

## GOALS

- Collect and share a large dataset and reproducible RF fingerprints
- Use off the shelf emitters from real-life IoT nodes
- SDR-based receiver
- Further rely on Machine Learning for authentication and localization

## CHALLENGES

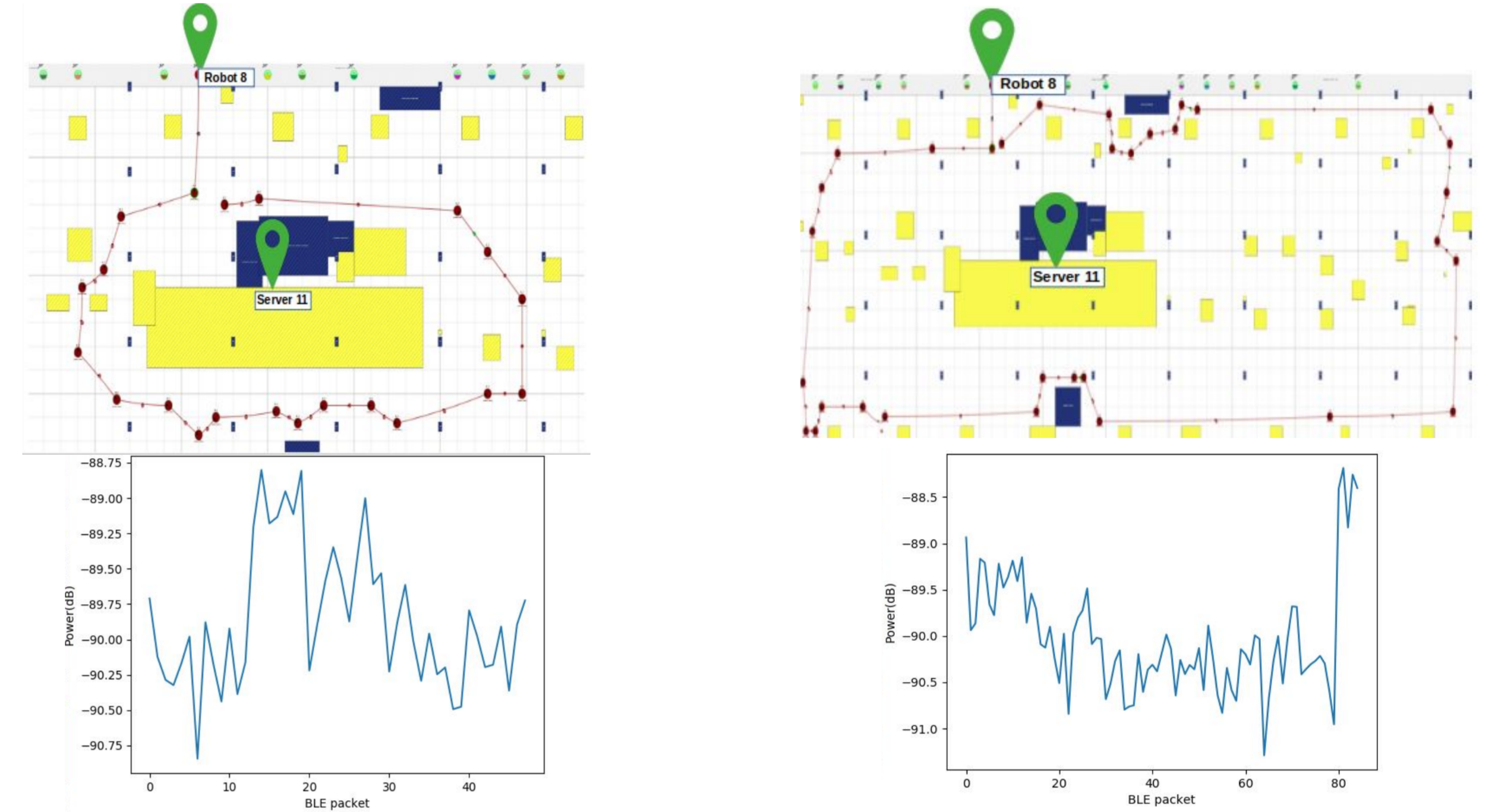
- Not familiar with Fed4FIRE+ tools and softwares
- Reproducibility and automation
- Off-the-shelf devices to scale up outside the testbed
- Dataset generation (time, position, node diversity) & data quality will impact machine learning performances

