

RESIN.(IO|OS)

NICO MAAS

DLR - EAW SE V - MAY 2018

WHO AM I?

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- @nmaas87

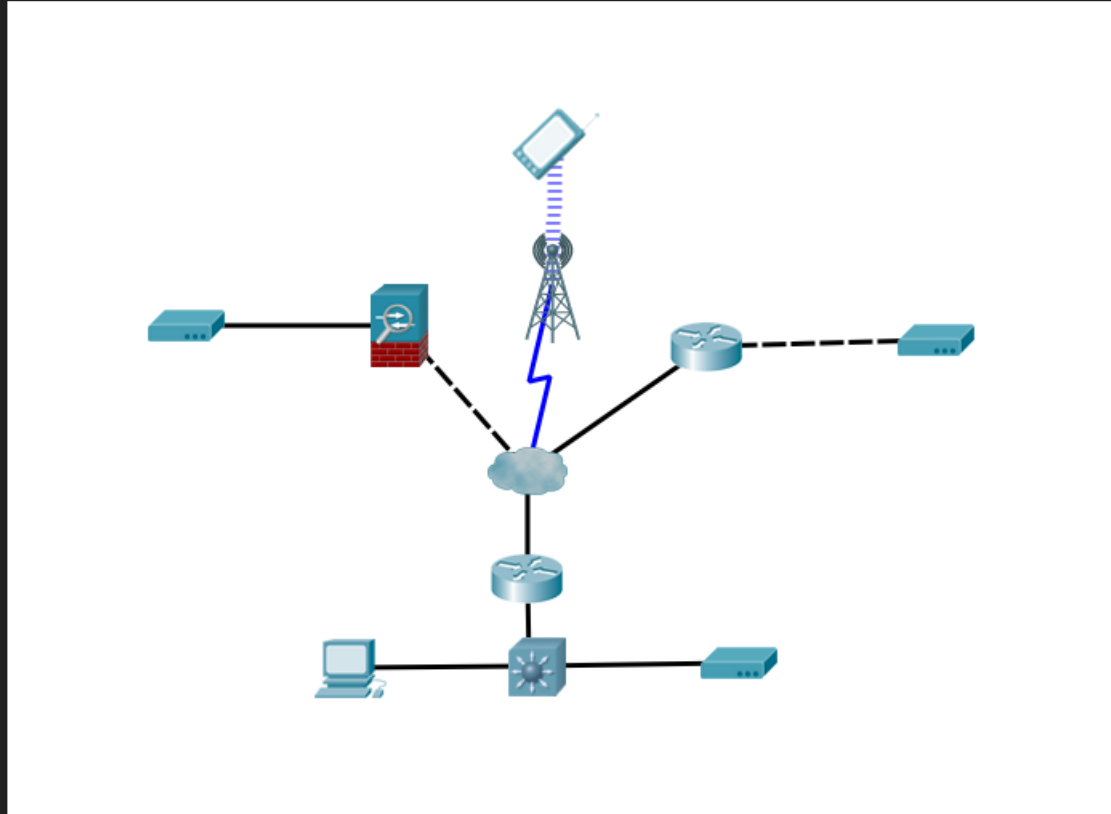
FULL DISCLOSURE

- Docker Campus Ambassador
- resin.io Ambassador
- PiAndMore Speaker / Committee

OVERVIEW

- Introduction: IoT
- Interlude: Docker
- resin ecosystem
- Demo

INTRODUCTION: IOT



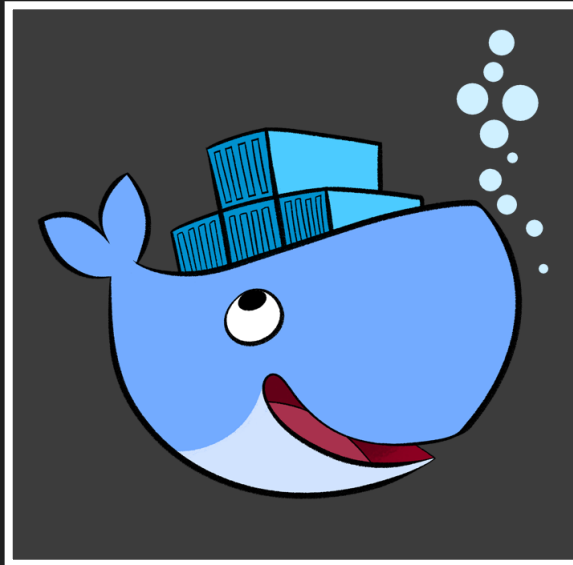
