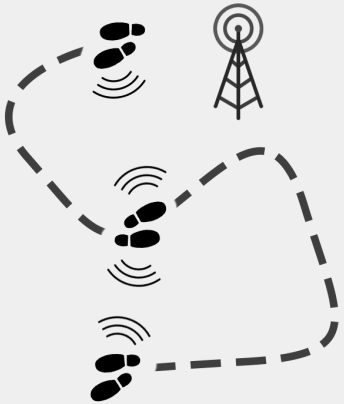
POLYTECH GRENOBLE

UNIVERSITÉ Grenoble Alpes

UltraTeamMV



Enzo MOLION
Léo VALETTE

Project description

Aim :

Outdoor long range whitezone geolocation (LoRa, BLE, cellular network)

To be achieved :

Protocol

- conception, implementation & test

Application

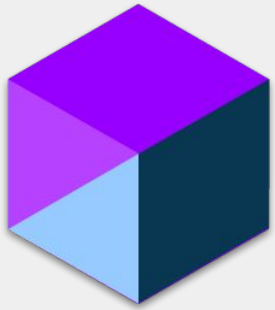
- local database, basic data display, data encryption

Not to be achieved :

Server side

How we worked

- *Pseudo-scrum*
- *Specification before implementation*
- *Solid baseline*



Typedoc

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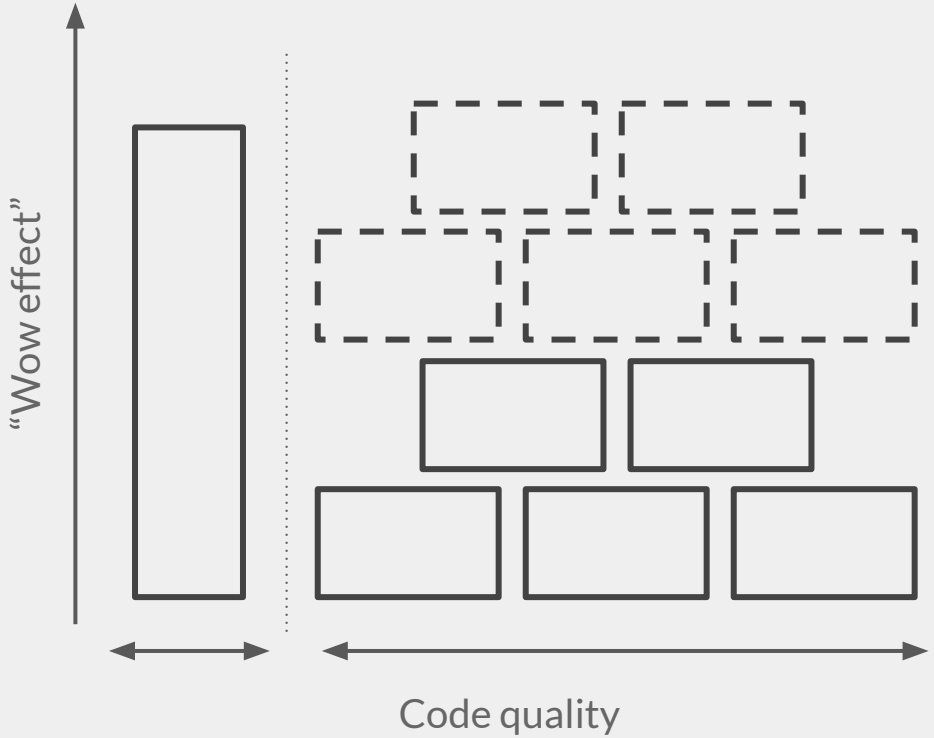
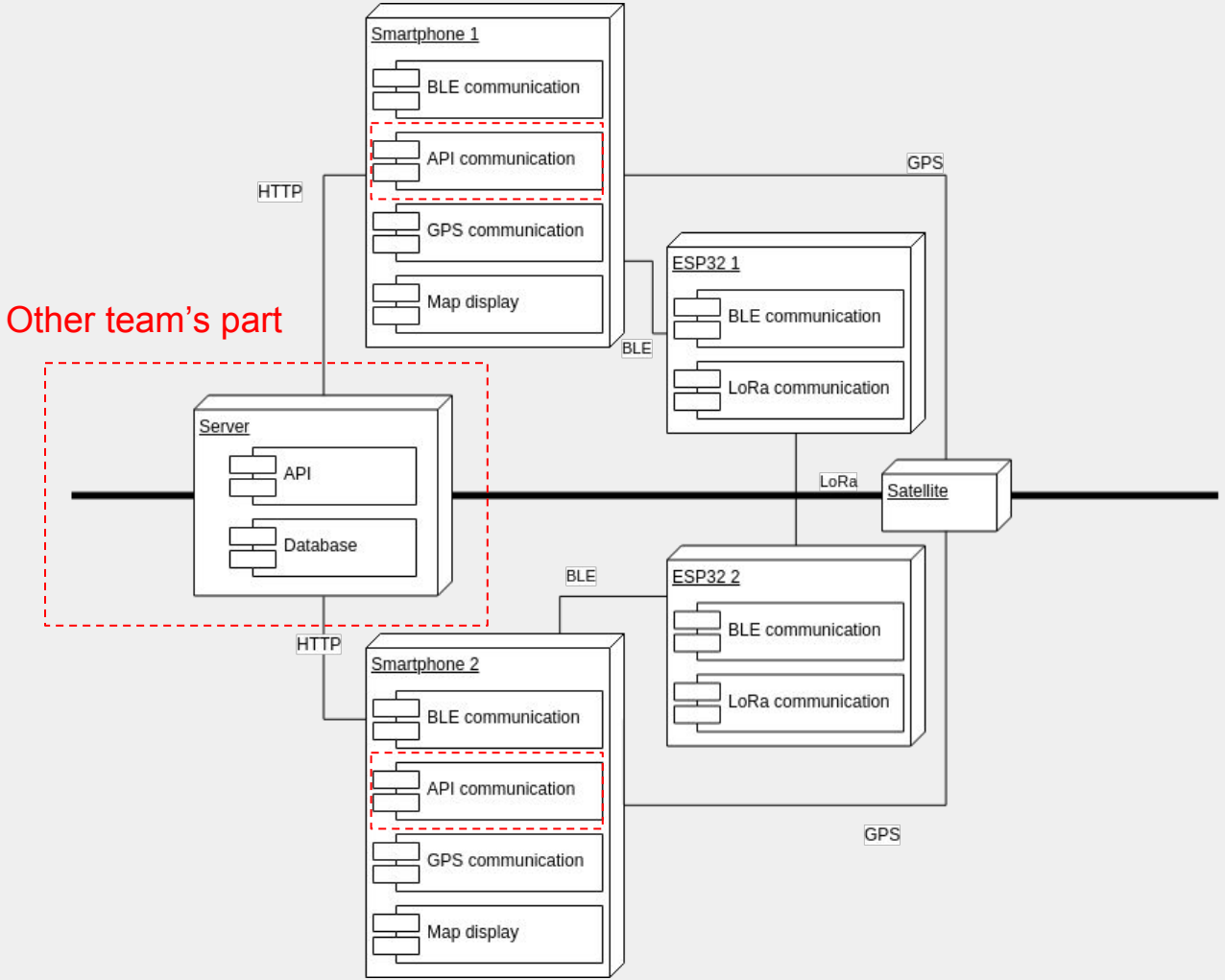
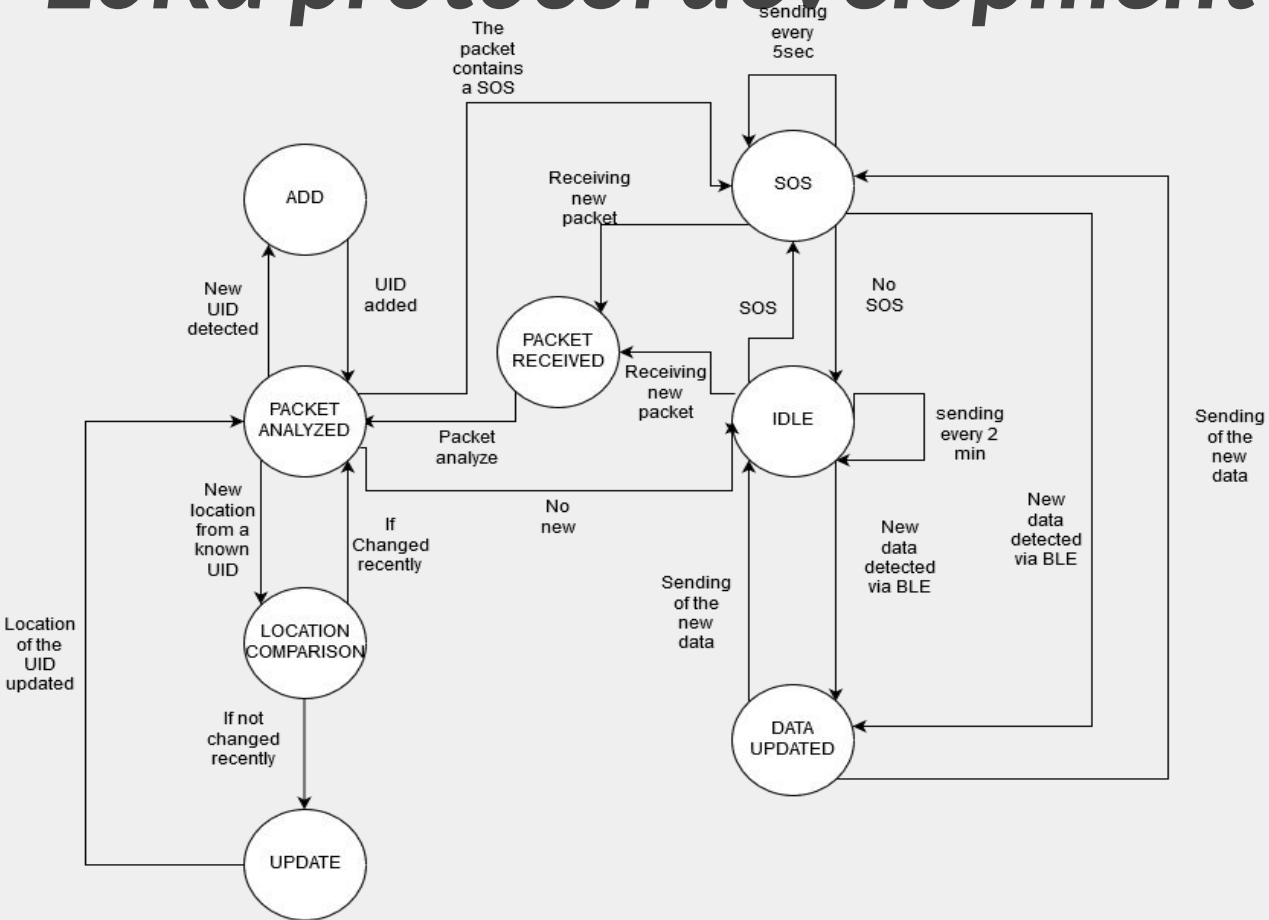



