Lattice Watering: First Status Report

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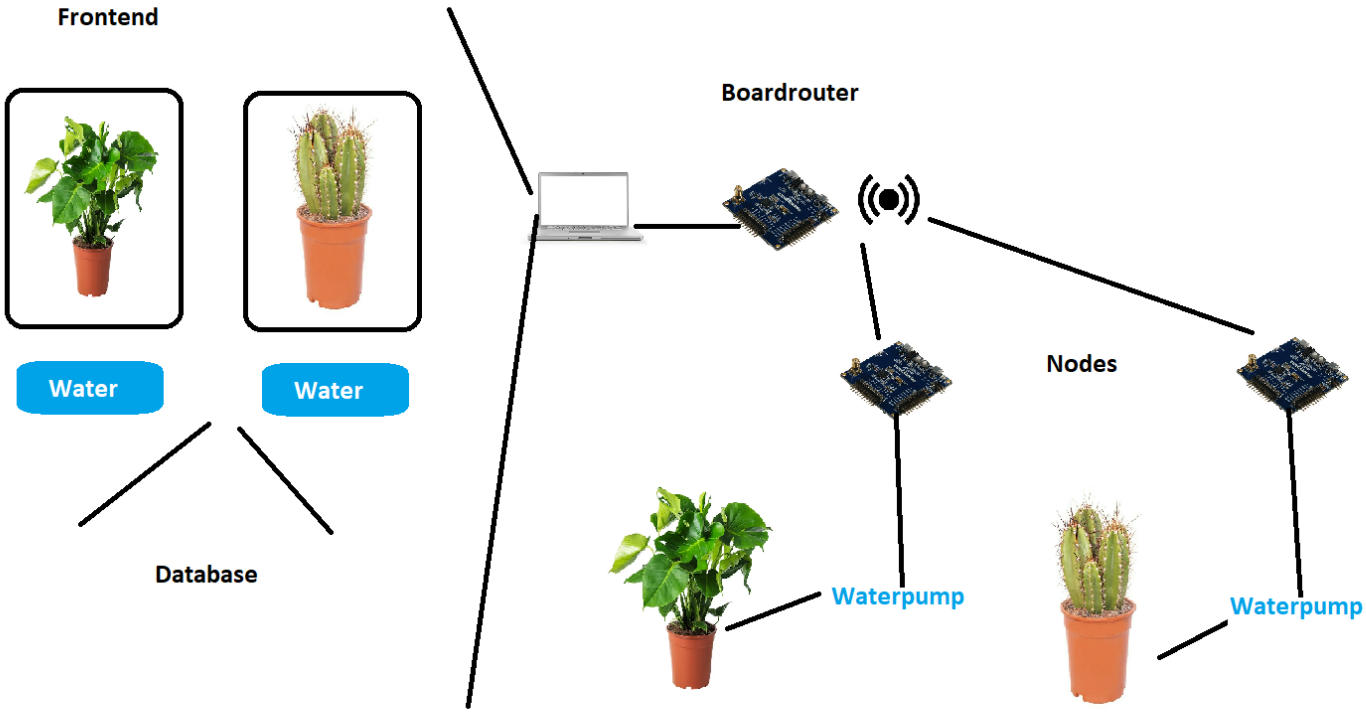
Our Idea

An automies Plant-wateringsystem with following features:

- plant-specific watering
- frontend design
- easy manually Usage
- scalability (?)



short Timeline

09.05.2022: Group has formed. Task and Ressources were discussed

Getting to know the project. Creating communication and development infrastructure. Thinking about Project Ideas.

11.05.2022: Hardware received from Hauke and bought ourselves. HDC1000 Sensor implemented. Started working on the Frontend.

16.05.2022: Talking about Problems and fixing them. Reorginising Project and development structure. (Communication problems Hardware problems)

Getting to know the Board and thinking about ways to communicate between boards and PC. Working on the sensor and waterpump.

