

Project Coldplay

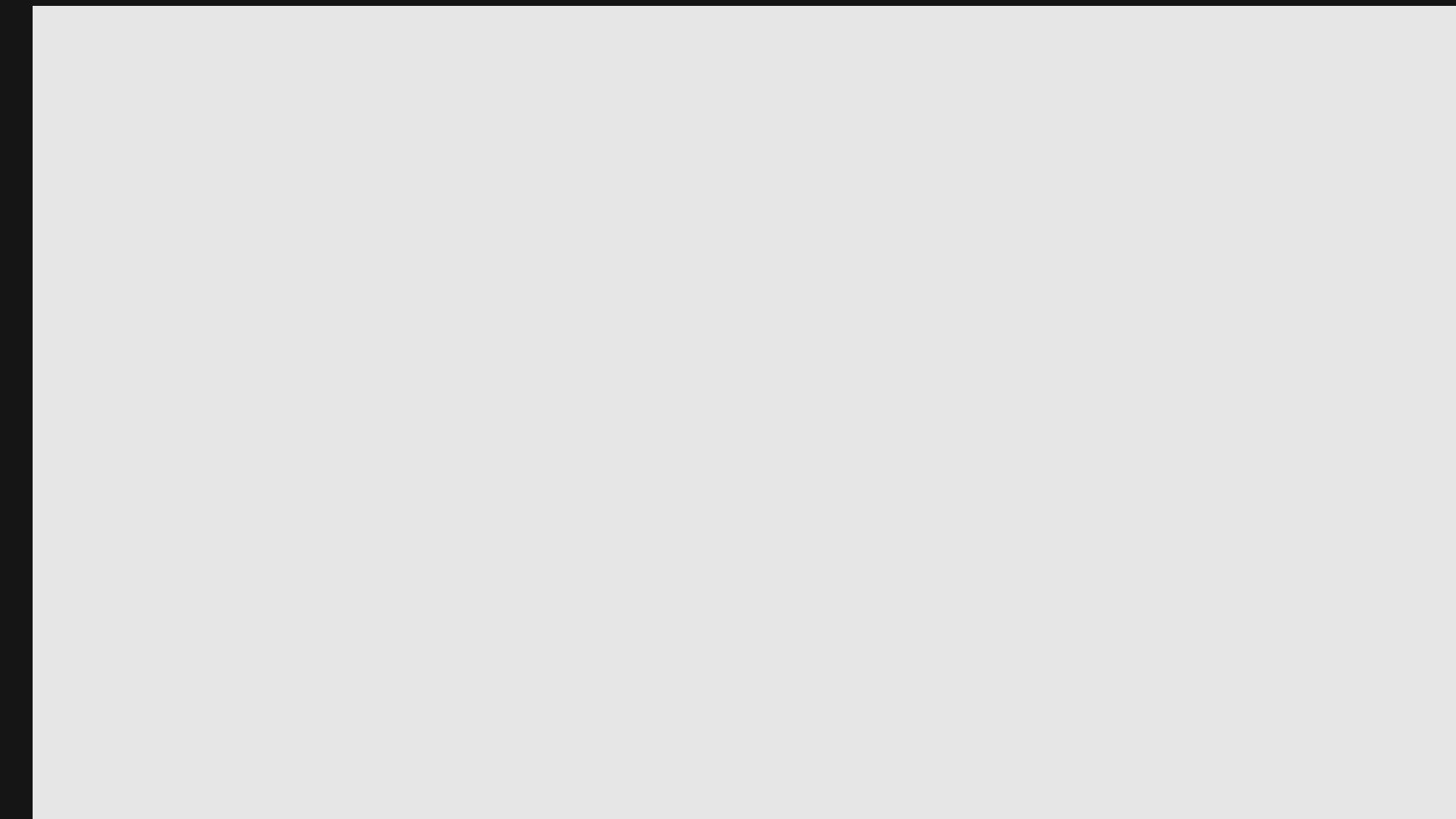
**Using CNCF Projects for Adding Music and Announcements to
My Home Elevator**

