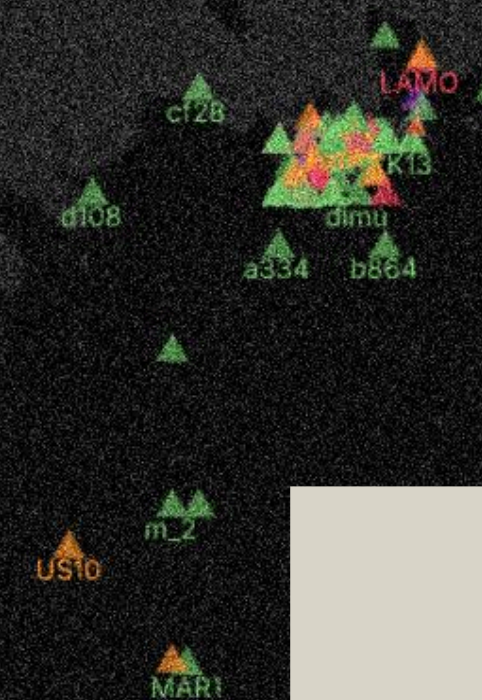
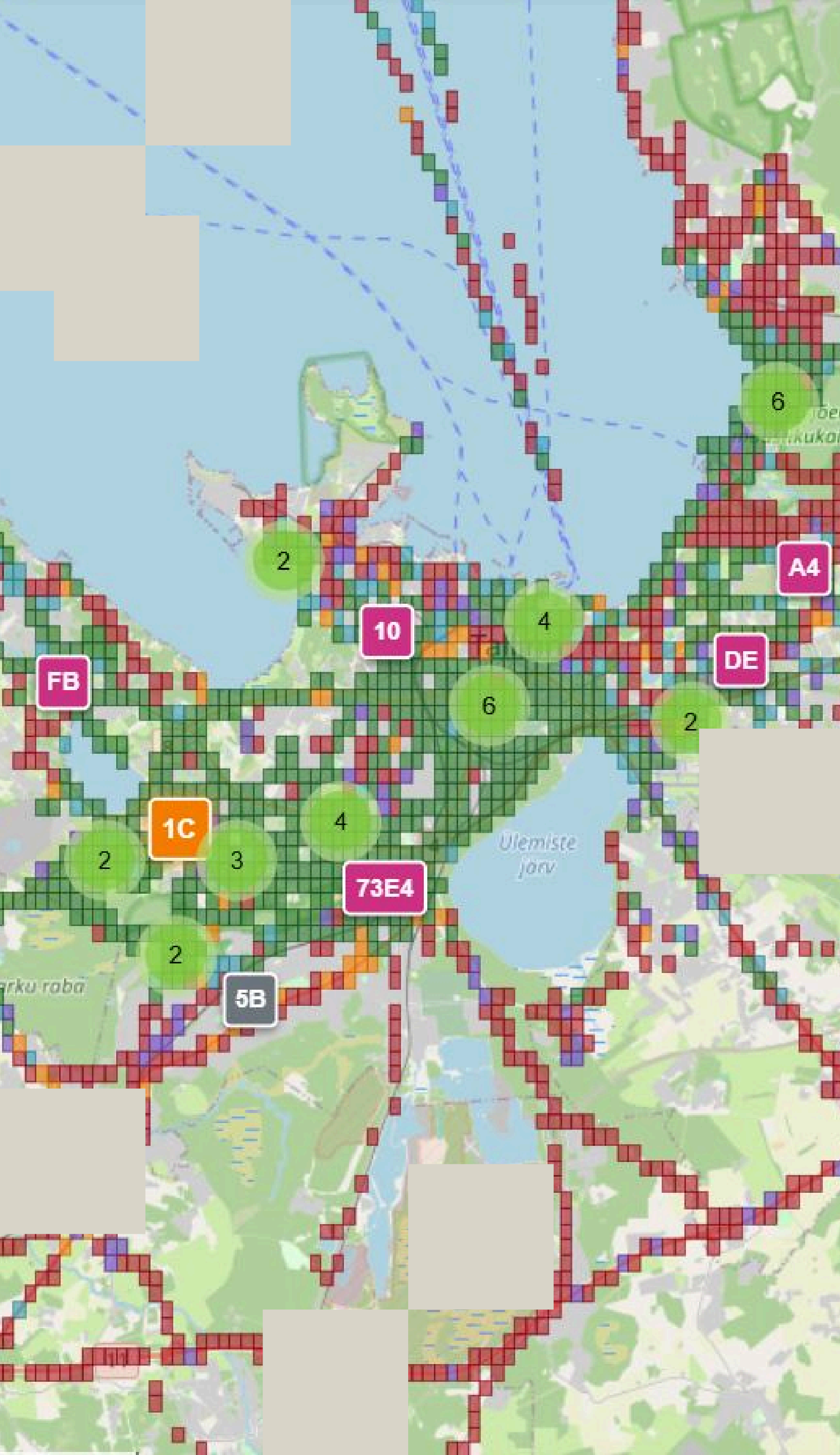