CHALLENGES POSED BY IOT

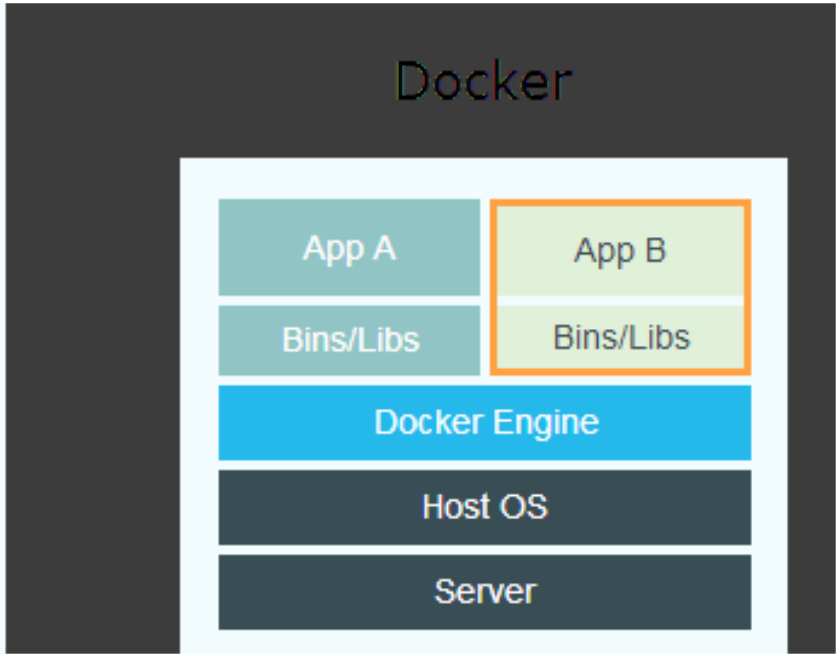
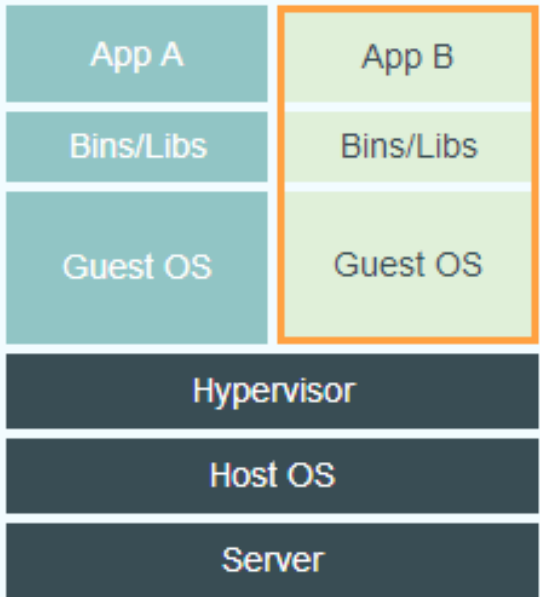
- Secure, reliable, bandwidth efficient updates
- Apps are not allowed to break device
- Sudden powerloss must not corrupt flash
- Device monitoring & logs

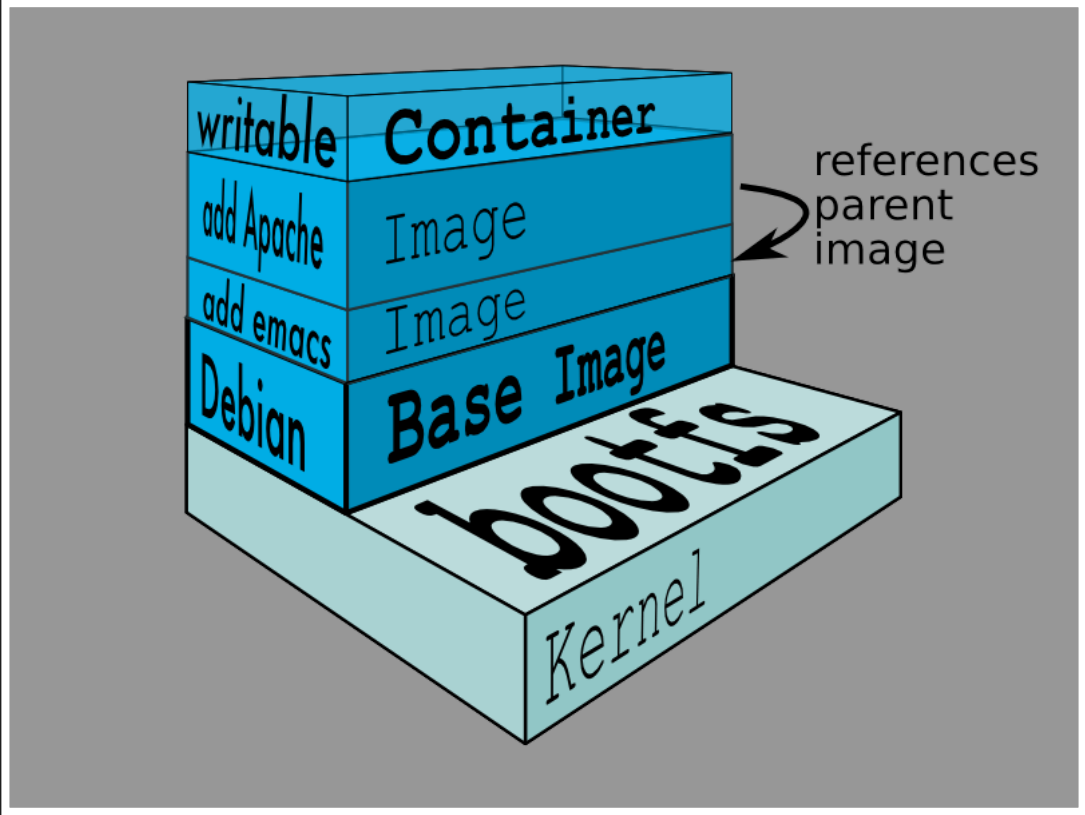
ONE POSSIBLE SOLUTION

resin - the topic of this talk :)