Erwin de Keijzer, Fullstaq



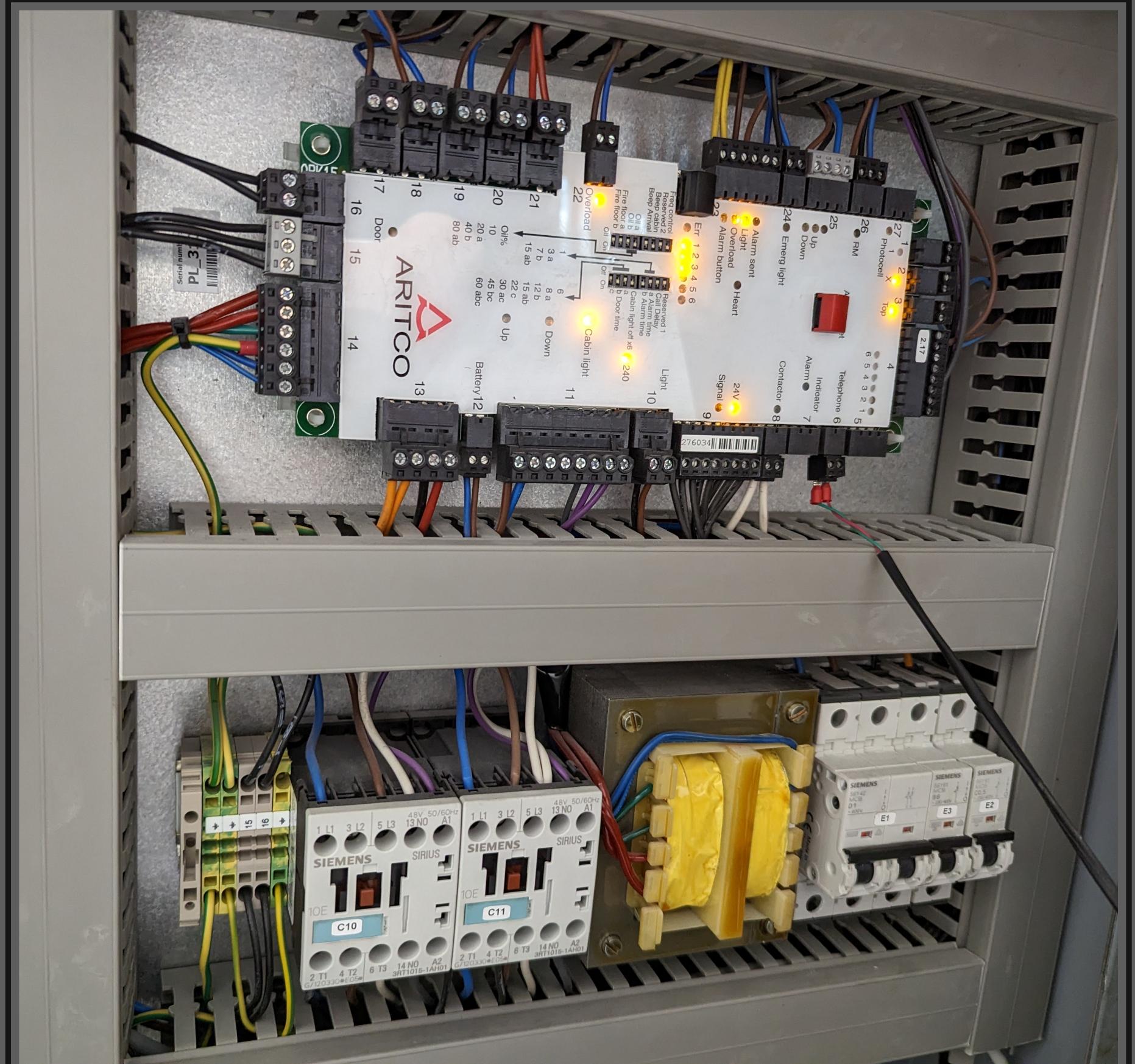
Erwin de Keijzer

Self proclaimed Elevator Engineer
Site Reliability / DevOps / Software Engineer



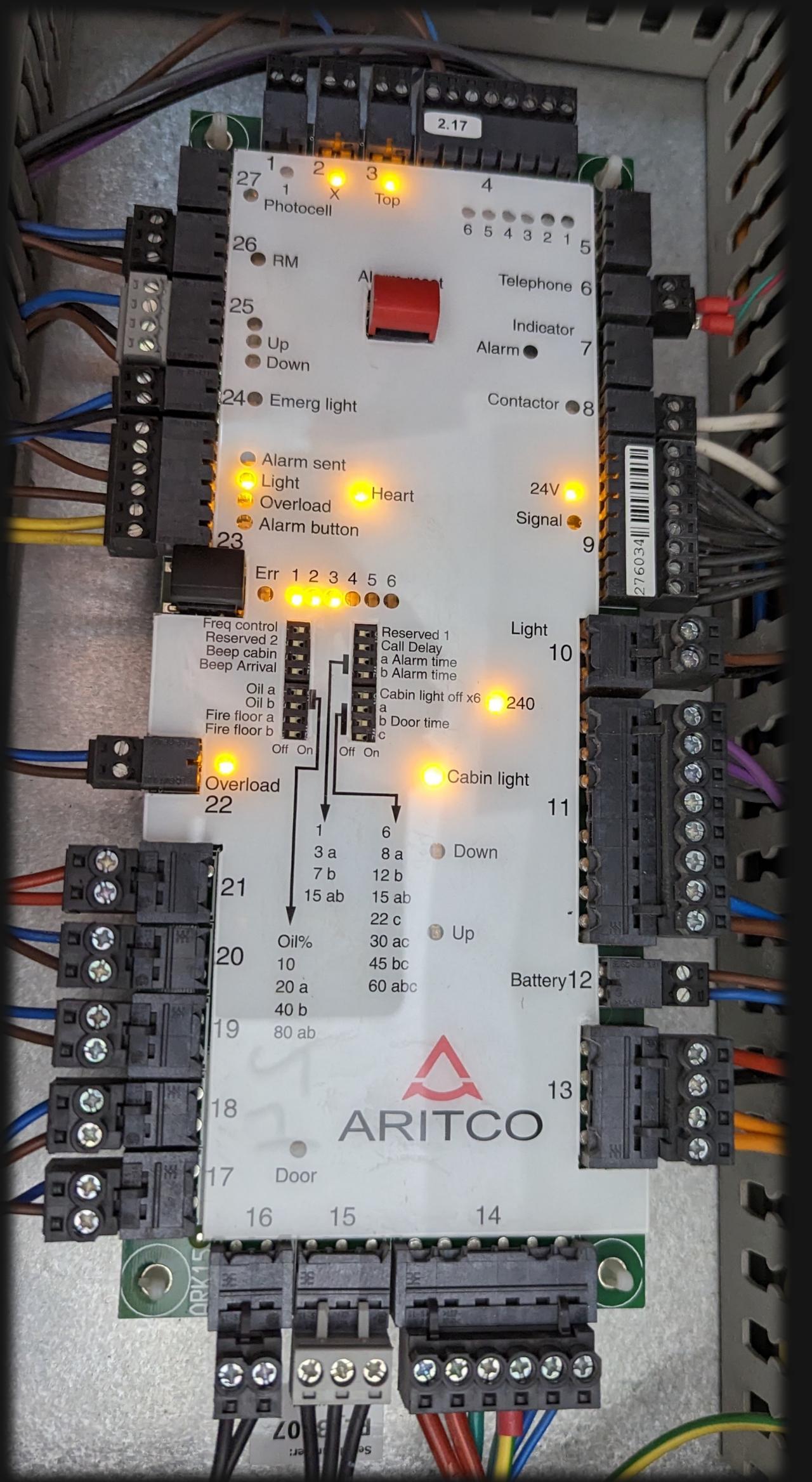
Background

The Elevator



