

# RFSee

Advies

Training

Consultancy

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# helium

Gold diggers and collateral coverage

*November 5, 2020 - LoRa IoT network in Apeldoorn meetup*

**RFSee**

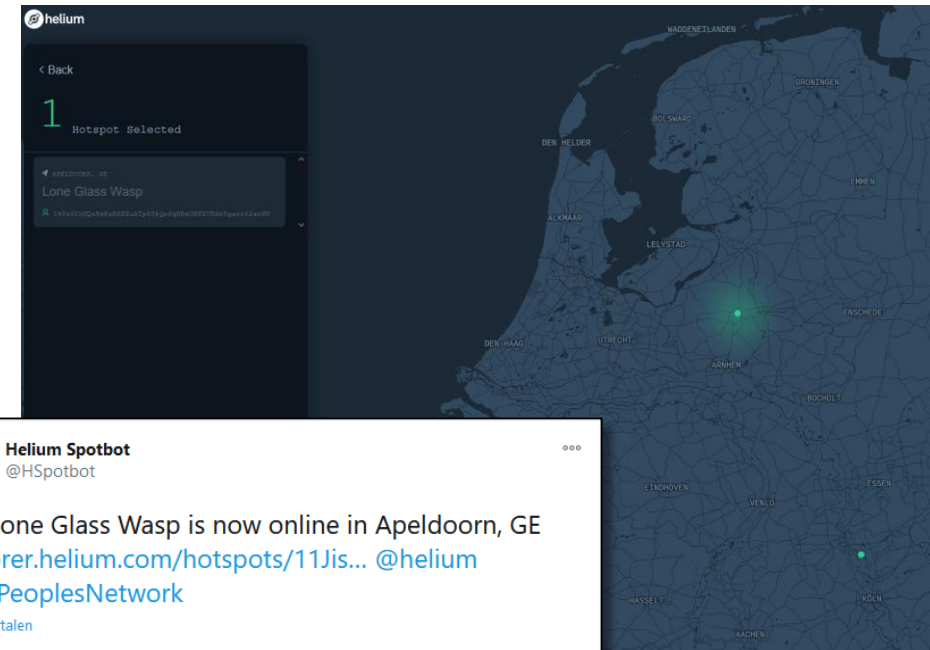
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# My Helium exploration efforts

- Early 2020, start following Helium development
- March, setup miner using UDP LoRaWAN gateway
- May, introduction of EU frequency support for miners
- May, node communicate over Helium!
- June, ordered Helium Hotspot
- Sep, Alpha trial, add 2 miners to blockchain
- Sep, delivery Helium Hotspot





# Helium overview

- US origin
- Founded in 2013, to *do IoT networking different, better!*
- Until 2016 Helium has received a total of \$38 million in seed
- *Decentralized* infrastructure with a new *blockchain*
- Developed the *LongFi* protocol *as the better alternative*
- Silently moved to *LoRa* and *LoRaWAN* early 2020
- June 2020: expand to EU.
- Hotspot deployment: November 2019: 1000, February 2020: 3000, October 2020: 10.000





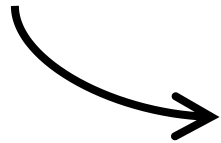
# Helium overview

- Purpose-built blockchain handles network security, microtransactions, and packet routing
- Helium Hotspots (gateways) get rewarded \$HNT for delivering *proof of coverage* to a new blockchain.
  - Hostpots communicate with each other over the air to verify and proof coverage through challenge, response and witnessing.
- Devices pay transaction fees in Data Credits (DC) for transferring data through the network.
- DC's are created by "burning" \$HNT.  $1 \$HNT = 100,000 DC$



