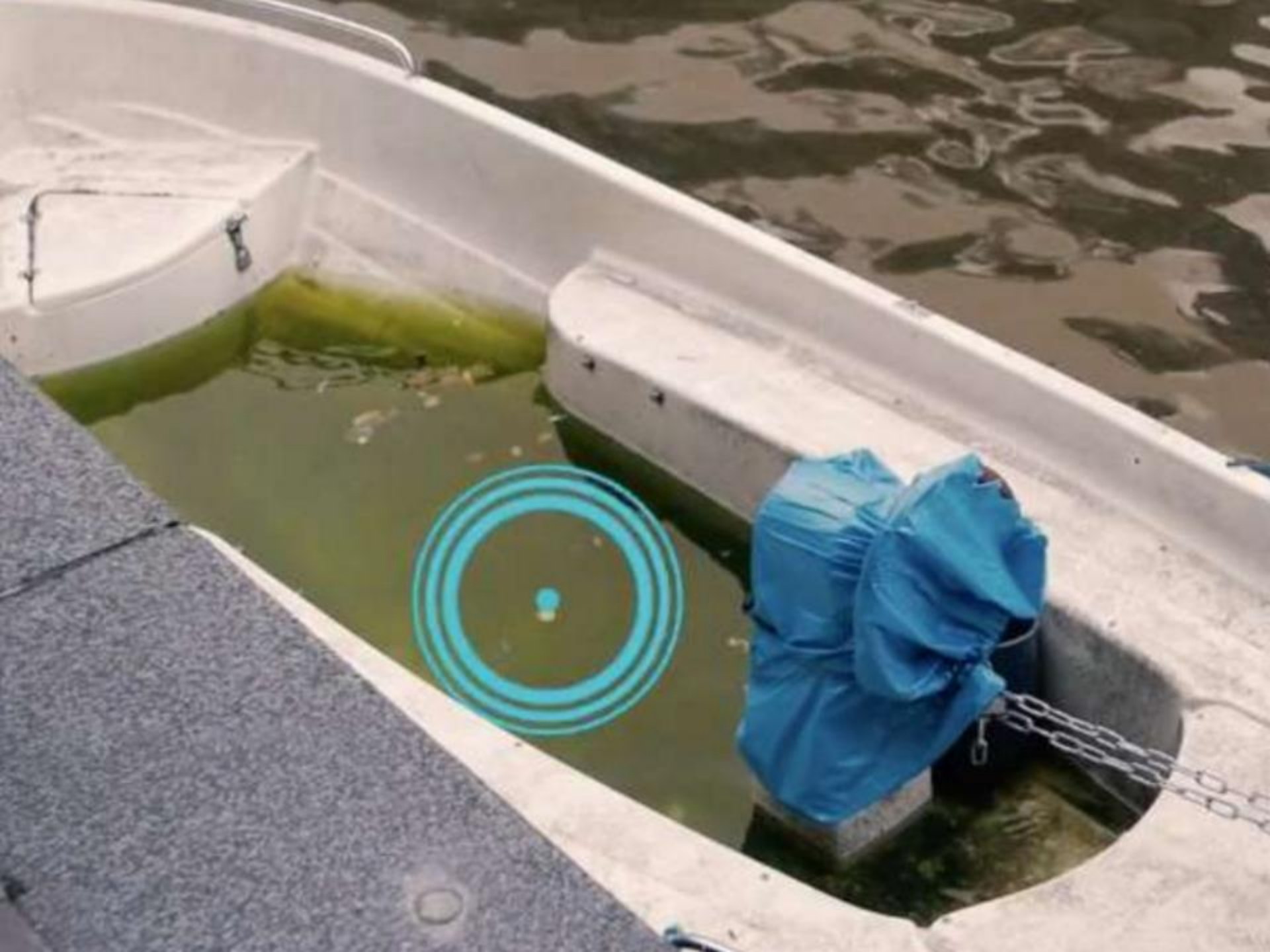




THE THINGS
N E T W O R K



@thethingsntwrk @eclipsepaho @EclipseScout
@ZimMatthias





- Long Range
1-5 km
- Low Power
2xAA (Nodes)
- Low Cost
€1,500

The Things Network



The Things Network is a global, crowdsourced, open, free and decentralized internet of things network.

