Microsoft

Uma demo de IOT com Power Platform

João Lucindo
TECH SPECIALIST

Waldemir Cambiucci
TECH SALES | MTC LEAD

20 de maio de 2021

Our Agenda

- Relembrando IOT
- Relembrando Power Platform
- Um cenário de comando CLOUD-TO-DEVICE
- Considerações
- Q&A

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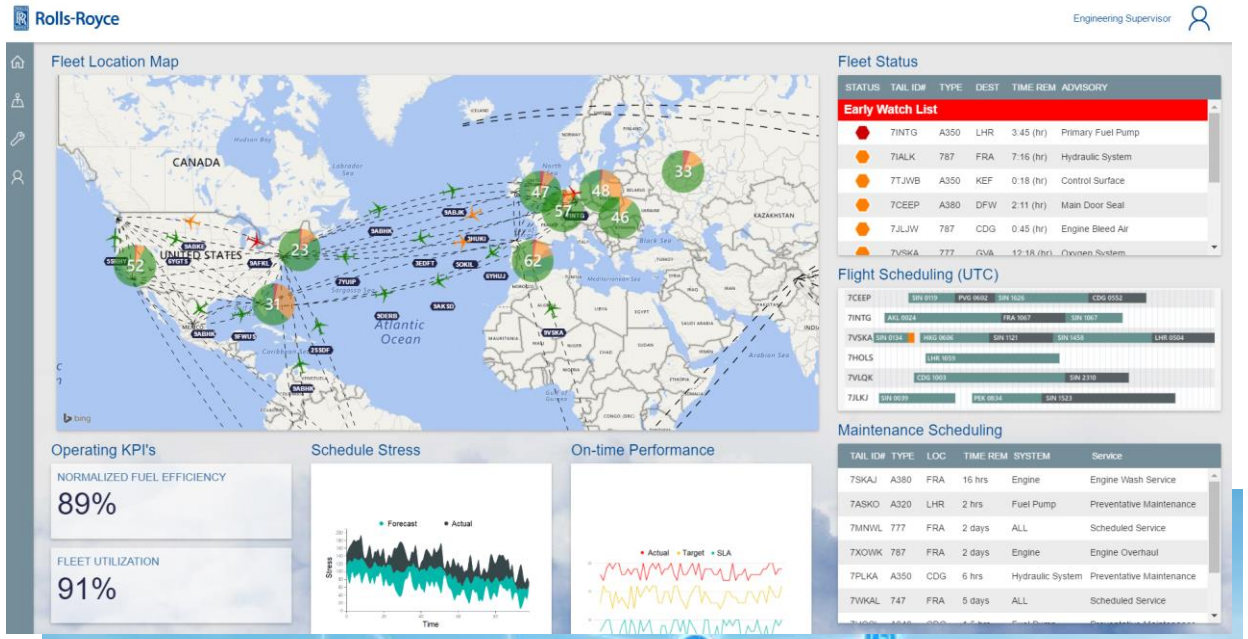
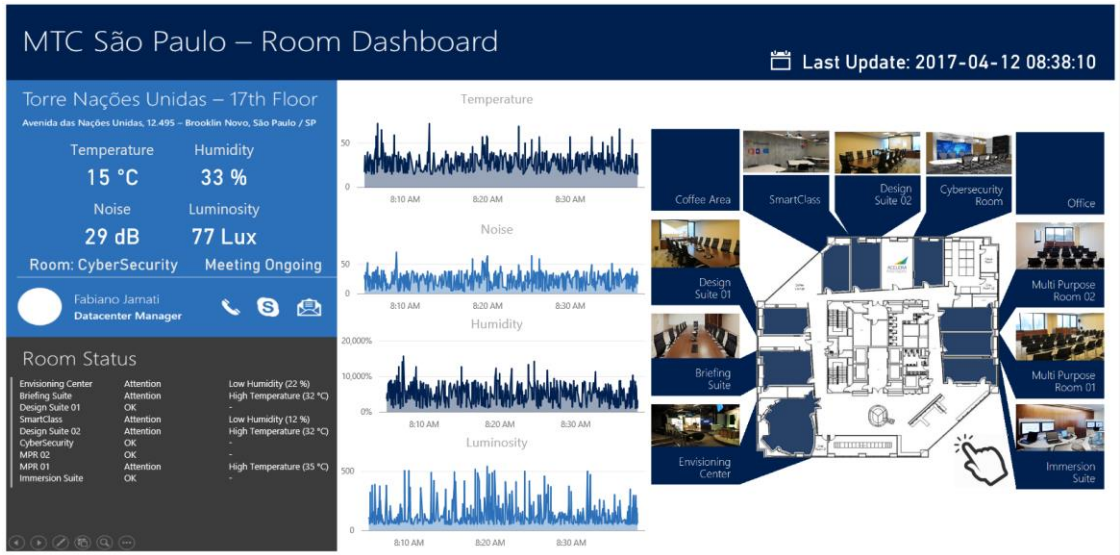
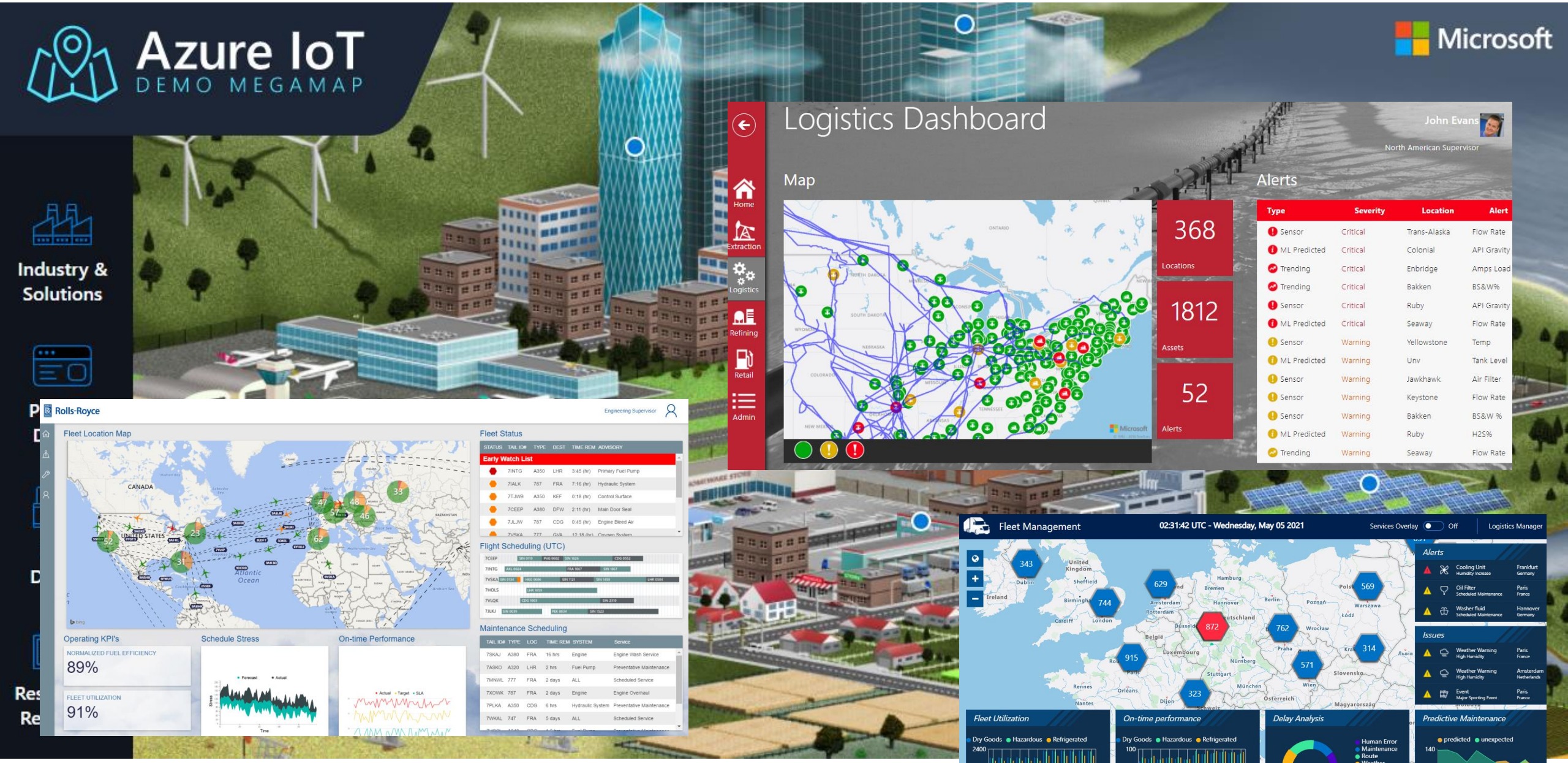
40
20
10
0
-10
J F M A M J J A S O N D
J F M A M J J A S O N D 1 2 3 4 5 6 7 8 9


Rolls-Royce
Engineering Supervisor
Fleet Location Map
CANADA
UNITED STATES
Atlantic Ocean
Fleet Status
STATUS TAIL ID# TYPE DEST TIME REM ADVISORY
Early Watch List
7INTG A350 LHR 3:45 (hr) Primary Fuel Pump
7IALK 787 FRA 7:16 (hr) Hydraulic System
7TJWB A350 KEF 0:18 (hr) Control Surface
7CEEP A380 DFW 2:11 (hr) Main Door Seal
7JLJW 787 CDG 0:45 (hr) Engine Bleed Air
Flight Scheduling (UTC)
Maintenance Scheduling
TAIL ID# TYPE LOC TIME REM SYSTEM Service
7SKAJ A380 FRA 16 hrs Engine Engine Wash Service
7ASKO A320 LHR 2 hrs Fuel Pump Preventative Maintenance
7MNWL 777 FRA 2 days ALL Scheduled Service
7XOWK 787 FRA 2 days Engine Engine Overhaul
7PLKA A350 CDG 6 hrs Hydraulic System Preventative Maintenance
7WKAL 747 FRA 5 days ALL Scheduled Service
Operating KPI's
NORMALIZED FUEL EFFICIENCY
89%
FLEET UTILIZATION
91%
Schedule Stress
Forecast
Actual
Stress
Time
On-time Performance
Actual
Target
SLA


MTC São Paulo – Room Dashboard
Last Update: 2017-04-12 08:38:10
Torre Nações Unidas – 17th Floor
Avenida das Nações Unidas, 12.495 – Brooklin Novo, São Paulo / SP
Temperature
15 °C
Humidity
33 %
Noise
29 dB
Luminosity
77 Lux
Room: CyberSecurity
Meeting Ongoing
Fabiano Jamati
Datacenter Manager
Room Status
Envisioning Center Attention Low Humidity (22 %)
Briefing Suite Attention High Temperature (32 °C)
Design Suite 01 OK -
SmartClass Attention Low Humidity (12 %)
Design Suite 02 Attention High Temperature (32 °C)
CyberSecurity OK -
MPR 02 OK -
MPR 01 Attention High Temperature (35 °C)
Immersion Suite OK -
Temperature
Noise
Humidity
Luminosity
8:10 AM
8:20 AM
8:30 AM
Coffee Area
SmartClass
Design Suite 02
Cybersecurity Room
Office
Design Suite 01
Multi Purpose Room 02
Briefing Suite
Multi Purpose Room 01
Envisioning Center
Immersion Suite


Logistics


Azure IoT
DEMO MEGAMAP
Microsoft
Industry & Solutions
Logistics Dashboard
John Evans
North American Supervisor
Map
Alerts
Home
Extraction
Logistics
Refining
Retail
Admin
368
Locations
1812
Assets
52
Alerts
Type
Severity
Location
Alert
Sensor Critical Trans-Alaska Flow Rate
ML Predicted Critical Colonial API Gravity
Trending Critical Enbridge Amps Load
Trending Critical Bakken BS&W%
Sensor Critical Ruby API Gravity
ML Predicted Critical Seaway Flow Rate
Sensor Warning Yellowstone Temp
ML Predicted Warning Unv Tank Level
Sensor Warning Jawkhawk Air Filter
Sensor Warning Keystone Flow Rate
Sensor Warning Bakken BS&W %
ML Predicted Warning Ruby H2S%
Trending Warning Seaway Flow Rate
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Maintenance Scheduling
Operating KPI's
NORMALIZED FUEL EFFICIENCY
89%
FLEET UTILIZATION
91%
Schedule Stress
On-time Performance
Fleet Management
02:31:42 UTC - Wednesday, May 05 2021
Services Overlay
Off
Logistics Manager
Alerts
Issues
Fleet Utilization
On-time performance
Delay Analysis
Predictive Maintenance
Dry Goods
Hazardous
Refrigerated
Human Error
Maintenance
Route
Weather
Traffic
predicted
unexpected

Um projeto de IOT pode ser complexo

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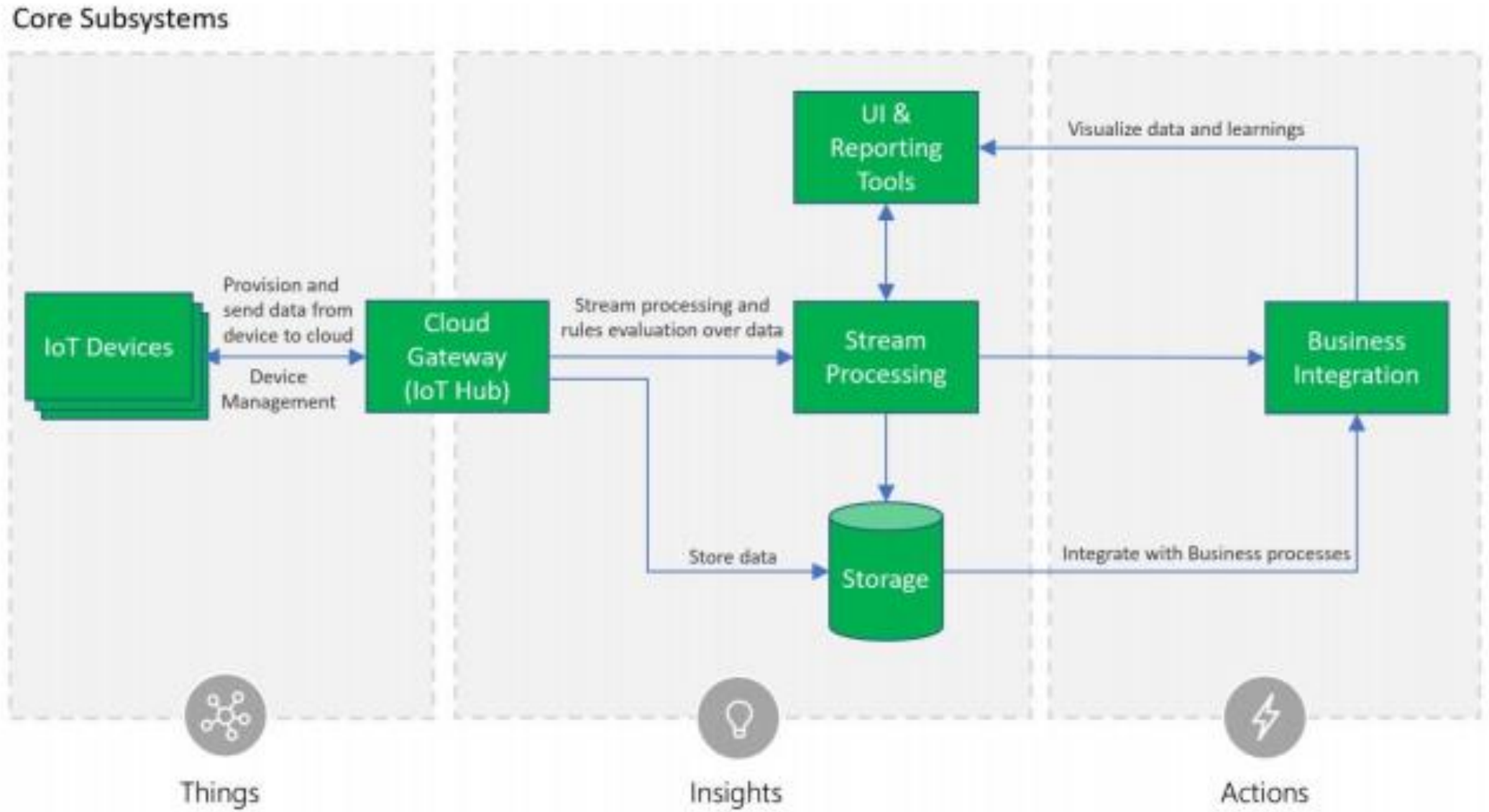