INTERLUDE: DOCKER



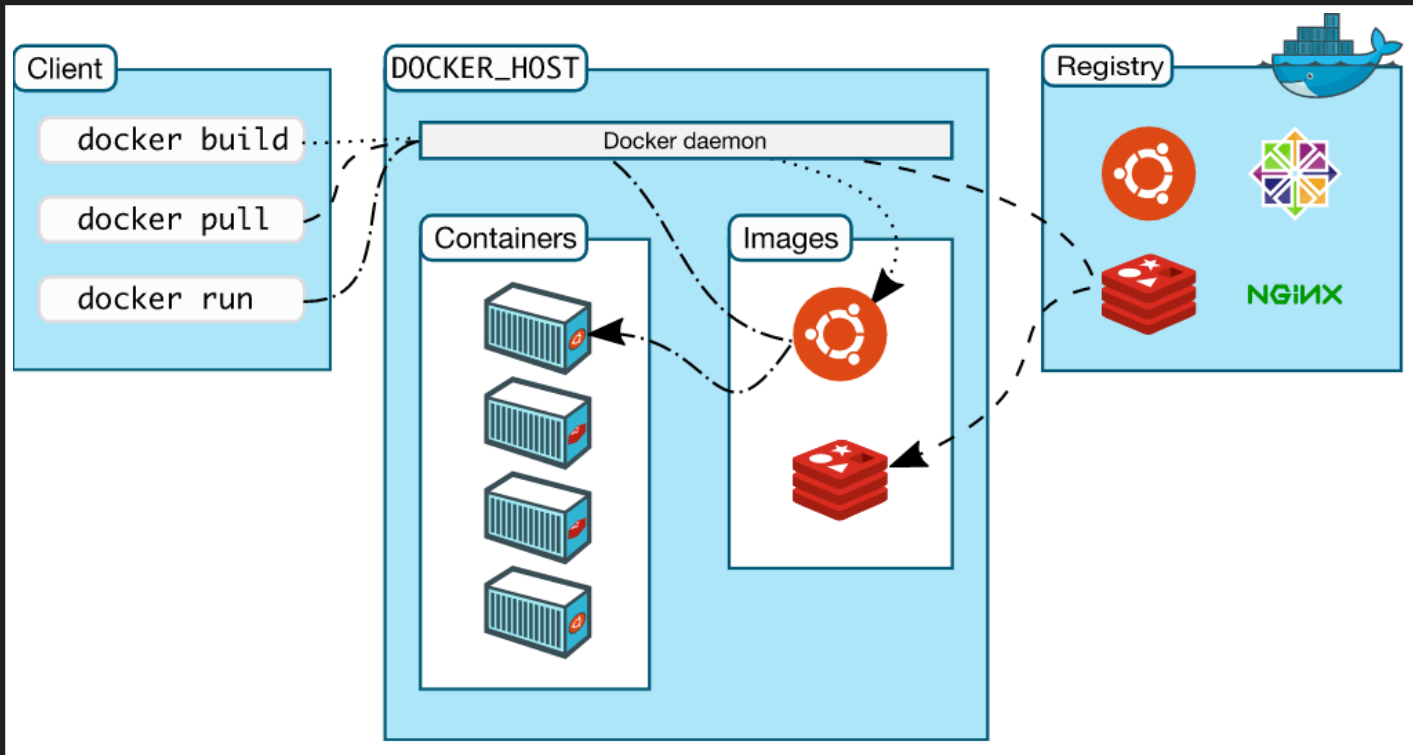




The Matrix of Hell

 Static website	?	?	?	?	?	?	?
 Web frontend	?	?	?	?	?	?	?
 Background workers	?	?	?	?	?	?	?
 User DB	?	?	?	?	?	?	?
 Analytics DB	?	?	?	?	?	?	?
 Queue	?	?	?	?	?	?	?
	Development VM	QA Server	Single Prod Server	Onsite Cluster	Public Cloud	Contributor's laptop	Customer Servers
							







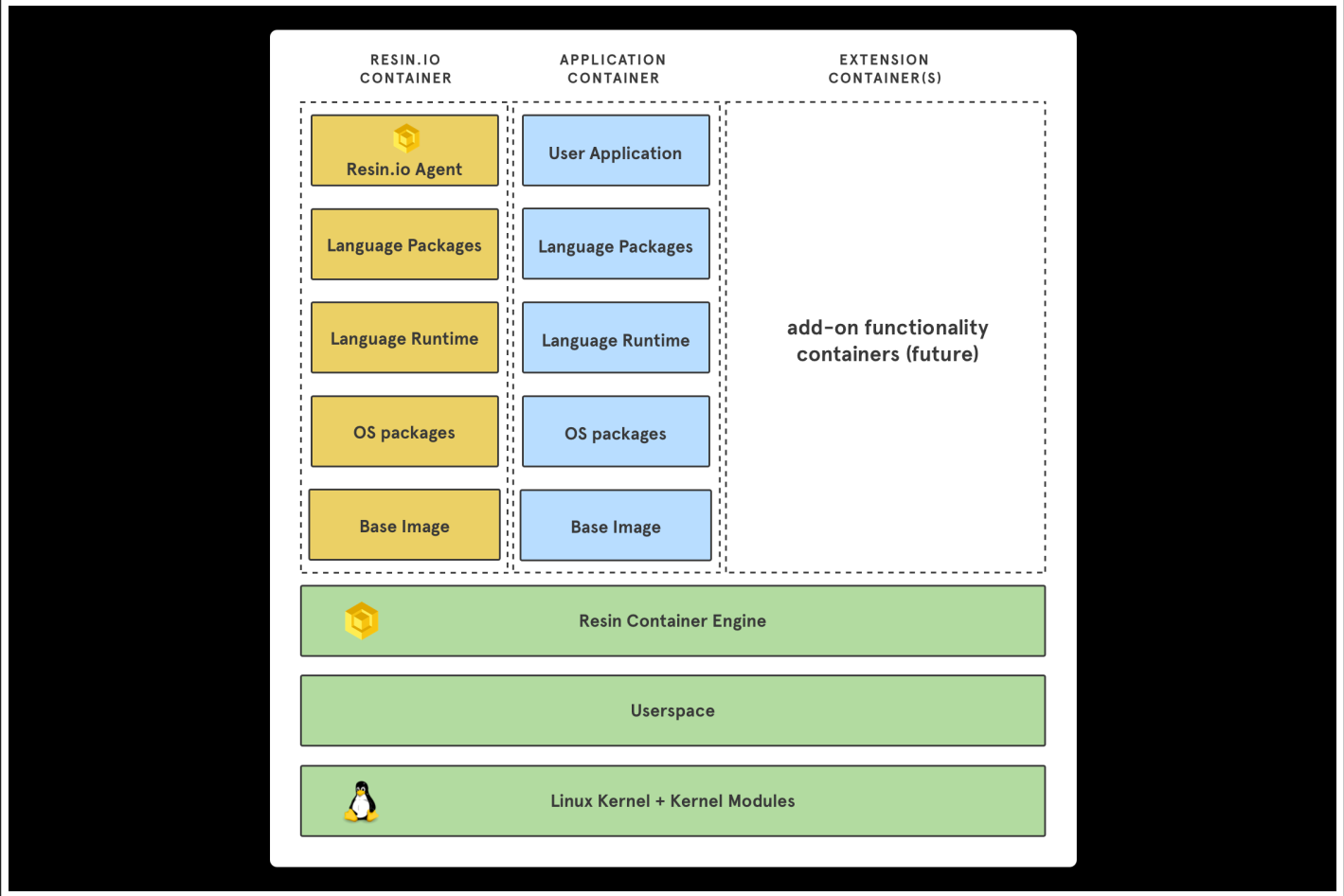
Lets make IOT Infrastructre Boring.

