Design and Performance Analysis of Parallel Processing of SRTP Packets

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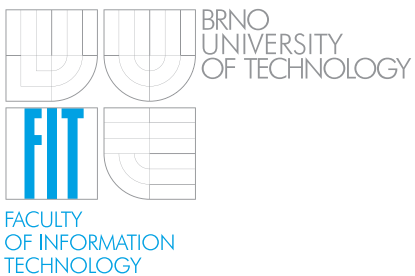
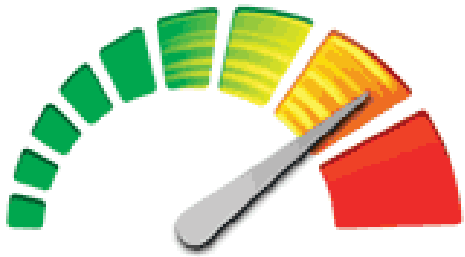


Parallel Processing of SRTP

Open Computing Language

- standard for parallel computations
- wide support of HW and SW
- active contributions
- many important vendors (including Apple, AMD, intel)

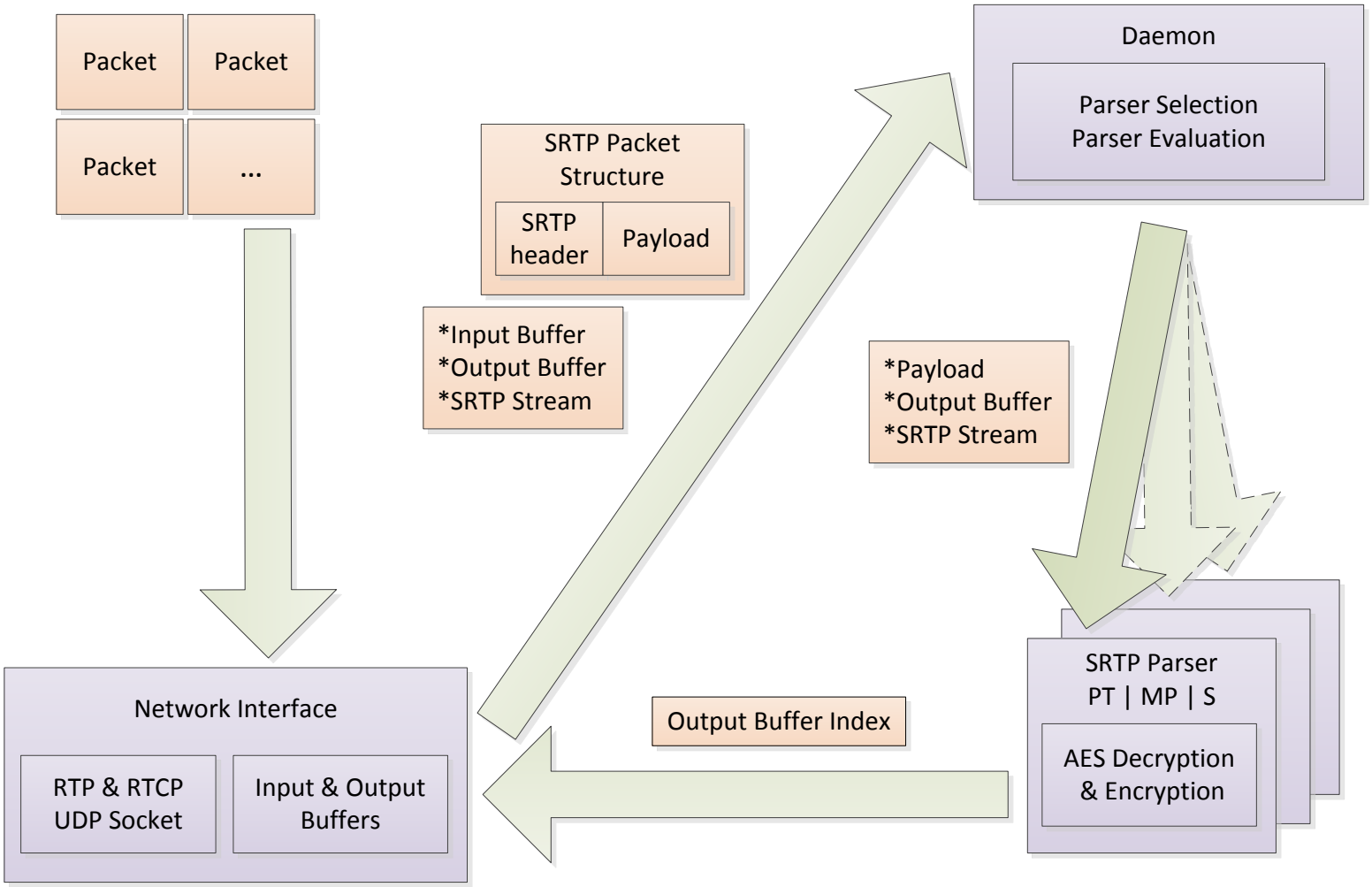


OpenCL

SRTP parsing

- usual size 2 to 10 AES blocks
- careful allocation of resources vs. massive parallelization – persistent thread paradigm
- minimize average delay caused by packet processing on gateway

Application Design



Results

Following graphs visualize distribution of packet delays in *ms* over *number of concurrent calls* using G.711 with sampling period 20ms during test.