23.05.2022: Finding a way to communicate between Boards. Discussing problems and fixing them (HDC1000 not that useful). Getting more Hardware.

Implementing Boardrouter. Frontend. Waterpump.
Still some Things to do

Hardware

- Atmel SAMR21 Xplained. $\rightsquigarrow$ One of the available boards from Hauke. We chose this one since we planned to not use Wifi but the more energy efficient IEEE802.15.4.
- HDC1000 Temperature and Humidity Sensor, soldered by us.
- Soil Moisture Sensor.
- Pumps. (ordered from Amazon)
- Boards with integrated circuitry for connecting the pumps. (After attempting to build a circuit ourselves)

Firmware

- Implemented fetching data from the HDC1000 sensor via the RIOT driver.
- The board comes with prebuilt 802.15.4 capabilities, so it is only natural to use low-power radio frequency communication.
- Which protocols to use? For 802.15.4, the RIOT documentation only specifies the availability of the GNRC, OpenWSN and OpenThread stacks. We went with the GNRC stack, as the others seemingly implement features we will surely not use. We do not think we will require any other stacks, so this should suffice.

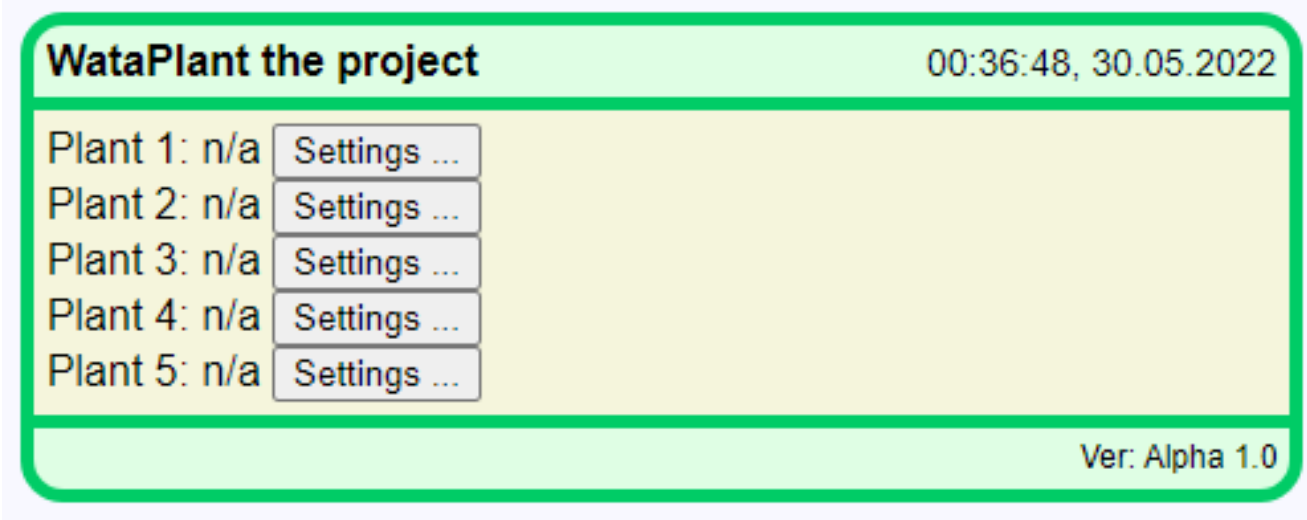
Boardrouter

- Board communicates over an USB-connection with Laptop. Several Methods and a lot of problems. One method worked:
  - Creating a localnetwork with ethos
  - able to send packages to HOST and NODES

Nodes

- Is able to control the pump
- receives packages from BR

Frontend



- Design
- Database

Improvement

- Everything is Hardcoded
- Can not send or receive package that triggers a function call
- Database has to be made or found
- Can not send function call from Buttonclick on Frontend
- no scalability

Conclusion

- Good in Time
- A lot of Problems on the way
- C is hard