Meshtastic networking in Estonia

and other mesh technologies

ES1MUF - Chris-Robin Soon





Statistics

Meshtastic

- About 300 nodes across Estonia (Based on the ones that send position packets).
- About 80% are in Tallinn and near Tallinn.
- Using LongFast and testing has been done with EdgeFastLow (Bridge is working between LF and EFL)
- Most used hardware models are Heltec V3 (107), RAK WisBlock 4631 (54) and Heltec V4 (60)

Meshcore

- About 45 repeaters active.
- Using 2byte hashes for adverts to avoid conflicts.
- Mostly used in Tallinn but a few nodes exist in Tartu aswell.
- 16% of Public Key Prefixes used.
- EU/UK Narrow preset is used.

Meshtastic



Zentek Omega

90 meters above sea level.

<https://estmesh.ee/node/66>



TV Tower

180 meters above sea level.

Antenna: This month will be a new directional antenna pointed towards Helsinki 10.9db gain.

<https://estmesh.ee/node/119>



TEM Tree

50 meters above sea level.

Module: RAK4631

Antenna: Alfa AOA-868-5ACM

Battery: ~17Ah / 3.7V

Solar: EZVIZ CS-CMT 7W Solar Panel

<https://estmesh.ee/node/70>

Meshcore



Harku

Expansion of the mesh outside of Tallinn.