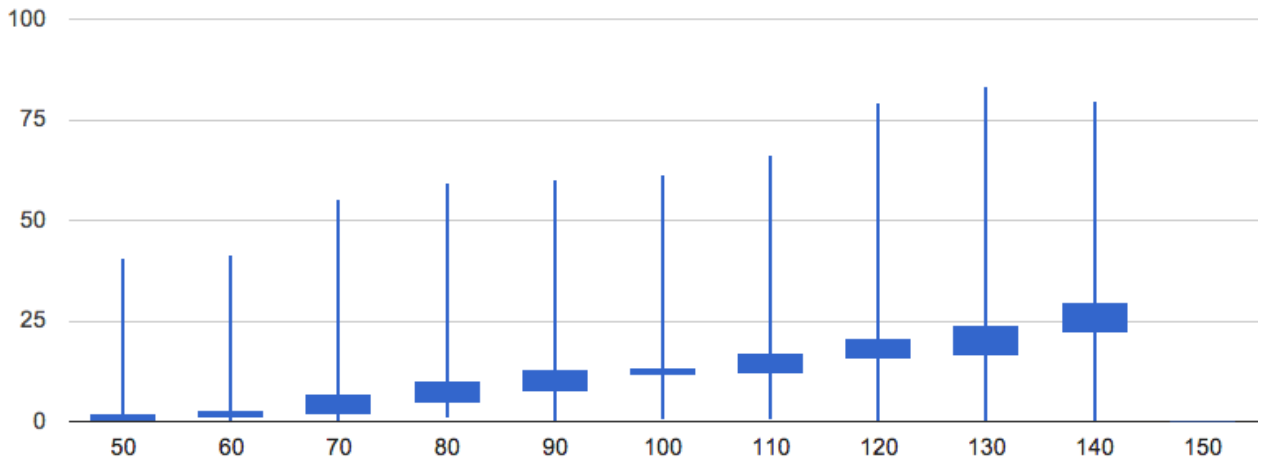


Figure: Serial implementation.

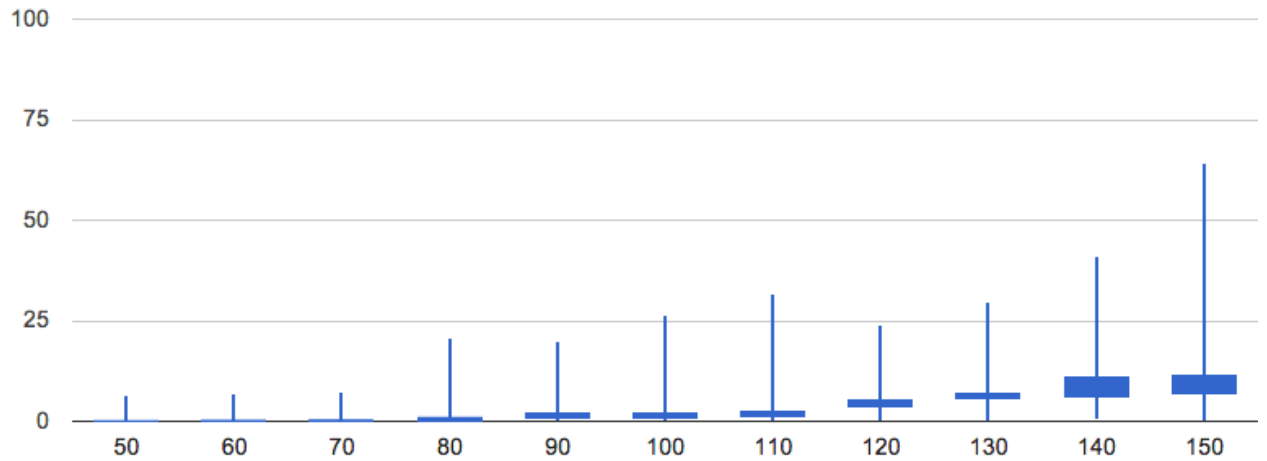


Figure: Parallel implementation.

Conclusion

Compiled and tested using:

- processor – intel core i5 2500k
- operating system – OpenSUSE 12.2
- used languages, frameworks and libraries
  - C/C++ std=c++11 (compiled with gcc 4.7)
  - OpenCL 1.2
  - Boost 1.53.0

Results:

- Average packet delay caused by SRTP encryption
  - dropped to one third during 140 concurrent calls
  - at least to half during smaller amount of concurrent calls