



CREW

Cognitive Radio Experimentation World

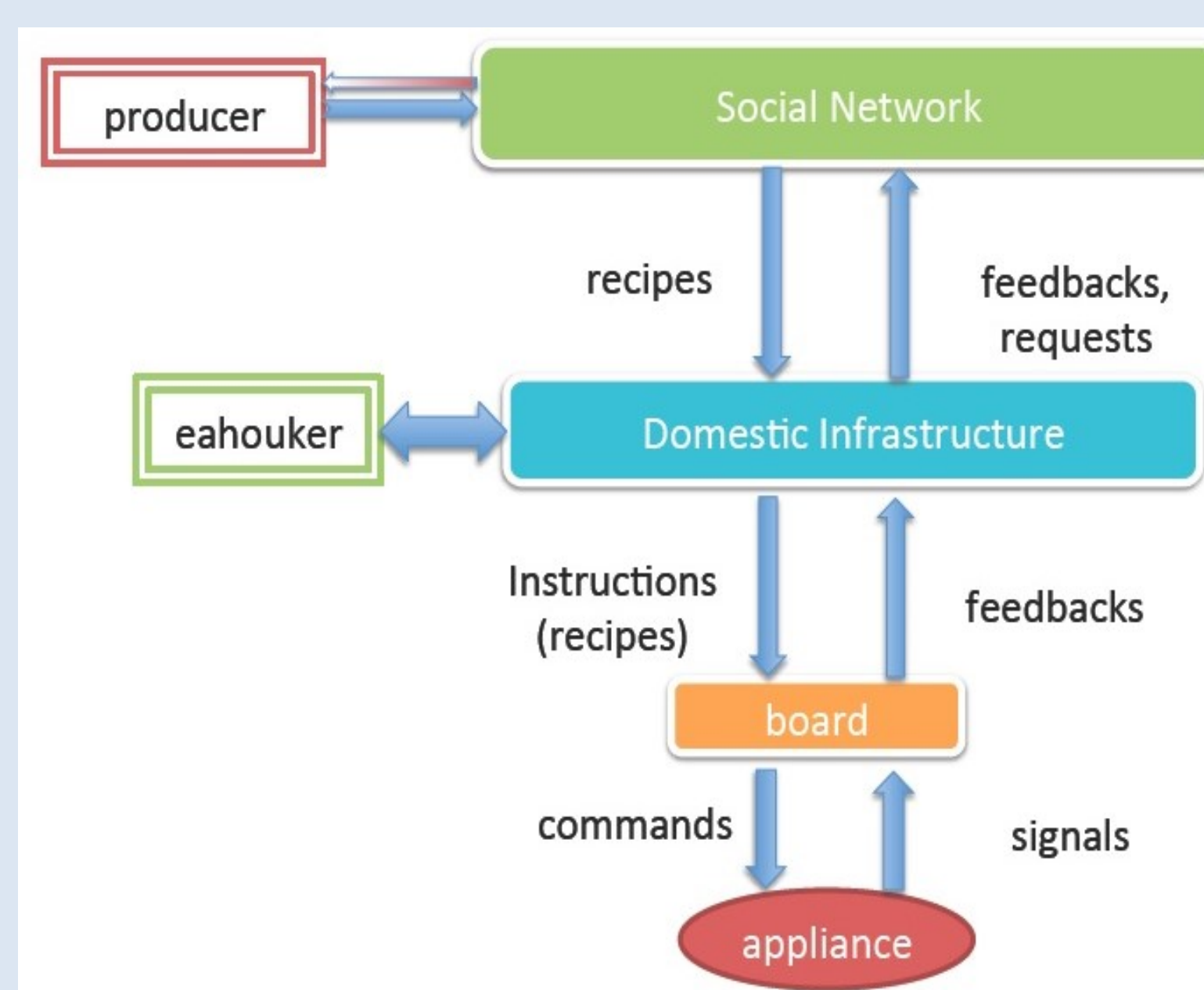


SandS Social and Smart [Arduino]

Goals

- To investigate how the SandS solution performs on a larger scale.
- To test the systems limitations regarding external interference