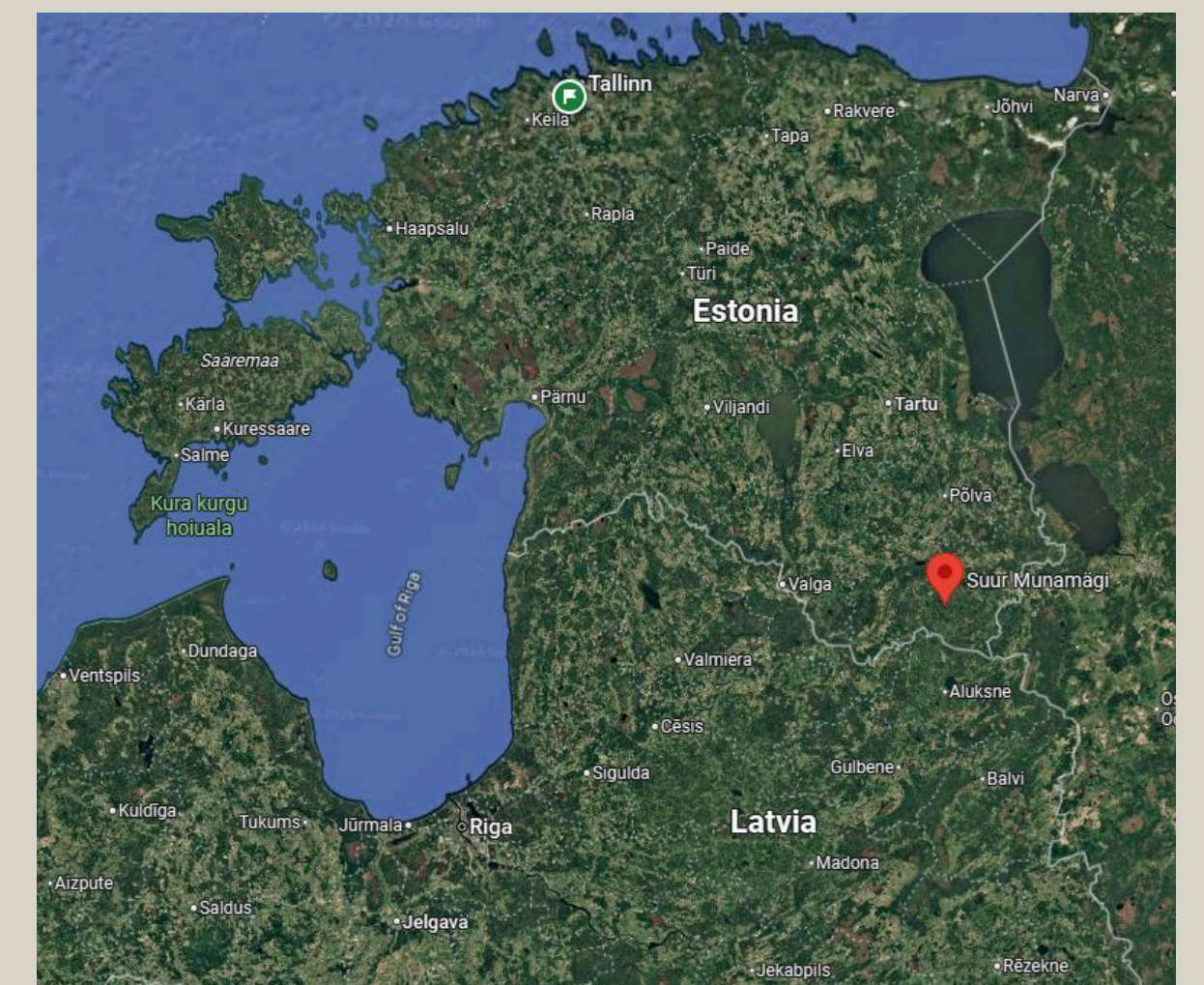
Shoreline to Latvia

A project by Zentek to connect the Pärnu, Haapsalu Saaremaa the western shoreline of Estonia and to reach Latvia.



Munamägi

Currently in discussion phase to start connecting Estonia with Latvia (As they use Meshcore mostly).



Current state of MQTT

How we connect cities?

