



Helium

鄭程哲 李浩榮 黃致閎

第九組



HELIUM



Outline

1.1 What is Helium

1.2 Wireless Network

1.3 Internet of Things

1.4 Decentralized Wireless Network

1.5 Process of Building Decentralized Network

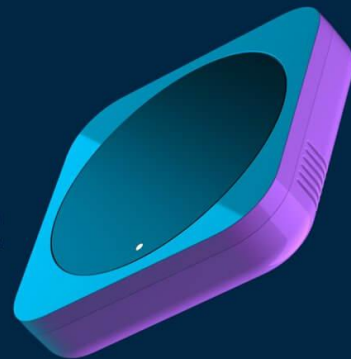
1.6 How to use Decentralized Wireless Network

1.7 Cryptocurrency Burning

1.1 What is Helium

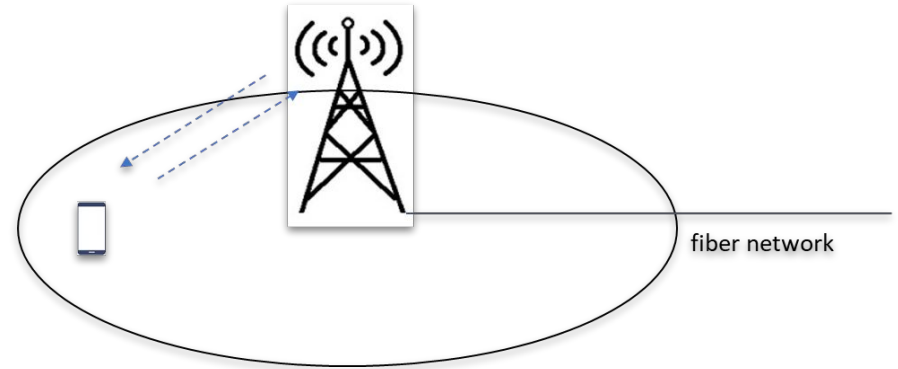
- Decentralized wireless network
- Proof of Coverage (PoC)

Buy your
Helium Hotspot



1.2 Wireless Network

- Base station
- User element
- Channel Frequency



FAREASTONE
遠傳

中華電信
Chunghwa Telecom

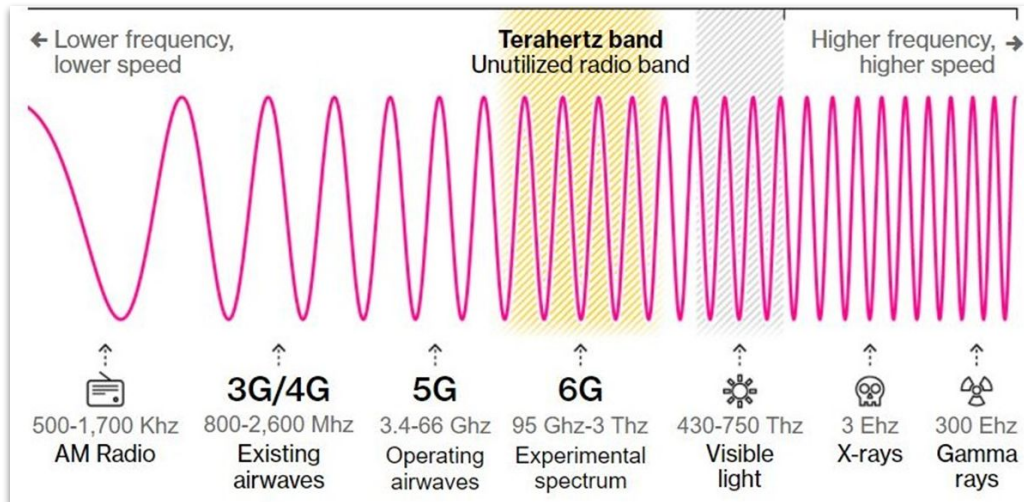
T STAR
台灣之星

亞太電信
Gt⁺

台灣大哥大

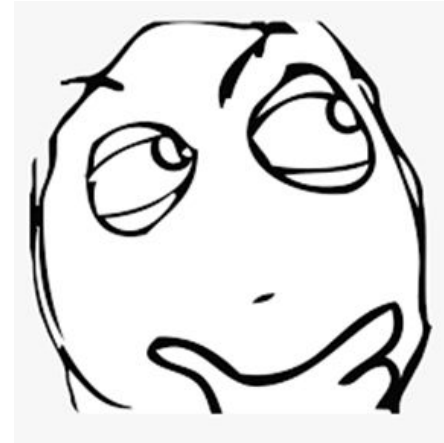
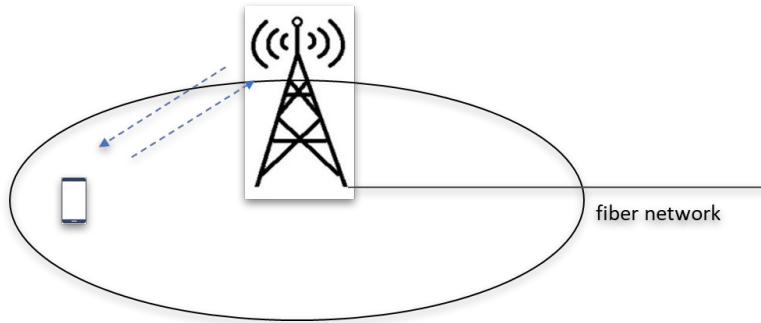
1.2 Wireless Network

- Frequency \uparrow , Bandwidth \uparrow , Coverage \downarrow
- Frequency \downarrow , Bandwidth \downarrow , Coverage \uparrow



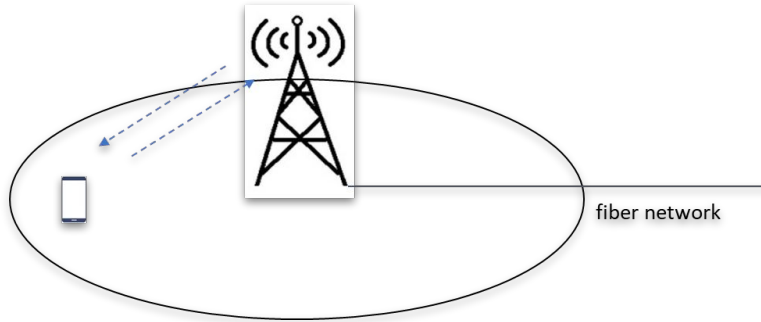
1.2 Wireless Network

- Can we create a base station with specific frequency?



