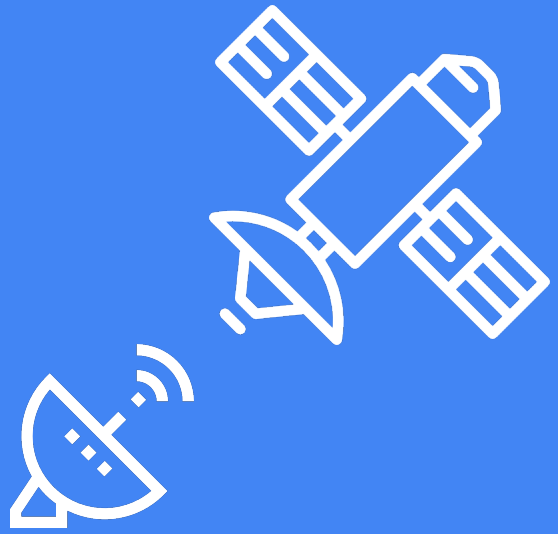
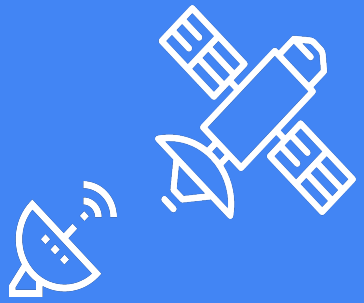
LORA SPACE

M2PGI
2017-2018



AMAZOUZ.S
BENOMAR.S
CHEBIHI.H
CHEMALI.R

Sommaire

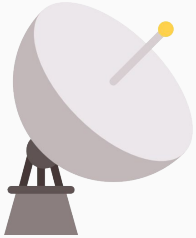


1. Contexte
2. Prototype
3. Architecture générale du projet
4. Technologies utilisées
5. Fonctionnement
6. Dashboard
7. Simulation de communication (LoRa)
8. Difficultés rencontrées
9. Démonstration

