

MING - An open-source LAMP-like stack for the IoT and the Edge

Eclipse Virtual IoT Edge Days 2023 - 16th of May 2023

How did you learn programming?

AMSTRAD CPC 6128



USER INSTRUCTIONS

Did you use any
framework or stack to
reduce friction?



Coined in 1998

Why LAMP succeeded?



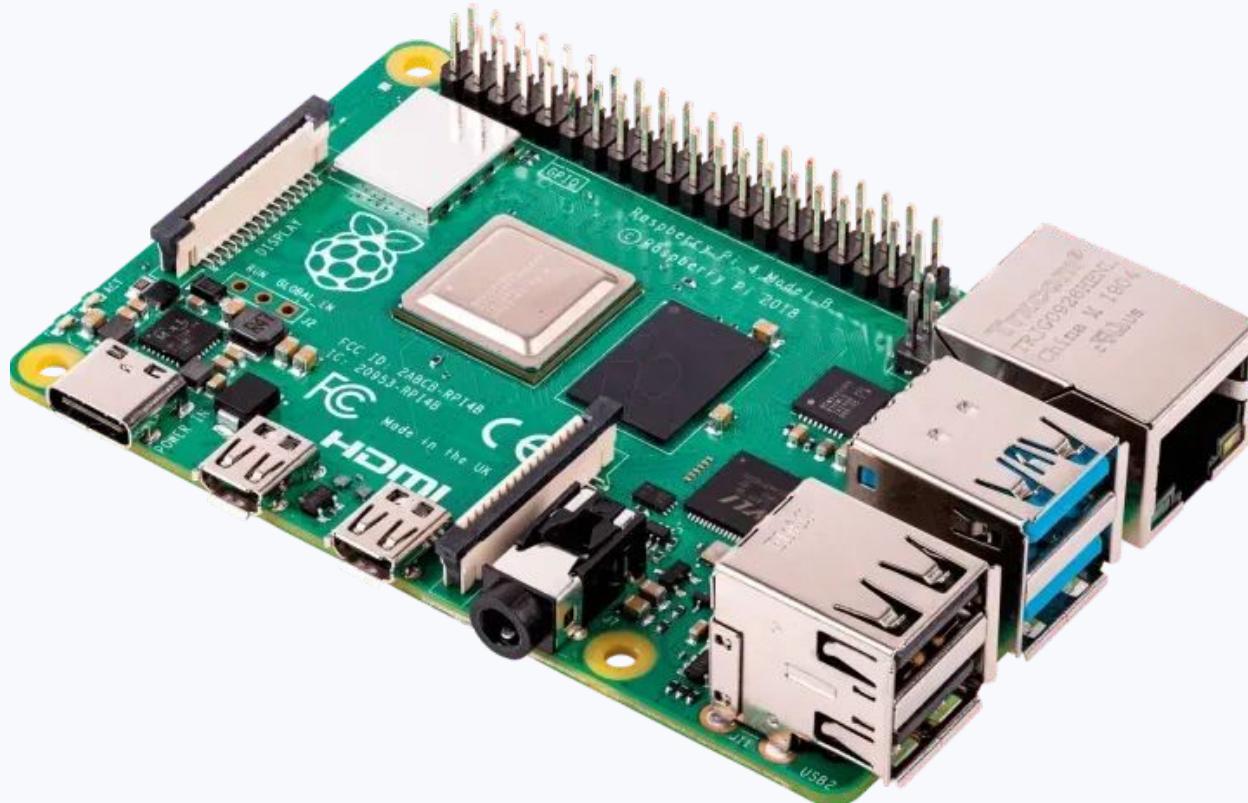
Why LAMP succeeded?

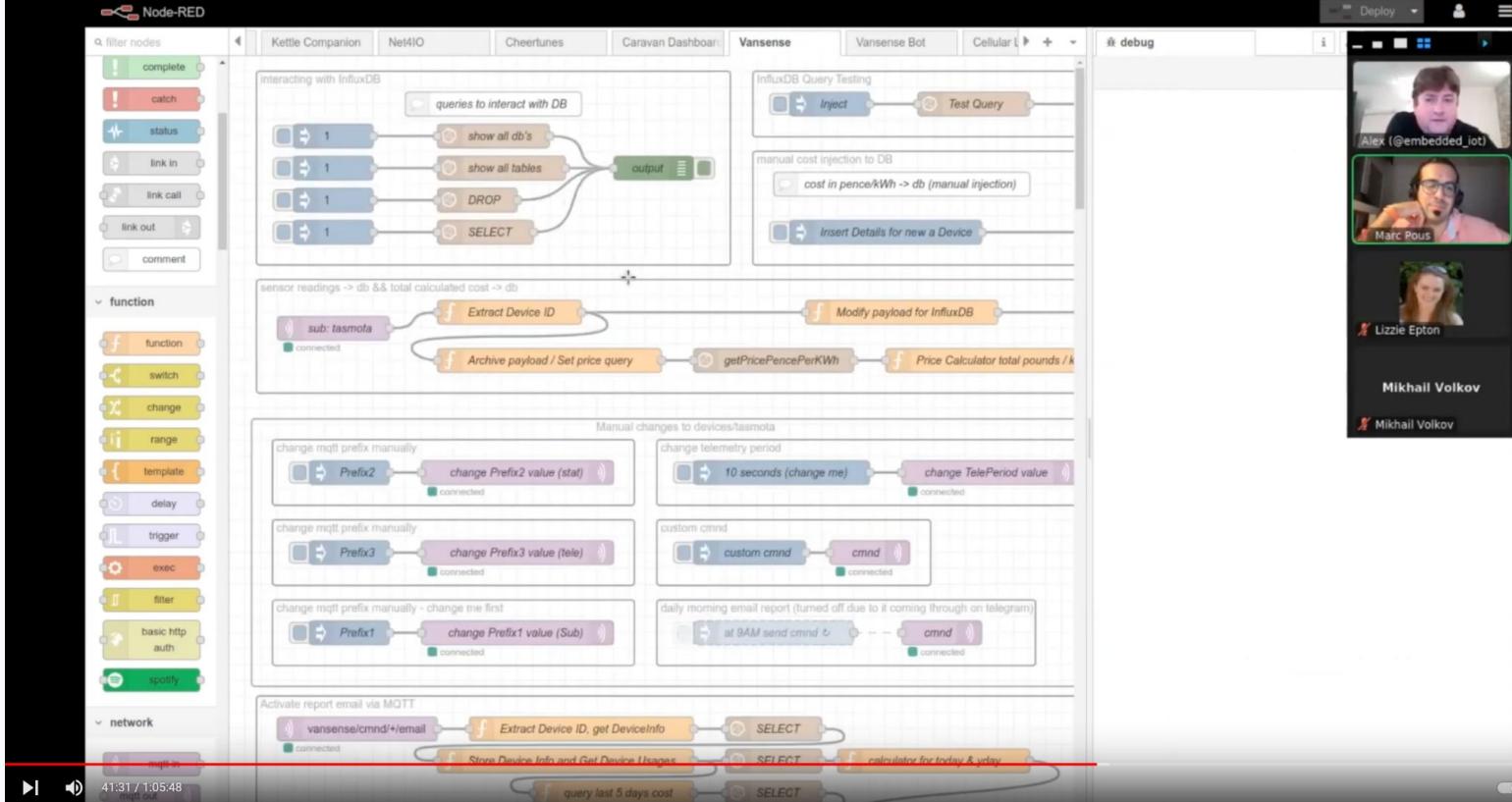
- Reduced the friction to developers
- Open-source and free
- Flexible and scalable
- Wide community support



What can we do for the
IoT and Edge?

What does a developer
need to run a LAMP-like
stack for the IoT and Edge?





