# Clea

Accelerate your business with Edge AI

# About Clea

# ABOUT CLEA

**HOW IT WORKS**

**From Off-the-Shelf and Customized HW...**

**...to an AI & IoT-Ready Platform**

EXISTING SECO FLEET

OR

NON-SECO FLEET

**Full Retrofitting Capabilities and Rapid Integration**

Modular Solution Ensuring Complete Integration with Existing Infrastructures...

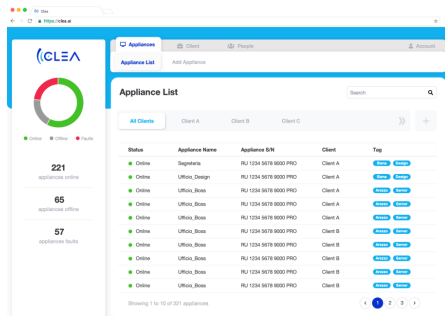...providing a wide cross-selling opportunity on both legacy and new products
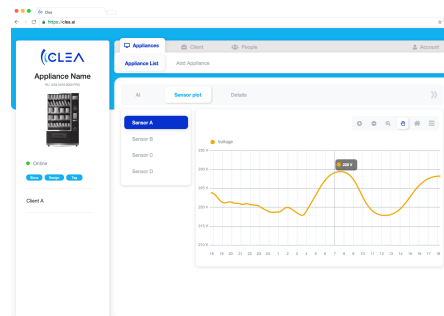
# ABOUT CLEA

## Fleet Management

- On-demand application deployment
- Bi-directional interaction between devices and the cloud



## IoT Data Management

- First-tier data analytics at the edge
- Automated data modelling in the cloud



## AI

- Assisted model training within the platform
- Integrated AIOps within data flows from the fields

# ABOUT CLEA     AI/IOT PLATFORM
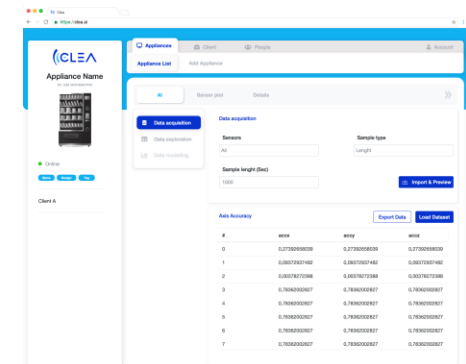
**Rapidly connect and cloud manage any hardware for smart control, monitoring and actionable insights using ML/AI:**

- Turn any device into a Cloud Managed Intelligent Device

- Secure, Scalable, Microservice architecture, API for everything, Multi-tenant

- Use our public cloud or host anywhere (GCP, Azure, AWS, private cloud or bare metal)

