

Voorstel eindwerk Datalab:

Ik zou graag metingen doen op temperatuur en vochtigheid met een SI7021 sensor, waarbij ik zowel de data van een ESP32Lora module als van een Raspberry Pi 3 (pi3) verzamel en verwerk. De ESP32Lora zal de gemeten gegevens via The Things Network (TTN) naar de Raspberry Pi sturen. Daarnaast zal op de Raspberry Pi 3 zelf ook een SI7021 sensor aangesloten zijn voor lokale temperatuur- en vochtigheidsmetingen.

Dit project heeft als doel om een overzicht te krijgen van de klimaatcondities op twee verschillende locaties, en om automatisch ventilatie of verwarming aan te sturen op basis van de verzamelde data. Hiervoor zal de Raspberry Pi 3 een set van 7 LED's aansturen om de status van de ventilatie of verwarming visueel weer te geven. De kleuren van de LED's geven specifieke situaties aan, gebaseerd op de gegevens die worden ontvangen van de ESP32Lora sensor of de lokale Pi-sensor:

LED-indicaties en functies:

- **LED 1 (groen):** Koude lucht wordt geblazen wanneer de temperatuur gemeten door de ESP32 sensor hoger is dan 25 graden.
- **LED 2 (wit):** Ventilator staat in ruststand bij een temperatuur tussen 20 en 25 graden, gemeten door de ESP32 sensor.
- **LED 3 (rood):** Warme lucht wordt geblazen wanneer de temperatuur gemeten door de ESP32 sensor lager is dan 20 graden.
- **LED 4 (groen):** Koude lucht wordt geblazen wanneer de temperatuur gemeten door de Pi3 sensor hoger is dan 25 graden.
- **LED 5 (wit):** Ventilator staat in ruststand bij een temperatuur tussen 20 en 25 graden, gemeten door de Pi3 sensor.
- **LED 6 (rood):** Warme lucht wordt geblazen wanneer de temperatuur gemeten door de Pi3 sensor lager is dan 20 graden.
- **LED 7 (blauw):** Ventilator staat in ruststand wanneer zowel de ESP32 sensor als de Pi3 sensor een temperatuur tussen 20 en 25 graden meten.

De LED's geven op een duidelijke en visuele manier de status van het systeem weer, afhankelijk van de gemeten temperatuur. Dit maakt het eenvoudig om in een oogopslag te zien of er verwarming of ventilatie nodig is op basis van de omgevingstemperatuur.

Link dashboard:

<https://amirdesign.net/public-dashboards/95d1a4bd07f045a09dc7ac709fa220f7>



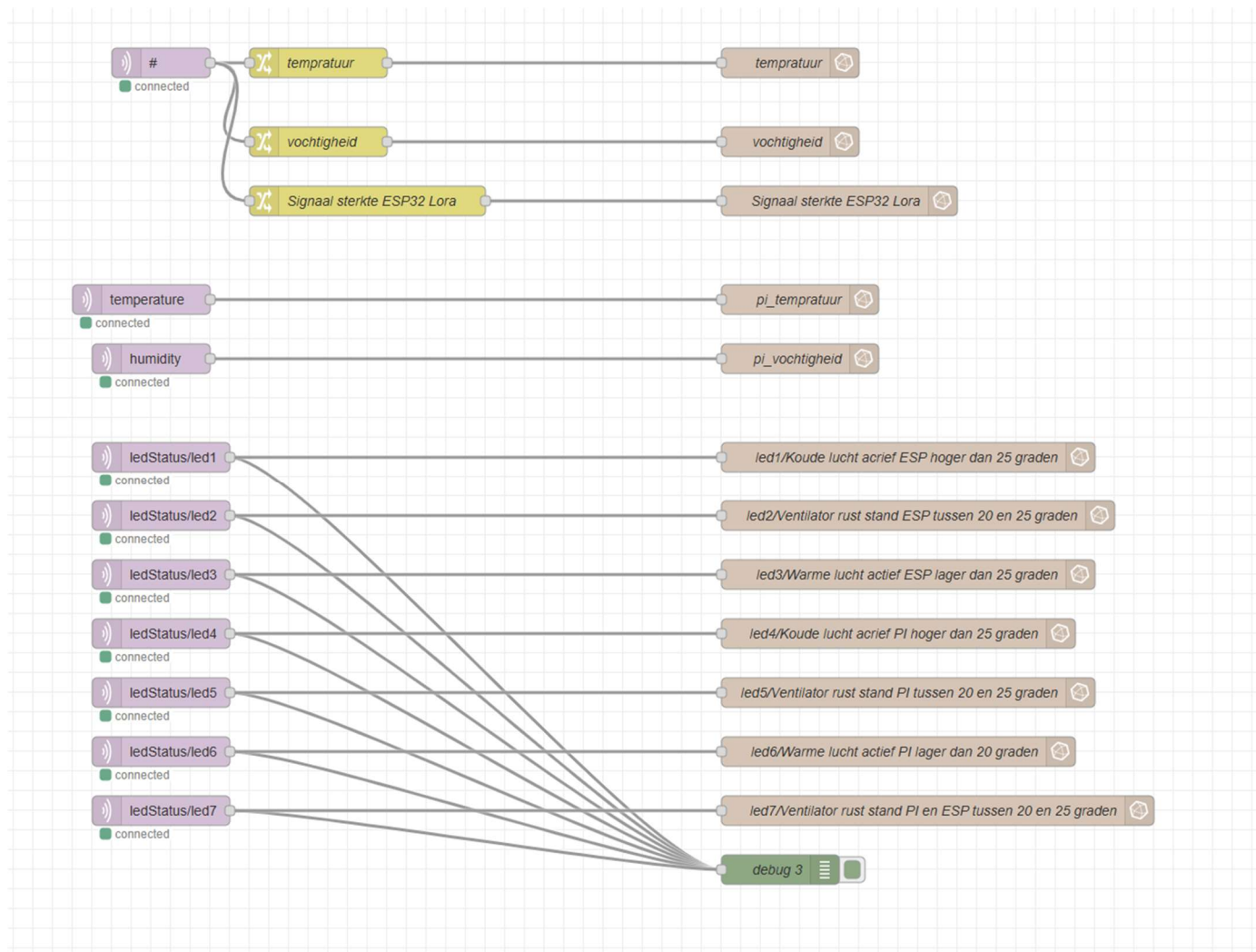
Link website:

<https://amirdesign.net/website/>

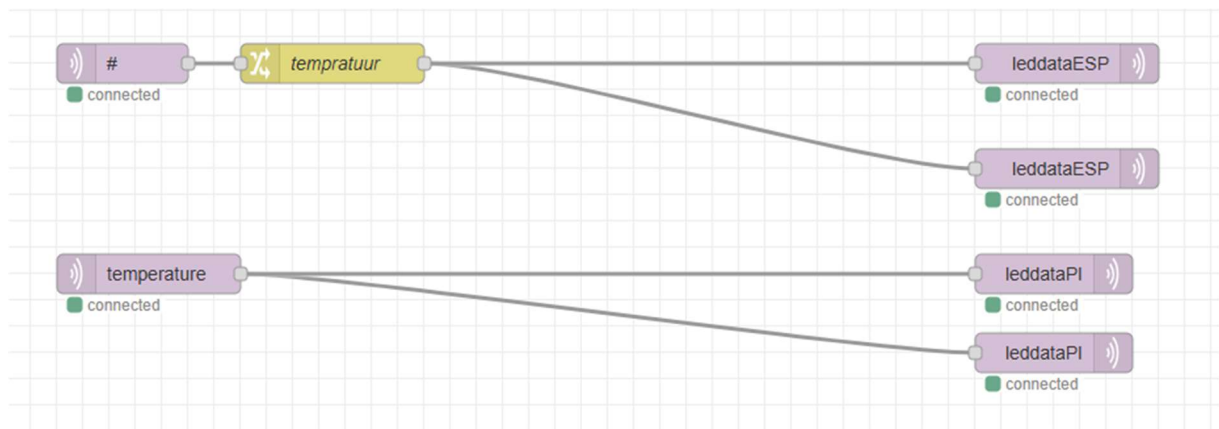


Node red

virtual machine



Nodered VS:



Grafana.ini /laag2

```
# disable protection against brute force login attempts
;disable_brute_force_login_protection = false

# set to true if you host Grafana behind HTTPS. default is false.
;cookie_secure = false

# set cookie SameSite attribute. defaults to 'lax'. can be set to "lax", "strict", "none" and "disabled"
;cookie_samesite = lax

# set to true if you want to allow browsers to render Grafana in a <frame>, <iframe>, <embed> or <object>. default is false.
allow_embedding = true

# Set to true if you want to enable http strict transport security (HSTS) response header.
# This is only sent when HTTPS is enabled in this configuration.
# HSTS tells browsers that the site should only be accessed using HTTPS.
# The default version will change to true in the next minor release, 6.3.
;strict_transport_security = false

# Sets how long a browser should cache HSTS. Only applied if strict_transport_security is enabled.
;strict_transport_security_max_age_seconds = 86400

# Set to true if to enable HSTS preloading option. Only applied if strict_transport_security is enabled.
;strict_transport_security_preload = false

# Set to true if to enable the HSTS includeSubDomains option. Only applied if strict_transport_security is enabled.
;strict_transport_security_subdomains = false
```

```
;encryption_provider = secretKey.v1

# list of configured key providers, space separated (Enterprise only): e.g., aws kms.v1 azurekv.v1
;available_encryption_providers =

# disable gravatar profile images
;disable_gravatar = false

# data source proxy whitelist (ip_or_domain:port separated by spaces)
;data_source_proxy_whitelist =

# disable protection against brute force login attempts
;disable_brute_force_login_protection = false

# set to true if you host Grafana behind HTTPS. default is false.
;cookie_secure = false

# set cookie SameSite attribute. defaults to 'lax'. can be set to "lax", "strict", "none" and "disabled"
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# Set to true if to enable HSTS preloading option. Only applied if strict_transport_security is enabled.
;strict_transport_security_preload = false

# Set to true if to enable the HSTS includeSubDomains option. Only applied if strict_transport_security is enabled.
;strict_transport_security_subdomains = false

# Set to true to enable the X-Content-Type-Options response header.
# The X-Content-Type-Options response HTTP header is a marker used by the server to indicate that the MIME types advertised
# in the Content-Type headers should not be changed and be followed.
;x_content_type_options = true

# Set to true to enable the X-XSS-Protection header, which tells browsers to stop pages from loading
/embed
```

328,24 22%

```
grafana:
  image: grafana/grafana-oss:9.5.9-ubuntu
  volumes:
    - ./grafana_data:/var/lib/grafana
  environment:
    - GF_FEATURE_TOGGLES_ENABLE=publicDashboards
    - GF_SECURITY_ALLOW_EMBEDDING=true
  networks:
    - internal_network
  depends_on:
    - influxdb
```

Cloudflare

```
cloudflared:
  image: cloudflare/cloudflared:latest
  restart: always
  command: tunnel --no-autoupdate run
  environment:
    - TUNNEL_TOKEN=eyJhIjoiodi0y2FjYzdlnmZkNTkwNjNhMGZjYmNmM2IzNzZhNDUiLCJ0Ijoie5ZDcxYjktODUxMy00YzBjLWExM2YtYjZmYzgzMDFlM2ViIiwicyI6IlpETXZdZVFV5Tm1JdE1XSXpZeTAwT0RkaExXSmt0amt0WXPJM1pHUTBNR0UyTW1NeSJ9
  networks:
    - internal_network
  depends_on:
    - nginx
```

Website:

```
nginx:
  image: nginx:1.25
  volumes:
    - ./nginx.conf:/etc/nginx/nginx.conf:ro
    - ./passwd:/etc/nginx/passwd:ro
    - ./www:/var/www/website
  ports:
    - "80:80"
  networks:
    - internal_network
  depends_on:
    - node-red
    - grafana
```

Opslag en netwerk

```
amirh@amirhPI:~$ cat .profile
# ~/.profile: executed by the command interpreter for login shells.
# This file is not read by bash(1), if ~/.bash_profile or ~/.bash_login
# exists.
# see /usr/share/doc/bash/examples/startup-files for examples.
# the files are located in the bash-doc package.

# the default umask is set in /etc/profile; for setting the umask
# for ssh logins, install and configure the libpam-umask package.
#umask 022

# if running bash
if [ -n "$BASH_VERSION" ]; then
    # include .bashrc if it exists
    if [ -f "$HOME/.bashrc" ]; then
        . "$HOME/.bashrc"
    fi
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/bin" ] ; then
    PATH="$HOME/bin:$PATH"
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/.local/bin" ] ; then
    PATH="$HOME/.local/bin:$PATH"
fi

python3 /home/amirh/si7021/eind_script_temperatuur_vochtigheid.py > /dev/null 2>&1 &
python3 /home/amirh/leds/ledsStatusMqtt.py > /dev/null 2>&1 &
```