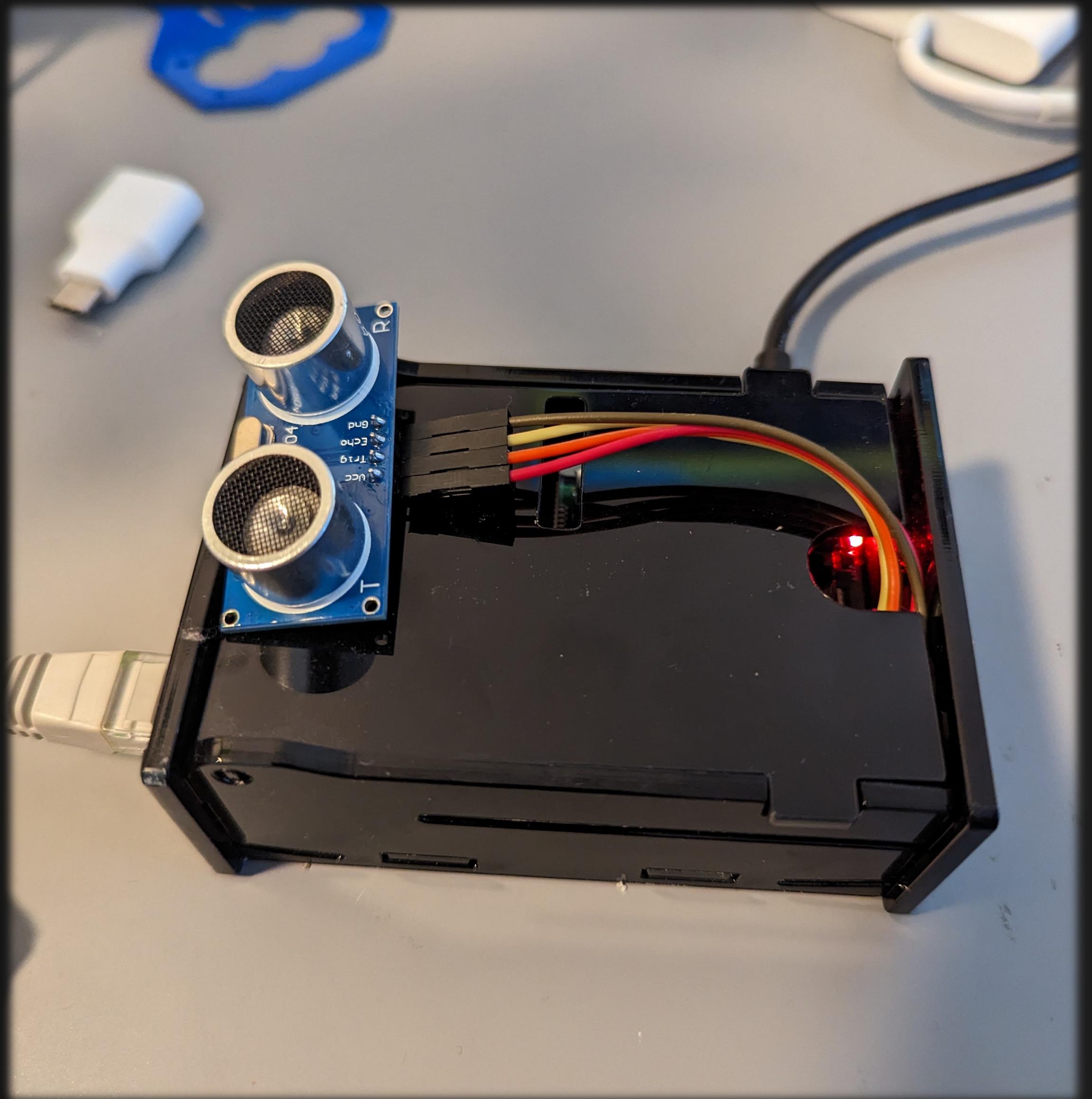
Project Coldplay goals and rules

- Add music when the elevator is moving
 - Play announcements when the elevator stops at a floor
 - Don't break the elevator
 - Don't mess with the internal electronics