## DEMO SETUP

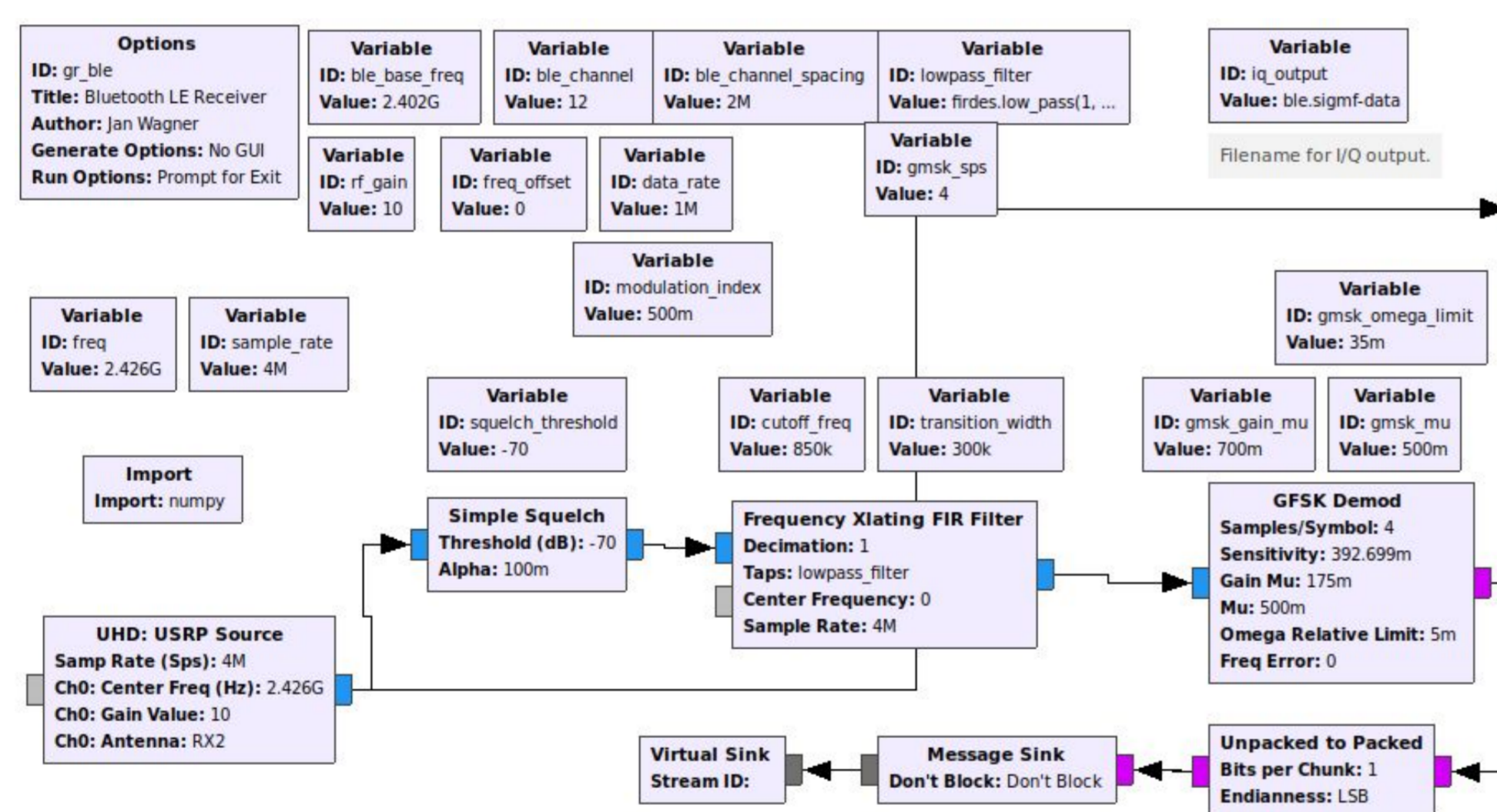
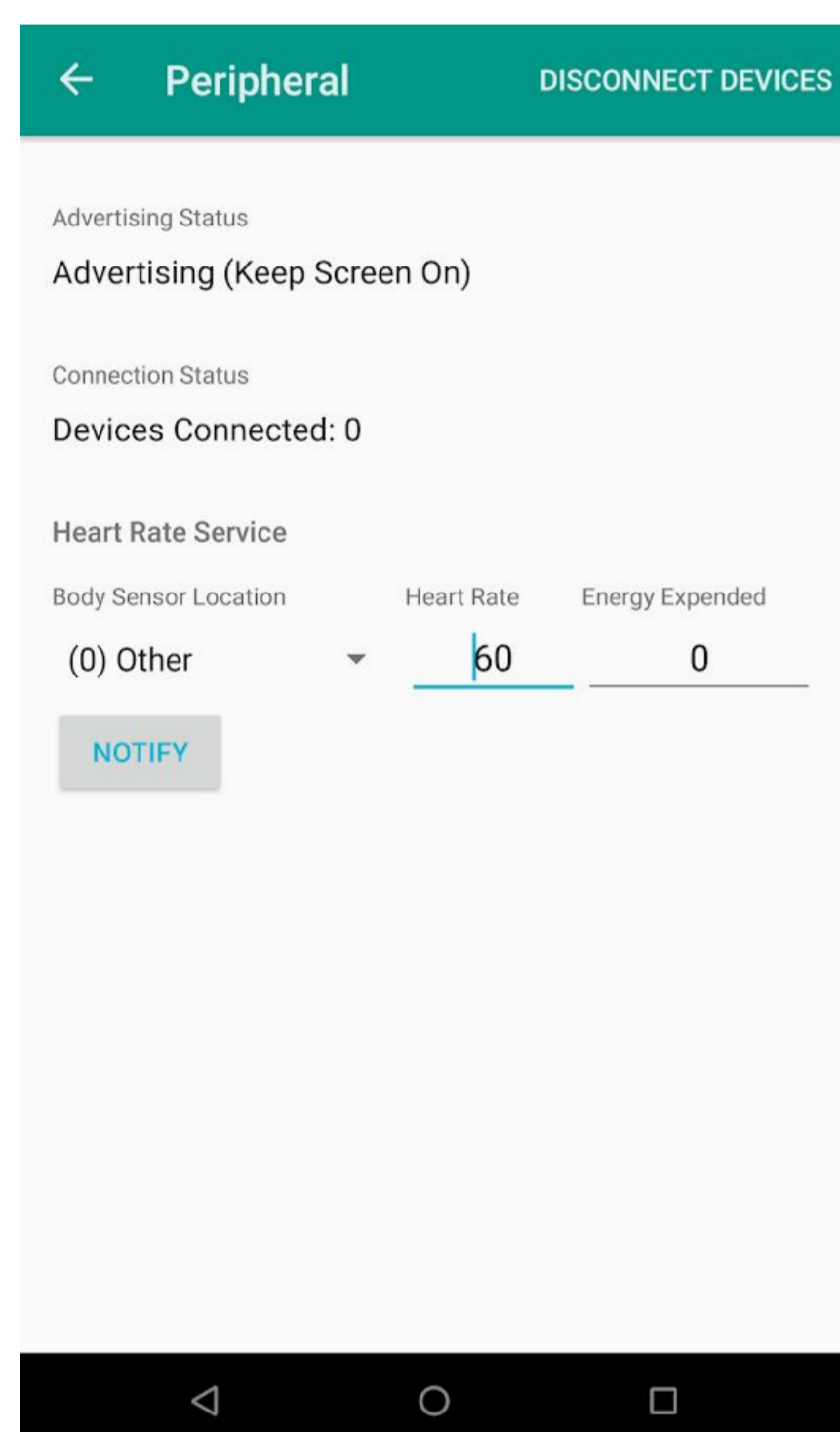
- Make a reservation on the testbed Web UI
- Setup the experiment scenario and provision nodes using our automation script
- Use mobile node(s) equipped with a Huawei Nexus 6P to run a custom Bluetooth Low Energy App that advertises as an HRM Peripheral
- Move the mobile node with robot to a fixed position
- Use the USRP N210 node(s) to receive and demodulate the BLE Advertising packet using GNU Radio
- Save raw IQ and advertising packet as PCAP