- Deploy AI pipelines on your IoT data at scale in minutes

- Select from ready-made apps or build your own

((CLEA

Secure                    HTTPS/REST API

**Connected Devices**

Device SDK

Device HW

**Browser, Mobile Apps, Chatbots**
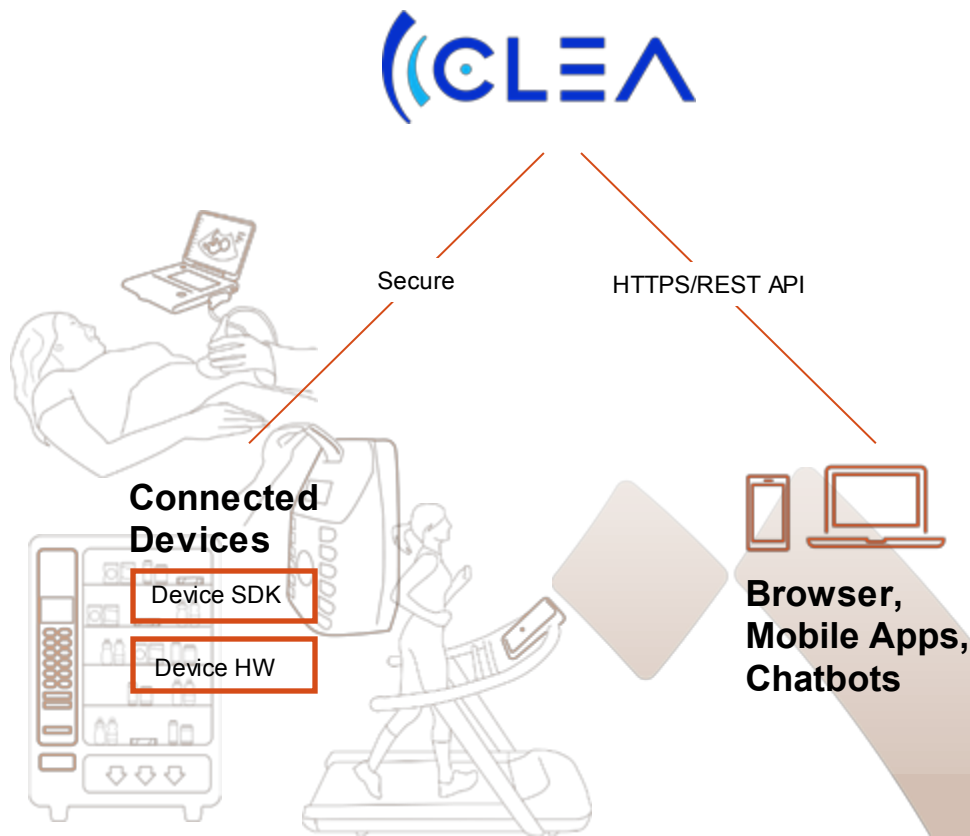
# ABOUT CLEA

**Platform architecture**

SECO Mind



**CONNECTORS**
- Saleforce
- SAP
- Power BI

**Cloud agnostic**
- On Premise
- aws
- Azure
- Google Cloud Platform

**CLEA** — Pre built Apps
- Human pose classification
- Augmented driving
- Sound classification
- Air quality
- Predictive Maintenance
- Facial recognition
- Web Apps — ReactJS Frontend Apps — Backend Apps — PostgreSQL
- Mobile App — Mongo DB

**API**
AppEngine API,
Web Socket & REST

**CLEA CORE**

**Portal**
- AI & DATA Analytics
- Data management
- Fleet management
- Platform management

**Open source**
- Tenant Manager
- Realm Manager
- Super Admin Manager
- Pairing
- Trigger Engine
- Data updater
- CFSSL
- RabbitMQ Container
- VerneMQ Broker

Cassandra DB

EDGEHOG
ALL-IN-ONE IIoT PLATFORM

astarte

**EDGE API
EDGE DEVICES**
- MCUs
- Arm Cortex A 32/64bit
- X86
- Microcontroller ESP32

SDK: C++, Java, Python, Rust.

docker

**EDGE AI**
- MCUs — Tiny ML
- NPU VPU — HW Acceleration
- EDGE Deep neural network
- Model optimization

# ABOUT CLEA

**From Core to the solution for the customer**

## Clea Enterprise

Premium SaaS, PaaS
and on-premise enterprise solution

One-stop customizable solution
(**Hardware + Software + Services**)
for companies looking for a
comprehensive IoT & AI solution,
from edge to cloud.

Large enterprises
and corporations

## Clea Public Cloud

SaaS

Freemium ready to use solution
available online.
A **limited non-customizable
version of Clea Enterprise** for
Proof of Concepts and field tests.