MING



Mosquitto InfluxDB NodeRED Grafana

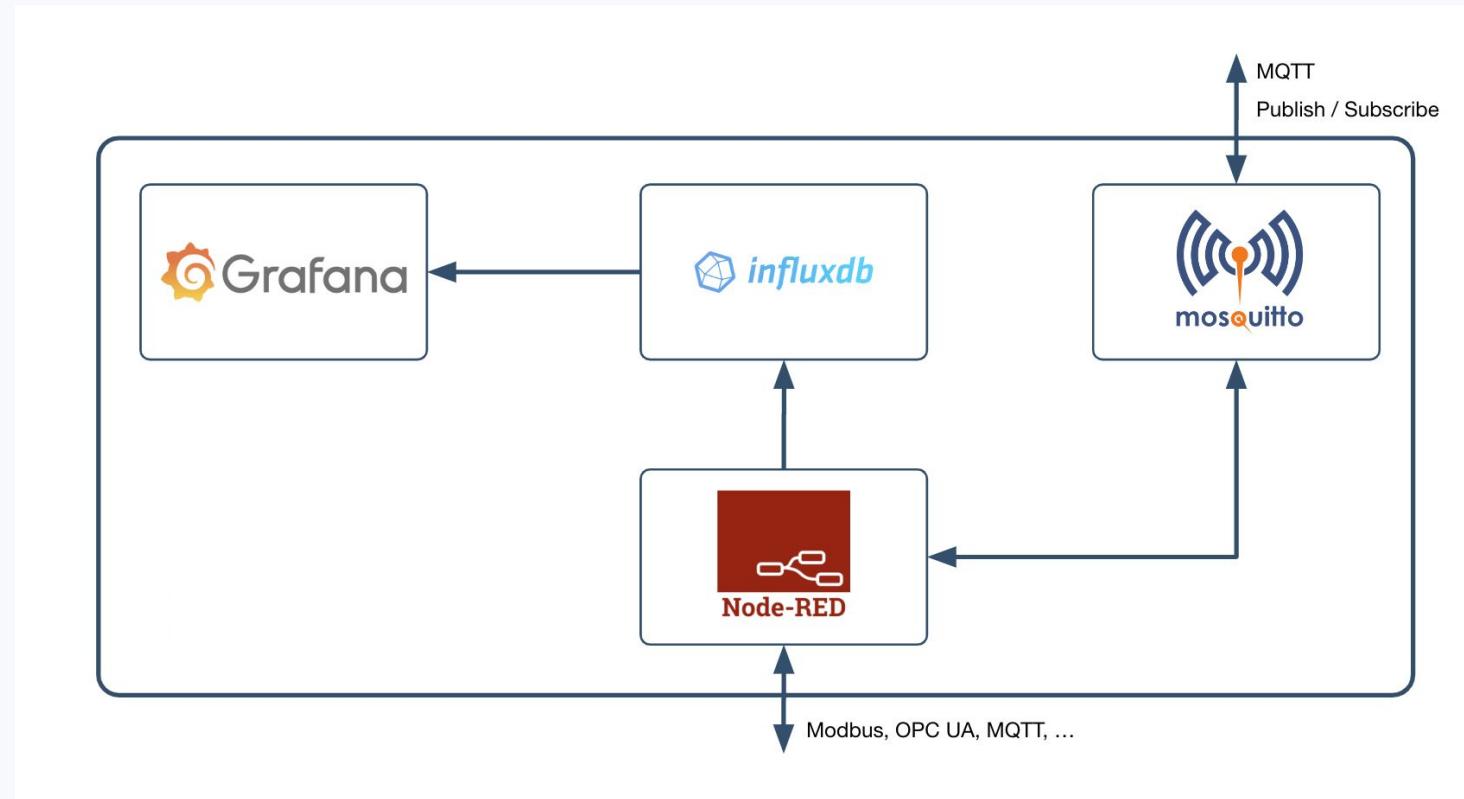
DATA COMMUNICATION

DATA STORAGE

DATA PROCESSING / ACQUISITION

DATA VISUALIZATION

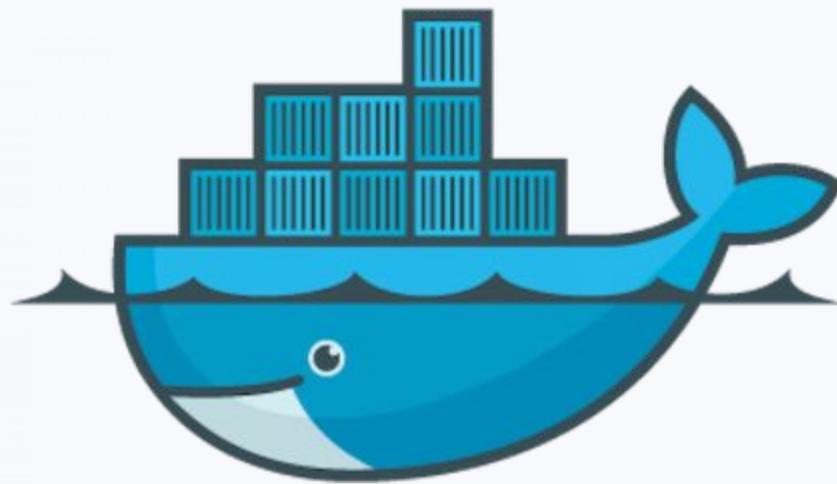
Architecture



How can I get started?

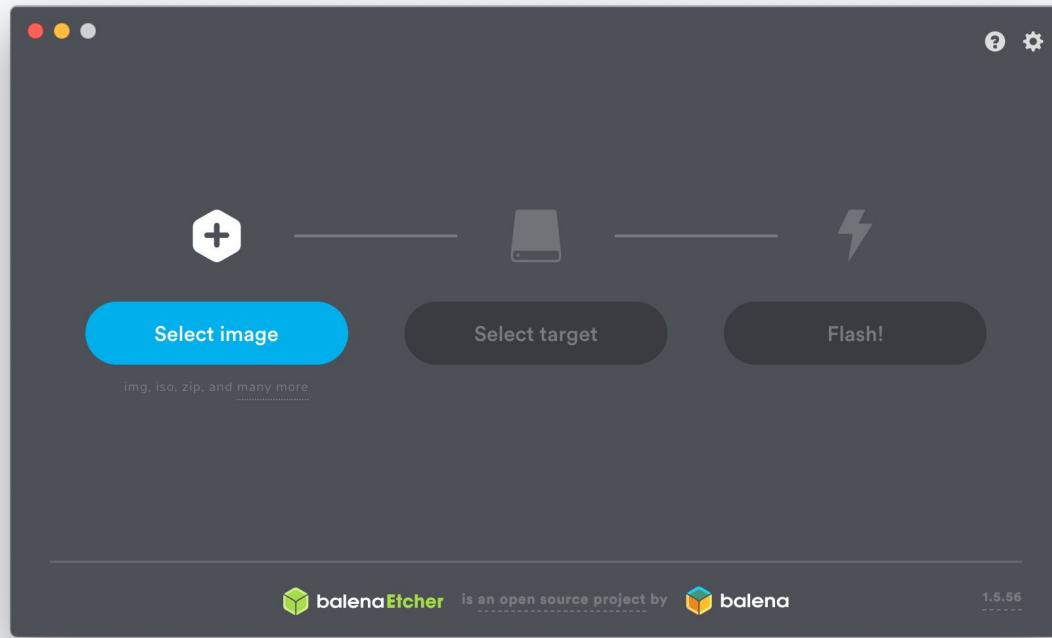


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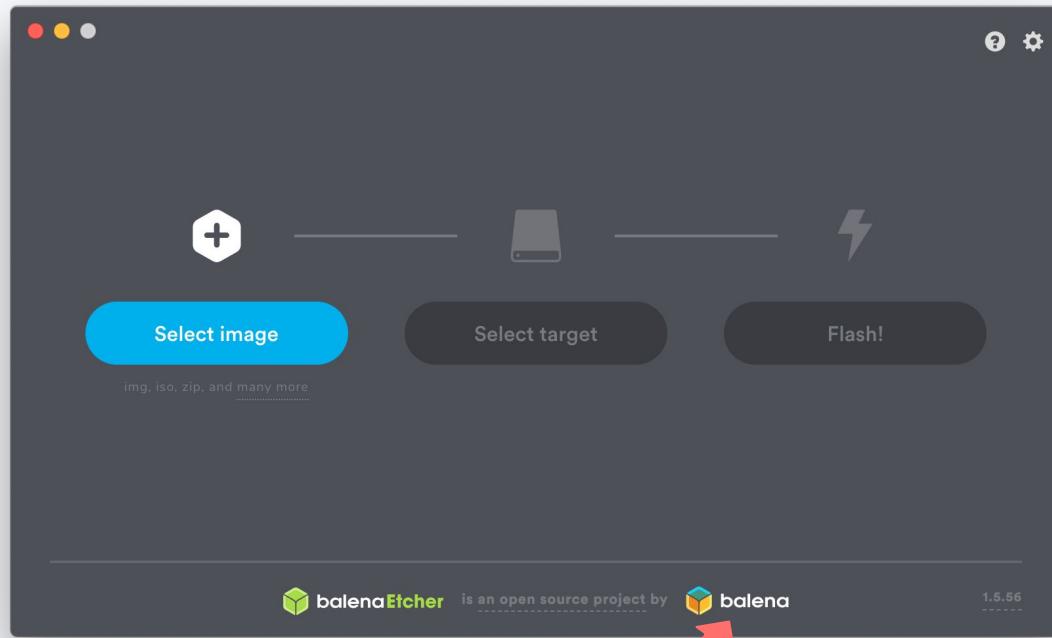