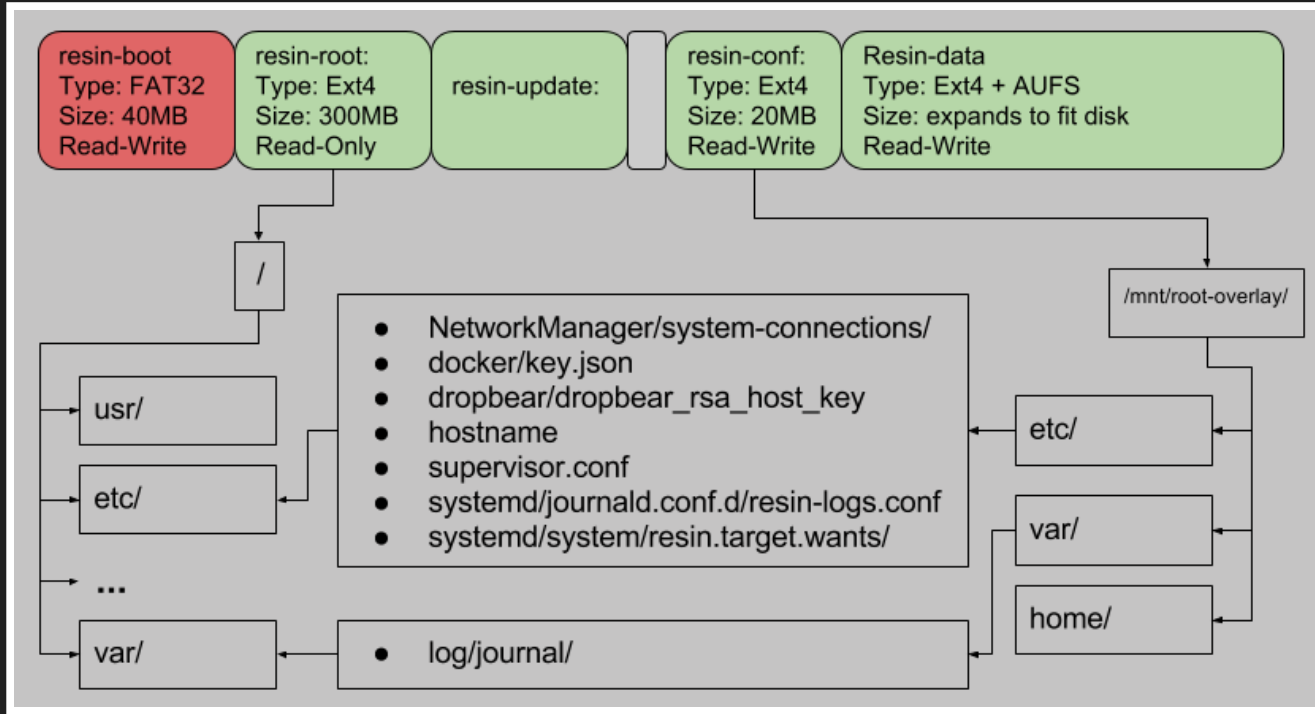
WHAT IS RESIN?

- Hosted IoT Infrastructure Service (resin.io)
- A free IoT Operating System (resinOS)
- A free Container Engine (balena)



Docker containers on embedded devices







A Moby-based container engine for IoT

OVERVIEW

- 3.5x smaller than Docker CE, single binary
- Multi-arch support / IoT devices
- Bandwidth-efficient updates / binary diffs: 10-70x smaller than pulling layers
- Minimal wear-and-tear: extract layers at receive to prevent excessive writing to disk
- Atomic and durable image pulls defend against partial container pulls in the event of power failure
- Conservative memory use: i.e. no plugins, swarm, etc.

