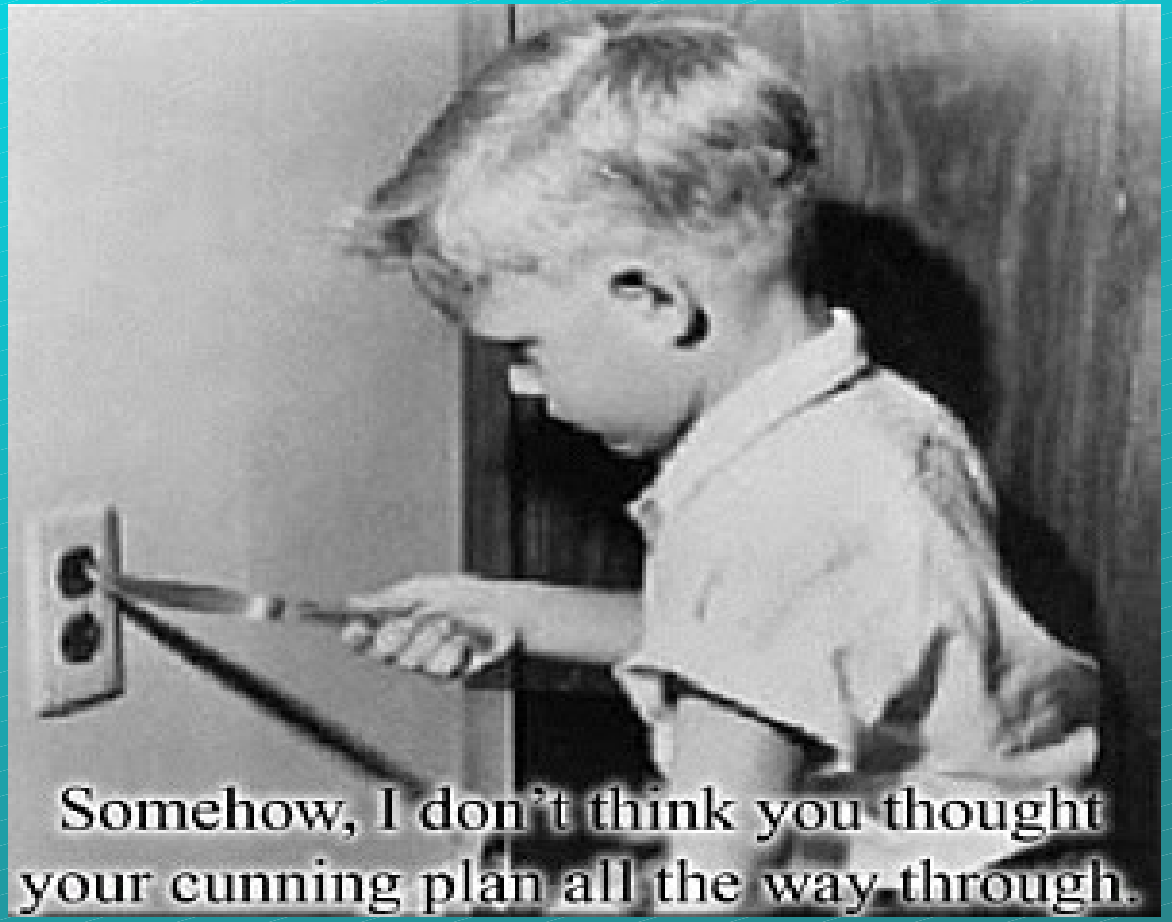
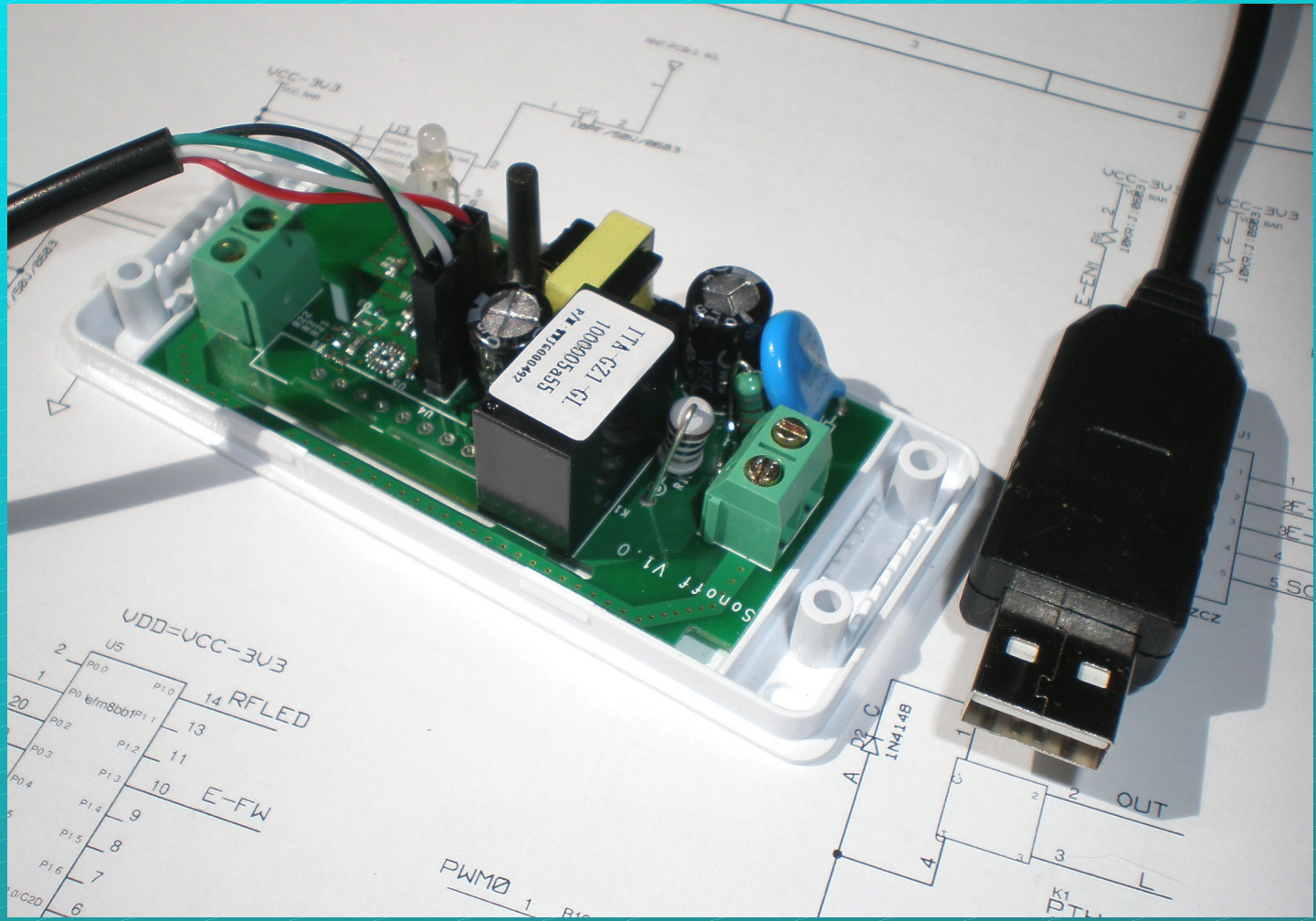
A Funny Thing Happened On The Way To A Quorum

TCF 2022 – Smart Things

Safety & Disclaimer




Sonoff V1.0
VDD=VCC-3V3
RFLED
E-FW
PWM0
OUT
1N4148

My Introduction

- Neil Cherry (ncherry@linuxha.com)
- Home Automation has been my hobby/passion/obsession since 1978
- Author: *Linux Smart Homes For Dummies* 2006, various magazine articles (see appendix)
- First TCF LHA presentation in 2008, I've not done it every year
- Background: computers, networking, electronics, embedded systems & programming (various languages)
- Worked on multiple open source projects
- Employed as a Tester for Network Services and now DevOps

CDL Computer Deconstruction Laboratory - The Jersey Shore Makerspace

On the INTERNET OF THINGS

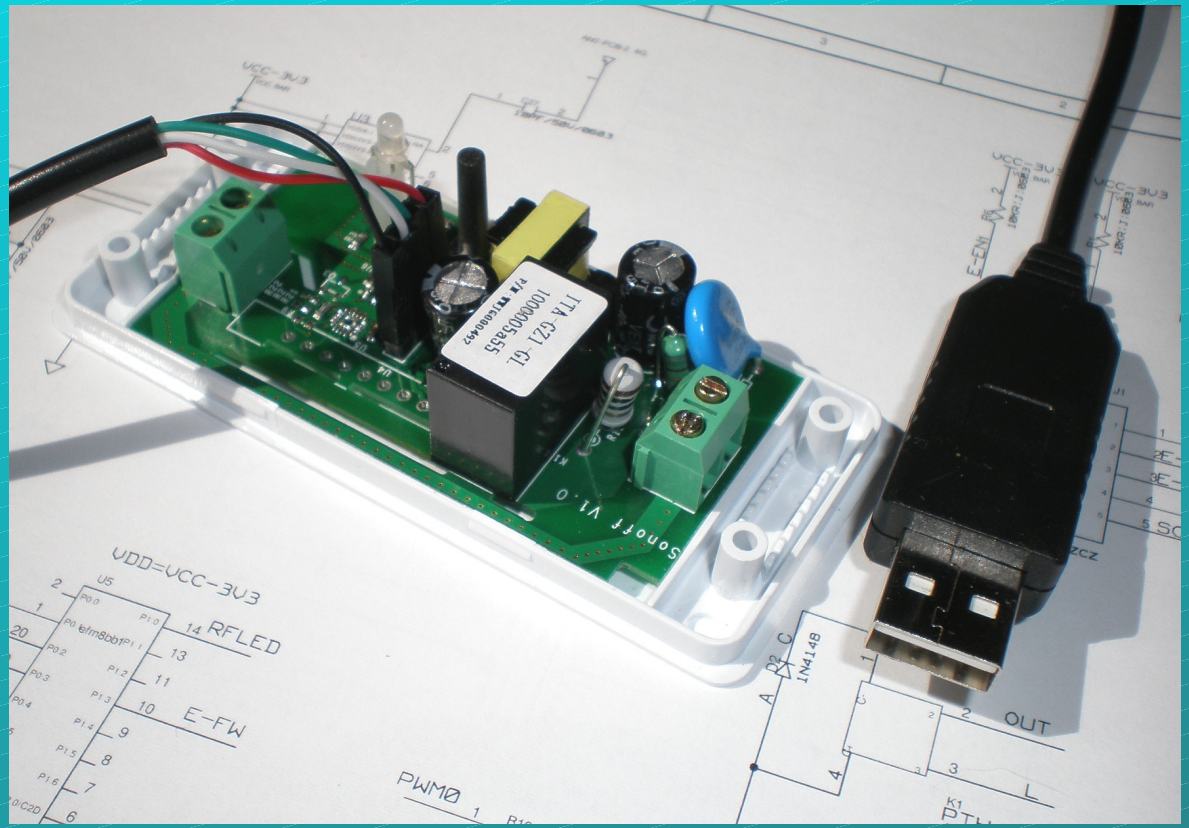
- I’ve always liked the idea of the Internet of Things, but in practice, it’s too close to a Cory Doctorow novel. Imagine your phone tracking your Strava runs and sending it to your healthcare provider, letting them know you’ve not been for that run you promised you were going to go on? Or your online shopping service being able to manipulate the price of cream to make you spend more if it knows, from your smart fridge, that you have a load of strawberries in the fridge? It could be excellent, but the future has unfortunately been hijacked by a couple of big companies that depend on advertising revenues. This is why we can’t have nice things. Unless we make them ourselves: the smart fridge in issue 43 is a perfect example of what we could and should have.

  Robin, Toronto

  (HackSpace Magazine)

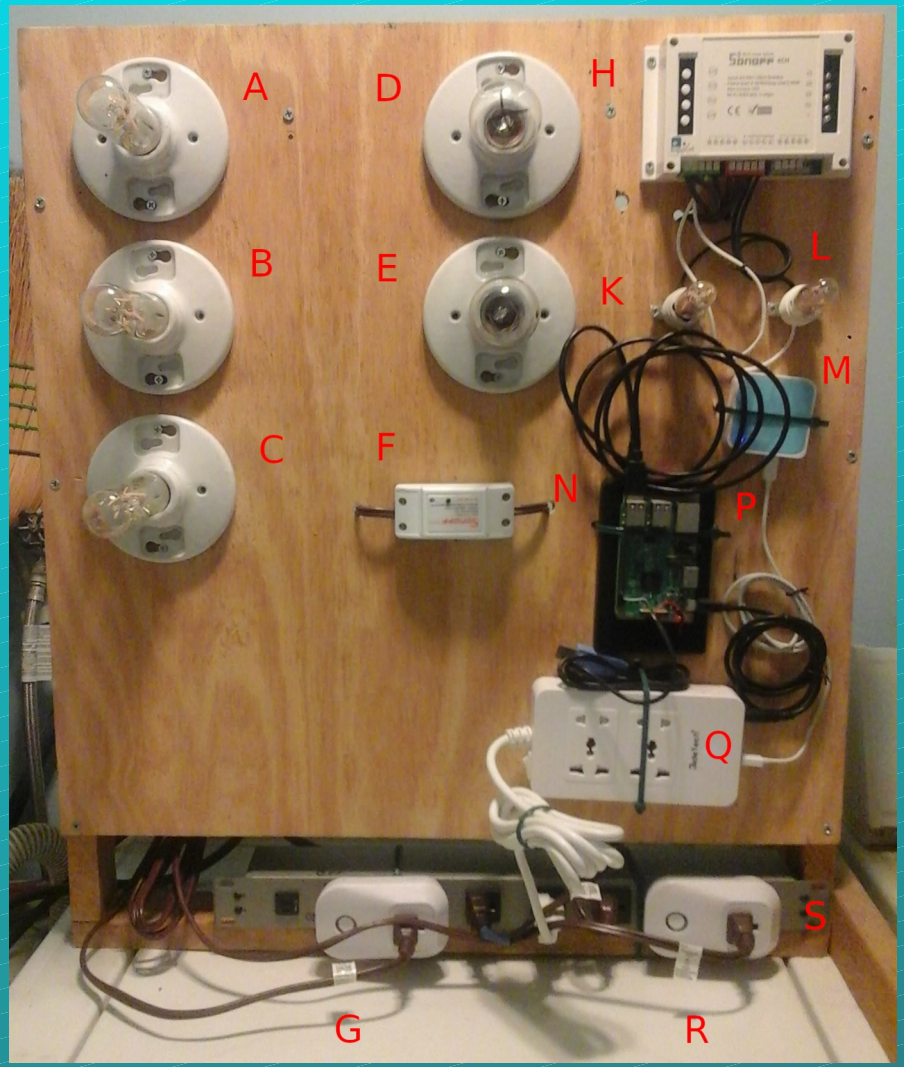
Minimal Setup

Minimal Starter’s setup



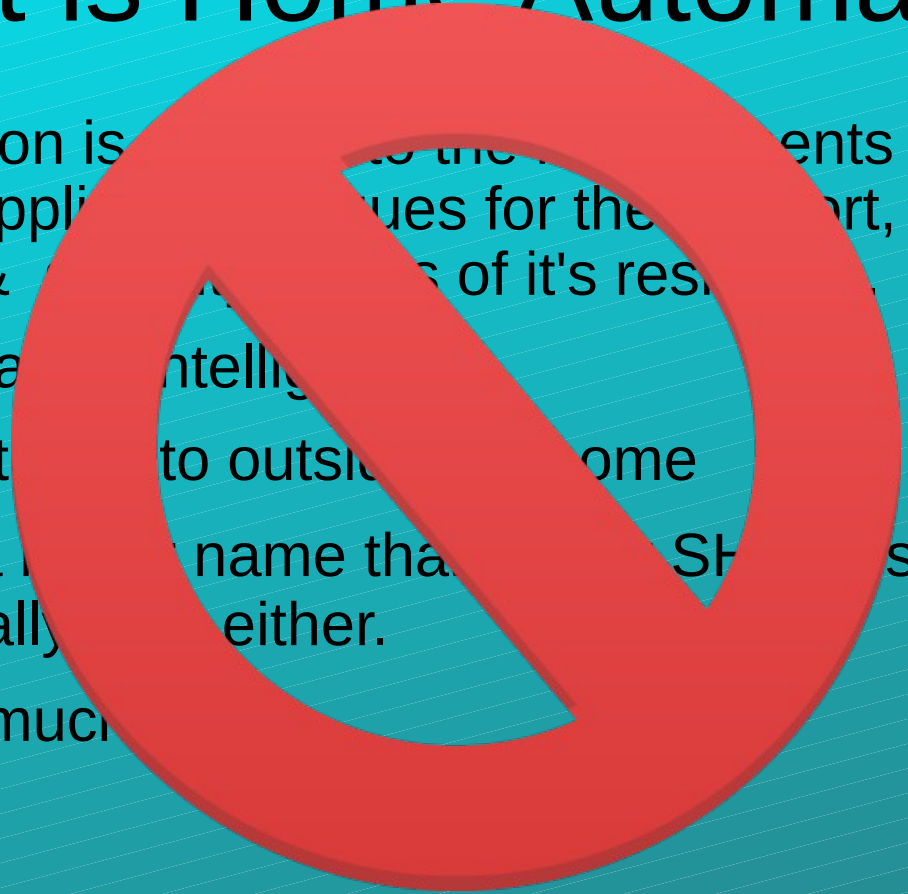
Winken, Blinken and Nod
or what's the hub-bub about hubs?

Description



What is Home Automation?

- Home Automation is ents of private residences. It appli ues for the rt, communications, entertainment & of it's res
- A Smart Home a ntelli
- Smart Thing ext to outsi ome
- We now need a name tha SH sonal assistant (PA) doesn't reall either.
- IoT covers too muc



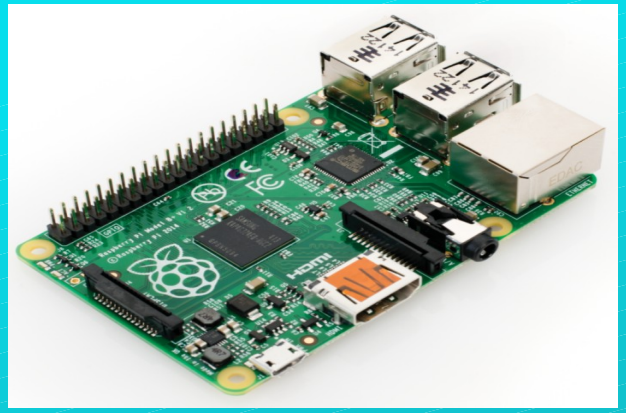
So why the title?

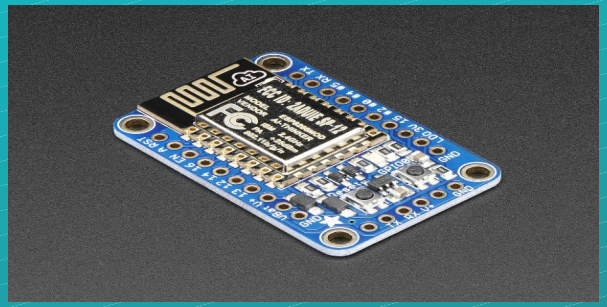
- A discussion with a colleague
  - Why can't I buy this stuff in the store?
  - You can but you need to have certain knowledge and a DIY mindset to build it
  - Rome wasn't built in a day (and not because of an energy drink)
- Has anyone ever built a car from scratch?
- But can you?
- Has anyone ever built a smart home solution from scratch?
  - You can but it's easier to buy one with a cloud solution
- But you can do it yourself and avoid the cloud.
- Hopefully Matter will help with this

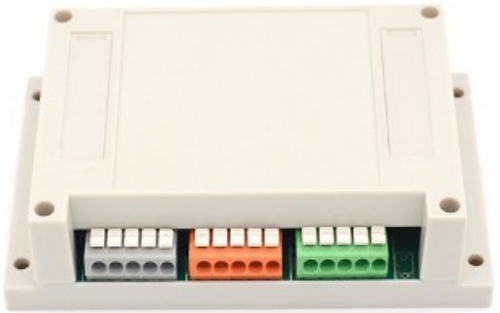
Typical high level view of your home.


