Improvements to Forward Erasure Correction Coding

Forward error correction (FEC) is a method to add redundant data before transmission over an unreliable network to account for potential packet losses (“erasures”) and to avoid retransmissions. We are using DPDK and Galois-field libraries to achieve high-performance reliable network transmission over one or multiple paths. There is an alternative, advanced coding approach available which needs to be integrated into a common code base. Also other optimization opportunities have already been identified. In this thesis you will work on yet to be discussed improvements of an existing FEC implementation.

Current Setup

- integration of convolutional coding schemes
- dynamic adjustment of coding parameters
- removal of unnecessary memory copies
- add compatibility with network emulators
- parallelization

Possible Tasks (TBD)

- agree on a set of tasks in discussion with the advisors
- implement and integrate the improvements into the code base
- assess the impact of your changes based on reproducible measurements

Approach

- experience in systems programming in C or C++
- structured work style

Requirements

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