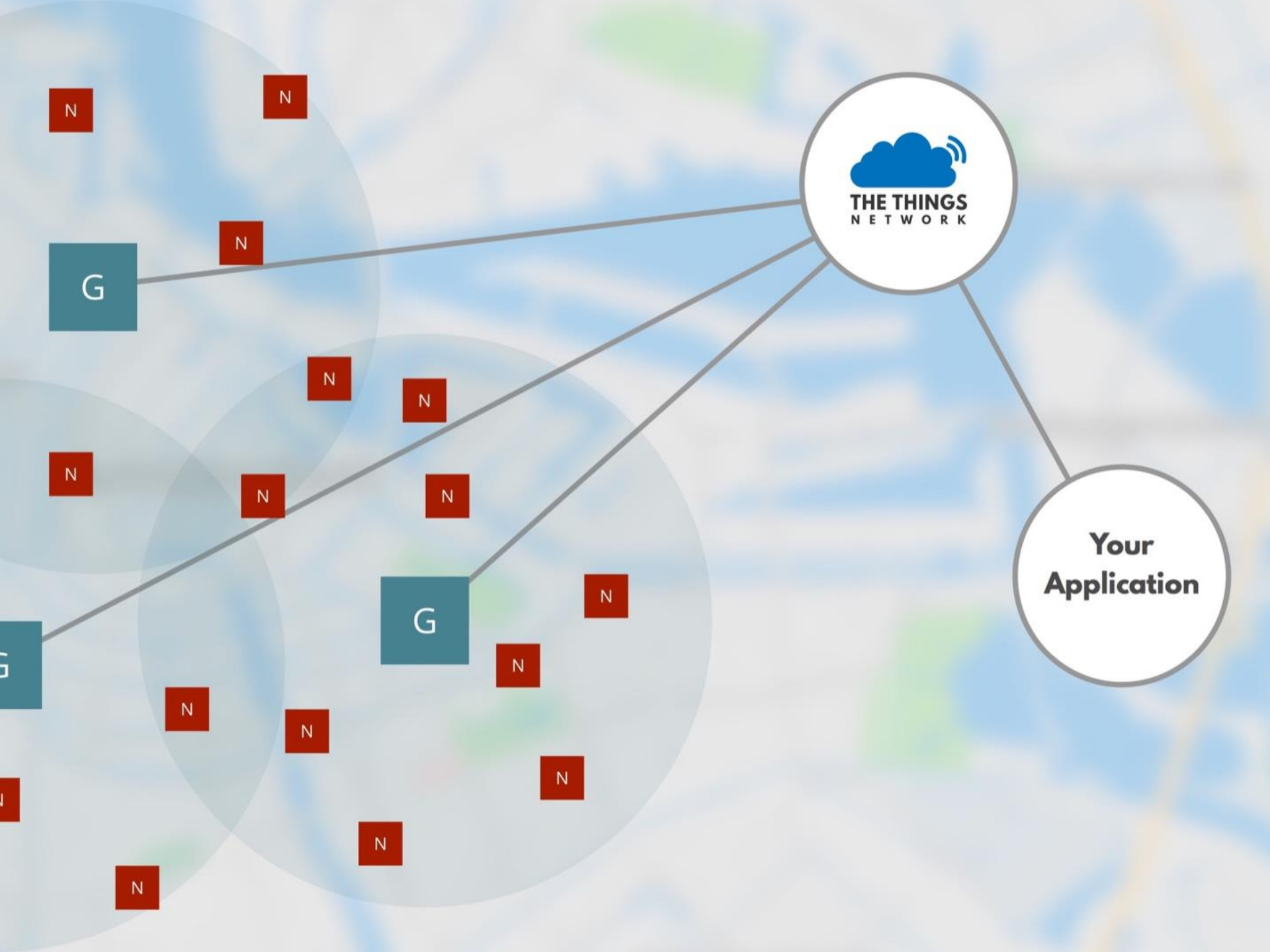
[Pre-order](#)

