Generic Application Programming Interface (API) for Window-Based Codes
draft-roca-nwcrg-generic-fec-api-00

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Which API?

- core sliding window codec API
  - a component of a much larger software

memory management  code rate adaptation management
congestion control  signaling header creation / parsing
selective ACK creation / parsing  transmission / reception
packet management  tunnel management

out of scope for this I-D

left codec API  right low level codec

- session management()
- encoding/decoding window()
- set/get coding coefficient()
- build coded symbol()
- decode with rcvd src/rep symbol()
What does generic API mean?

- API compatible with different codes
- API compatible with block and sliding window codes
- API compatible with MDS and non-MDS codes
- API compatible with fixed-rate and rateless codes
- API compatible with codes for end-to-end and in-network re-encoding use-cases
**KEY question: why should we do that?**

- ease software development that rely on window-based codes
  - an API provides guidelines
  - a common API reduces dependencies, making it easier to remove a codec and plug another one

- ease benchmarking
  - of codes, of codecs, of full solutions

- ease development of a future reference FEC codec
  - (see discussion, later)

- because it’s feasible
  - within NWCRG several of us already did it
This ID

- gathers 3 existing APIs for sliding window codes
  - (Inria) private version of OpenFEC.org extended to sliding window codes
  - (ISAE-Supaéro) private codec used in research projects
  - (Inria) GardiNet project’s API for embedded devices
    https://gitlab.inria.fr/GardiNet/liblc/

- additional API expected
  - in particular from Morten V. P.
Next steps

- next steps
  - finish to gather APIs in the I-D
  - analyze all the APIs
  - agree on a generic API version

- update I-D accordingly
  - replace existing APIs with the proposed API
About our future reference codec...

- develop an open-source, free window-based codec
  - C or C++
  - sufficiently generic to enable specialization (if needed)
  - meant to facilitate Proof-of-Concepts

- existing candidate open-source, free codecs
  - GardiNet project (C++). Targets embedded devices.
    https://gitlab.inria.fr/GardiNet/liblc/
    (see: 09-adjih-network-coding-and-multihop-wireless-networks)

- if anybody is aware of another interesting project, tell us...