1.2 Wireless Network

- **No!** we need to buy the licensed frequency bands.
- Also need to pay billion-dollar for the bandwidth.





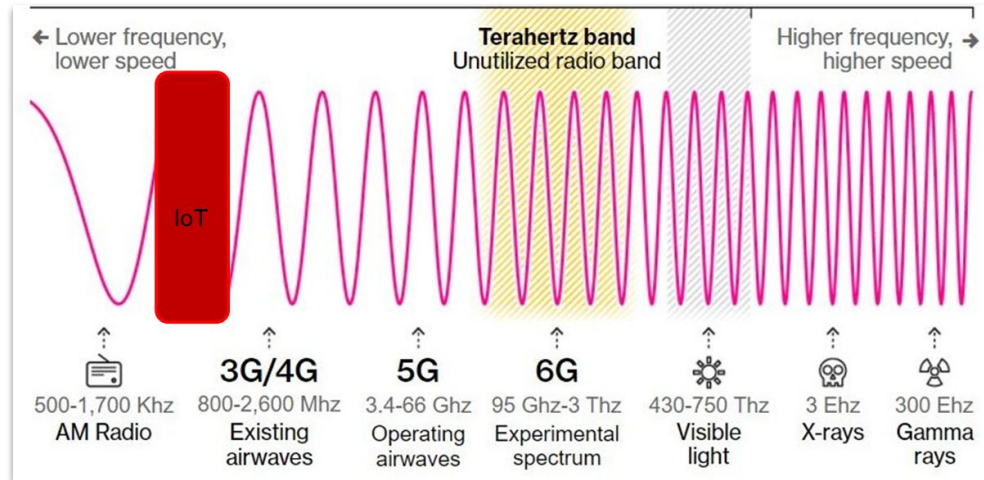
1.2 Wireless Network

- However, there still have **unlicensed** frequency bands.
- **3GPP** (The 3rd Generation Partnership Project)

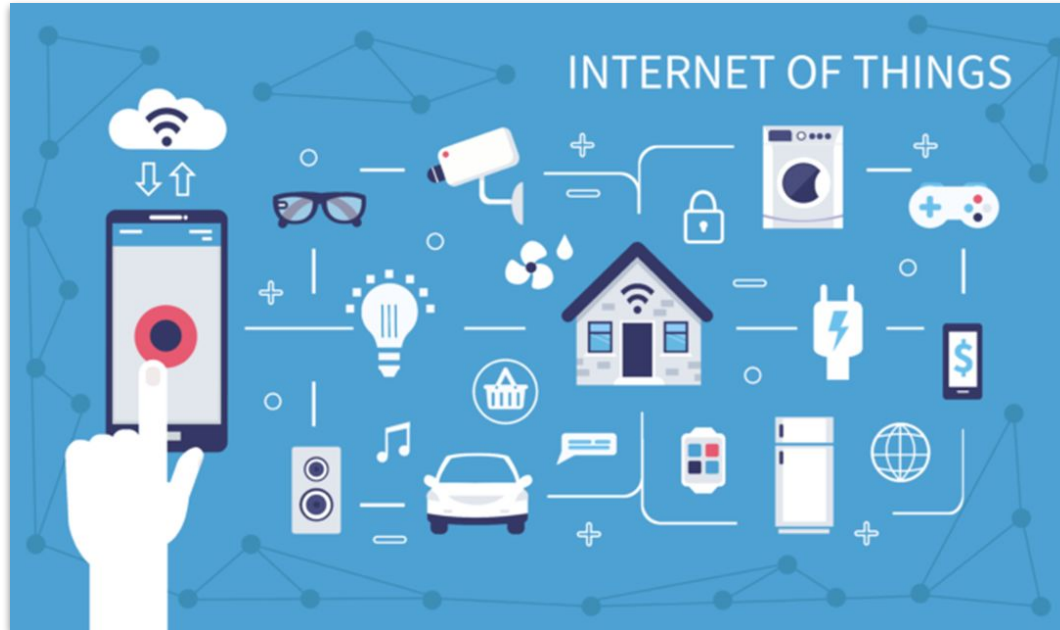


1.2 Wireless Network

- Internet of Things (IoT)