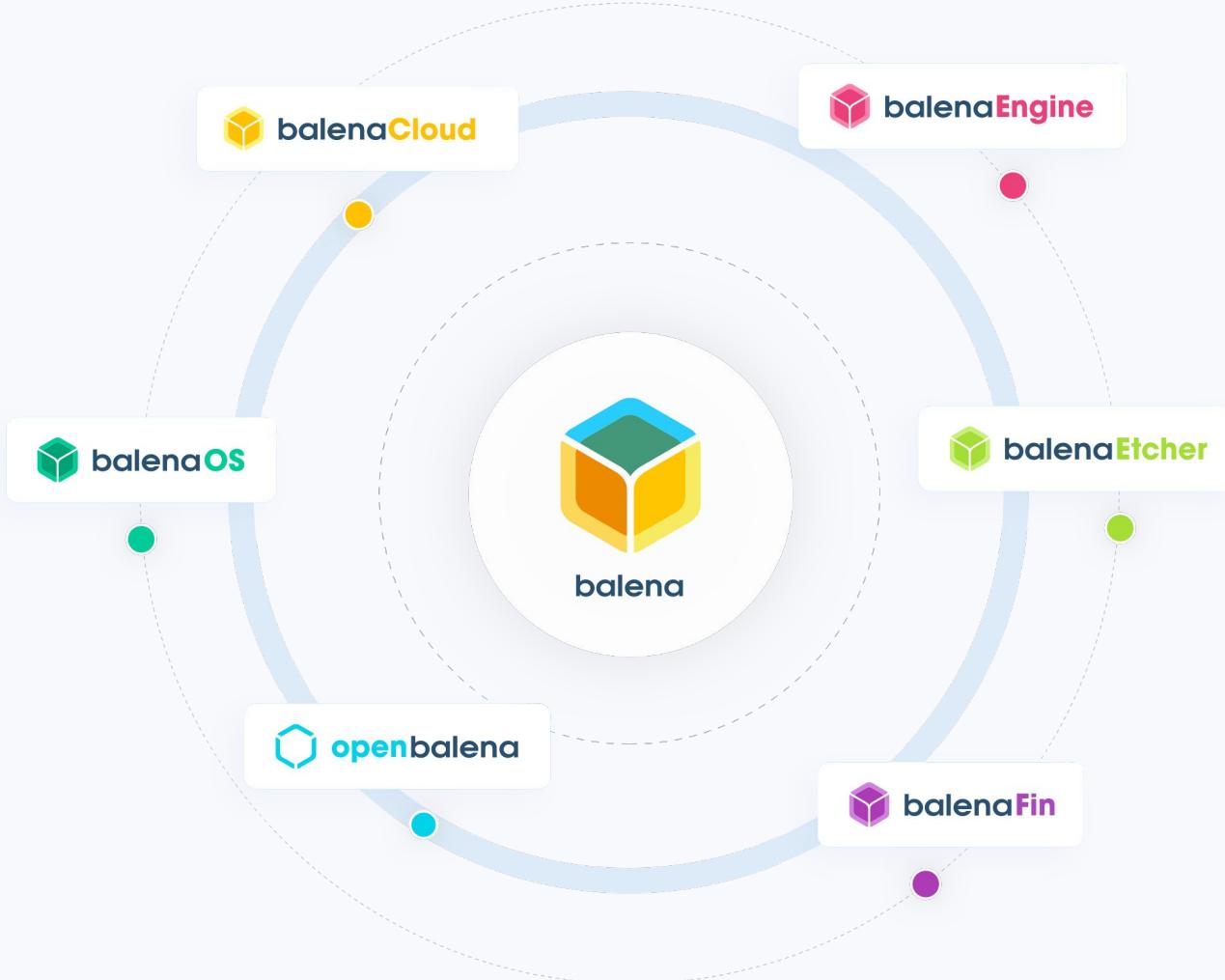
docker

Anyone know this?

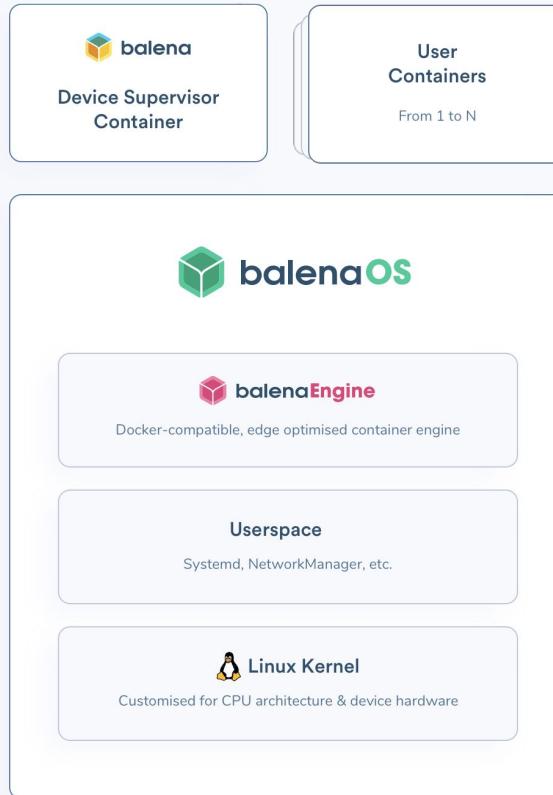


Anyone know this?