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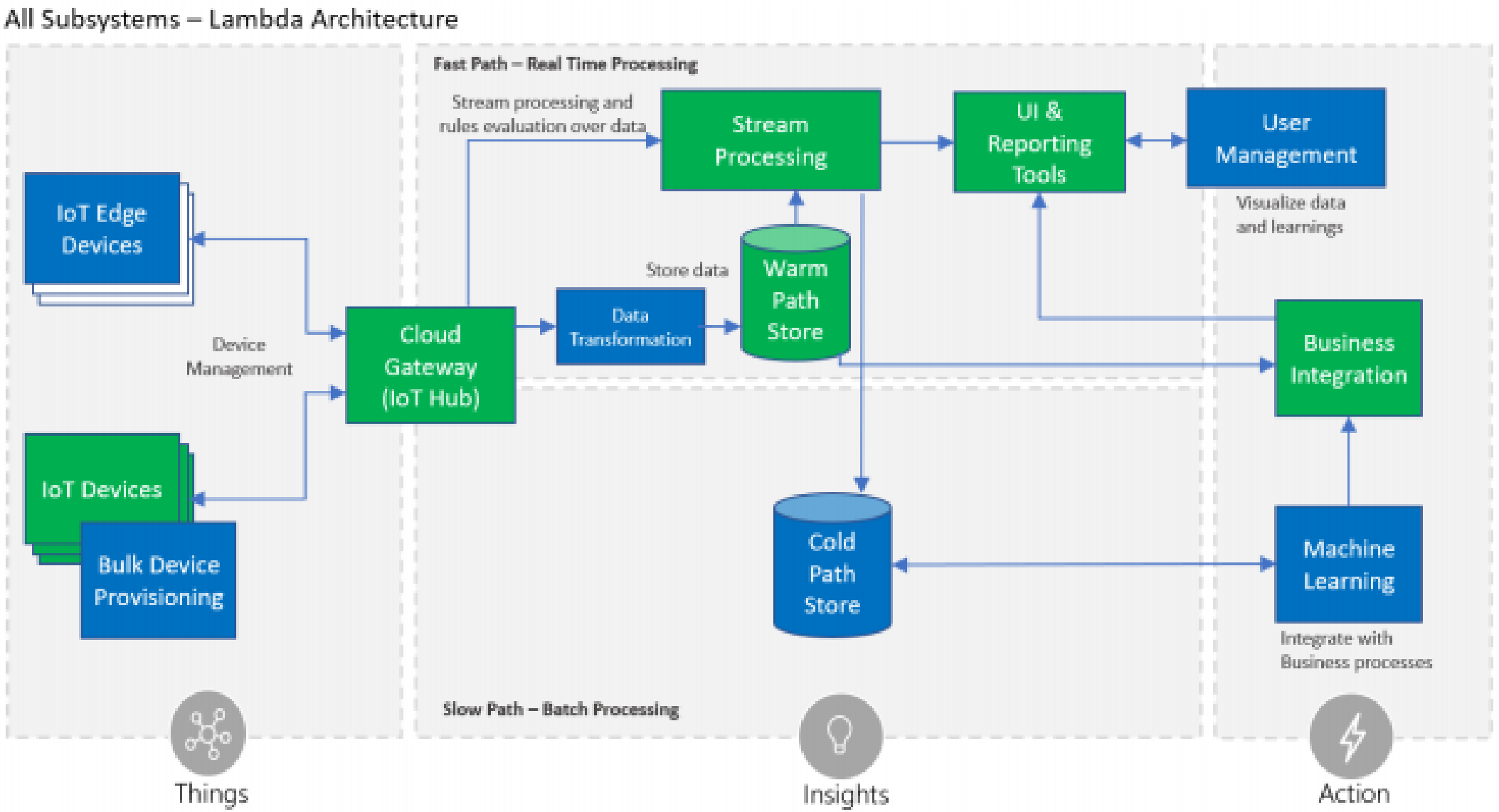
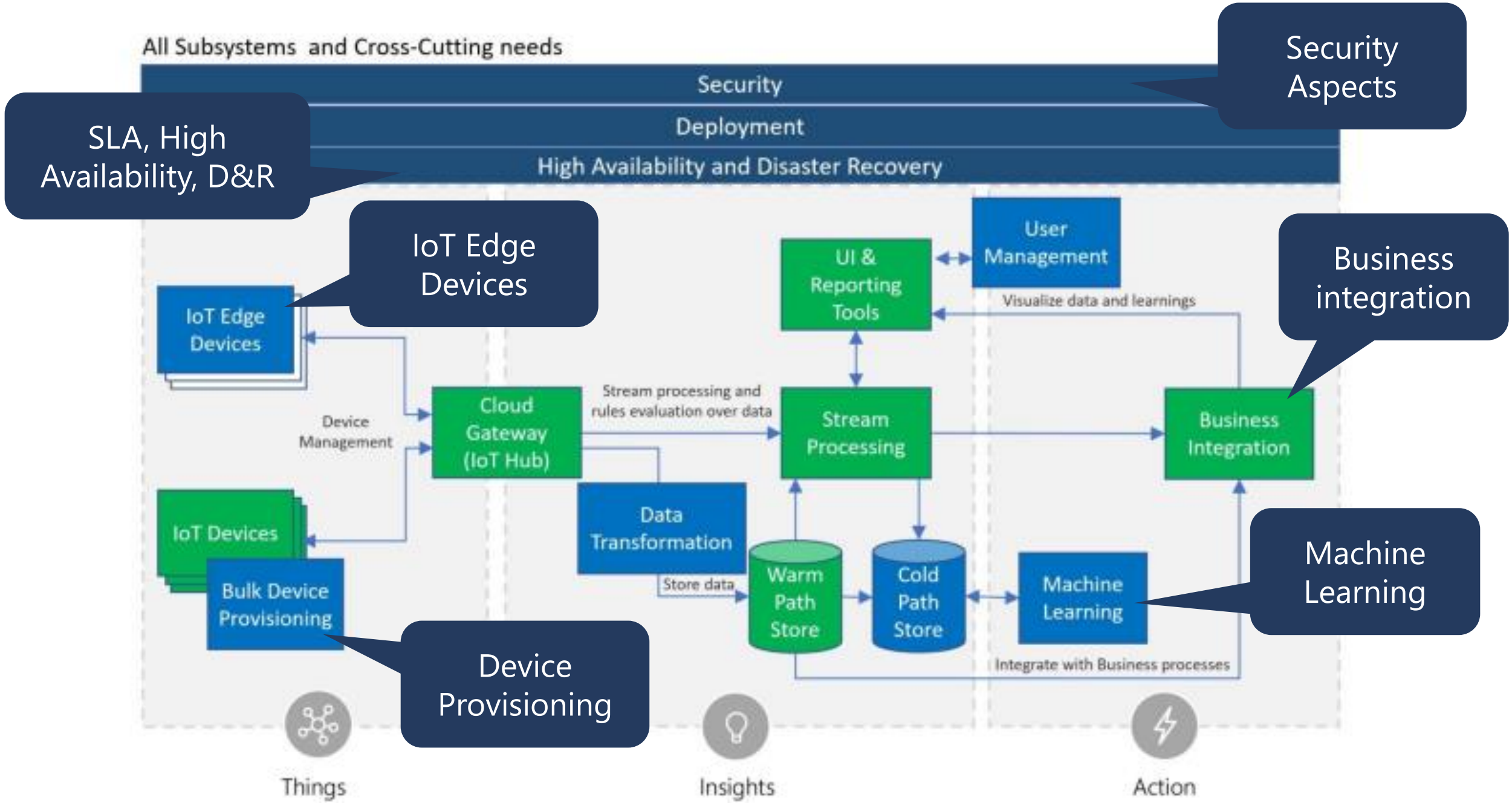
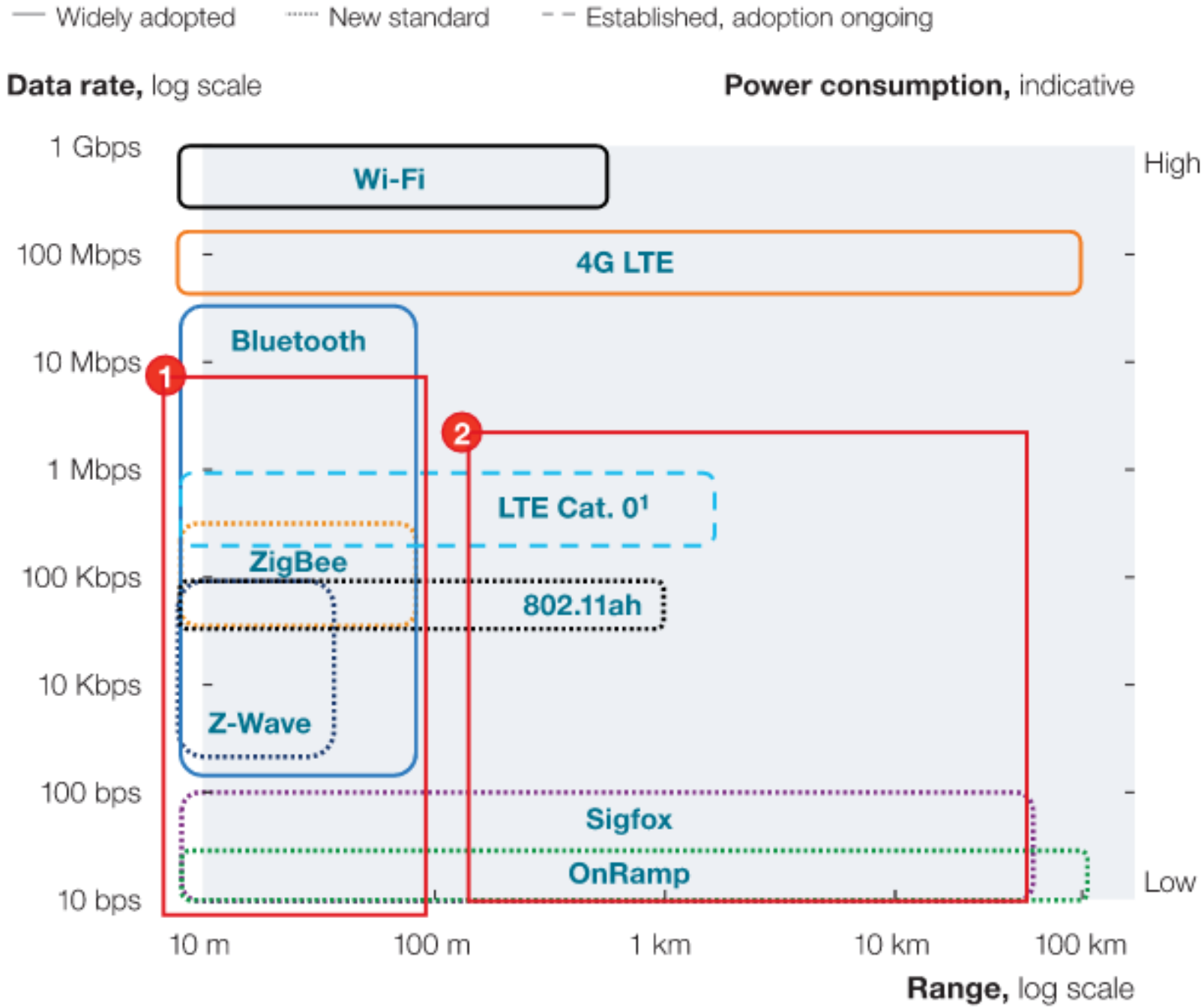



All Subsystems and Cross-Cutting needs
Security
Deployment
High Availability and Disaster Recovery
Security Aspects
SLA, High Availability, D&R
IoT Edge Devices
IoT Edge Devices
User Management
UI & Reporting Tools
Visualize data and learnings
Business integration
Device Management
Cloud Gateway (IoT Hub)
Stream processing and rules evaluation over data
Stream Processing
Business Integration
IoT Devices
Data Transformation
Store data
Warm Path Store
Cold Path Store
Machine Learning
Machine Learning
Bulk Device Provisioning
Integrate with Business processes
Device Provisioning
Things
Insights
Action

Conectividade

1. Many competing standards for low-range, medium-low data rate hinder growth for many IoT applications
   - Interoperability missing
   - Consortia wars might be emerging
   - Additional incompatibilities in higher communication layers, eg, 6LoWPAN vs ZigBee

2. Standard white space for low-data-rate, low-power, high-range applications such as smart grid
   - Wi-Fi and LTE have high power consumption
   - Alternatives with low power and wide range (eg, LTE Cat. 0, 802.11ah, Sigfox, and OnRamp) are in very early stages and compete against each other

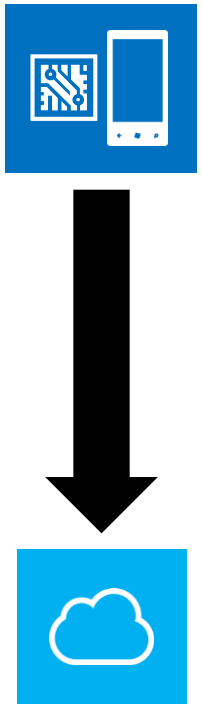


Microsoft Azure IoT Reference Architecture

https://download.microsoft.com/download/A/4/D/A4DAD253-BC21-41D3-B9D9-87D2AE6F0719/Microsoft_Azure_IoT_Reference_Architecture.pdf

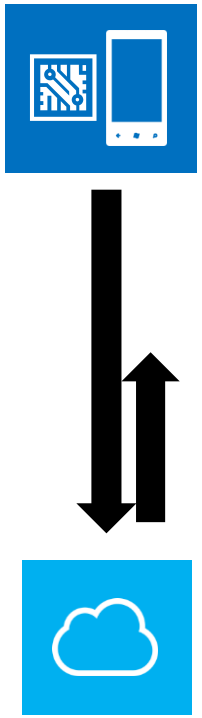
Contents

Exemplos de mensagens para IOT



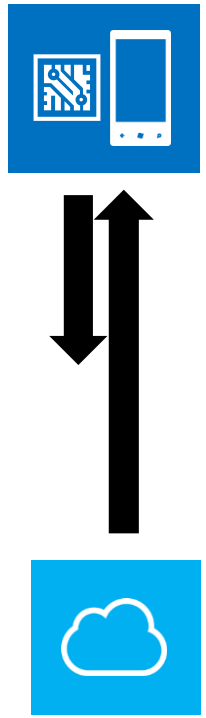
Telemetria

Captura de dados do ambiente a partir do dispositivo para outros sistemas, gerando alertas, telemetria, monitoração



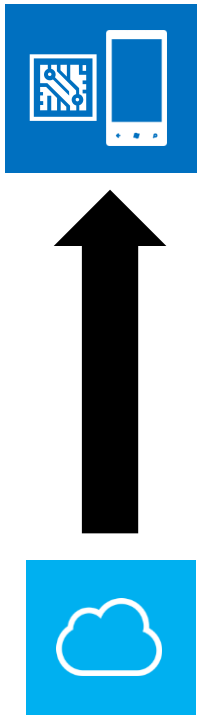
Consultas

Solicitações a partir do dispositivos para disparo de ações, sinalização ou mudança de estados



Comandos

Comandos de outros sistemas para um dispositivo para disparo de tarefas a partir de triggers ou thresholds de negócio



Notificações

Informações fluindo de outros sistemas para um dispositivo ou grupo de dispositivos para a mudanças de status ou sinalização