Created by

Wienke Giezeman

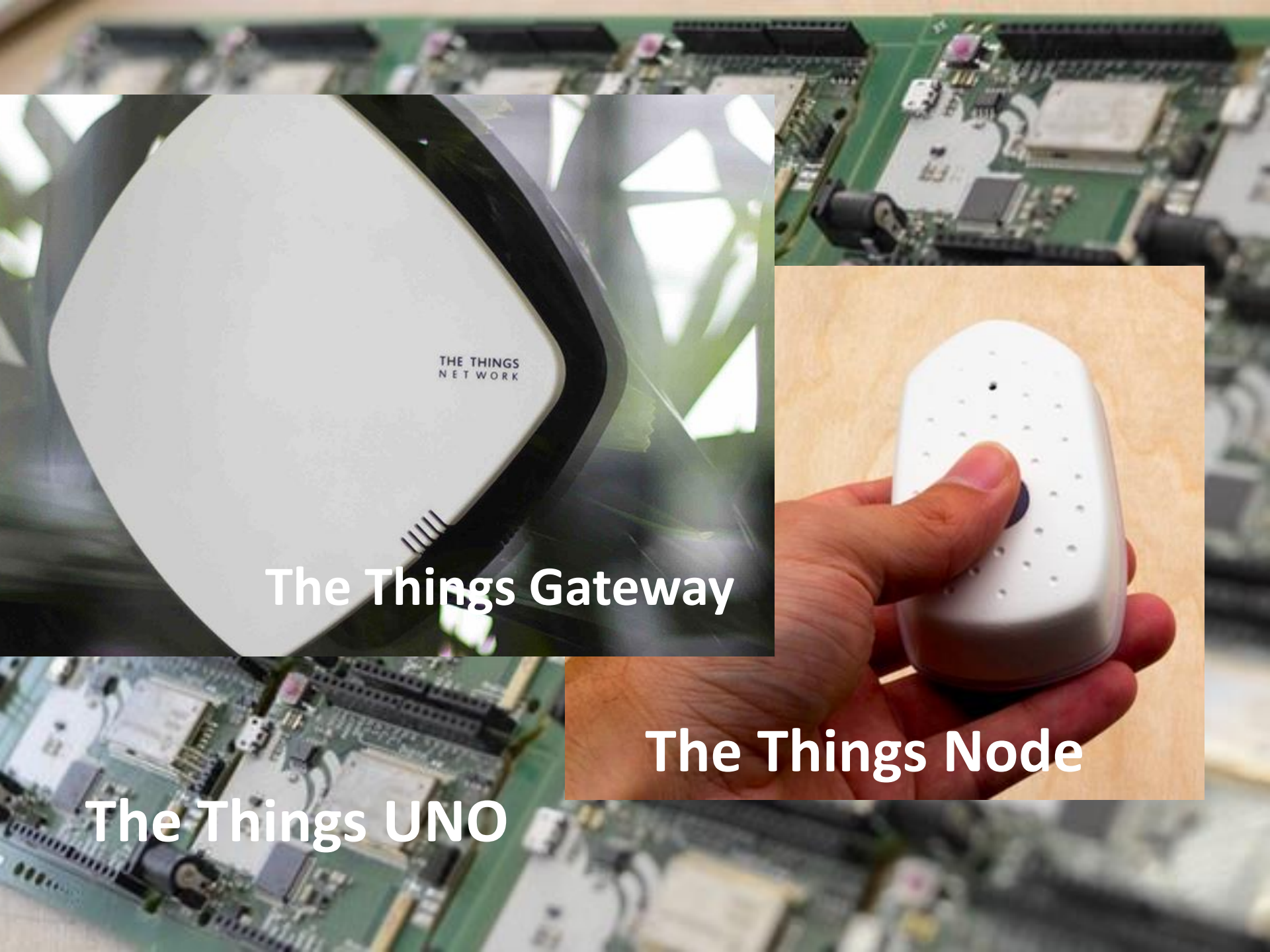


934 backers pledged €295,331 to help bring this project to life.



