Introduction to the Internet Things

Session 07

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Outline

- IoTempower Under the Hood
  - Services provided
  - System in Folders
  - Nodes
  - Compilation Process
  - How to write drivers
  - Multitasking?

IoTempower Feature List

- In existing report:
  - During lecture check off more features
  - Add notable features (under separator)
- End of lecture: match and handcount

IoTempower

- Open https://github.com/iotempire/iotempower
- Answer the following questions during demonstration (→ research report):
  - How can you install IoTempower locally in a Linux environment?
  - Where are the tools/scripts?
  - Where is documentation?
  - What is the role of the different folders in lib/node_types?

Services provided

- What is/needs to be running in an IoTempower system?
  - During presentation write down different services and how to find, monitor, and control them.

System in Folders

- myhouse
  - living_room
    - leds1 (rgb_strip)
    - leds2 (rgb_strip)
  - kitchen
    - toaster
      - consumption (i2c_dev returning power)
      - switch (output)
    - coffee-machine
      - coffee_left (ultrasonic distance)
      - milk_left (swimmer with reed switch → contact)
      - switch (output)
  - main
    - switch (output)
  - system.conf

- With neighbor (5min):
  - which topic needs to be called with what to
    - switch on the coffee machine?
    - set all lights in living room to blue?
    - turn the main power off?
  - what is the general rule for forming topics in IoTempower?
  - When does it make sense to change something in system.conf?
- → research report

Nodes

- During demonstration add to research report:
  - What needs to/can go into node.conf?
  - How do config.txt, etc/iotempower.conf, system.conf, and node.conf influence environment variables for compiling?
    Give examples for when to change which.

Compilation

- During demonstration write down answers to following questions:
  - What are the steps IoTempower executes, when you call deploy in a node-folder (or room or system folder)? What types of deploy are there?
  - Why can only one deploy run at once?

Device

- While lecturer demonstrates:
  - What are the common functions, devices support?
  - What is the “fluent interface”?
  - Which functions need to be overwritten?
  - In which order and when are the overwritten functions called?
  - What is a Subdevice (look at output for example)?
  - What generic filters would be nice?

How to write a driver?

- Demonstration
  - What are the steps building a new IoTempower device driver?
  - What are the challenges/pitfalls?
  - → all into research record
- Any takers on MPR121 or PCF8591?
- Any other devices you would like to see? → issues on github

IoTempower Recap

- Count how many of your preferred features are supported by IoTempower – compute vs. total (percentage)
- Put number in research report and refer to it in reflection part (why do you think you got this number?)
- Handcount

Lab 7

- Work on project 1
- Setup scale (with ESP8266 and IoTempower)
  - Connect HX711 directly with Wemos D1 Mini via i2c
  - Calibrate
  - Combine with scale/update project 1 table (share one scale in one big team)