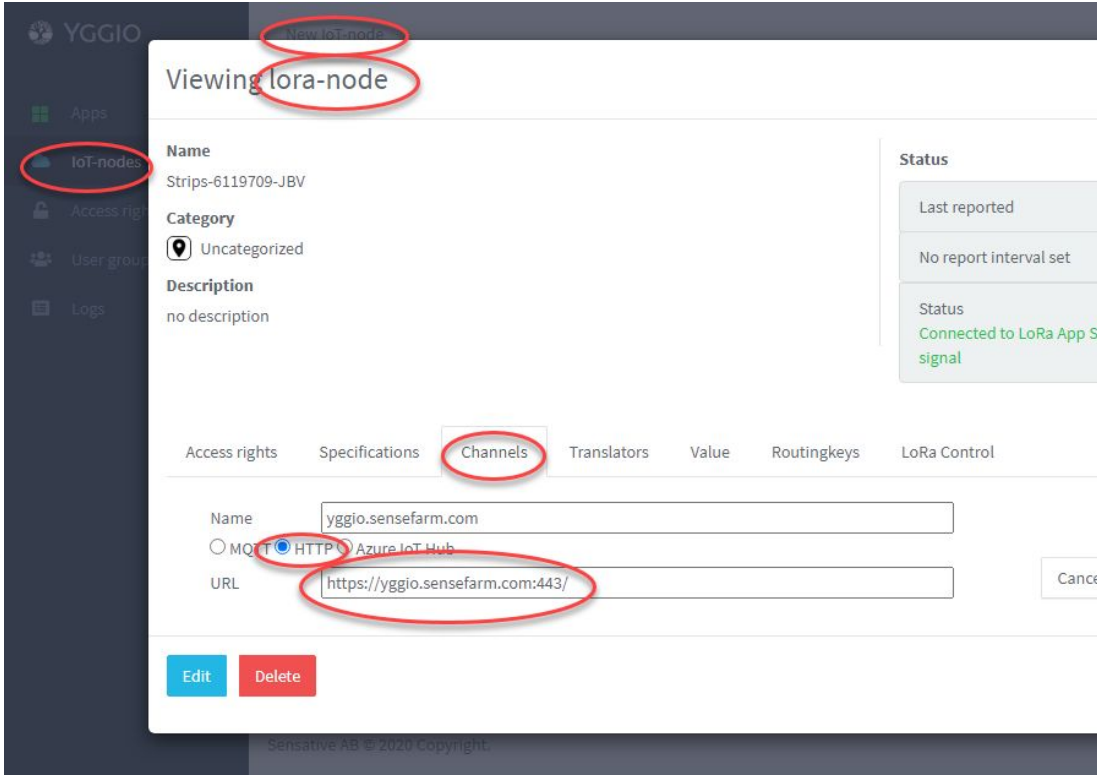
Select IoT-nodes

Press “New IoT-node” at the top of the screen and follow the wizard. Device model name is “sensefarm-cube02-sm”

Select the new node from the list.
Obs! There is a translated xxx(simple-lora-node) Do not select that node as we need the raw data!

Select Channels
Select HTTP

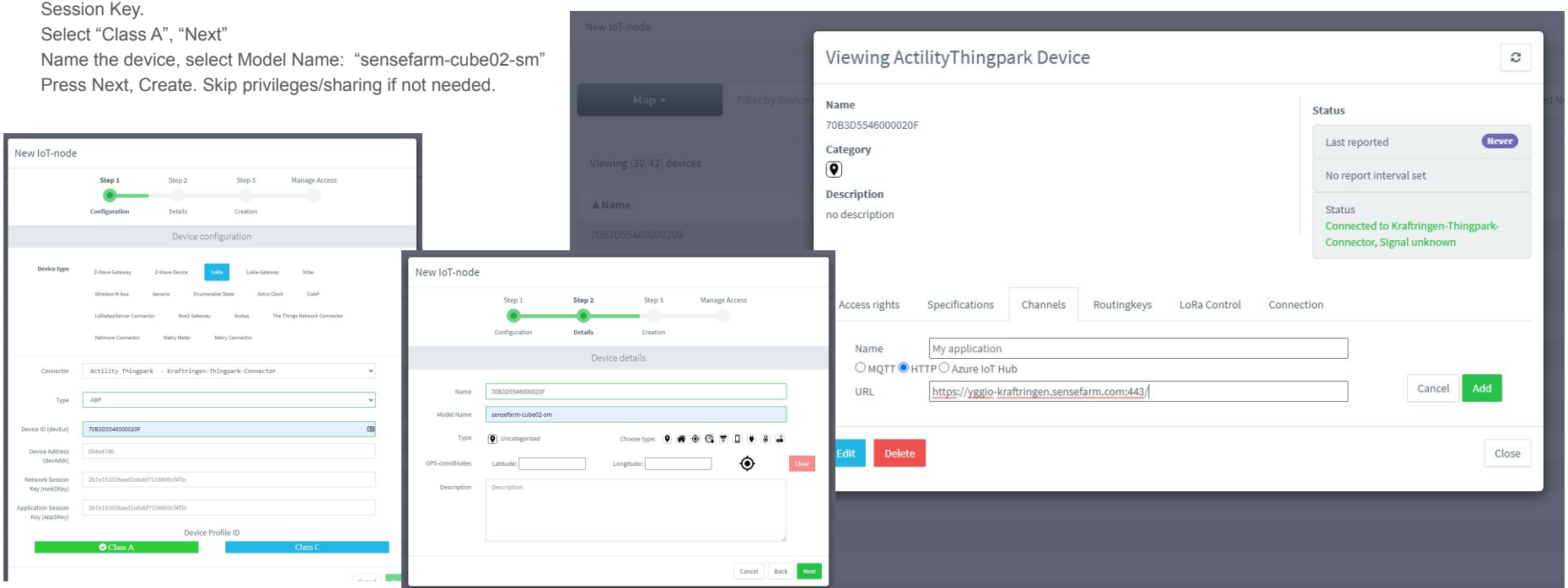
Enter URL:
https://yggio.sensefarm.com:443/



Yggio version 3 (https://kraftringen.yggio.net)

Login, click “New IoT node” (it’s not marked as a button)
Select “Lora”, “Actility Thingpark”, “**ABP**”
Enter correct values (found on hub.sensefarm.com -> Devices->Edit->Show Advanced Info) for Device ID, Device address, Network Session Key, Application Session Key.
Select “Class A”, “Next”
Name the device, select Model Name: “sensefarm-cube02-sm”
Press Next, Create. Skip privileges/sharing if not needed.

Once created, do...
Select the node again from the list.
Select “Channels”->”HTTP”
Enter “https://yggio-kraftringen.sensefarm.com:443/”



The Things Network

https://console.thethingsnetwork.org/

The Things Network

CUBE series of devices

The Cube-02 DevAddr can not be configured from the web-interface.

The TTN command line tool is needed, please check out "ttnctl devices set" on this page

https://www.thethingsnetwork.org/docs/network/cli/api.html

The TTN CLI tool can be downloaded from https://www.thethingsnetwork.org/docs/network/cli/quick-start.html

Hub.sensefarm.com

For connecting to hub.sensefarm.com, please contact info@sensefarm.com