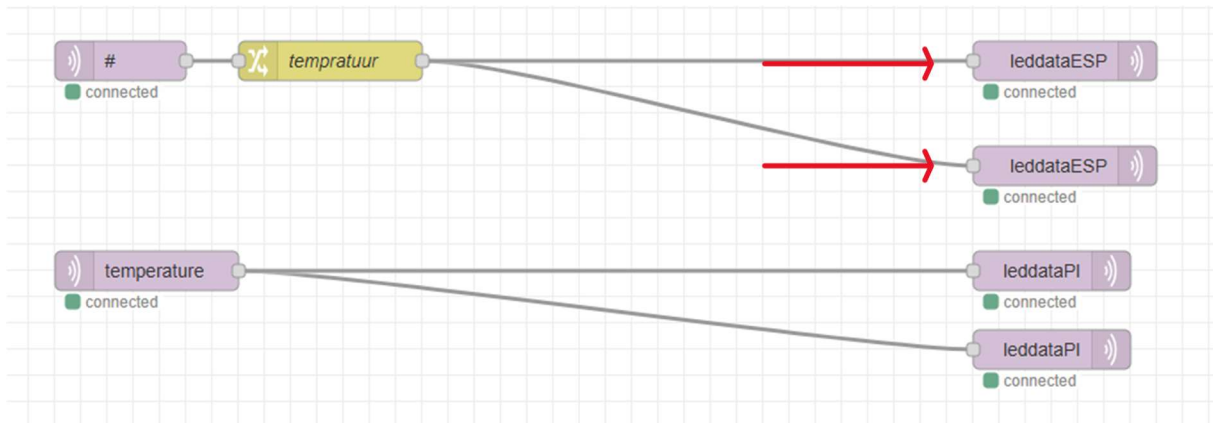

- 1 Dit Python-script leest **temperatuur** en **luchtvochtigheid** uit via een **SI7021-sensor** aangesloten op een **I2C-bus** en publiceert de meetgegevens naar een **MQTT-broker**.
2. Python-script ontvangt **temperatuurwaarden** via MQTT van **twee apparaten** (ESP32 en Raspberry Pi) en bestuurt verschillende **LED's** op basis van deze temperaturen. Daarnaast publiceert het de status van de LED's naar specifieke **MQTT-topics**

```
python-scripts:  
  build: ./python-scripts  
  volumes:  
    - ./si7021:/app/si7021  
    - ./leds:/app/leds  
  depends_on:  
    - mosquitto  
  restart: always
```

Netwerk:

```
# GPIO-pinnen voor LEDs en corresponderende MQTT-topics  
LED_CONFIG = {  
    "led1_esp_cold": {"pin": 17, "topic": "ledStatus/led1"},  
    "led2_esp_rest": {"pin": 18, "topic": "ledStatus/led2"},  
    "led3_esp_warm": {"pin": 27, "topic": "ledStatus/led3"},  
    "led4_pi_cold": {"pin": 22, "topic": "ledStatus/led4"},  
    "led5_pi_rest": {"pin": 23, "topic": "ledStatus/led5"},  
    "led6_pi_warm": {"pin": 24, "topic": "ledStatus/led6"},  
    "led7_both_rest": {"pin": 25, "topic": "ledStatus/led7"},  
}  
  
# MQTT Configuratie  
BROKERS = ["10.160.0.14", "192.168.0.16"]  
PORT = 1883  
TOPICS = ["leddataESP", "leddataPI"]
```

```
# MQTT Configuratie  
MQTT_BROKERS = [  
    {"broker": "10.160.0.14", "port": 1883},  
    {"broker": "192.168.0.16", "port": 1883}  
]  
MQTT_TOPIC_TEMP = "Temperature"
```

```
student@IoT-datalab:~/html/tea-flower/tea-flower$ ls
images index.html kamer1.html kamer2.html style.css
```

```
amirh@amirhPI:~$ sudo systemctl status openvpn
○ openvpn.service - OpenVPN service
   Loaded: loaded (/lib/systemd/system/openvpn.service; disabled; preset: enabled)
   Active: inactive (dead)
amirh@amirhPI:~$
```

VPN uit : `sudo systemctl disable openvpn`

VPN aan : `sudo openvpn --config /home/amirh/vpn_bestaand/vpnDATA.ovpn --daemon`

status vpn: `sudo systemctl status openvpn`

Web:

WHOIS information

What Cloudflare has sent to WHOIS as the legal record of your domain registration.

Domain name: AMIRDESIGN.NET
Registry Domain ID:
Registrar WHOIS Server: whois.cloudflare.com
Registrar URL: https://www.cloudflare.com/
Updated Date: 2024-12-11T22:43:42Z

[View more](#)

Registrant information

This is for your domain's legal record, and to contact you if there are problems with your registration.

Amir Hasanzada



For: Domain owner, Administrative, Technical, Billing

Automatic renewal

This domain is set to expire on Dec 11, 2025.
Cloudflare will automatically renew your registration 60 days before it expires.

[Cancel auto renew](#)

Do more with Cloudflare

Down for Everyone or Just Me

Short URL @ [downforio](#)

Is

Facebook

down for everyone

or just me?

Is Amirdesign.net down?

It's just you. [amirdesign.net](#) is up.