Contexte

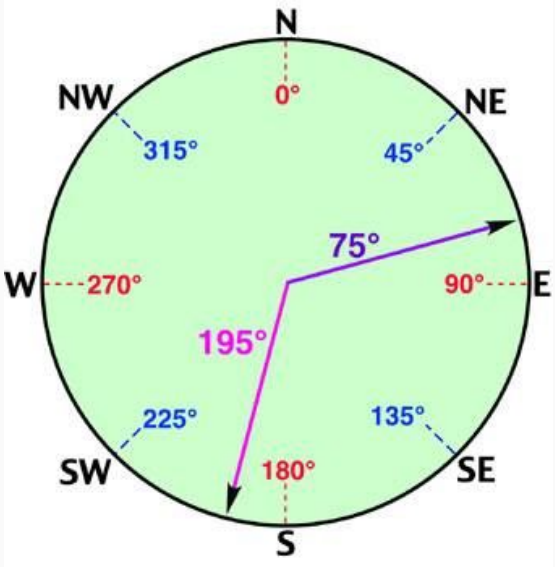
Contexte

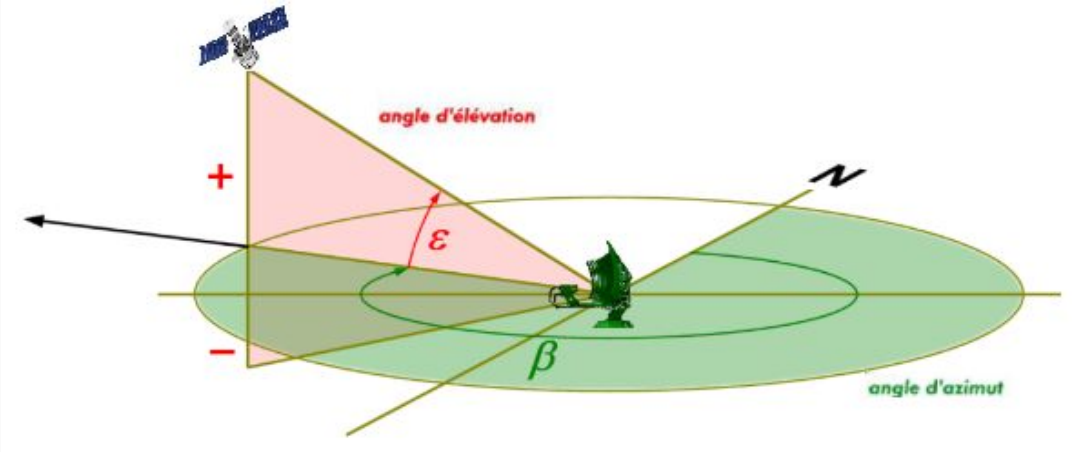
LoRa™



Prototype
Conception et plans

L'azimut et l'élévation

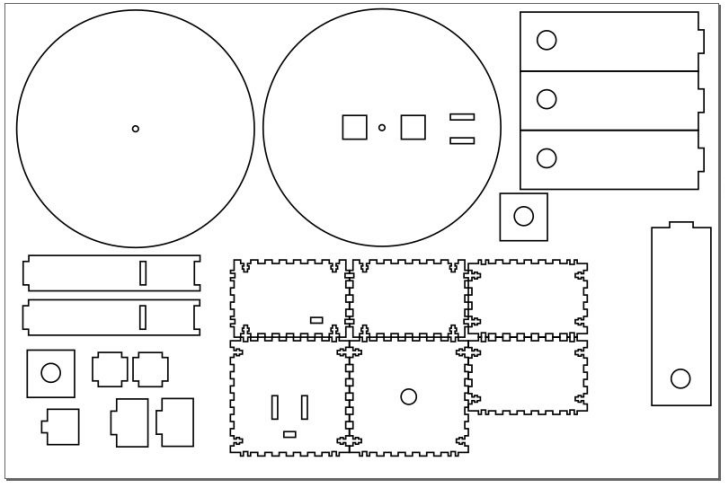




Prototype
Réalisation

INKSCAPE

makercase



Tower pro mg995r

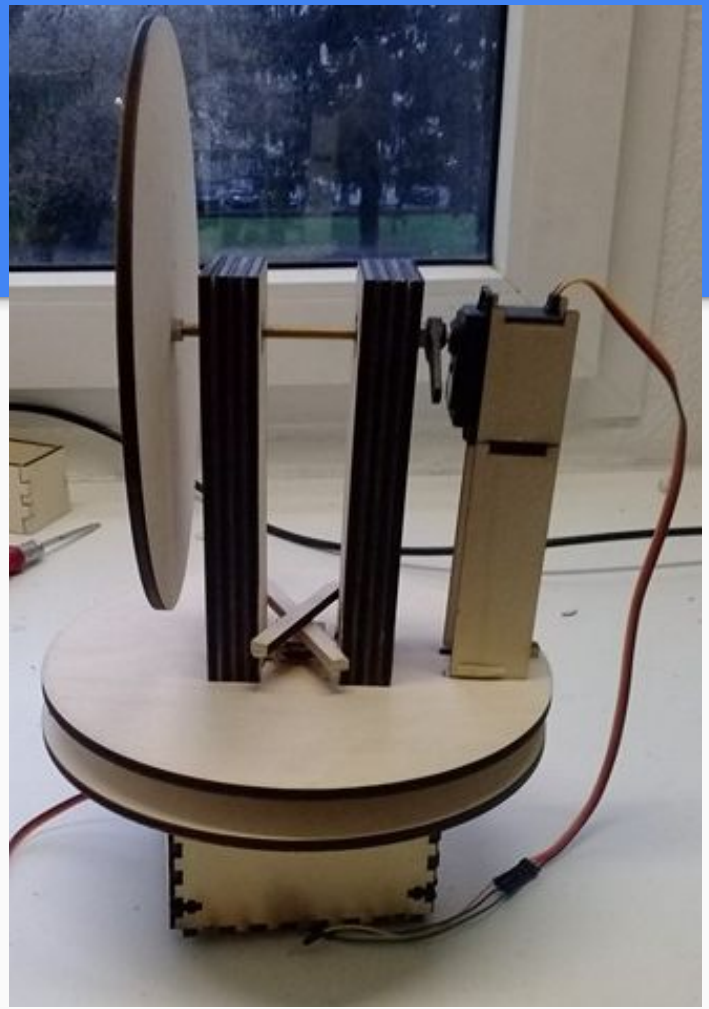
- 2 tiges filetées de 5 mm
- 9 roulement 5*16*5 mm
- un roulement axiale (butée à billes) de 50*70*14 mm.

Fonctionnement

Le **1er** servomoteur tourne en fonction de **l'Azimut**

Le **2eme** servomoteur va faire tourner le disque

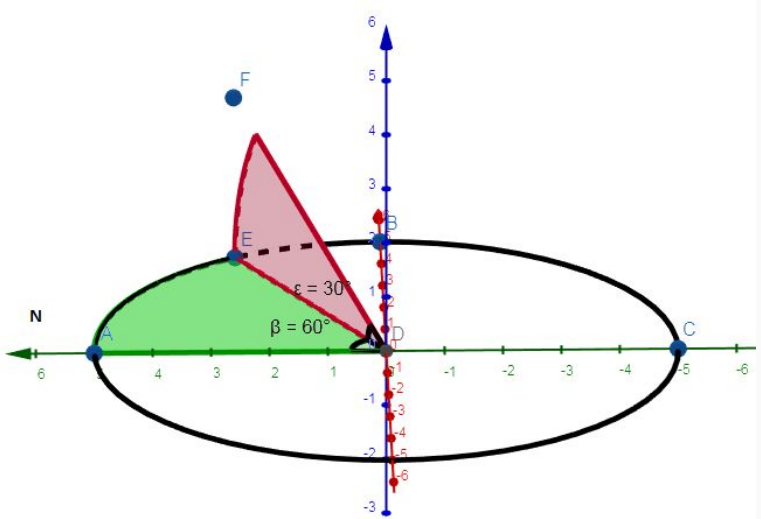
en fonction de **l'Élévation**.

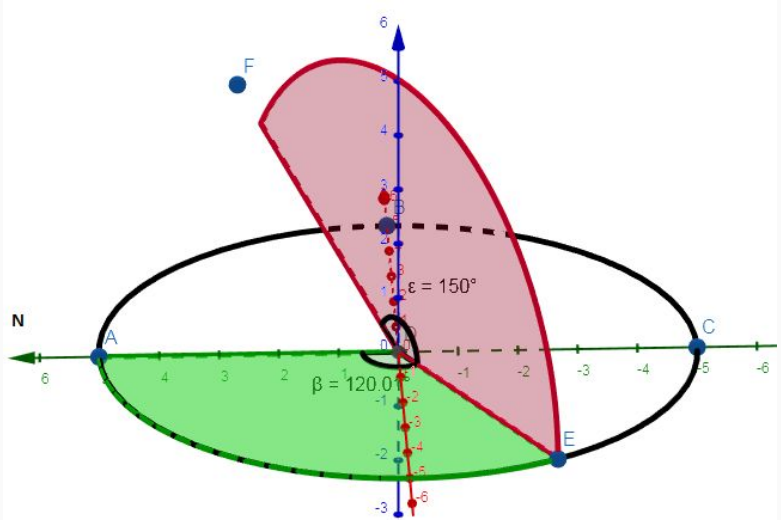


Calcule pour avoir le bon angle en fonction du sens de rotation des servomoteurs

Azimut <= 180° : **Azimut=180 - Azimut;**

Élévation=180 - Élévation;