Attempt #1

Ultrasonic sensor





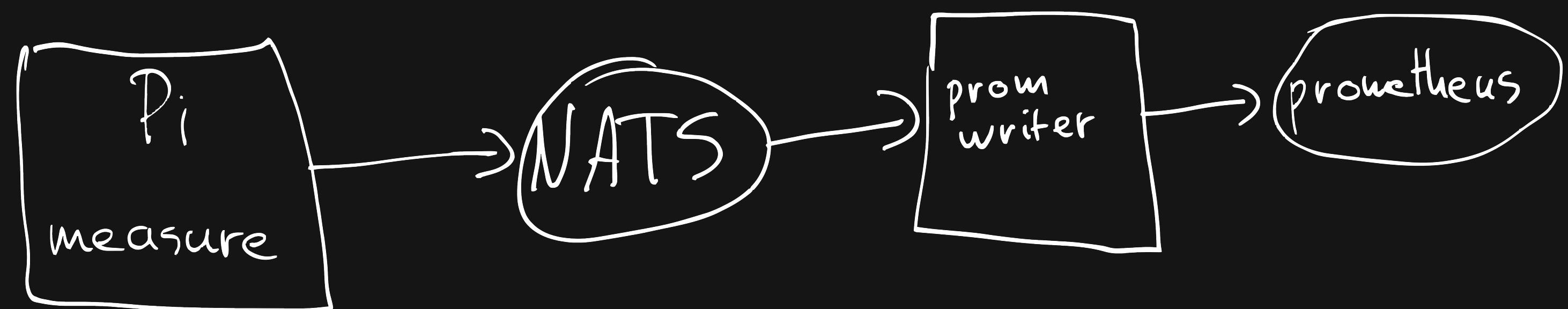
Failure #1

Attempt #2

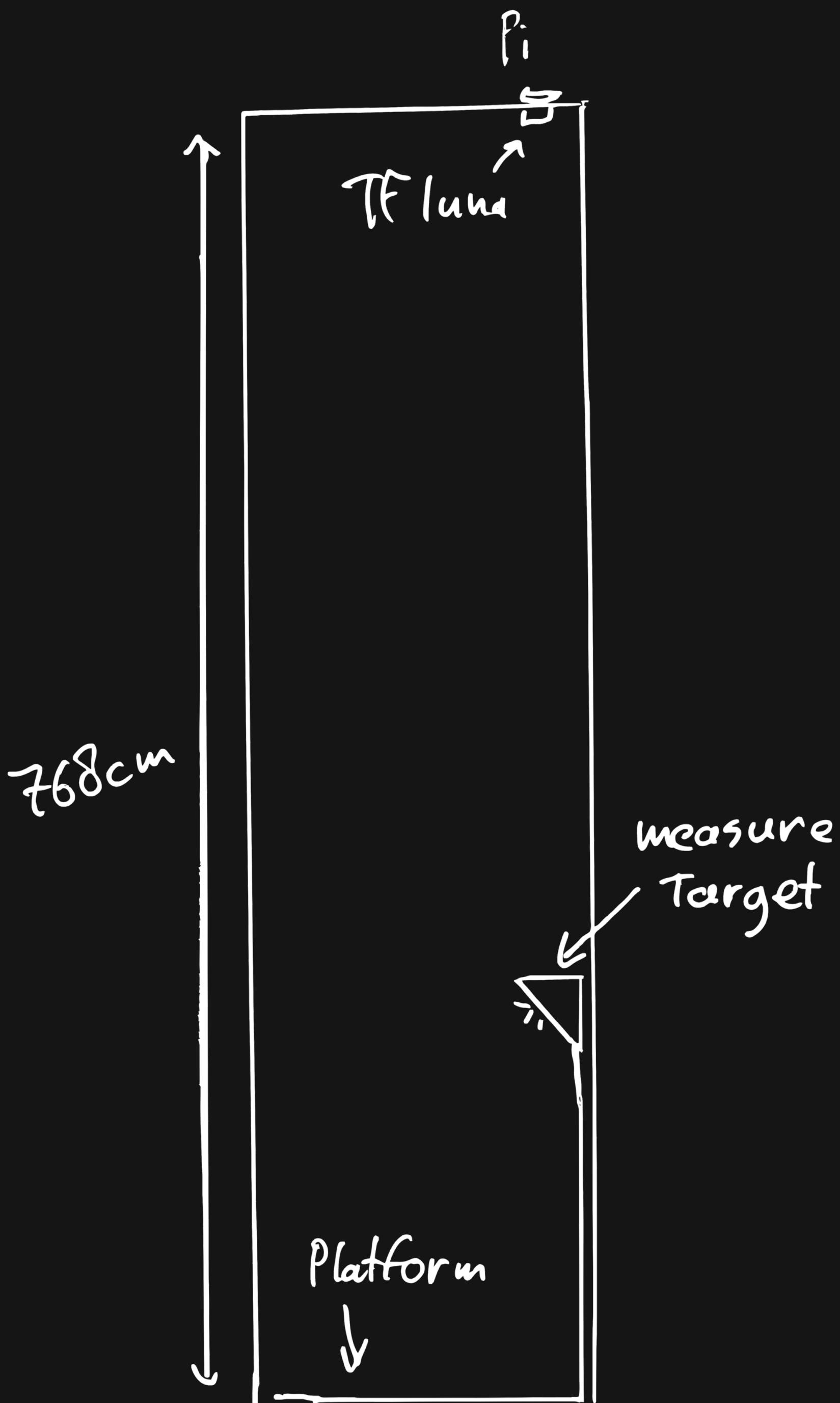
TF Luna LiDAR

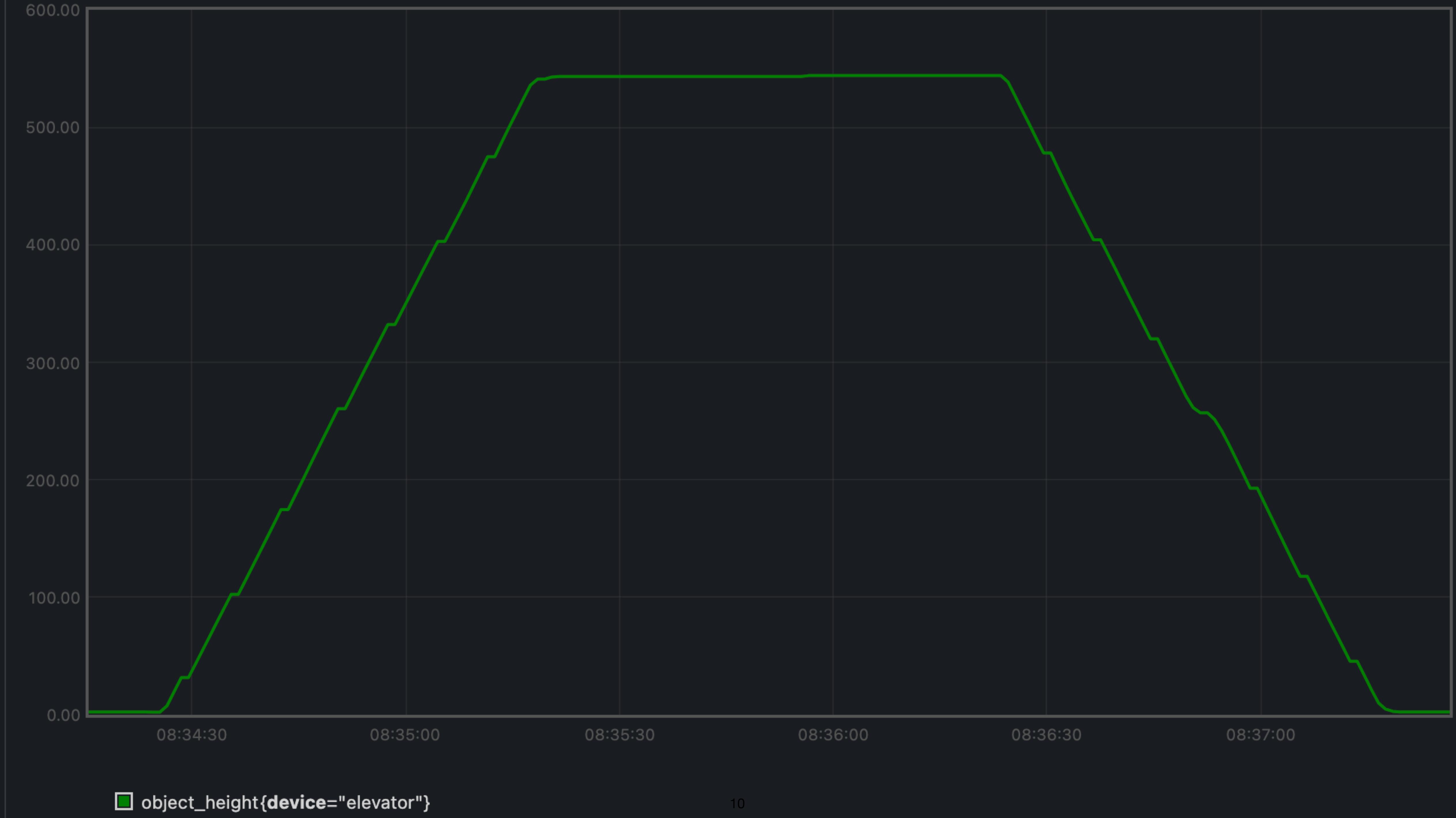