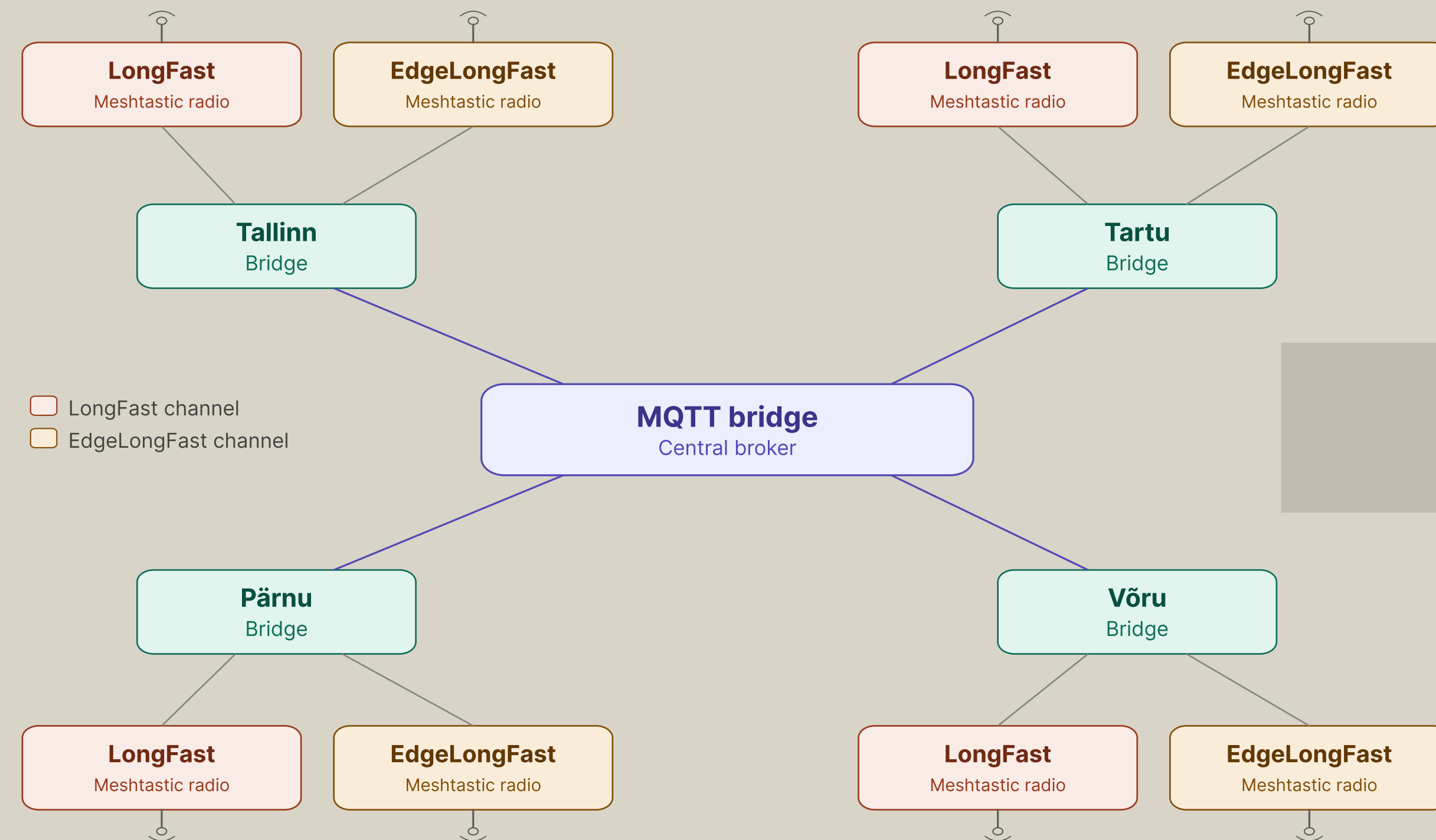
Private MQTT server using EMQX. (Less reliance on public MQTT)
Hosted in Tallinn Polytechnic school/Techno Tallinn (ES1TP).

MQTT access behind authentication, only people that request access are allowed on.

One bridge per city, in a central location for all the nodes.

Currently a manual adding process for bridges.

Currently no high availability cluster only a single server.