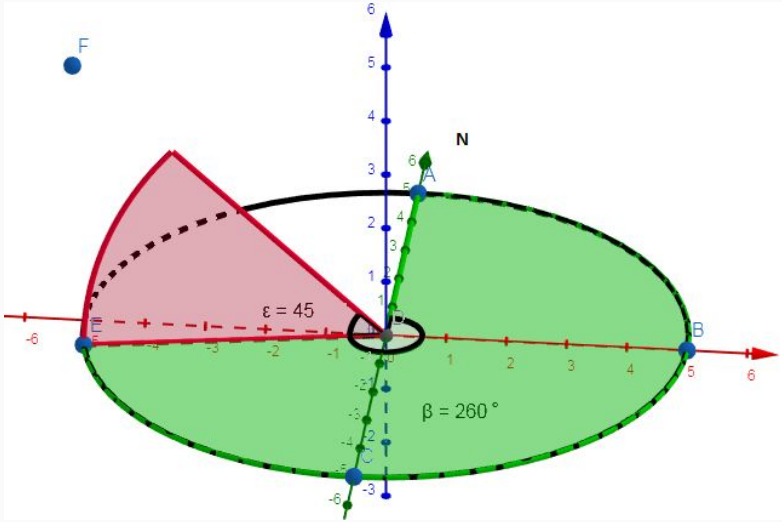


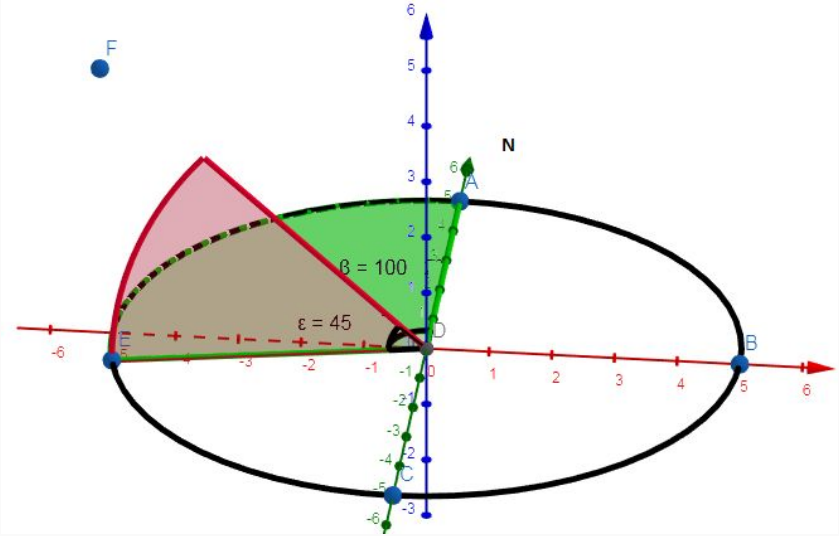


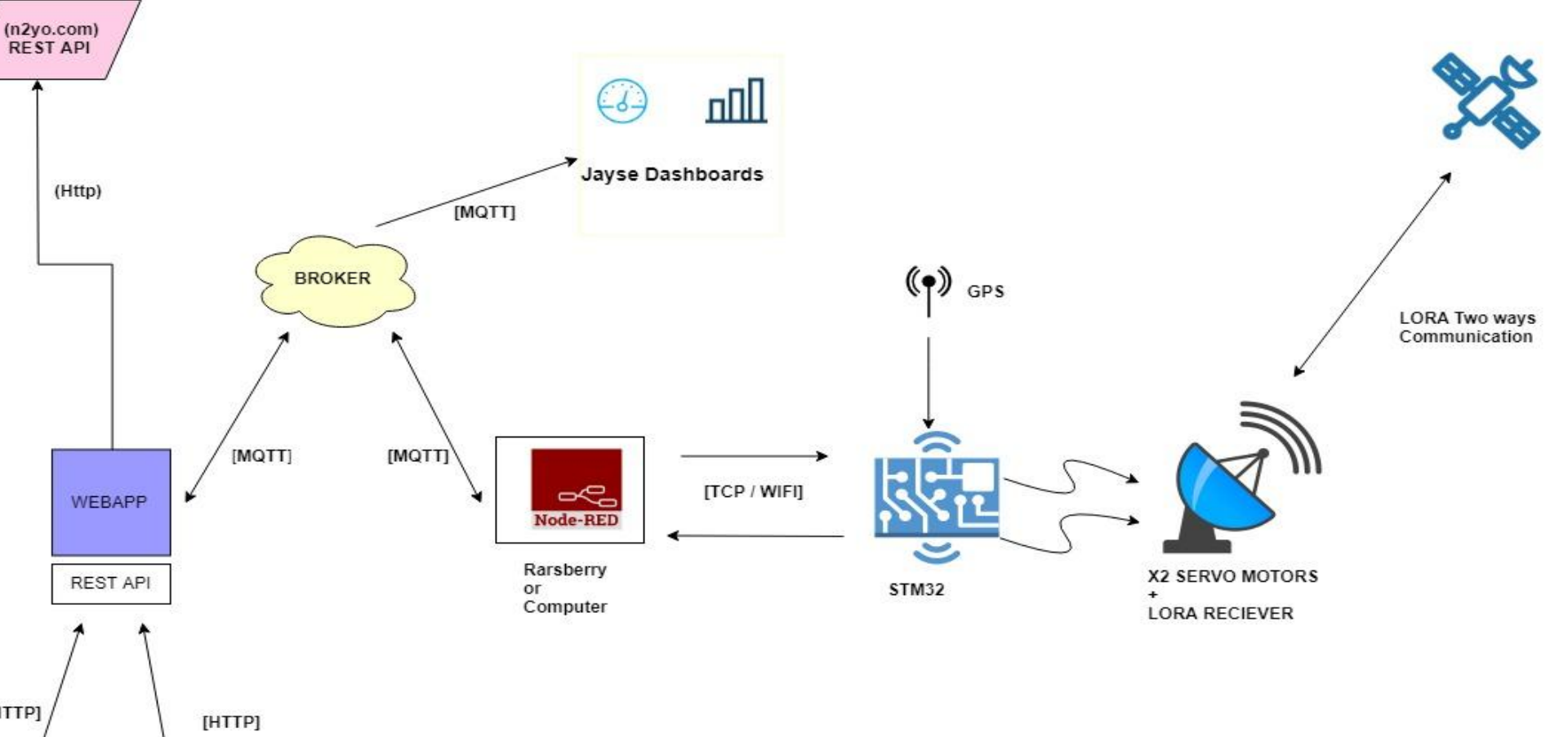
Calcule pour avoir le bon angle en fonction du sens de rotation des servomoteurs

Azimut > 180° :

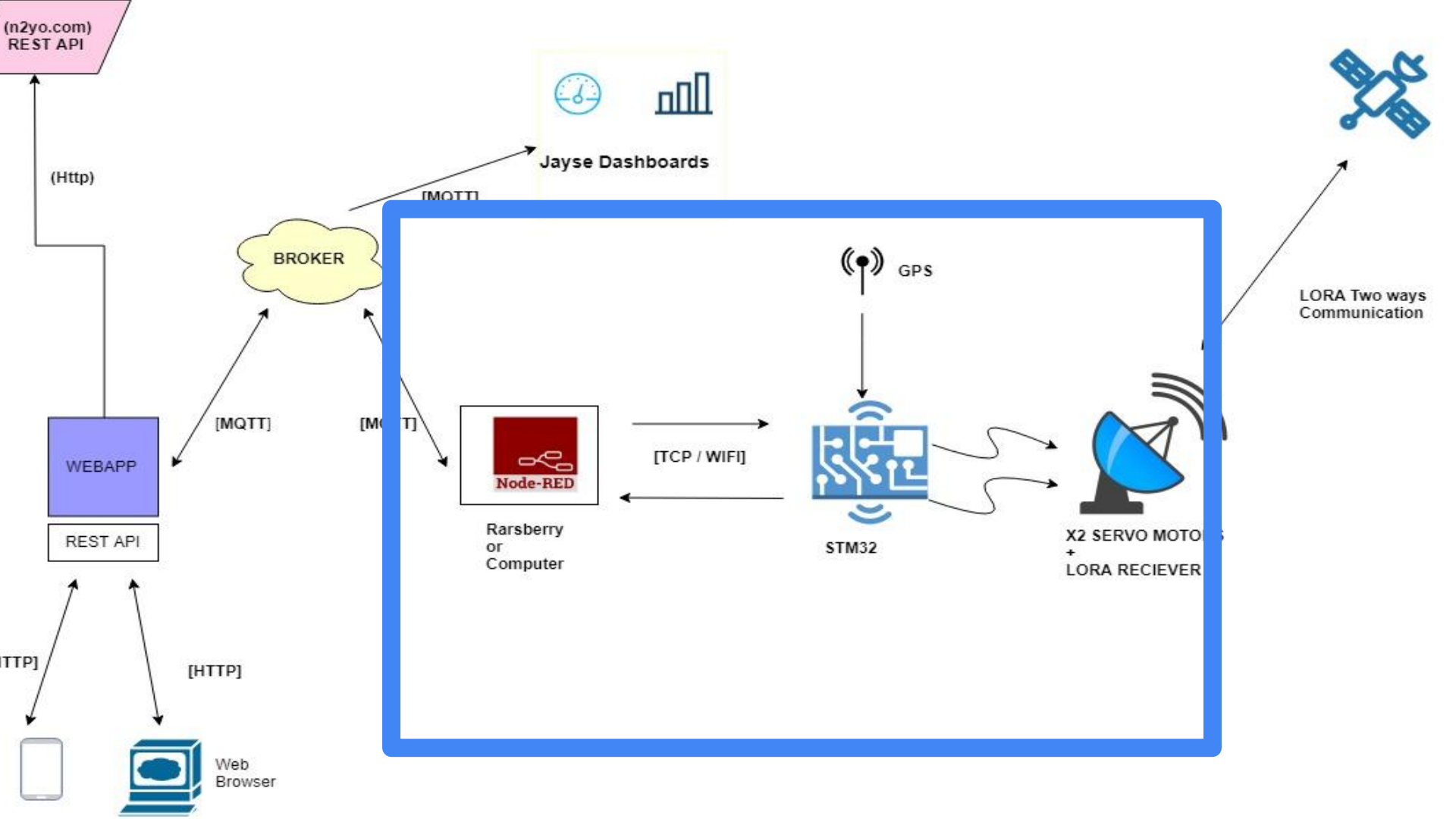
Azimut=360- Azimut;