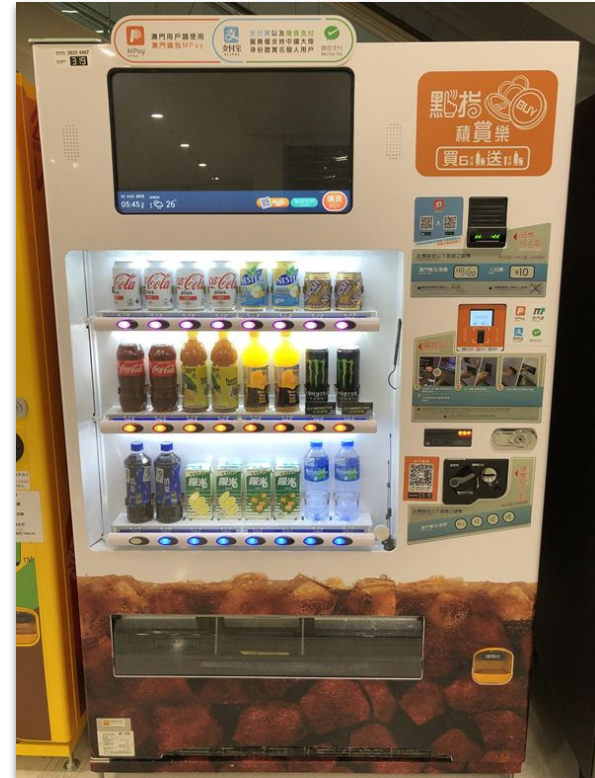
1.3 Internet of Things



1.3 Internet of Things

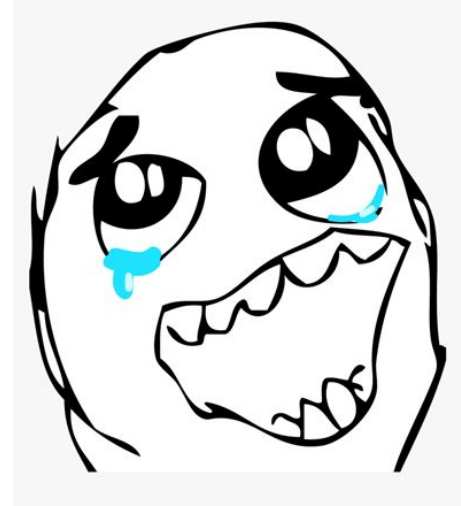
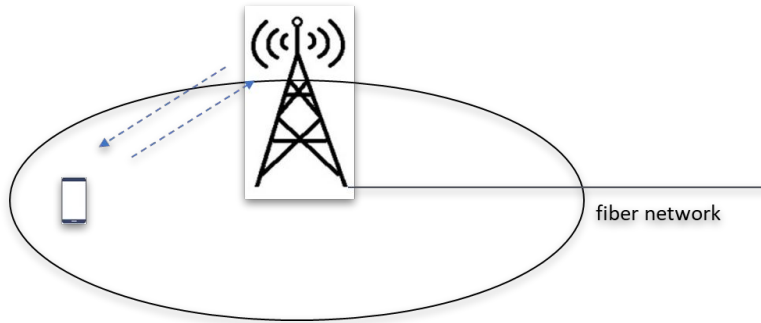
LoRaWAN Network

- low power, wide area
- low - cost devices
- low data rate



1.4 Decentralized Wireless Network

- **The People's Network**
- IoT



1.5 Process of Building Decentralized Network

- buy wireless device of IoT
- create a Hotspot
- Hotspots earn **HNT** by providing wireless coverage
 - **HNT** is its crypto





1.6 How to use Decentralized Wireless Network

- Due to HNT is not stable coin and fiat money, it's not good to pay.
- Thus, we use **Data Credits**.
- **Data credits** allow users to transfer bytes of data via Helium LongFi and use for blockchain transaction fees.
- The price of **Data Credits** is fixed in USD (1 Data Credit = \$0.00001).



1.7 Cryptocurrency Burning

- Due to the number of **HNT** doesn't have an upper limit.
- It needs to be burned to maintain its price.



HNT is burned

It is removed from the circulating supply and creates DCs.



DCs are created

Data Credits are used by devices in order to use the network



Helium

- ✓ **Decentralized wireless network**
- ✓ **IoT**
- ✓ **Proof of Coverage**
- ✓ **HNT and Data Credits**



Outline

2.1 What is decentralization

2.2 How PoC work

2.3 How to mine HNT

2.4 What kind of situation can mine efficiently



2.1 What is decentralization

- Using open-source software and distributed system concept, let the economy product doesn't need any service that provided by the middle agent or any platform anymore.
- If the whole system or platform are depends on some certain companies, the profit and rights may get affected when the companies makes some negative change.
- Management's right separated, every user have **identical rights**. Hard to modified the rule of the system, this needs permission from all the users.
 - Transparency
 - Trade efficient
 - Assets right



2.1 What is decentralization

- Helium doesn't build network. **Helium let users to buy a physical devices and build the network by themselves**, all the participant get crypto token **HNT** as rewards.
- **Maintaining and built by users based on physical devices to ensure the system stability** in the future.