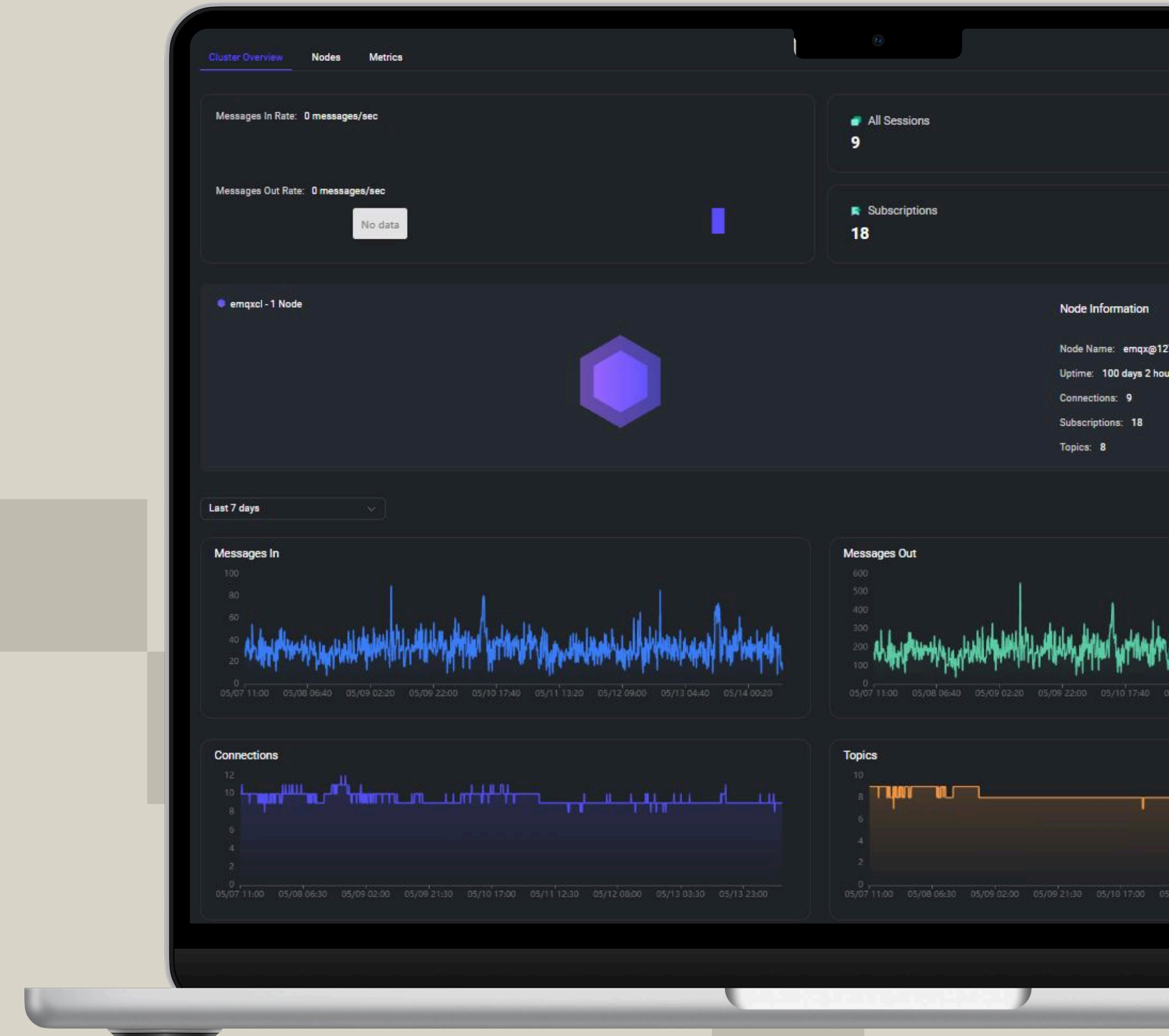


Why a private MQTT server?

We believe in LoRa and want to keep its spirit alive. Not everyone needs to be on MQTT. By setting up only a few bridges, we actively encourage more nodes to be deployed across Estonia.

Current state of MQTT control on a node

- Currently each node has to enable OK to MQTT and disable Ignore MQTT.
- Credentials are per user and MQTT settings are specific which brings complexity.



Future state of MQTT

- A member of the community (flaviopontes) is working on custom firmware for MQTT bridges.
- Will ignore OK to MQTT and Ignore MQTT flags on a packet. (Is being discussed with the community).
- Have credentials already implemented to the firmware itself (easier deployment).
- Automatic system for MQTT access approval.
- High Availability clustering.

MQTT Access Request

Node

Select a node...

Why is MQTT needed for this node?

Describe why you need MQTT access...

Where do you live? (City)

e.g. Tallinn

How many LoRa nodes near you?