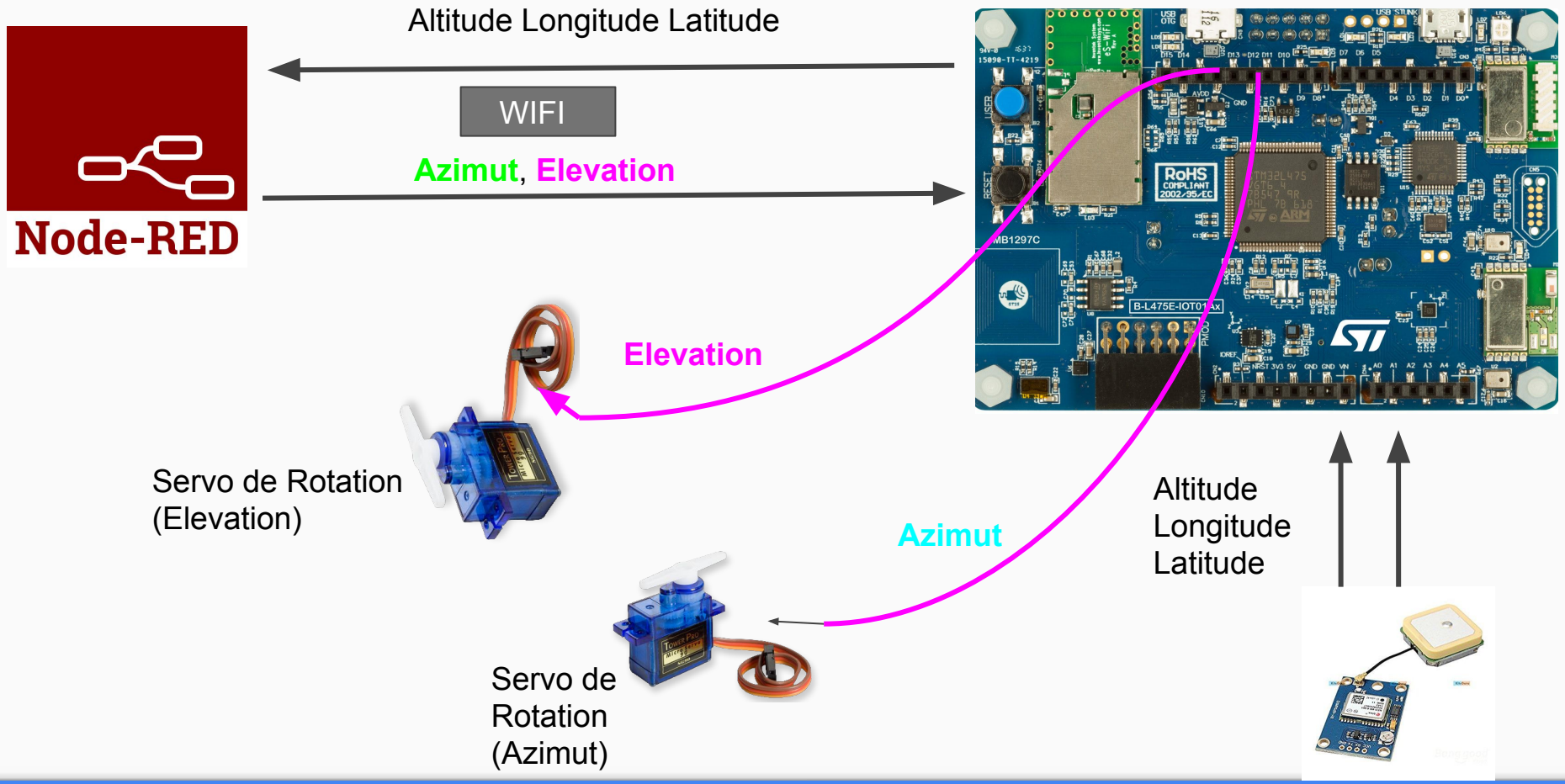




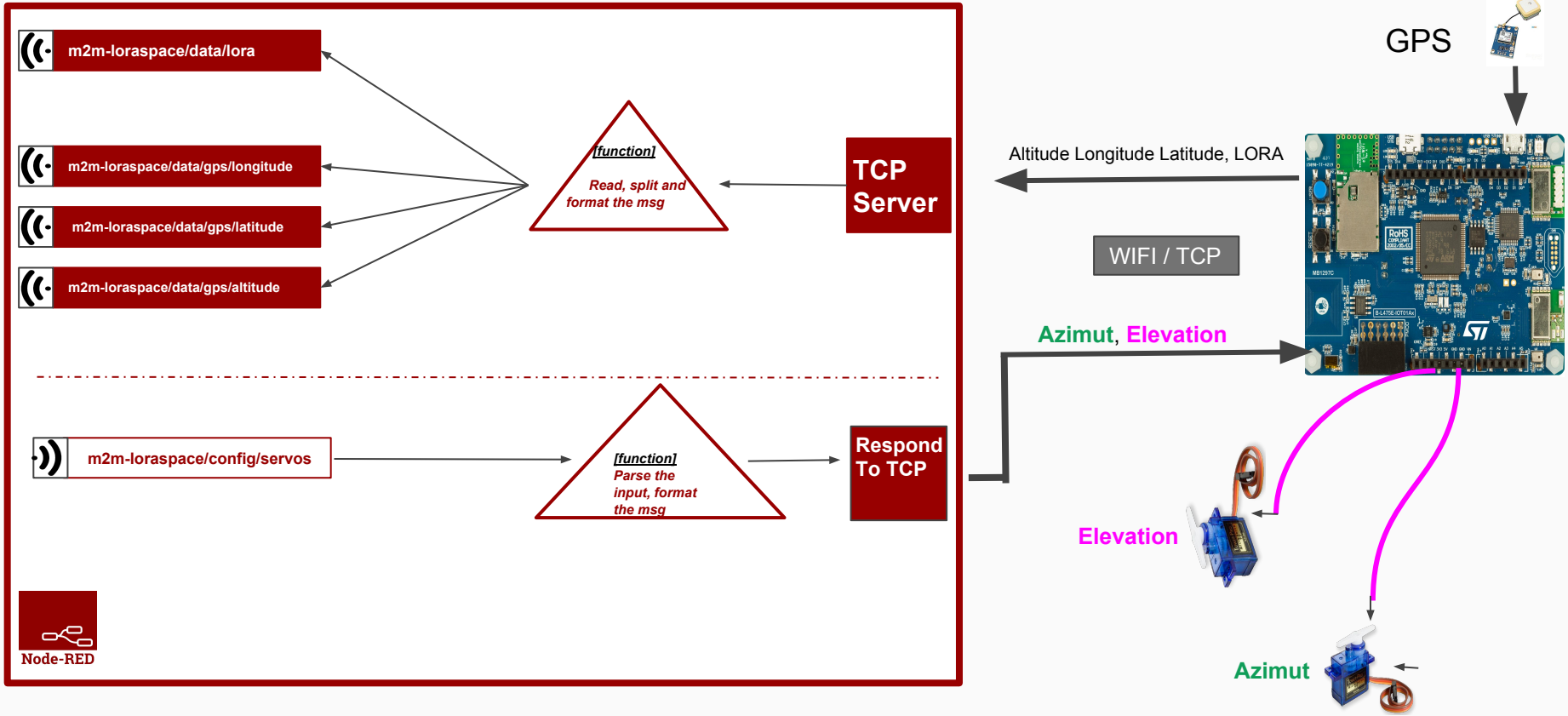


Notre Architecture


(n2yo.com)
REST API
(Http)
Jayse Dashboards
[MQTT]
BROKER
GPS
LORA Two ways
Communication
[MQTT]
WEBAPP
REST API
Node-RED
Rarsberry
or
Computer
[TCP / WIFI]
STM32
X2 SERVO MOTO