Startups, SMEs,
developers, R&D dept,
pilot/PoC projects

## Clea Open

Open-Source Core

It represents the core
**Open Source products at the
cornerstone of Clea**
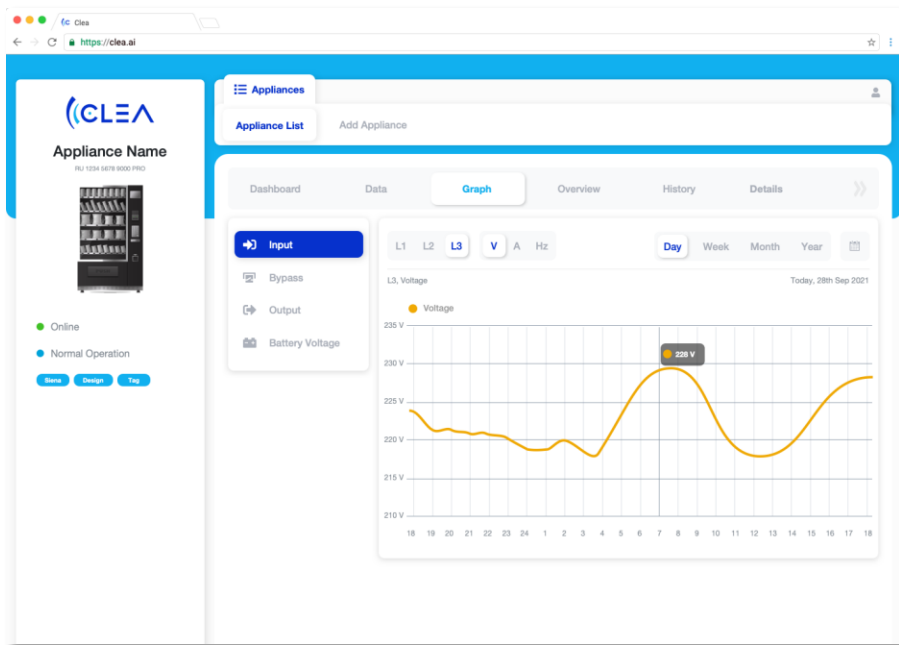i.e. Astarte, Edgehog,
Ilyde and SECO OS Linux/Micro

Open source developers

# Main features

# MAIN FEATURES



## Telemetry
The client has all the data coming from the machines always under control. He can also sort the data in groups, dates, download and visualize them in a very simple way.

## Data Flow
This tool allows to manage data that flows towards different kind of software in cloud.

## Data Orchestration
Simple and flexible data management allowing the client to program the data orchestration if needed.

## Data Visualization Frontend and Apps
Starting from the client needs we can develop Mobile Apps and Frontend Services specifically tailored for their own use. An easy and quick solution to create powerful visualization services.
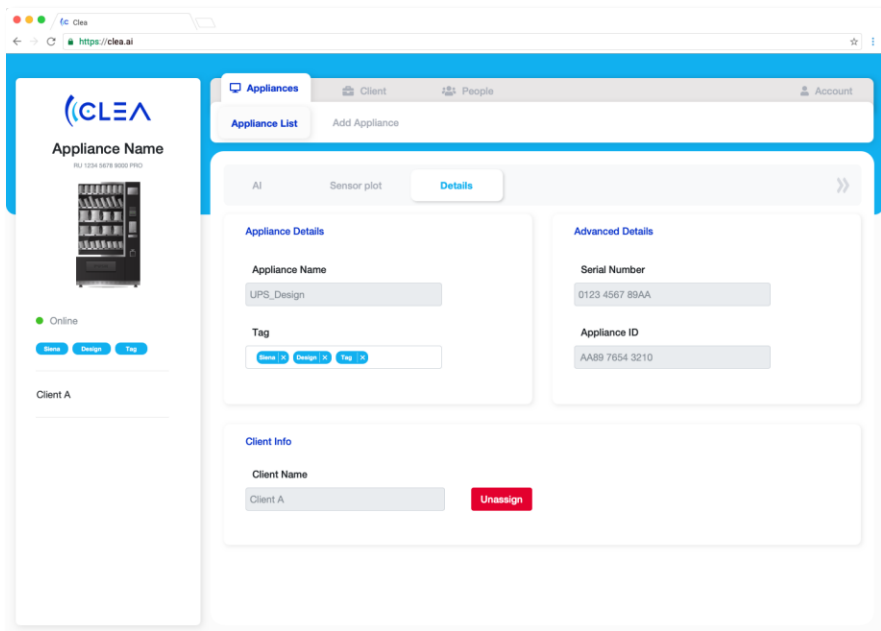
# MAIN FEATURES
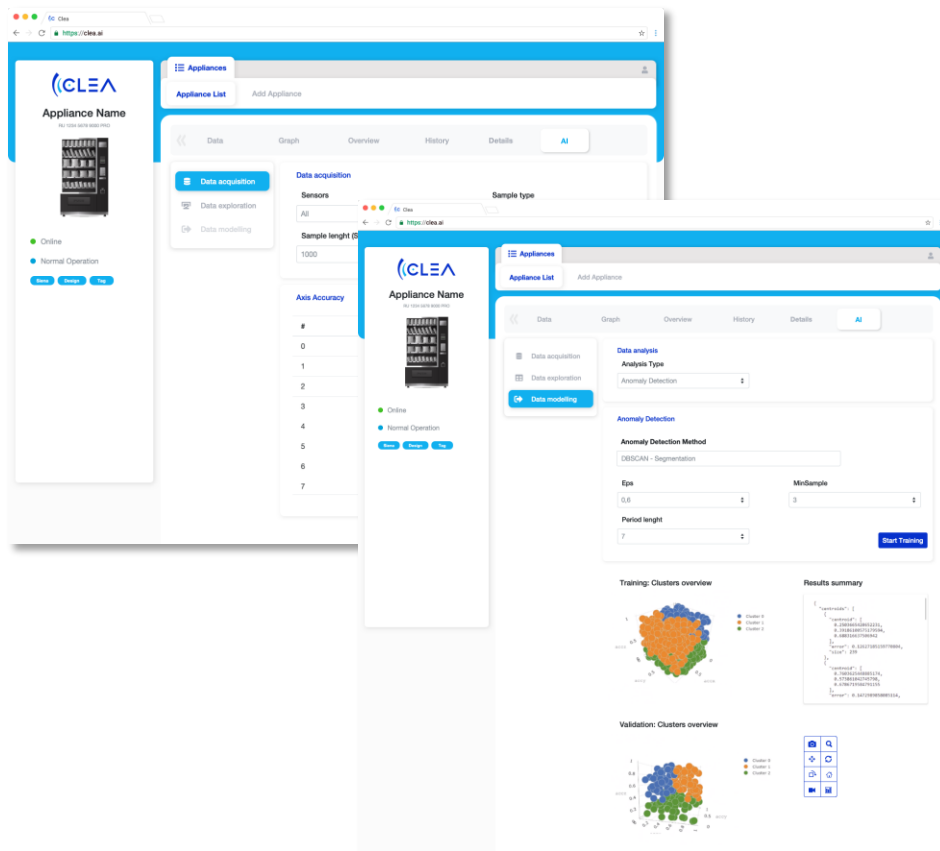