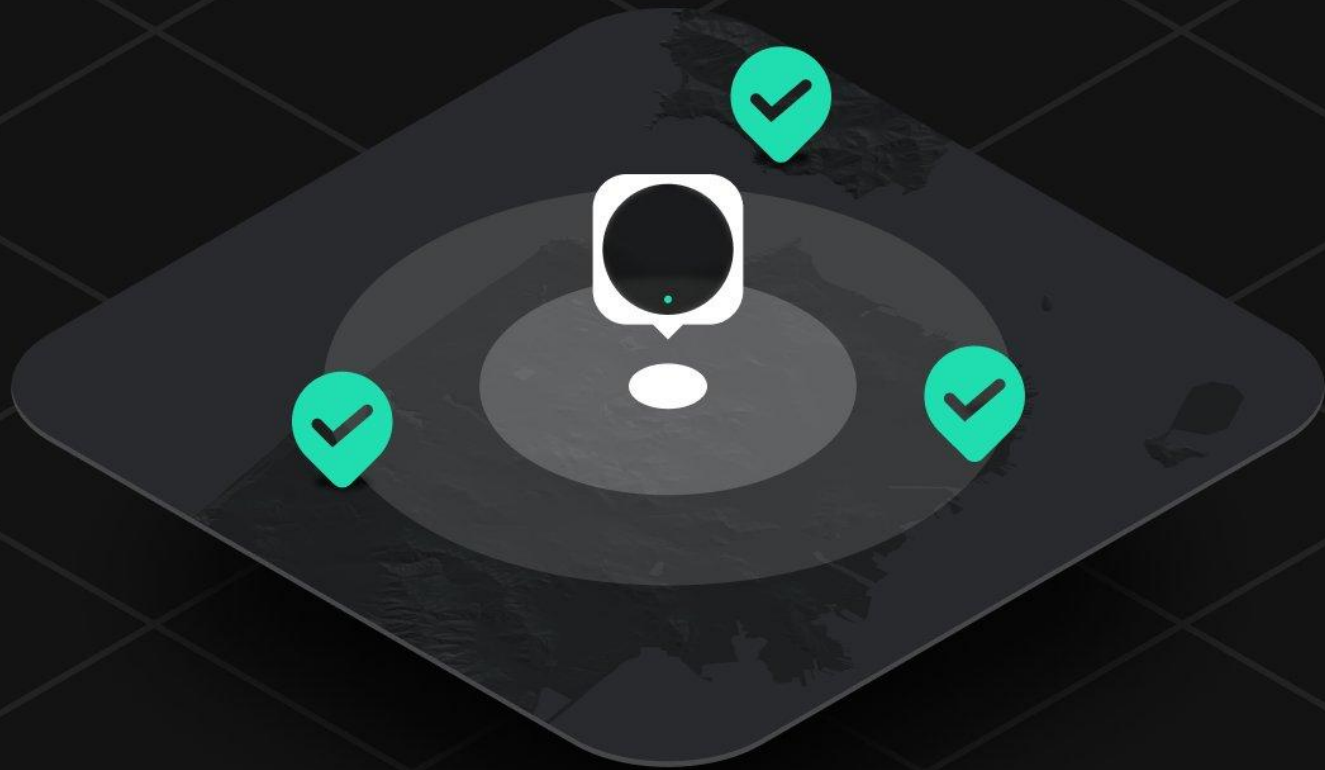
2.2 How PoC work

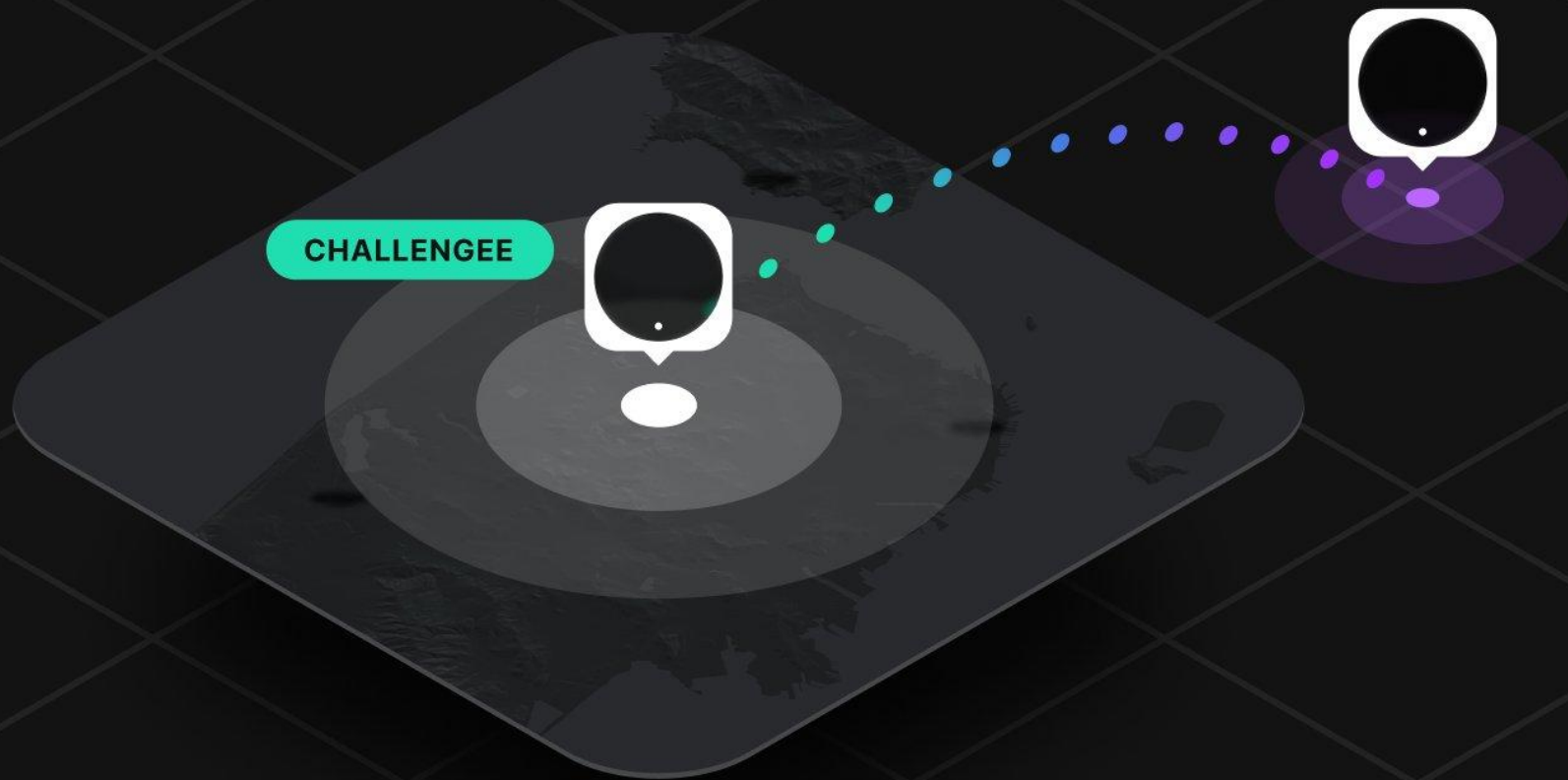
- **Proof of Area / Coverage**
- Helium is using proof-of-coverage as its algorithm to engine the whole work. This algo only spend a little amount of energy and eco-friendly if compare to other crypto.
- According to the official announcement, their hotspot energy is same with a 5W bulb.



Helium Explains

Proof-of-Coverage.









2.3 How to mine HNT

- Revenue is based on the proof-of-coverage.
- The more devices are connected, the more profit you will get.
- Your identity decide your income.
 1. **Challenger** / **Challengers**: When the processes of transmit and receive challenge package work successfully, challenger and challenges will get rewarded.
 2. **Witnesses**: Get reward if they have any transmission emit successfully in your anthena area.