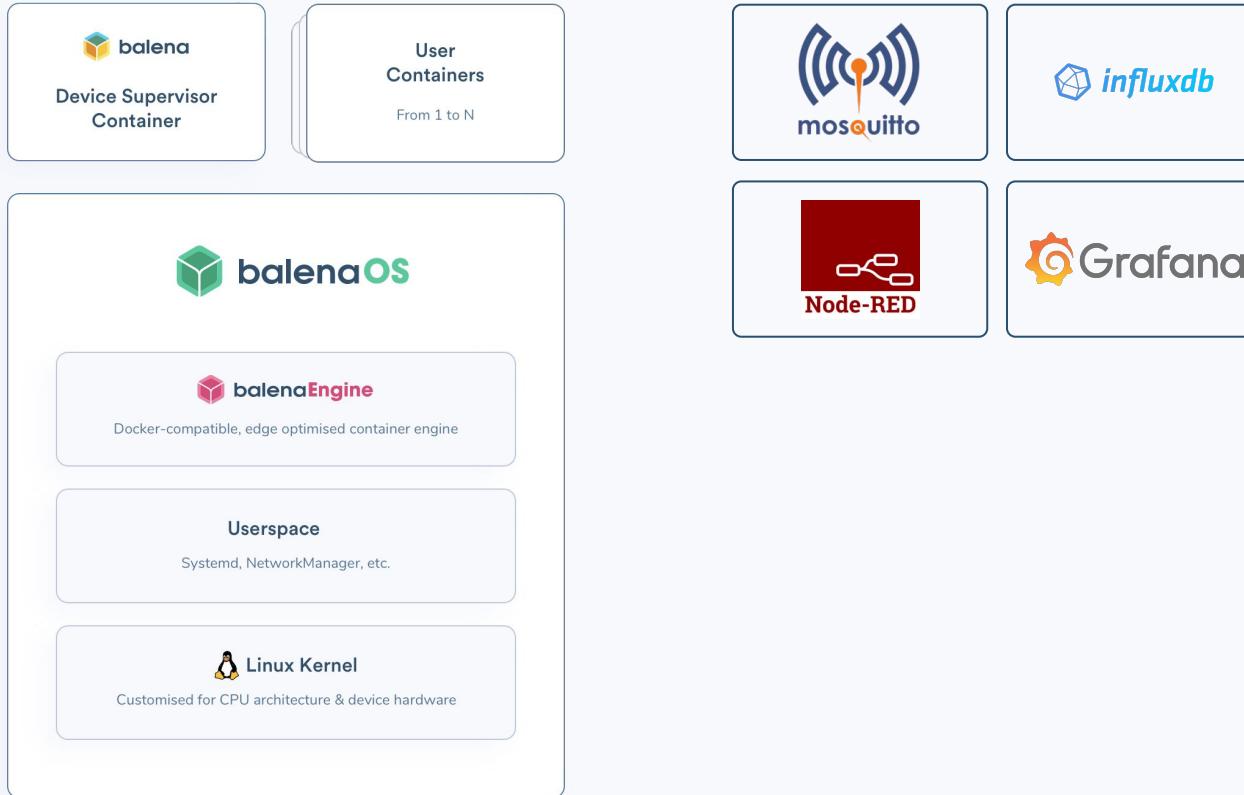




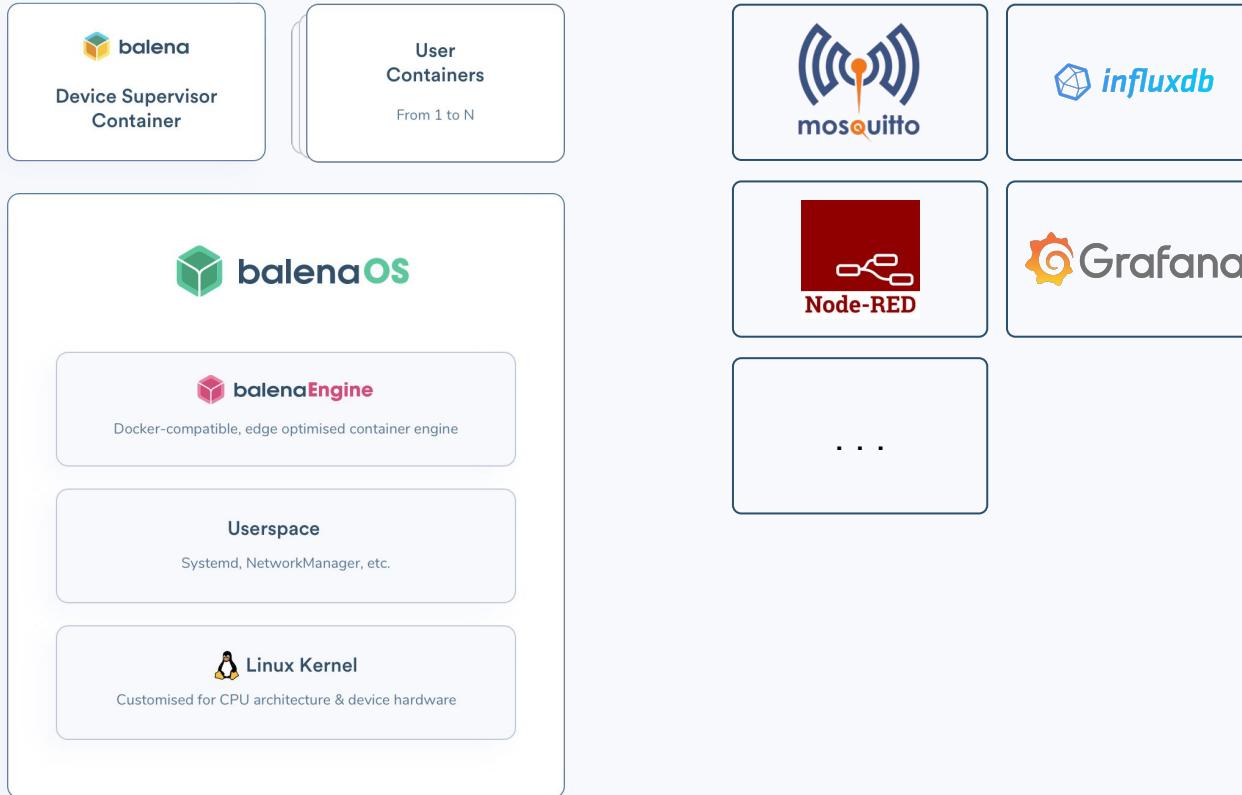
Let's take advantage of the containers in the Edge



Let's take advantage of the containers in the Edge



Let's take advantage of the containers in the Edge



MING by Marc Pous - Balena X +

https://hub.balena.io/apps/1874947/MING

balenaHub IoT Marketplace

Apps Blocks Fleets for Good balenaCloud > IoT Dashboard

balenaHub has a new look! Read more on our blog

Home / Apps / MING Share

 **MING** by Marc Pous

Deploys MING Stak (MQTT, InfluxDB, NodeRED and Grafana). An Open-Source LAMP-like stack for the Internet of Things

[View code](#) [Report issue](#)

App overview

Version 0.0.0+rev10
Size 14MB
Last Update 7/10/2022
Supported Devices Raspberry Pi 3 (using 64bit OS), Raspberry Pi 4 (using 64bit OS), Raspberry Pi 400, Raspberry Pi CM4 IO Board

Description

No description

Release notes

No release notes

 Terms of use

<https://hub.balena.io/apps/1874947/MING>

balena dashboard | mean-rainfall

https://dashboard.balena-cloud.com/devices/79274f1c47d09ad5888d3d092a01e049

Getting Started Docs Forums Status Marc Pous

mean-rainfall

Actions

STATUS Online **UUID** 79274f1 **TYPE** Balena Fin (CM3)

ONLINE FOR 5 days **HOST OS VERSION** balenaOS 2.83.21+rev1 **SUPERVISOR VERSION** 12.10.3

CURRENT RELEASE 4e72605 **TARGET RELEASE** 4e72605

LOCAL IP ADDRESS 10.136.218.127 **PUBLIC IP ADDRESS** 192.168.1.34 **MAC ADDRESS** B8:27:EB:1F:04:F09
AC:3F:A4:EB:21:EC
AC:3F:A4:EB:20:EC

PUBLIC DEVICE URL [Link](#)

TAGS (0) [Edit](#)
No tags configured yet

SERVICES

Service	Status	Release	Actions
grafana	Running	4e72605	View Logs Terminal Edit Delete
influxdb	Running	4e72605	View Logs Terminal Edit Delete
mqtt	Running	4e72605	View Logs Terminal Edit Delete
node-red	Running	4e72605	View Logs Terminal Edit Delete
wifi-connect	Running	4e72605	View Logs Terminal Edit Delete

90% [Help](#) [Docs](#) [Forums](#) [Status](#) [Marc Pous](#)

Logs

Search entries... Add filter Views

```
07.10.22 02:35:02 (+0000) influxdb [httpd] 172.18.0.2 - - [07/Oct/2022:02:35:02 +0000] "GET /query?db=balena&q=show+field+keys HTTP/1.1" 200 70 "-" "Python-urllib/3.7" a549f3ed-45e8-11ed-8075-0242ac120003 1 159
07.10.22 02:35:02 (+0000) grafana Interim dashboard sync skipped: No schema found.
07.10.22 02:35:12 (+0000) influxdb [httpd] 172.18.0.2 - - [07/Oct/2022:02:35:12 +0000] "GET /query?db=balena&q=show+field+keys HTTP/1.1" 200 70 "-" "Python-urllib/3.7" ab42ab82-45e8-11ed-8075-0242ac120003 1 302
07.10.22 02:35:12 (+0000) grafana Interim dashboard sync skipped: No schema found.
07.10.22 02:35:22 (+0000) influxdb [httpd] 172.18.0.2 - - [07/Oct/2022:02:35:22 +0000] "GET /query?db=balena&q=show+field+keys HTTP/1.1" 200 70 "-" "Python-urllib/3.7" b13b454f-45e8-11ed-8077-0242ac120003 1 974
07.10.22 02:35:22 (+0000) grafana Interim dashboard sync skipped: No schema found.
```

Terminal

Select a target Start terminal session

Changelog v15.2.0

Need help ?

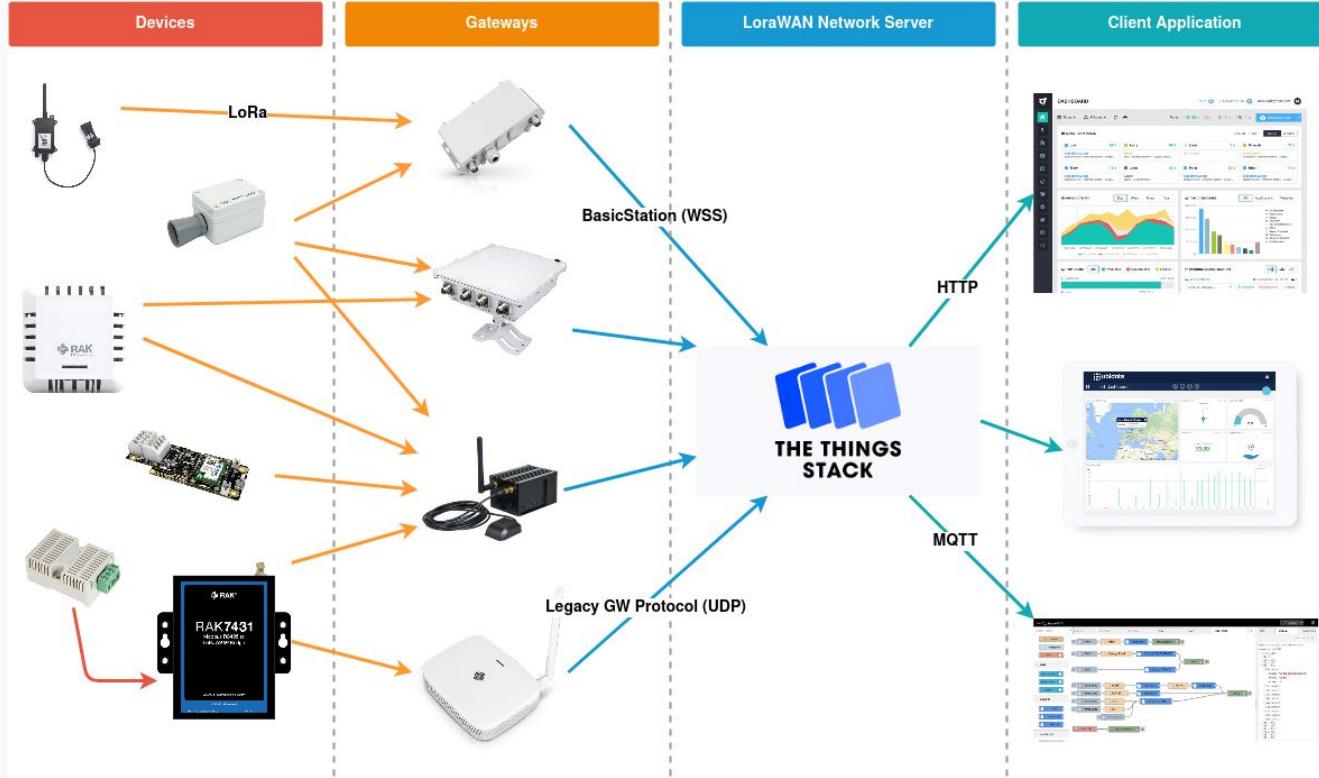
Some examples
about MING?