# Helium overview – Hotspot hardware

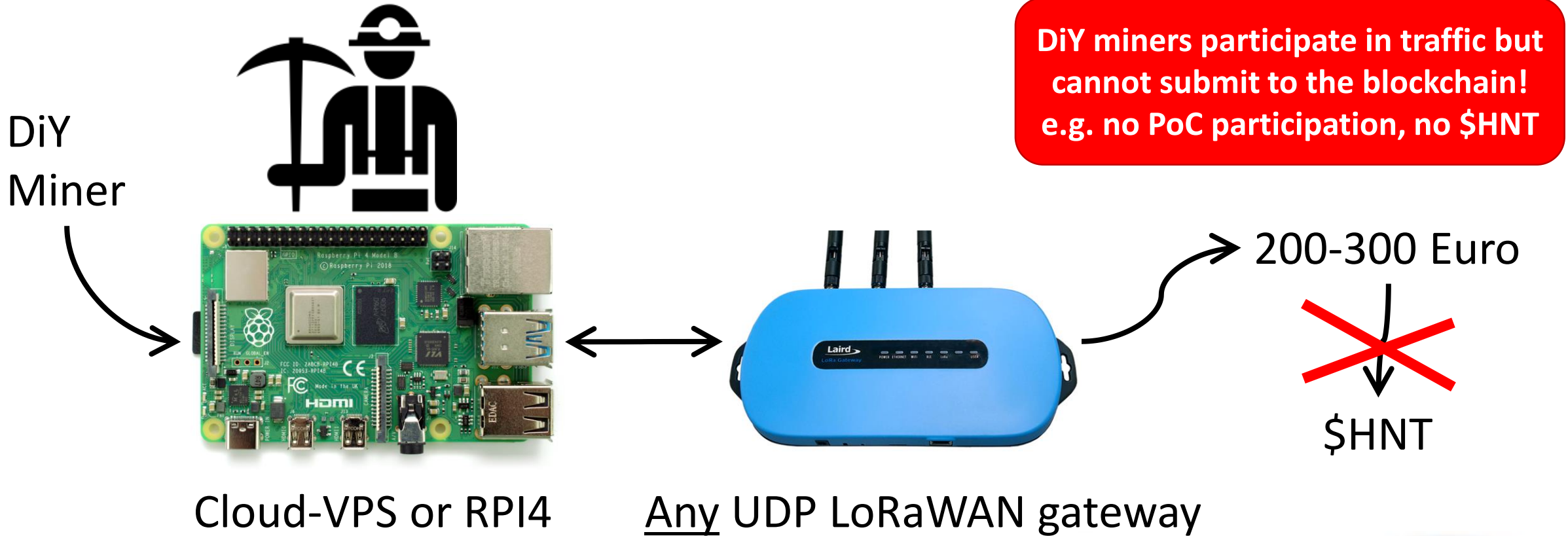
Helium  
Hotspot



→ +/- 500 Euro  
↓  
\$HNT



# Helium overview – DiY hardware





# Helium Participation

## Use Helium:

- Every LoRaWAN node can use Helium
- Registration at <https://console.helium.com>
- User receives 100,000 DC to start

**DiY miners participate in PoC after  
“onboarding” on the blockchain.  
Onboarding comes #soon**

## Add Helium coverage:

- Buy hotspot → Create coverage, PoC rewarding
- Buy RAK DiY Hotspot → Create coverage, PoC rewarding
- Build DiY miner → **Create coverage, no PoC rewarding yet.**





# Helium Console



Administration of:

- Devices (Only OTAA!)
- Integrations: *Helium Cargo (Tracking), Cayenne Mydevices, HTTP, MQTT.*
- Functions: *Payload en- and decoding (custom & CayenneLPP)*
- Organizations
- Users
- Data Credits

<https://console.helium.com>



# Helium Console (demonstration)



The screenshot displays the Helium Console interface. At the top, there is a dark navigation bar with a home icon, a search bar labeled "Search Console...", and a user profile for "remko@rfsee.nl" with the role "RFSee".

On the left side, there is a sidebar menu with the following sections:

- Devices
- Integrations
- Labels
  - cayenne (2)
  - http\_rfseebridge (1)
  - mqtt (1)
  - cargo (1)
- Functions
- Organizations
- Users
- Data Credits

The main content area is titled "Devices" and features two buttons: "+ Import Devices" and "+ Add New Device". Below these buttons, there is a summary for "3 Devices" and controls for "Edit Columns", "10 results", and "Quick Action".