Helium Explains

Mining Rewards





Challengers 0.95%



Challengees 5.31%



Witnesses 21.24%



Network Data
Transfer 32.5%



PoC Challenger
0.90%

PoC Challengee
5.02%

Witness
20.08%

Consensus Group
6%

Security Tokens
33%

Network Data Transfer
Up to 35%



2.4 How to mine efficiently

1. Always be a **witnesses** (Surrounded by a lot of **challengers** and **challengees**).
2. Always be **challengees** (beaconing challenge packet) and transmit data.
3. Strong and wide antenna to receive more challenge.



Hotspots | 🇳🇵 Nanded | 💎 88608...

Broad Opaque Millipede

📶 SenseCAP 📶 5 dBi 📏 28 m
📶 11CC4AP...xZfvMoW 📶 📶 13wvymw...

Statistics Activity Witnesses Nearby

Beacons Data Consensus Rewards All Activity >

Hotspot Activity (Beacons)

Details ▾

Challenged Beaconer

11h ago

📶 2 Dec 2021, 8:04am → 🇳🇵 Csaba 📶 10 📶 0



Challenged Beaconer

18h ago

📶 2 Dec 2021, 1:12am → 🇨🇦 Rosemère 📶 5 📶 2



Challenged Beaconer

1d ago

📶 1 Dec 2021, 1:08pm → 🇺🇸 Phoenix 📶 7 📶 3



Challenged Beaconer

2d ago

📶 30 Nov 2021, 10:58pm → 🇺🇸 Herndon 📶 6 📶 0



Challenged Beaconer

2d ago

📶 30 Nov 2021, 3:42pm → 🇺🇸 Brooklyn 📶 4 📶 0



Challenged Beaconer

2d ago

📶 30 Nov 2021, 8:10am → 🇺🇸 Dallas 📶 0 📶 2



Challenged Beaconer

3d ago

📶 30 Nov 2021, 1:04am → 🇺🇸 Annapolis 📶 6 📶 0



Challenged Beaconer

3d ago

📶 29 Nov 2021, 7:19pm → 🇺🇸 San Jose 📶 18 📶 0



Challenged Beaconer

mapbox

Hotspots Beacons Blocks Validators Market Tools

Search...



Pawadevadi Road

Pawadevadi Road

Ganesh Nagar Road

SRINAGAR















سما



500 m

© Mapbox © OpenStreetMap Improve this map © Maxar

Beacons Data Consensus **All Activity**

Created Challenge	1d				
Received Mining Rewards	1d		+0.120 HNT		
Sent Beacon	1d			 4	
Received Mining Rewards	1d		+0.122 HNT		
Witnessed Beacon	1d			 2	
Received Mining Rewards	1d		+0.007 HNT		
Challenged Beaconer					

Hotspots
Haarlem
88196...

Best Eggplant Butterfly

SenseCAP
6 dBi
33 m

11QG UWZ... xWLoMmh
13LcPno...

Statistics
Activity
Witnesses
Nearby

Beacons

Data
Consensus
Rewards
All Activity

Hotspot Activity (Beacons)

Details

Challenged Beaconer
4h ago

3 Dec 2021, 4:22am
→
Ebreichsdorf
2
0

Sent Beacon
5h ago

3 Dec 2021, 3:18am
→
Haarlem
14
4

Sent Beacon
8h ago

3 Dec 2021, 12:08am
→
Haarlem
16
2

Witnessed Beacon
9h ago

2 Dec 2021, 11:39pm
→
Spaarndam
18
0

Witnessed Beacon
9h ago

2 Dec 2021, 11:30pm
→
Haarlem
18
0

Challenged Beaconer
18h ago



Outline

3.1 History Price of HNT

3.2 Coverage of Helium Network in the world

3.3 Mining Machine

3.4 Revenue

3.5 Conclusions

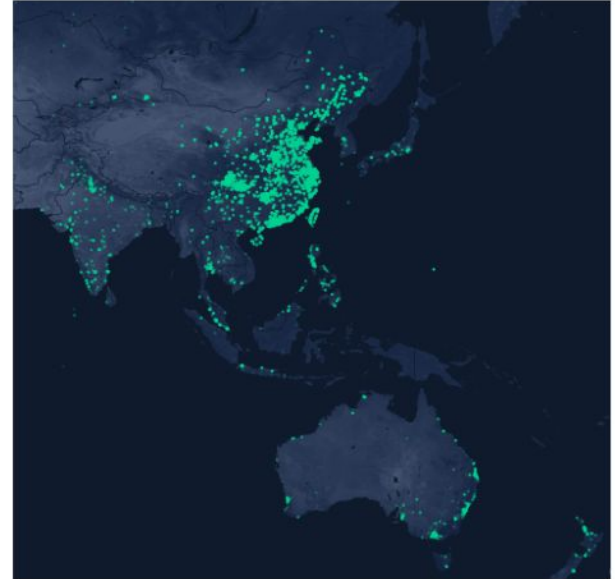
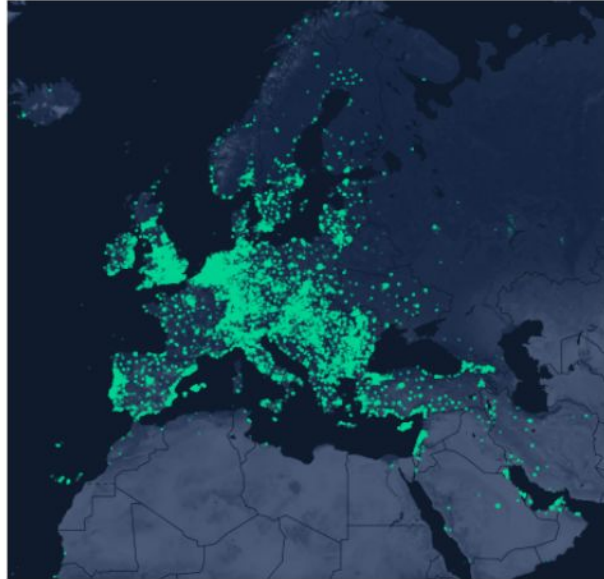
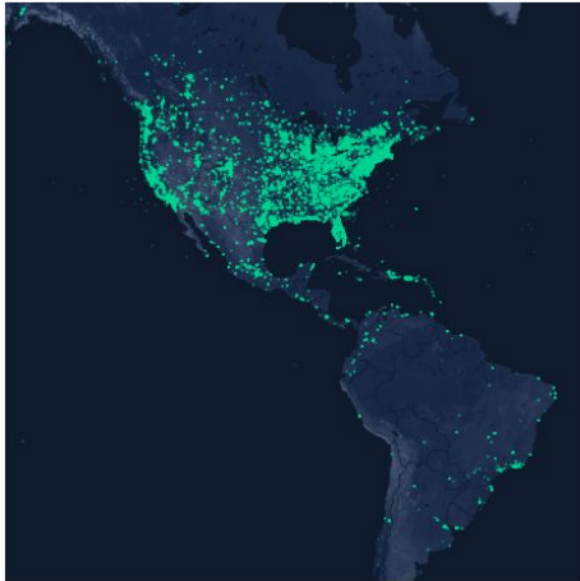
3.1 History Price of HNT