0

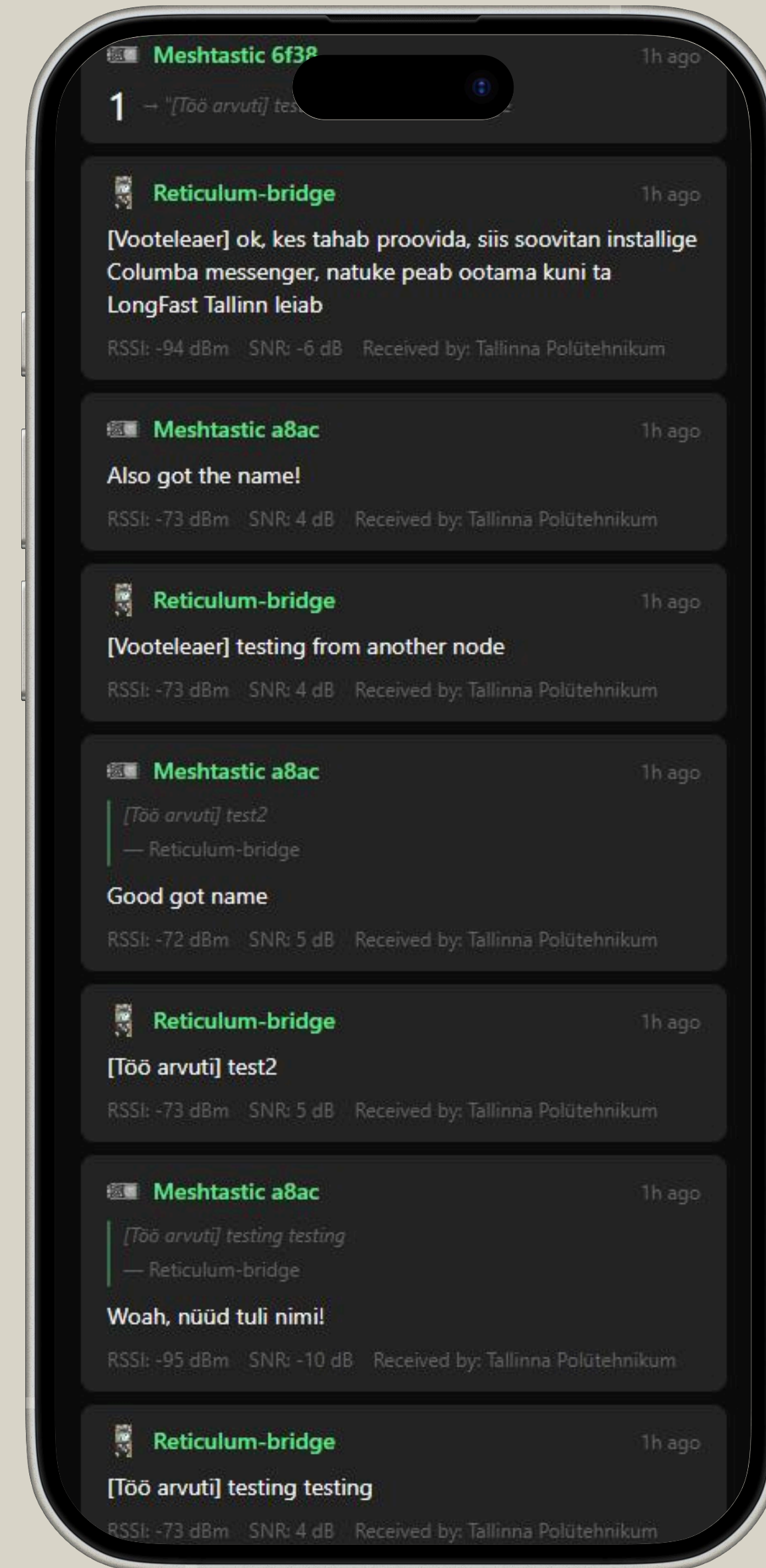
Submit Request

Cancel

Other mesh bridges

Connecting multiple mesh technologies together.

- LongFast < - > EdgeFastLow - <https://github.com/mesh-ee/mesh-bridge>
- Reticulum < - > Meshtastic bridge - <https://wiki.estmesh.ee/en/docs/Reticulum>
- Meshcore < - > Meshtastic - Is currently being worked on



Reticulum < - > Meshtastic bridge
(by vooteleaer)

Resources

<https://estmesh.ee> - Main website for Meshtastic Estonia

<https://wiki.estmesh.ee> - Wiki for Meshtastic, Meshcore and in the future other mesh technologies