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Power BI

Power Apps

Power Automate

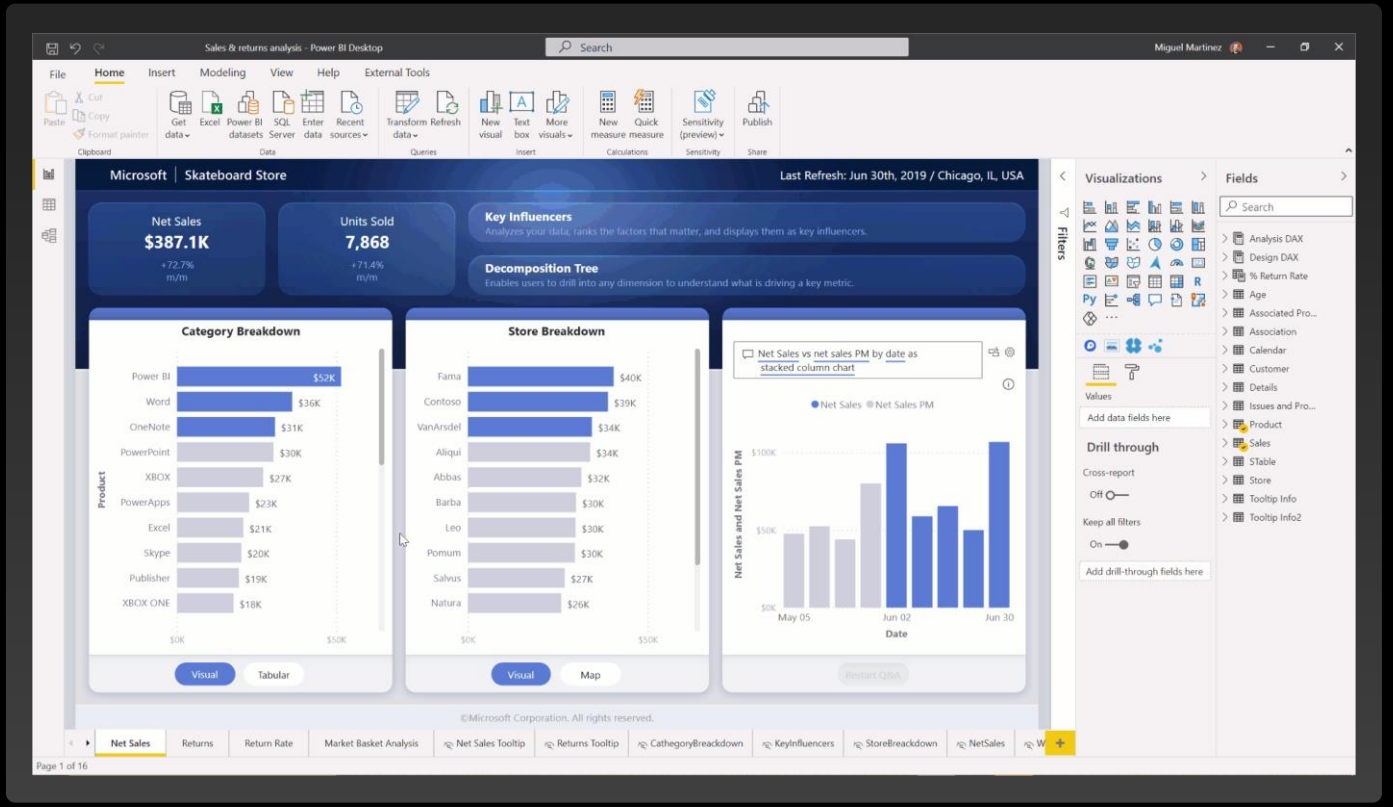
Power Virtual Agents

Power BI

Power Apps

Power Automate

Power Virtual Agents



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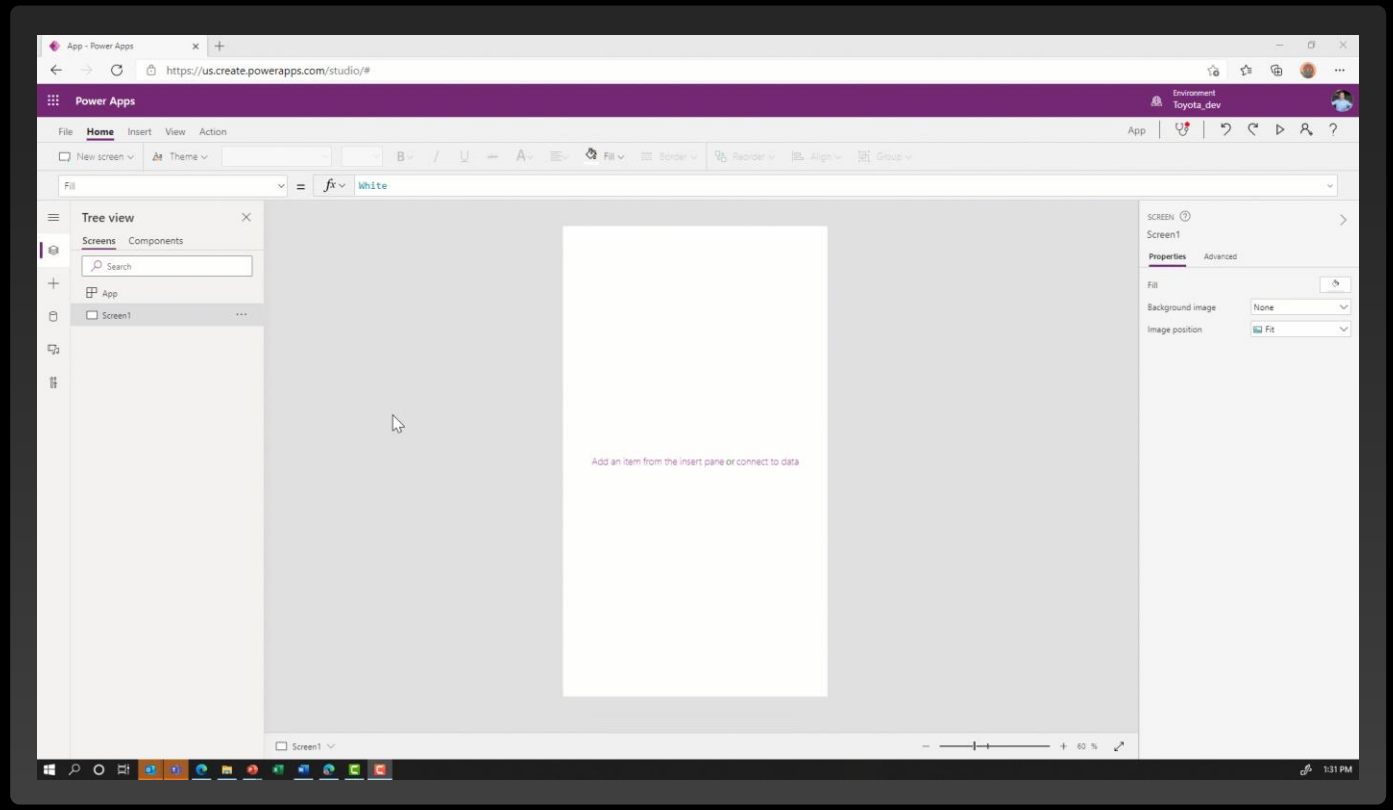

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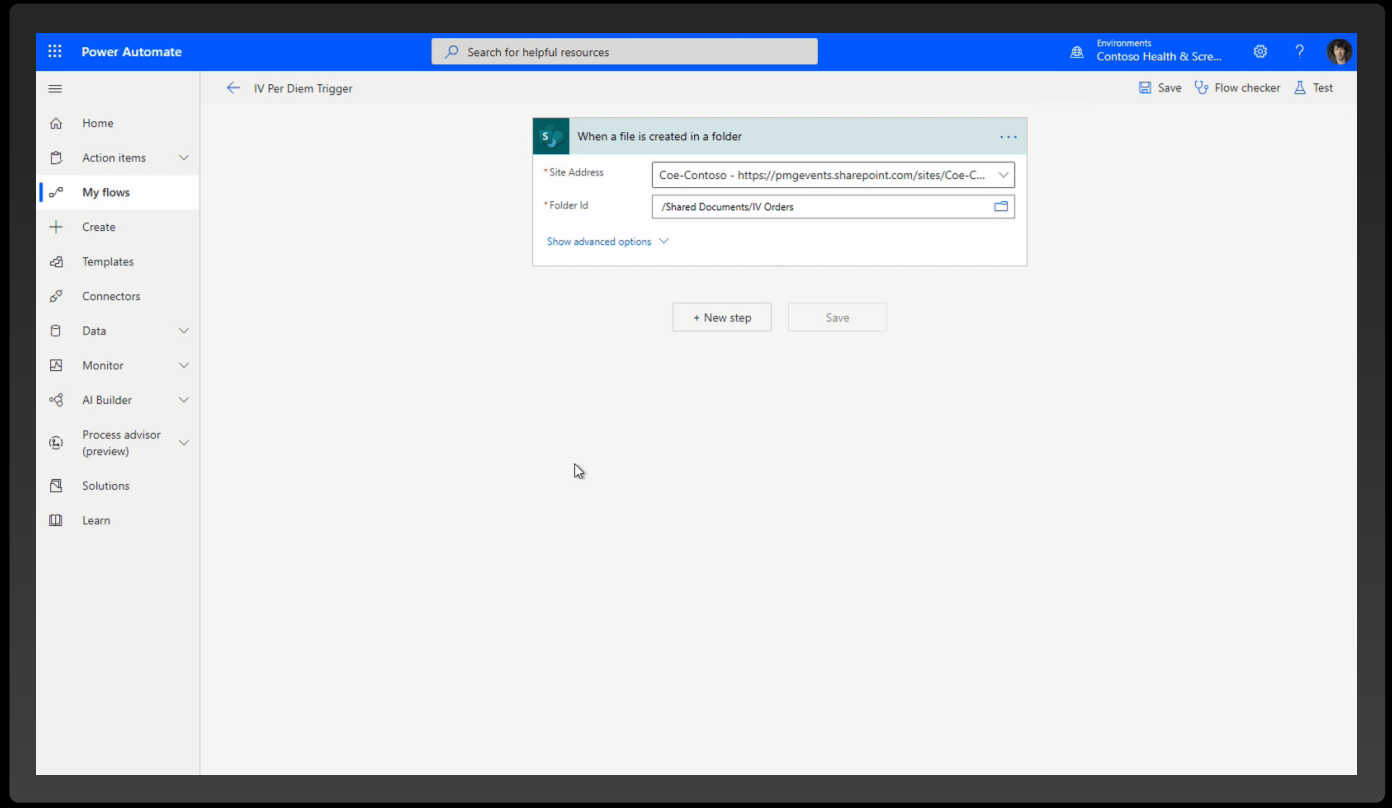

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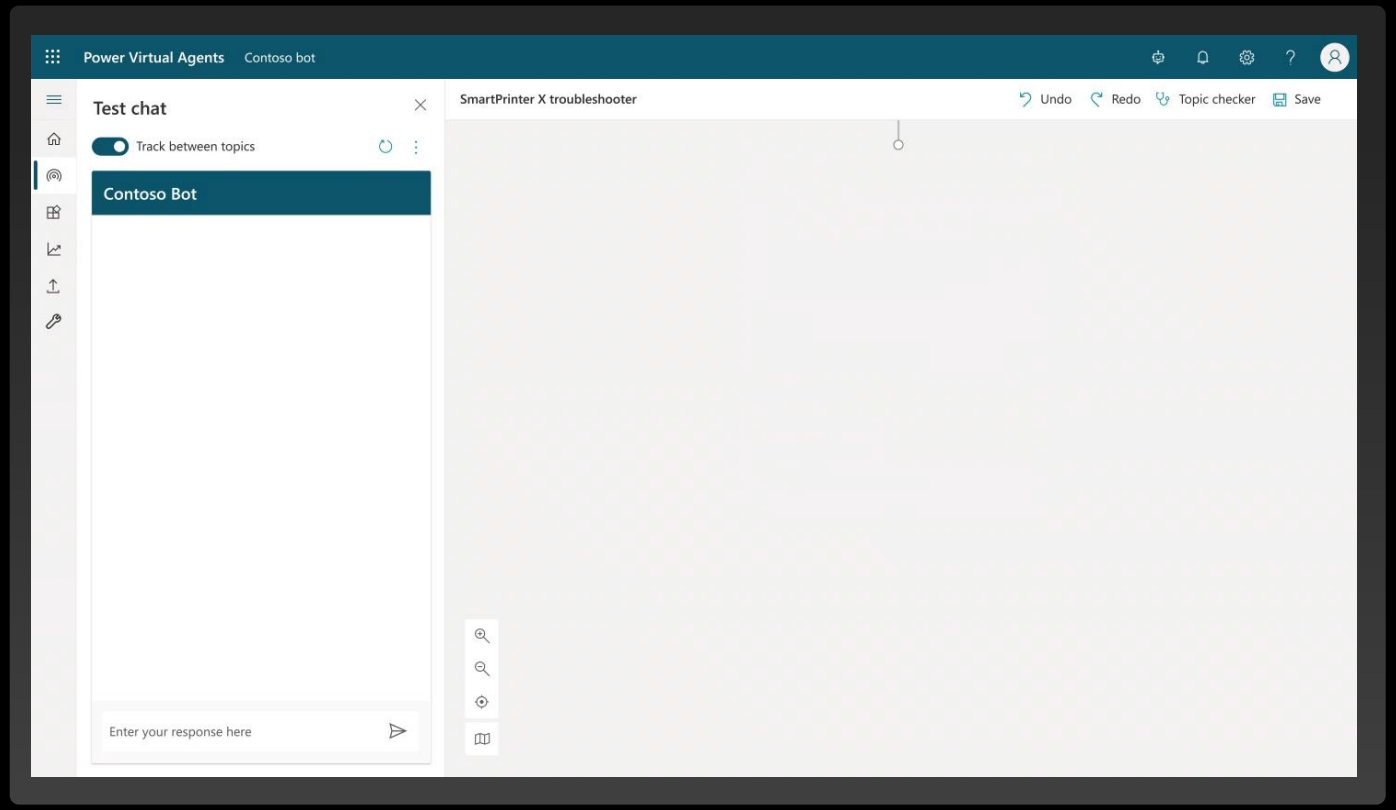
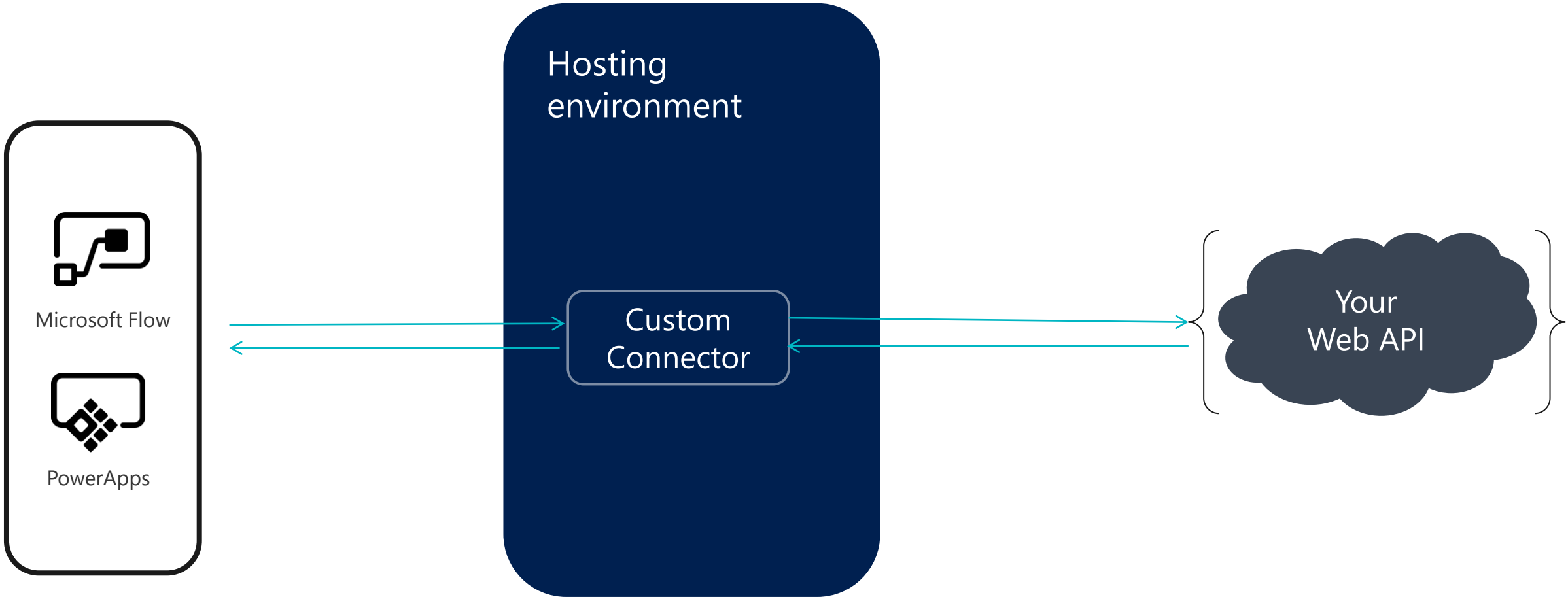


Conectores

+450 conectores

(incluindo on-prem)