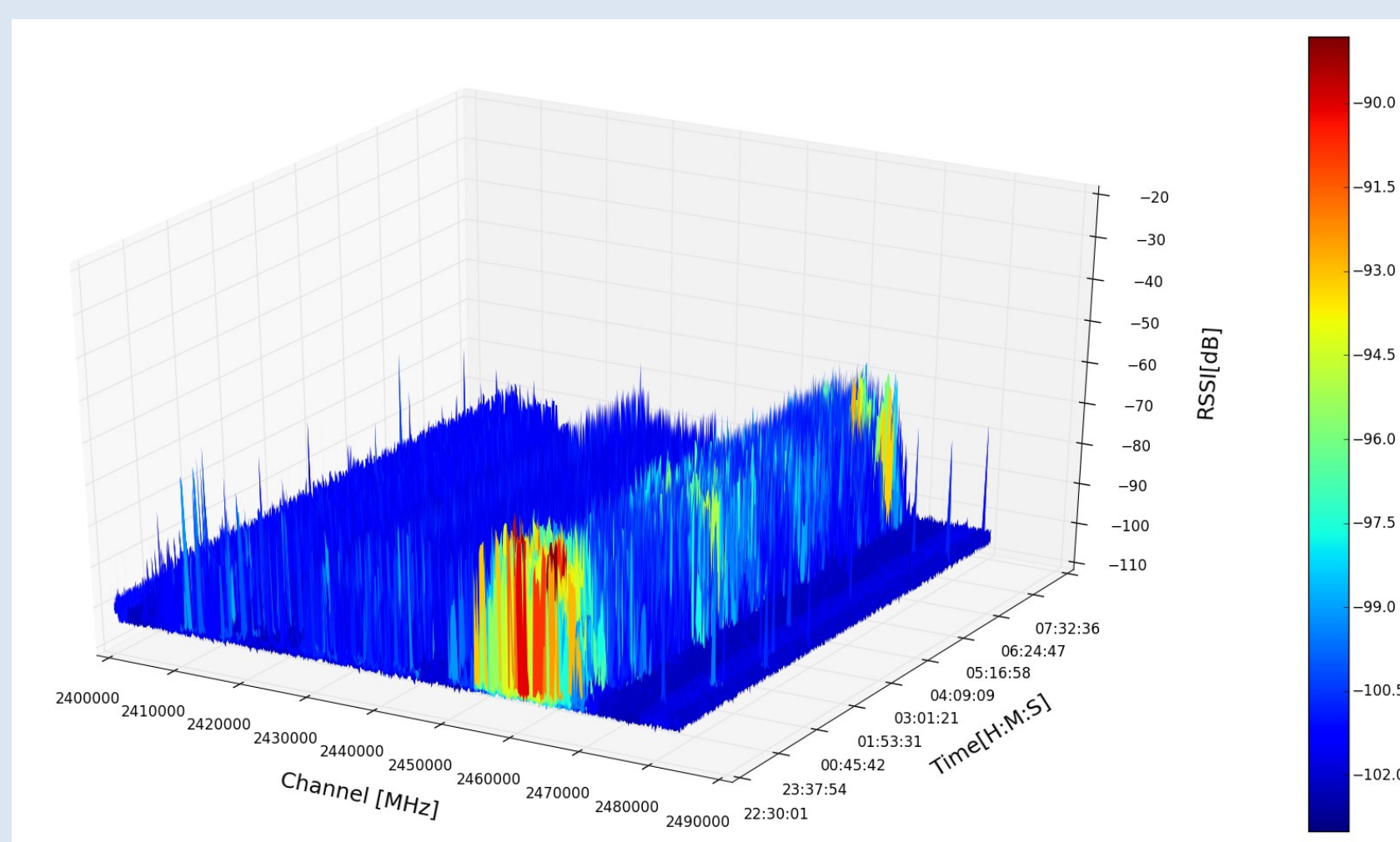
SandS architecture



- Household appliances communicate with e.g. Arduino boards
- The boards receive their instructions from the Domestic Infrastructure (DI), which is responsible for translating recipes into board specific instructions. The eahouker operates the DI.
- Recipes are the intelligence products of the social network. Thanks to its massive data feeding, it is enabled to sophisticatedly rule the appliances.