AVAILABLE ON...

aarch64, armv5, armv6, arvm7...

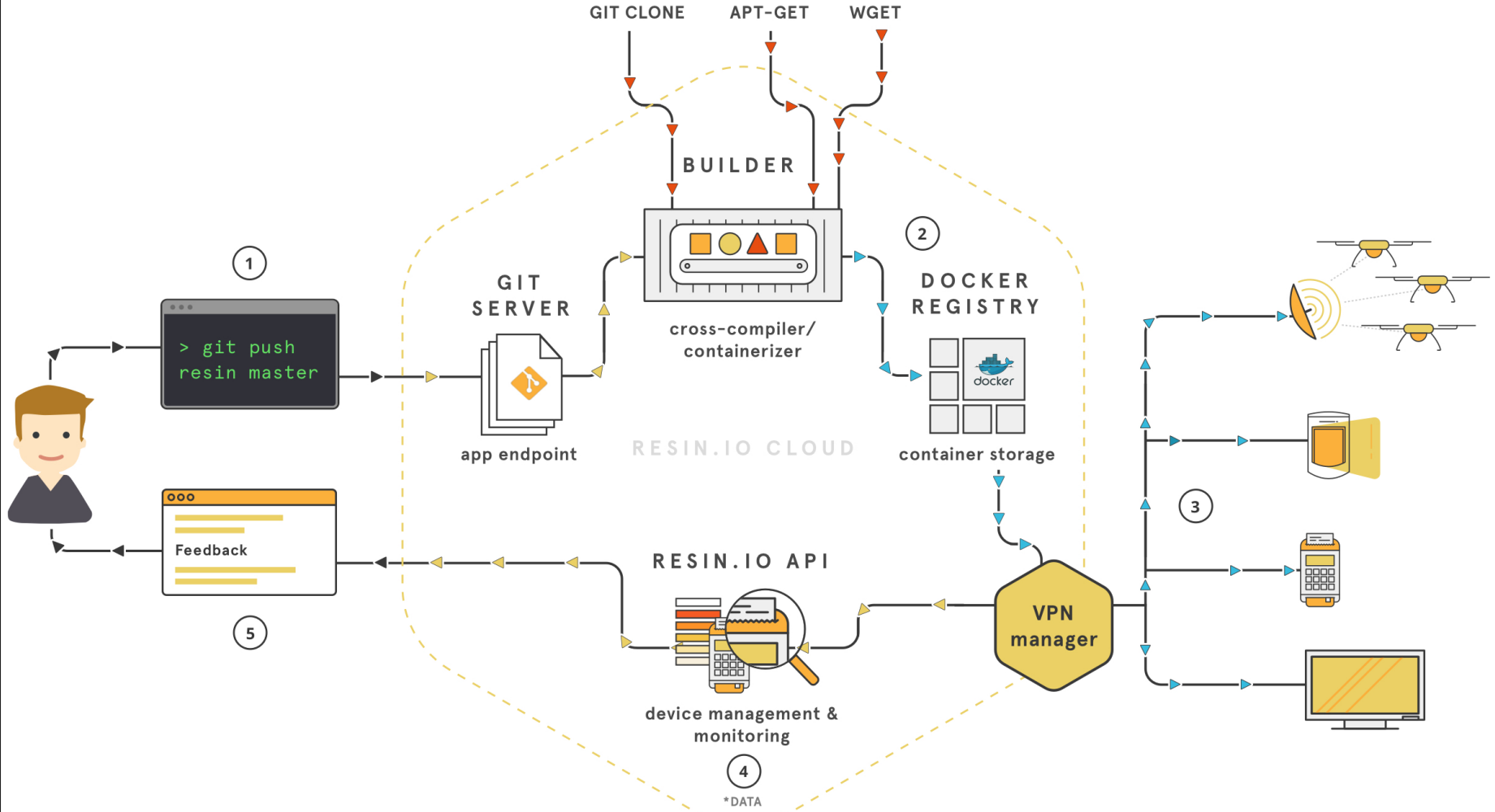
i386 & x86_64 :)

```
curl -sfL https://balena.io/install.sh | sh
```



This time for real ;)

DEPENDENCIES



SUMMARY

DEVICE CONFIGURATION

DEVICE VARIABLES

DEVICE SERVICE VARIABLES

LOCATION

ACTIONS

DEVICE **old-silence** Reboot Restart Lightbulb Dropdown

STATUS **Offline** **UUID** 14e474b

LAST ONLINE 4 days ago **HOST OS VERSION** Resin OS 2.12.5+rev2 (dev) **SUPERVISOR VERSION** 7.1.18

COMMIT 14e474b **IP ADDRESS** 192.168.192.168 **PUBLIC DEVICE URL**

NOTES

SERVICES

Service	Last known status	Commit	
led	Running	14e474b	▶ ■ ↻ 📄
logic-counter	Running	14e474b	▶ ■ ↻ 📄
button	Running	14e474b	▶ ■ ↻ 📄
mqtt	Running	14e474b	▶ ■ ↻ 📄