### Data Analytics
A feature that analyzes the data coming from the connected devices and machines.

### Custom AI Algorithms on the Edge and Cloud
The Data Analytics allows to develop AI Models that can be a huge value added for the client in terms of ROI.

# MAIN FEATURES



## Device Status
Check the status of all the connected devices (online/offline, size of Free Storage Memory, ID info, Connectivity info).

## Geolocalization
This tool allows to detect the devices geographic location in a map with great accuracy. The datas can be sent via Cell-ID + Wi-Fi or throught modem GPS.

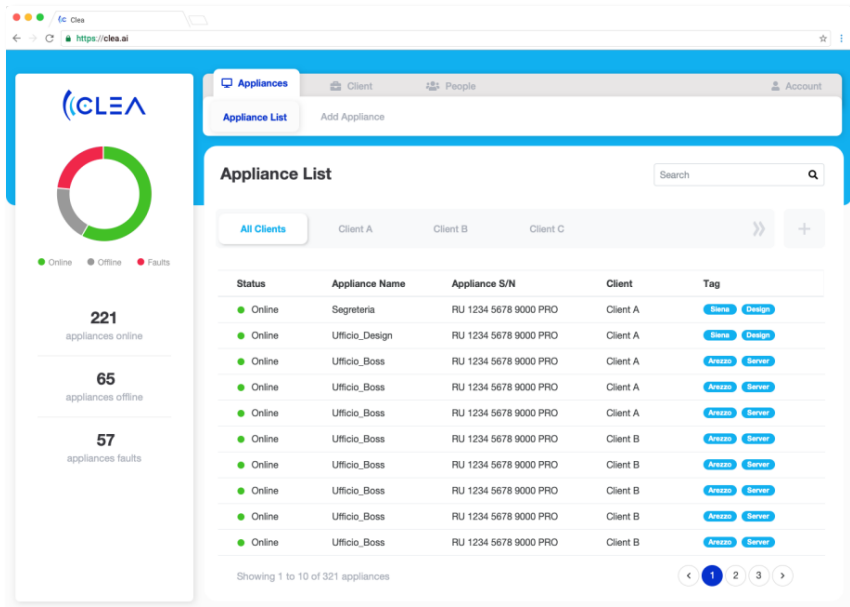## Mobile, Wi-Fi and Bluetooth Connectivity Manager
A BLE Mobile App that allows the client to manage the WiFi and SIM/eSIM Connectivity.