LoRaWAN Network with MING

LoRaWAN Network with MING

LoRaWAN Network with MING



The screenshot shows the balena dashboard interface for a device named "aged-wood".

Device Summary:

- Status:** Online (green checkmark)
- UUID:** d4576c7
- Type:** Raspberry Pi 4 (using 64bit OS)
- Online For:** an hour
- HOST OS VERSION:** balenaOS 2.103.1+rev1 (development)
- SUPERVISOR VERSION:** 14.0.14
- CURRENT RELEASE:** 0fc85a1
- TARGET RELEASE:** 0fc85a1
- LOCAL IP ADDRESS:** 192.168.1.38
- PUBLIC IP ADDRESS:** 79.153.124.126
- MAC ADDRESS:** DC:A6:32:55:4B:34
- PUBLIC DEVICE URL:** (disabled)
- TAGS:** EUI: DCA632FFFFE554B34, URL: https://192.168.1.38
- NOTES:** EUI : DCA632FFFFE554B34

Services:

Service	Status	Release
basicstation	Running	0fc85a1
grafana	Running	0fc85a1
influxdb	Running	0fc85a1
node-red	Running	0fc85a1
postgres	Running	0fc85a1
redis	Running	0fc85a1
stack	Running	0fc85a1
wifi-connect	Running	0fc85a1

Logs:

Search entries... UTC Timestamps

```

: "pipe", "request_id": "01GDDADY55FB0AYKCHM8ATZ94Y"
20.09.22 11:27:20 (+0000) basicstation 2022-09-20 11:27:20.111 [SYN:VERB] Time sync rejected: quality=2
74 threshold=241
20.09.22 11:27:24 (+0000) influxdb 2022-09-20T11:27:24.536Z61Z info Executing query ("log_id"
: "0d2b1lt000", "service": "query", "query": "SELECT Fieldkey, FieldType FROM balena.autogen_fieldKeys"
}
20.09.22 11:27:24 (+0000) influxdb [http://172.17.0.5:8086/] [20/Sep/2022:11:27:24 +0000] GET /query?db=b
alena&q=show:field_keys HTTP/1.1 200 153 "-" "Python-urllib/3.7" 322355e-38d7-11ed-81dd-0242ac100004 16
62
20.09.22 11:27:24 (+0000) grafana 2022-09-20T11:27:24 [Dashboard not found] logger=
context user_id=0 org_id=1 remote_addr="Dashboard not Found" remote_addr=127.0.0.1
20.09.22 11:27:24 (+0000) grafana INFO [09-20|11:27:24] Request Completed logger=
context user_id=0 org_id=1 uname=method=GET path=/api/dashboards/uid/paylod.end_device_ids.device_id stat
us=404 remote_addr=127.0.0.1 time_ms=152 size=33 referer=
20.09.22 11:27:24 (+0000) grafana [Interim dashboard sync complete.

```

Terminal:

```

root@58a70af2e71a:/# influx
Connected to http://localhost:8086 version 1.7.11
InfluxDB shell version: 1.7.11
> create database balena

```

balena dashboard | shy-sky Overview - Console - The Thing +

https://012e801cea281877752c446b9295026.balena-devices.com/console/

THE THINGS STACK
Open Source

Overview Applications Gateways Organizations admin

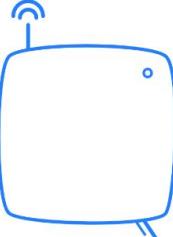
Welcome to the Console!

Get started right away by creating an application or registering a gateway.

Need help? Have a look at our [Documentation](#).