The device list is presented in a table with the following columns: Device Name, Device EUI, Labels, Integrations, Frame Up, Frame Down, Packets Transferred, DC Used, Date Activated, and Last Connected.

Device Name	Device EUI	Labels	Integrations	Frame Up	Frame Down	Packets Transferred	DC Used	Date Activated	Last Connected
Cargo	81006DAA940BF621	cargo	cargo			0	0	Aug 31, 2020 3:52 PM	
kiss_01	0004A308001EFDAF	mqtt, http_rfseebridge, cayenne	helium_http_rfseebridge, helium_cayenne	2527	33	13252	5586	Jun 20, 2020 9:00 AM	Oct 27, 2020 9:04 AM
test_device	0004A308001C5C69	cayenne	helium_cayenne	21	0	354	60	Mar 7, 2020 3:07 PM	Sep 29, 2020 9:04 PM

At the bottom right of the table, there are navigation controls showing page 1 of 1. A version indicator "v1.2.7" is located in the bottom left corner of the sidebar area.

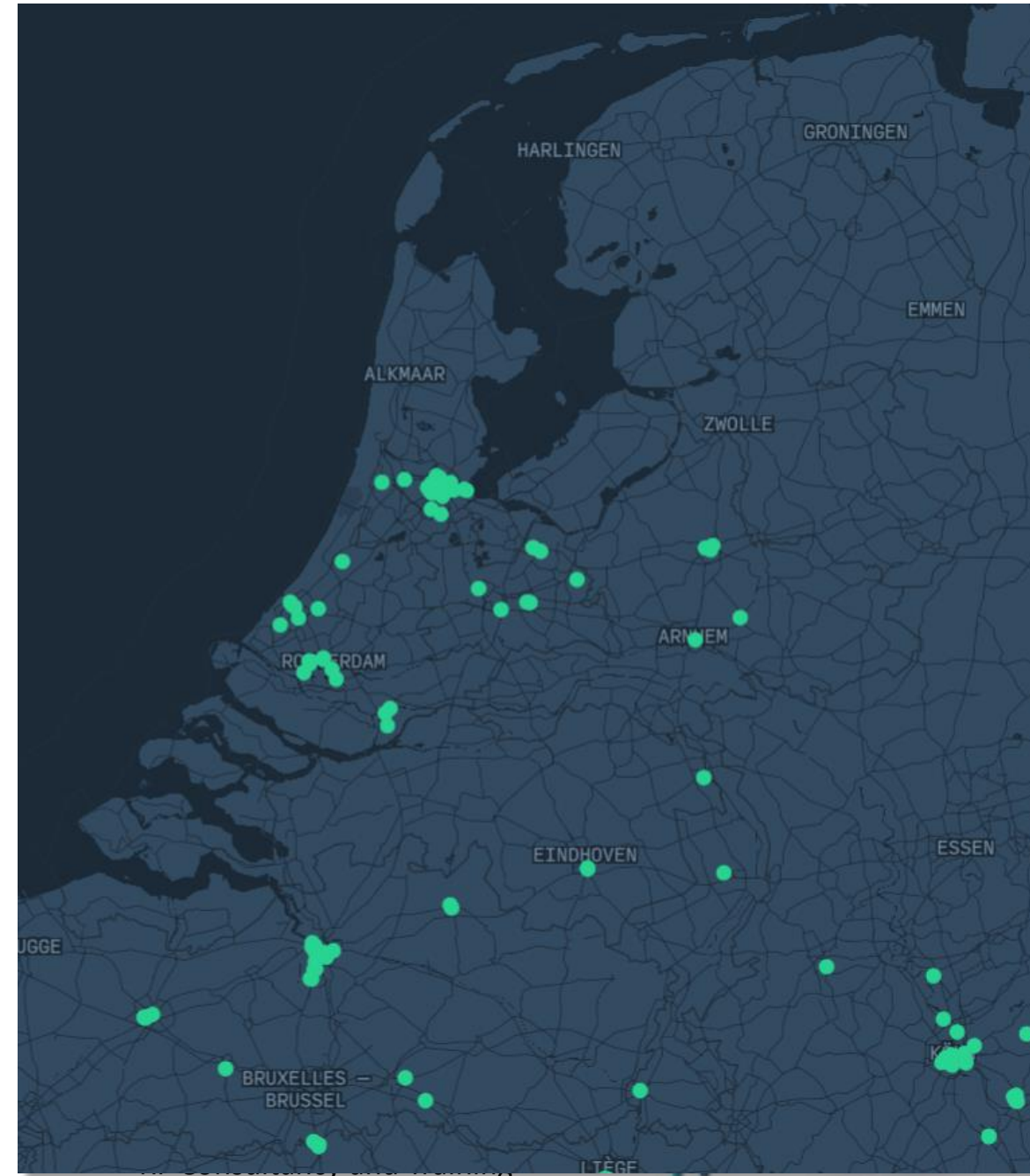


# Helium status

<https://network.helium.com/coverage>

October 27, 2020:

- 64 Hotspots in NL
- 3 in Apeldoorn
- De Mheen *DIY miner*
- Stadhuis *DIY miner*
- RFSee *Hotspot*



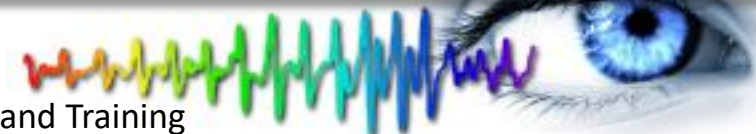
# Helium application - Cargo

- Asset tracking application
- <https://cargo.helium.com/>

The screenshot displays the Helium Cargo application interface. On the left, the 'cargo' logo is at the top, followed by a 'Devices' section with a search bar and a list of devices. One device is highlighted in blue, showing a QR code and the text '20 minutes ago Apeldoorn, GE'. The main area is a map showing a path of blue dots connected by a purple line, starting from a purple dot near 'APELDOORN' and ending at a blue dot near 'WILP-ACHTERHOEK'. On the right, there are two panels: 'Last Packet Stats' and 'Hotspots List'. The 'Last Packet Stats' panel shows the following data:

Last Packet Stats	
NAME:	[blurred]
HOTSPOT:	Lone Glass Wasp
SEQUENCE NO.	39
AVG SPEED	0mph
ELEVATION	0m
VOLTAGE	3.99v
RSSI	-102dBm
SNR	-6.80

The 'Hotspots List' panel shows a checkbox for 'SHOW HOTSPOT PATHS' which is checked, and a list of '1 HOTSPOTS WITNESSED' containing 'unique-jetblack-whale'.





# My 2 cents

- Interesting use of Blockchain in an IoT network
- The incentive to create coverage seems attractive but introduces new challenges
- Crypto attracts other audience than generally seen in IoT
- Knowledge of LoRaWAN in the community seems low.
- Helium has similar “openness” compared to TTN.
- Helium is vulnerable for “gaming”,
- System development focusses on countermeasures to “gaming the system”
- DIY gateways are not likely to be allowed again soon

**Helium: Just another LoRaWAN network**





# Helium information

- Community on Discord: <https://discord.gg/helium>
- Documentation: <https://developer.helium.com/>
- Coverage <https://network.helium.com/coverage>
- Updates: <https://blog.helium.com/>
- Sources: <https://github.com/helium>



# Interesting links:

- <https://staceyoniot.com/a-deep-dive-into-heliums-hotspot-and-business-plans/>
- <https://mightygadget.co.uk/helium-hotspot-review-scam-or-innovative/>
- <https://spectrum.ieee.org/telecom/wireless/iot-network-companies-have-cracked-their-chicken-and-egg-problem>





# helium

Questions?

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