ESP
ESP
ESP
ESP
MQTT.ORG
Raspberry Pi

Hardware

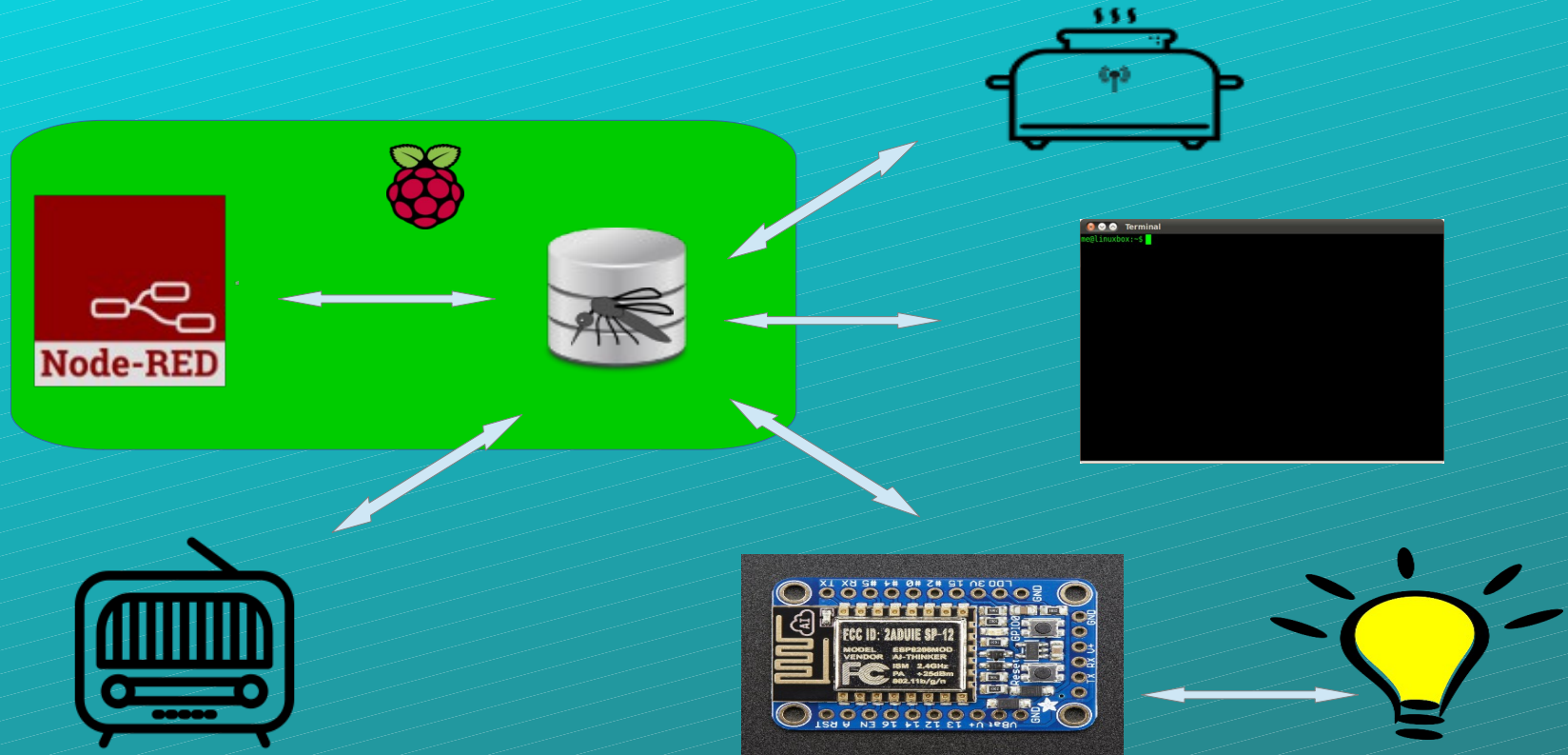






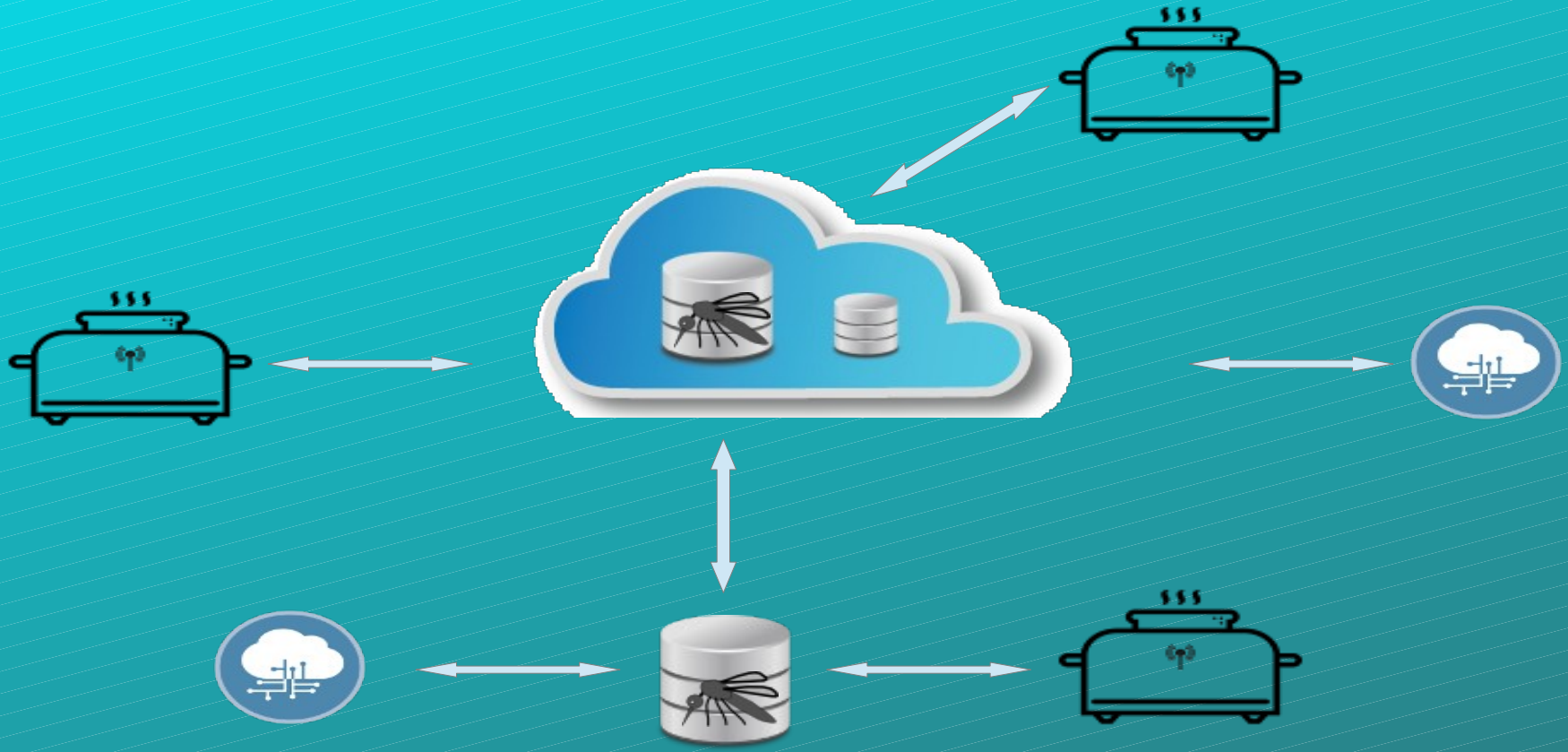
Software

MQTT
Message Queue Telemetry Transport

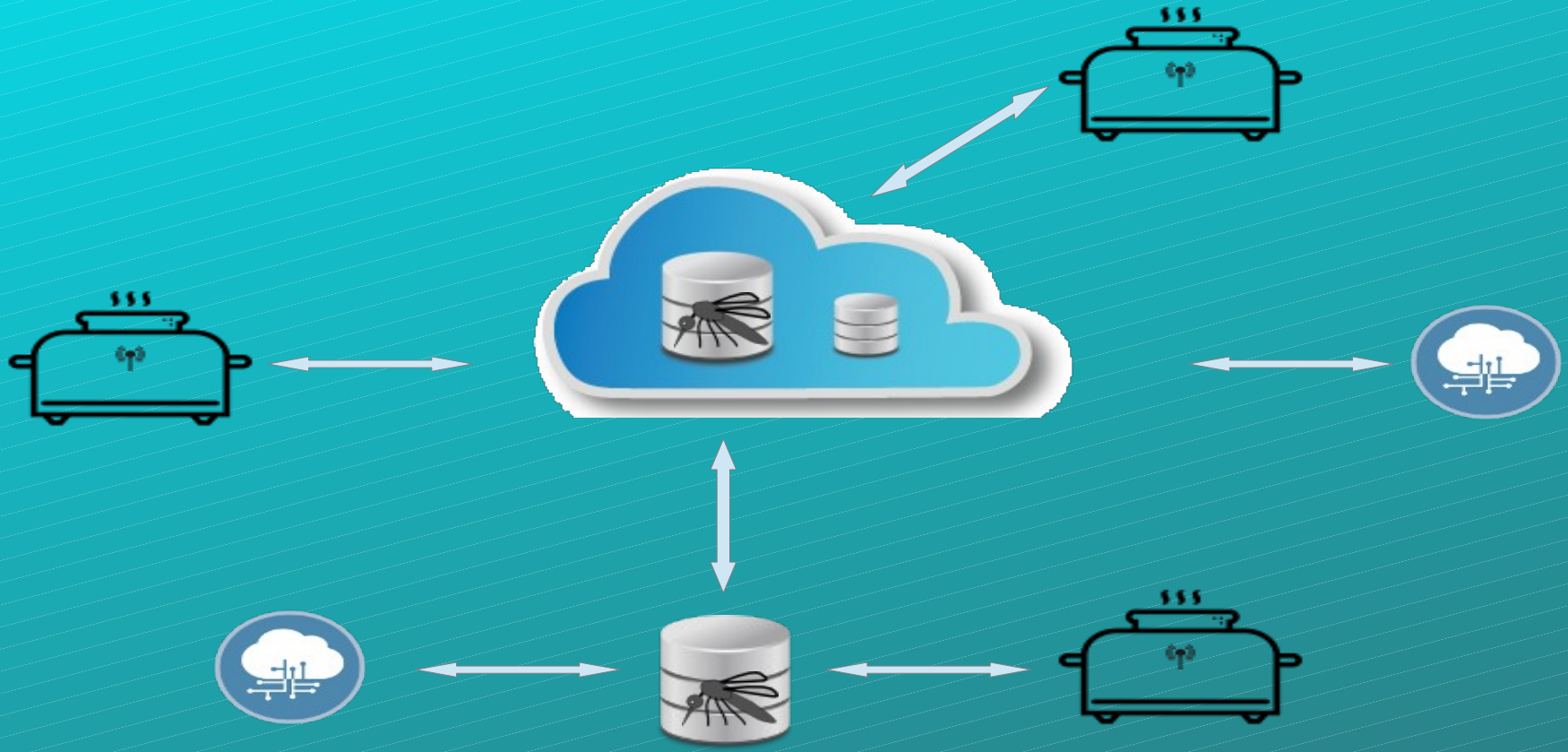


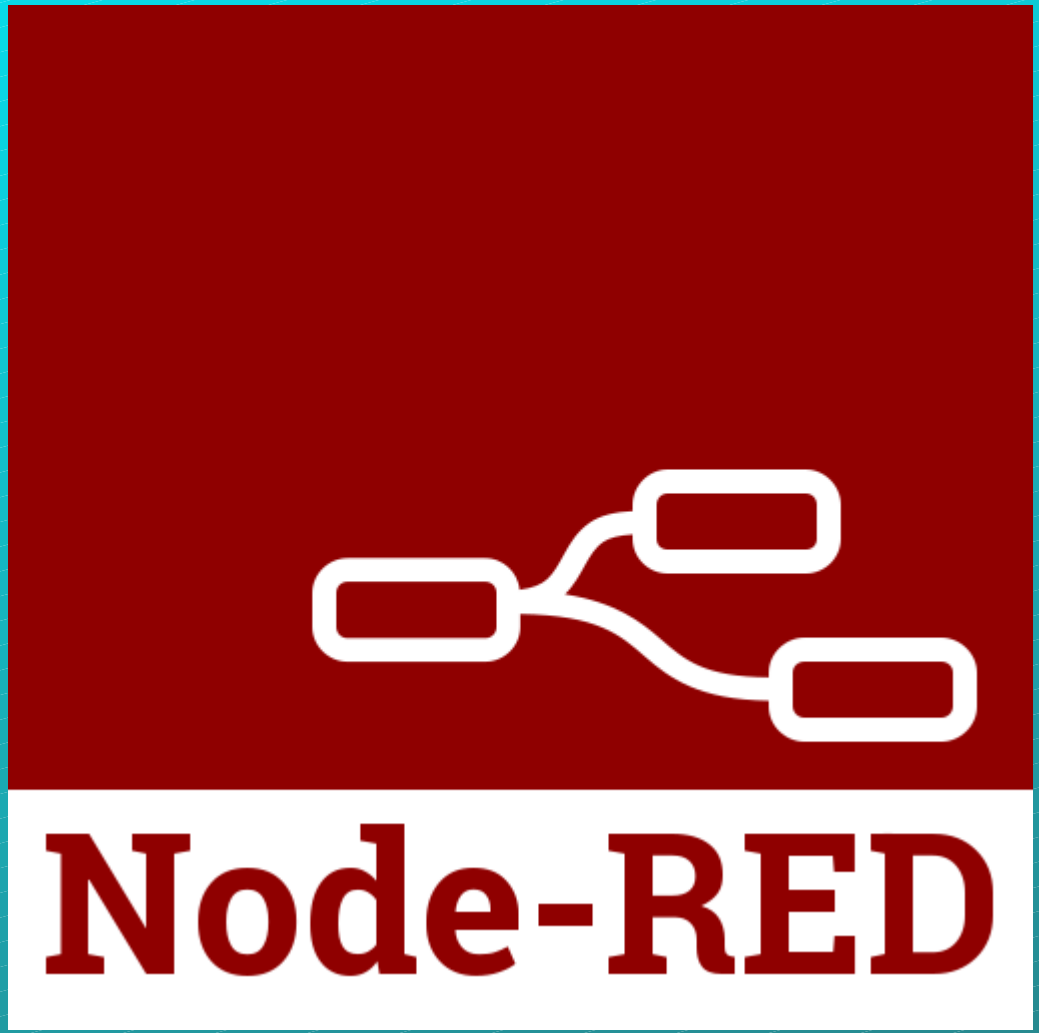
Mosquitto MQTT Broker

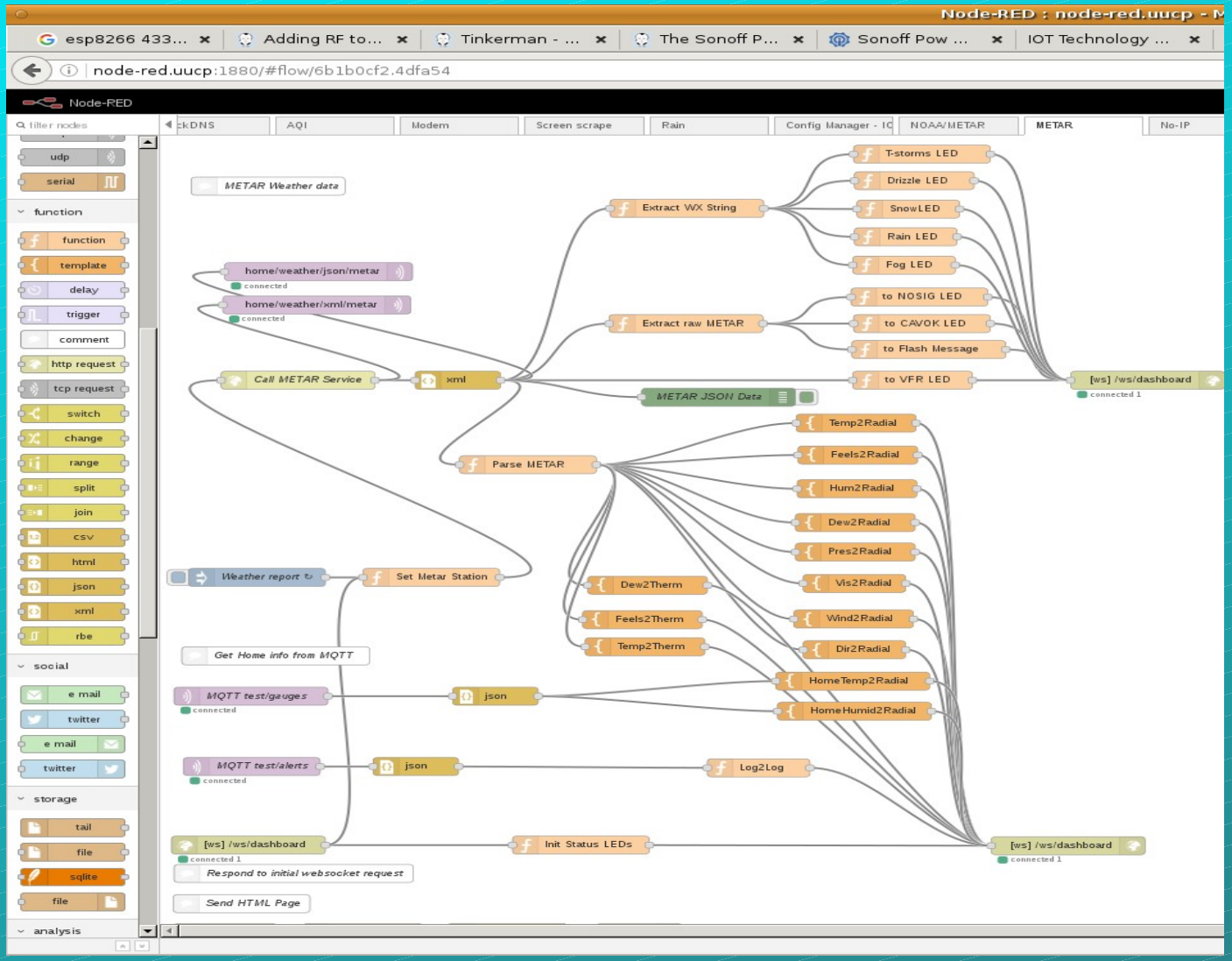
MQTT w/ Int. of Toasters
(Message Queue Telemetry Transport)



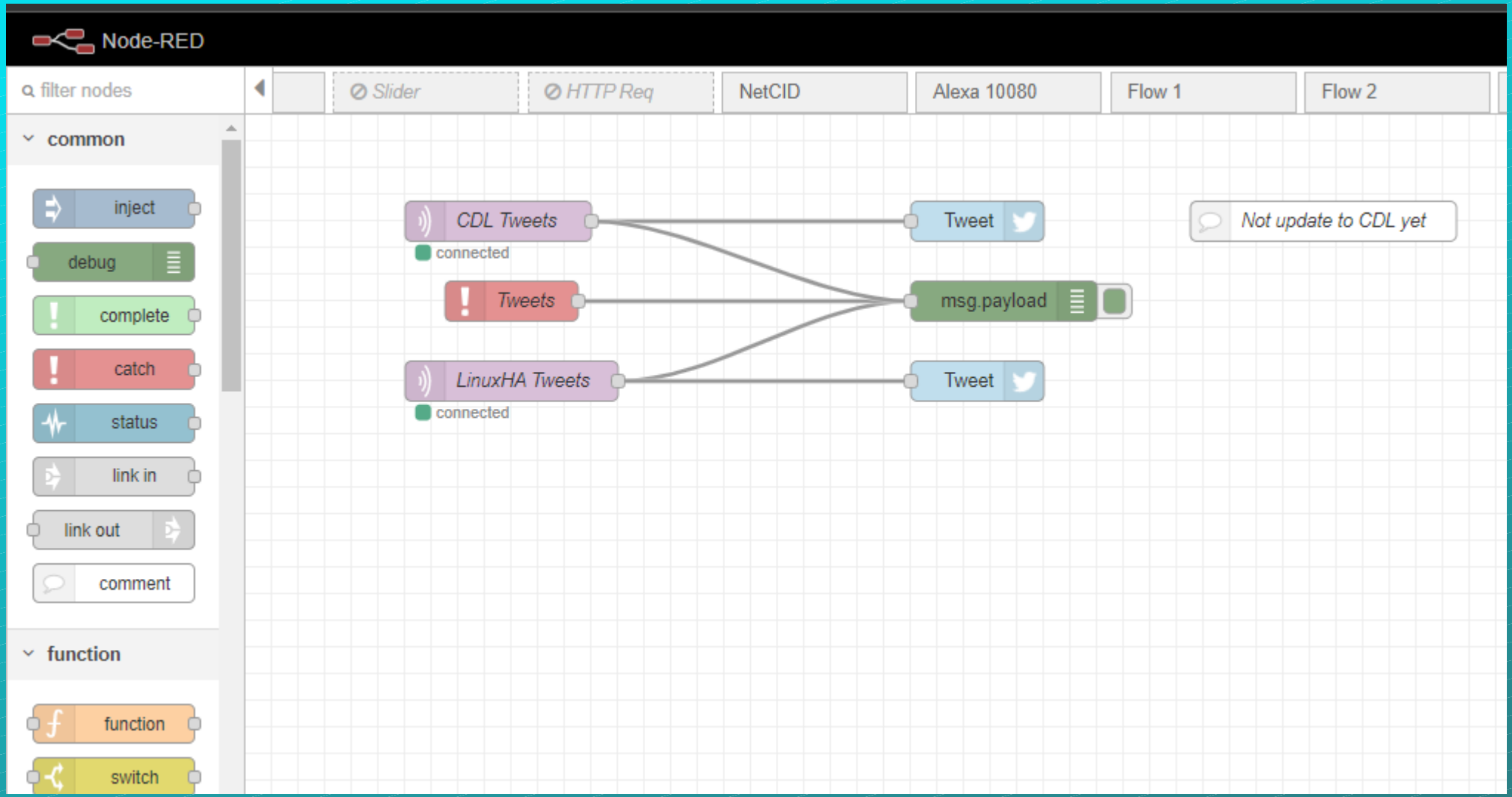
MQTT w/ Int. of Toasters
(Message Queue Telemetry Transport)




Node-RED

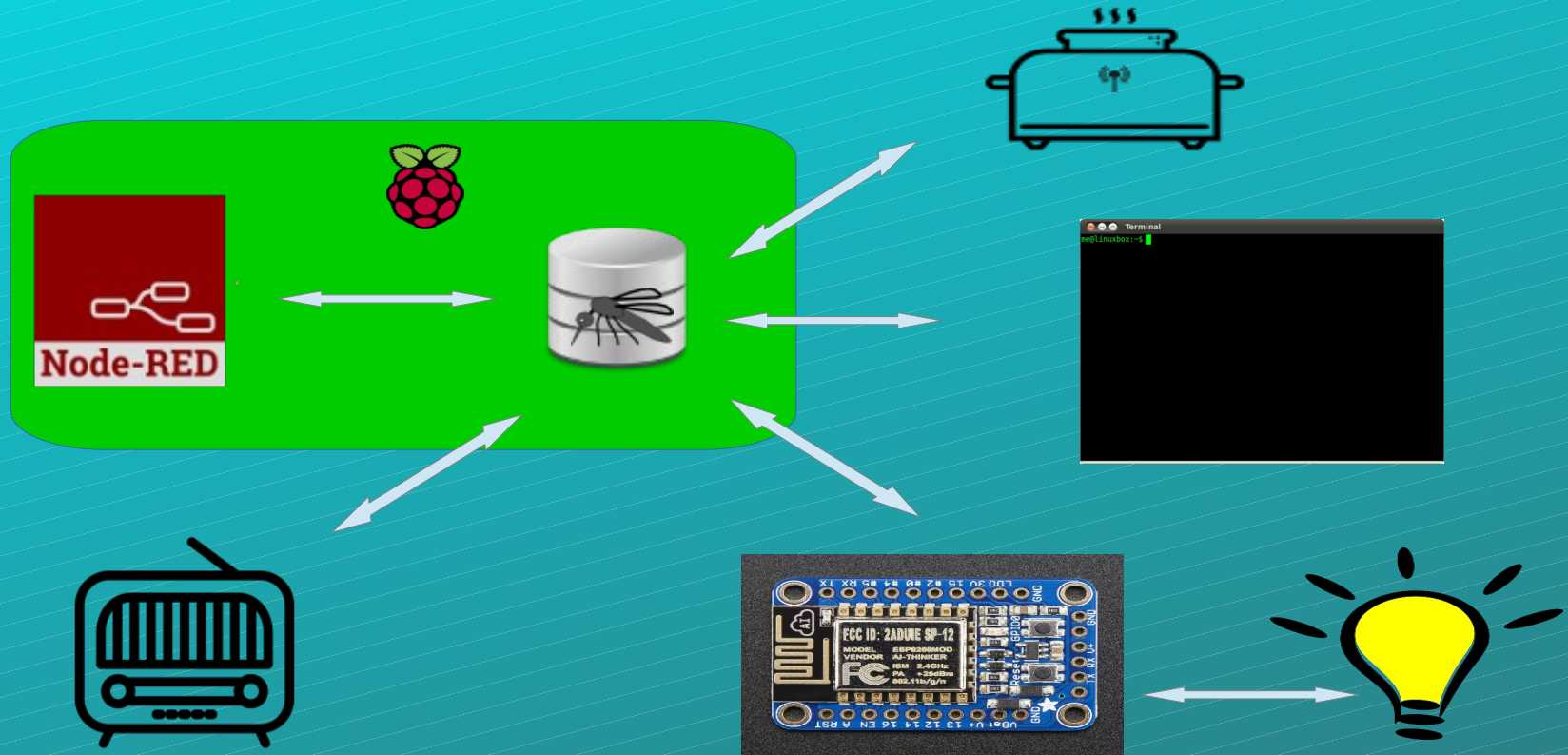

Node-RED : node-red.uucp - M
esp8266 433...
Adding RF to...
Tinkerman - ...
The Sonoff P...
Sonoff Pow ...
IOT Technology ...
node-red.uucp:1880/#flow/6b1b0cf2.4dfa54
Node-RED
filter nodes
udp
serial
function
function
template
delay
trigger
comment
http request
tcp request
switch
change
range
split
join
csv
html
json
xml
rbe
social
e mail
twitter
e mail
twitter
storage
tail
file
sqlite
file
analysis
ckDNS
AQI
Modem
Screen scrape
Rain
Config Manager - IC
NOAA/METAR
METAR
No-IP
METAR Weather data
home/weather/json/metar
connected
home/weather/xml/metar
connected
Call METAR Service
xml
Extract WX String
Extract raw METAR
T-storms LED
Drizzle LED
Snow LED
Rain LED
Fog LED
to NOSIG LED
to CAVOK LED
to Flash Message
to VFR LED
METAR JSON Data
[ws] /ws/dashboard
connected 1
Parse METAR
Temp2Radial
Feels2Radial
Hum2Radial
Dew2Radial
Pres2Radial
Vis2Radial
Wind2Radial
Dir2Radial
HomeTemp2Radial
HomeHumid2Radial
Weather report
Set Metar Station
Dew2Therm
Feels2Therm
Temp2Therm
Get Home info from MQTT
MQTT test/gauges
connected
json
MQTT test/alerts
connected
json
Log2Log
[ws] /ws/dashboard
connected 1
Init Status LEDs
[ws] /ws/dashboard
connected 1
Respond to initial websocket request
Send HTML Page