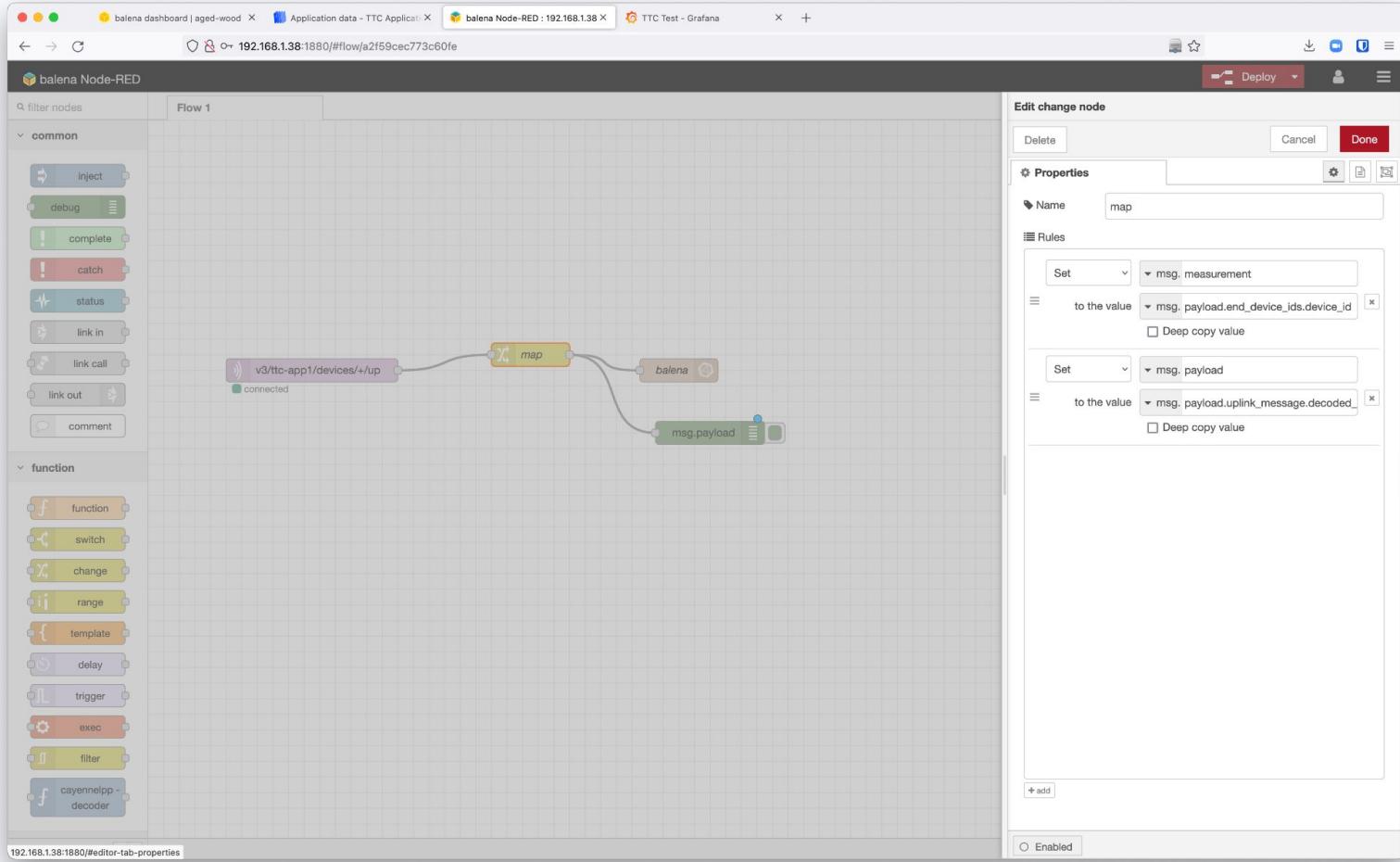
Create an application

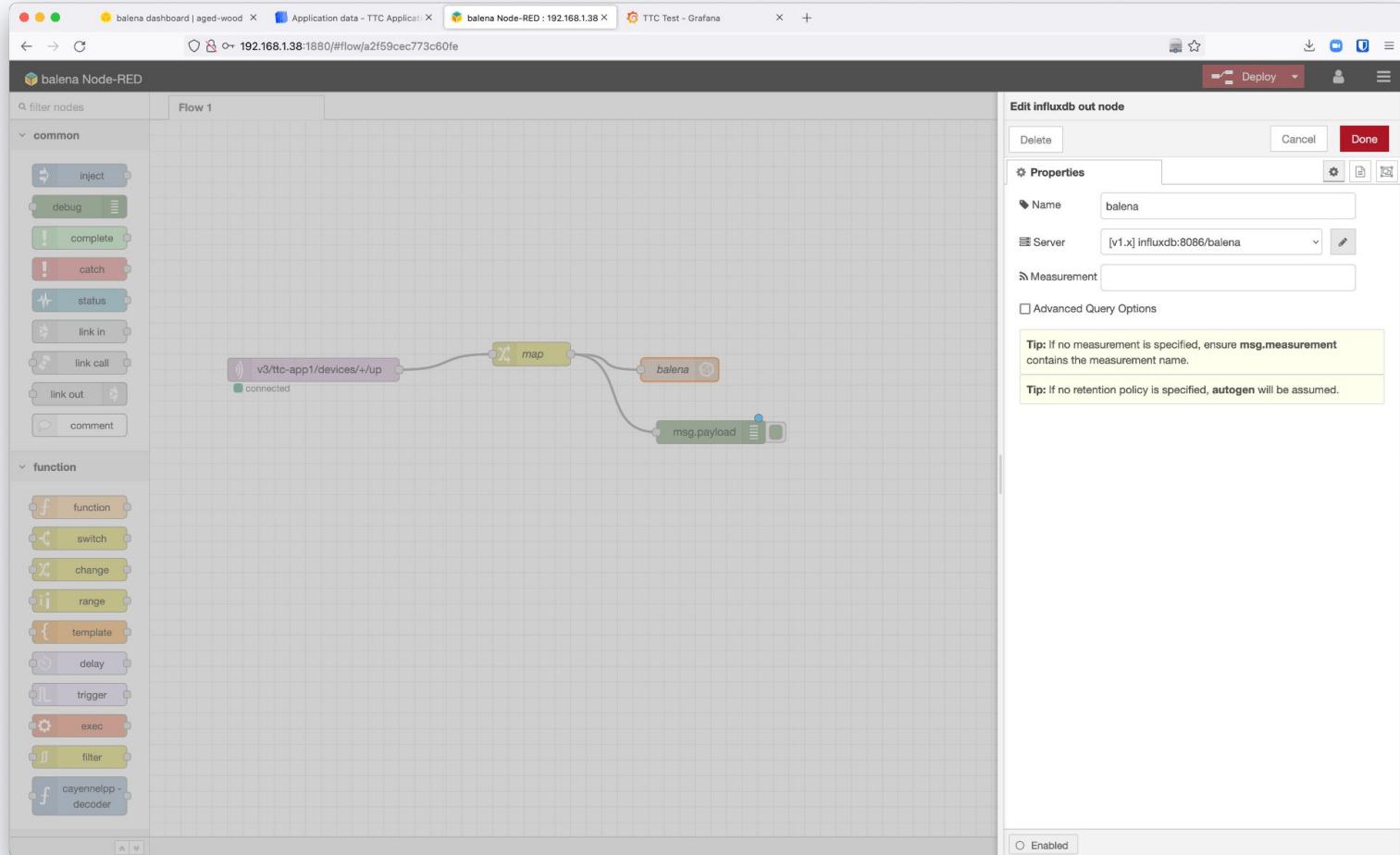


Register a gateway

Version info Component status

Application Server





Industrial IoT with MING

Industrial-Gateway-MING-x86

https://hub.balena.io/apps/2016701/Industrial-Gateway-MING-x86

balenaHub
IoT Marketplace

balenaHub has a new look! Read more on our blog

Home / Apps / Industrial-Gateway-MING-x86

Share

Free

Deploy

View code Report issue

App overview

Version 0.0.0
Size 682MB
Last Update 6/2/2023
Supported Devices Generic x86_64 (legacy MBR) Intel NUC

Description

Run this Industrial IoT Gateway gateway compatible with amd64 and x86 using NodeRED, MQTT, InfluxDB and Grafan to convert legacy to digital. To access NodeRED use the local IP address on port 80, if you are on the same network of your device. You also can use the Public Device URL by balena to access to the Node-RED UI. Use balena as Username and Password to access to the Node-RED UI. You can change this variables on the Device Variables.

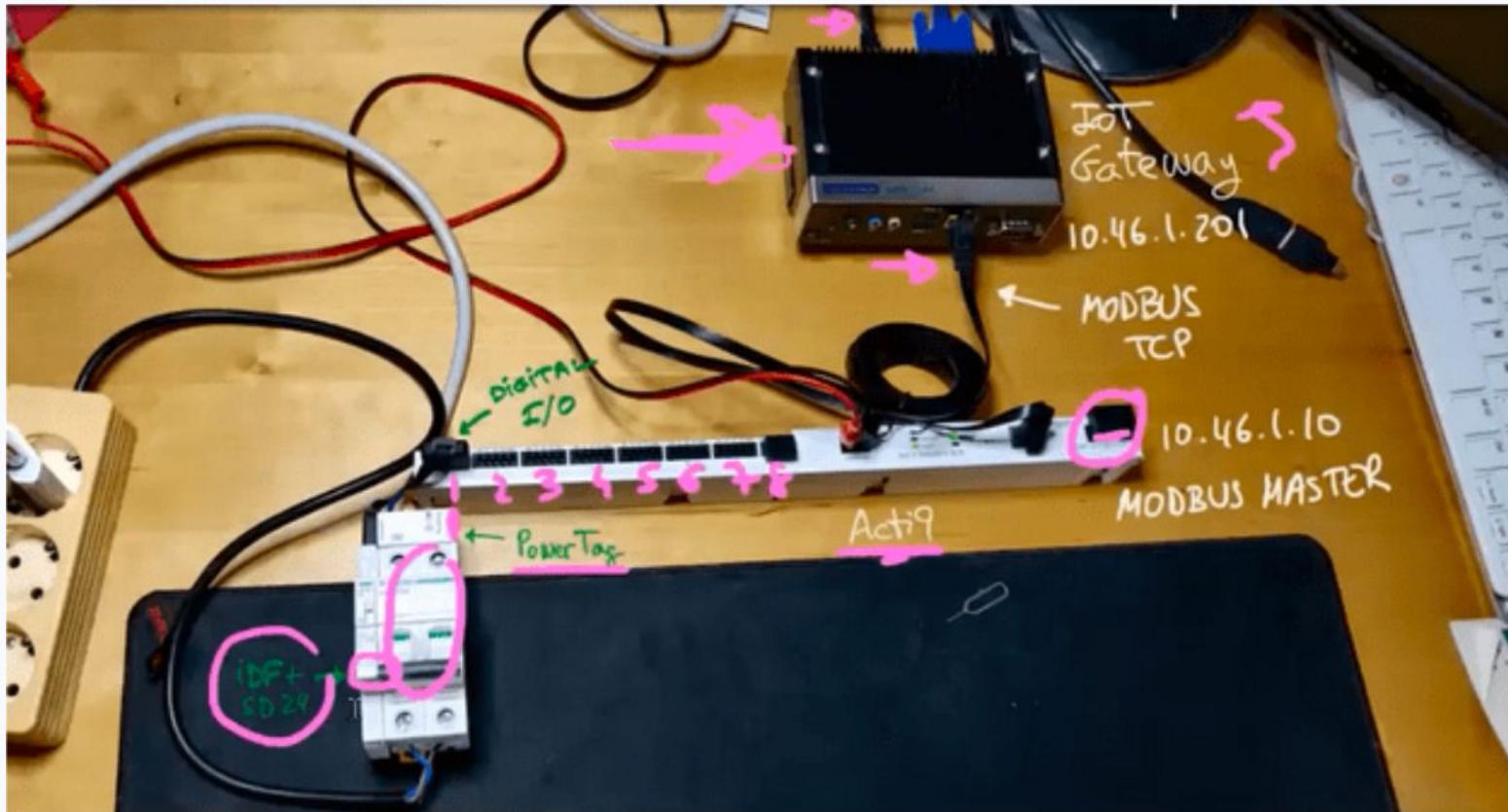
To access Grafana use the local IP address on port 3000. Find more instructions on the [Github repository](#) and feel free to contribute.