## RESULTS

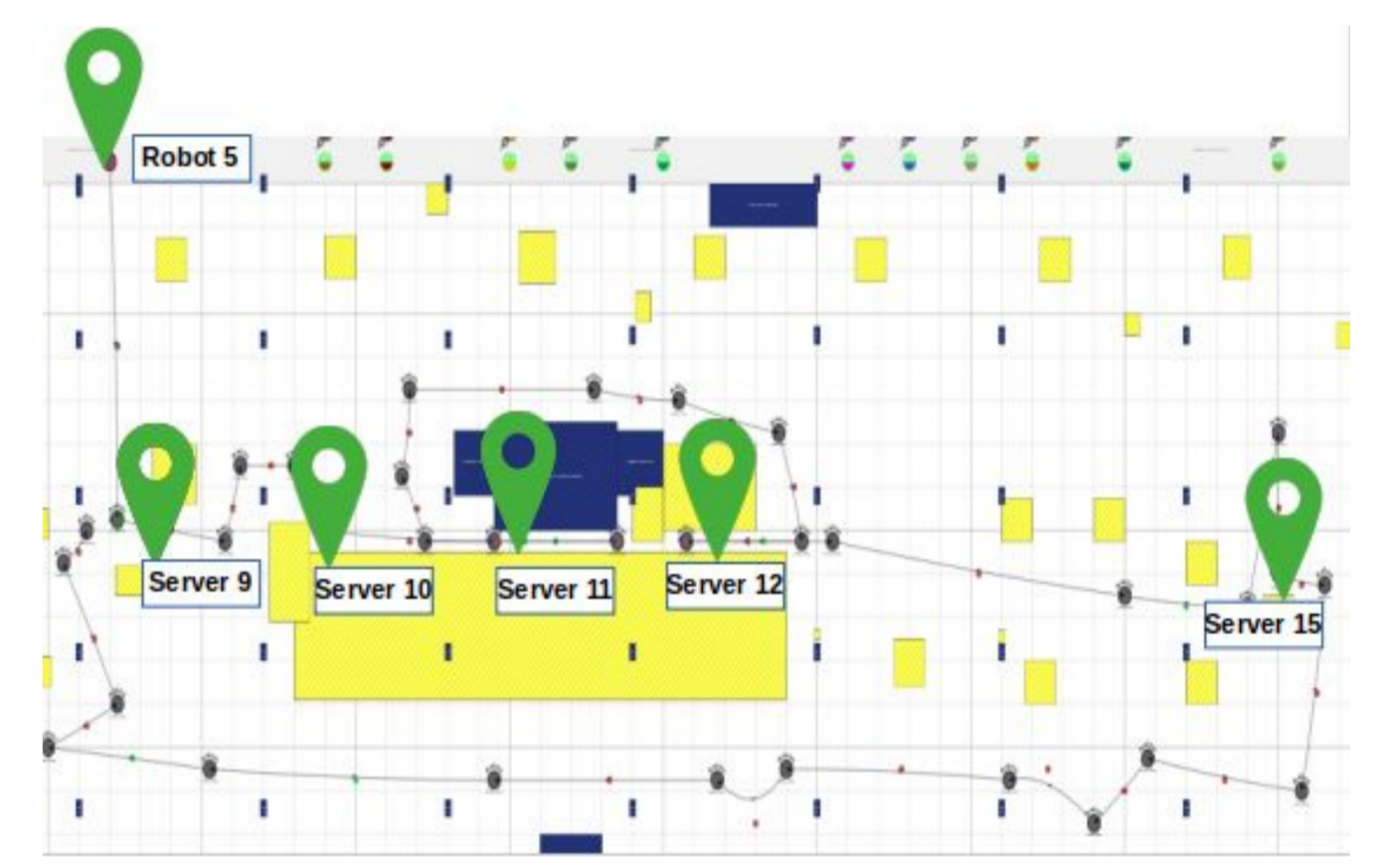
- PCAP and raw IQ datasets have been collected
- Using all the available smartphones and USRP N210
- Mobile node and smartphones located at 10+ positions



## MORE RESULTS



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
2	1.074137	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
3	2.143532	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
4	3.854244	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
5	5.9421540	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
6	13.246563	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
7	16.233966	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
8	17.947419	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND
9	18.887432	69:89:d8:3c:da:e7	Broadcast	LE LL	35	ADV_IND



## CONCLUSIONS

- We have collected a preliminary dataset ready to be used
- We have assessed our interest for Fed4FIRE+ testbeds federation
- Impact on both research and business activities at Rtone
- Fed4FIRE+ provides a great opportunity by open calls to SMEs
- Others IoT nodes and RF protocols + Machine Learning in Phase 2 experiment

## POST MORTEM

- Time to get acquainted with the testbed is not negligible
- Time for running an experiment is not negligible
- Sharing (very large) experiment results across different testbeds is a nice feature
- Fast and helpful technical support
- Remind that nodes and resources are shared among all the experimenters!