Results

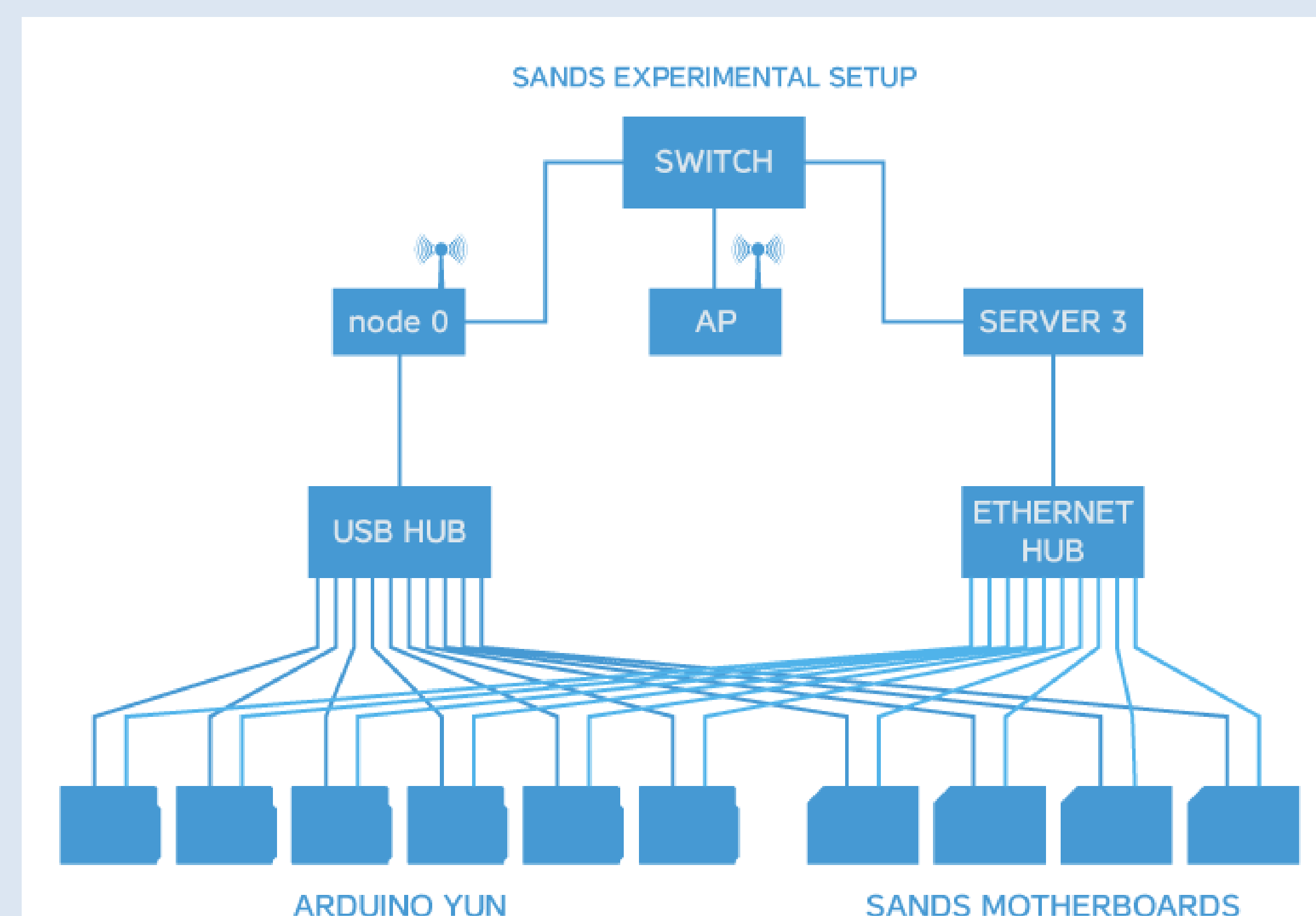
- RSSI of Wi-Fi signals at 2.4GHz during overnight test. The boards do not interfere with each other, which results in 9 perfectly connected boards.



Conclusions

- The experiments led to the fixing of lots of software issues in the Domestic Infrastructure (DI).
- The tests also resulted in an improved robustness of the DI connection manager.
- Error detection on appliances could be achieved by analyzing communication patterns generated from the logs of the DI

Hardware setup



Experimentation

Three experiments were set up on the iMinds w-iLab.t testbed:

- Configuration test: 9 physically integrated SandS boards, all in configuration mode. The goal was to measure how the spectrum behaves when all devices in a kitchen are configured as access points, waiting for the first configuration.
- Single network setup: 9 physical boards, multiple testbed Wi-Fi nodes as clients and 1 Wi-Fi node configured as access point, all simulating a concurrent full-chain of communication between appliances and DI within the same network.
- Multi-network setup: consisted of 9 physical boards, multiple testbed Wi-Fi nodes as clients and multiple Wi-Fi nodes configured as access-points. The test will generate a real-life simulation of highly saturated Wi-Fi spectrum with multiple networks operating and fully overlapping.

Testimony

- The facilities at iMinds allow for an endless series of possible configurations and topologies by using the mobile nodes. However, in order to keep maximum control of the experiment, we decided to stick to fixed nodes.
- Installation of new hardware in the testbed takes some effort
- Excellent support was given during the experiment



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 258301.

PROJECT DATA

Start Date: 01/09/2010; Duration: 60 M
EU Funding: 4.885 M€

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