**THE THINGS
NETWORK**

**Your
Application**



THE THINGS
NETWORK

The Things Gateway

The Things Node

The Things UNO

TheThingsNetwork / ttn Watch 24 Star 76 Fork 23

Code Issues 32 Pull requests 1 Pulse Graphs

The Things Network is a global open crowdsourced Internet of Things data network. <http://thethingsnetwork.org>

1,538 commits 7 branches 0 releases 5 contributors

Branch: develop New pull request Find file Clone or download

htdivisser Merge pull request #176 from kersing/develop ...		Latest commit 9b9f36b 21 days ago
cmd	Fields adapter in Handler	a month ago
core	Fix formatting	23 days ago
mqtt	Set retry count to 10	a month ago
semtech	[debt/metadata] Add missing mandatory metadata to uplink and downlink...	3 months ago
ttntcl	Set Accept header for user create	a month ago
utils	[ttntcl] Windows doesn't like colors :(2 months ago
vendor	[vendor] Update gRPC	2 months ago
.drone.sec	[ci] Update .drone.sec	2 months ago
.drone.yml	Fix CI build for ARM [Skip CI]	2 months ago
.gitignore	Add coverage to makefile + update travis	3 months ago
.gitmodules	[hotfix/grpc] Use HTTPS version of gRPC repo	2 months ago

«Let's build a TTN Use Case»