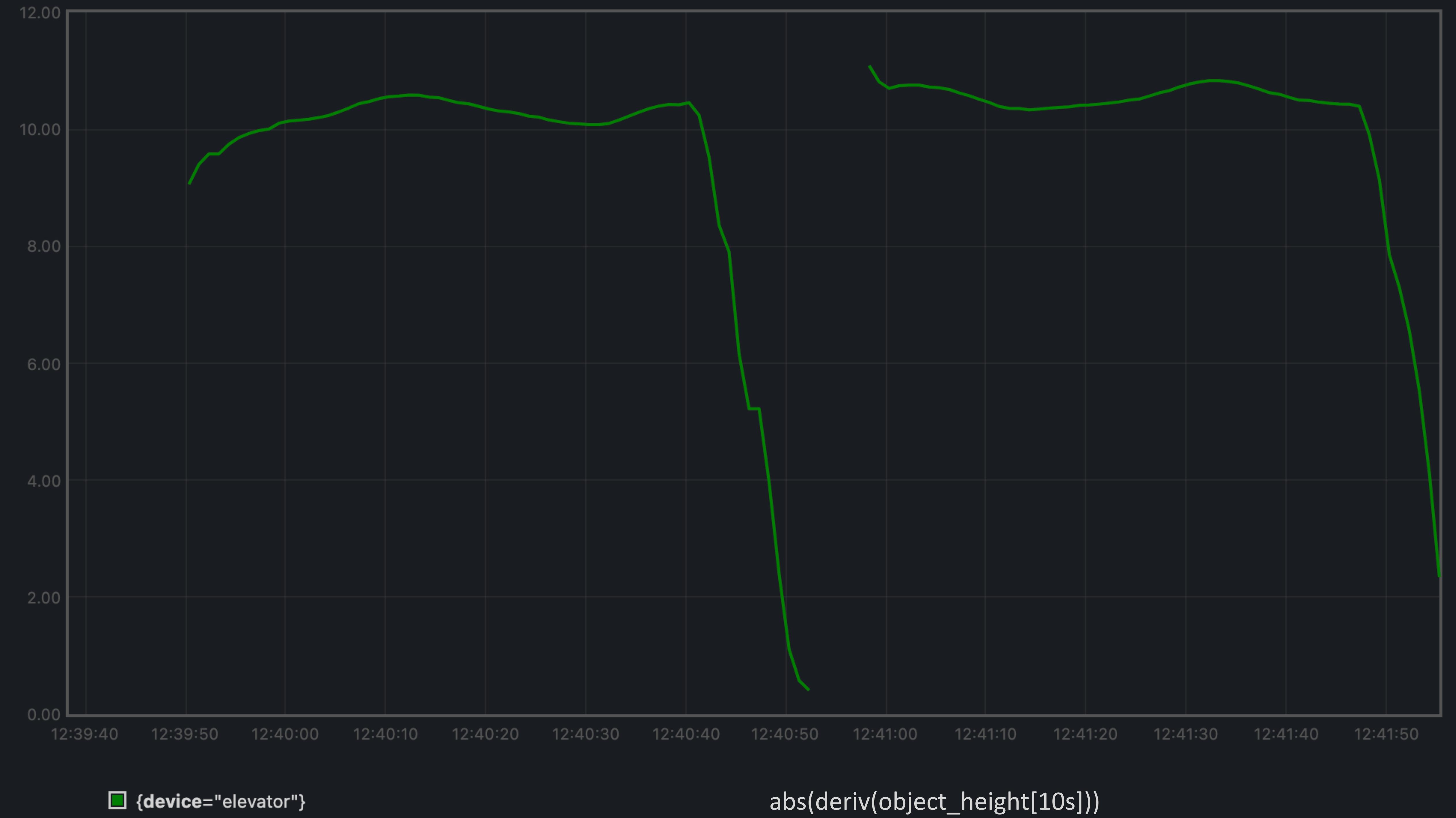
TF Luna setup



```
{  
  "height": 1.9715774869499016,  
  "timestamp": "2023-04-10T17:50:38.865396803Z"  
}
```