Fri Mar 18 2022 06:29:54 GMT-0400 (Eastern Daylight Time) - KTTN 180953Z 24003KT 1/4SM FG VV002 10/10 A2997 RMK AO2 SLP143 T01000100


Node-RED
filter nodes
common
inject
debug
complete
catch
status
link in
link out
comment
function
function
switch
Slider
HTTP Req
NetCID
Alexa 10080
Flow 1
Flow 2
CDL Tweets
connected
Tweets
LinuxHA Tweets
connected
Tweet
msg.payload
Tweet
Not update to CDL yet

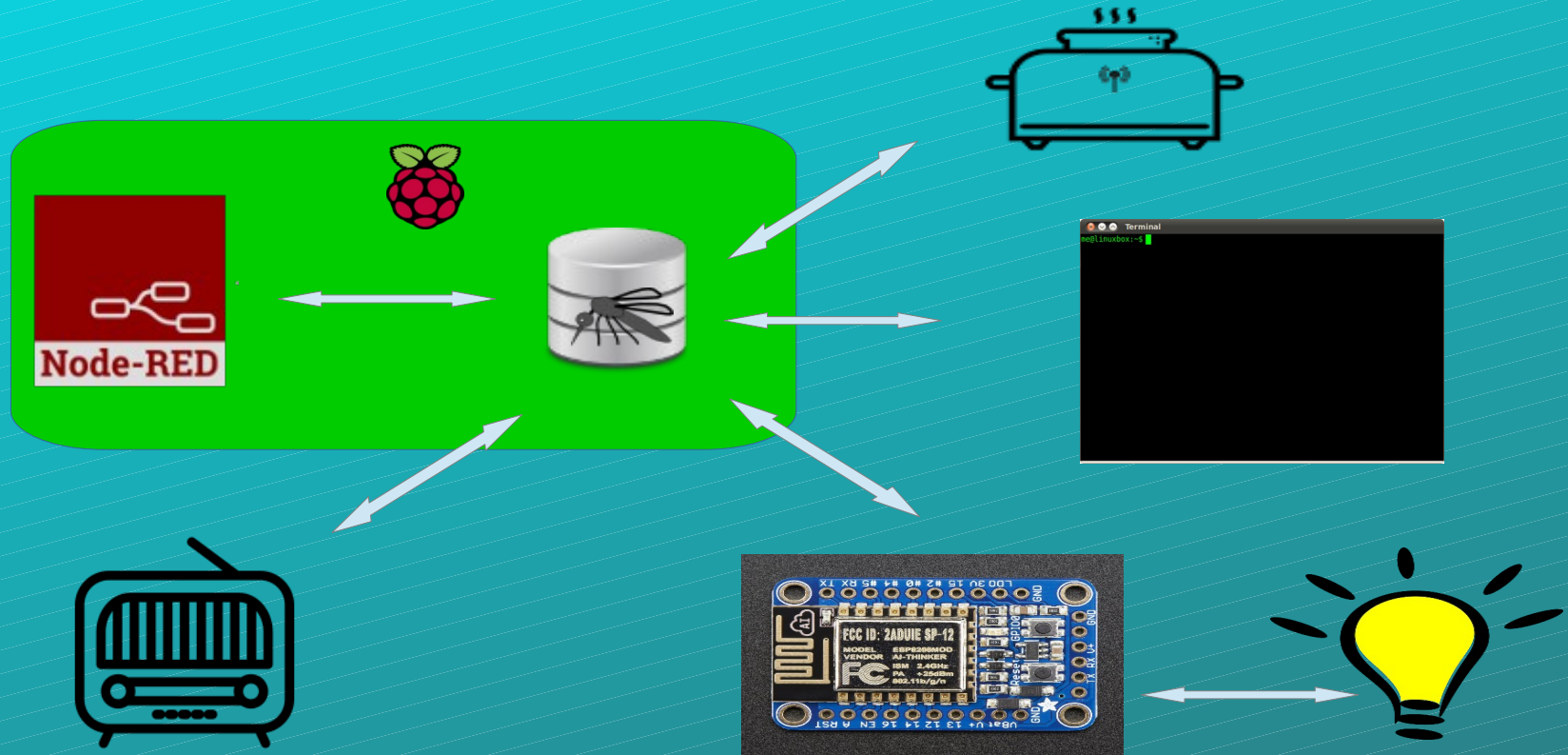
Putting it together

MQTT
Message Queue Telemetry Transport

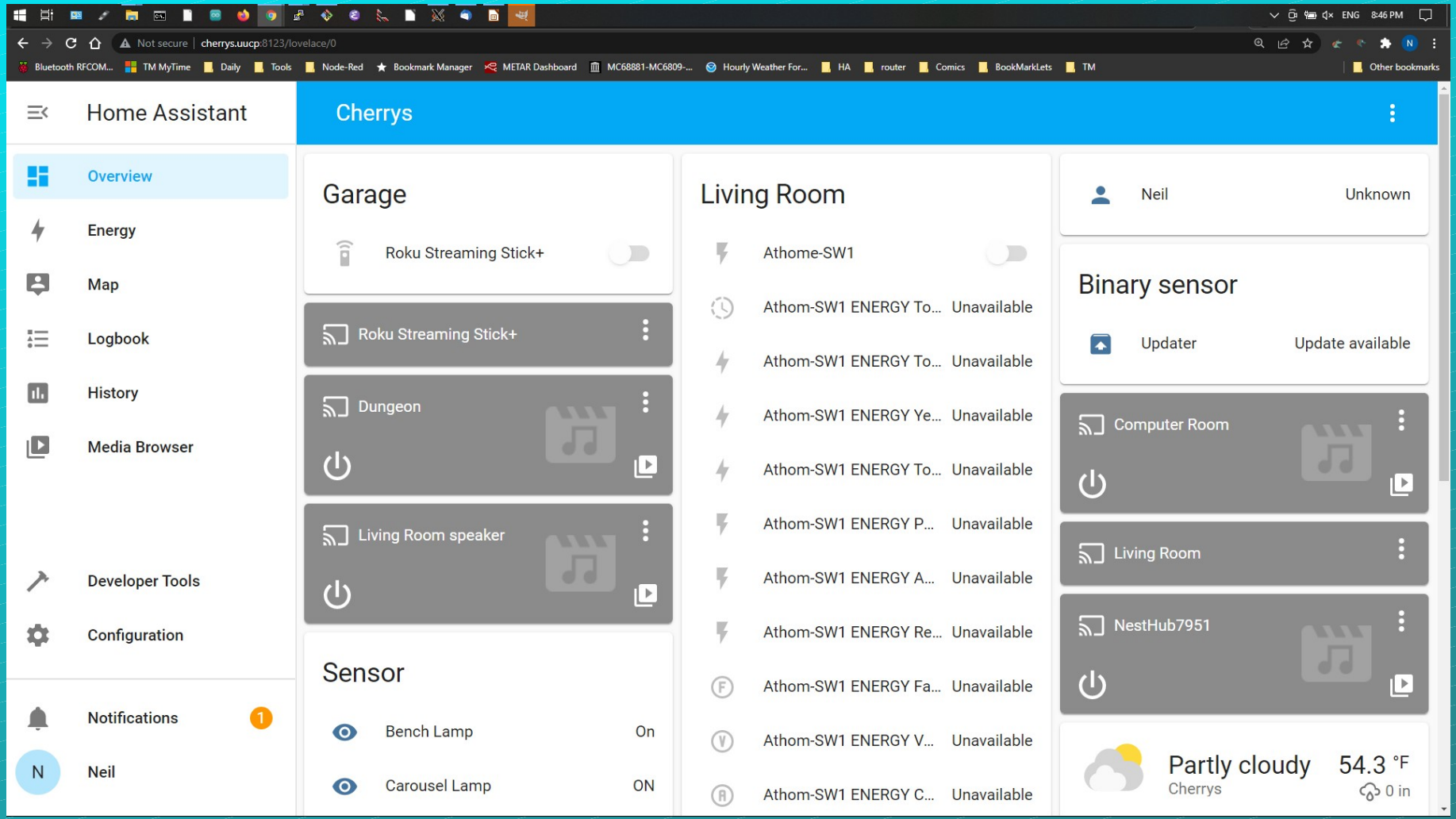


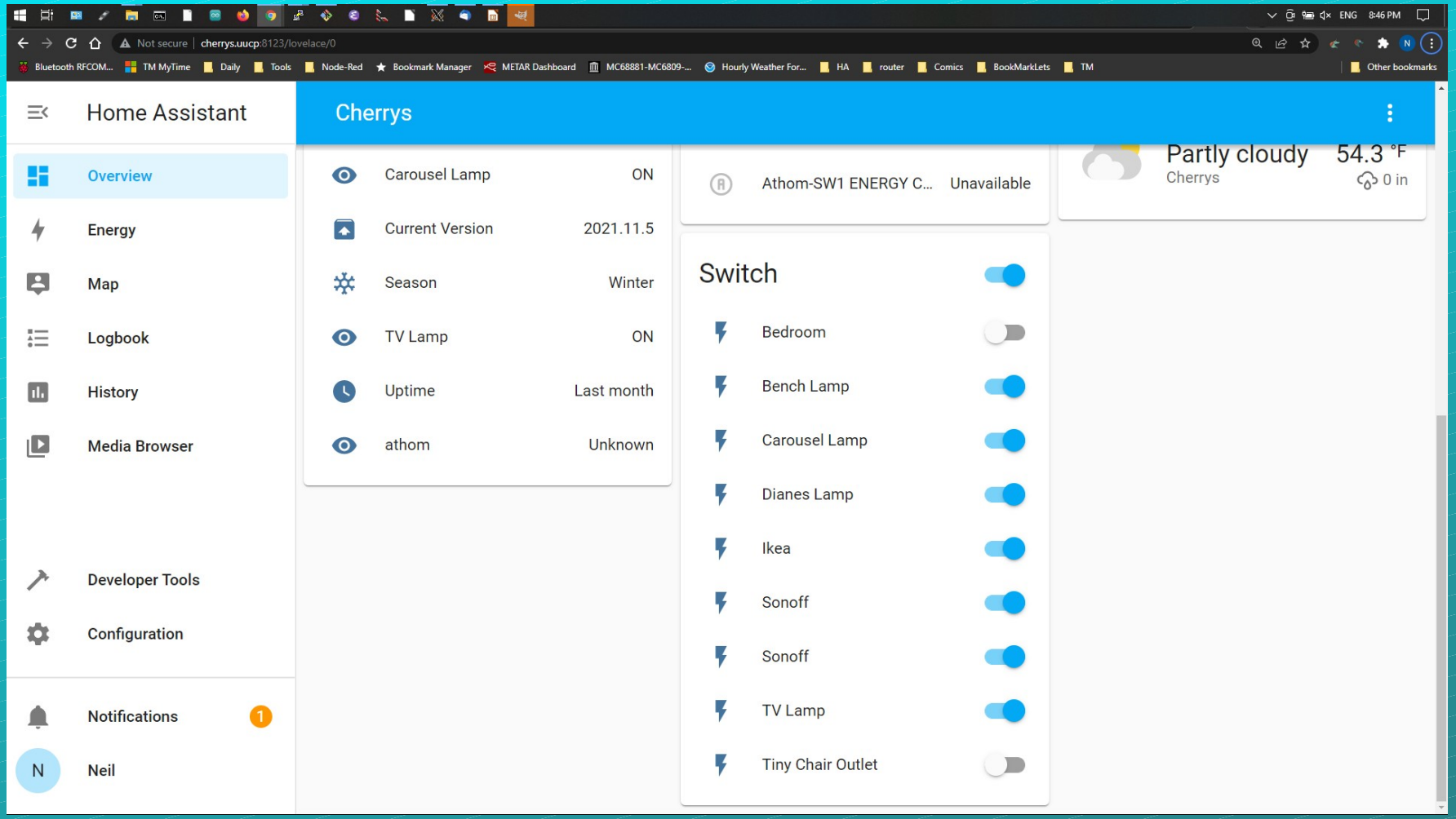

would you
like some
toast ?