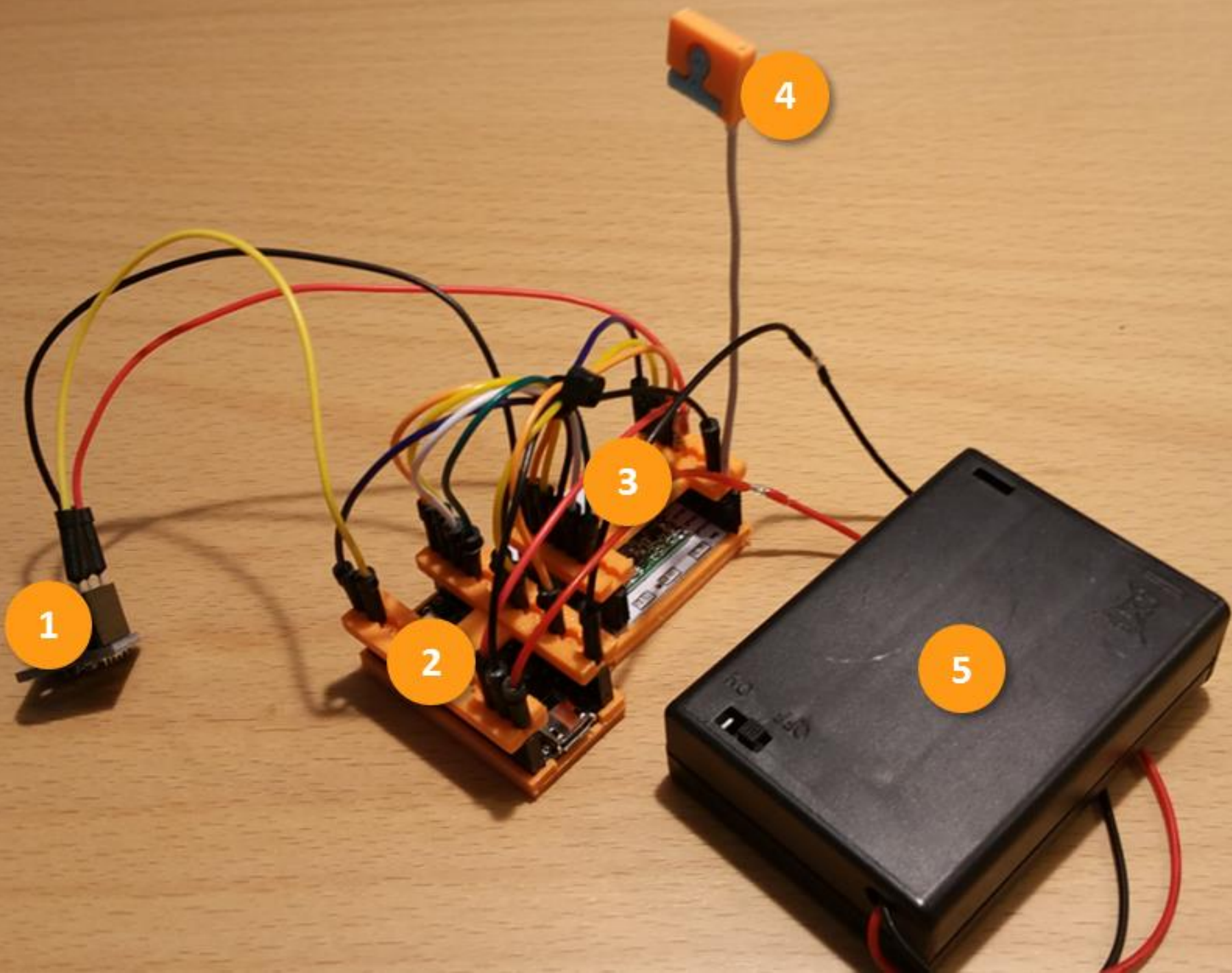
Real Time Noise Map for Zurich

- Assemble/Install a Gateway
- A simple Node

- Noise sensor
Lots of tinkering

- Backend Application
The simple part (TTN relies on MQTT to stream data)





1

2

3

4

5



noise_monitor LoRa.cpp LoRa.h

```

void setup() {
  Serial.begin(9600);
  pinMode(13, OUTPUT);

  if (PRINT_DEBUG) {
    Serial.println(LINE);
    Serial.println("Starting setup ...");
  }

  initLora();
  initSensor();
  resetRawSensorValues();
  resetNoiseLevelValues();

  if (PRINT_DEBUG) {
    Serial.println(LINE);
  }
}

```

```

void loop() {
  updateRawSensorValues(analogRead(PIN_NOISE));

  // update/print current noise level
  if (cnt == CNT_MAX) {