Extendendo a plataforma



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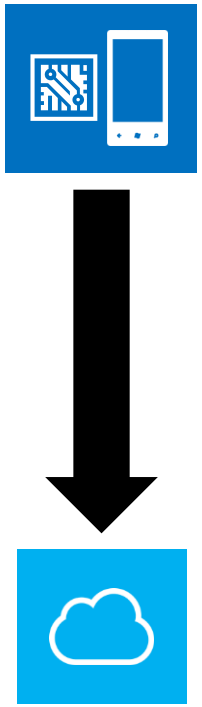

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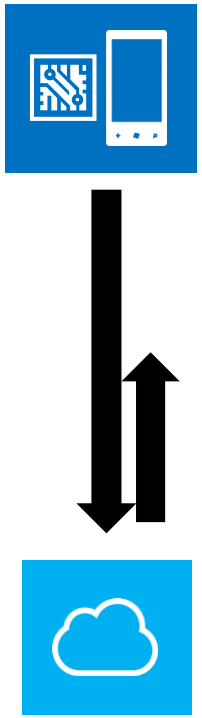

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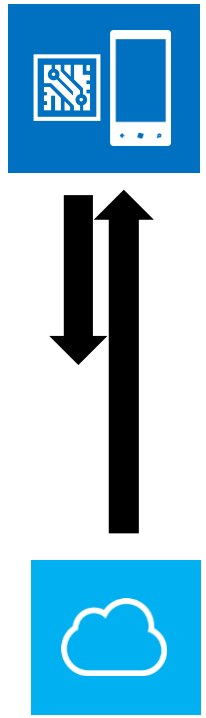

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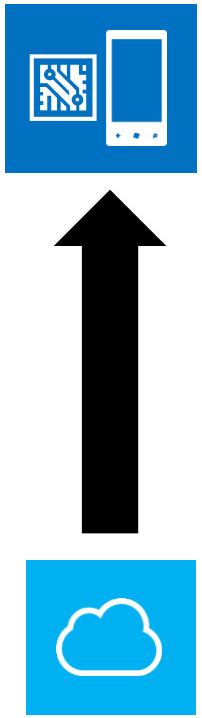

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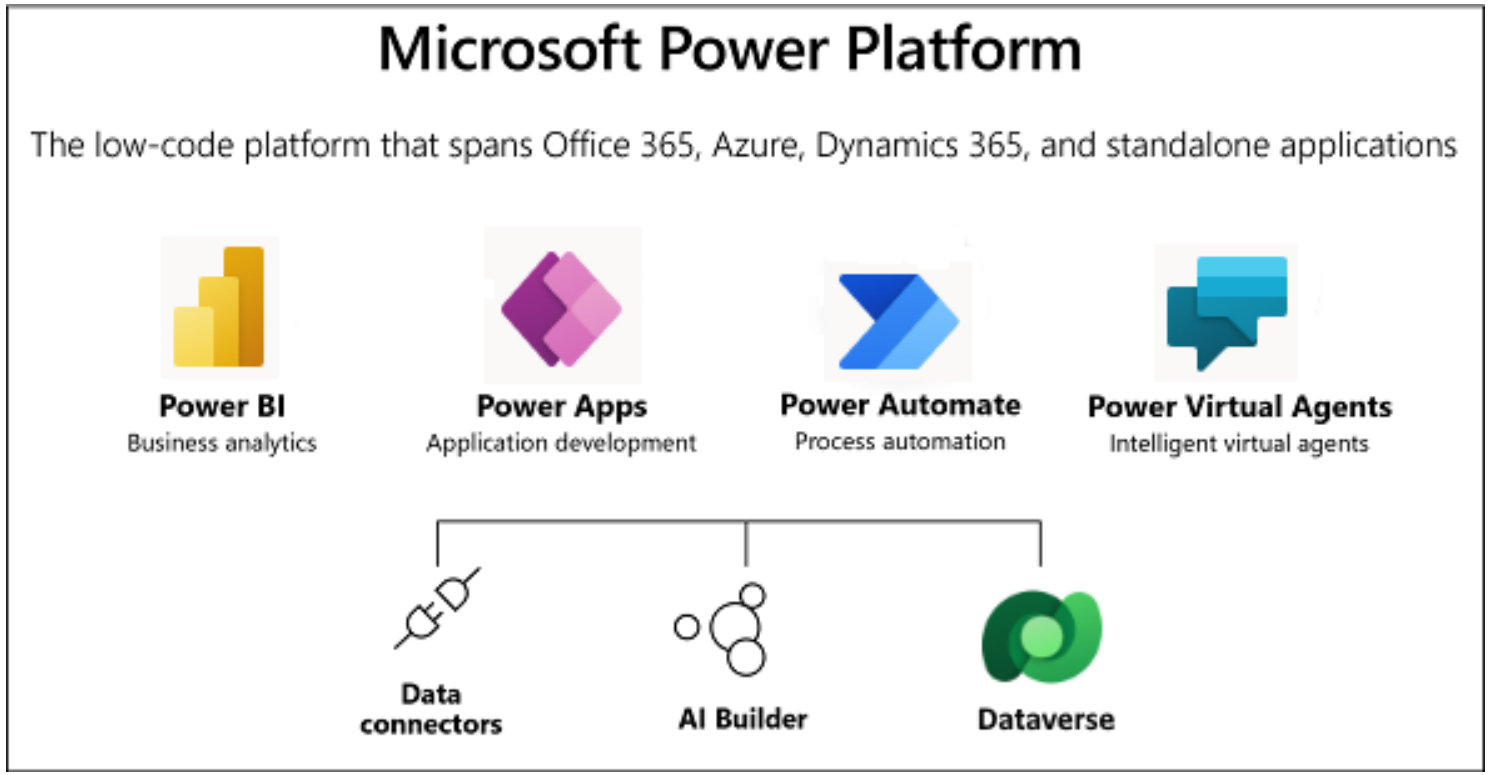
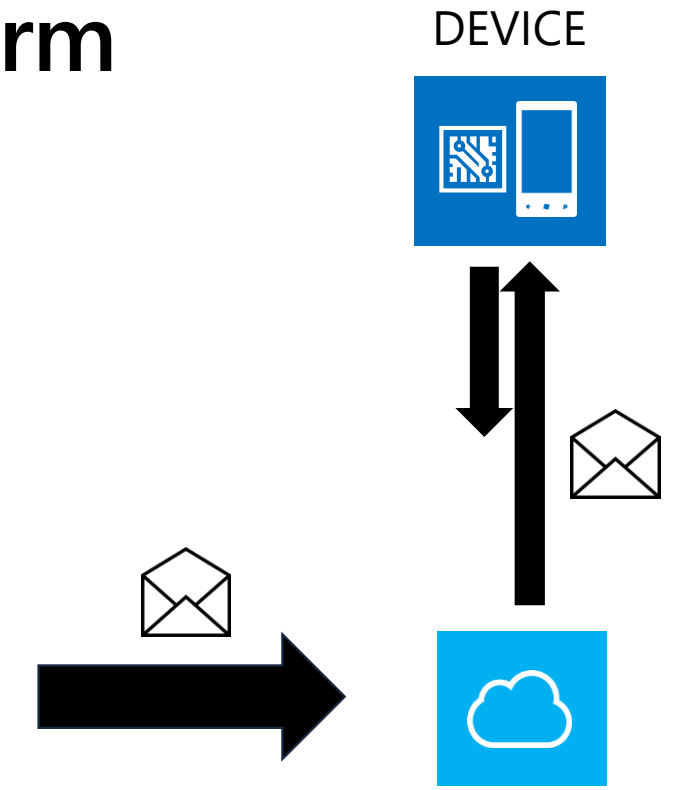
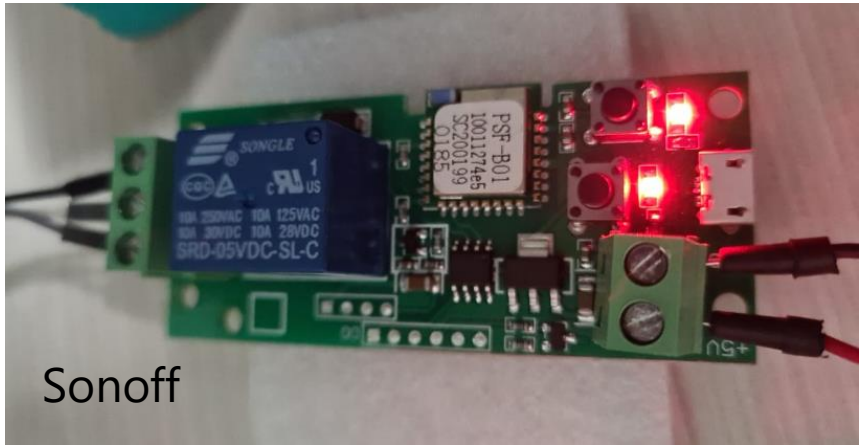
Uma demo de comando a partir de um trigger de negócio disparado via Power Platform

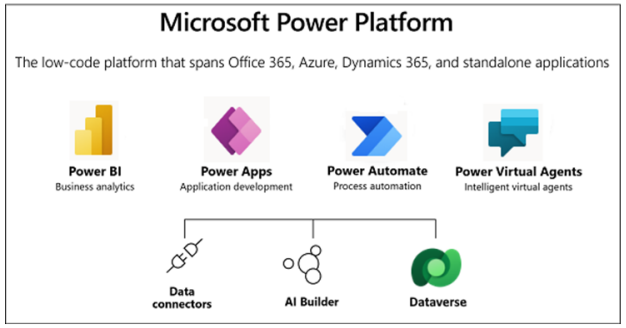


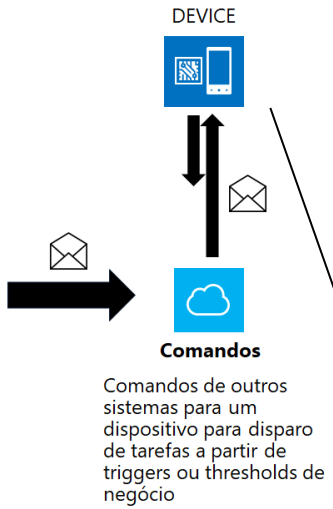


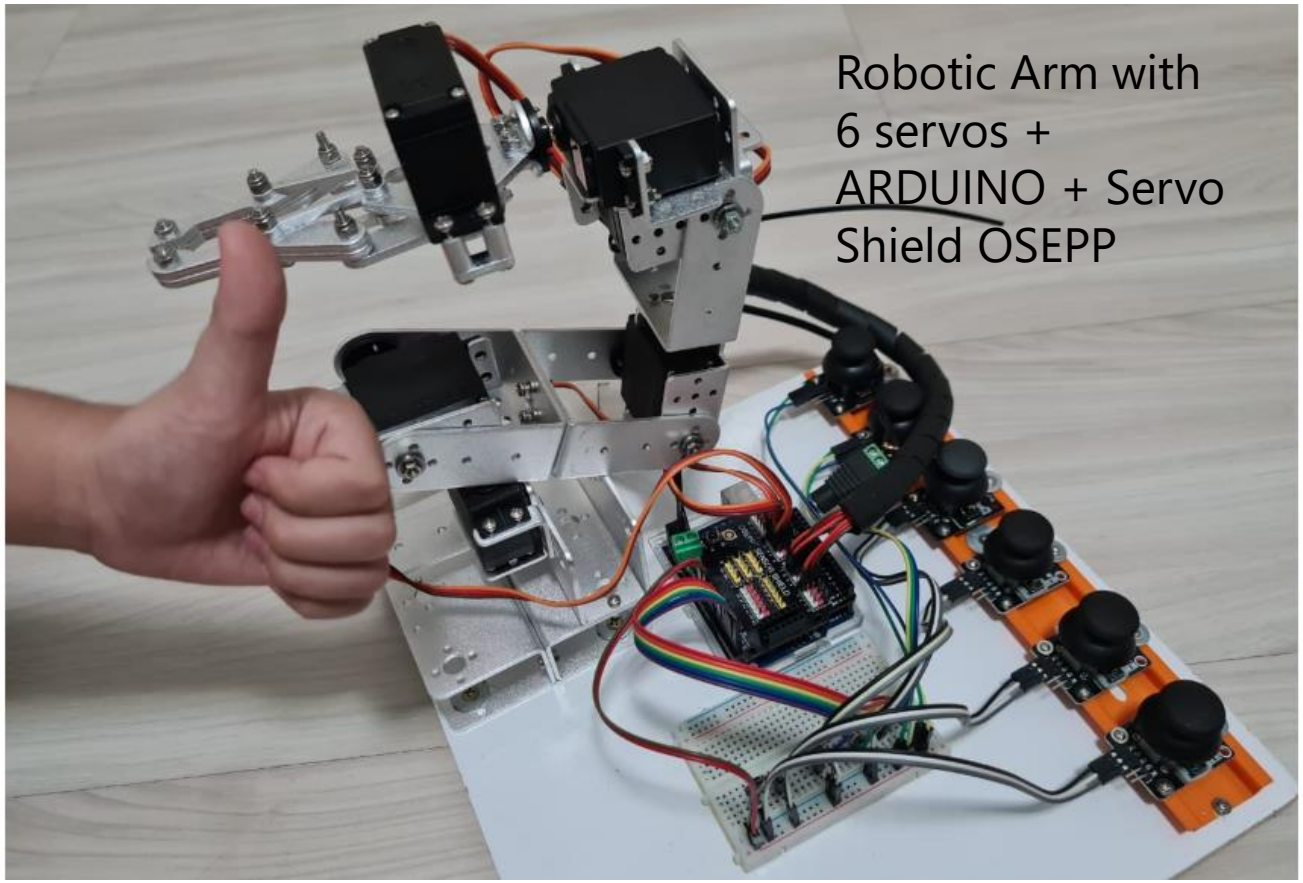
Comandos de outros sistemas para um dispositivo para disparo de tarefas a partir de triggers ou thresholds de negócio

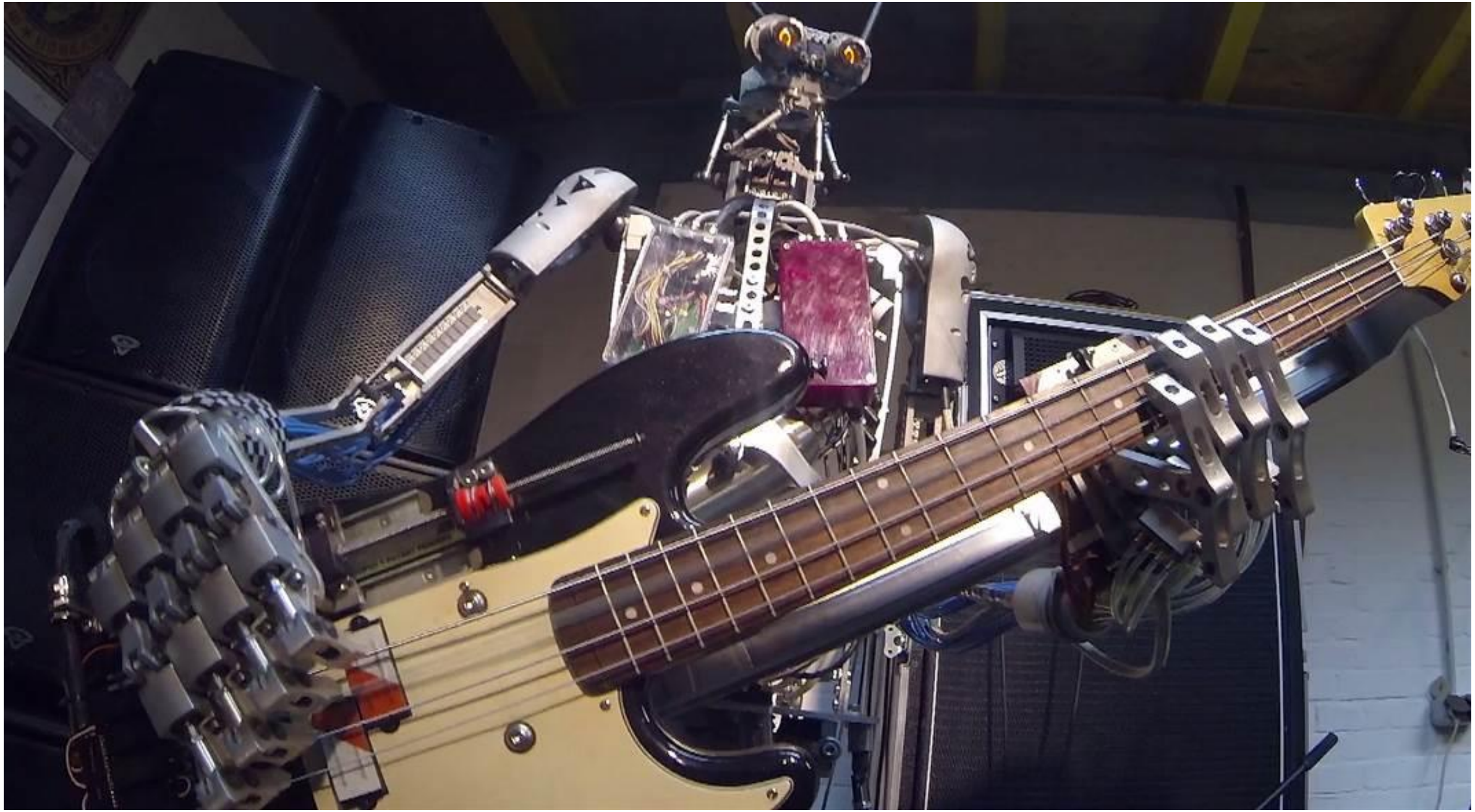
Na ponta, um device conectado via placa de relê wifi SONOFF