## Logs Reading
A useful Features for debugging and retrieve low-level analysis.

# MAIN FEATURES



**Fleet Manager and device manager**
With this feature the IT manager can control the whole device fleet.
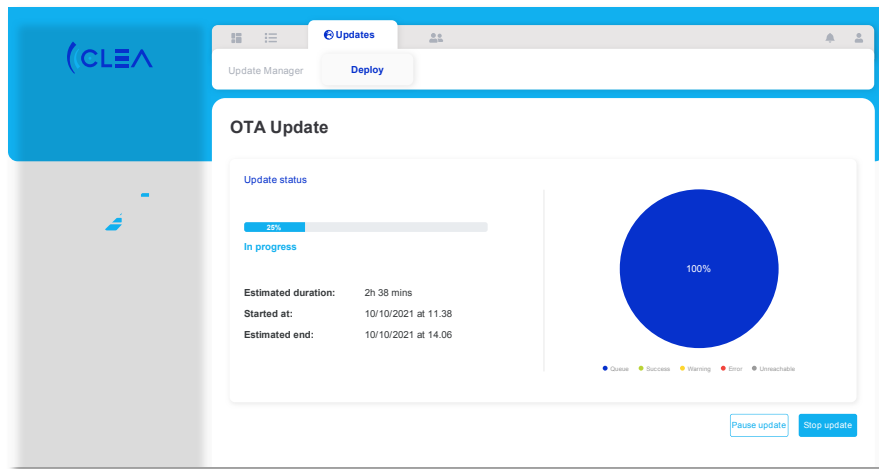
**File Transfer**
File Transfer allows you to manage file uploads on Linux devices

**Remote Shell**
This is a web-based remote terminal for Linux devices.

# MAIN FEATURES



### Secure Application, Firmware or OS OTA (Over The Air) Updates
This main feature allows to remotely update the devices' firmware, OS and containerized applications.

### Port Forwarding
An easy way to SSH/VNC/Web-view remotely.

### Open SDK
This includes:
- SDK for ESP32 devices, based on esp-idf.
- SDK for Linux: Qt5, Java, Rust, Python, Go.

# MAIN FEATURES



### Custom Theme & Logo
Clea platform allows logo, look and feel customization. It's possible to choose a different color schema from a number of available schemas, for each tenant from the tenant admin panel.

### Custom Application
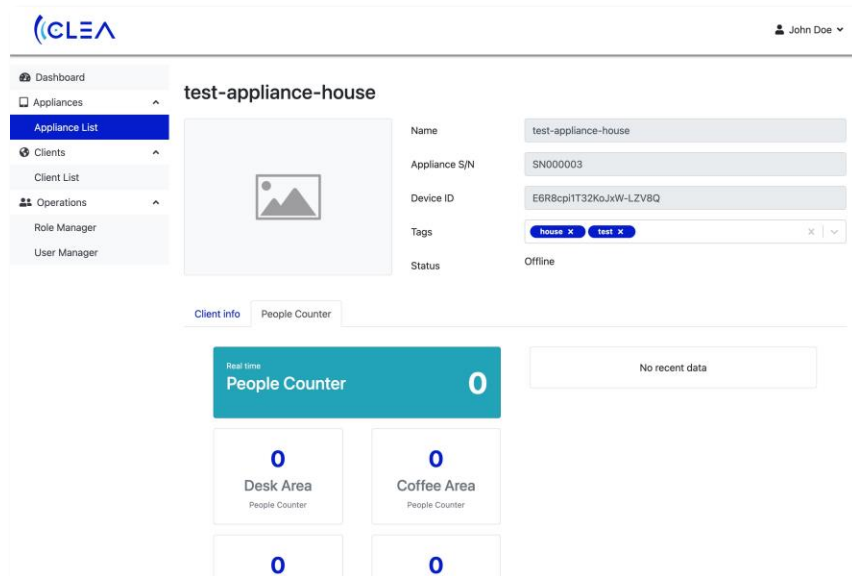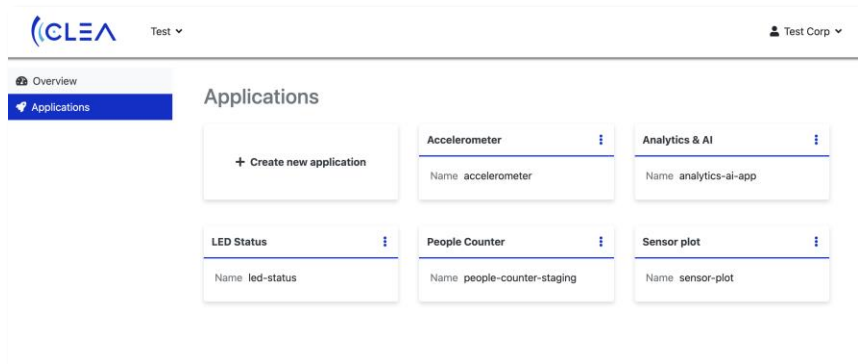Clea platform supports loading external web apps that can be developed by third-party actors.