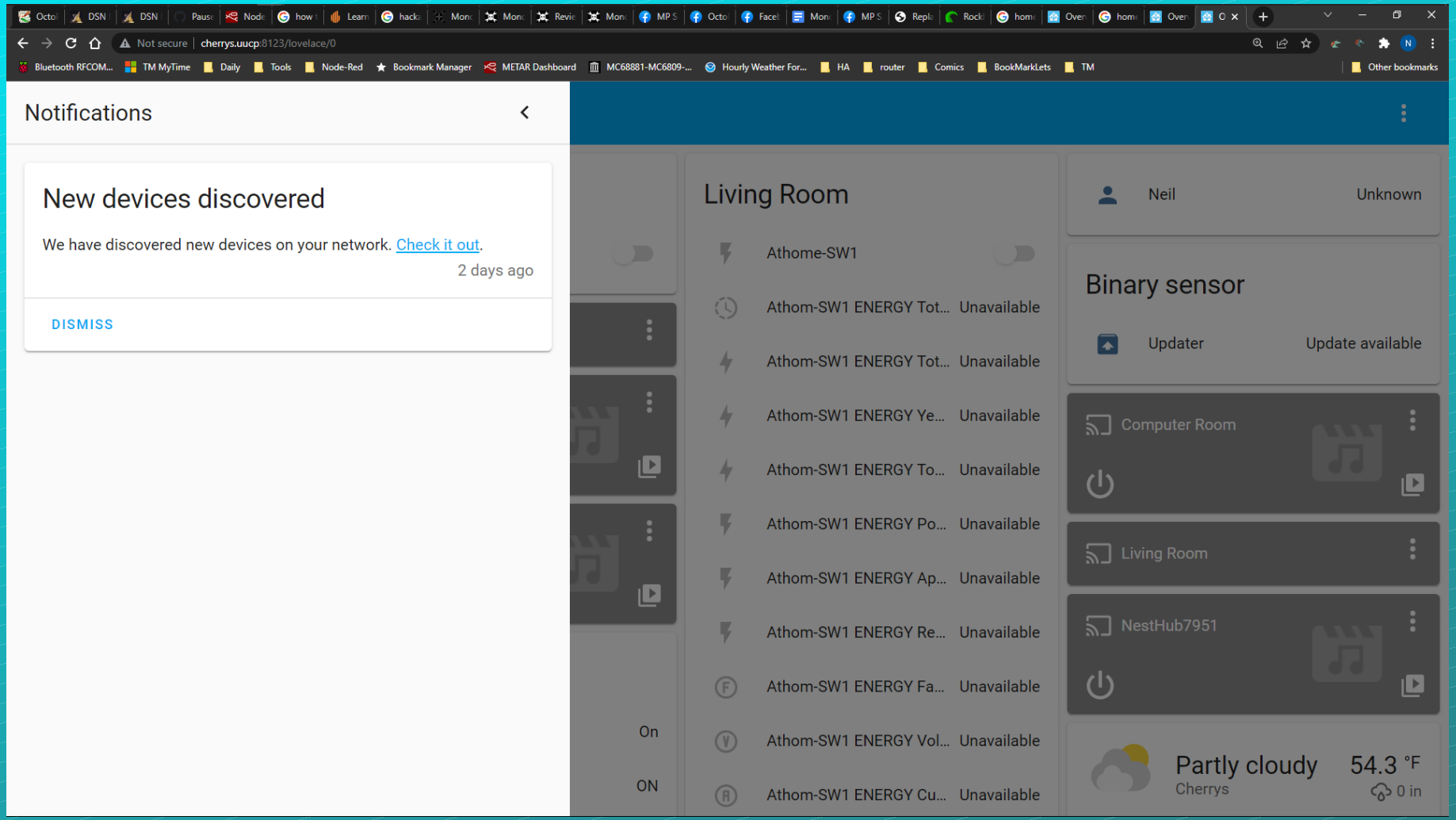
MQTT
Message Queue Telemetry Transport

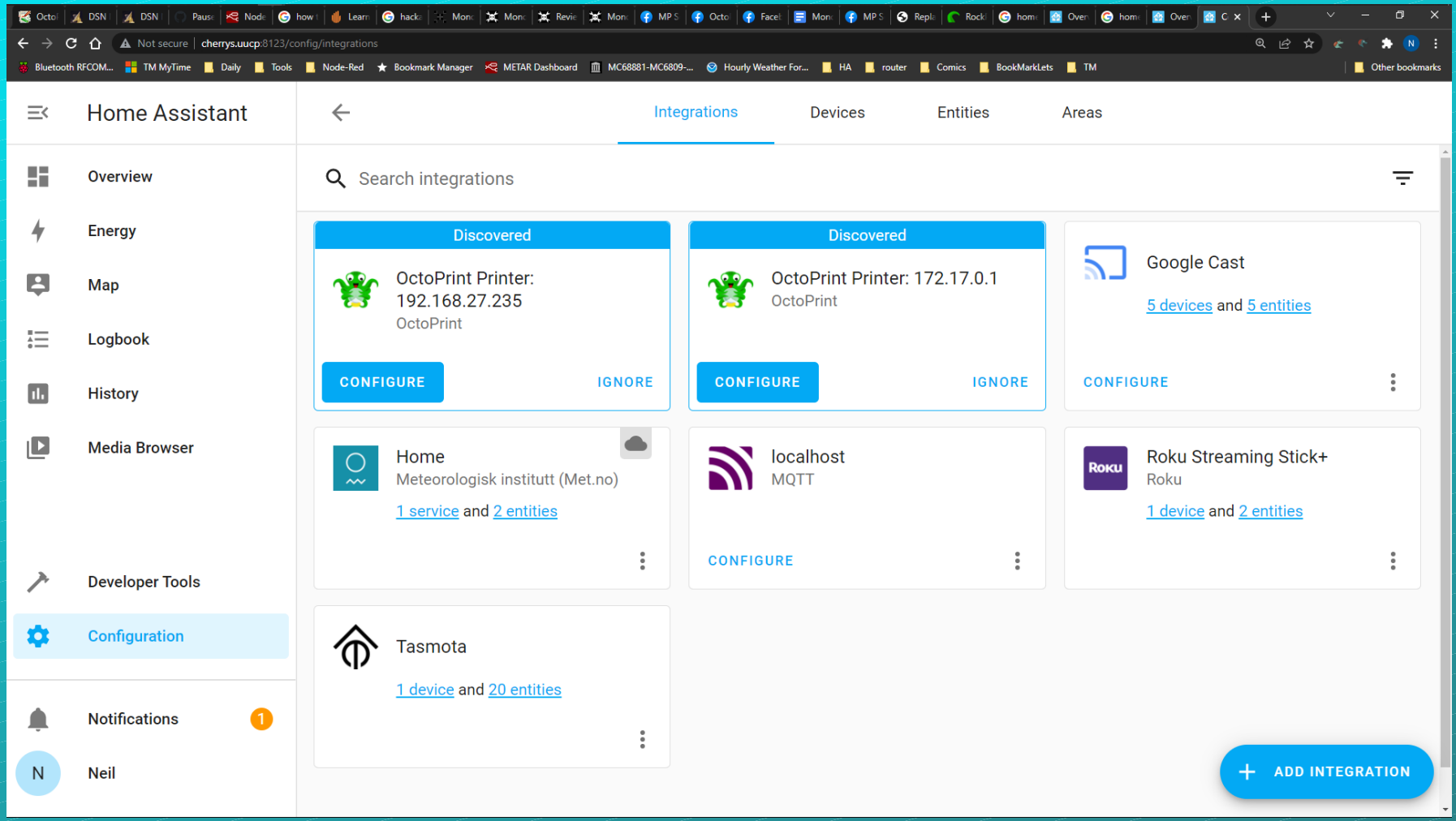


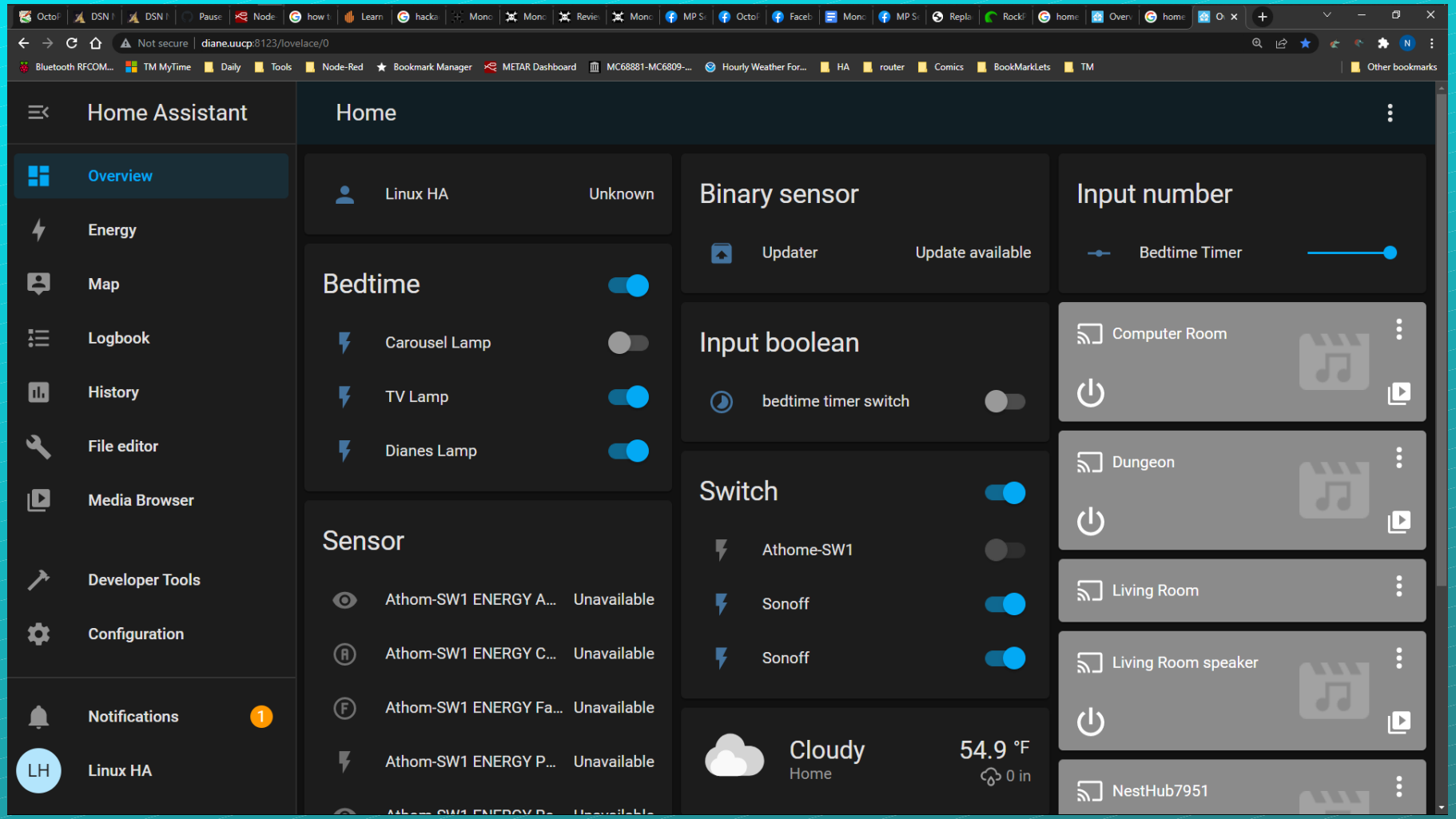
Home Assistant

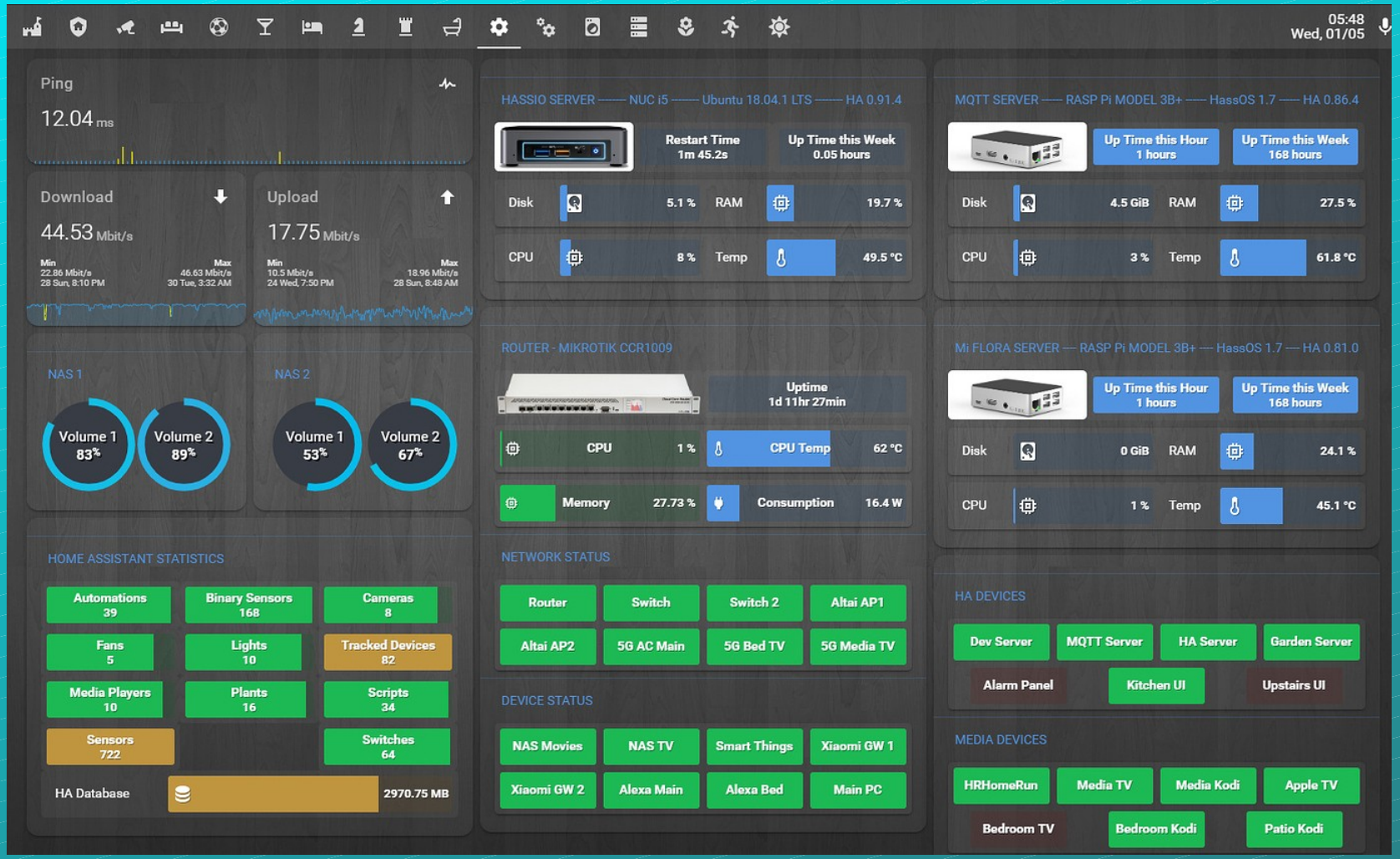

Not secure | cherrys.uucp:8123/lovelace/0
Home Assistant
Cherrys
Overview
Energy
Map
Logbook
History
Media Browser
Developer Tools
Configuration
Notifications
1
N
Neil
Garage
Roku Streaming Stick+
Roku Streaming Stick+
Dungeon
Living Room speaker
Sensor
Bench Lamp
On
Carousel Lamp
ON
Living Room
Athome-SW1
Athom-SW1 ENERGY To... Unavailable
Athom-SW1 ENERGY To... Unavailable
Athom-SW1 ENERGY Ye... Unavailable
Athom-SW1 ENERGY To... Unavailable
Athom-SW1 ENERGY P... Unavailable
Athom-SW1 ENERGY A... Unavailable
Athom-SW1 ENERGY Re... Unavailable
Athom-SW1 ENERGY Fa... Unavailable
Athom-SW1 ENERGY V... Unavailable
Athom-SW1 ENERGY C... Unavailable
Neil
Unknown
Binary sensor
Updater
Update available
Computer Room
Living Room
NestHub7951
Partly cloudy
Cherrys
54.3 °F
0 in

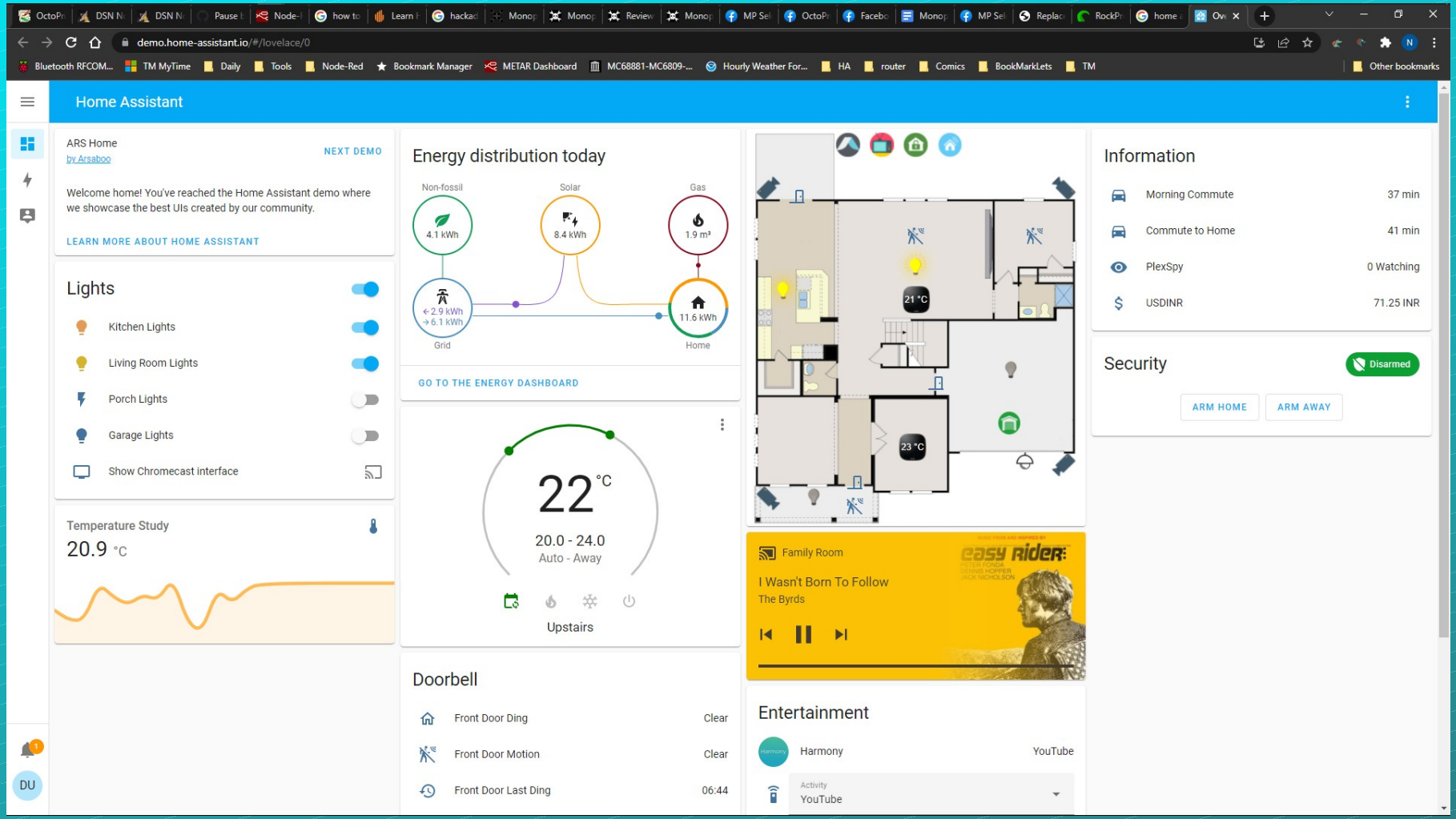

Not secure | cherrys.uucp:8123/lovelace/0
Bluetooth RFCOM...
TM MyTime
Daily
Tools
Node-Red
Bookmark Manager
METAR Dashboard
MC68881-MC6809-...
Hourly Weather For...
HA
router
Comics
BookMarkLets
TM
Other bookmarks
Home Assistant
Overview
Energy
Map
Logbook
History
Media Browser
Developer Tools
Configuration
Notifications
1
N
Neil
Cherrys
Carousel Lamp ON
Current Version 2021.11.5
Season Winter
TV Lamp ON
Uptime Last month
athom Unknown
Athom-SW1 ENERGY C... Unavailable
Partly cloudy
Cherrys
54.3 °F
0 in
Switch
Bedroom
Bench Lamp
Carousel Lamp
Dianes Lamp
Ikea
Sonoff
Sonoff
TV Lamp
Tiny Chair Outlet


Not secure
cherrys.uucp:8123/lovelace/0
Bluetooth RFCOM...
TM MyTime
Daily
Tools
Node-Red
Bookmark Manager
METAR Dashboard
MC68881-MC6809-...
Hourly Weather For...
HA
router
Comics
BookMarkLets
TM
Other bookmarks
Notifications
New devices discovered
We have discovered new devices on your network. Check it out.
2 days ago
DISMISS
Living Room
Athome-SW1
Athom-SW1 ENERGY Tot... Unavailable
Athom-SW1 ENERGY Tot... Unavailable
Athom-SW1 ENERGY Ye... Unavailable
Athom-SW1 ENERGY To... Unavailable
Athom-SW1 ENERGY Po... Unavailable
Athom-SW1 ENERGY Ap... Unavailable
Athom-SW1 ENERGY Re... Unavailable
Athom-SW1 ENERGY Fa... Unavailable
Athom-SW1 ENERGY Vol... Unavailable
Athom-SW1 ENERGY Cu... Unavailable
On
ON
Neil
Unknown
Binary sensor
Updater
Update available
Computer Room
Living Room
NestHub7951
Partly cloudy
Cherrys
54.3 °F
0 in

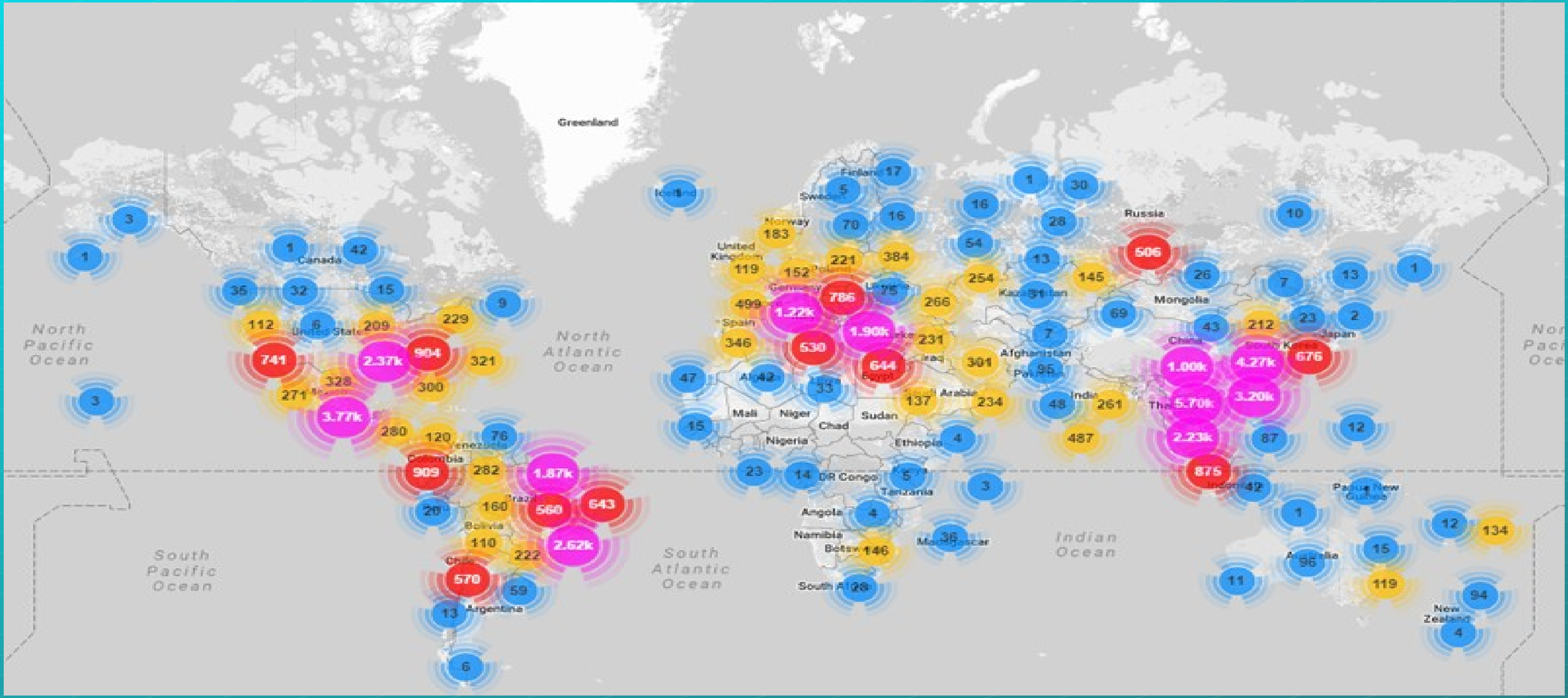

Not secure
cherrys.uucp:8123/config/integrations
Home Assistant
Integrations
Devices
Entities
Areas
Search integrations
Overview
Energy
Map
Logbook
History
Media Browser
Developer Tools
Configuration
Notifications
1
Neil
Discovered
OctoPrint Printer: 192.168.27.235
OctoPrint
CONFIGURE
IGNORE
Discovered
OctoPrint Printer: 172.17.0.1
OctoPrint
CONFIGURE
IGNORE
Google Cast
5 devices and 5 entities
CONFIGURE
Home
Meteorologisk institutt (Met.no)
1 service and 2 entities
localhost
MQTT
CONFIGURE
Roku Streaming Stick+
Roku
1 device and 2 entities
Tasmota
1 device and 20 entities
ADD INTEGRATION


Not secure
diane.uucp:8123/lovelace/0
Home Assistant
Home
Overview
Energy
Map
Logbook
History
File editor
Media Browser
Developer Tools
Configuration
Notifications
1
Linux HA
LH
Linux HA
Unknown
Bedtime
Carousel Lamp
TV Lamp
Dianes Lamp
Sensor
Athom-SW1 ENERGY A...
Unavailable
Athom-SW1 ENERGY C...
Unavailable
Athom-SW1 ENERGY Fa...
Unavailable
Athom-SW1 ENERGY P...
Unavailable
Binary sensor
Updater
Update available
Input boolean
bedtime timer switch
Switch
Athome-SW1
Sonoff
Sonoff
Cloudy
Home
54.9 °F
0 in
Input number
Bedtime Timer
Computer Room
Dungeon
Living Room
Living Room speaker
NestHub7951


05:48
Wed, 01/05
Ping
12.04 ms
Download
44.53 Mbit/s
Min
22.86 Mbit/s
28 Sun, 8:10 PM
Max
46.63 Mbit/s
30 Tue, 3:32 AM
Upload
17.75 Mbit/s
Min
10.5 Mbit/s
24 Wed, 7:50 PM
Max
18.96 Mbit/s
28 Sun, 8:48 AM
NAS 1
Volume 1
83%
Volume 2
89%
NAS 2
Volume 1
53%
Volume 2
67%
HOME ASSISTANT STATISTICS
Automations
39
Binary Sensors
168
Cameras
8
Fans
5
Lights
10
Tracked Devices
82
Media Players
10
Plants
16
Scripts
34
Sensors
722
Switches
64
HA Database
2970.75 MB
HASSIO SERVER —— NUC i5 —— Ubuntu 18.04.1 LTS —— HA 0.91.4
Restart Time
1m 45.2s
Up Time this Week
0.05 hours
Disk
5.1 %
RAM
19.7 %
CPU
8 %
Temp
49.5 °C
MQTT SERVER —— RASP Pi MODEL 3B+ —— HassOS 1.7 —— HA 0.86.4
Up Time this Hour
1 hours
Up Time this Week
168 hours
Disk
4.5 GiB
RAM
27.5 %
CPU
3 %
Temp
61.8 °C
ROUTER - MIKROTIK CCR1009
Uptime
1d 11hr 27min
CPU
1 %
CPU Temp
62 °C
Memory
27.73 %
Consumption
16.4 W
Mi FLORA SERVER — RASP Pi MODEL 3B+ — HassOS 1.7 — HA 0.81.0
Up Time this Hour
1 hours
Up Time this Week
168 hours
Disk
0 GiB
RAM
24.1 %
CPU
1 %
Temp
45.1 °C
NETWORK STATUS
Router
Switch
Switch 2
Altai AP1
Altai AP2
5G AC Main
5G Bed TV
5G Media TV
HA DEVICES
Dev Server
MQTT Server
HA Server
Garden Server
Alarm Panel
Kitchen UI
Upstairs UI
DEVICE STATUS
NAS Movies
NAS TV
Smart Things
Xiaomi GW 1
Xiaomi GW 2
Alexa Main
Alexa Bed
Main PC
MEDIA DEVICES
HRHomeRun
Media TV
Media Kodi
Apple TV
Bedroom TV
Bedroom Kodi
Patio Kodi


demo.home-assistant.io/#/lovelace/0
Home Assistant
ARS Home
by Arsaboo
NEXT DEMO
Welcome home! You've reached the Home Assistant demo where we showcase the best UIs created by our community.
LEARN MORE ABOUT HOME ASSISTANT
Lights
Kitchen Lights
Living Room Lights
Porch Lights
Garage Lights
Show Chromecast interface
Temperature Study
20.9 °C
Energy distribution today
Non-fossil
4.1 kWh
Solar
8.4 kWh
Gas
1.9 m³
2.9 kWh
6.1 kWh
Grid
11.6 kWh
Home
GO TO THE ENERGY DASHBOARD
22 °C
20.0 - 24.0
Auto - Away
Upstairs
Doorbell
Front Door Ding
Clear
Front Door Motion
Clear
Front Door Last Ding
06:44
21 °C
23 °C
Family Room
I Wasn't Born To Follow
The Byrds
Entertainment
Harmony
YouTube
Activity
YouTube
Information
Morning Commute
37 min
Commute to Home
41 min
PlexSpy
0 Watching
USDINR
71.25 INR
Security
Disarmed
ARM HOME
ARM AWAY

Security

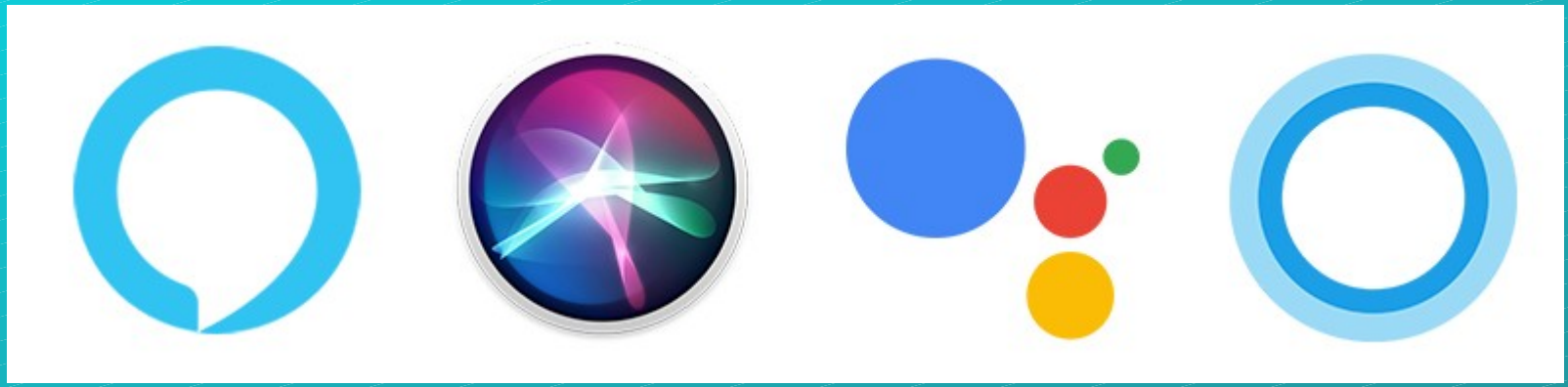

Greenland
Canada
North Pacific Ocean
North Atlantic Ocean
South Pacific Ocean
South Atlantic Ocean
Indian Ocean
Norway
Finland
United Kingdom
Germany
Spain
Russia
Mongolia
Afghanistan
China
Japan
Saudi Arabia
India
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
DR Congo
Tanzania
Angola
Namibia
Colombia
Bolivia
Argentina
New Zealand

End of Presentation

AI, ML & Voice Assistants

WHEN VISITING A NEW HOUSE, IT'S GOOD TO CHECK WHETHER THEY HAVE AN ALWAYS-ON DEVICE TRANSMITTING YOUR CONVERSATIONS SOMEWHERE.