Passo 1

- Configuração de um Sonoff Wifi Módulo Relé Dc 5v Função Pulso E Travado, acessando o device via App eWeLink.

eWeLink - Smart Home

CoolKit Technology Estilo de vida

Todos

Você não tem dispositivos

Adicionar à lista de desejos

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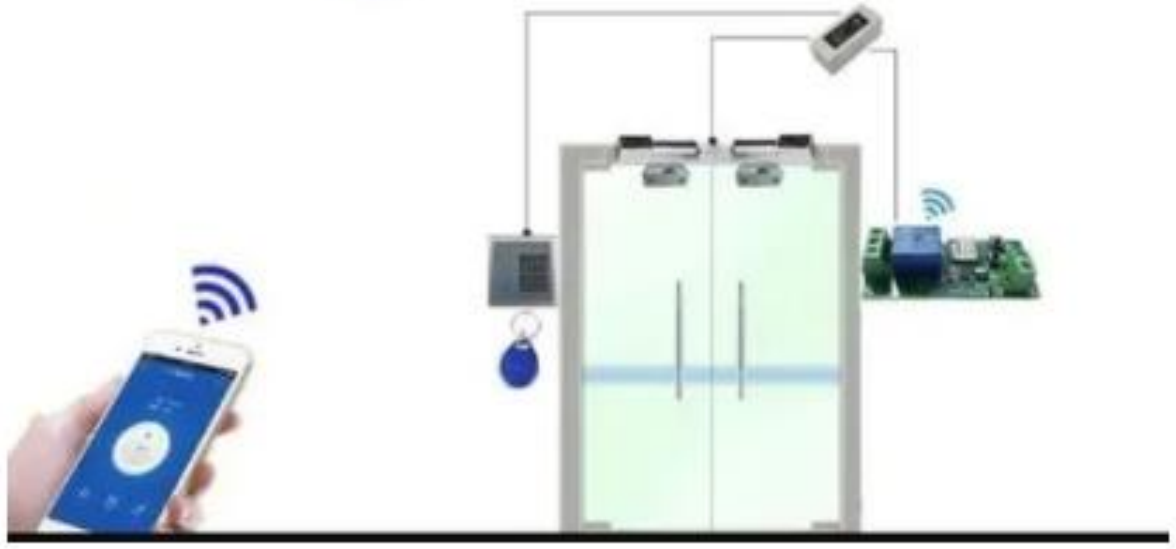

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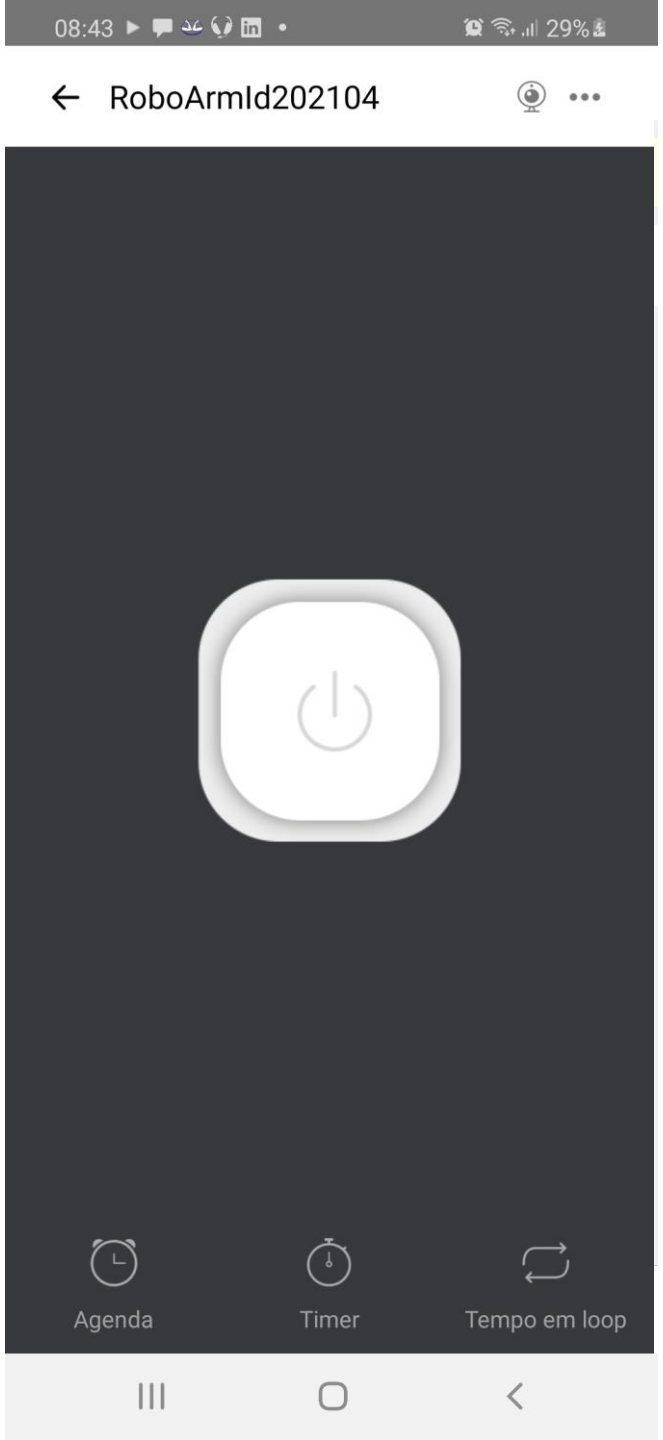
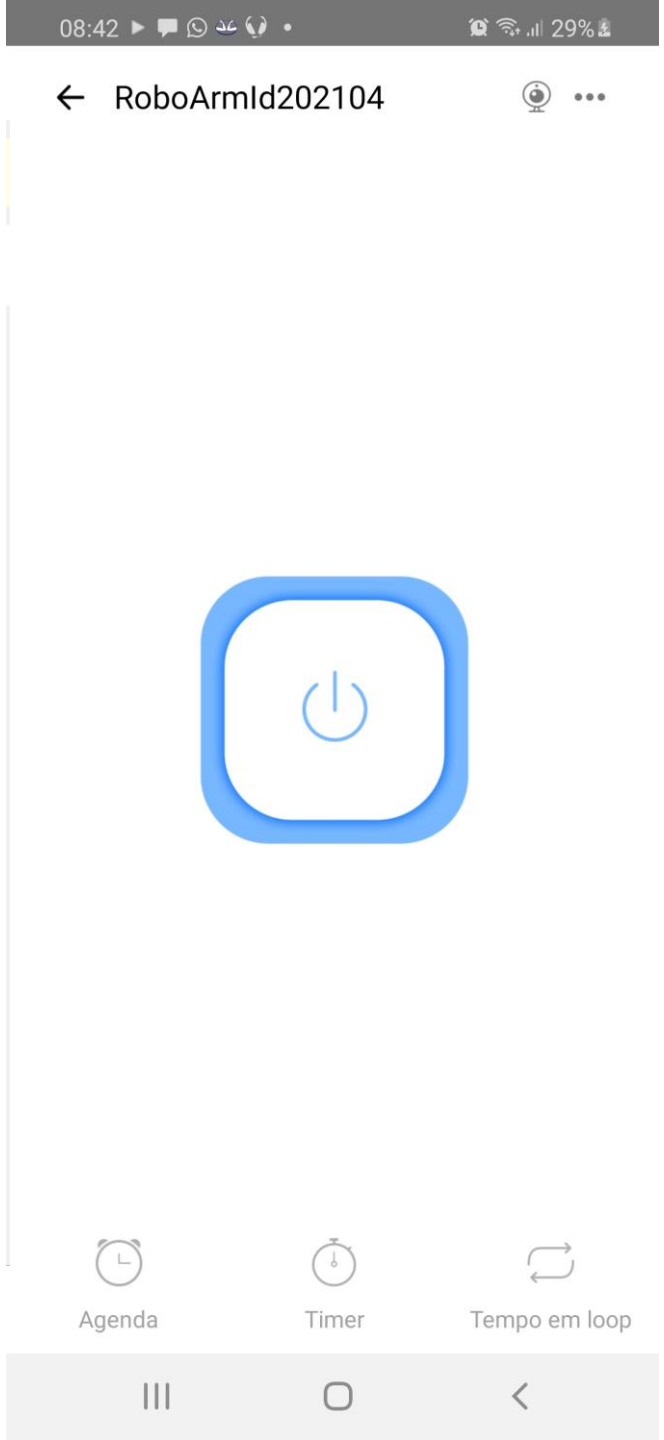


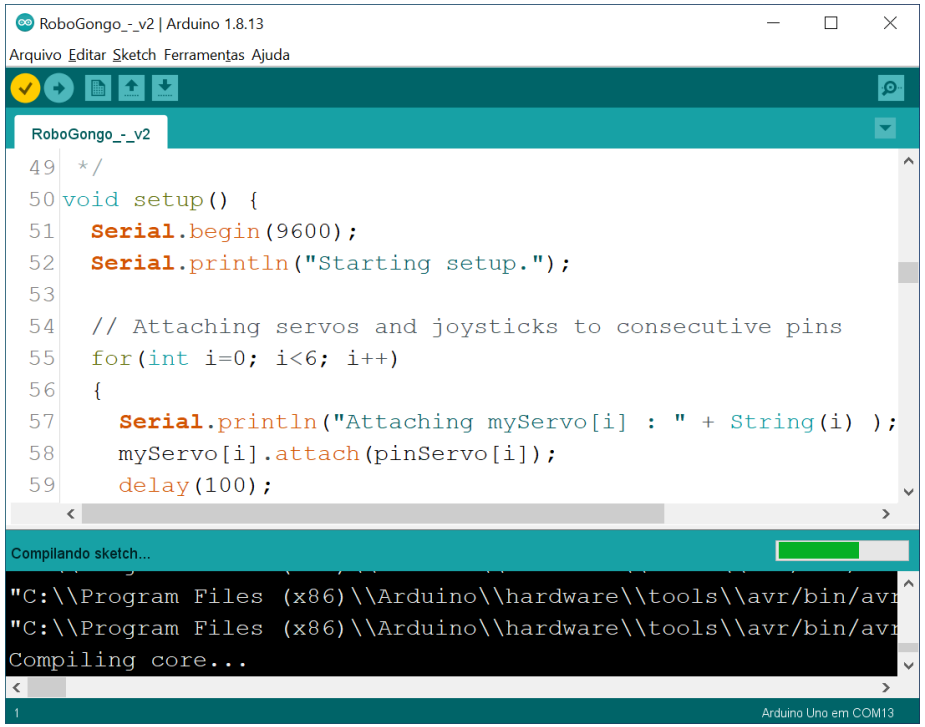


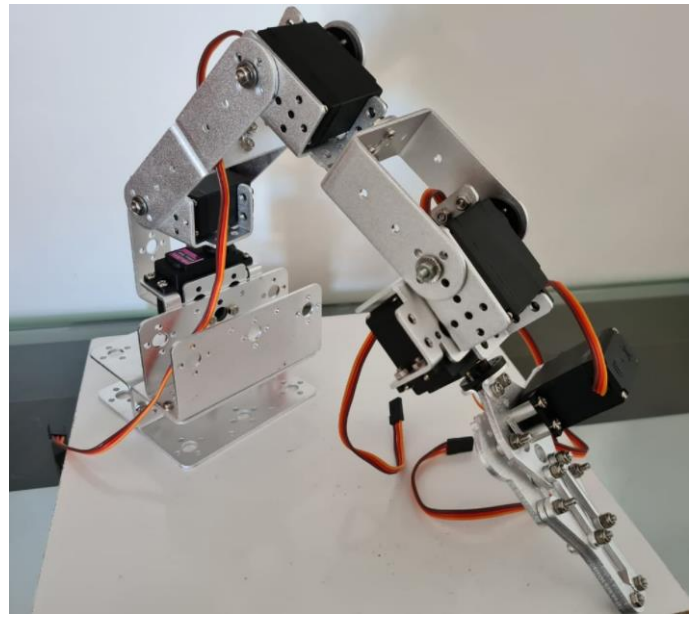
Demo

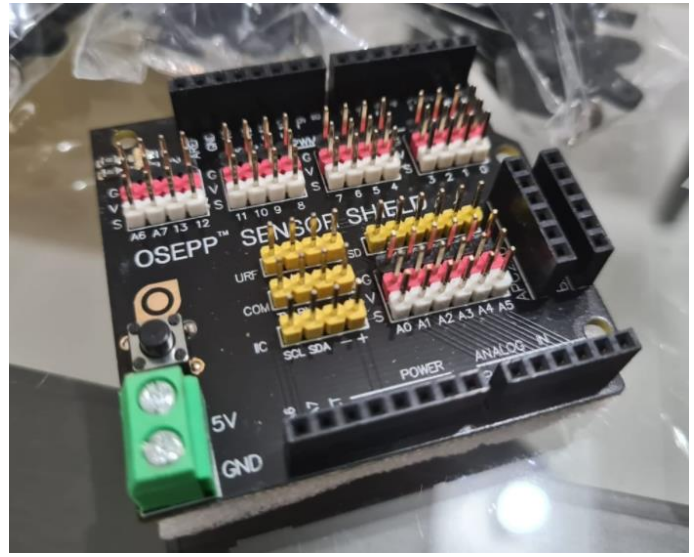
Disparando diversos SONOFFs
a partir do aplicativo eWelink

Passo 2

- Conectar o Sonoff Wifi Módulo Relé Dc 5v Função Pulso E Travado com um protótipo de braço robótico de 6 servos MG996-R controlados por Arduino UNO R3, com sensor shield OSEPP