Clea

**Apps**

# Build your apps from scratch

**Clea** gives you all the tools to **build your own Clea App**, or you can simply **use** and **edit** among the ones **we provide**.

# How to build a Frontend Application

## Setup

- **Setup your project** using the app template in this link https://github.com/clea-platform/clea/tree/master/templates/external-app

- In the project, **specify and define** interfaces you would like your app to interact with modifying the implementation of AstarteClient.ts

## Clea App

- **Implement**, **Build** and **deploy** your project

- You're ready to **register your App** in Clea, in Clea admin, **create a new application** specifying url to the js bundle of your application

- **All done**, your application will be available in all appliances that support your application's interfaces.

### Create application

Create

| Display name | | | |
|---|---|---|---|
| Display name | | | |

| Name | |
|---|---|
| Name | |

| JS Bundle URL | |
|---|---|
| JS Bundle URL | |

| Required Astarte interfaces | **Interface name** | **Major** | **Minor** |
|---|---|---|---|
| | | 0 | 0 | + |

No required Astarte interface. This application is always displayed.

# Edge Application

Clea is designed to be an **Edge AI platform**

**Open SDK**
for a range of platforms

**Containerized**
Applications

**Remote**
Deploy and Update

**Remote Apps**
and Logs control

# How to build an Edge Application

## Setup

- **create a realm** (or use an existing one) in which to publish device data;

- **define an interface** that describes the format of the data to be published on Clea. This interface will then be installed on the cloud instance in order to accept the data coming from the devices;

- **obtain the token** that allows a device to communicate with clea (eventually generate the token and then pass it to the device developer);

## EDGE App

- using one of the supported libraries, **connect the device to Clea** by passing it the remote url, the id of the device to which the token is associated, the token itself, and the realm;

- **define the interface** or **interfaces you will use** to publish the data;

- you can now **send the data to Clea** in two ways:

    **aggregate:** you send a bundle of data all together in one message because they all belong to the same common topic;

    **single:** send several different messages, one for each piece of data to be updated.

```json
{
    "interface_name": "ai.clea.examples.PeopleCounter",
    "version_major": 0,
    "version_minor": 1,
    "type": "datastream",
    "ownership": "device",
    "aggregation": "object",
    "mappings": [
        {
            "endpoint": "/%{camera_id}/reading_timestamp",
            "type": "integer",
            "reliability":"unique",
            "retention":"volatile",
            "expiry":60,
            "database_retention_policy": "use_ttl",
            "database_retention_ttl": 28800
        },
        {
            "endpoint": "/%{camera_id}/people_count",
            "type": "integer",
            "reliability":"unique",
            "retention":"volatile",
            "expiry":60,
            "database_retention_policy": "use_ttl",
            "database_retention_ttl": 28800
        },
        {
            "endpoint": "/%{camera_id}/people",
            "type": "stringarray",
            "reliability":"unique",
            "retention":"volatile",
            "expiry":60,
            "database_retention_policy": "use_ttl",
            "database_retention_ttl": 28800
        }
    ]
}
```

# Open SDK for multiple platform

**SDK for ESP32** devices, based on esp-idf.
https://github.com/astarte-platform/astarte-device-sdk-esp32

**SDK for Linux:** Qt5, Java, Rust, Python, Go.
https://github.com/astarte-platform/astarte-device-sdk-qt5
https://github.com/astarte-platform/astarte-device-sdk-java
https://github.com/astarte-platform/astarte-device-sdk-rust
https://github.com/astarte-platform/astarte-device-sdk-python
https://github.com/astarte-platform/astarte-device-sdk-go

Thank you

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