Thesis Plan

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Preliminary title

A study on the effects on performance and maintainability the libuv library has on low-cost ARM-based IoT-devices.

Problem description

The IoT industry is rapidly growing. Ericsson has made a forecast that around 400 million IoT-devices will be connected by the end of 2016, and by the end of 2018, they will surpass in numbers the amount of mobile phones that are connected to the cellular network. This increases the importance of performance and maintainability of embedded devices.

Approach

Study some cases of IoT applications used in the industry; their architecture, libraries used and benchmark tests. Use this information to compare similar implementations used with the libuv library to find the difference in performance and maintainability.

Literature base

[1] Agajanian, Arthur H. "A bibliography on system performance evaluation." *Computer* 8.11 (1975): 63-74.

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[4] Kopetz, Hermann. *Real-time systems: design principles for distributed embedded applications*. Springer Science & Business Media, 2011.

[5] Wu, Geng, et al. "M2M: From mobile to embedded internet." *IEEE Communications Magazine* 49.4 (2011).

[6] Oman, Paul, and Jack Hagemeister. "Metrics for assessing a software system's maintainability." *Software Maintenance, 1992. Proceerdings., Conference on*. IEEE, 1992.

[7] Siboldi, Massimo. "Node JS Performance Testing." (2014).

[8] Rajaraman, Chandrashekar, and Michael R. Lyu. "Reliability and maintainability related software coupling metrics in c++ programs." *Software Reliability Engineering, 1992. Proceedings., Third International Symposium on*. IEEE, 1992.

[9] Jamil, Tariq. "Risc versus cisc." *Ieee Potentials* 14.3 (1995): 13-16.

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[11] Hu, Erh-Wen, Bogong Su, and Jian Wang. "Software performance prediction at source level." *Software Engineering Research, Management and Applications (SERA), 2017 IEEE 15th International Conference on*. IEEE, 2017.

[12] Gardašević, Gordana, et al. "The IoT architectural framework, design issues and application domains." *Wireless Personal Communications* 92.1 (2017): 127-148.

[13] Yuqing, Lan, Xu Hao, and Liu Xiaohui. "The research of performance test method for Linux process scheduling." *Information Science and Engineering (ISISE), 2012 International Symposium on*. IEEE, 2012.

Time Plan

- 20 weeks total
  - 10 weeks implementation
    - Identify test applications and devices
    - Write test cases and base architectures
    - Run benchmark tests and capture result
  - 10 weeks information search and writing
    - Writing report
    - Identify suitable theory and methods