Voice Assistants and TV Dongles



Voice Assistant

- Google Assistant
- Google Home
- Amazon Alexa
- Apple Siri
- Microsoft Cortina
- Integrating it into HA (like on your NR)

The Cloud

- VPN/SSH
- Voice Assistants
- IFTTT
- MQTT
- DB (SAS)
- SDN
  - Amazon AWS
  - Azure
  - Google Cloud

Resource Page

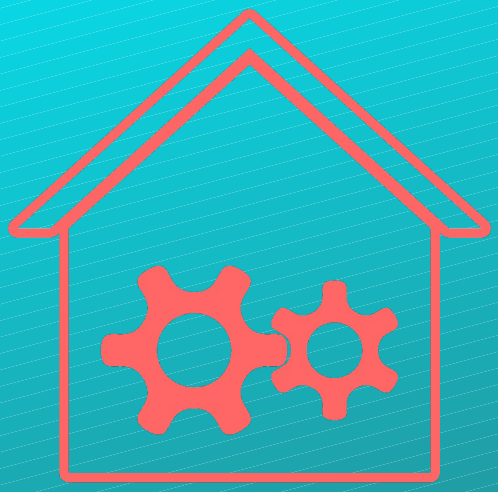
https://ushomeautomation.com/Presentations/ (Presentations)

- ncherry@linuxha.com (email)
- https://linuxha.com/ (my web pages)
- https://ushomeautomation.com/ (my web pages)
- https://compdecon.github.io/ (my Makerspace)
- https://hackspace.raspberrypi.com/ (Hackerspace magazine)
- https://www.hivemq.com/public-mqtt-broker/ (Public MQTT Broker)
- https://www.home-assistant.io/ (Home Assistant)
- https://www.androidpolice.com/matter-explained-what-is-the-next-gen-smart-home-standard/ (Matter)

Resource Page

- https://github.com/arendst/Sonoff-Tasmota
- https://github.com/arendst/Sonoff-Tasmota/wiki
- https://nodered.org/
- https://flows.nodered.org/?num_pages=1

A Funny Thing Happened On The Way To A Quorum



TCF 2022 – Smart Things

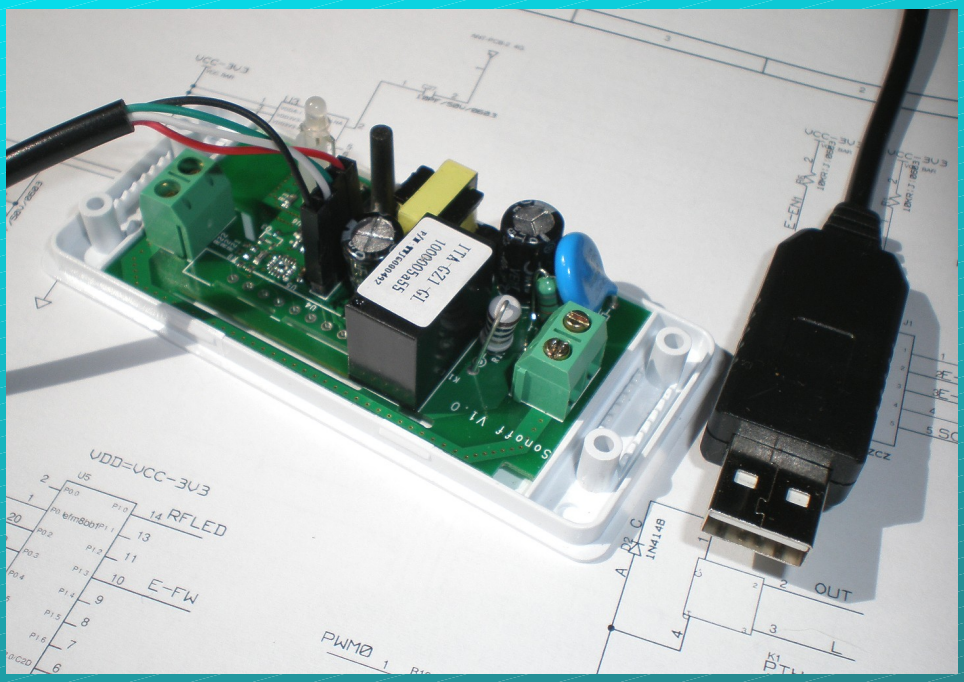
Because of the move to Zoom my rather interactive presentation needs to be shuffled and this is what I could figure out. Understand that I don’t know how to access external cameras that I would need to show the other parts of the live demos.

Safety & Disclaimer

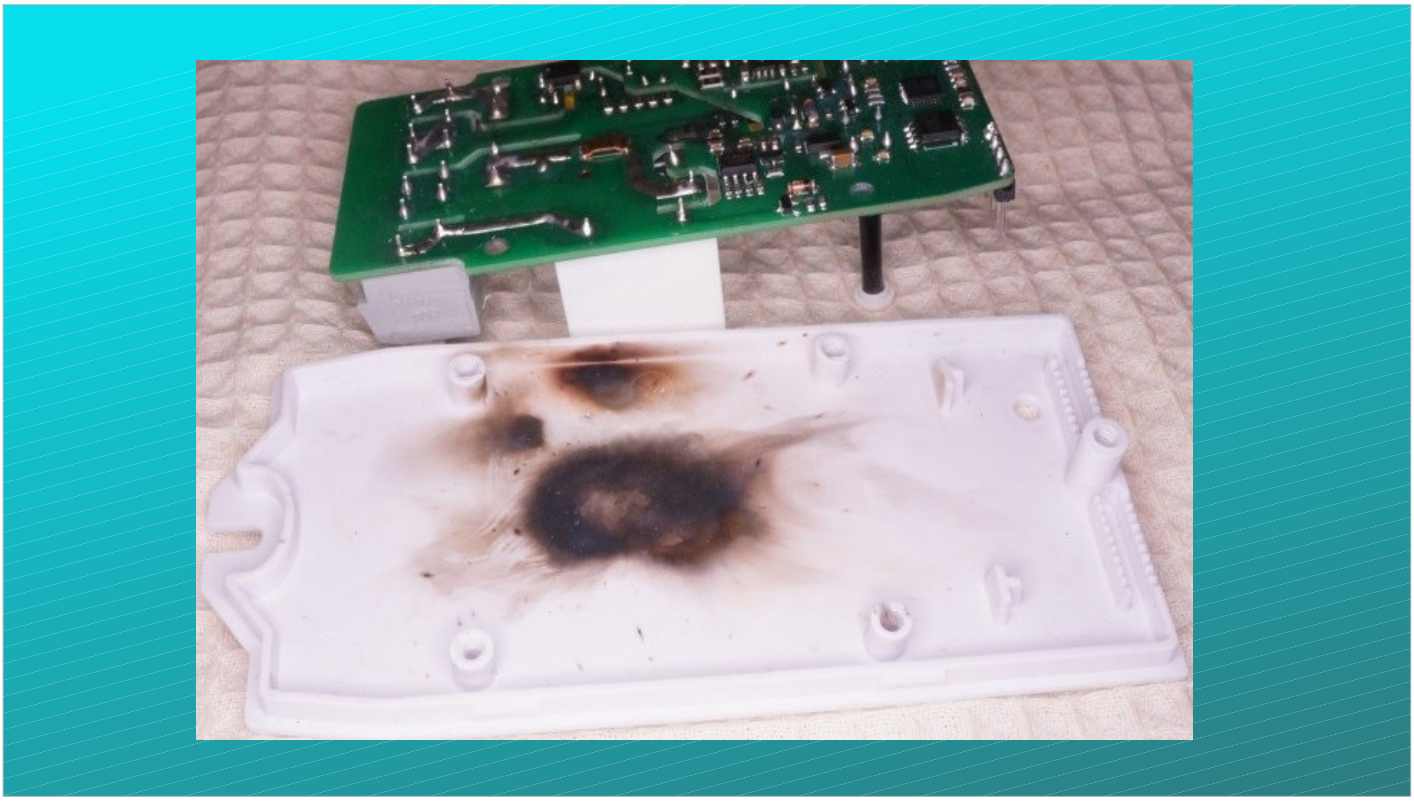
STOP! Think before you work with AC power!

If you are not comfortable with playing with electricity then let a professional wire up any outlets or switches. This stuff can damage home appliances, burn down your home or worse, kill you!

Check you local ordinances, many require a licensed electrician to do the work on your home.



Sonoff Basic switch, before something bad’s about to happen.



Sonoff Basic switch after.

DO NOT program your switch plugged into the AC. You will let the magic smoke out.

Most USB TTL serial dongles provide the power needed to program the switch with the new software (Tasmota for example). Not all do though.

Once the device has been installed in your home you can use OTA (over the air) updates to upgrade your software. If the switch loses it’s mind and really needs to use the USB programmer, Then disconnect it from the AC, connect the programmer and program. Make sure to disconnect the programmer before connecting the switch to the AC.

My Introduction

- Neil Cherry (ncherry@linuxha.com)
- Home Automation has been my hobby/passion/obsession since 1978
- Author: *Linux Smart Homes For Dummies* 2006, various magazine articles (see appendix)
- First TCF LHA presentation in 2008, I've not done it every year
- Background: computers, networking, electronics, embedded systems & programming (various languages)
- Worked on multiple open source projects
- Employed as a Tester for Network Services and now DevOps

Neil Cherry (ncherry@linuxha.com)
Home Automation has been my hobby/passion/obsession since 1978
Author: *Linux Smart Homes For Dummies* 2006, various magazine articles (see appendix)
First TCF LHA presentation in 2008, I've not done it every year
Background: computers, networking, electronics, embedded systems & programming (various languages)
Worked on multiple open source projects
Employed as a QA Eng/DevOps for Software Defined Networks

- Computer Deconstruction Lab – The Jersey Shore Makerspace
- Podcast, lab and classroom
- @The InfoAge Science History Learning Center and Museum,
- @ historic Camp Evans
- 2201 Marconi Road, Building 9059,Wall, NJ 07719
- RT 18, Brighton Ave Exit 7a or 7
- Monday nights, 7 PM to 10 PM

On the INTERNET OF THINGS

- I’ve always liked the idea of the Internet of Things, but in practice, it’s too close to a Cory Doctorow novel. Imagine your phone tracking your Strava runs and sending it to your healthcare provider, letting them know you’ve not been for that run you promised you were going to go on? Or your online shopping service being able to manipulate the price of cream to make you spend more if it knows, from your smart fridge, that you have a load of strawberries in the fridge? It could be excellent, but the future has unfortunately been hijacked by a couple of big companies that depend on advertising revenues. This is why we can’t have nice things. Unless we make them ourselves: the smart fridge in issue 43 is a perfect example of what we could and should have.

  Robin, Toronto

  (HackSpace Magazine)

- I’ve always liked the idea of the Internet of Things, but in practice, it’s too close to a Cory Doctorow novel. Imagine your phone tracking your Strava runs and sending it to your healthcare provider, letting them know you’ve not been for that run you promised you were going to go on? Or your online shopping service being able to manipulate the price of cream to make you spend more if it knows, from your smart fridge, that you have a load of strawberries in the fridge? It could be excellent, but the future has unfortunately been hijacked by a couple of big companies that depend on advertising revenues. This is why we can’t have nice things. Unless we make them ourselves: the smart fridge in issue 43 (10 IoT Projects – Pg 47) is a perfect example of what we could and should have.

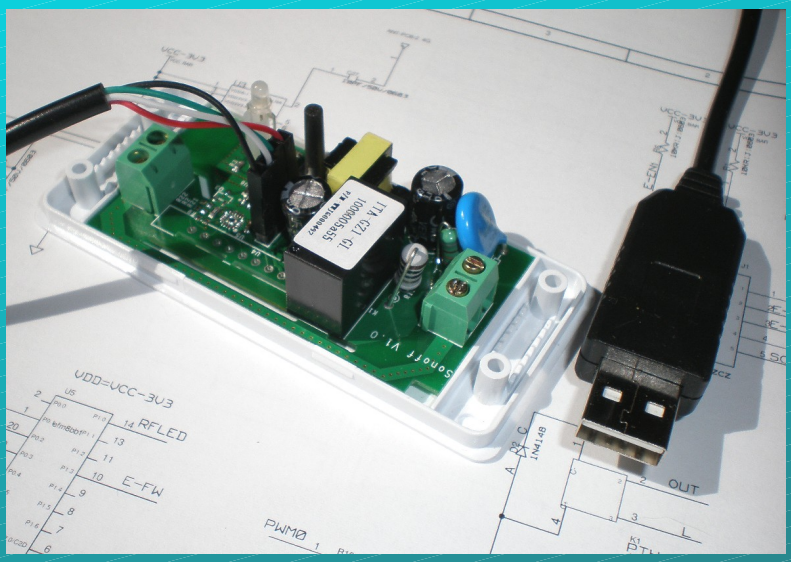
  Robin, Toronto

  (HackSpace Magazine)

Minimal Setup

Minimal setup

Minimal Starter’s setup



Most basic setup
- Lamp
- bulb
- Sonoff
- WiFi
- Phone, tablet, laptop, computer
- Sonoff’s App for your phone

Or reprogram your Sonoff

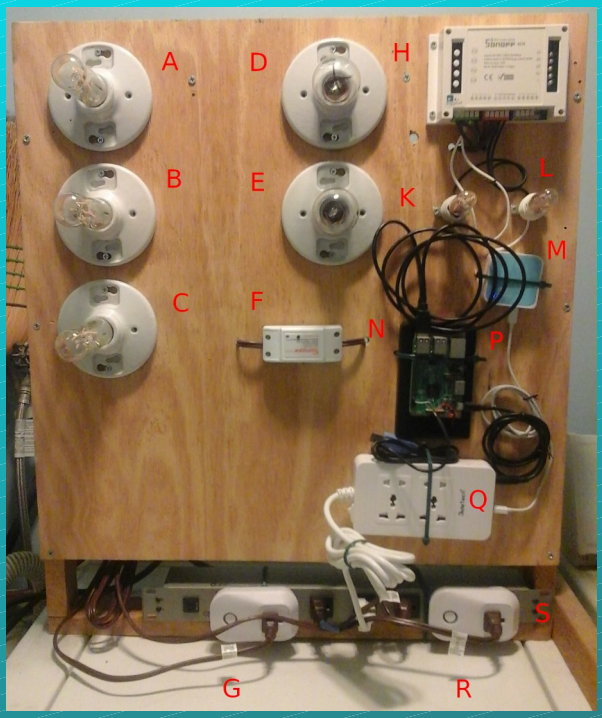
- USB/TTL serial cable/dongle
- Tasmota (or ESPEZ or ESPHome)
- Any web browser (phone or PC)

Winken, Blinken and Nod
or what's the hub-bub about hubs?

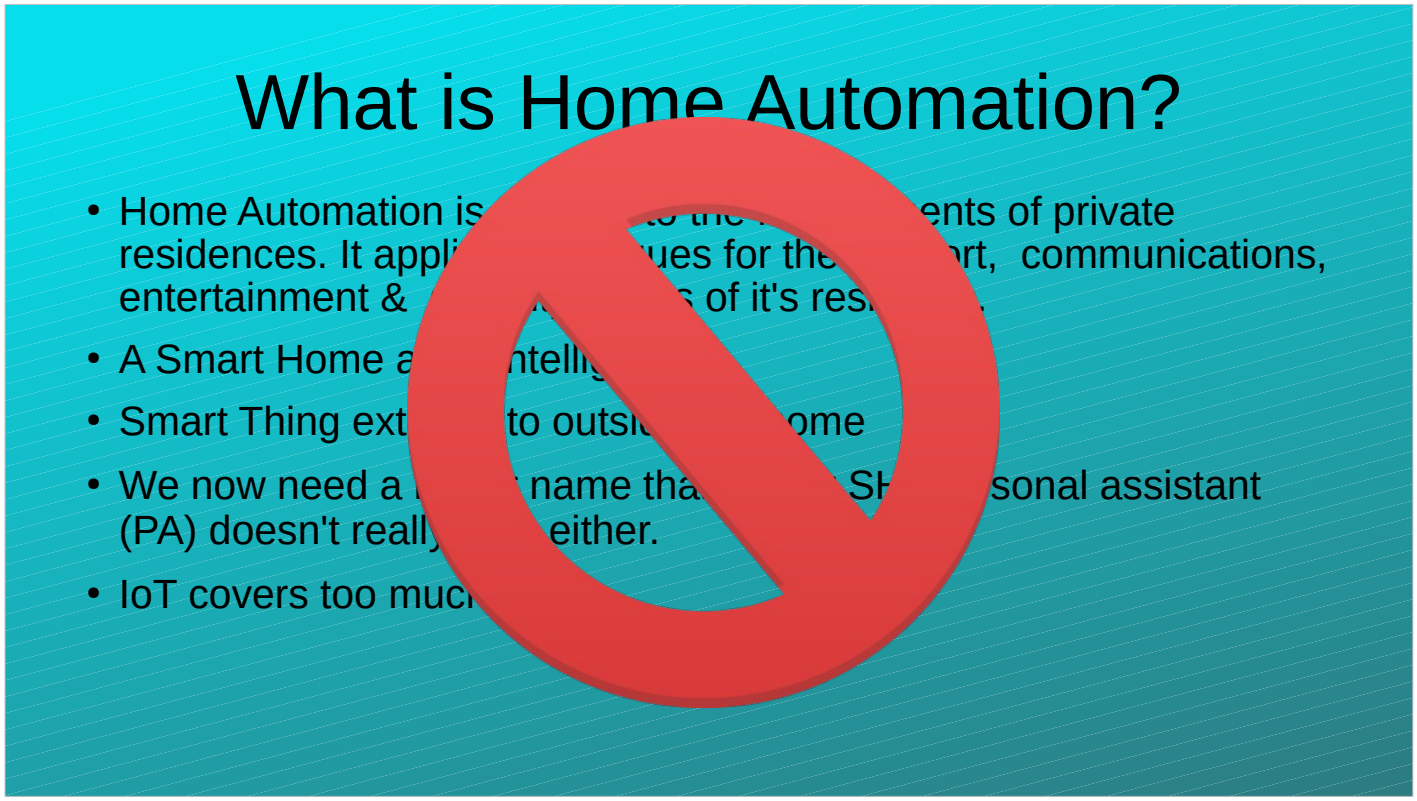
There's a lot to talk about here.
- What is a hub?
  - Pi like computer
  - ZigBee radio
  - Z-Wave radio
  - WiFi radio
- Alexa, Google Home are not a hub exactly
- Philips Hue (ZigBee but not everyone's)
- TCP (gone and forgotten)
- SmartThings – good hub but things are changing
  - Old hub will need to be replaced to add more features
- Wink – disappeared in the Wink of an eye
- Other vendors – hub'd to death

Quick note on EOL and Bionic eyes

Description



A - LED bulb - controlled by G – Sonoff S26 Outlet
B - LED bulb - controlled by R – Sonoff S26 Outlet
C - LED bulb - controlled by F – Sonoff Basic
D - Incandescent bulb - controlled by H (4CH button 1)
E - Incandescent bulb - controlled by H (4CH button 2)
F - Sonoff BASIC (Tasmota Firmware/wifi)
G - Sonoff Smart Switch (Tasmota Firmware/wifi)
H - Sonoff 4CH (Tasmota Firmware/wifi)
K - LED bulb - controlled by H (4CH button 3)
L - LED bulb - controlled by H (4CH button 4)
M - TP Link TL-WR703N OpenWRT AP
N - SSD via USB
P - Raspberry Pi 3B (v1.2)
Q - 4 AC (US/Europe) outlets, 4 USB power outlets
R - Sonoff Smart Switch (wifi)
S - 6 AC outlet AC intellectual challenged power strip
T - USB TTL Serial dongle (not labeled)



Home Automation definitions but we are no longer limited to the home.

So we need a better name, but what?

Smart Home is okay but limited to the home.

Smart Things (but it's trademarked by Samsung) is okay but a lot things and not very

IoT – Internet of Things is too much. I don't interact with everything.

So why the title?

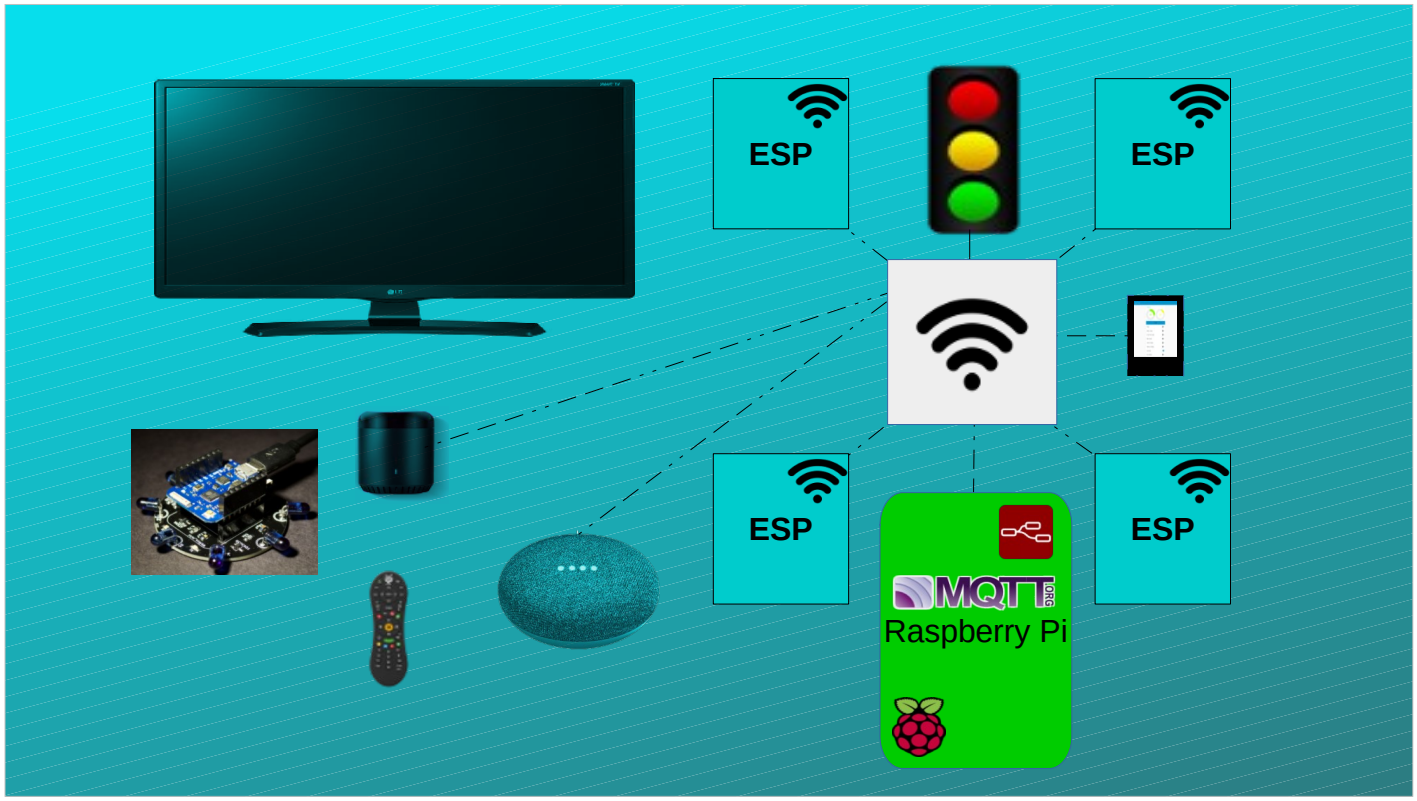
- A discussion with a colleague
  - Why can't I buy this stuff in the store?
  - You can but you need to have certain knowledge and a DIY mindset to build it
  - Rome wasn't built in a day (and not because of an energy drink)
- Has anyone ever built a car from scratch?
- But can you?
- Has anyone ever built a smart home solution from scratch?
  - You can but it's easier to buy one with a cloud solution
- But you can do it yourself and avoid the cloud.
- Hopefully Matter will help with this

Herb challenged me. Herb's view is that DIY HA is dead. Which isn't true. Rather it's a complex subject and it's not just about home automation, though that is a part of it.