+
LORA RECIEVER
[HTTP]
Web
Browser



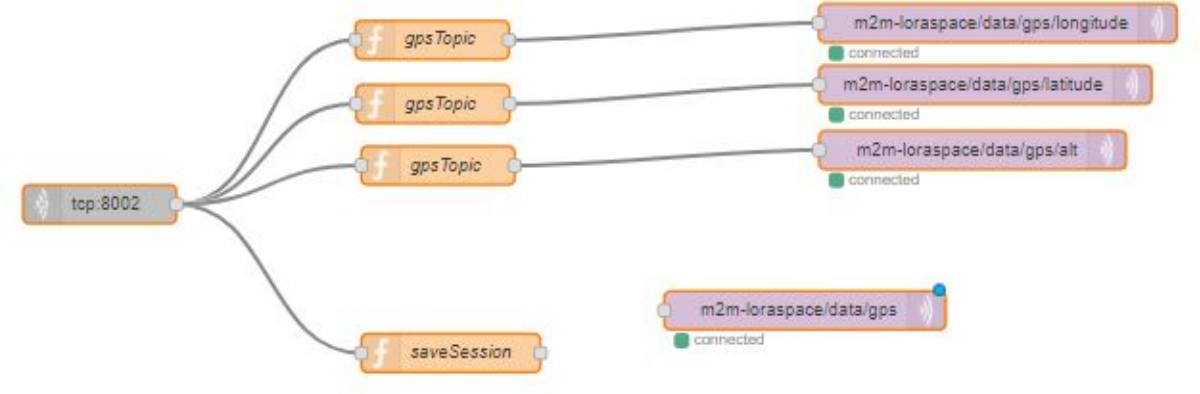
Notre Architecture (Details)



Notre Architecture (Details)

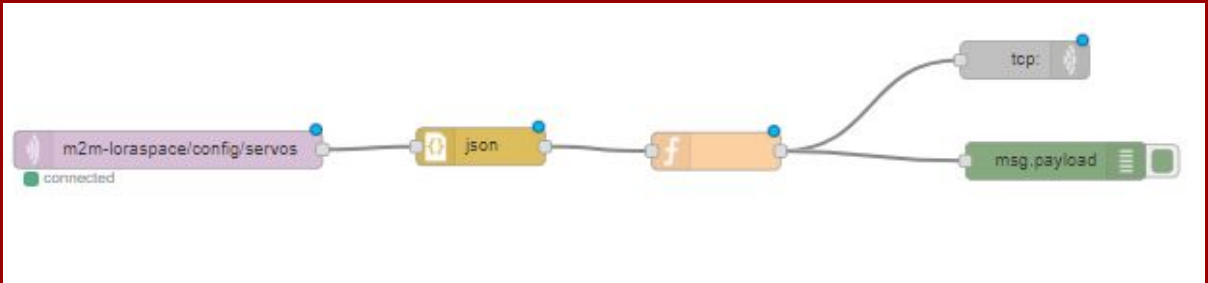
Récupération des données GPS envoyé par la STM32 via réseau TCP

Et Transmission sur broker MQTT.