Last updated: Dec 12, 2024, 5:19 PM (1 seconds ago)

✖ Outages Happening Right Now

Chai	began 17 minutes ago
Comcast Mail	began 31 minutes ago
Nexusmods	began 43 minutes ago

⚠ Recent Outages and Problems

JanitorAI	2 hours ago
Wattpad	2 hours ago
Nexusmods	2 hours ago
Linkedin	4 hours ago
Internet Archive	5 hours ago
ChatGPT	6 hours ago
Facebook Messenger	9 hours ago



Cloudflare<noreply@notify.cloudflare.com>



Aan: amir.hz.be@hotmail.com

Za 14/12/2024 4:24

Hello,

Click the link below to finish your login to amirdesign.net:
<https://iot2025.cloudflareaccess.com/cdn-cgi/access/callback?nonce=fk4LLsdxAbMjKKY1aSxIAE9pZzObMTczNDE3OTA2Ng&code=375173&secret=9gDoRRbzqHcG1aQ799VxuspkeEaSNFjDk>

You can also copy and paste the code below into the Cloudflare Access login screen:

375173

This code will expire after 10 minutes or if you request a new code.

Thanks,

The Cloudflare Team

↩ Beantwoorden

➡ Doorsturen



iot2025.cloudflareaccess.com

Grafana

A code has been emailed to you.

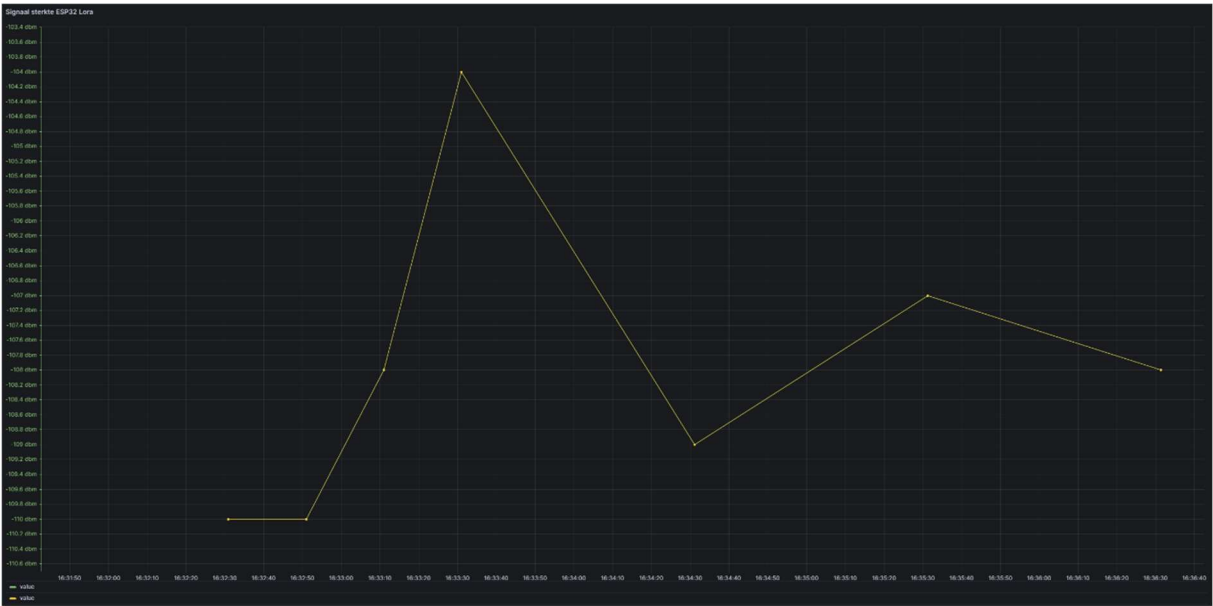
Enter code

← back

[Resend email](#)

[Didn't receive an email?](#)





[Public Hostnames](#) [Private Networks](#)

Add public hostname for test

Public hostname

Subdomain

(optional) subdomain

Domain (Required)

amirdesign.net

Path

(optional) path

Service

Type (Required)

HTTP

URL (Required)

nginx:80

For example, <https://localhost:8001>

[Additional application settings](#)

[Back](#) [Save tunnel](#)

[Back to tunnels](#)

Connector diagnostics

Tunnels establish a secure connection between Cloudflare's edge and your infrastructure.

[Learn more](#)

Connector details					
Connector ID					
3eacf529-3ec9-4720-b4c3-9cdabf8a5405					
Data centers	Origin IP	Version	Platform	Private IP	Hostname
bru01, ams13, ams15	193.191.187.203	2024.12.1	linux_amd64	172.18.0.7	c7c6caf3b768

Live logs

See a live stream of your tunnel's output and exceptions.

