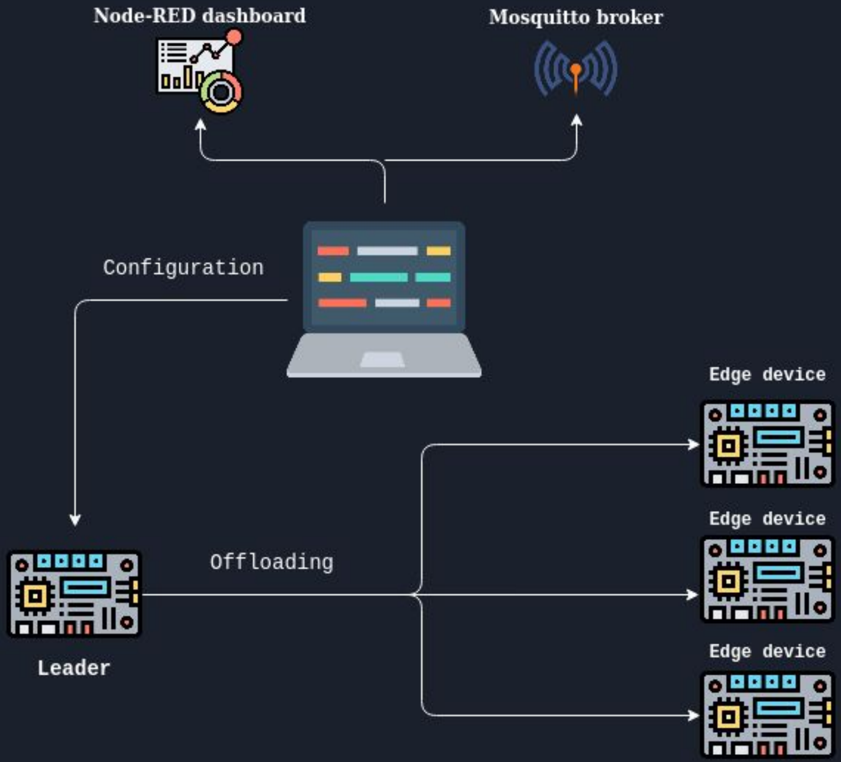
Framework to load balance data analysis on the device or at the edge

System diagram



Tools

- Mosquitto (mqtt)
- Node-Red (dashboard)
- VSCode with PlatformIO (embedded development)
- paho mqtt (python library)

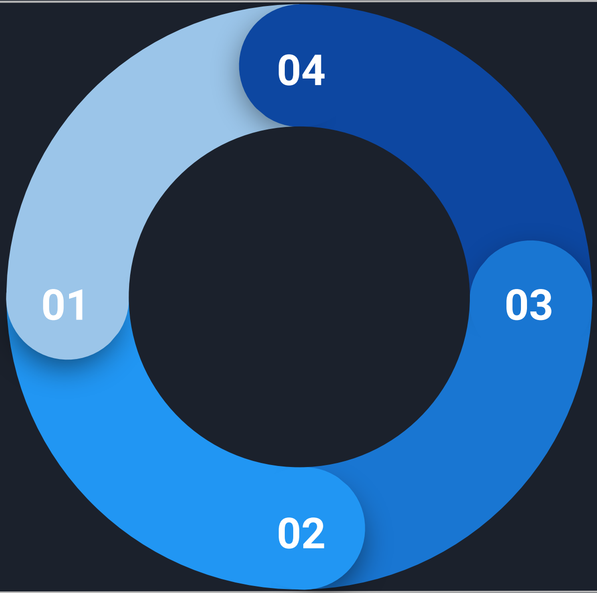
Flowchart

Configure the problem

Choose the type of problem, its input and the number of iterations per second

Load balancing

Determines if and how to assign load to edge devices



Show results

View results and performance on the dashboard

Run the problem

Each device performs the required problem

System's features

01 Dynamic Wifi credentials

02 OTA Updates

03 Ability to detect the computational capabilities of any device

04 Distribute computation to edge devices if the computational capabilities of the leader aren't enough

System's features

05 It works fine even if an edge device runs out of battery or disconnects from the network

06 Monitor the status of the mqtt broker constantly

07 Dashboard to monitor workload distribution

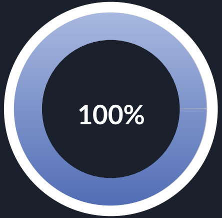
08 Stop the system in case of too high latency

Persona 01

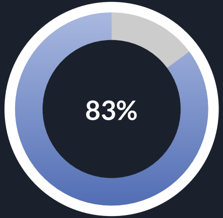
Load distribution

As long as the leader is able to solve the number of iterations of the required problem, then no other device is involved.

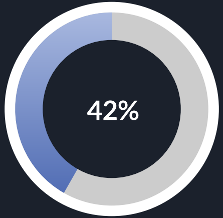
Otherwise, the leader carries out all the iterations he can and distributes them to the edge devices based on their computational capabilities: the more powerful a device is, the higher the number of iterations assigned to it will be



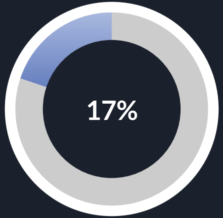
Leader



Edge1



Edge2



Edge3

Thanks for the attention