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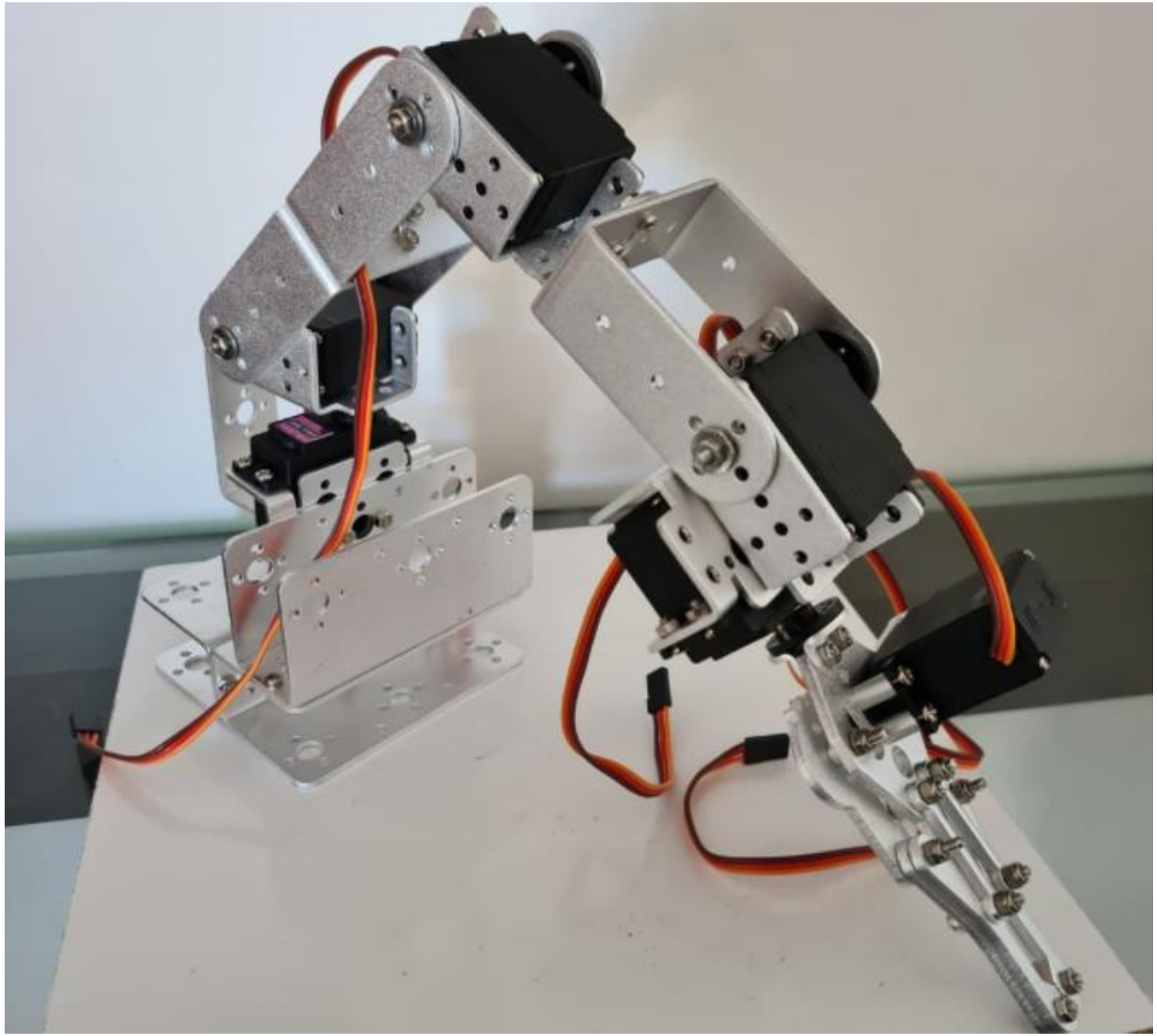
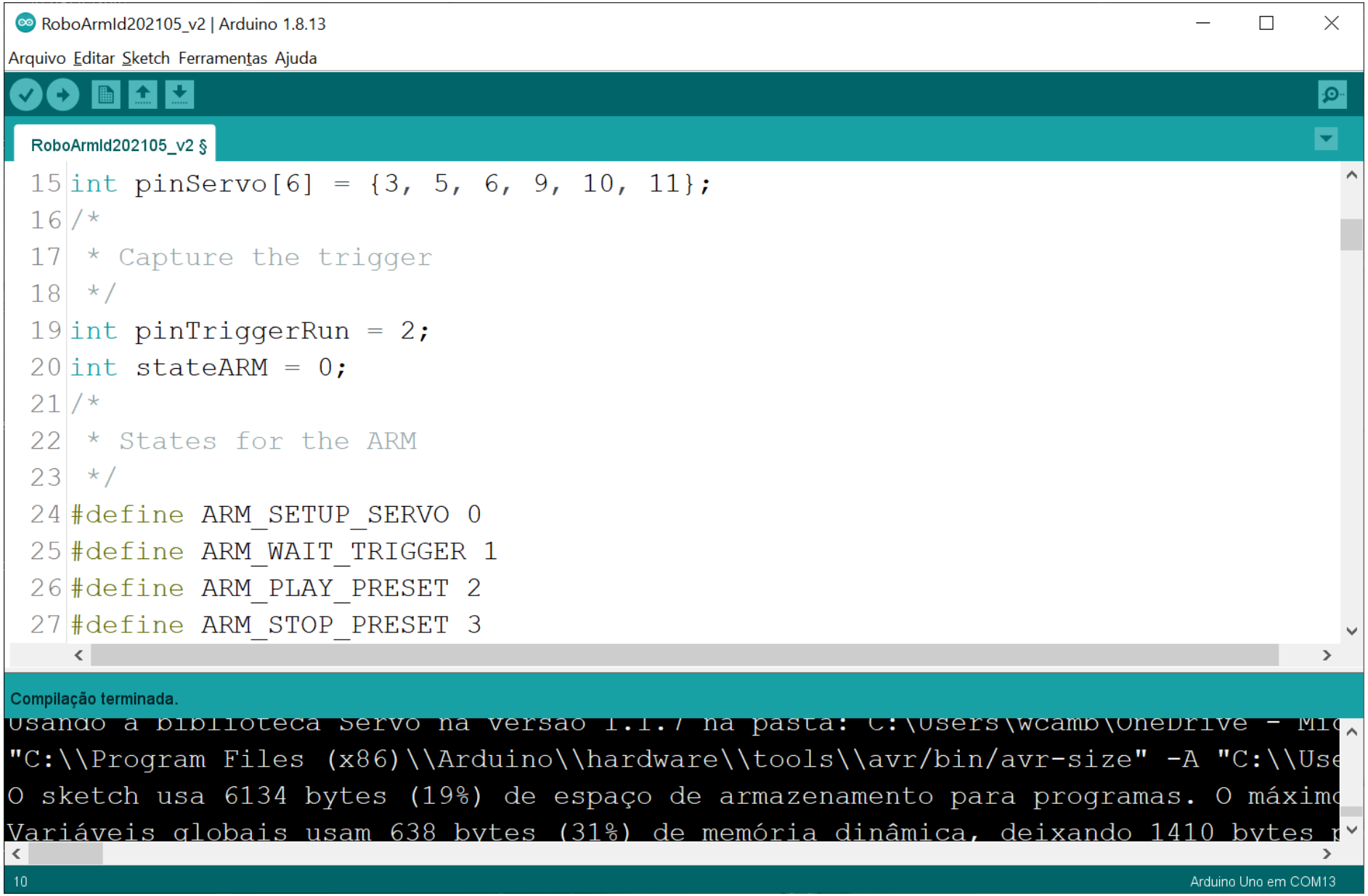


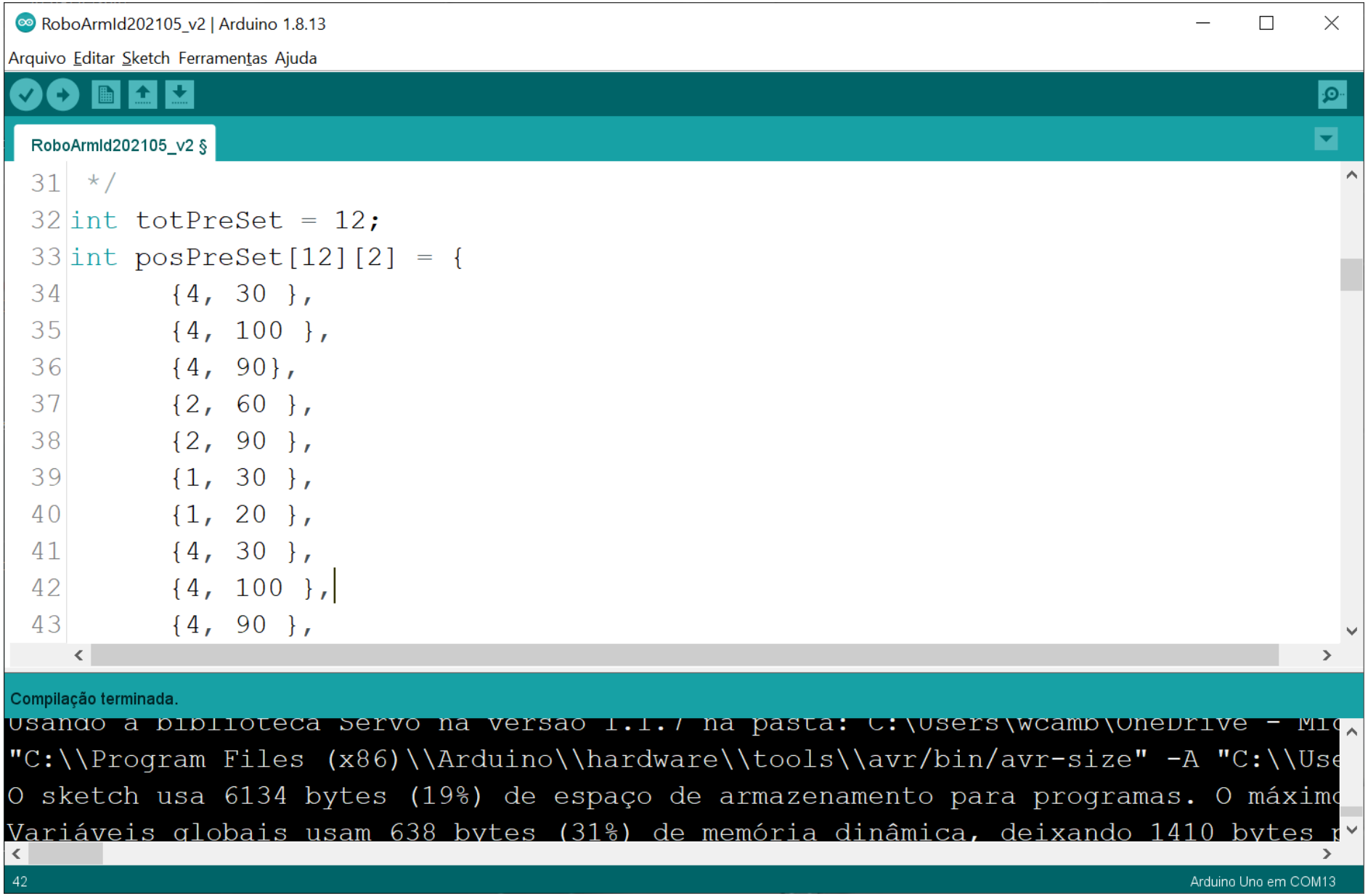
Passo 2

- Exemplo de código com máquina de estados.



Passo 2

- Movendo os servos com um preset de posições



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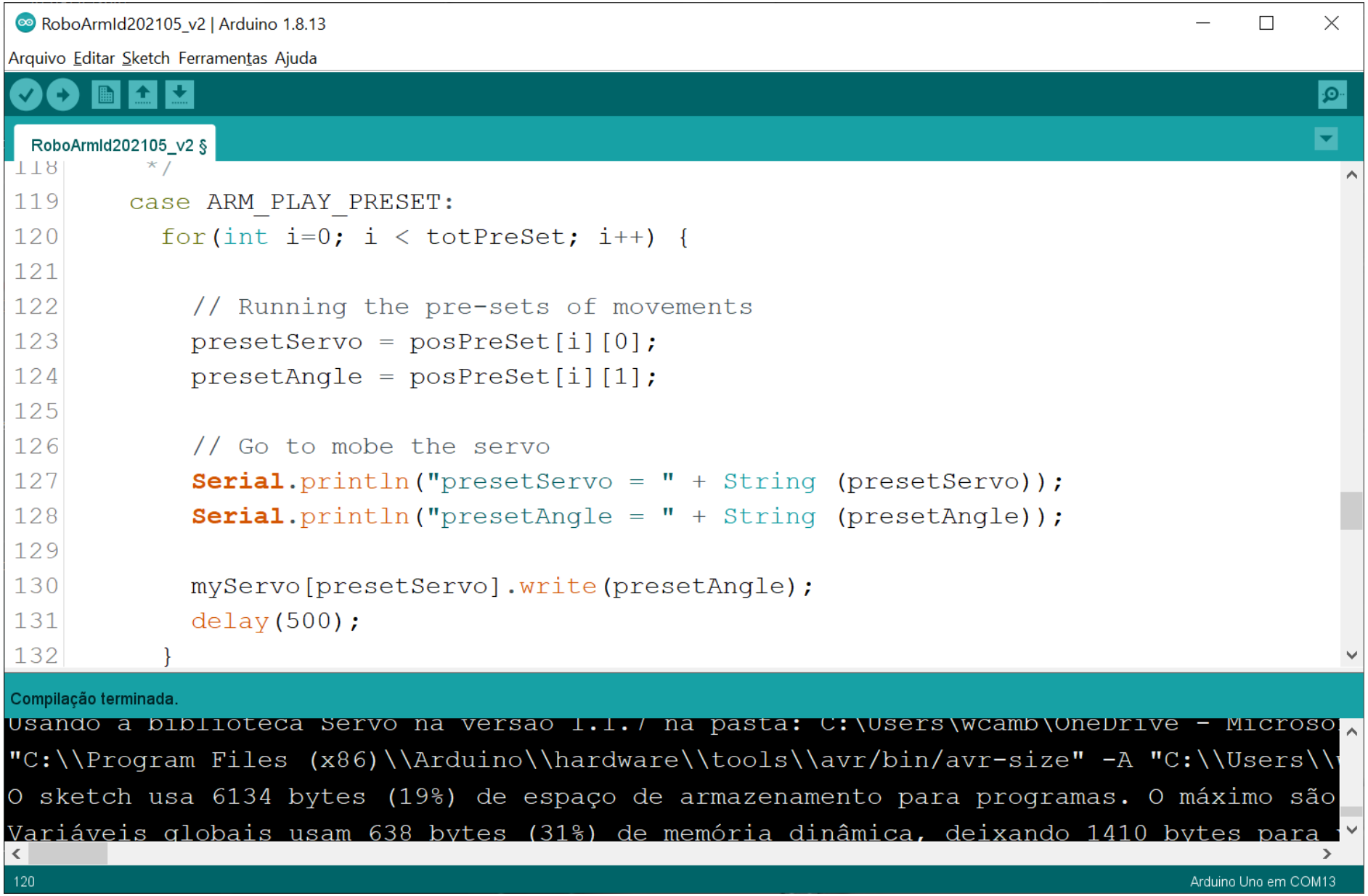

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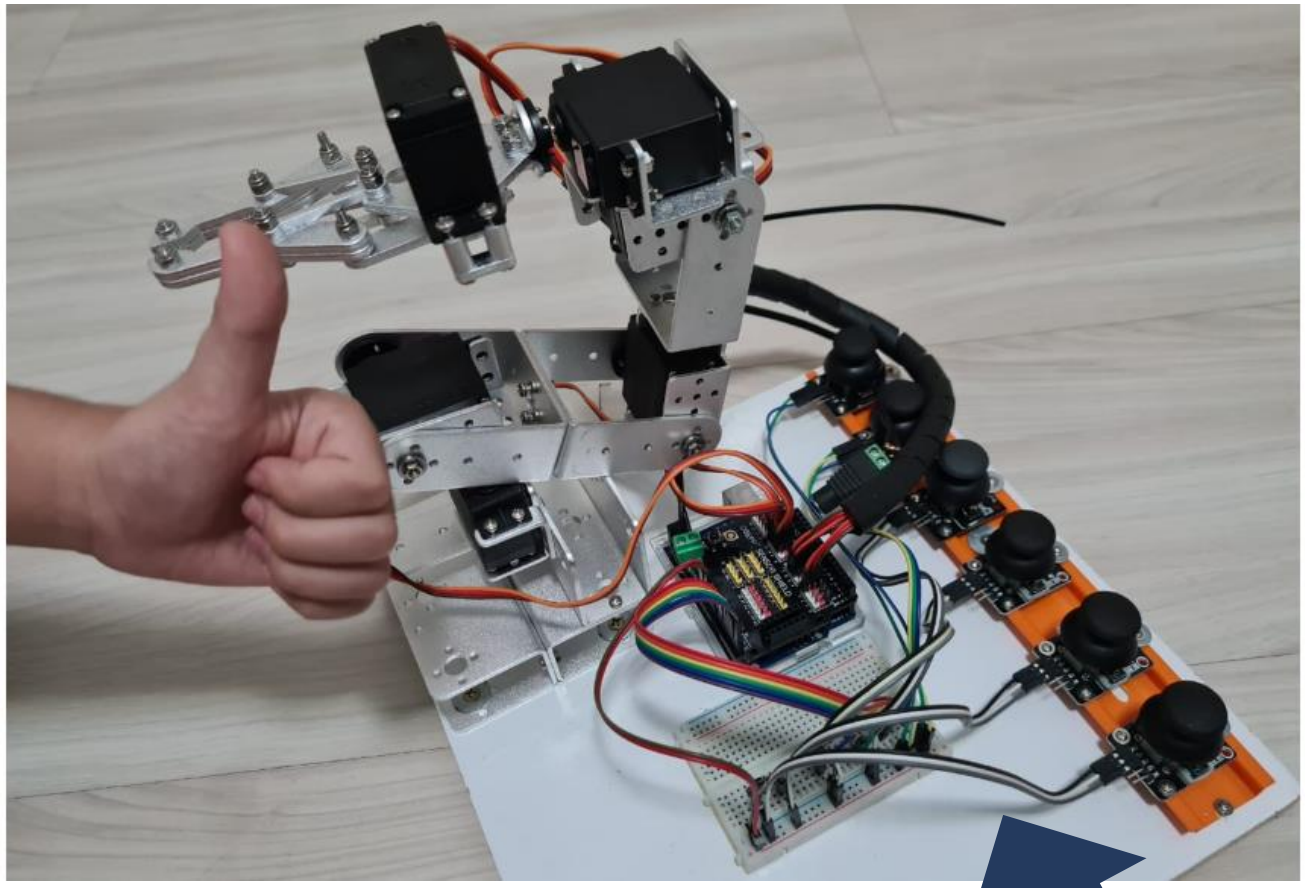