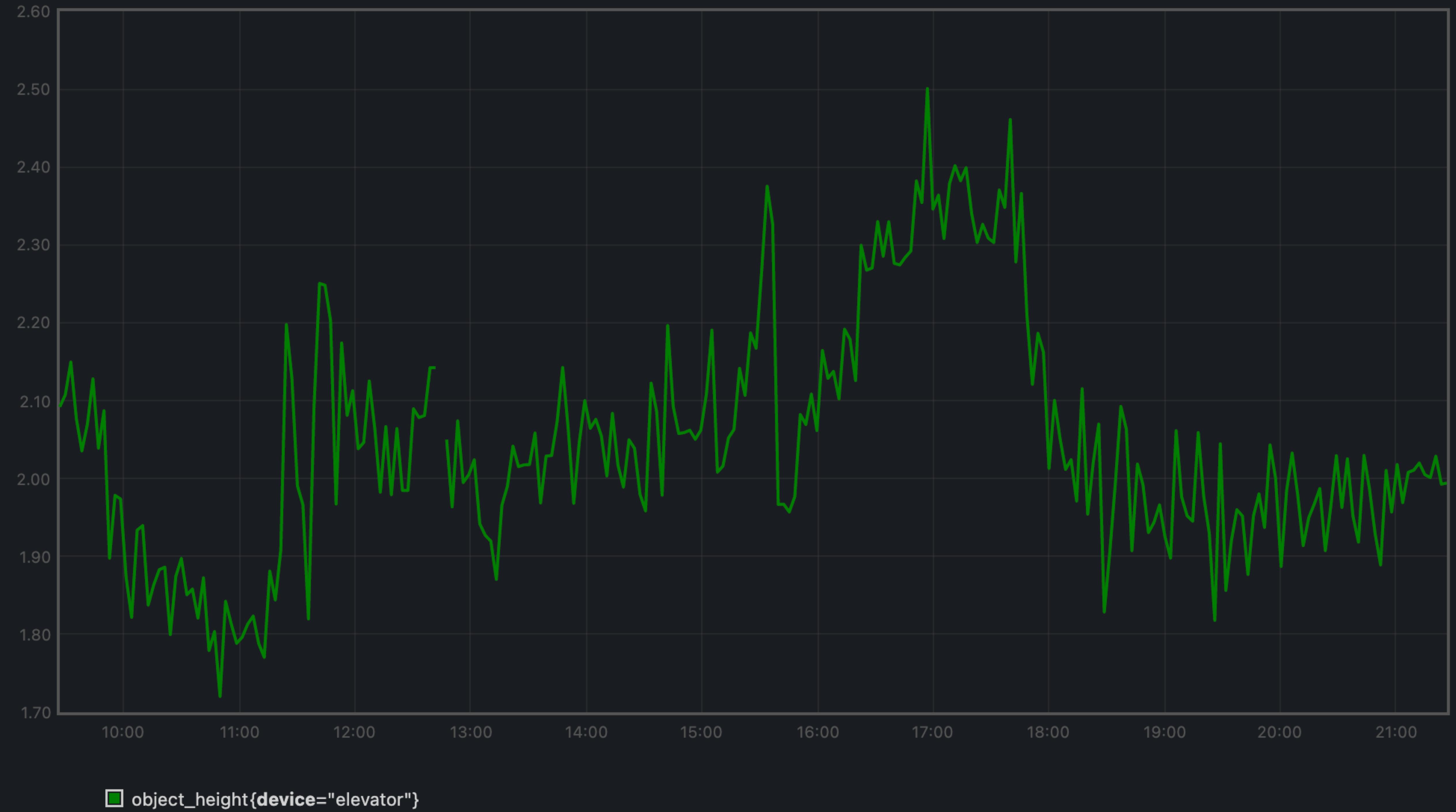






Alerts

- Elevator stuck between floors
- Elevator moves too fast
- Elevator moves too slowly
- Elevator out of bounds ($< 0 \text{ cm}$ or $> 550 \text{ cm}$)



Clever idea time

TF Luna I2C spec sheet

```
{  
  "height": 1.9715774869499016,  
  "temperature": 29.54,  
  "timestamp": "2023-04-10T17:50:38.865396803Z"  
}
```

Appendix III I2C register table

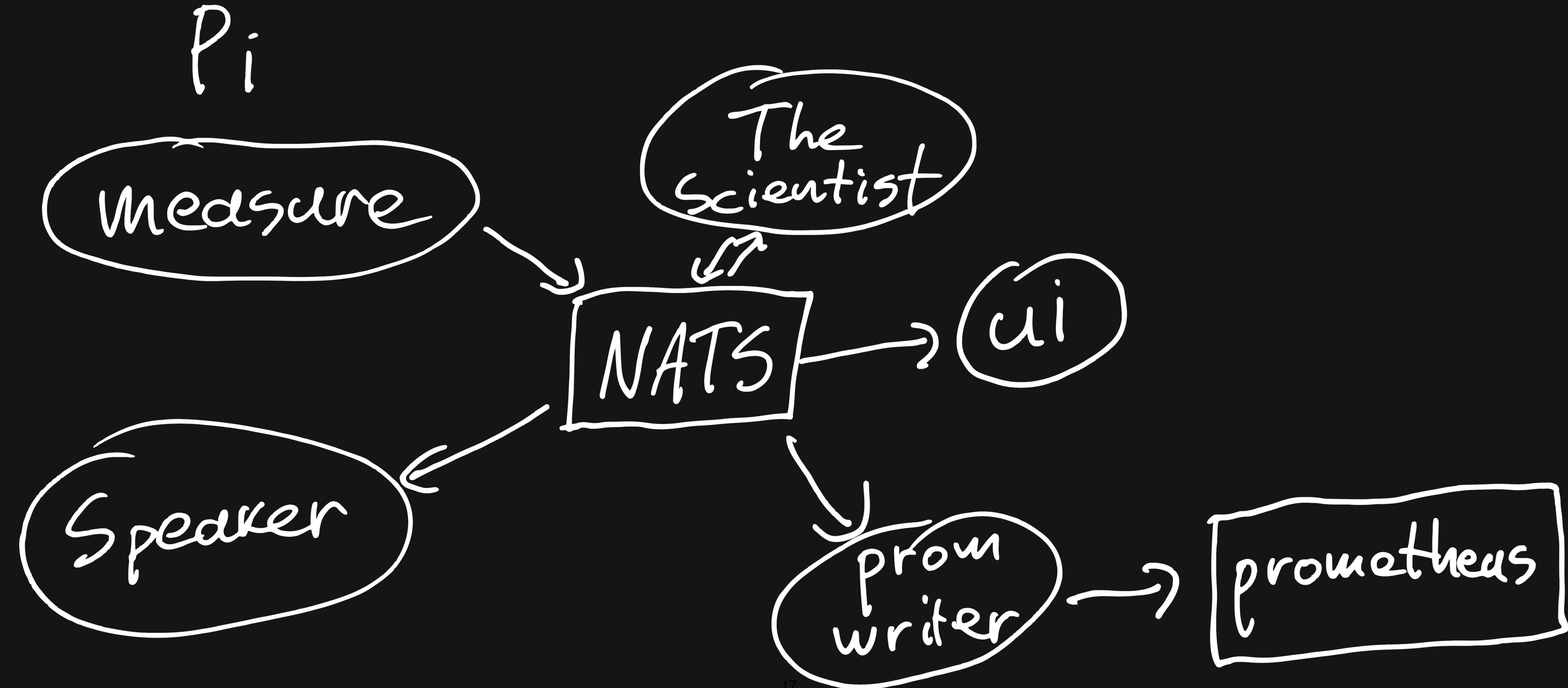
Address	R/W	Name	Initial Value	Description
0x00	R	DIST_LOW	--	cm
0x01	R	DIST_HIGH	--	
0x02	R	AMP_LOW	--	
0x03	R	AMP_HIGH	--	
0x04	R	TEMP_LOW	--	Unit: 0.01 Celsius
0x05	R	TEMP_HIGH	--	
0x06	R	TICK_LOW	--	Timestamp
0x07	R	TICK_HIGH	--	