[Begin log stream](#) [Clear logs](#)

[Show filters](#)

Level	Event	Message	Time
-------	-------	---------	------

Workers & Pages

Overview

Build & deploy serverless functions, sites, and full-stack applications with Workers & Pages. Read the [Workers documentation](#) and [Pages documentation](#) to learn more.

[Create](#)

Search applications

[Search](#)

Filter by

Show all

Sort by

Last modified

amiriot	Visit
assets uploaded amiriot.pages.dev	
Production main	✓ 2 days ago View details
test2	Visit
assets uploaded test2-cs7.pages.dev	
Production main	✓ 4 days ago View details
amir	Visit
assets uploaded amir-9u6.pages.dev	
Production main	✓ 5 days ago View details
amir1	Visit
assets uploaded amir1-as1.pages.dev	
Production main	✓ 5 days ago View details

NEW VIDEO TUTORIAL

Easily Deploy Your Astro Application Globally

Build a Full-Stack Application using Astro on Cloudflare Workers and Cloudflare Pages.

[Watch the video](#)

Account details

Free

[Upgrade Plan](#)

12:00AM Mon (UTC) - 10:33PM Mon (UTC)

Requests today

7 / 100,000

Observability events today

0 / 200,000

Account ID

R24cacc7e6fd59063a0fcbcd3b376a45

[Manage API tokens](#)