    updateNoiseLevelCalibration();
    diff = val_max - val_min < diff_min? 0: val_max - val_min - diff_min;
  }
}

```

COM14 (Arduino Leonardo)

Send

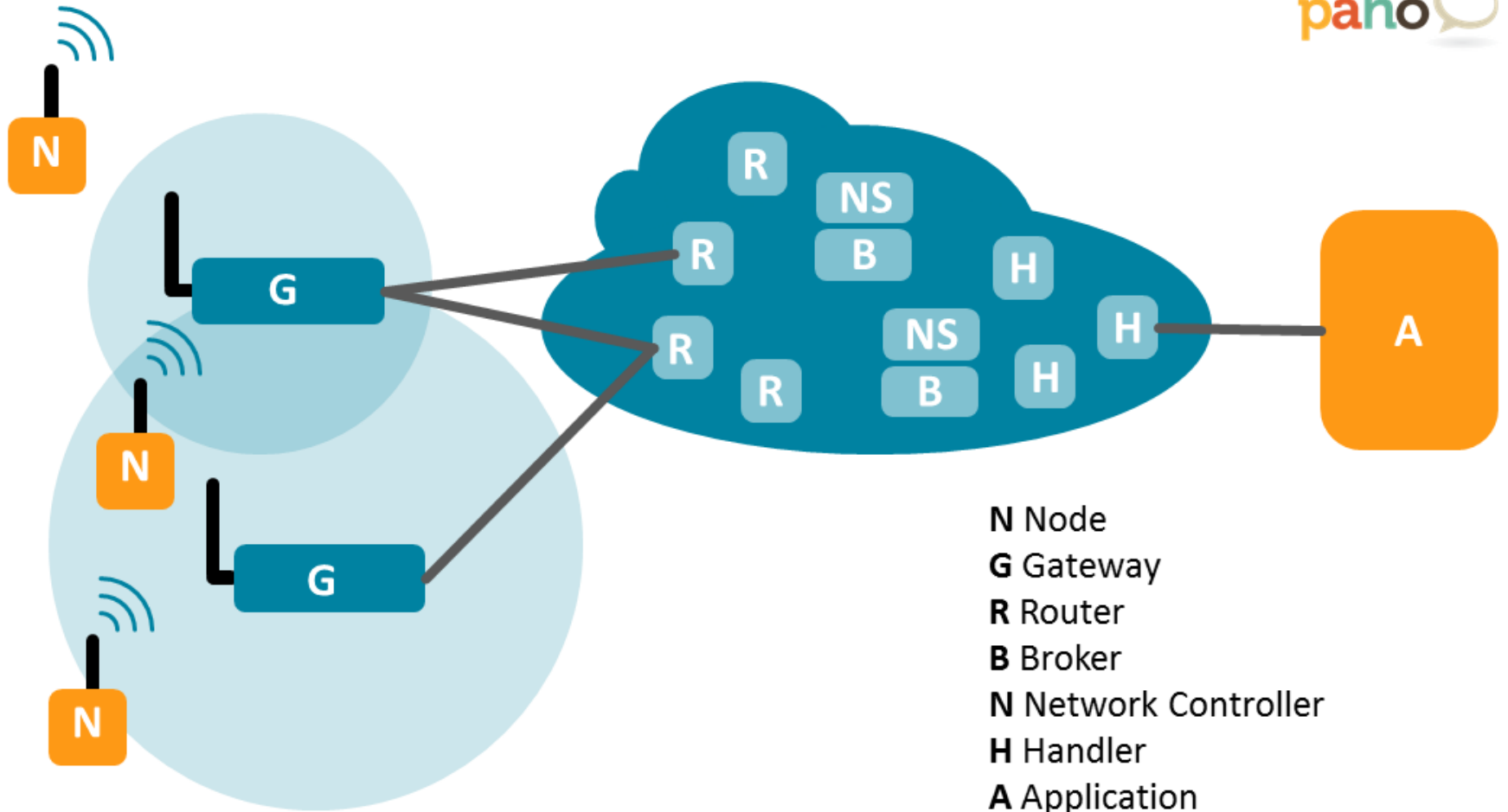
```

. 0 (min 272 max 274 diff_min 2) cnt=184
## 2 (min 271 max 275 diff_min 2) cnt=185
. 0 (min 272 max 274 diff_min 2) cnt=186
. 0 (min 272 max 274 diff_min 2) cnt=187
#### 6 (min 268 max 276 diff_min 2) cnt=188
##### 15 (min 263 max 280 diff_min 2) cnt=189
. 0 (min 273 max 274 diff_min 2) cnt=190
## 2 (min 271 max 275 diff_min 2) cnt=191
. 0 (min 273 max 274 diff_min 2) cnt=192
### 5 (min 270 max 277 diff_min 2) cnt=193
. 0 (min 273 max 274 diff_min 2) cnt=194
. 0 (min 273 max 274 diff_min 2) cnt=195
. 0 (min 273 max 275 diff_min 2) cnt=196