Smartphone 1
BLE communication
API communication
GPS communication
Map display
HTTP
GPS
ESP32 1
BLE communication
LoRa communication
BLE
Other team's part
Server
API
Database
LoRa
Satellite
BLE
ESP32 2
BLE communication
LoRa communication
HTTP
Smartphone 2
BLE communication
API communication
GPS communication
Map display
GPS

LoRa protocol development



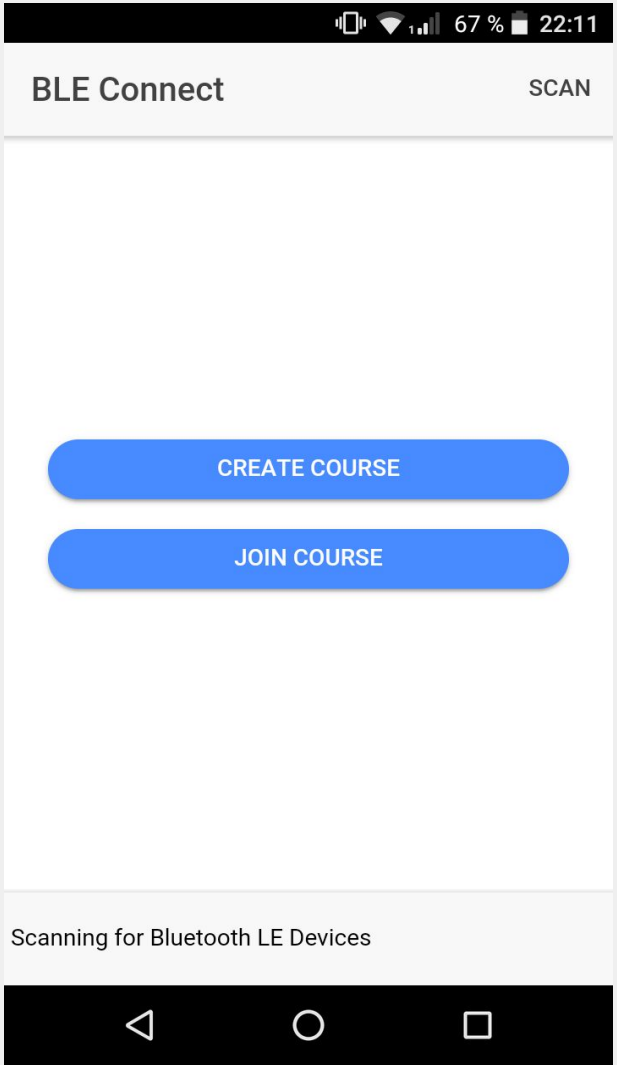
LoRa protocol development

User ID (1byte)	Geolocation (8 bytes)	SOS Flag (1 byte)

BLE development

Application side

ESP32 side



BLE development : App side

- Finished
- Merge on master to do

BLE development : ESP32 side

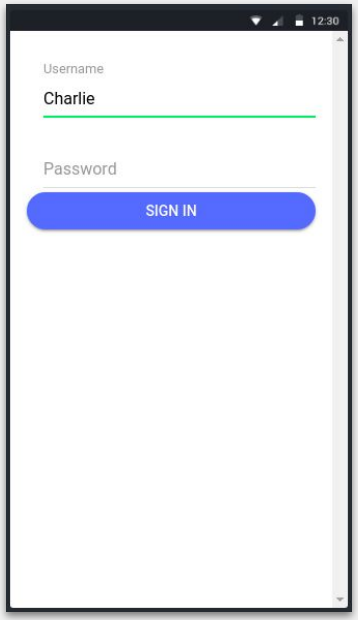
- Pairing works
- Data exchange to implement