Subdomain

49qbbc294k.workers.dev

Compute setting

Global

Analytics Engine

—

Account members

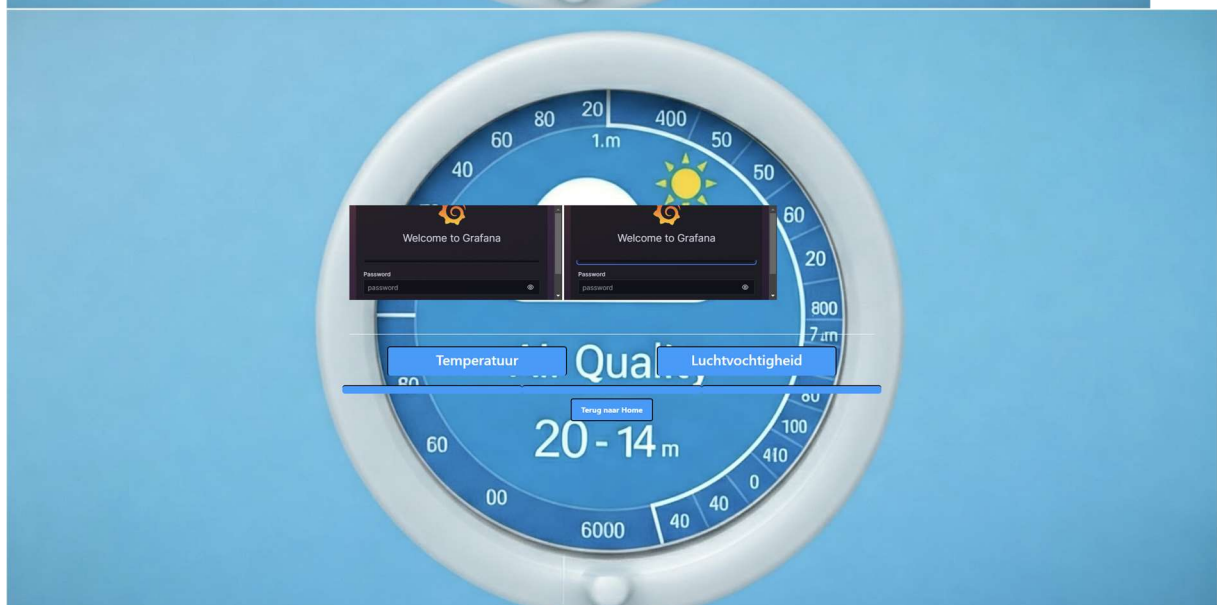
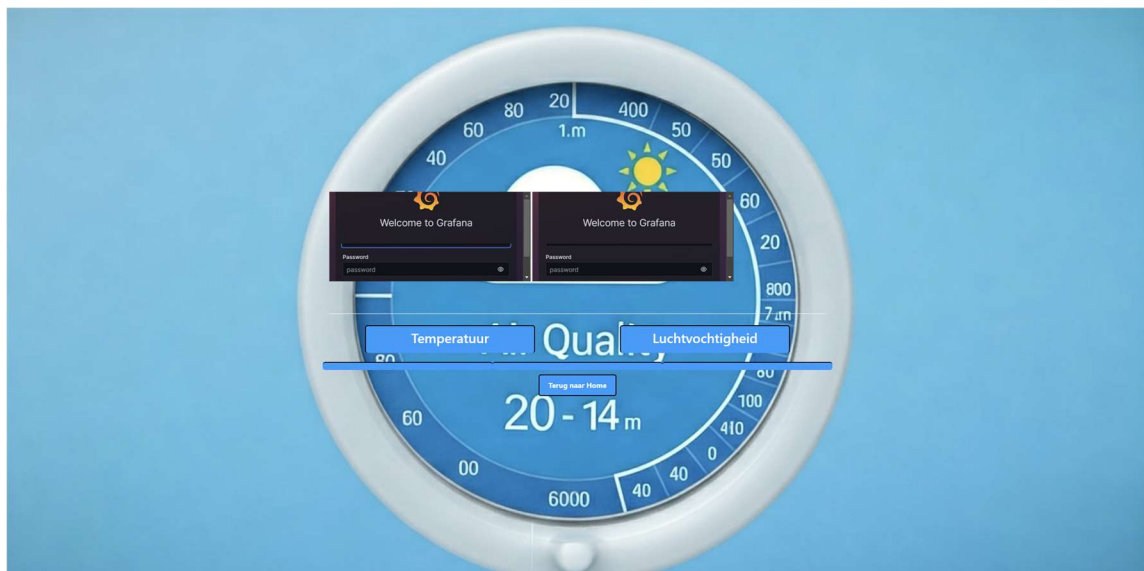
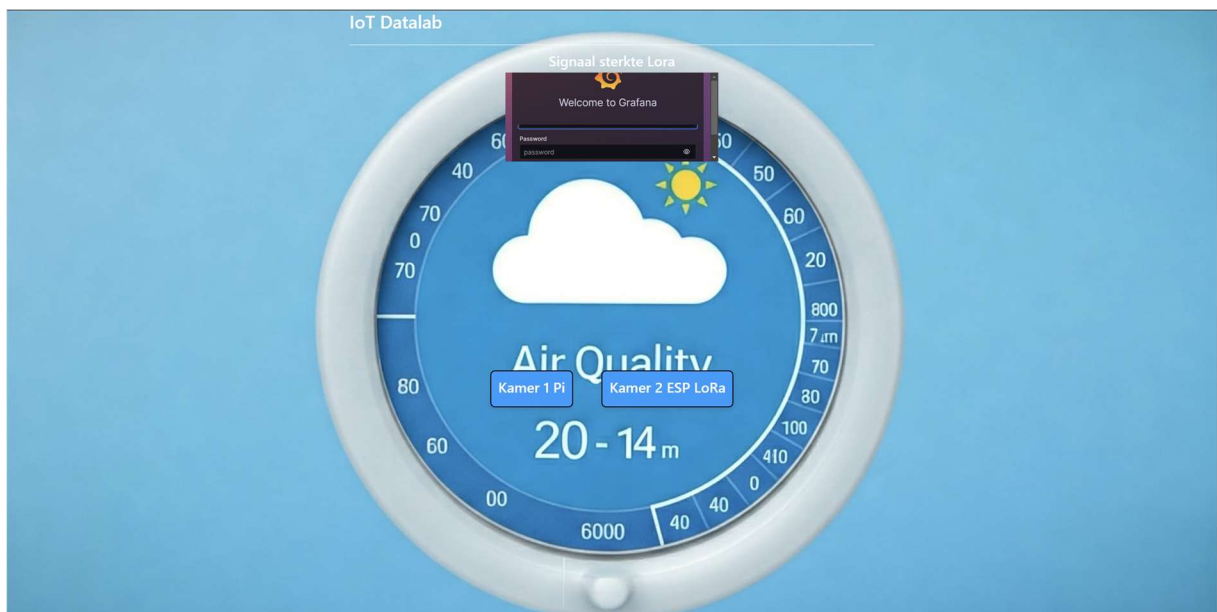
Account notifications & alerts