Industrial-Gateway-MING-x86

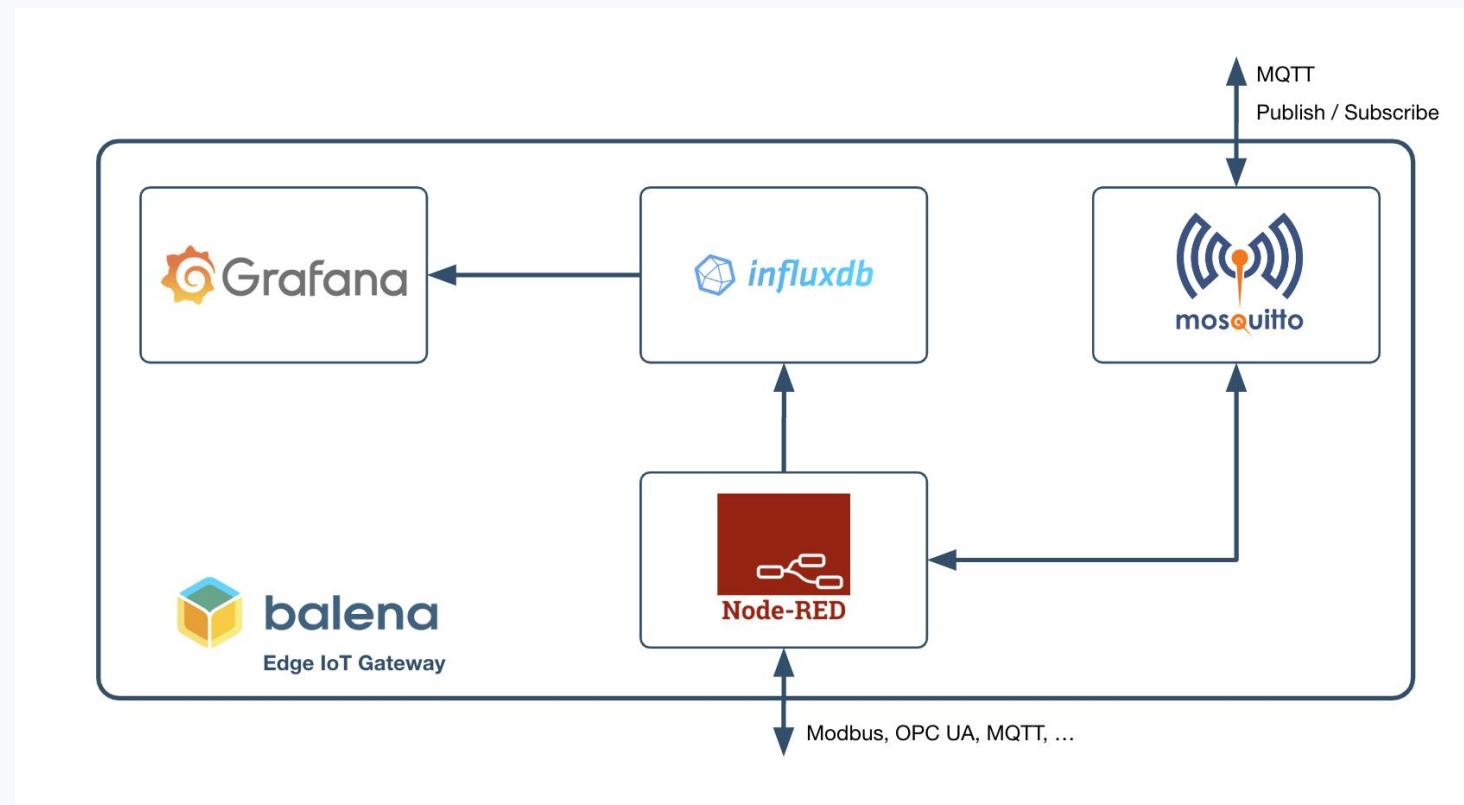
by Marc Pous

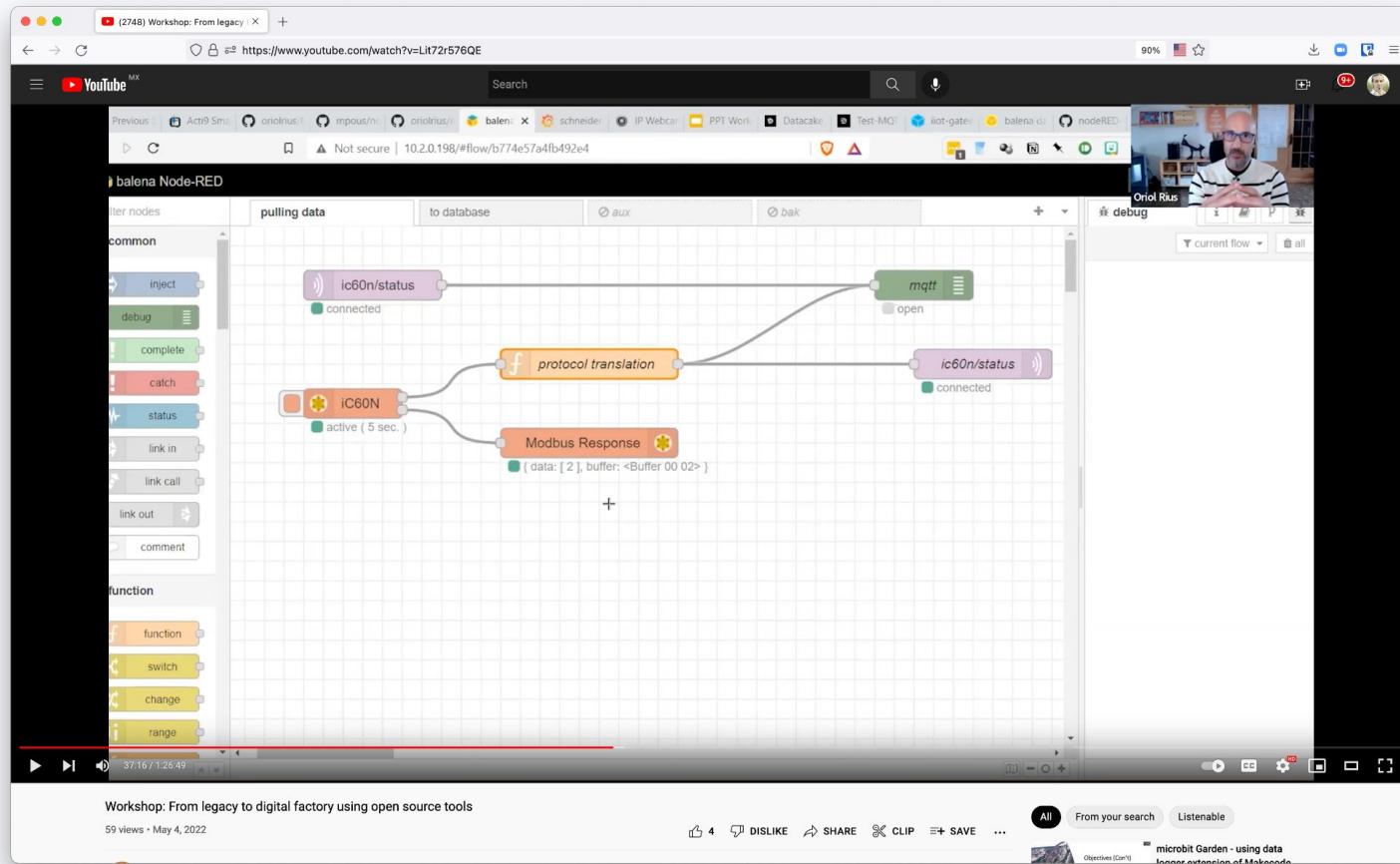
Industrial IoT gateway compatible with Modbus to convert legacy to digital.