- A discussion with a colleague
  - Why can't I buy this stuff in the store?
  - You can but you need to have certain knowledge and a DIY mindset to build it
  - Rome wasn't built in a day (and not because of an energy drink)
- Has anyone ever built a car from scratch?
- But can you?
- Has anyone ever built a smart home solution from scratch?
  - You can but it's easier to buy one with a cloud solution
- But you can do it yourself and avoid the cloud.
- Hopefully Matter will help with this, hence the Quorem, but I have my doubts.

Typical high level view of your home.

Typical Home



High level diagram of a typical home:
WiFi AP/FW/Modem because it's easy to start with.
Hmm, do I need a switch and an Ethernet device? That depends on how your network grows.
But be wary of starting off with expensive items. You should start off with the simple device and build upon your experiences.
Here the Wireless ESP devices are either ESP/Arduino, DIY or Tasmota devices (store bought but reprogrammed).

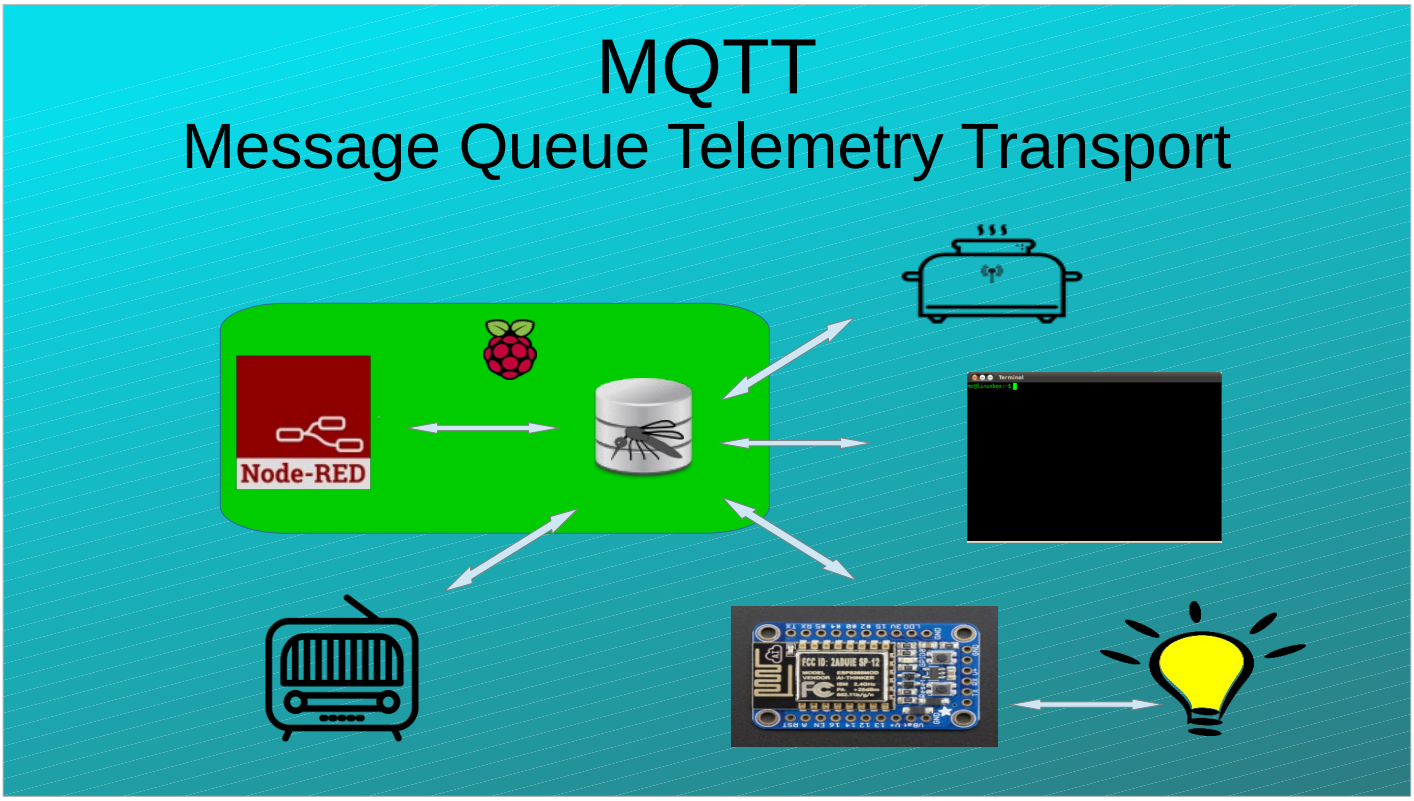
Hardware

Typical hardware

Raspberry Pi 3B (I think)
USB ZigBee Dongle
ESP32 (Adafruit Feather)
Sonoff S26
Sonoff MiniiR2
Sonoff 4CH
Tuya Thermostat (WiFi or ZigBee)
Sonoff Basic module

Software

Software



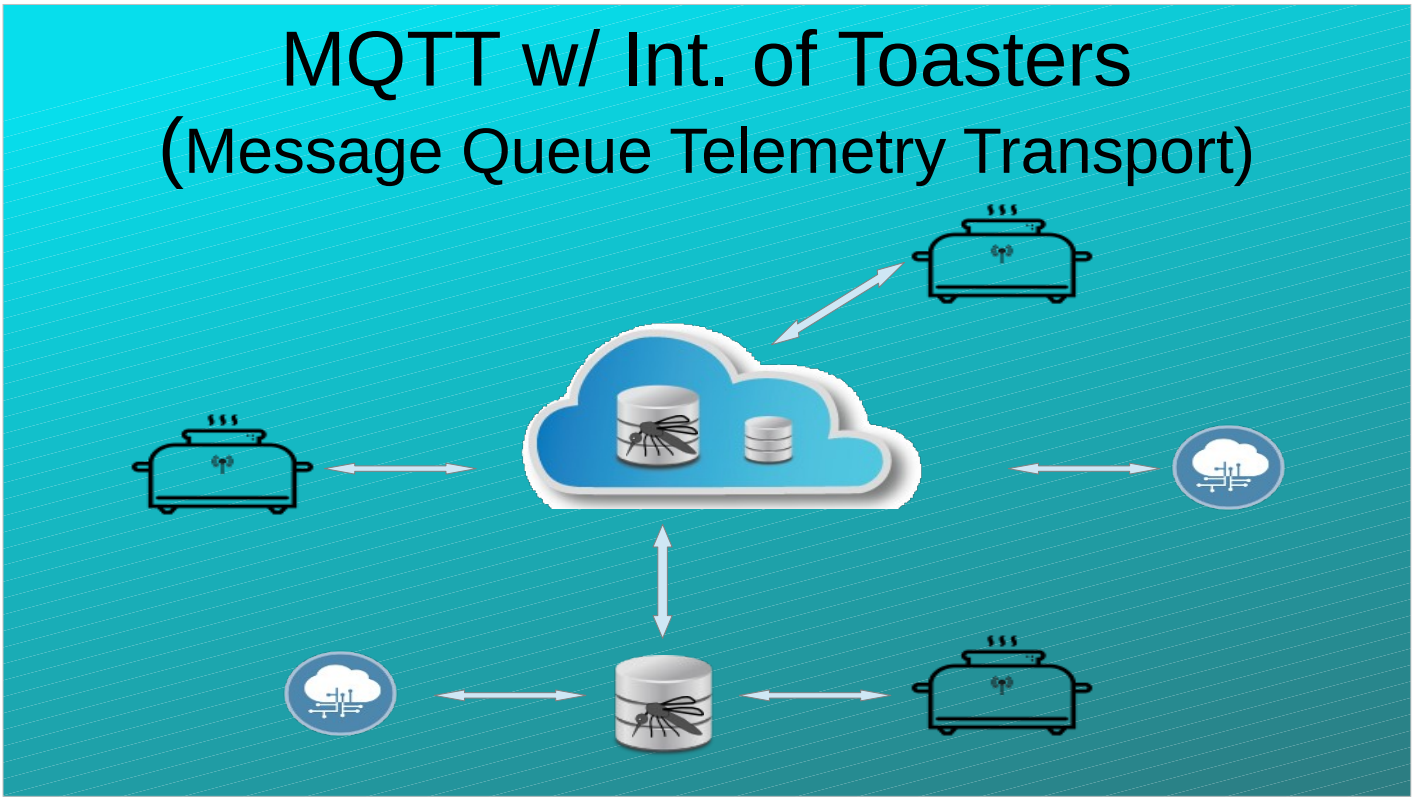
The Green box represents the Raspberry Pi hardware which is running Linux.

Under Linux that are several services (software): Mosquitto MQTT, Node-Red, a Web server, SSH, shell, Progamming Languages, etc.

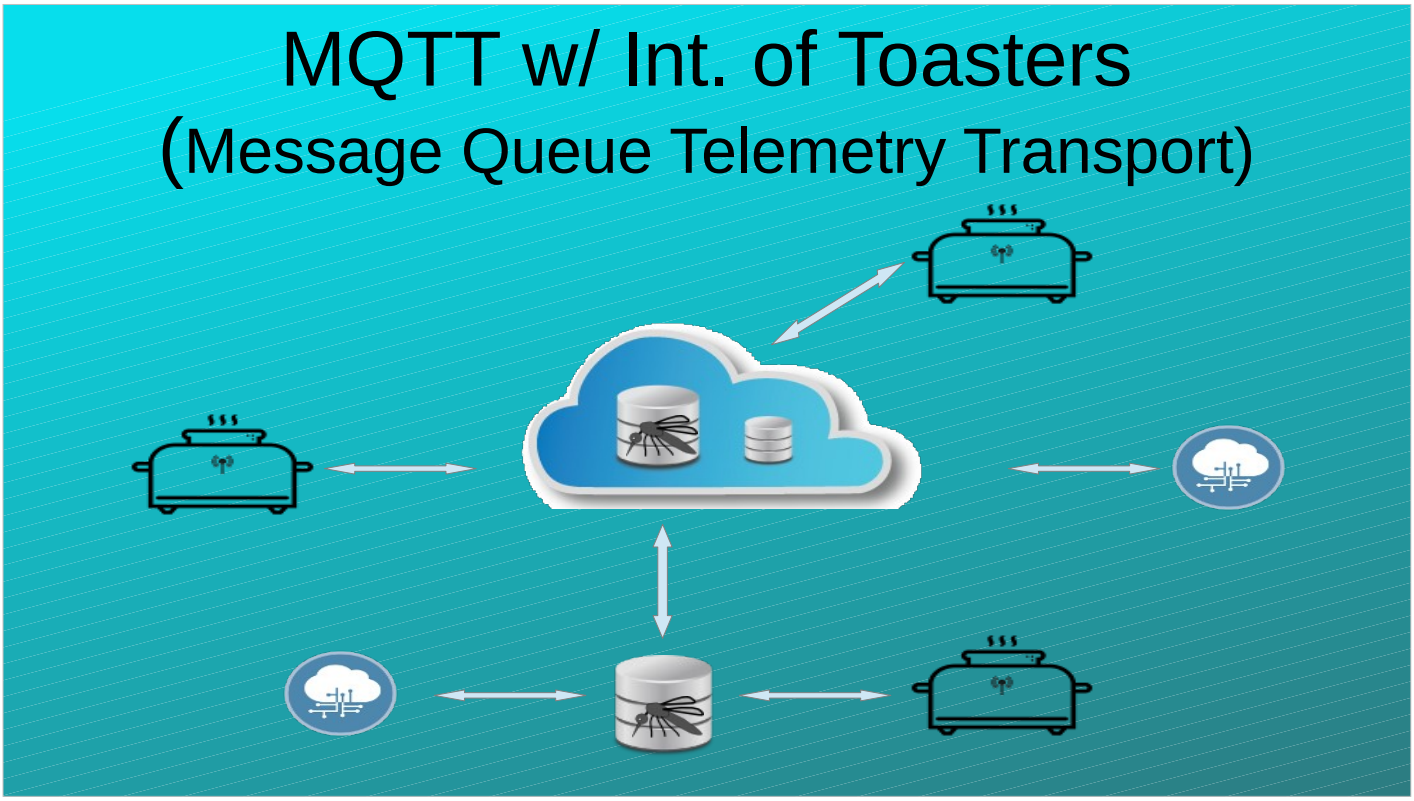
Here I've added the icons for Node-Red and Mosquitto – MQTT Broker. I also have a terminal session with bash, That's also on the Raspberry Pi. I'll explain the toaster, radio, ESP board and light bulb in a few slides.

Mosquitto MQTT Broker

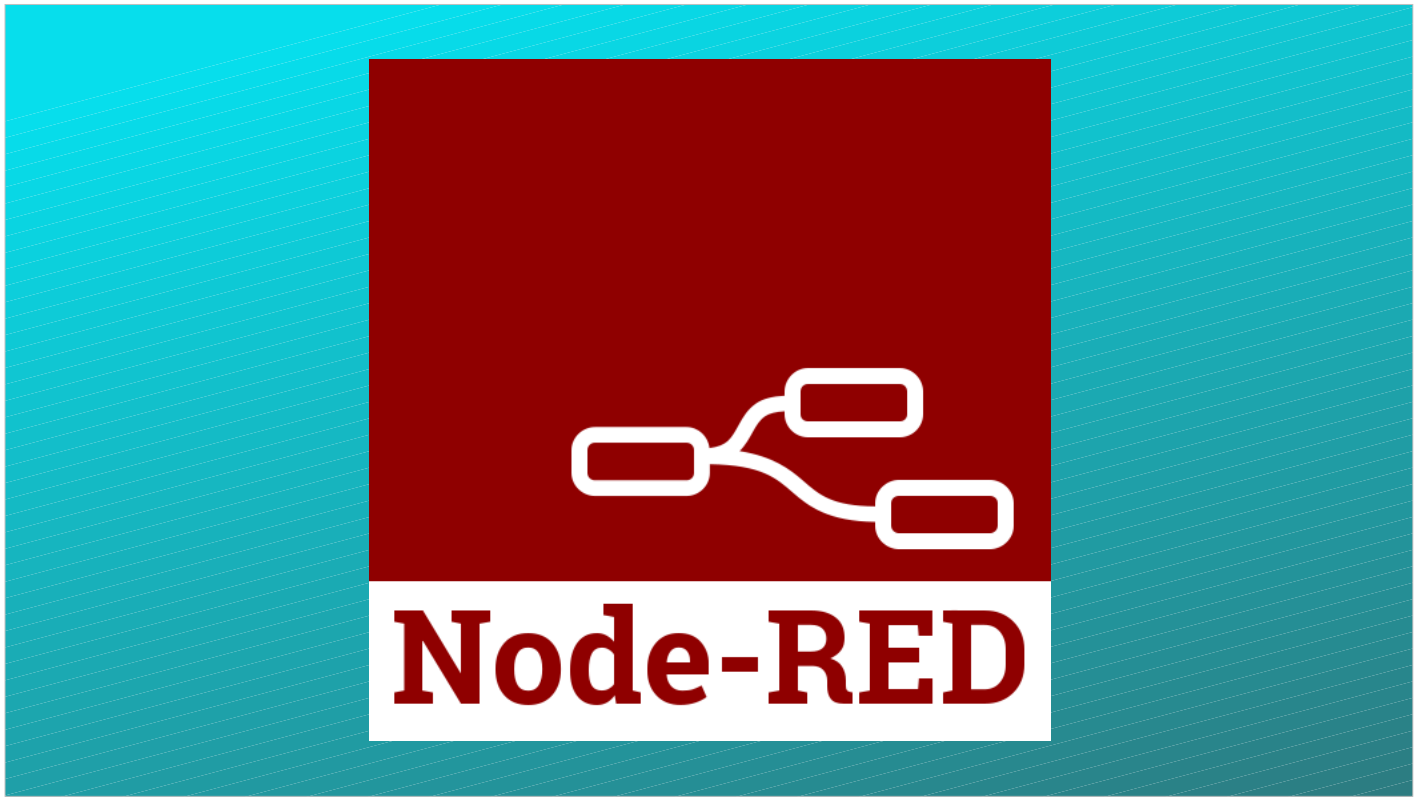
Mosquitto MQTT broker (server), client, and libraries



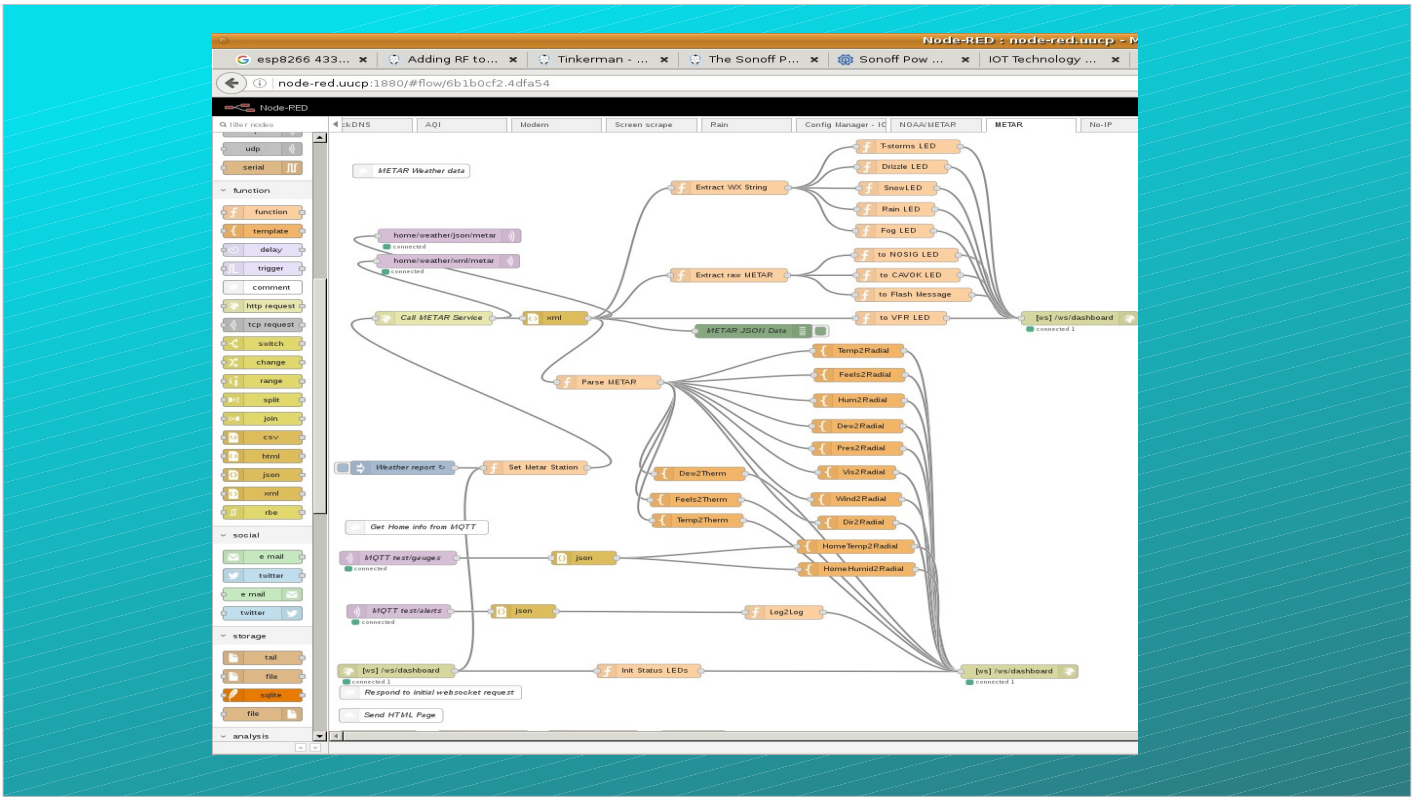
MQTT is a network service, a software message broker. It's job is to accept messages from publishers and send them to subscribers. It does this with topics which look like file system paths. A publisher, like a smart temperature sensor will publish a message. The broker then takes the message ...



… and sends it to all the subscribers of a topic. Anyone can be both a publisher and subscriber and may publish and/or subscribe to different topics. The MQTT libraries are popular with small devices which don’t have a lot of resources. Messages can be in JSON (popular) or in plain text. The messages tend to be small.



Node-red



Node-red is a software flow-based development tool for visual programming.

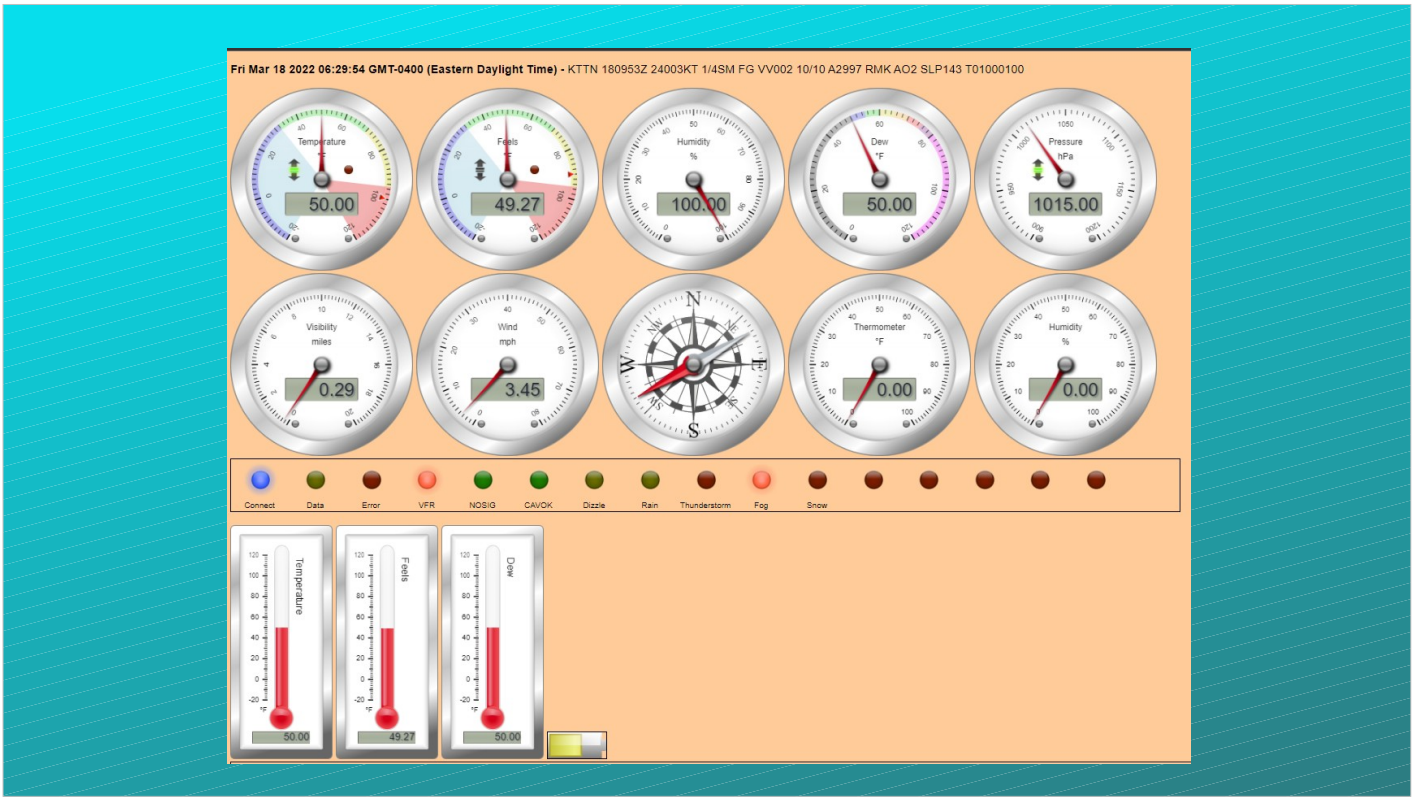
Developed originally by IBM for wiring together hardware devices, APIs and online services as part of the Internet of Things.