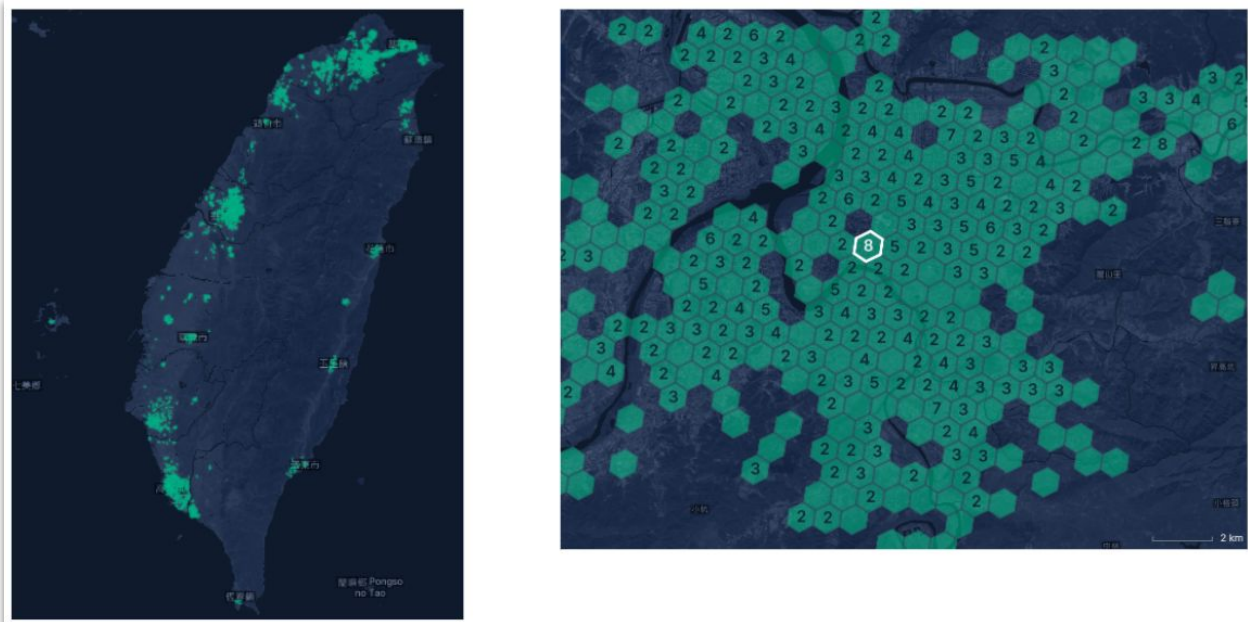
3.1 History Price of HNT



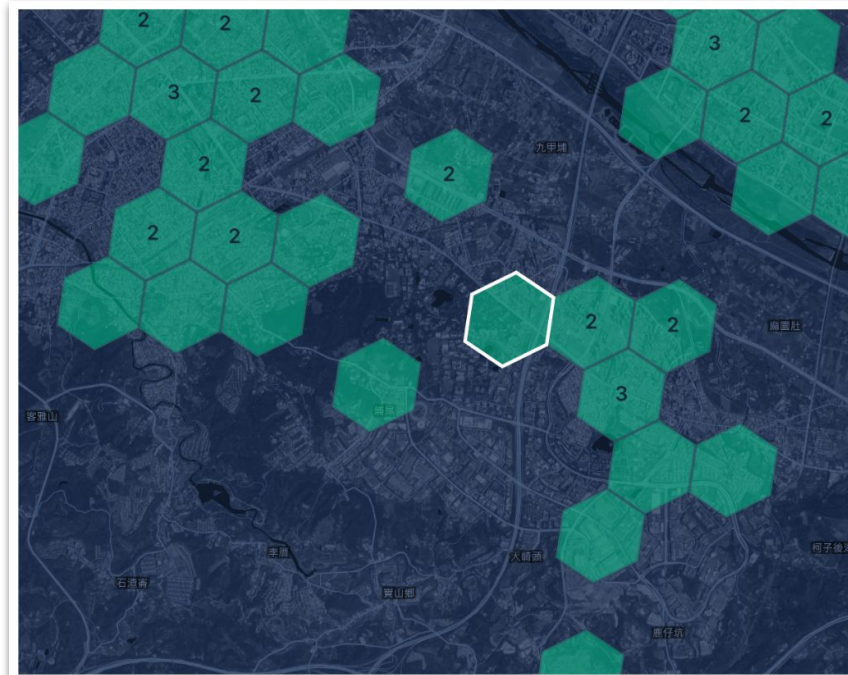
3.2 Coverage of Helium Network in the World



