Master Thesis – Rust for Fast Path

Background
Fast path is the packet processing functionality in the RAN SW providing very efficient IP based traffic handling. Traditionally this functionality is implemented using C on top of DPDK (https://www.dpdk.org/). DPDK is a Data Plane Development Kit that consists of libraries to accelerate packet processing workloads. DPDK is provided by Linux Foundation.

Thesis Description
Rust (https://www.rust-lang.org/) is an up-and-coming language with strong support. It promises type and memory safety with comparable speed to C. This thesis aims to investigate if Rust could be a possible target for fast path implementations to improve quality and security?

Could Rust be used for an easier implementation of the fast path?

The following steps are envisioned as part of the thesis work:

- Investigate if some DPDK components could be replaced by Rust components
- Analyze and evaluate using selected metrics,
  - Development speed
  - CPU efficiency
  - Memory efficiency?
  - Etc.

The thesis will be concluded with a result presentation for the Ericsson team.

Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar. Background in wireless communication is preferred.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2022

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