

Thesis Work: Data Serialisation Framework for Embedded Systems

Background

An increasing number of embedded systems require to exchange messages with other systems, via radio, Internet or other means of communication. While a big selection exists for the communication channel, the format of the messages sent across the chosen channel is most of the times handcrafted.

However handcrafted solutions can have problematic drawbacks. In general terms they are more prone to errors, difficult to maintain and adapt to the future requirements, and also more difficult to integrate with other systems.

Large distributed systems like Hadoop, Facebook, or Google faced similar problems. To solve their problems they developed different data serialisation formats like Avro, Thrift or Protobuf to describe, encode and decode messages.

These formats are nowadays in wide spread use to describe the communication between different systems. However they do not support the proprietary and huge number of embedded systems in an easy fashion.

Assignment

The thesis should investigate the current state of data serialisation, select a few of the existing solutions for comparison and depending on the outcome implement a solution for an embedded system – ideally Microchip's PIC32MX.

Qualifications

The correct candidate is very proficient with C, C++, embedded systems and not afraid to work with 3rd party code and low level libraries.

Familiarity with any of the following is a plus but not required:

- TCP/IP
- Communication protocols / Data Serialisation
- Contiki OS
- Microchip PIC32MX

Company

ATC Industrial Group AB works on the next generation heating control system. Our self-learning system Scypho will deliver Comfort On Demand to home owners, while saving energy and reducing the heating bill.

Contact

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