Software Engineering of Internet of Things

Radio Handin: Wireless Uplink

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March 3, 2020

1 Context

Both types of IoT devices have temperature sensors; they have one on-board and one cabled. They also have a light sensor and a WIFI radio each. Radio links are not always reliable. In this handin we explore the quality of such a link.

2 Exercise

By now, you should have a setup where acode running on your IoT device is sampling temperature and pushing it over WIFI link(s) to some code that appends these values to a file on your laptop. This exercise is to gain insights into the reliability of that radio link.

3 Recipe

1. Locate your documentation.
2. Update the code of your IoT device that samples the temperature to:
   - Also sample the light level.
   - Keep track of the number of samples.
   - At each loop transmit the temperature, light level and number of transmissions in a single message.
3. Run it for a significant amount of time (e.g., a week).
   - **Note:** You are welcome to send the data to a service in the cloud instead of anchoring your laptop for a week.
4. Take a look at the resulting log.

5. Write code for processing the log in order to answer the questions from the requirement sections below.

4 Requirements

1. Describe the experimental setup. Use technical terms such as
   - Service
   - Workload
   - Parameter
   - Factor
   - Levels
   - Metric
2. Answer the following questions:
   (a) At which frequency did you receive data?
   (b) How precise are the reception times?
   (c) Are there any missing frames, and if so are there patterns (e.g., around lunch on workdays)?
3. Hand in as a group by sending a mini-report as PDF (code in appendix) to asjo@mmmi.sdu.dk with subject
   `"SDU IoT 2020: Handin 3 - Wireless Uplink"`
4. Deadline: April 1, 2020