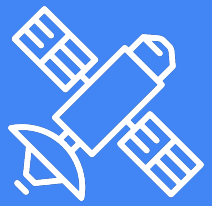


NODE-RED

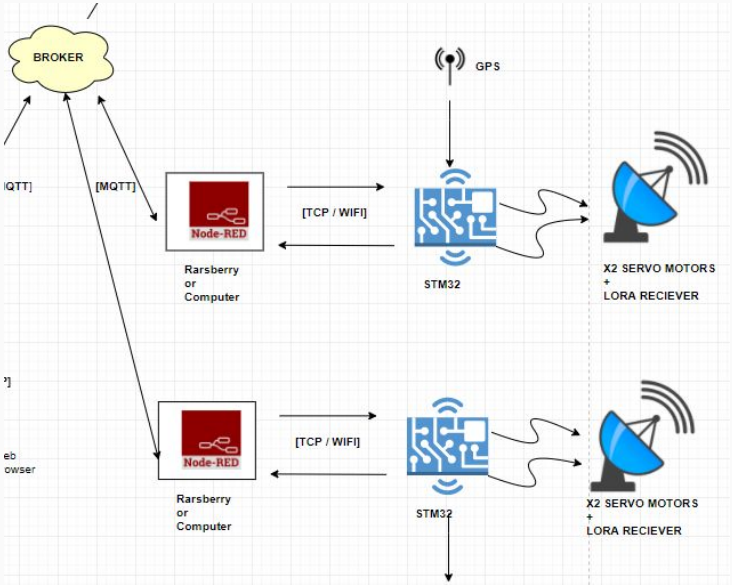
Envoi des données de configuration des servos (azimut, elevation)



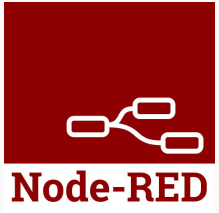
Mais pourquoi cette architecture ?



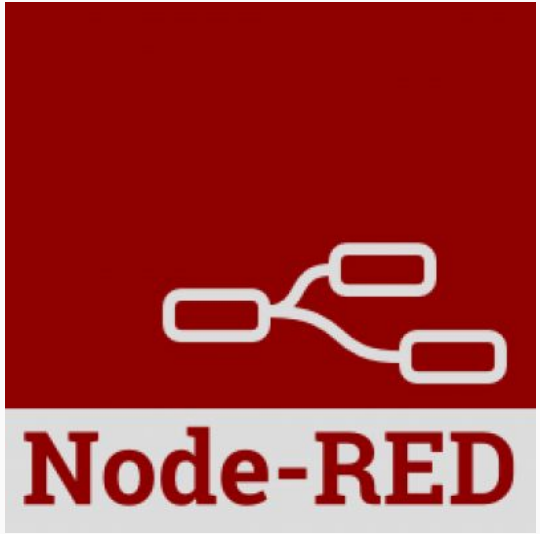
1 - Scale up facile



2 - Modification et mise à jour de la configuration facilement
#node-red



Technologies utilisées



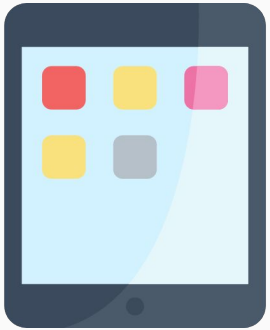
Technologies utilisées

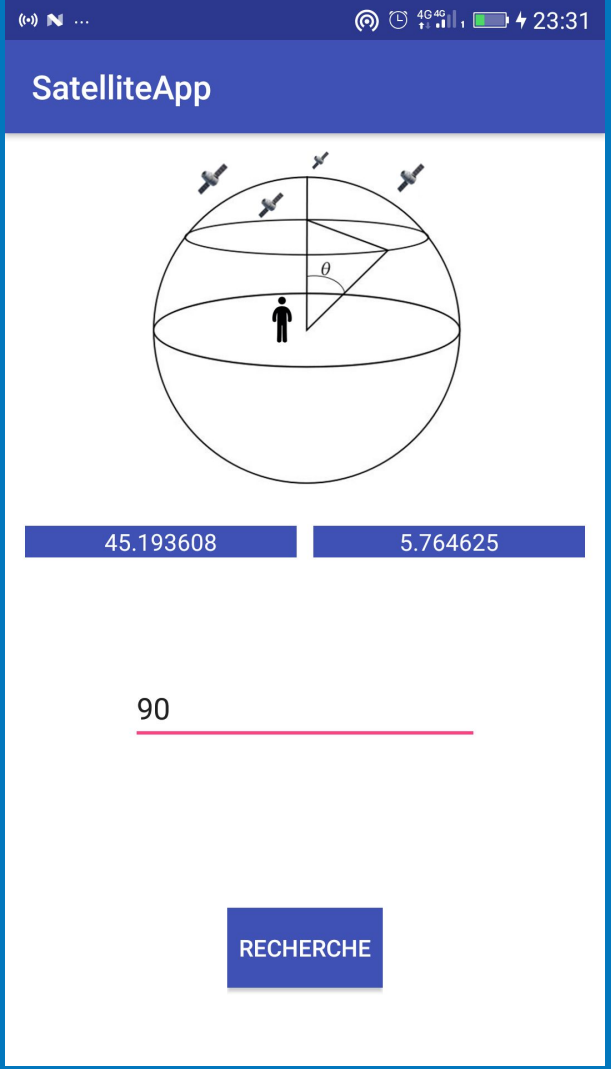
N2YO.com

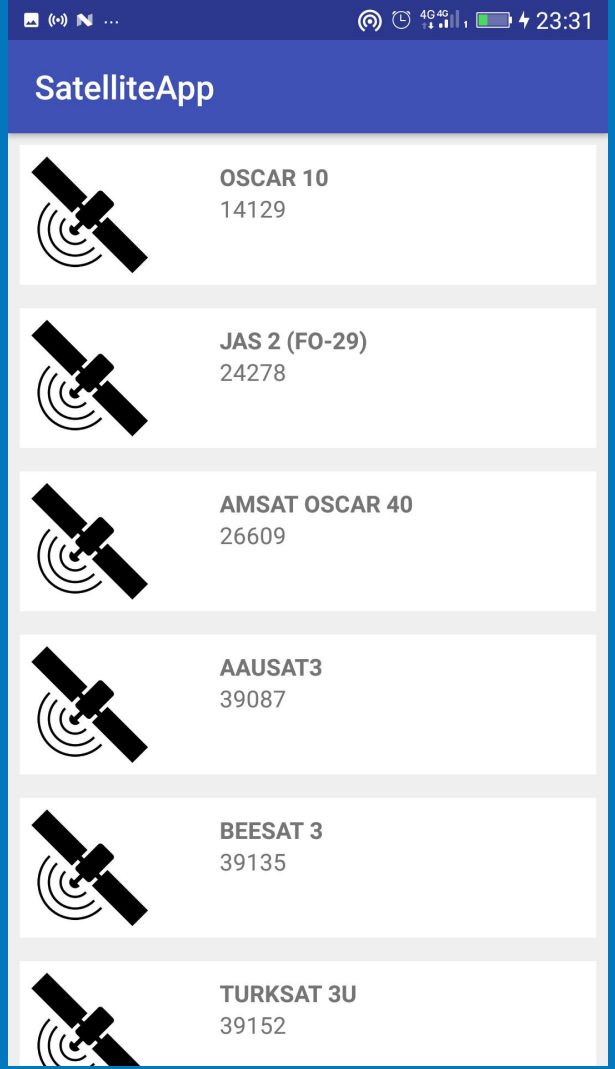
Site web spécialisé dans l'actualité spatiale , il offre un web service gratuit (limité) sur le positionnement des satellites