tmp vs height





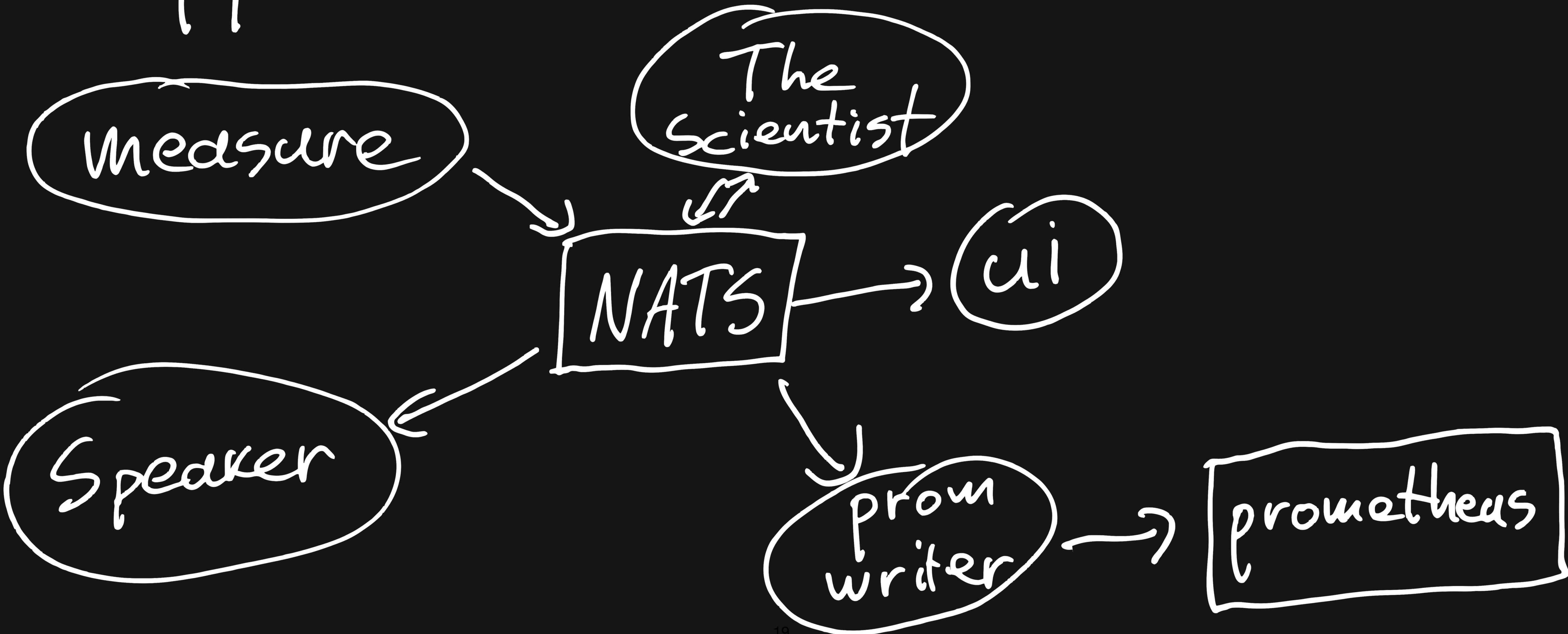
Software architecture



Tailscale

Failure #2

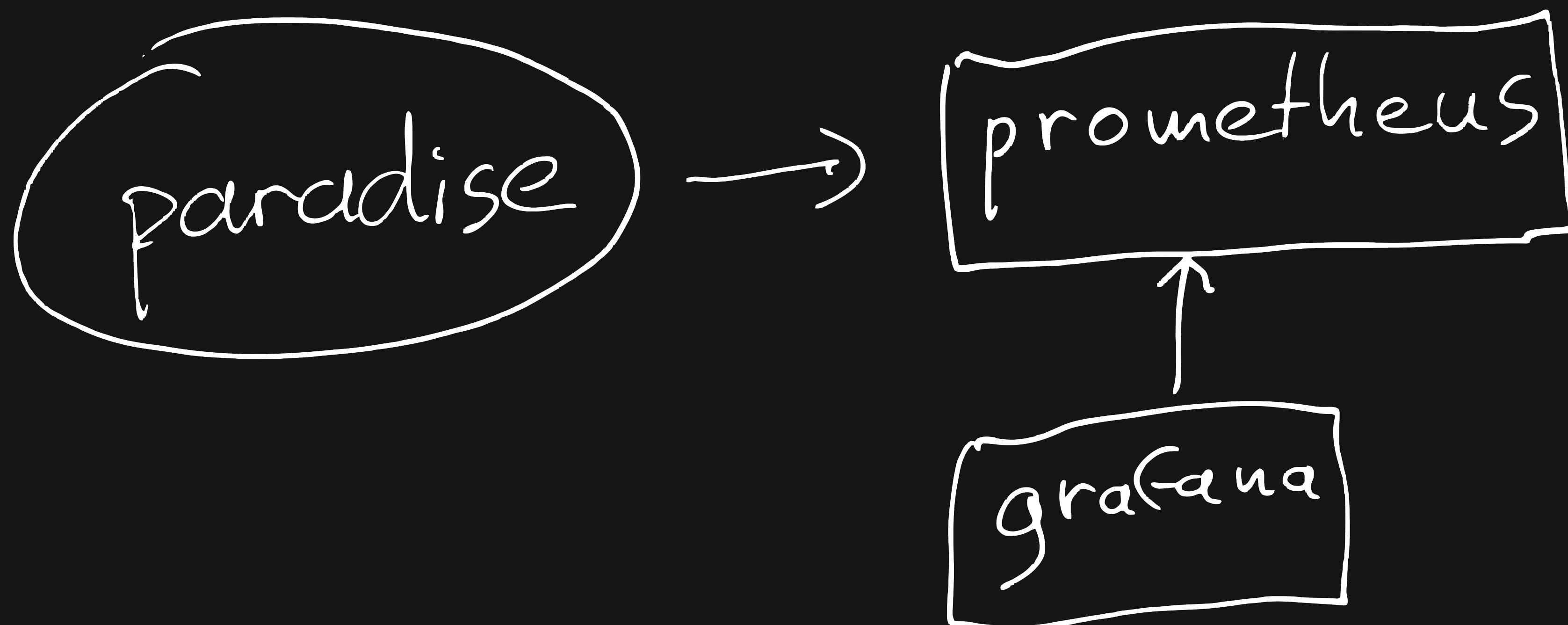
Pi



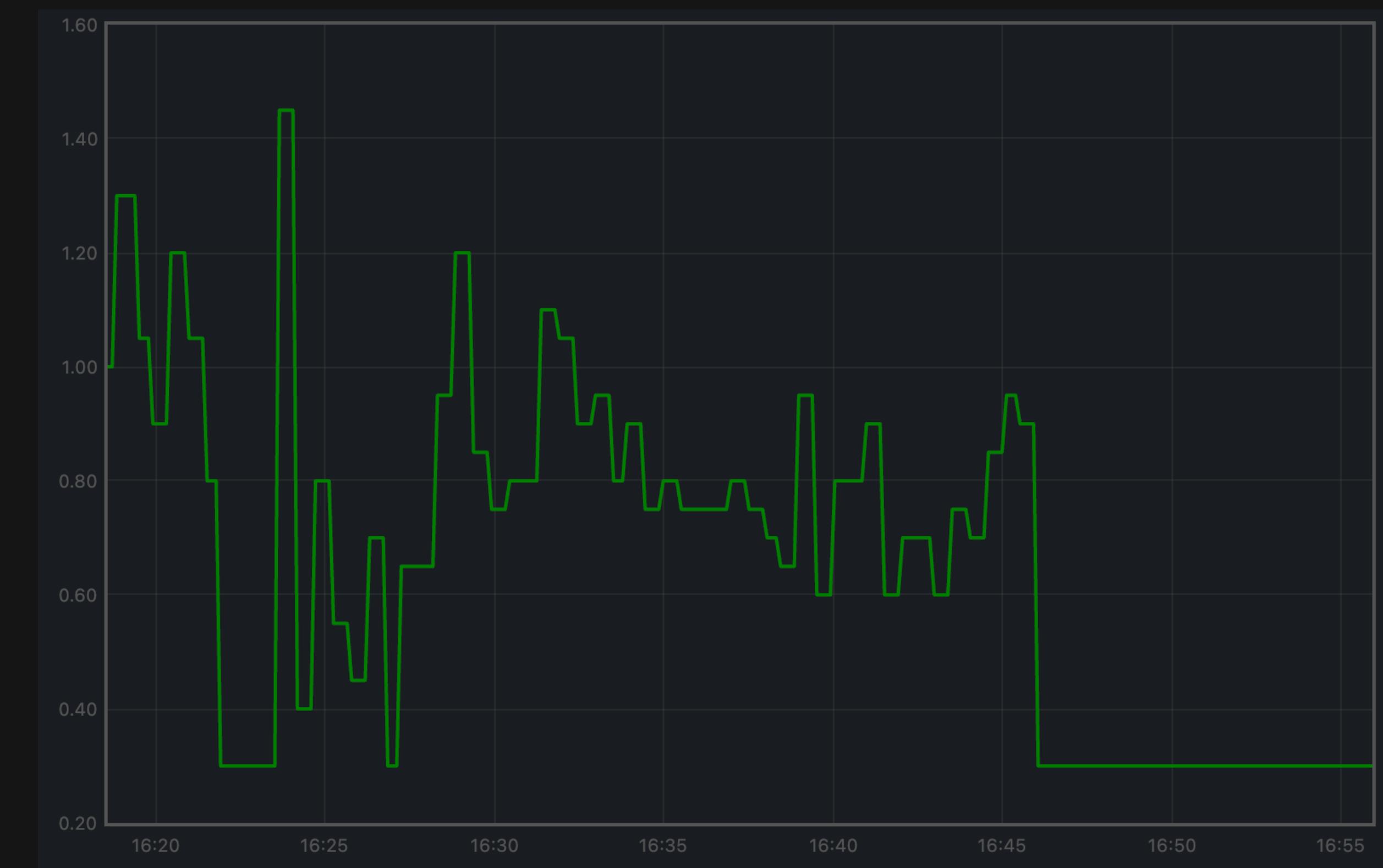
*“There is no problem in distributed computing
that a bigger monolith cannot solve.”*