Node-RED provides a web browser-based flow editor, which can be used to create flows which are made up of node (pre-made functions) that you wire together.

A function node is a javascript node which allows you to handle special programming.

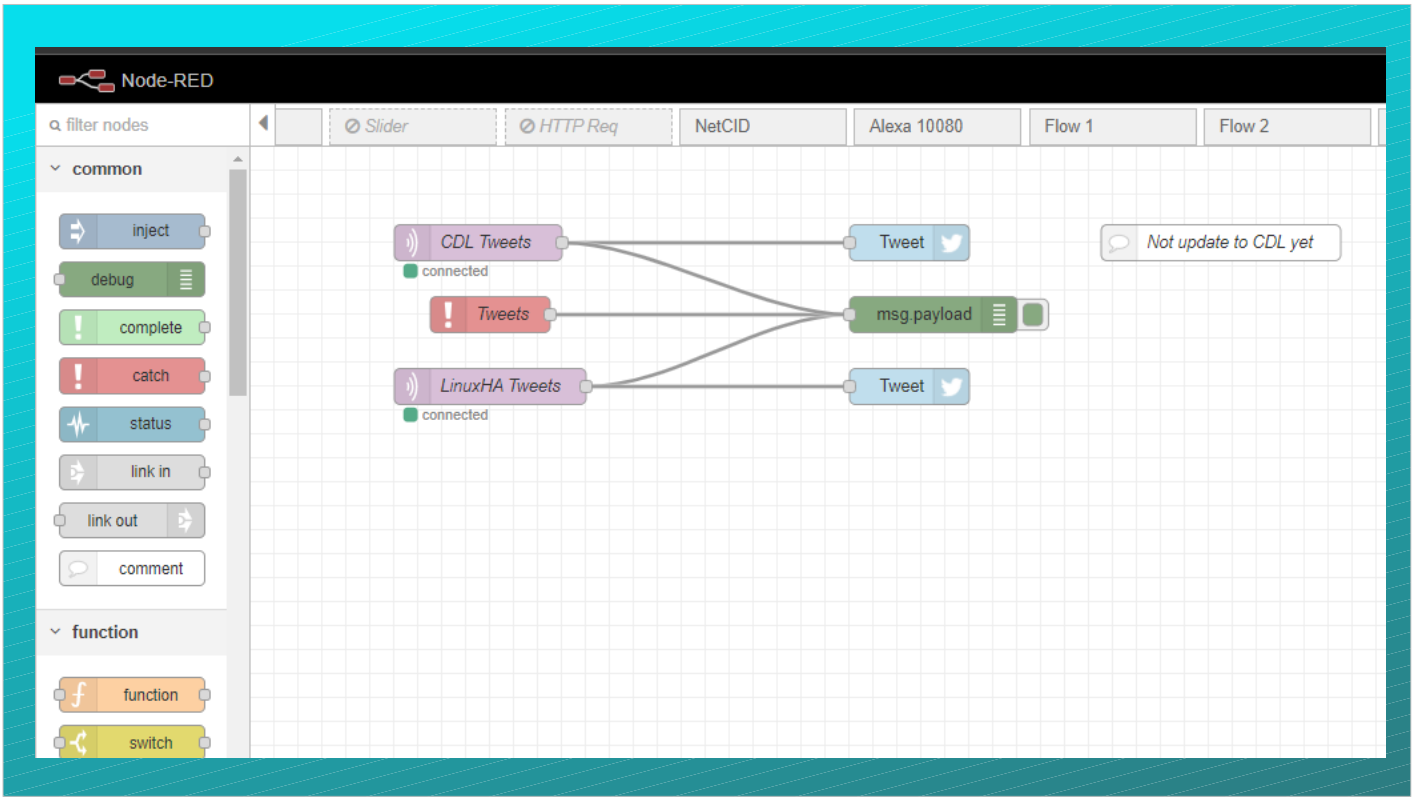
Here I show you a Browser accessing the node-red service on the Raspberry Pi.

This is my Metar node which pulls data from Mercer County Airport and ...



Here's what that mess produced a web page full of gauges, LEDs and thermometers

This page is displaying weather information coming from an airport in Trenton NJ.



This is a much simpler flow. It takes tweets and publishes them to the appropriate twitter account. I have 2 here, one for my CDL twitter account and one for my Linux HA account.

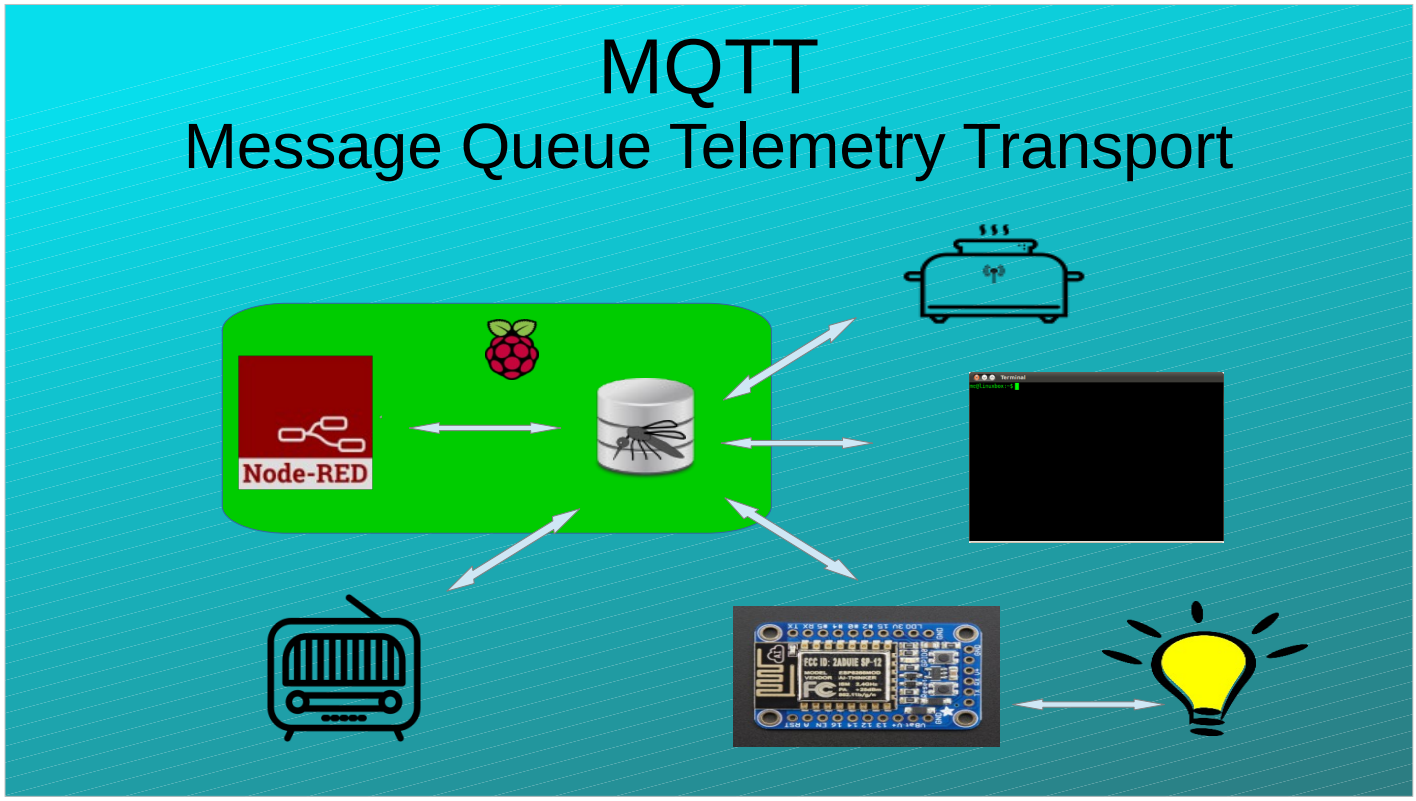
To build this flow, you drag the nodes onto the editor, double click each node, configure then wire together. Then configure the appropriate settings by double clicking each node.

Here I have 2 MQTT in nodes (Purple), 2 Twitter out nodes (blue), 1 error catch node (red), one debug node (green) and one comment node (white).

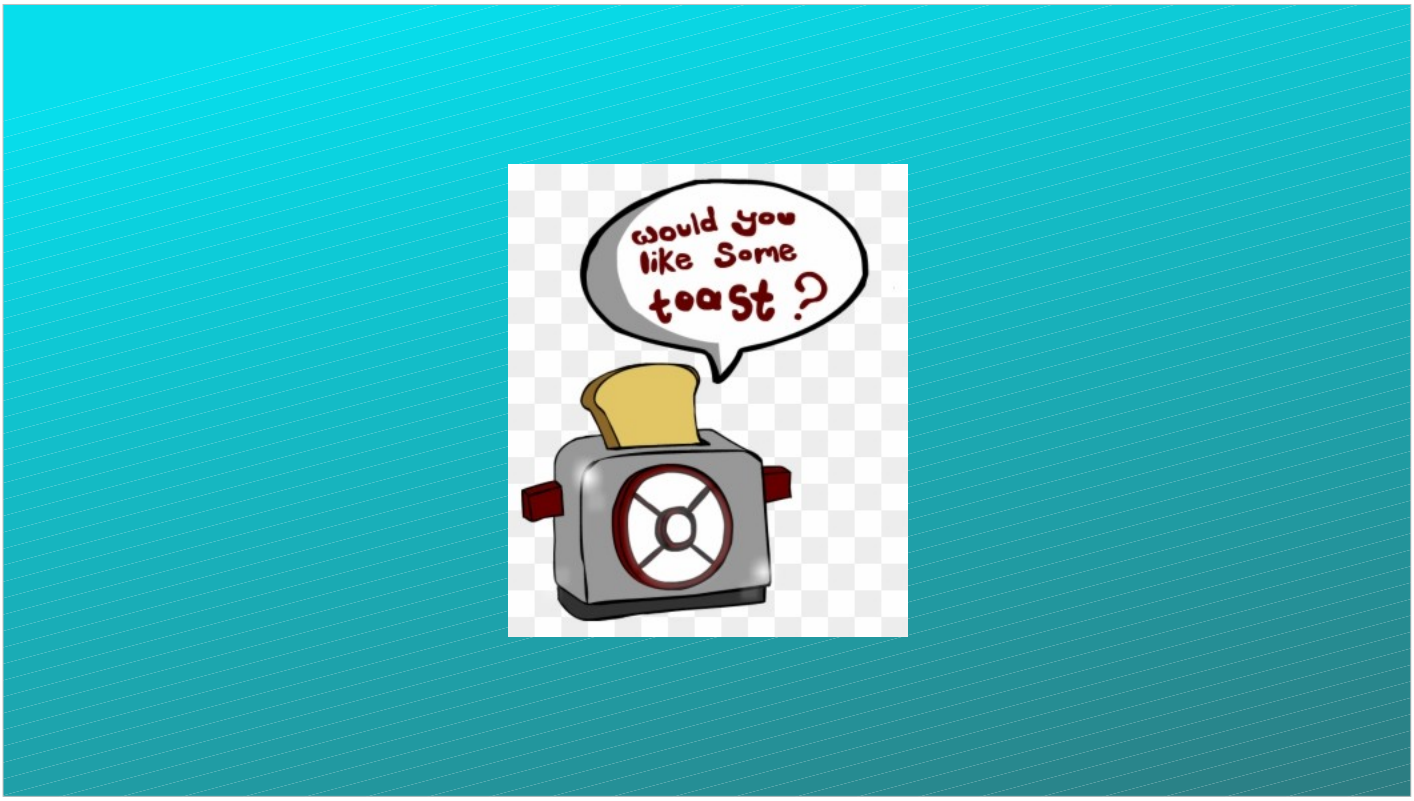
Putting it together

Putting it all together

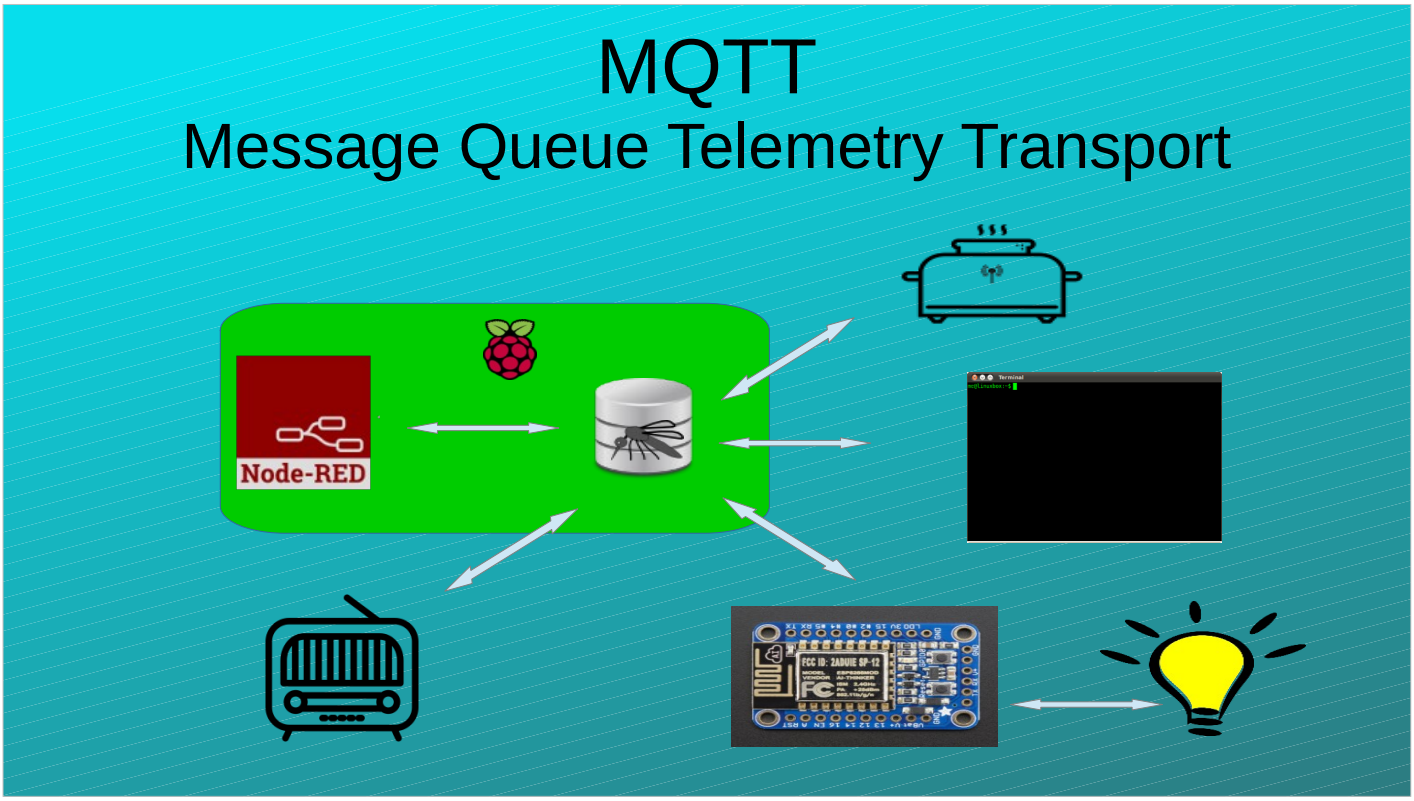
MQTT
Message Queue Telemetry Transport



- Using node-red, MQTT, an ESP32 with Tasmota firmware and a web page I'm able to create automation based on time of day, events like weather prediction or the input from a browser to control lights. I can monitor devices and using node-red display the information as guages or graphs. Or use the information to control devices.
- Because I use MQTT to send the messages (weather, temperature, on/off) and because MQTT allows multiple subscribers and publishes I can manually or programatically use the information in other ways such as shell scripts or other smart home software.
- I currently use Samsung's SmartThings with my node-red flows, shell scripts, Python scripts and Home Assistant to deal with the automation in my home.



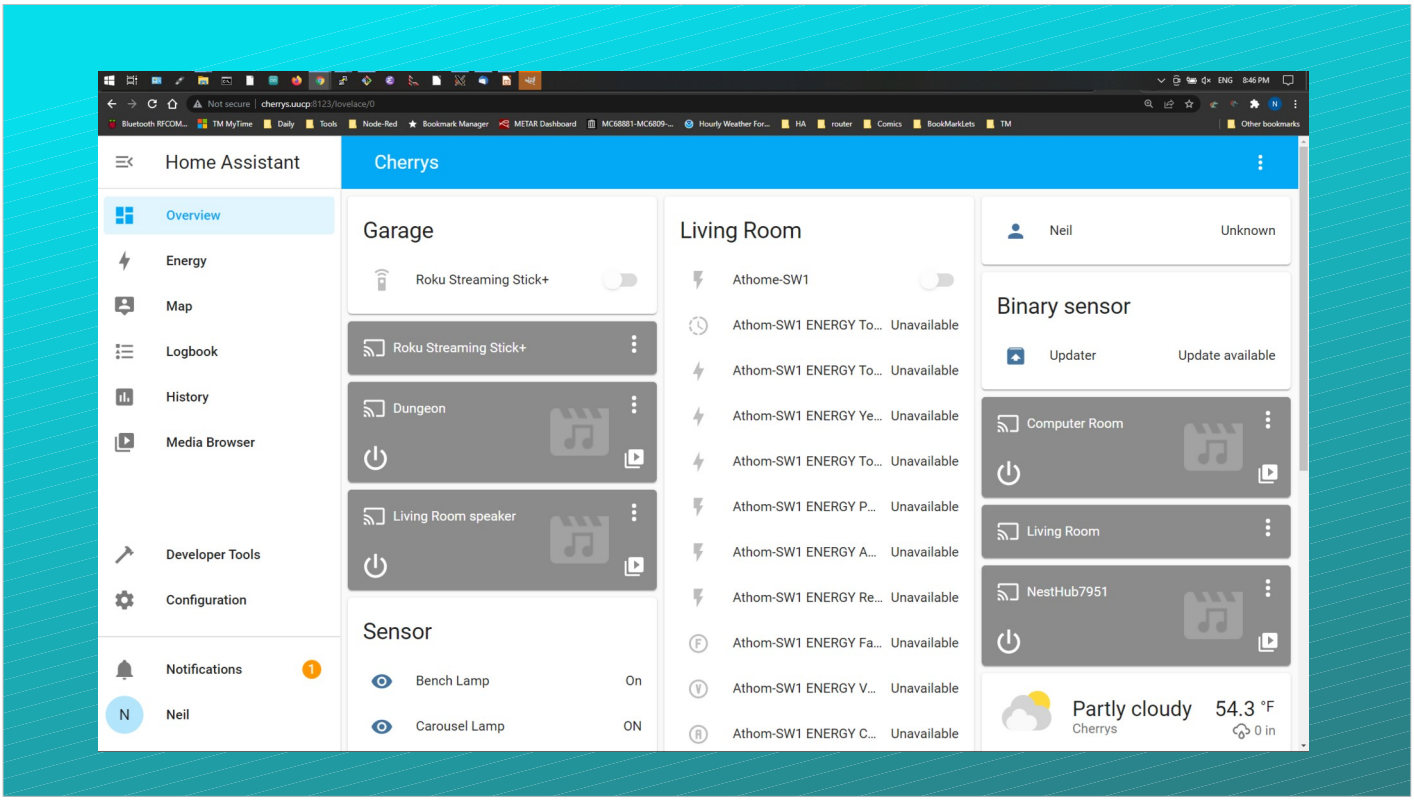
Talkie Toaster from the British TV series Red Dwarf.



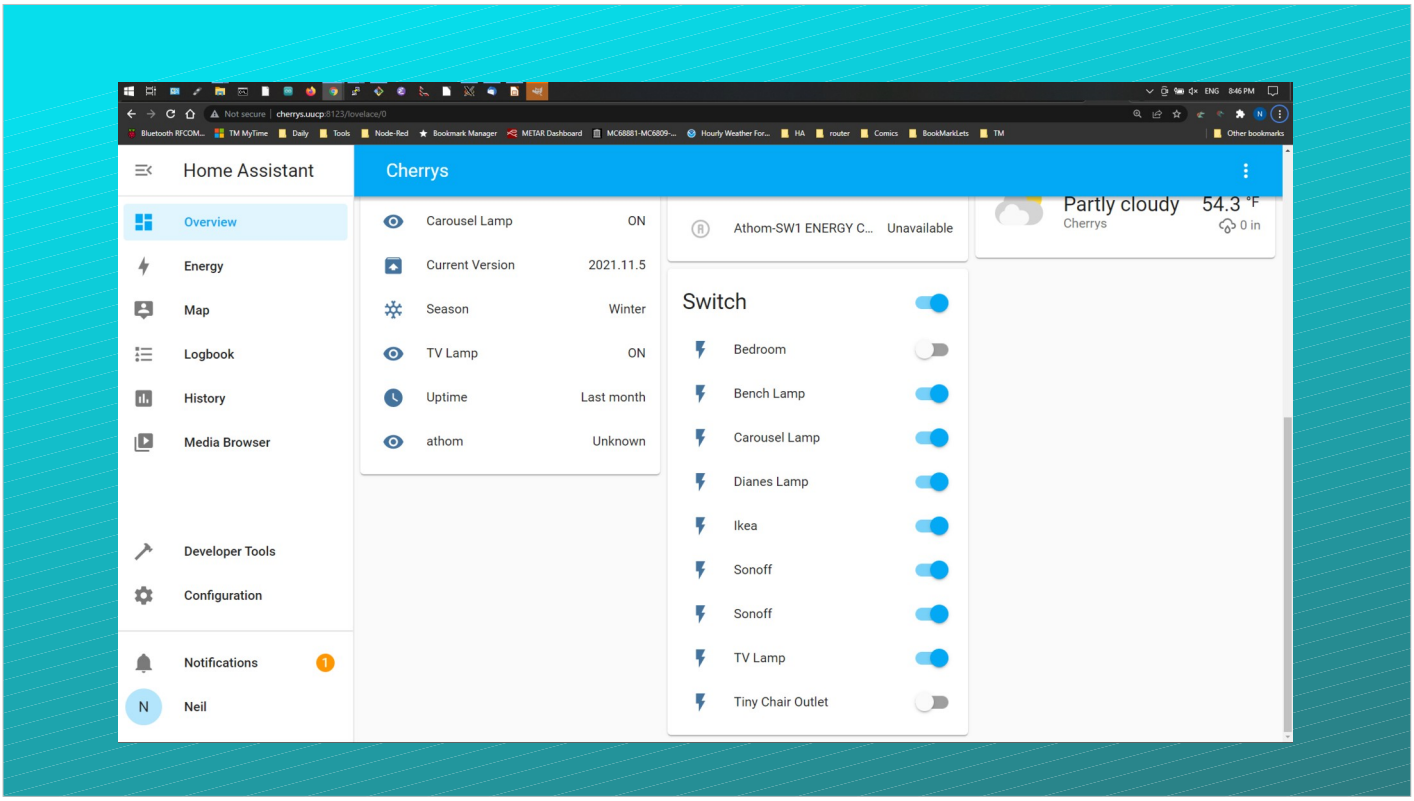
Operation of Talkie Toaster and Talkie Radio

1. Impress (this presentation software) executes a script that tells Node-Red to coordinate the conversation between the toaster and radio using MQTT topics to communicate with the toaster and radio.
2. The radio and toaster have a simple arduino/ESP32 sketch that tells an MP3 what to play. The sketch also listens to a MQTT topic and returns the status to another topic.