3.2 Coverage of Helium Network in the World



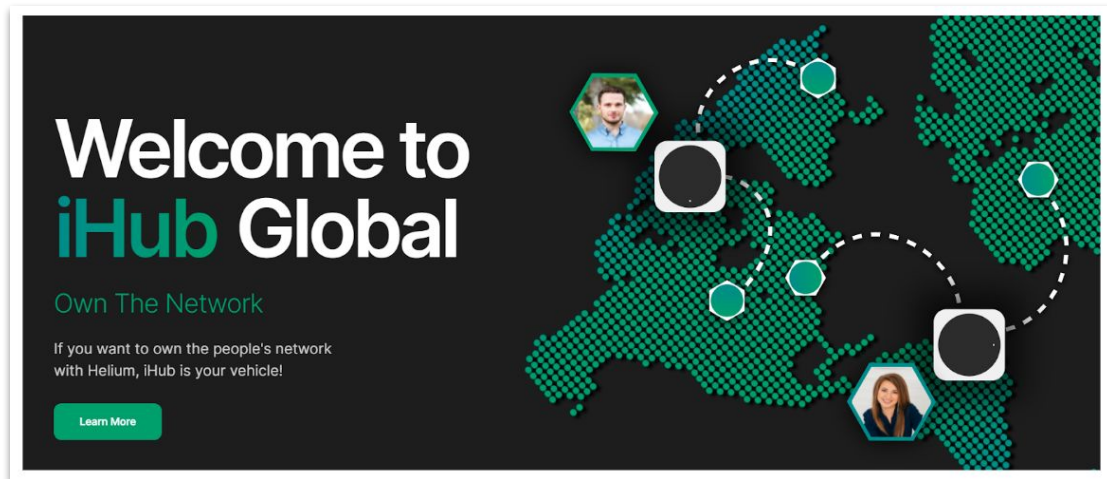
3.2 Coverage of Helium Network in the World