Erwin de Keijzer, 2023

Software architecture 2.0



Failure #3

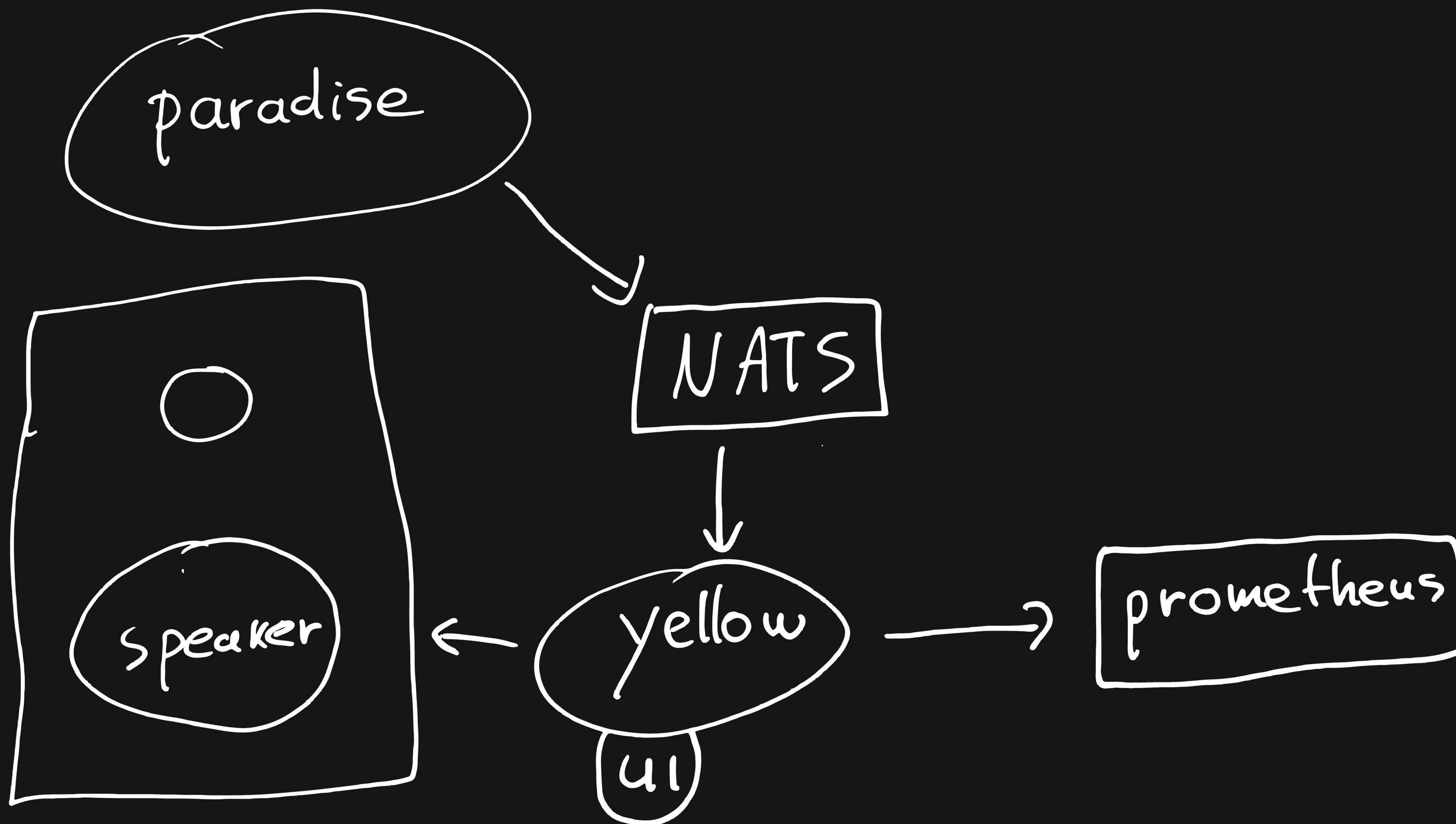


“You can't give it a taste of crab and then just expect it to not hate you for taking it away”



Ruan de Bruyn, 2023

Software architecture 3.0



Hardware



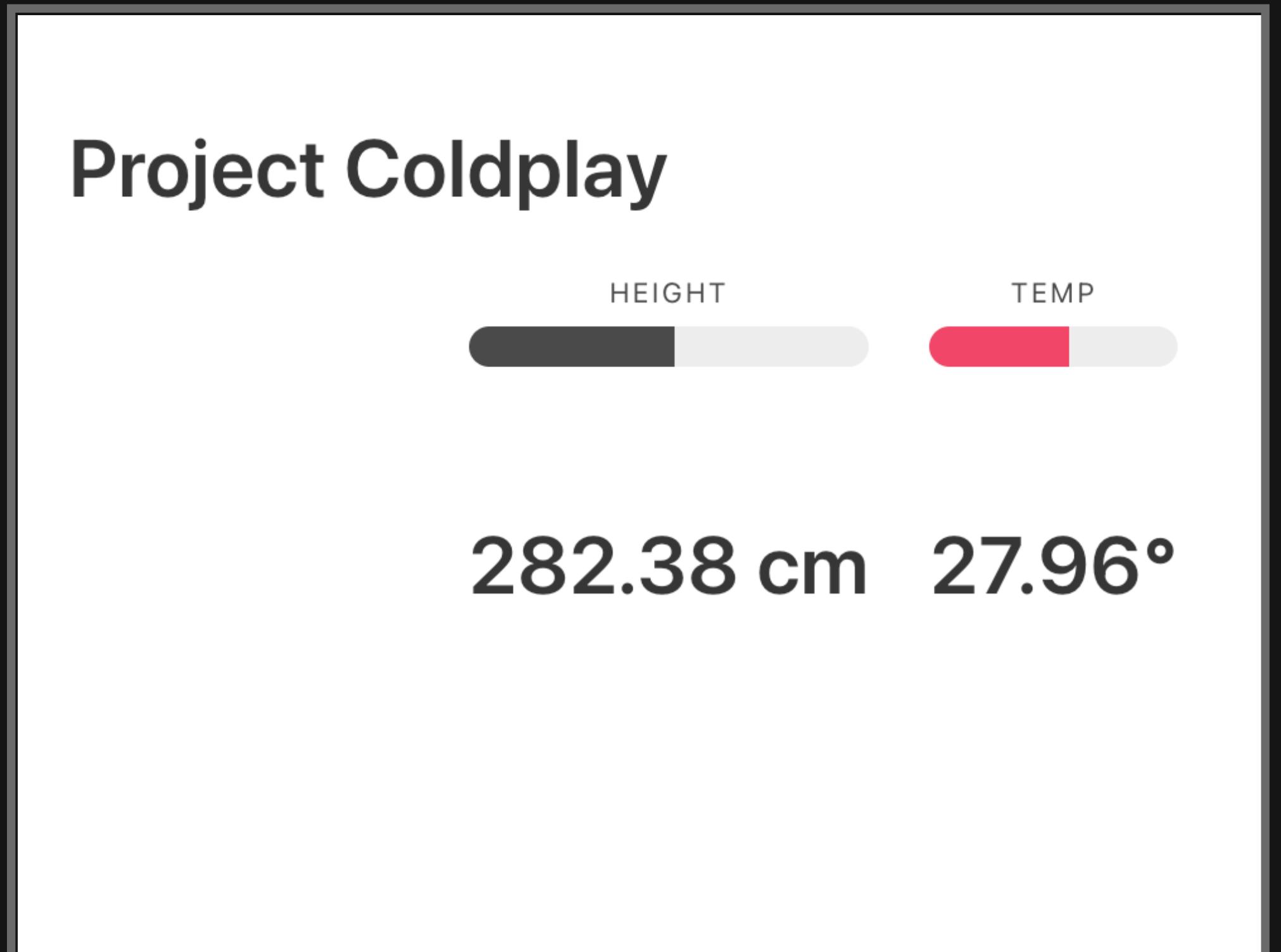


UI

```
File: html/templates.html

1 {{define "index.html"}}
2 <!DOCTYPE html>
3 <html>
4   <head>
5     <meta charset="utf-8">
6     <meta name="viewport" content="width=device-width, initial-scale=1">
7     <title>coldplay</title>
8     <link rel="stylesheet" href="/bulma.min.css">
9     <script src="/htmx.min.js"></script>
10    <script src="/sse.js"></script>
11  </head>
12  <body>
13    <section class="section">
14      <div class="container">
15        <h1 class="title">
16          Project Coldplay
17        </h1>
18
19        <nav class="level" hx-ext="sse" sse-connect="/events?stream=measurements">
20          {{template "height" .}}
21        </nav>
22
23      </div>
24    </section>
25  </body>
26</html>
27{{end}}

28{{define "height" -}}
29  <div class="level-item has-text-centered" sse-swap="message">
30    <div class="px-5">
31      <p class="heading">Height</p>
32      <p class="title">
33        <progress class="progress" value="{{.Height}}" max="550">{{.Height}}%</progress><br>
34        {{floatDecimal .Height}} cm
35      </p>
36    </div>
37    <div>
38      <p class="heading">Temp</p>
39      <p class="title">
40        <progress class="progress is-danger" value="{{.Temp}}" max="50">{{.Temp}}%</progress><br>
41        {{floatDecimal .Temp}}°
42      </p>
43    </div>
44  </div>
45{{end}}
```



Muzak

Butler

Houd de knop ingedrukt tijdens de gehele rit

++
BG

1

2



250 kg
x 2

SERVICE:
701177

Challenges

- Go with I2C and TF Luna
- ssh'ing into wrong host when testing audio
- Thinking the raspberry pi broke when I unplugged the network switch
- Having 2 copies of the measuring software running at the same time
- Bad soldering job on the connectors of the TF Luna
- Ultrasonic sensor
- "The real world"
- Cross compiling Rust and Go from M1 Mac to Linux Arm
- Nerd sniping myself



Project Coldplay