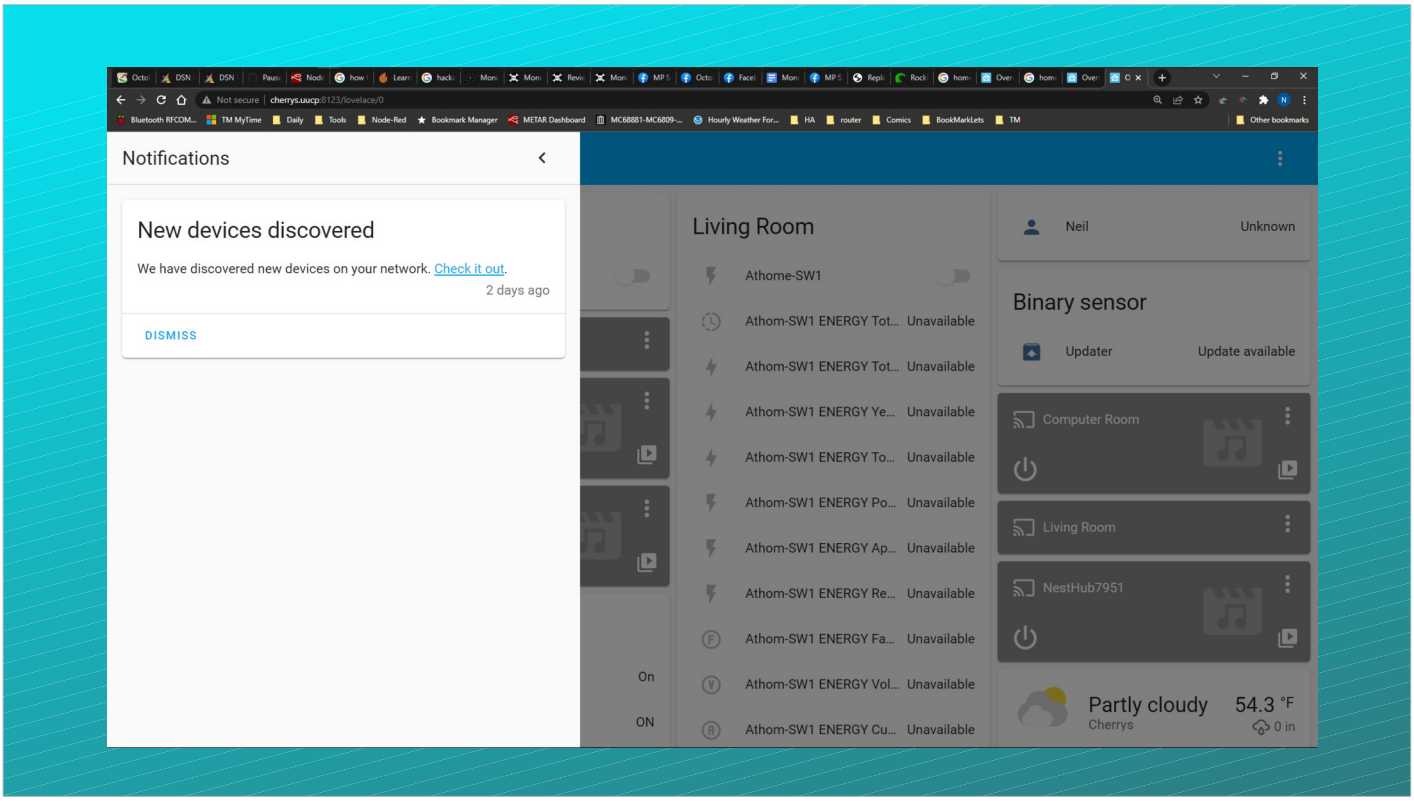
Home Assistant



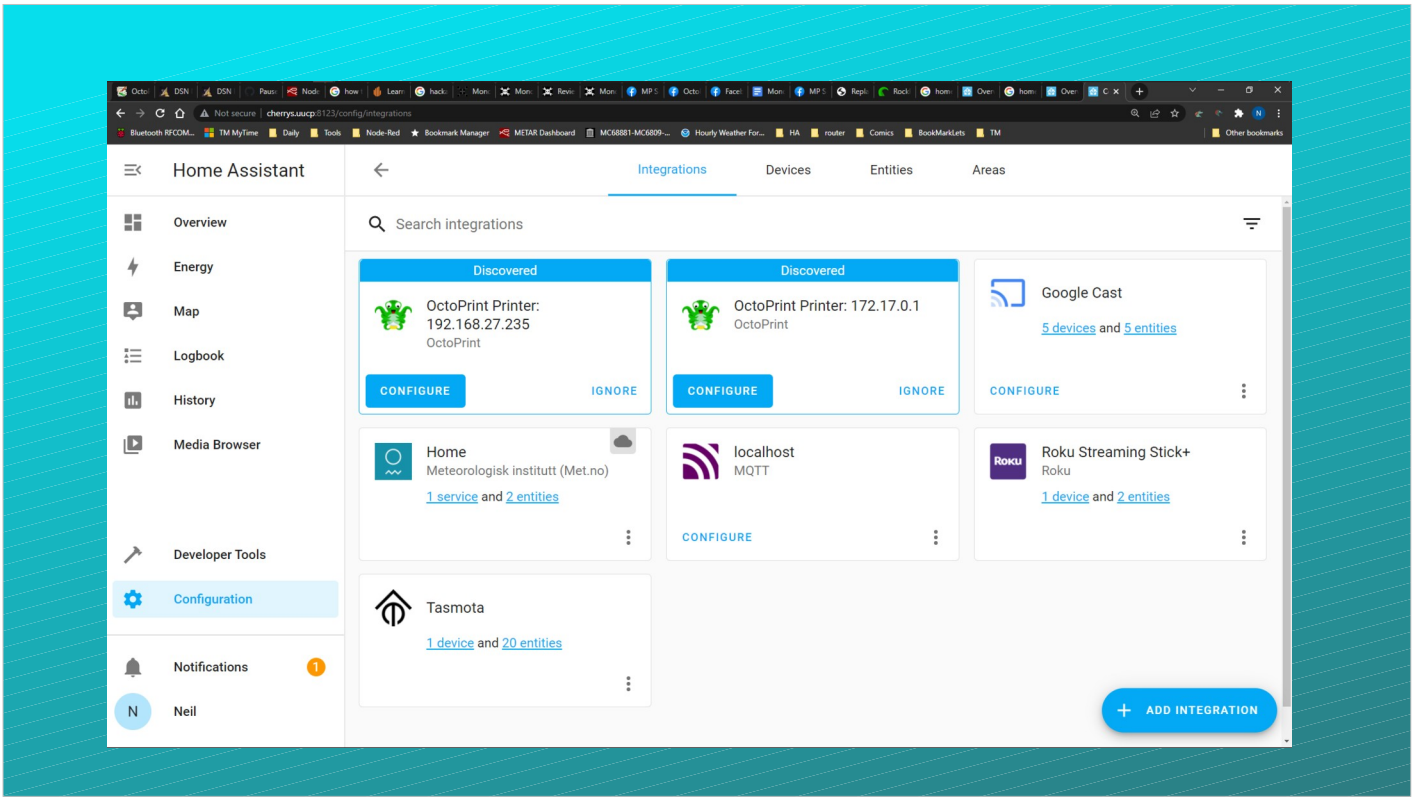
Here's one of the 2 Home Assistant setups I have. I'm still learning how to configure and program HA so I don't have the nice web pages. This is the top part of the page.



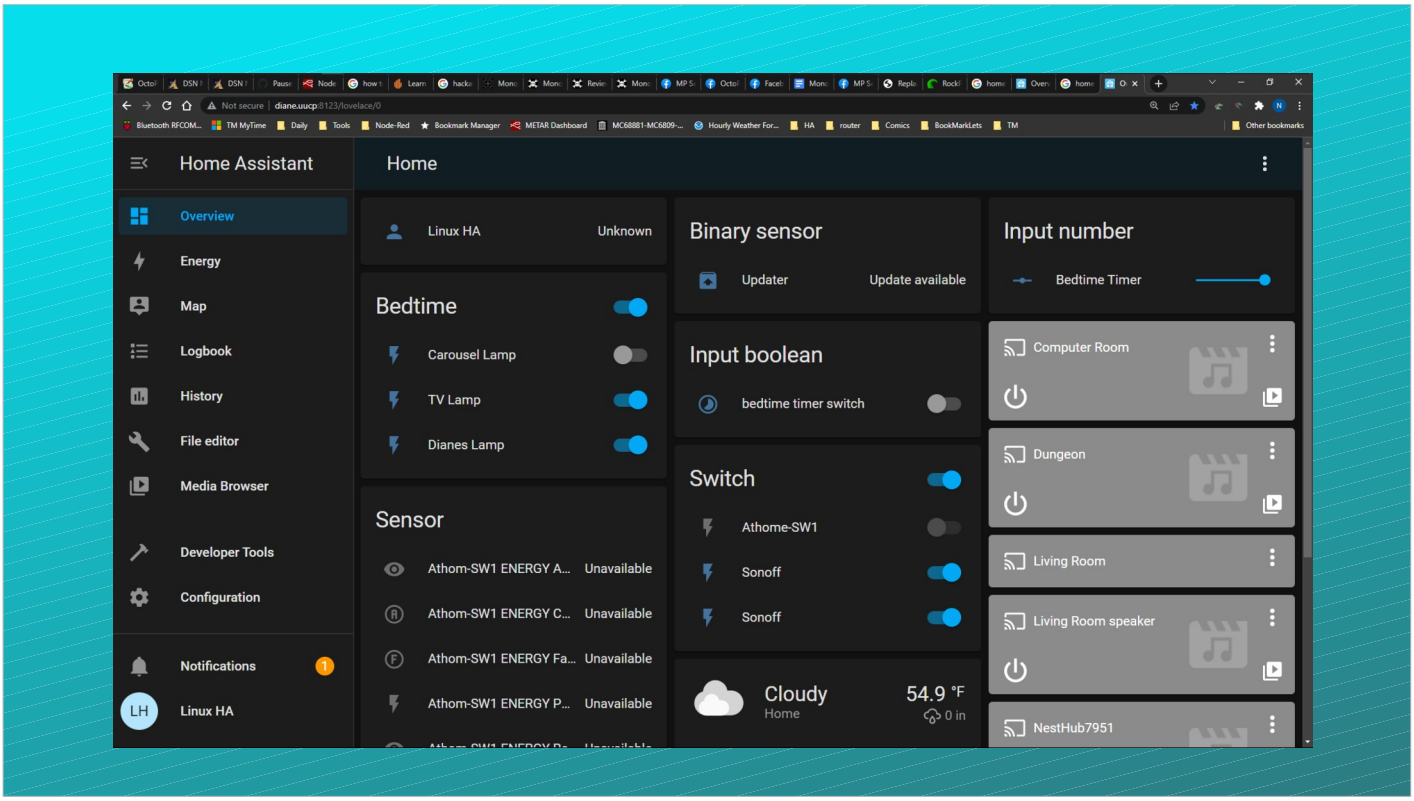
… and this is the bottom. BTW sensors only sense/ Things like switched can be controlled.



Click on the notification and I see that HA has discovered some new devices.

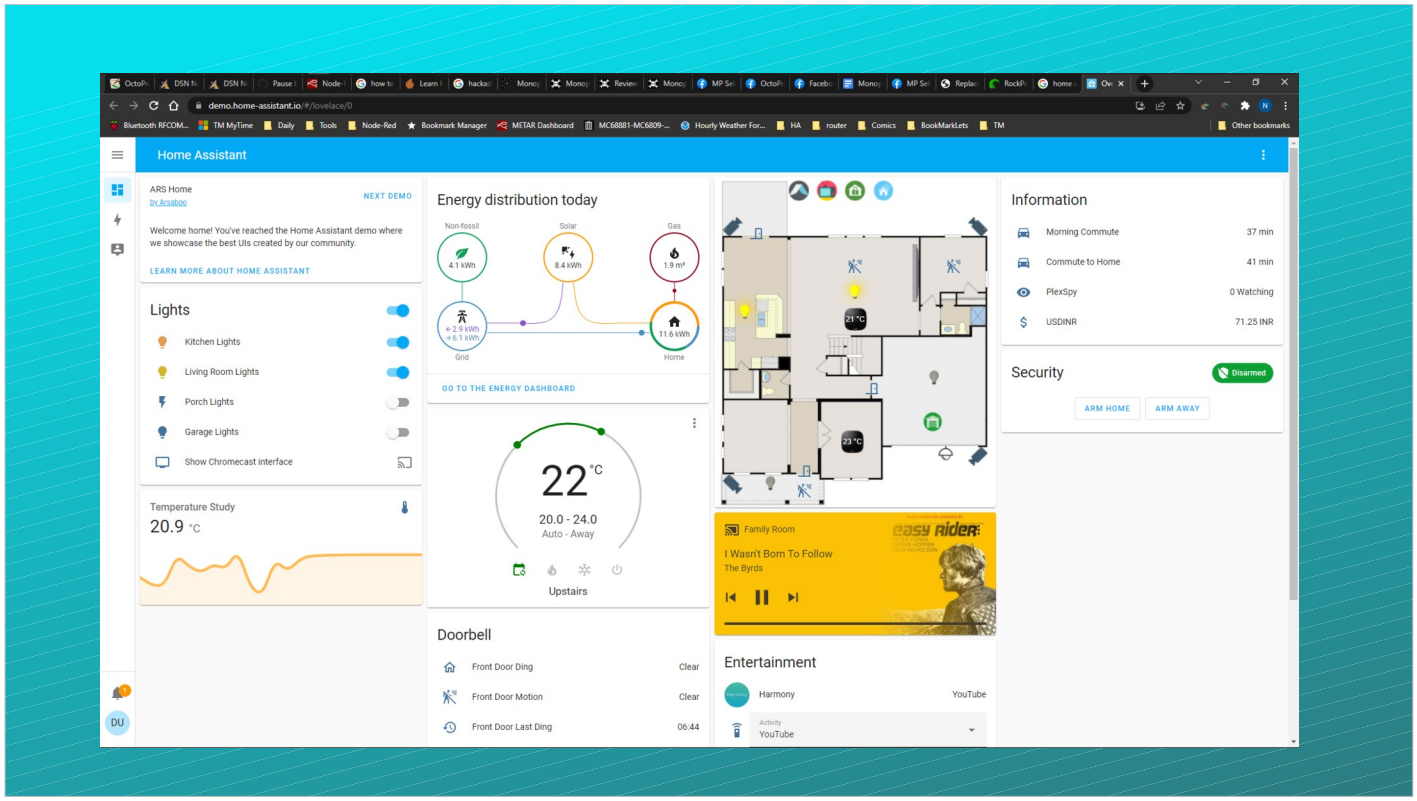


I was a bit surprised to see my 2 Octoprint instances here.



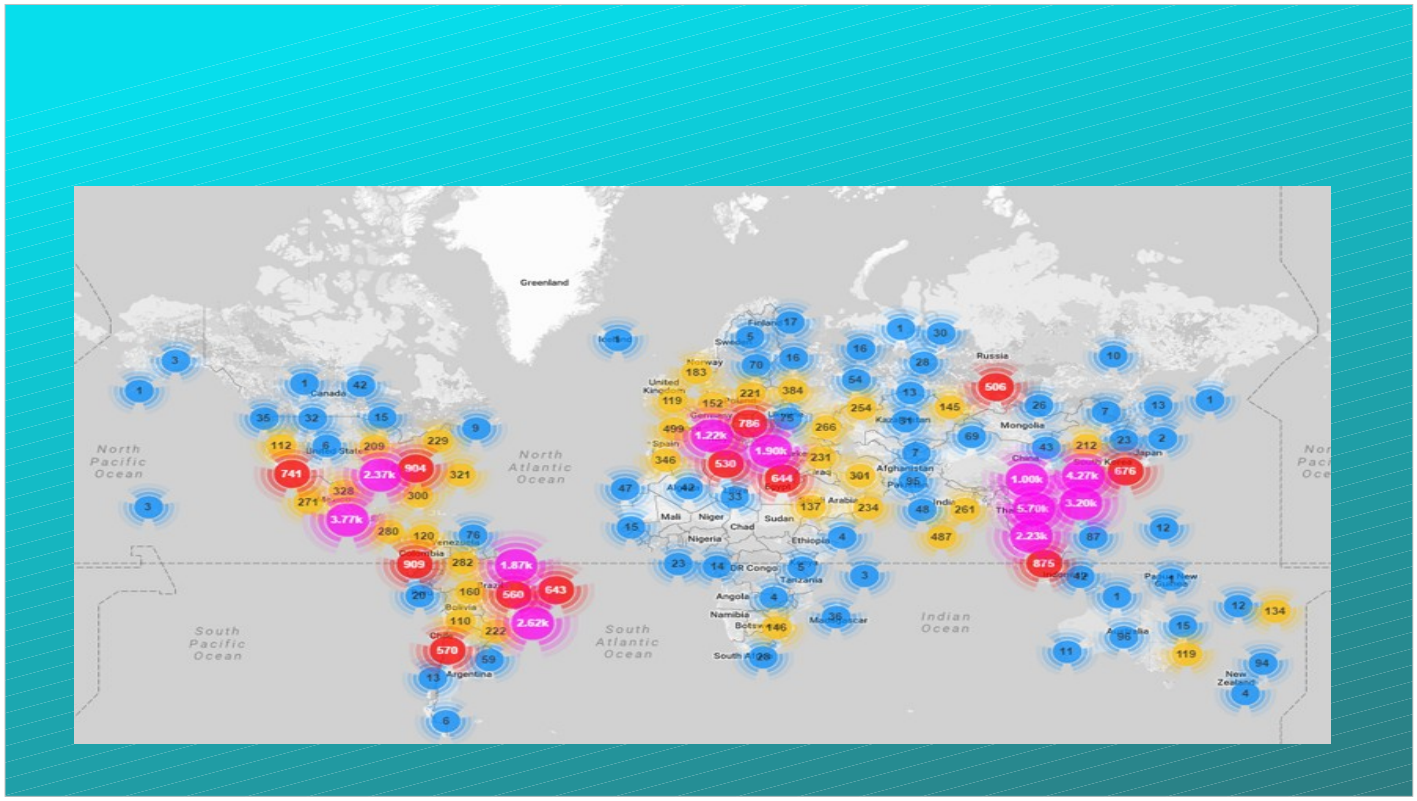
My second instance in dark mode

Someone else’s fancier setup



Another fancier setup

Security



https://www.incapsula.com/blog/malware-analysis-mirai-ddos-botnet.html

In 2016 a bot net was used to DDOS attack Brian Krebs, Security Journalist.

The botnet generated 280Gbps floods.

End of Presentation

AI, ML & Voice Assistants

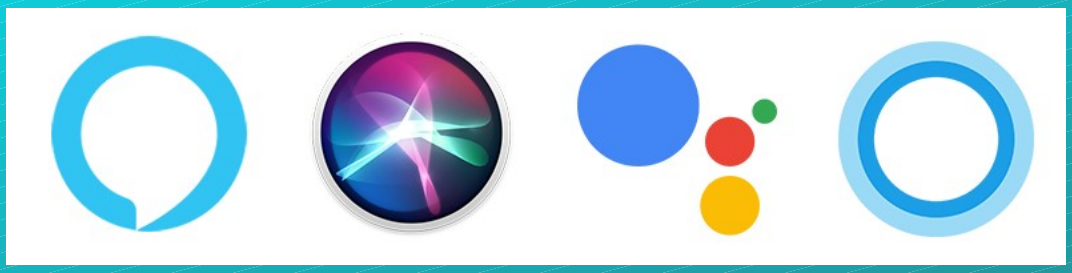
AI, ML & Voice Assitants

Listening
https://xkcd.com/1807/
Sure, you could just ask, but this also takes care of the host gift thing.

https://www.explainxkcd.com/wiki/index.php/1807:_Listening

This comic depicts Cueball and Ponytail welcoming Black Hat and Danish to their house. Black Hat immediately talks to Amazon Alexa to order two tons of creamed corn. This would be quite expensive (around $10,000), and the hosts would be charged because it was ordered on their Amazon Echo device. It would also be a serious inconvenience, as the purchase would be quite bulky and useless, seeing as an average person would have very little use for two tons of creamed corn.

Voice Assistants and TV Dongles



Voice Assistant

- Google Assistant
- Google Home
- Amazon Alexa
- Apple Siri
- Microsoft Cortina
- Integrating it into HA (like on your NR)

Need to find a non-cloud service

Privacy – What does it mean to you and what does it mean to a company?

The Cloud

- VPN/SSH
- Voice Assistants
- IFTTT
- MQTT
- DB (SAS)
- SDN
  - Amazon AWS
  - Azure
  - Google Cloud

VPN/SSH isn't really the cloud but it fits here better

Voice Assistants – Alexa, Google Home, Apple Siri
Not cloud? - ???

IFTT – If This Then That - is a service that allows a user to program a response to events in the world of various kinds

SAS – Software as a Service (Gmail, Web pages,

Cloud Computing

Resource Page

https://ushomeautomation.com/Presentations/ (Presentations)

- ncherry@linuxha.com (email)
- https://linuxha.com/ (my web pages)
- https://ushomeautomation.com/ (my web pages)
- https://compdecon.github.io/ (my Makerspace)
- https://hackspace.raspberrypi.com/ (Hackerspace magazine)
- https://www.hivemq.com/public-mqtt-broker/ (Public MQTT Broker)
- https://www.home-assistant.io/ (Home Assistant)
- https://www.androidpolice.com/matter-explained-what-is-the-next-gen-smart-home-standard/ (Matter)

Resource Page

- https://github.com/arendst/Sonoff-Tasmota
- https://github.com/arendst/Sonoff-Tasmota/wiki
- https://nodered.org/
- https://flows.nodered.org/?num_pages=1