Updates on Coding and congestion control in transport

draft-irtf-nwcrig-coding-and-congestion-02

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Main changes since *-00

- Received comments from Spencer (and Gorry)
- Received comments from Vincent
- Questions for some wording from Lloyd
- Now a research group document
  - draft-irtf-nwcrг-coding-and-congestion-02
Context and objective of *-02

• FEC coding: a reliability mechanism (distinct and separate from the loss detection of congestion controls)

• + : FEC coding to deal with
  - transfer tail losses
  - Networks having non-congestion losses

• - : FEC coding should not hide congestion signals

• This memo :
  - discussion of how FEC coding and congestion control can coexist.
  - encourage the research community to also consider congestion control aspects when proposing and comparing FEC coding
Separate channels, separate entities

- Congestion Control channel carries
  - source packets from a sender to a receiver
  - packets signaling information about the network (number of packets received vs. lost, ECN marks, etc.)

- Forward Erasure Correction channel carries
  - repair packets (from the sender to the receiver)
  - potential information signaling which packets have been repaired

- There are cases where these channels are not separated

- More details on the content of each message in the draft
FEC above Transport

- Advantage
  - does not add congestion in the network.

- Drawback / Comment
  - CC is often embedded in reliable transfer protocols (e.g. TCP)
  - This approach requires that the transport protocol does not implement a fully reliable data transfer service (e.g., based on lost packet retransmission).
  - UDP is an example of a protocol for which this approach is relevant.
FEC within Transport

• Advantage
  - Enable conjoint optimization between the CC and the FEC
  - Transmission of repair packets does not add congestion in potentially congested networks but helps repair lost packets (such as tail losses)

• Drawback
  - Maybe not much gains as opposed to classical retransmission mechanisms
  - Bandwidth cost that could have been exploited to transmit source packet
  - Coding ratio needs to be carefully designed
**FEC below Transport**

- **Advantage**
  - Performance gains when there are persistent transmission losses

- **Drawback**
  - Add congestion in already congested networks.
  - Coding ratio needs to be carefully designed
Next steps

• Questions ?

• Please, review and comment