Industrial IoT with MING



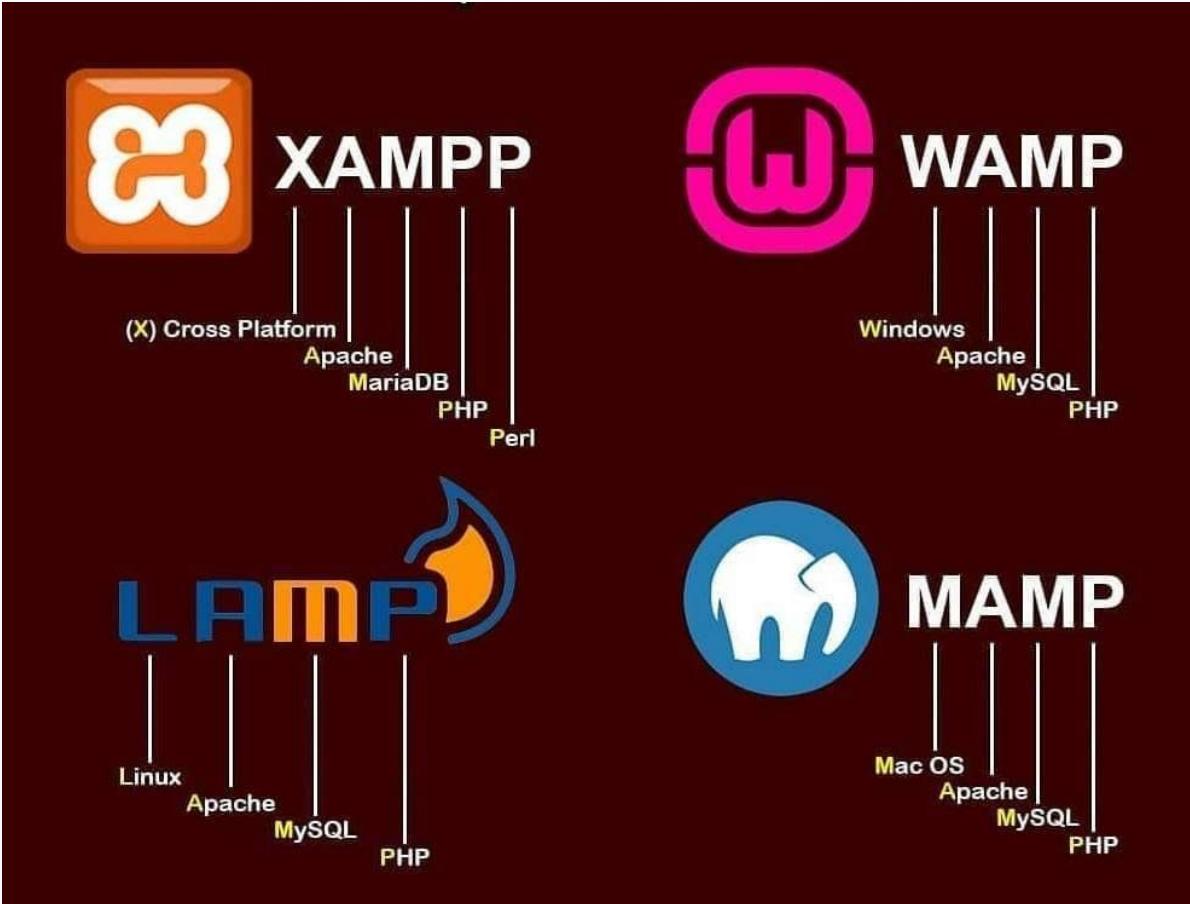
Industrial IoT with MING

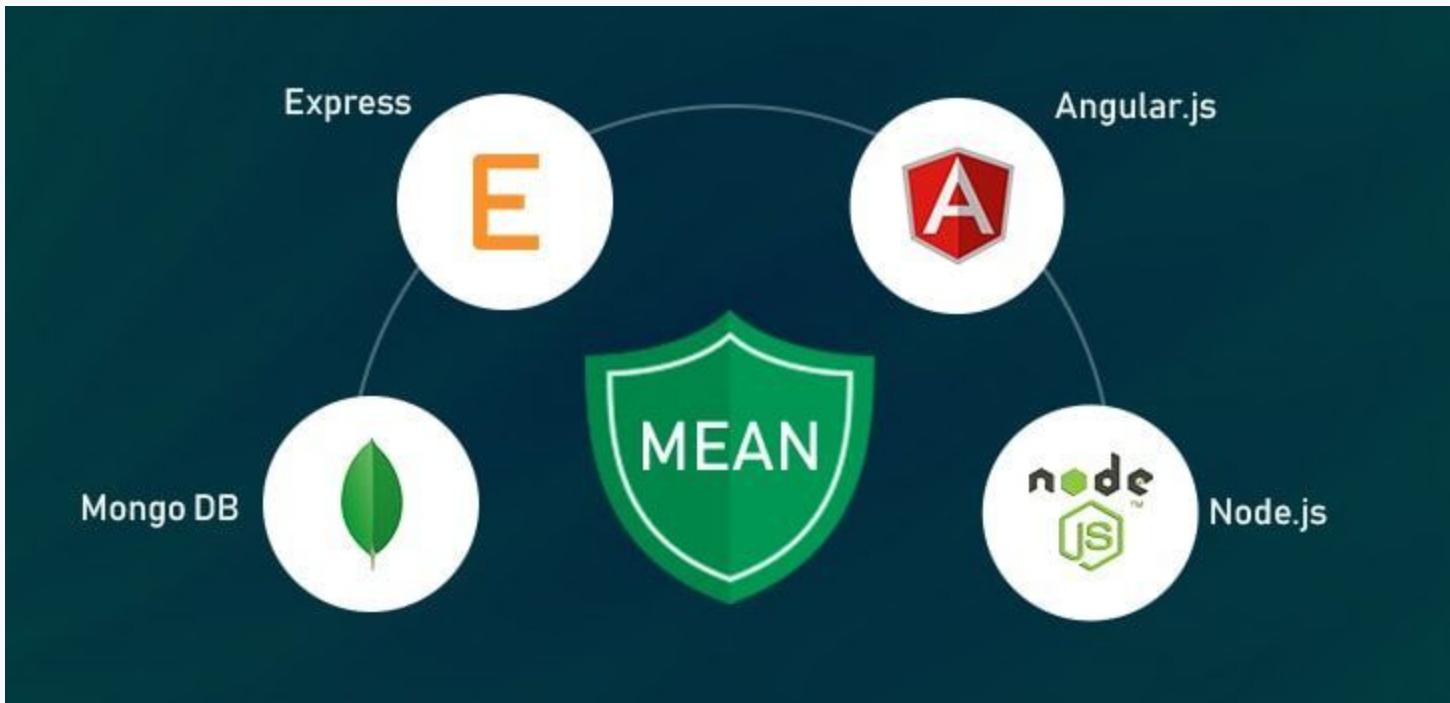




Some ideas to
extend MING?







Ideas for MING?

Ideas for MING?

- New UIs? Excel Sheets? (Eclipse [Streamsheets](#))
- Digital Twins? (Eclipse [Ditto](#))
- Cloud service for multiple deployments?
- ...

Ideas for MING?

- New UIs? Excel Sheets? (Eclipse [Streamsheets](#))
- Digital Twins? (Eclipse [Ditto](#))
- Cloud service for multiple deployments?
- ...

Please, do contribute!

https://github.com/mpous/ming

The screenshot shows the GitHub repository page for 'mpous/ming'. The repository is public and contains 1 commit, 2 branches, and 0 tags. The README.md file is displayed, featuring the title 'MING (MQTT, InfluxDB, NodeRED and Grafana)'. It describes MING as an educative project based on MQTT, InfluxDB, balena Node-RED block, Grafana and WiFi Connect balena blocks. The repository also lists requirements for hardware and software, and contributors.

Code

Issues 1 Pull requests Actions Projects Wiki Security Insights Settings

master 2 branches 0 tags Go to file Add file Code

mpous ming made by blocks 052f828 10 hours ago 1 commit

README.md ming made by blocks 10 hours ago

balena.yml ming made by blocks 10 hours ago

docker-compose.yml ming made by blocks 10 hours ago

logo.png ming made by blocks 10 hours ago

About

No description, website, or topics provided.

Readme 0 stars 1 watching 1 fork

Releases

No releases published Create a new release

Packages

No packages published Publish your first package

Contributors 16

+ 5 contributors

Let's build it here :)

Let's wrap-up!



Why do we do this?

- Reduce friction to developers who want to get introduced into the IoT.
- Open-source and free toolkit.
- Flexible and scalable for multiple use cases.
- Open to anyone to contribute!

The screenshot shows a GitHub repository page for the user mpous under the repository name ming. The repository is public and contains 1 commit, 2 branches, and 0 tags. The README.md file is displayed, featuring the title "MING (MQTT, InfluxDB, NodeRED and Grafana)". It describes MING as an educative project based on MQTT, InfluxDB, balena Node-RED block, Grafana and WiFi Connect balena blocks. It is an Open-Source LAMP-like stack for the Internet of Things. The README also lists the applications built and runs in containers: Mosquitto MQTT broker, InfluxDB, NodeRed, and Grafana. Requirements and hardware sections are partially visible below the README.

Code

Issues 1 Pull requests Actions Projects Wiki Security Insights Settings

master 2 branches 0 tags

Go to file Add file Code

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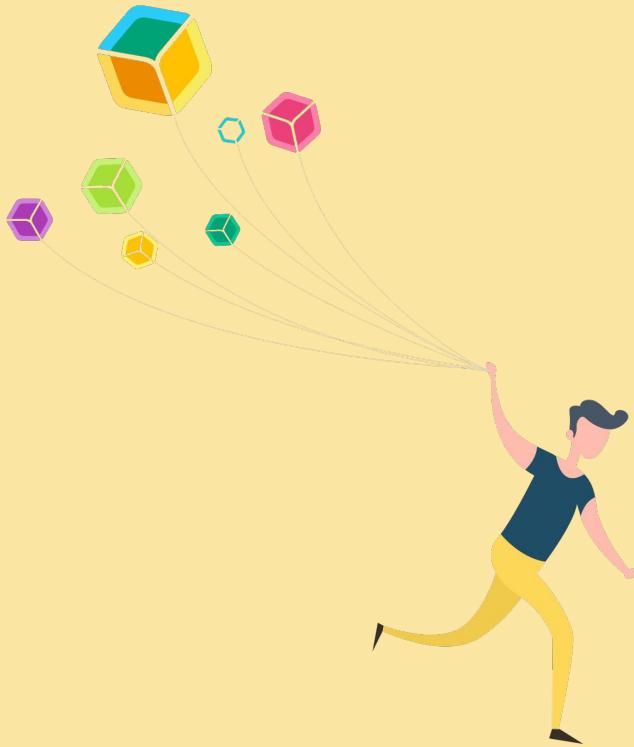
Marc Pous

Developer Advocate @ balena.io

e: marc@balena.io

t: [@gy4nt](https://twitter.com/@gy4nt)

Questions?



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