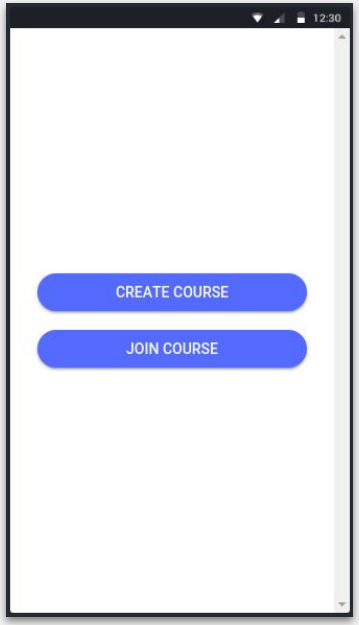
Application development

Frontend

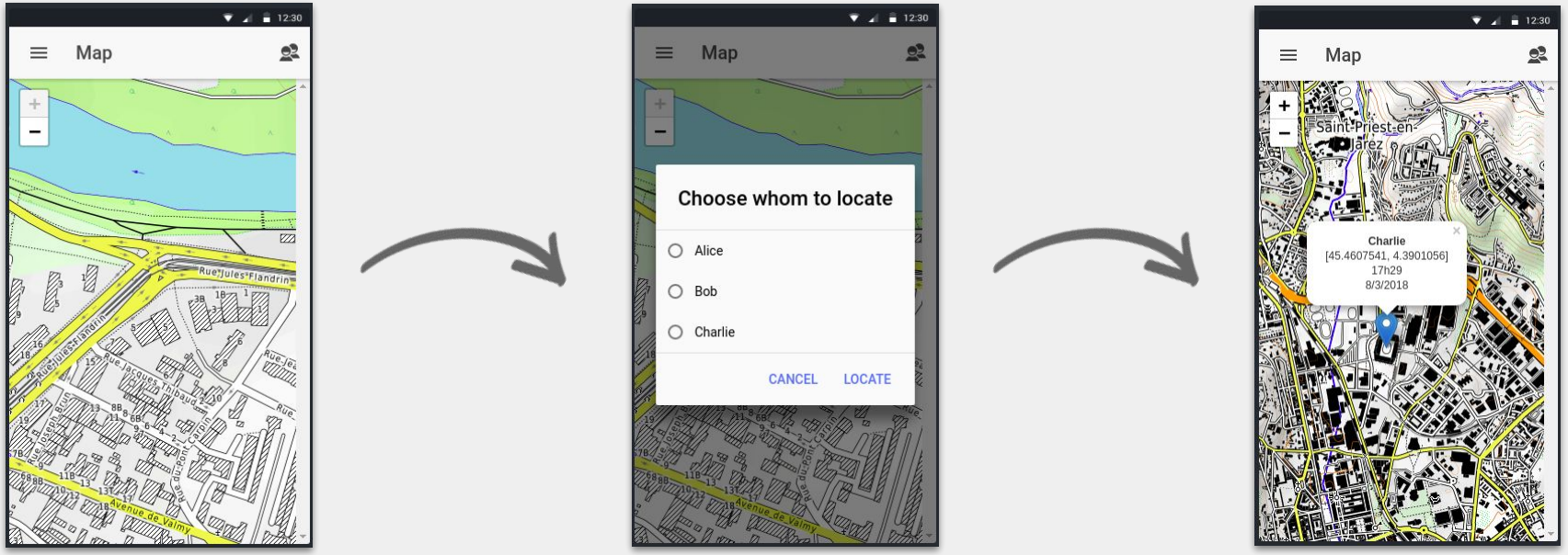
Backend

Interface : initialisation phase

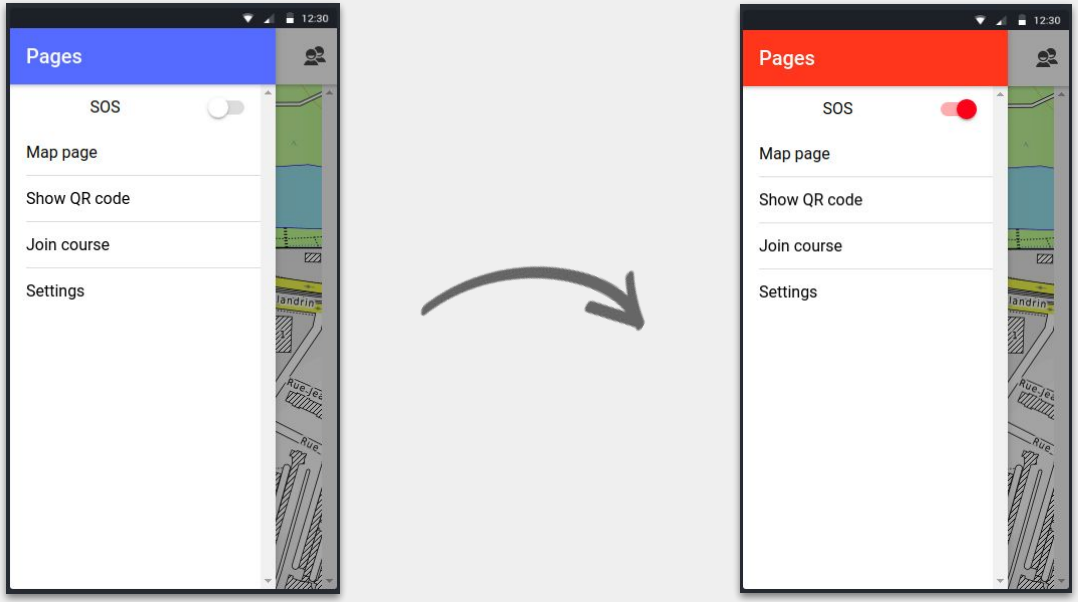




Interface


12:30
Map
Choose whom to locate
Alice
Bob
Charlie
CANCEL
LOCATE
Saint-Priest-en-Jarez
Charlie
[45.4607541, 4.3901056]
17h29
8/3/2018

Interface


12:30
Pages
SOS
Map page
Show QR code
Join course
Settings
12:30
Pages
SOS
Map page
Show QR code
Join course
Settings

⚠ *Issue*

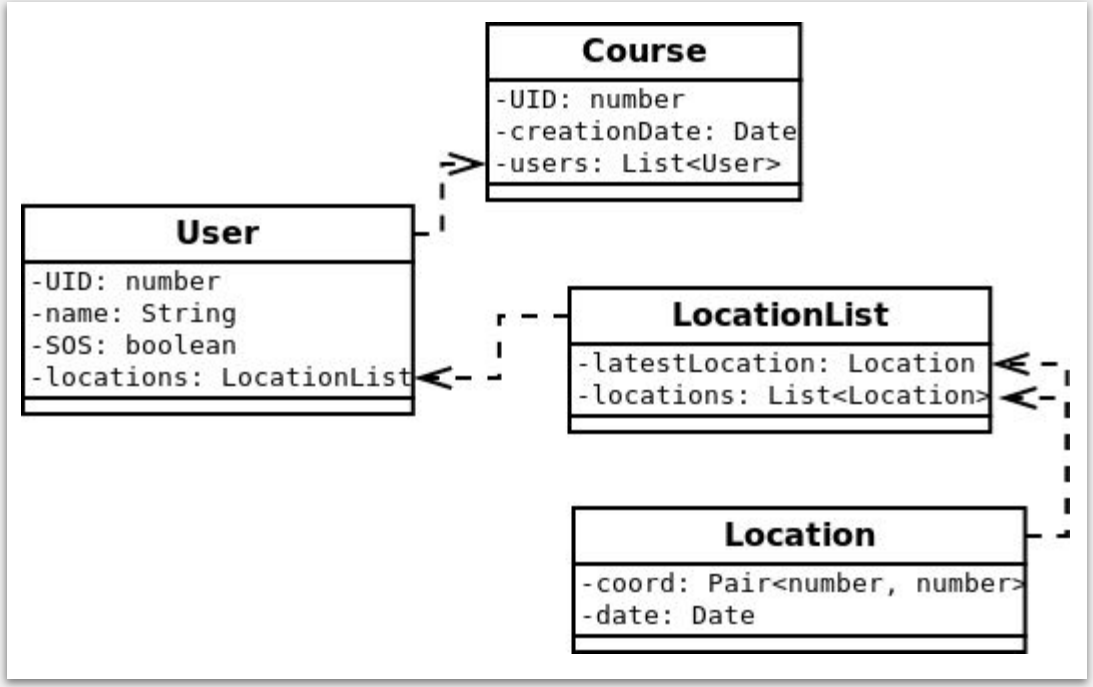
What's the problem ?

New instances on opening pages

What's the solution ?

An injected provider

Backend : data structure



Classes as usual

Injected provider

Backend : Course creation

Creation

On user request
Call to server via API
Shared via QR Code

AES encryption

Key + IV
Shared via QR Code

Remaining work

To complete the project :

BLE communication
Actual calls to the server API
Deporting AES encryption to ESP32

To enhance the project :

Offline map loading
Add protocol version number in packets
Reduction of LoRa packet size

Conclusion

We learned difference between aim and real result

We liked this project

We are proud of what we achieved

We are excited to see next year's version of UltraTeam

Thanks for your attention !
(Let’s see it for real now !)