Resources

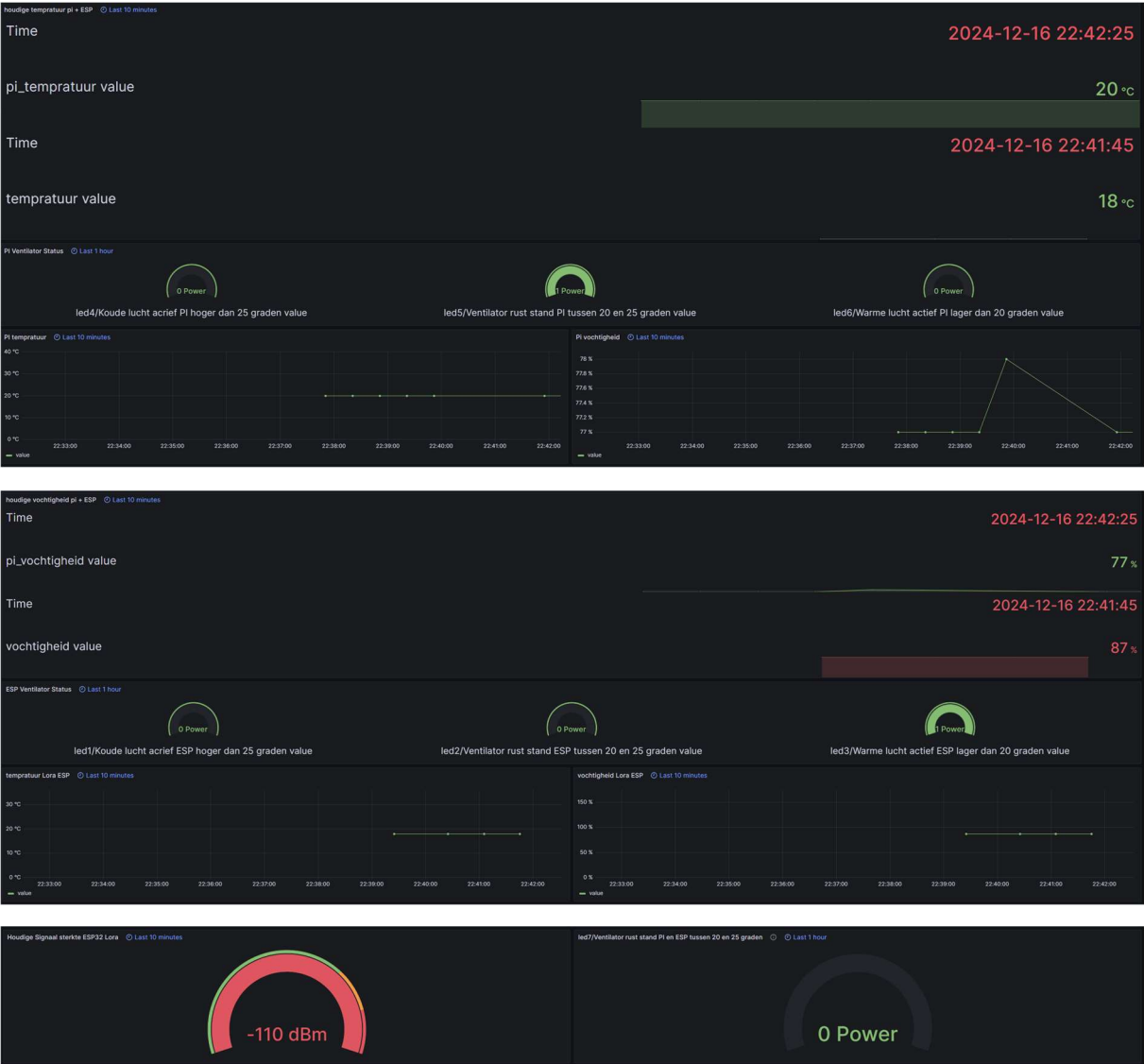
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<https://amiriot.pages.dev/>



<https://amirdesign.net/public-dashboards/95d1a4bd07f045a09dc7ac709fa220f7?orgId=1>



huidige vochtigheid pi + ESP

Last 10 minutes

Time

2024-12-16 22:42:25

pi_vochtigheid value

77 %

Time

2024-12-16 22:41:45

vochtigheid value

87 %

ESP Ventilator Status

Last 1 hour

0 Power

led1/Koude lucht actief ESP hoger dan 25 graden value

0 Power

led2/Ventilator rust stand ESP tussen 20 en 25 graden value

1 Power

led3/Warme lucht actief ESP lager dan 20 graden value

tempratuur Lora ESP

Last 10 minutes

30 °C

20 °C

10 °C

0 °C

value

22:33:00

22:34:00

22:35:00

22:36:00

22:37:00

22:38:00

22:39:00

22:40:00

22:41:00

22:42:00

vochtigheid Lora ESP

Last 10 minutes

150 %

100 %

50 %

0 %

value

22:33:00

22:34:00

22:35:00

22:36:00

22:37:00

22:38:00

22:39:00

22:40:00

22:41:00

22:42:00

Huidige Signaal sterkte ESP22 Lora

Last 10 minutes

-110 dBm

led7/Ventilator rust stand PI en ESP tussen 20 en 25 graden

Last 1 hour

0 Power

<https://amirdesign.net/website/>