Logs UTC Timestamps 👤 🗑️ 🔗

▼ Add filter 👁 Views

No logs yet

Terminal 🔗

The terminal is disabled because your device is offline



dockercon 16

Resin Dashboard: [STAGING] resin.io

Applications > dockercon2016 > dark-paper

Device Name: dark-paper

Device Summary

Environment Variables

Device Configuration

Terminal

Location

Actions

Download Device OS

STATUS: Online

GAME ONLINE: 15 minutes ago

SSID: 4b827a9

COMMIT: 42f3ce6

IP ADDRESS: 192.168.1.1

HOST OS VERSION: Resin OS 1.2.0

SUPERVISOR VERSION: 1.11.3

VPN ADDRESS: 4b827a9

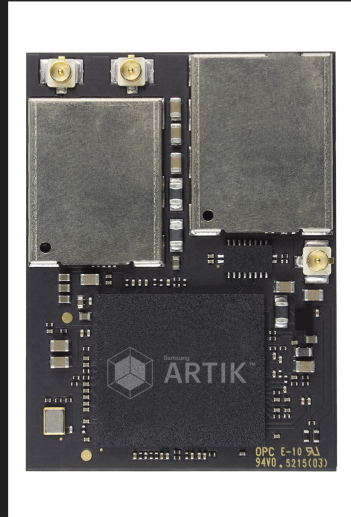
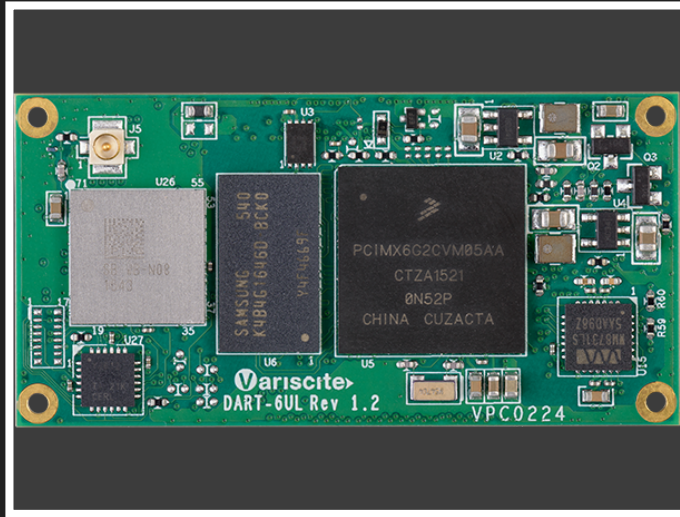
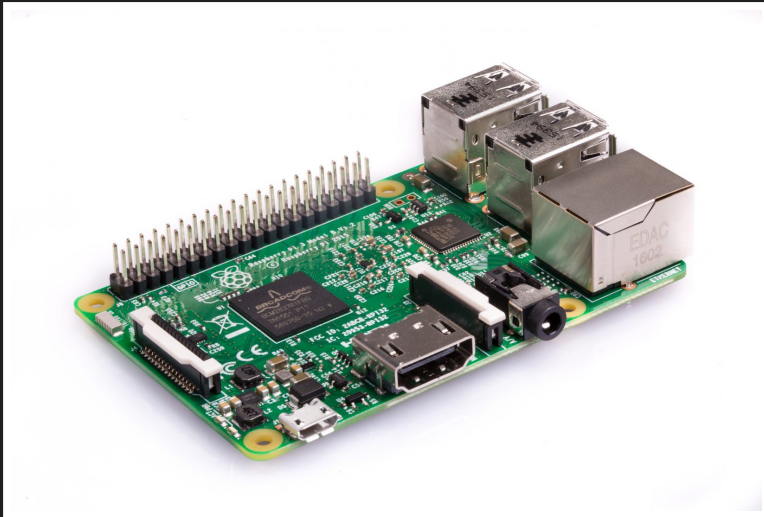
Logs

```
21.06.16 17:26:36 [ 0/0] Downloading application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:26:43 [ 0/0] sending xzpg header
21.06.16 17:26:57 [ 0/0] Downloaded application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:26:58 [ 0/0] Installing application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:26:59 [ 0/0] Installed application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:26:59 [ 0/0] Starting application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:27:00 [ 0/0] Started application
'registry.resinstaging.io/dockercon2016/42f3ce61f491
190c1MaB05617c44950e09380'
21.06.16 17:27:00 [ 0/0] forwardpubsub: Initialize
module
21.06.16 17:27:00 [ 0/0] Killing application
'registry.resinstaging.io/dockercon2016/w/23c40863605
63066e6c6d8c9b0f1773139'
21.06.16 17:27:00 [ 0/0] forwardpubsub: Module
Uninitialized
21.06.16 17:27:00 [ 0/0] forwardpubsub: Started
module
21.06.16 17:27:00 [ 0/0] sending xzpg header
21.06.16 17:27:00 [ 0/0]
21.06.16 17:27:01 [ 0/0] Killing application
'registry.resinstaging.io/dockercon2016/w/23c40863605
63066e6c6d8c9b0f1773139'
```

