

Aggregation Support by RIOT OS Devices under SecureWSN (BA/MA)

Over several years a big IoT network called [SecureWSN](#) was established and continuously expended towards a trustworthy environmental monitoring framework for constrained networks. The network itself consists of 3 parts: (1) Data collection via constrained devices, (2) gateway component handling incoming data and managing the network called CoMaDa, and (3) a framework realizing backend and front-end for the end-user called WebMaDa. Several theses are available in those parts of SecureWSN.

This thesis looks on the extension of the data collection part via constraint devices running RIOT OS and the application protocol TinyIPFIX (RFC 8272) for data gathering. Depending on the application a preprocessing of data in the collecting network makes sense, especially to reduce the network traffic in total. Thus, powerful devices within the network on designated location should preprocess the data by supporting message and data aggregation as requested by the network owner. The protocol itself should follow the TinyIPFIX message format in order to allow easy integration into the running infrastructure (CoMaDa and WebMaDa) at the same time.

The following things are requested to be designed, implemented, and evaluated (most likely via proof-of-concept) in this thesis:

- Aggregation support following TinyIPFIX message format under RIOT OS
- Integration and support into CoMaDa and WebMaDa
 - Configuration and deployment
 - XML integration for template translation
 - Integration into logging system
 - Integration into privilege management
 - Accessibility via front-end for end-user

Finally, the report needs to be written, as well as a detailed documentation and handing over a running VM with the complete project with all sources. Depending on the chosen thesis type the content will be adapted. Depending of the results we will try to publish it on high ranked conferences and workshops.

Knowledge in C programming and little bit SQL, PHP, JavaScript, and AngularJS for CoMaDa/WebMaDa integration would be an advantage.

We will offer you:

- Access to existing source code in different operating systems (TinyOS and Contiki)
- Access to written theses of SecureWSN
- Virtual machine running Ubuntu and CoMaDa including a link to WebMaDa and the backend
- Initial literature
- Smart working environment
- Deep contact to supervisors and a lot of discussions and knowledge exchange

As this work is based on different works and research results, a willingness to familiarize oneself with the existing system is expected. Based on the results of the work, further work will be put out to tender, so that detailed documentation is required at all levels, as well as close cooperation with the supervisors.

If you are interesting in this thesis contact us and let's discuss:

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