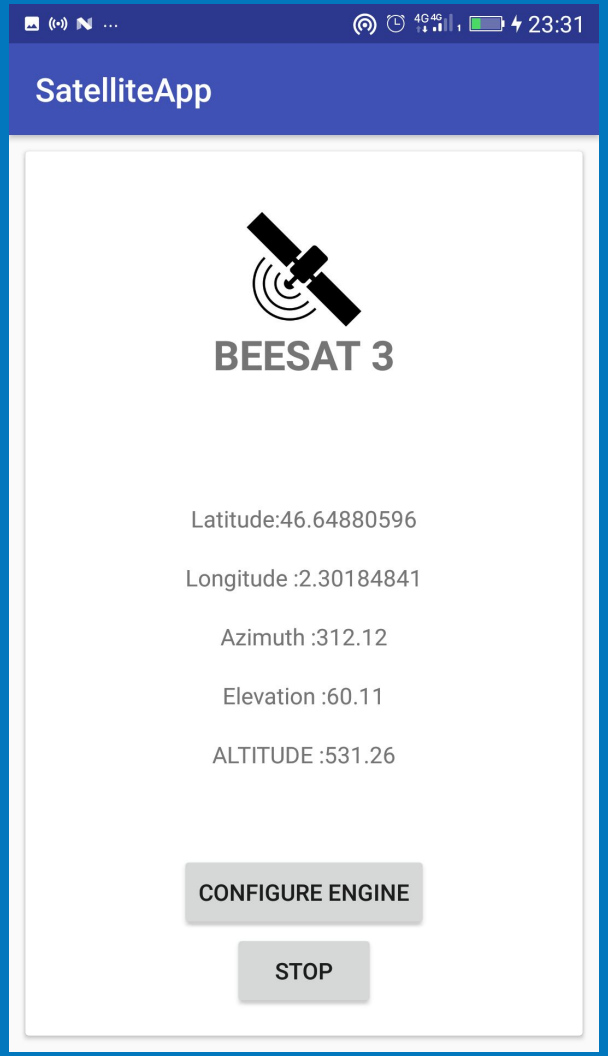
Technologies utilisées

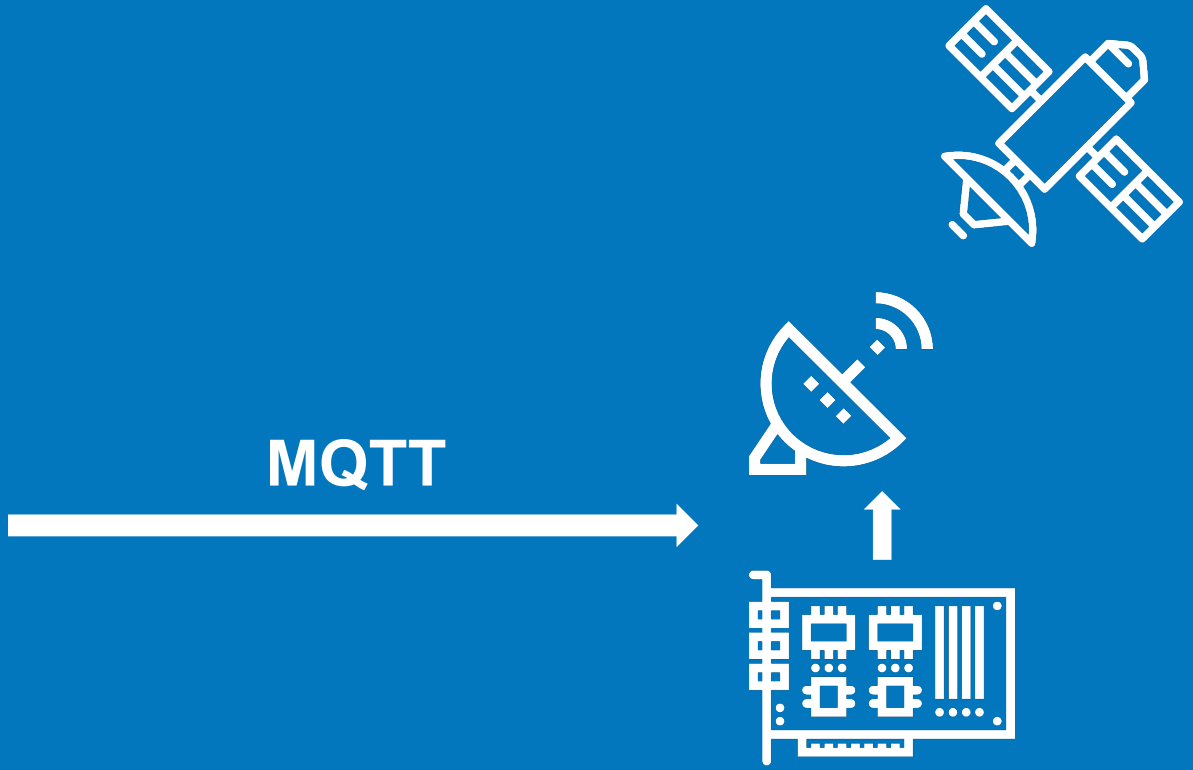
Technologies utilisées



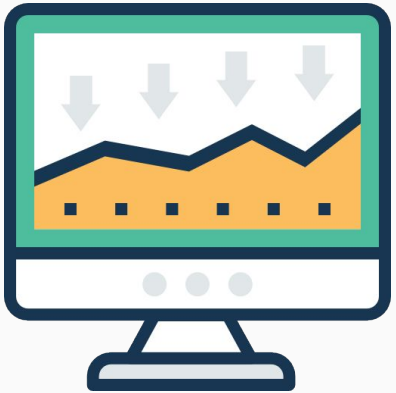

23:31
SatelliteApp
θ
45.193608
5.764625
90
RECHERCHE


23:31
SatelliteApp
OSCAR 10
14129
JAS 2 (FO-29)
24278
AMSAT OSCAR 40
26609
AAUSAT3
39087
BEESAT 3
39135
TURKSAT 3U
39152


23:31
SatelliteApp
BEESAT 3
Latitude:46.64880596
Longitude :2.30184841
Azimuth :312.12
Elevation :60.11
ALTITUDE :531.26
CONFIGURE ENGINE
STOP