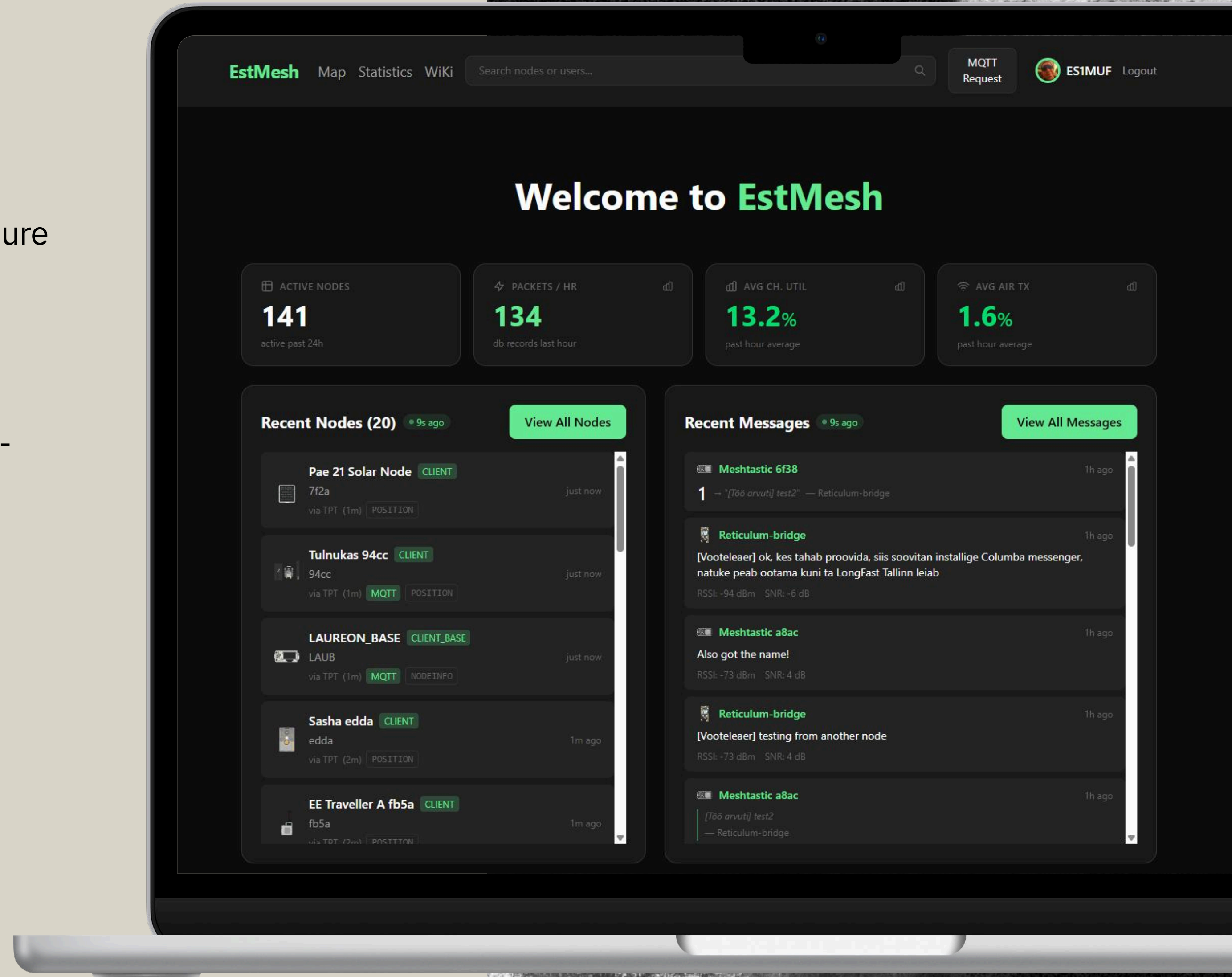
<https://mesh.es1tem.uk> - Meshtastic, Meshcore dashboard

<https://analyzer.letsmesh.net/nodes/prefix-utilization?region=TLL> - Meshcore analyzer

<https://tll.meshmapper.net> - Meshcore mapper to see signal propagation



<https://discord.gg/4HBTDZq3cM> - Radio enthusiasts Discord community



Kiitos!
Tack!
Aitäh kuulamast!
Thank you for listening!

My wife called Meshtastic "Tinder for Linux users"

I'm never going to emotionally recover from this.