```

Autoscroll

No line ending 115200 baud

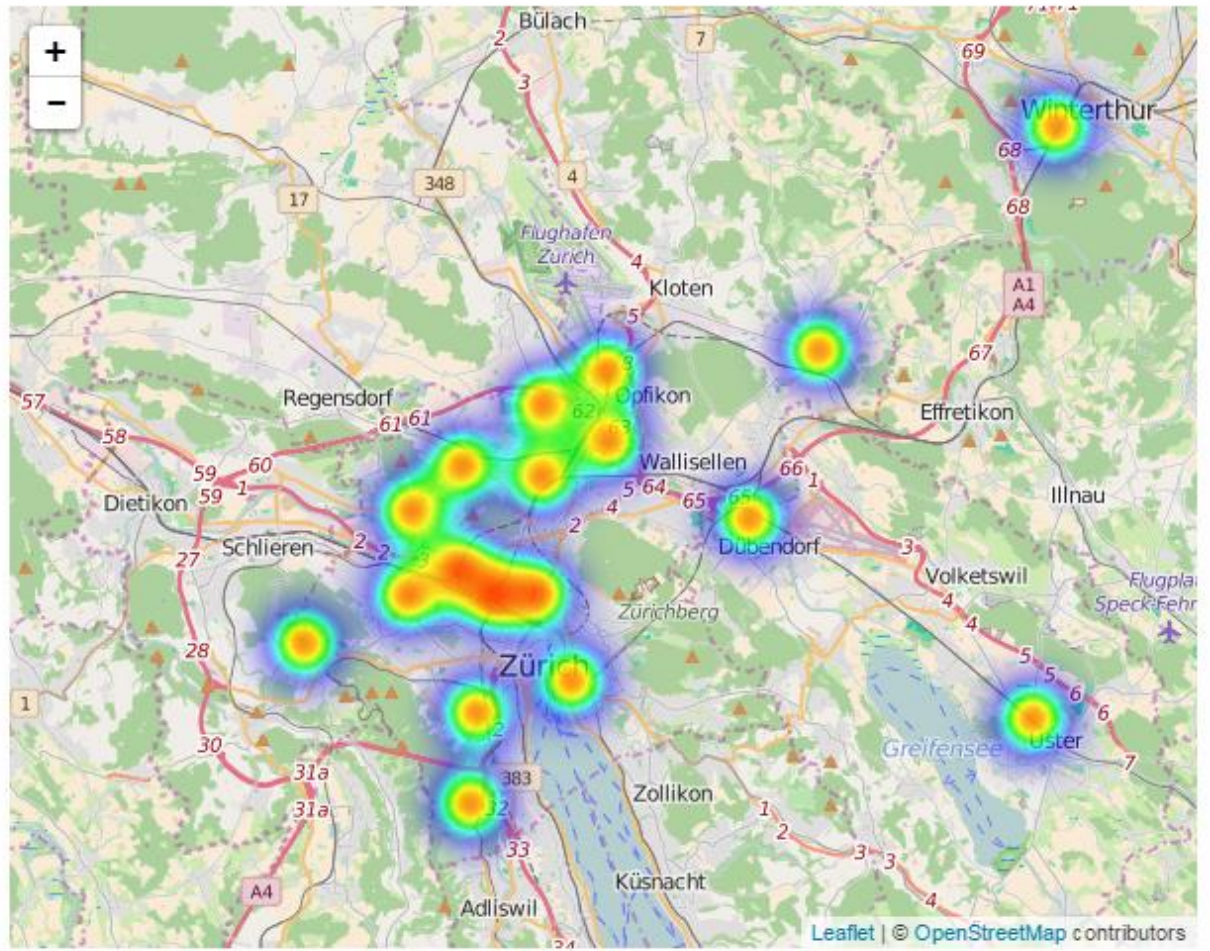


The Things Network

Reset

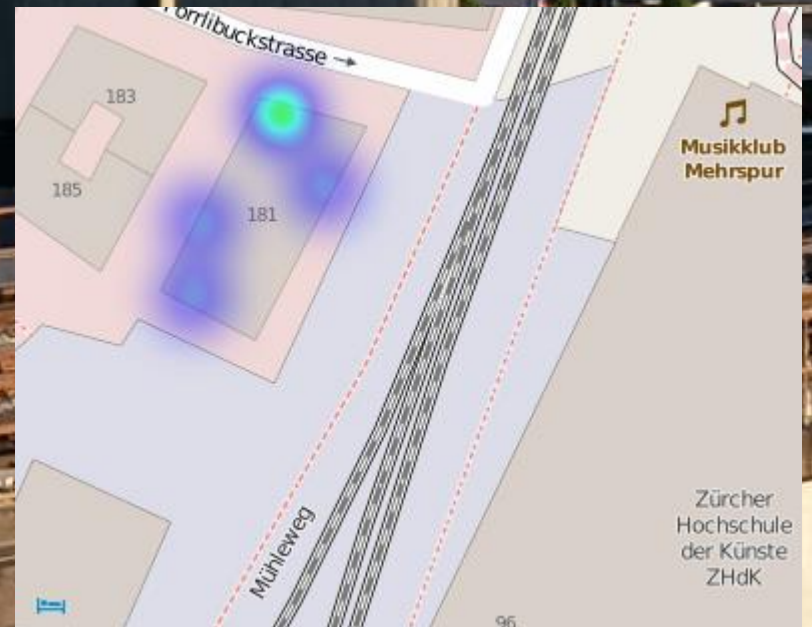
Live Map

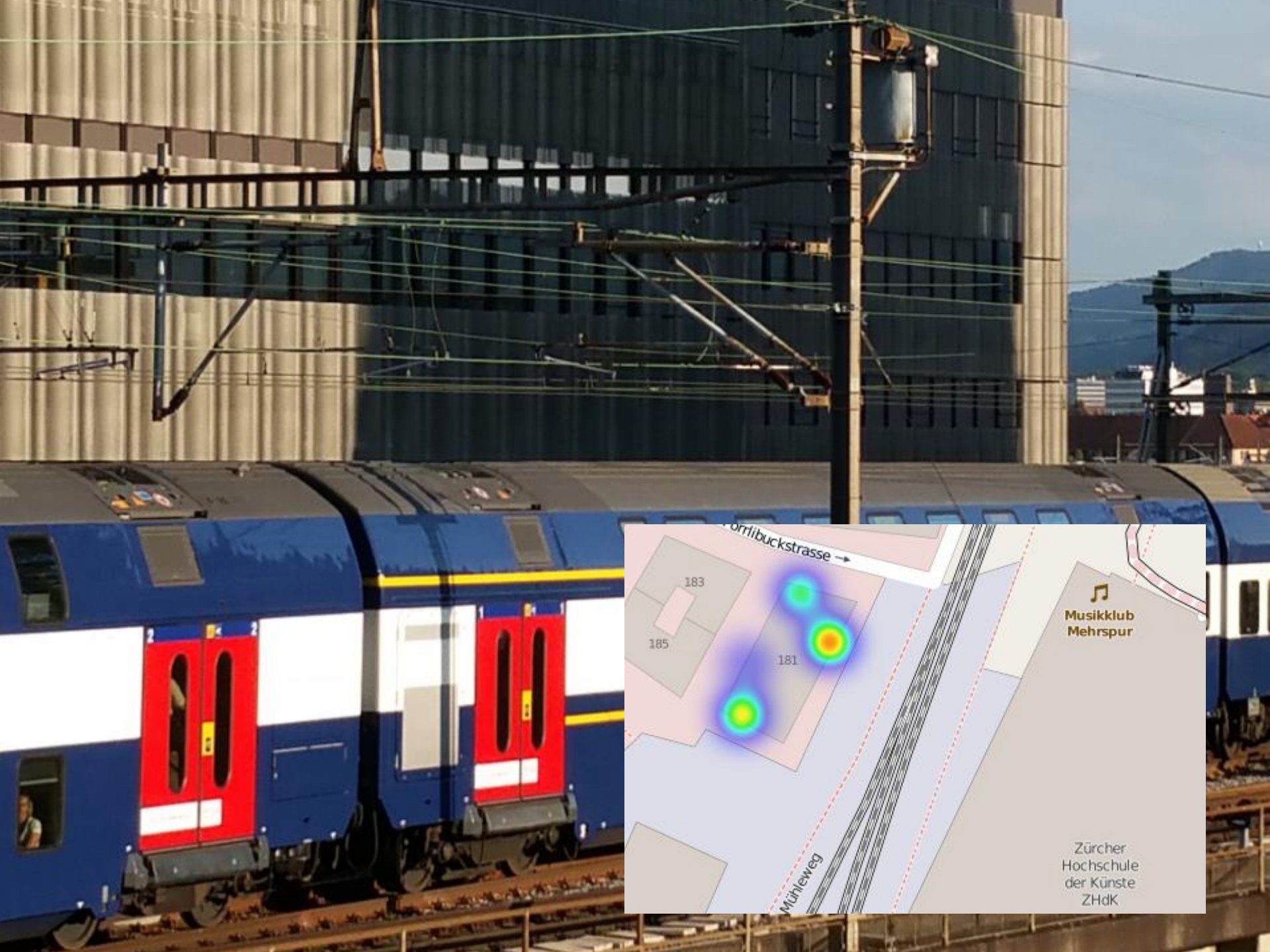
- > Gateways
- > Nodes
- > Messages



Leaflet | © OpenStreetMap contributors

Center longitude Center latitude Zoom level Time





Wrap Up

- The Things Network is an IoT Platform
 - Low Cost, Low Power, Long Range
 - Open Source + Open Hardware
 - Global Community

- Noise Monitoring App
 - Connect via MQTT (TTN uses **Eclipse Mosquitto**)
 - **Eclipse Paho** for the MQTT Java Client
 - **Eclipse Scout** for the Application (Java + HTML5)

What's Missing?

→ The Things Network

- Prototype Setup vs. «Final» Platform
- Device Activation
- Security

→ Noise Node

- Teensy vs. Arduino
- RN2483 vs. RFM95

→ Backend Application

- Application Architecture
- Heatmap Widget (Leaflet Framework)

Links

TTN Community Zurich

thethingsnetwork.org/c/zurich

HOWTO Build your own gateway

github.com/ttn-zh/ic880a-gateway/wiki

Noise Monitor Use Case

dzone.com/articles/the-things-network-and-eclipse-scout

Twitter

[@thethingsntwrk](#) [@EclipseScout](#) [@ZimMatthias](#)

TX! Qs?