MQTT

Technologies utilisées

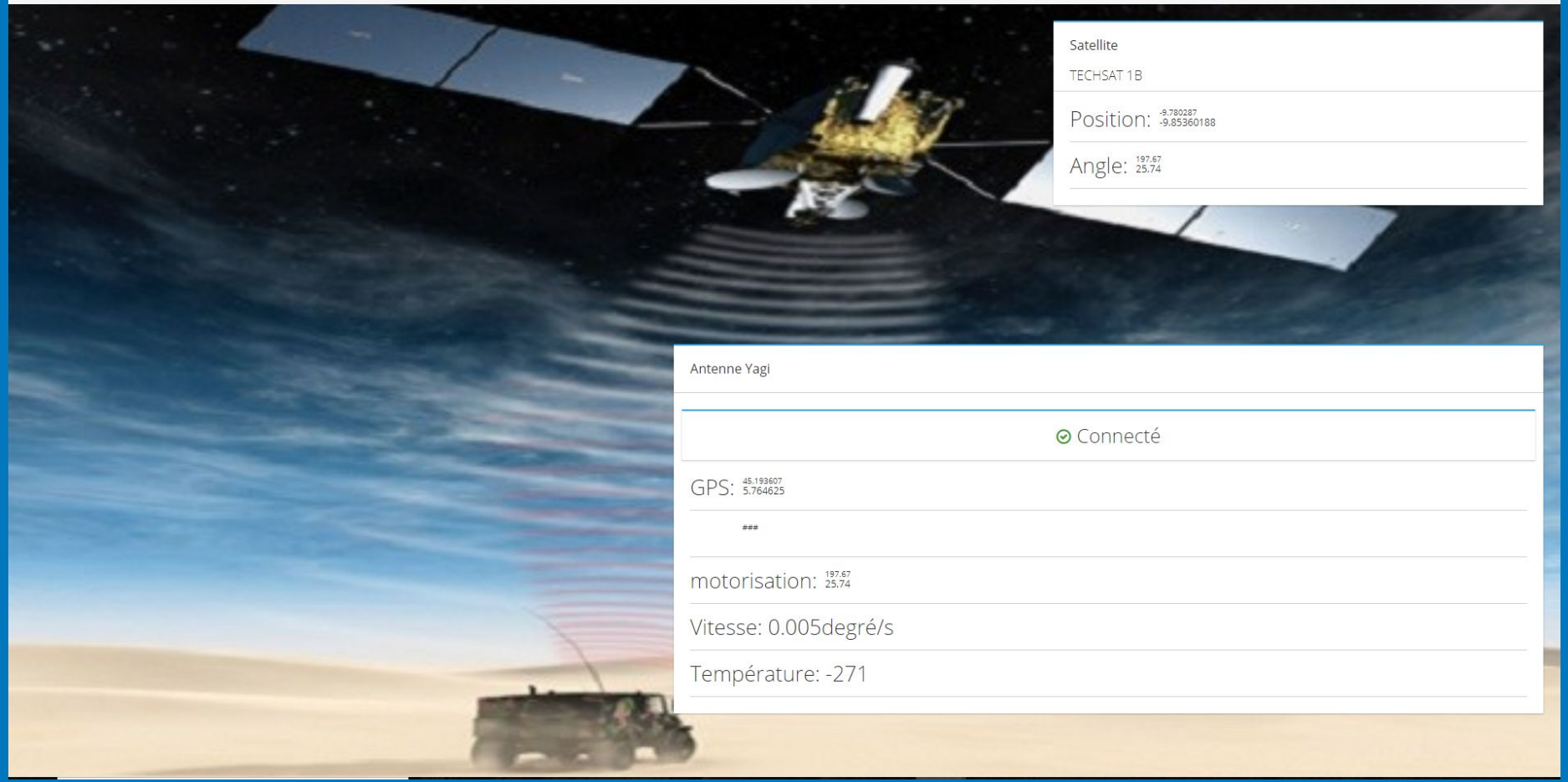


Jyse

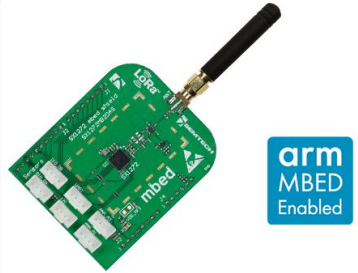
CREATE WITH DATA

LoRaSpace - Preview - Google Chrome

Sécurisé | https://uga.jyse.io/preview.html

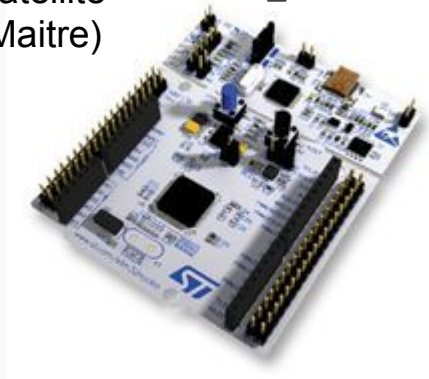


Simulation de la communication bidirectionnelle (LoRa)



Station
(Esclave)

Satellite
(Maitre)



Simulation de la communication bidirectionnelle (LoRa)

```
SX1276 Demo Application

> Board Type: SX1276MB1MAS <

> LORA Mode <

Satellite LoRaSpace 38400
> OnRxTimeout
Conexion d'un appareil...
Collecte de donnees...
Envoi de donnees...
Appareil deconnecte
```

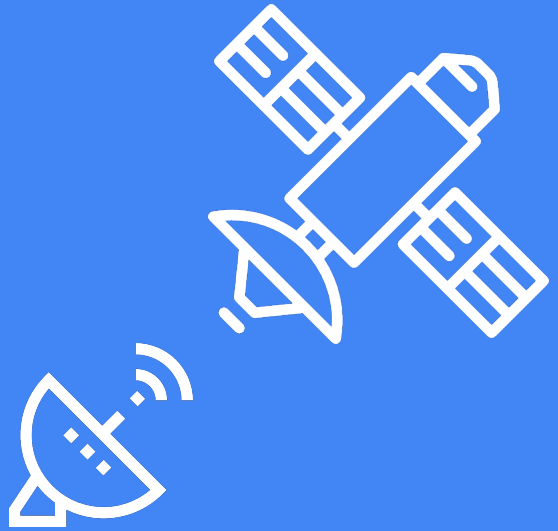
```
SX1272 Demo Application

> Board Type: SX1272MB2xAS <

> LORA Mode <

Station IM2AG
Detection du satellite...demande de connection!!!
connecte au satellite LoRaSpace... demande de donnees
Donnees:
Name: LoRaSpace
ID: 38
Temperature: -271
Vitesse: 0.005degre/s
Deconnexion...
```

Difficultés rencontrées

- Configuration matérielle
- Captation signal GPS (lors des testes à l’intérieur)
- Matériel pour le montage de la structure
- Le webservice à changé en cours de développement

Démonstration