3.3 Mining Machine

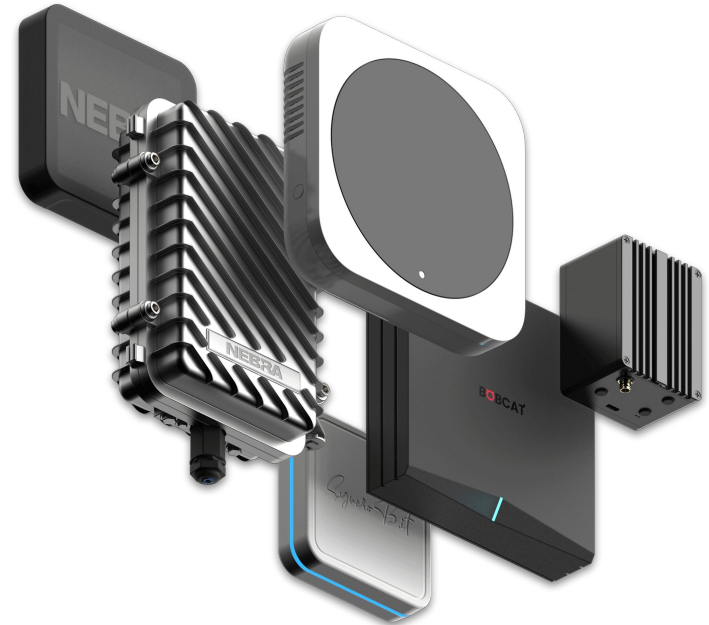
iHub Global 租賃計劃

- 租賃計劃: 每月\$18
- 押金計劃

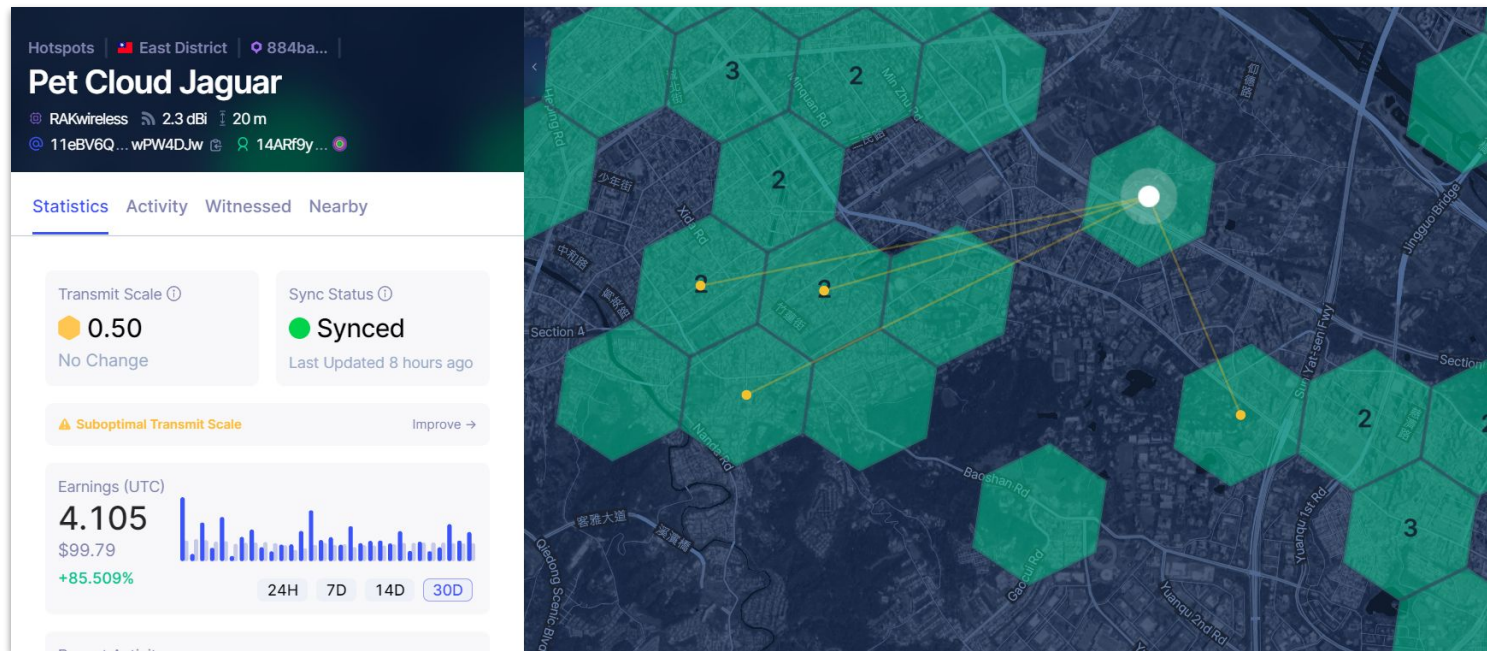


3.3 Mining Machine

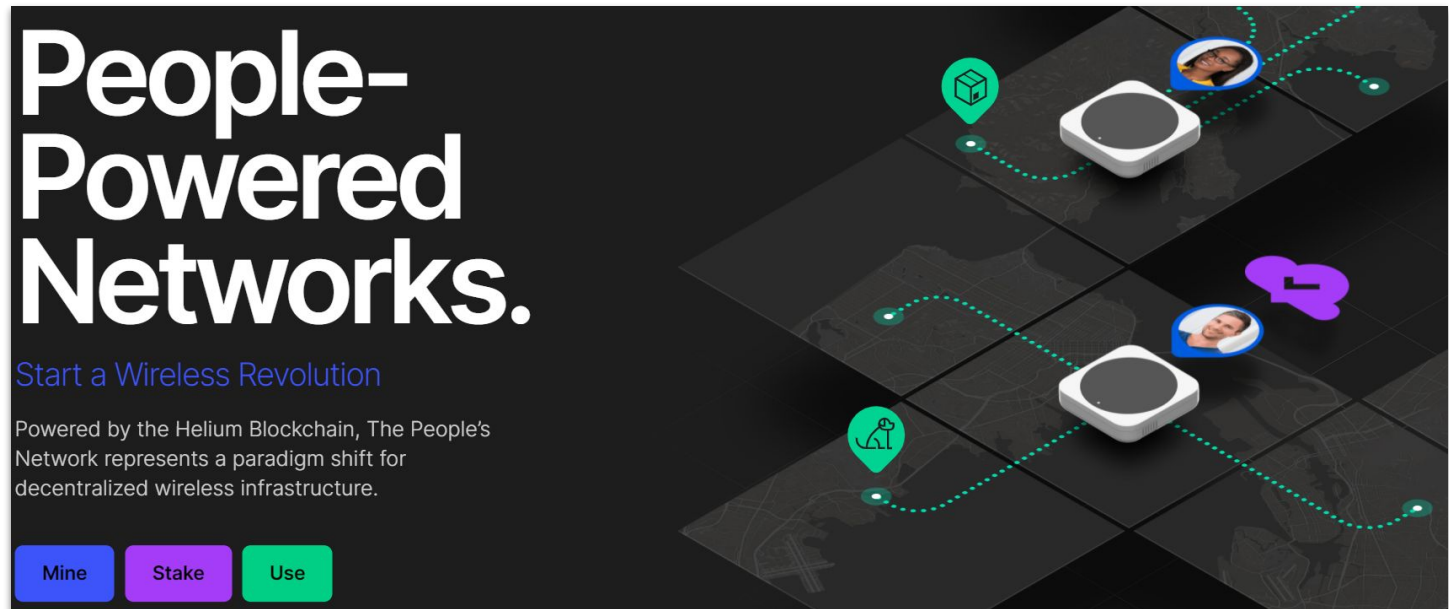
Bobcat	LoRaWAN	Purchase	Community	Support
Cal-Chip	LoRaWAN	Purchase	Email Support	
ClodPi	LoRaWAN	Purchase	Community	Email Support
Controllino	LoRaWAN	Purchase	Community	Support
Dragino	LoRaWAN	Purchase	Email Support	
Finestra	LoRaWAN	Purchase	Support	
FreedomFi	LoRaWAN 5G	Purchase	Community	Email Support
FXTec Linxdot	LoRaWAN	Purchase	Community	Email Support
Heltec	LoRaWAN	Purchase	Community	Email Support
Hummingbird	LoRaWAN	Purchase	Support	
Kerlink	LoRaWAN	Purchase	Community	Support
LongAP	LoRaWAN	Purchase	Email Support	
Milesight IoT	LoRaWAN	Purchase	Support	
MNTD.	LoRaWAN	Purchase	Community	Support
Nebra	LoRaWAN	Purchase	Email Support	
Pisces/ Green Palm Technologies	LoRaWAN	Purchase	Community	Email Support
RisingHF	LoRaWAN	Purchase	Community	Email Support
Sensecap	LoRaWAN	Purchase	Community	Email Support
Syncrobit	LoRaWAN	Purchase	Community	Email Support



3.4 Revenue



3.5 Conclusions

A promotional graphic for the Helium Network. It features a dark background with a grid pattern. Two white, cube-shaped Helium Hotspots are positioned diagonally. Dotted green lines connect the hotspots to various icons: a green cube, a blue speech bubble with a person's face, a purple speech bubble with a person's face, and a green speech bubble with a dog icon. The text 'People-Powered Networks.' is prominently displayed in large white letters on the left. Below it, the text 'Start a Wireless Revolution' is in blue. Further down, a paragraph explains the network's purpose. At the bottom, there are three colored buttons: 'Mine' (blue), 'Stake' (purple), and 'Use' (green).

People-Powered Networks.

Start a Wireless Revolution

Powered by the Helium Blockchain, The People's Network represents a paradigm shift for decentralized wireless infrastructure.

Mine Stake Use



References

- <https://www.theblockbeats.info/tw/news/29340>
- <https://www.helium.com/zh/mine>
- <https://vocus.cc/article/61eac524fd89780001e1dfec>
- <http://www.ancheng.tw/wp/%E4%BB%80%E9%BA%BC%E6%98%AFbeacon%E4%BC%9F/>
- <https://twitter.com/helium>
- <https://www.youtube.com/watch?v=dOFWZZ58UYs>
- <https://docs.helium.com/blockchain/mining/>
- <https://docs.helium.com/api/blockchain/challenges>