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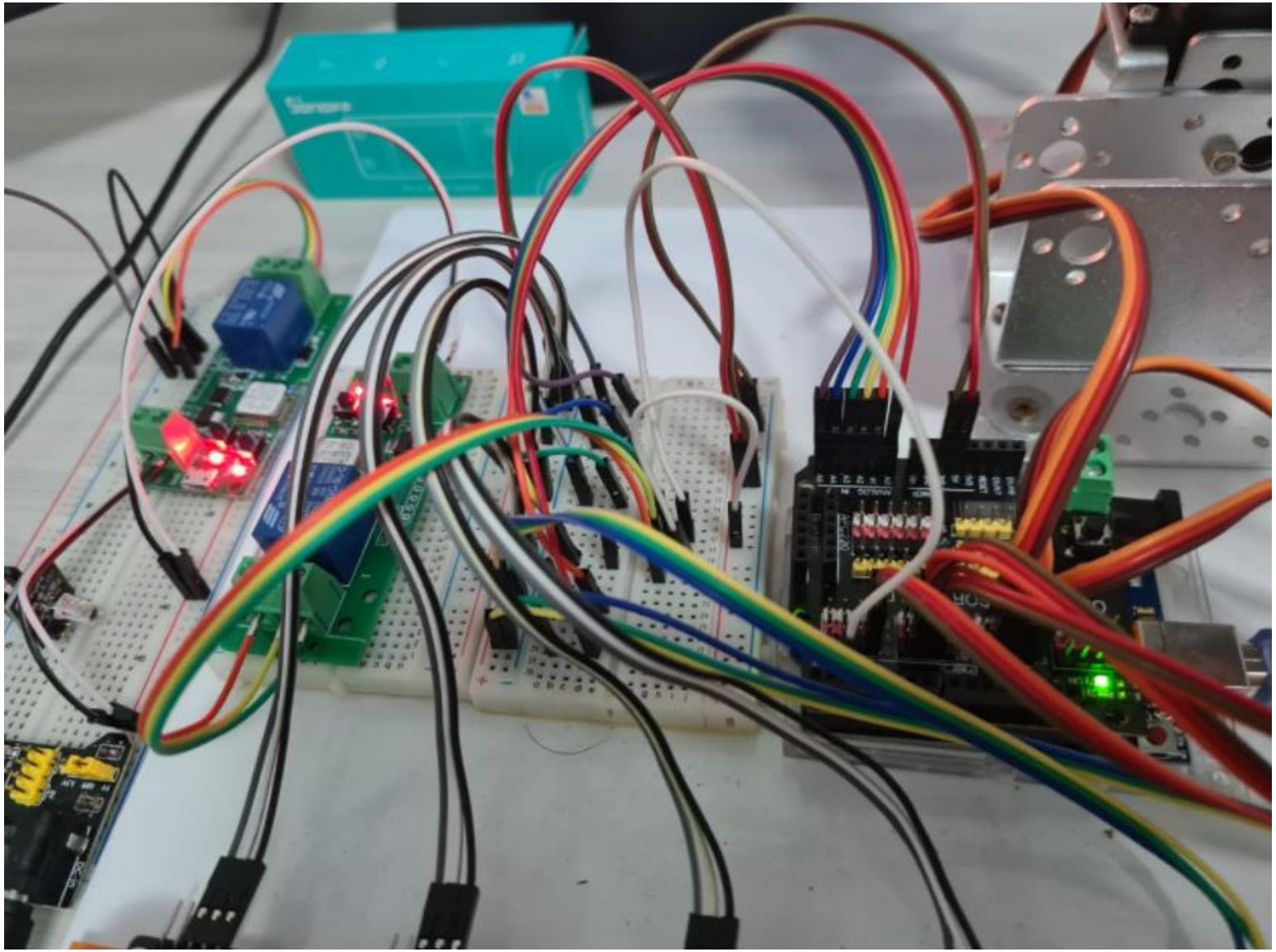
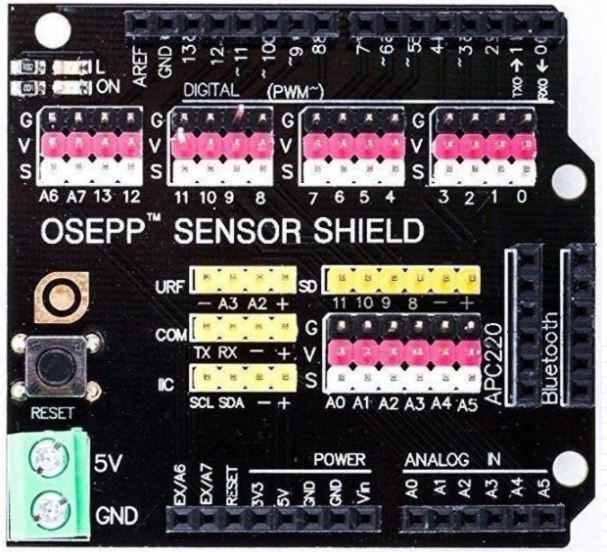
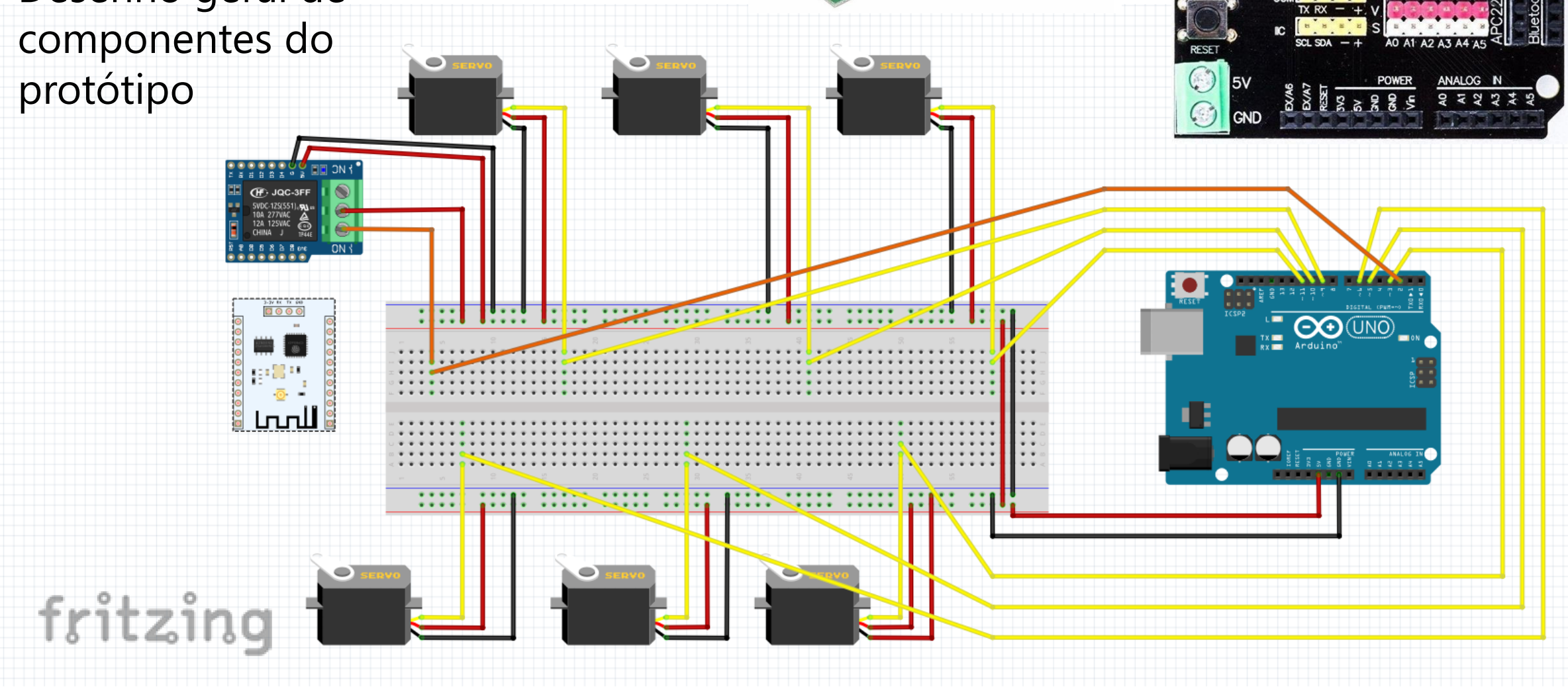


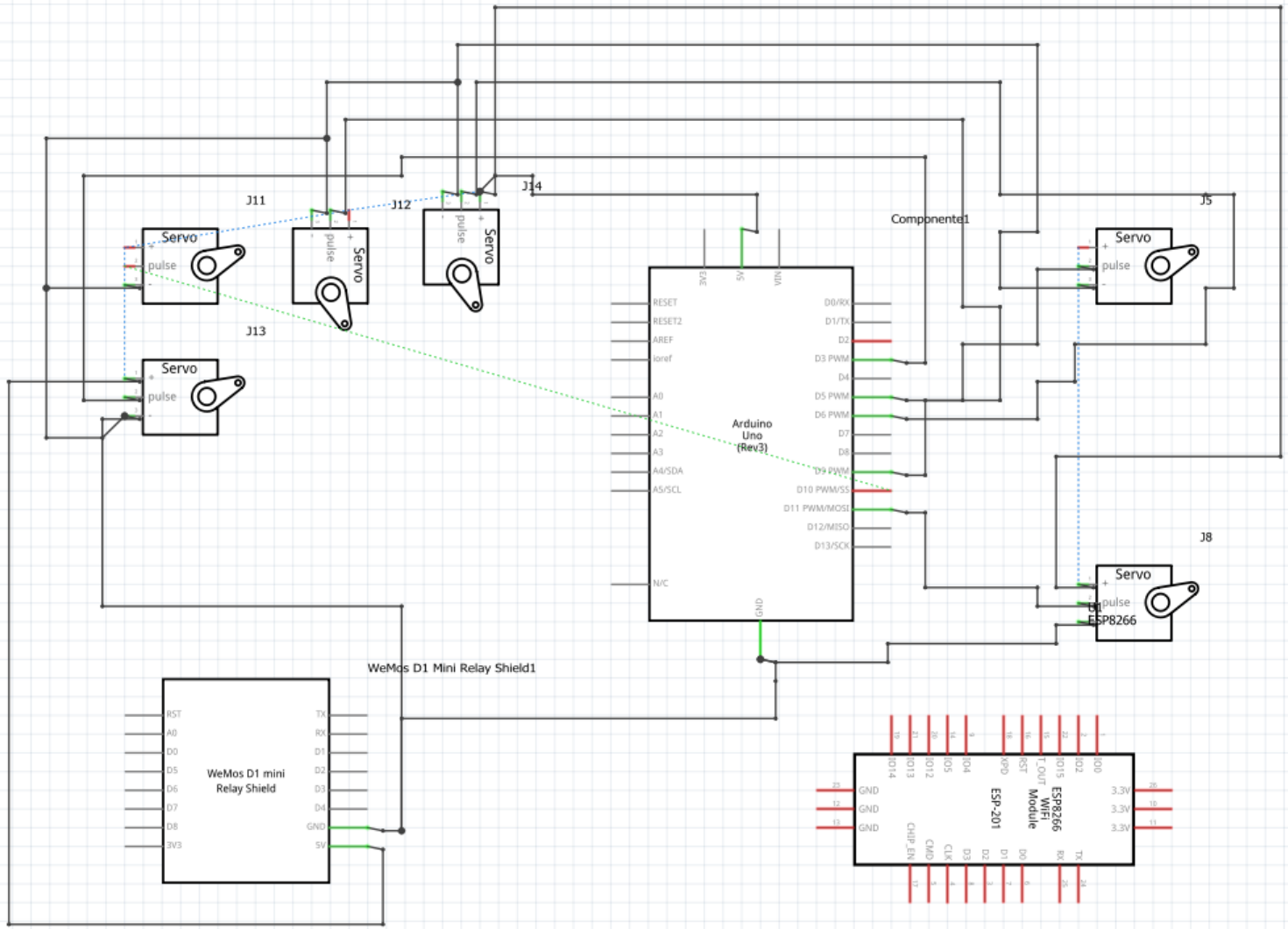
Passo 2

- Desenho geral de componentes do protótipo





Welcome | Protoboard | Esquemático | PCB | Código



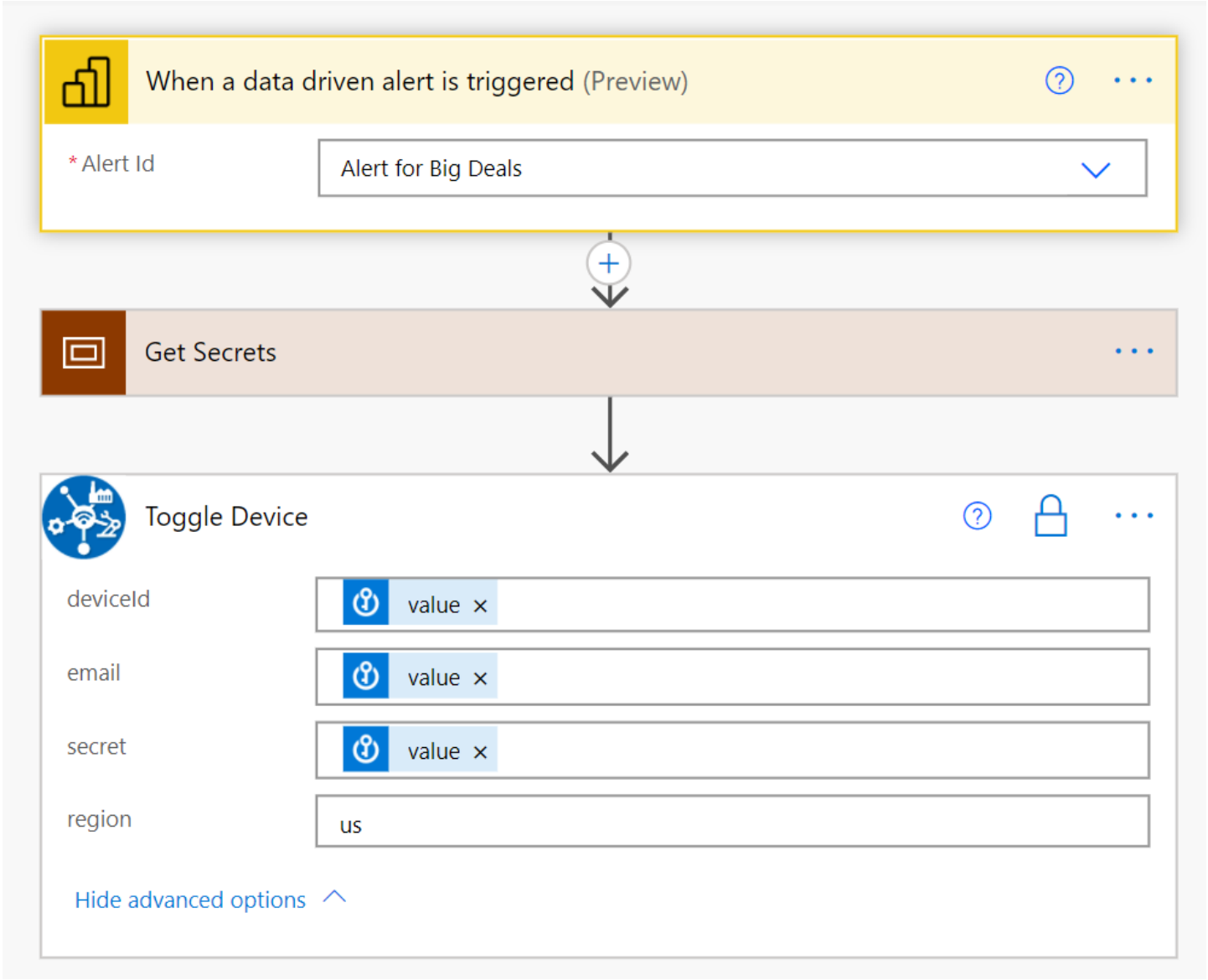
fritzing

Demo

Disparando o robô a partir do aplicativo eWelink

Passo 3

- Publicando a API do Sonoff no POWER APPS



Passo 3 - Arquitetura

Power BI

Power Automate

Azure Function

Sonoff Device

skydiver/ewelink-api: eWeLink API for JavaScript (github.com)