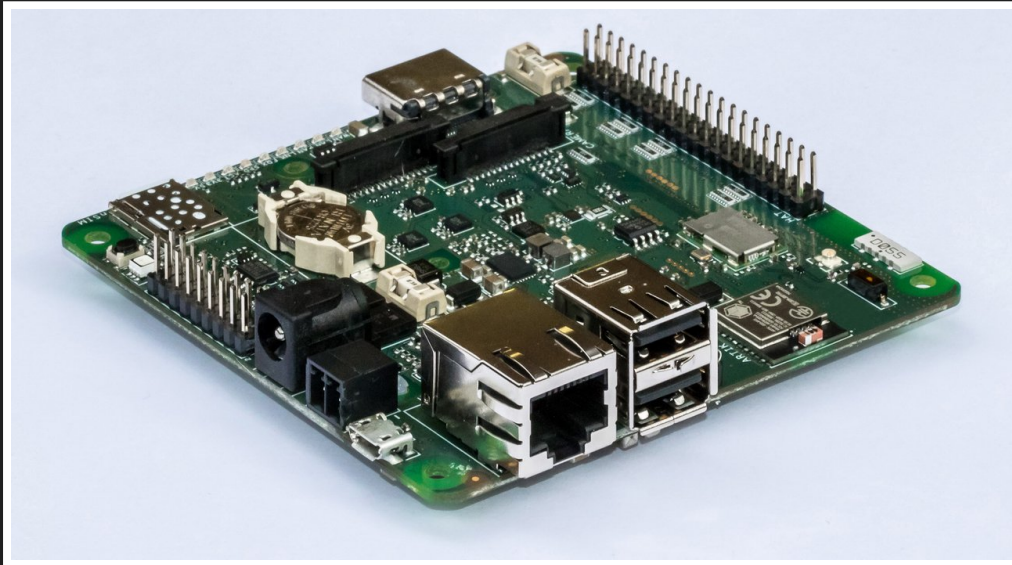
Drone Control Panel

Gyroscope

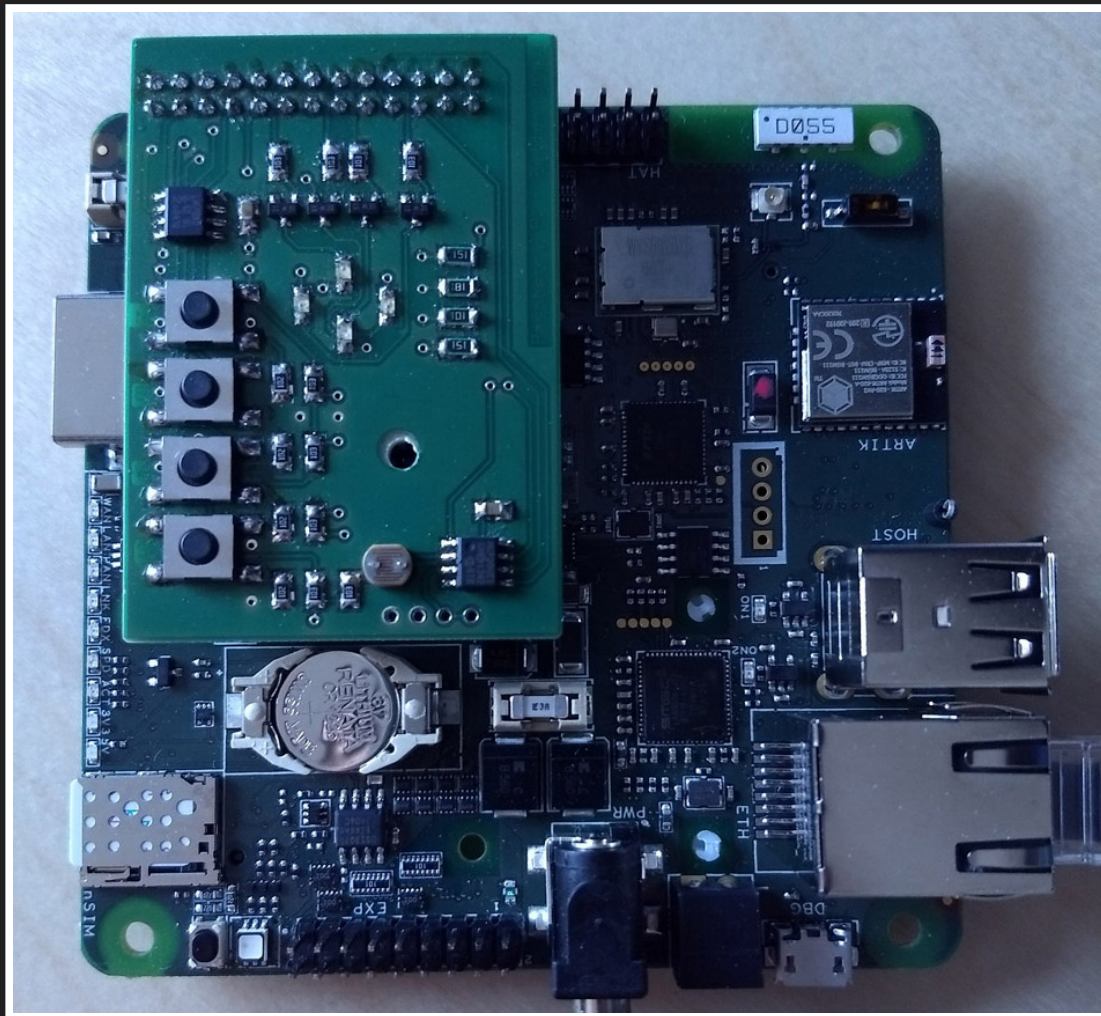
Thermal Camera



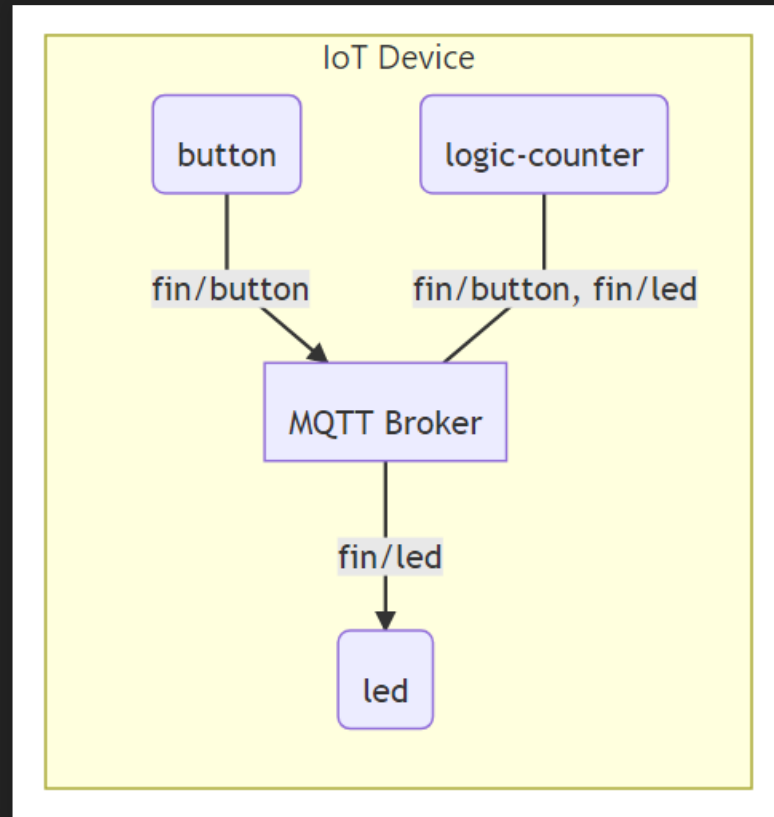
FIN



DEMO

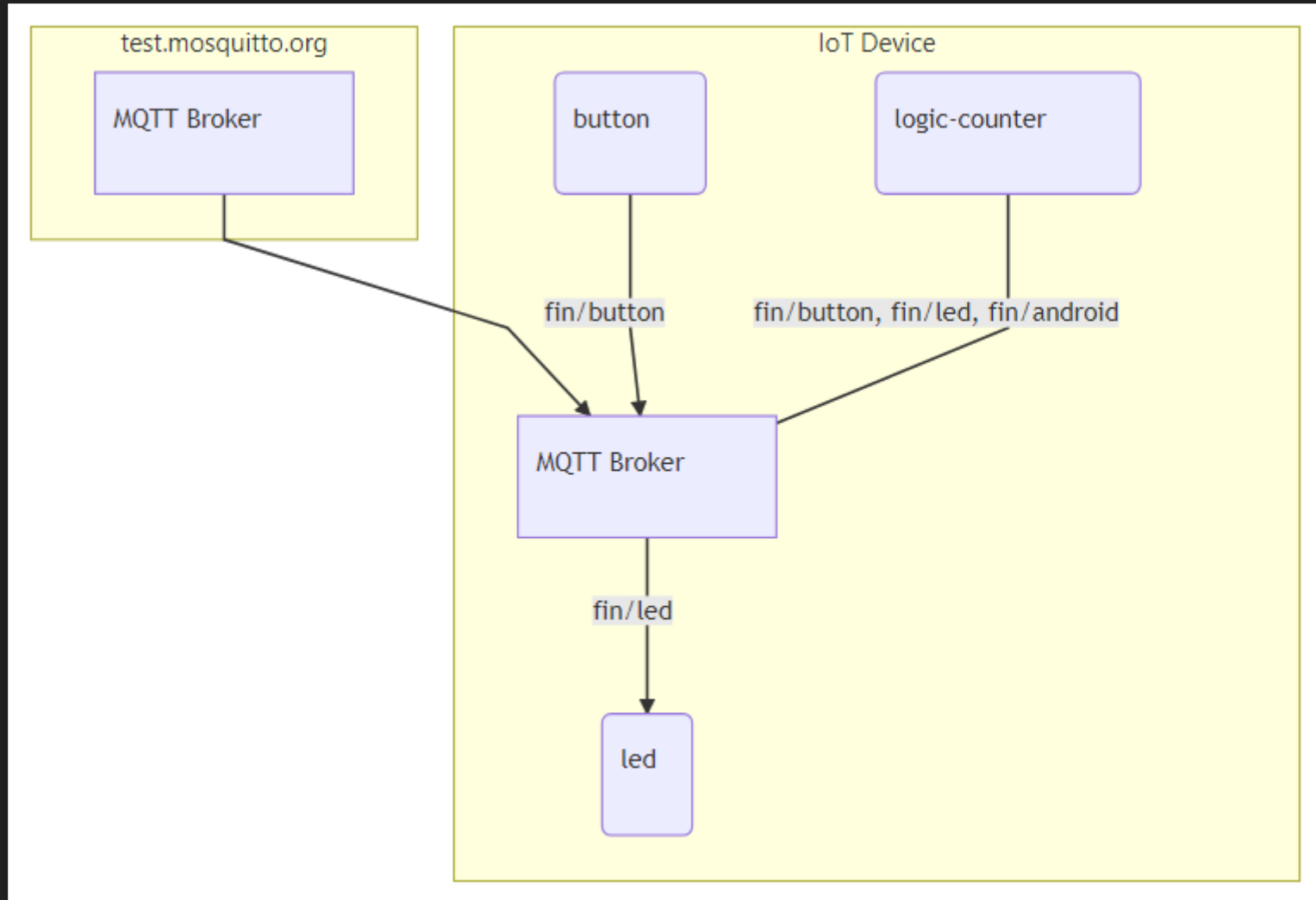


MICROSERVICES



with docker-compose :)

MICROSERVICES & BRIDGE



WRAP-UP TIME

- resin.io
- resinOS
- balena

QUESTIONS?

Thank you for your attention :)

www.resin.io

www.resinos.io

www.balena.io

www.nico-maas.de