README.md

ewelink-api

> eWeLink API for JavaScript

Key features

- can run on browsers, node scripts or serverless environment
- set on/off devices
- get power consumption on devices like Sonoff POW
- listen for devices events
- using zeroconf (LAN mode), no internet connection required

Installation

```
npm install ewelink-api
```

Usage

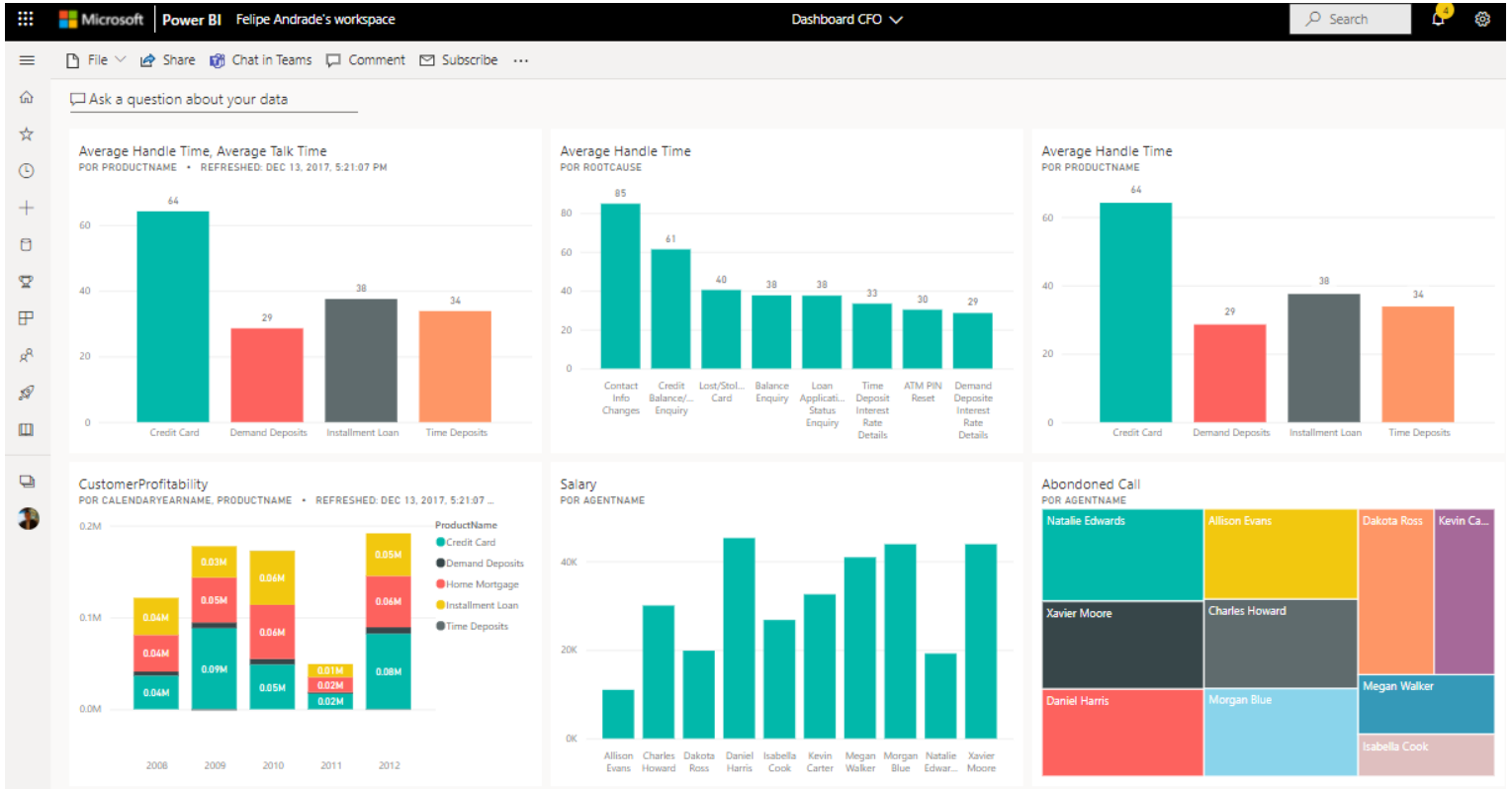
Check library documentation and examples at https://github.com/skydiver/ewelink-api/tree/master/docs

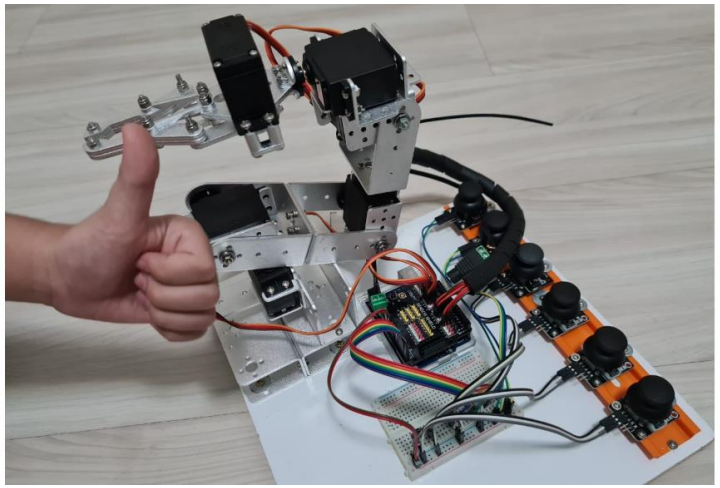
Demo

Construindo um conector para SONOFF

Passo 4

- Acionando o trigger e disparando uma mensagem para o device via Power Automate





Demo

Disparando o robô a partir do Power Platform

Our Agenda

- Relembrando IOT
- Relembrando Power Platform
- Um cenário de comando CLOUD-TO-DEVICE
- **Considerações**
- Q&A

Considerações sobre Power Platform e Azure Functions

1. A extensibilidade da Power Platform é incrível: oferece a possibilidade da criação dos seus próprios conectores. Podendo inclusive acelerar a conexão com devices de IOT, agilizando automação, monitoração remota, atuação, etc.

2. Submeta seu conector para certificação Microsoft

3. Azure Function é uma excelente opção Serveless para extensibilidade pro-dev da plataforma.

Considerações sobre Power Platform + IOT

1. Um cenário de IOT pode ter diferentes tipos de mensageria, como TELEMETRIA, CONSULTA, COMANDO e NOTIFICAÇÃO

2. Diferentes cenários de conectividade podem ser usados entre os dispositivos de IOT e a nuvem, como WIFI, ZIGBEE, 4G, LORA, etc.

3. Não reinvente a roda! Aproveite os aceleradores de plataforma para seus cenários de IOT, como telemetria, notificação, comando, etc.

4. Prototipação é um passo super especial para polir o cenário e resultados esperado. Dedique um bom tempo para testes sobre seu protótipo.

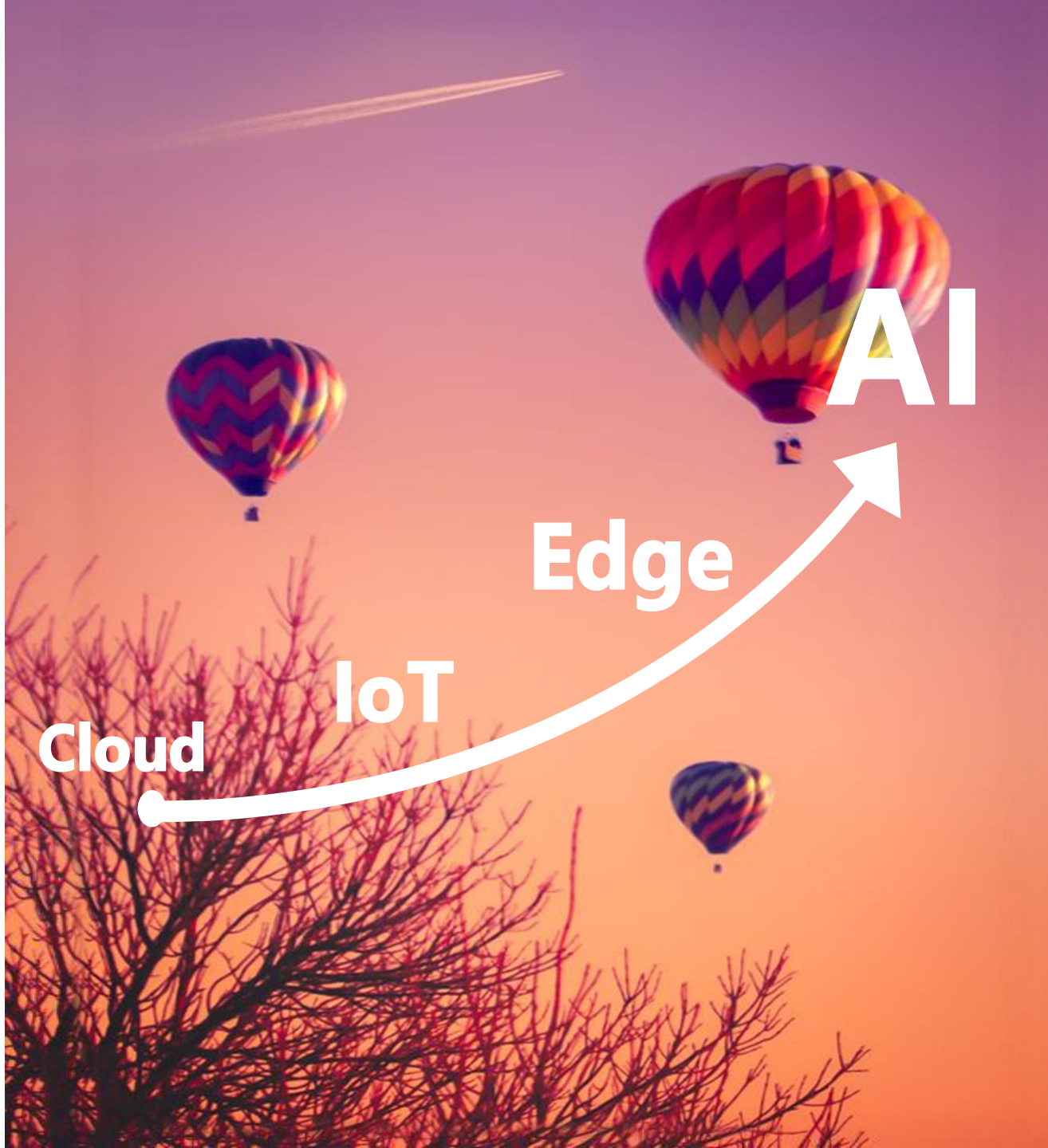
Tendências de inovação

Cloud
Disponibilidade global, recursos ilimitados, SLA

IoT
Captura de dados do ambiente através de sensores, para monitoração, atuação, consulta, etc.

Edge
Workloads de machine learning e serviços cognitivos hospedados em dispositivos de borda

AI
Capacidades de inteligência artificial com machine learning na Nuvem e na Borda



Referências e links importantes

- Microsoft Azure IoT Reference Architecture
  - https://download.microsoft.com/download/A/4/D/A4DAD253-BC21-41D3-B9D9-87D2AE6F0719/Microsoft_Azure_IoT_Reference_Architecture.pdf
  - https://docs.microsoft.com/en-us/azure/architecture/reference-architectures/iot

- Sonoff Tech
  - SONOFF Official Homepage| Smart Home automation SONOFF Official

- Conectores customizados para a Power Platform

  Links to content about custom connectors for canvas apps - Power Apps | Microsoft Docs

- Sonoff Library

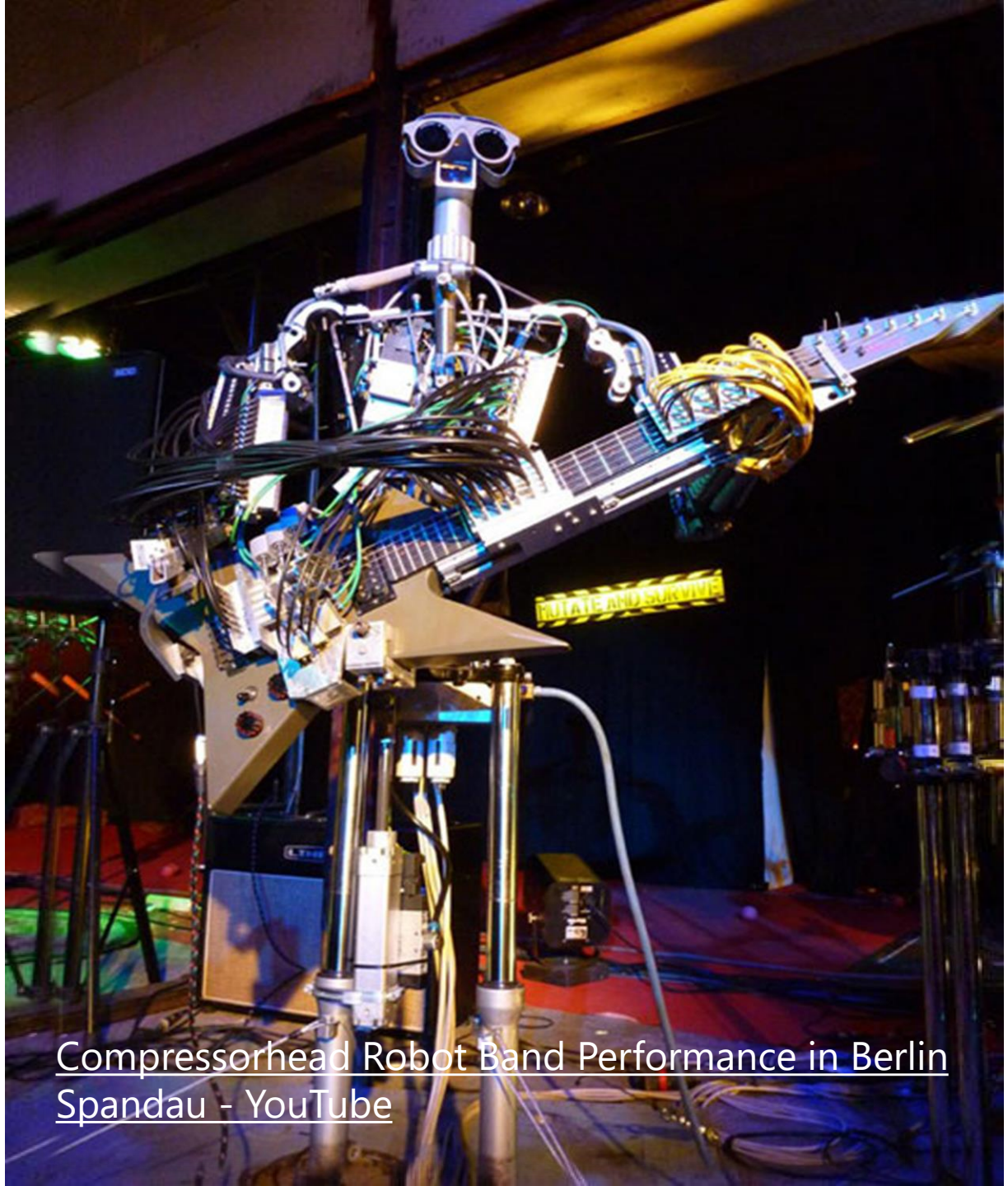
  skydiver/ewelink-api: eWeLink API for JavaScript (github.com)

- Primeiros passos com Azure Functions

  Getting started with Azure Functions | Microsoft Docs

Our Agenda

- Relembrando IOT
- Relembrando Power Platform
- Um cenário de comando CLOUD-TO-DEVICE
- Considerações
- **Q&A**



Compressorhead Robot Band Performance in Berlin Spandau - YouTube

Microsoft

Obrigado!