

# Coding and congestion control in transport draft-irtf-nwcrp-coding-and-congestion-03

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# Abstract

## Objective of the document

- 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 solutions in communication systems

# Separate entities

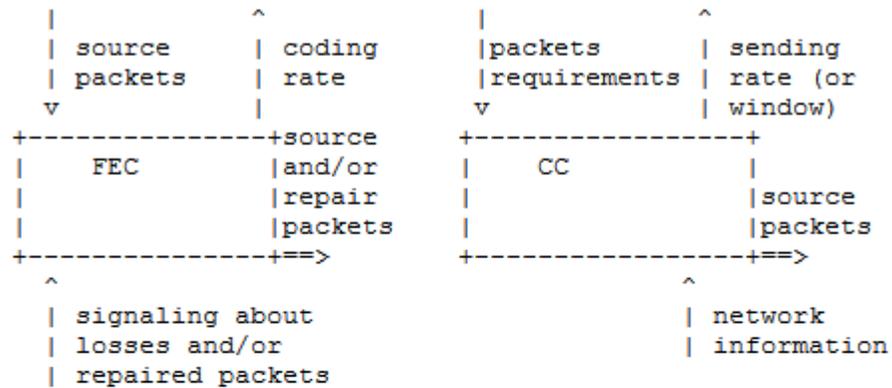


Figure 2: Separate entities (sender-side)

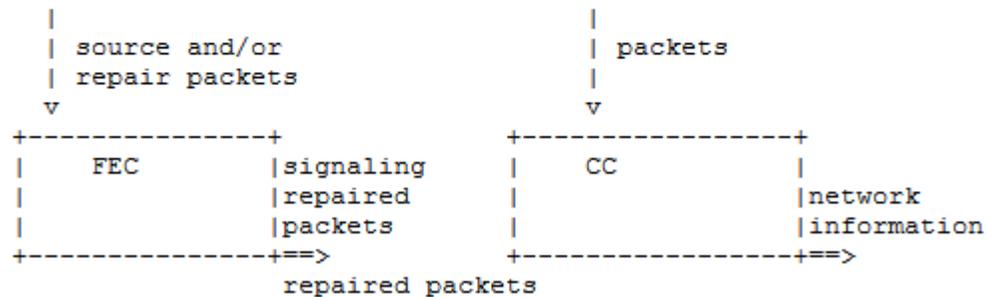
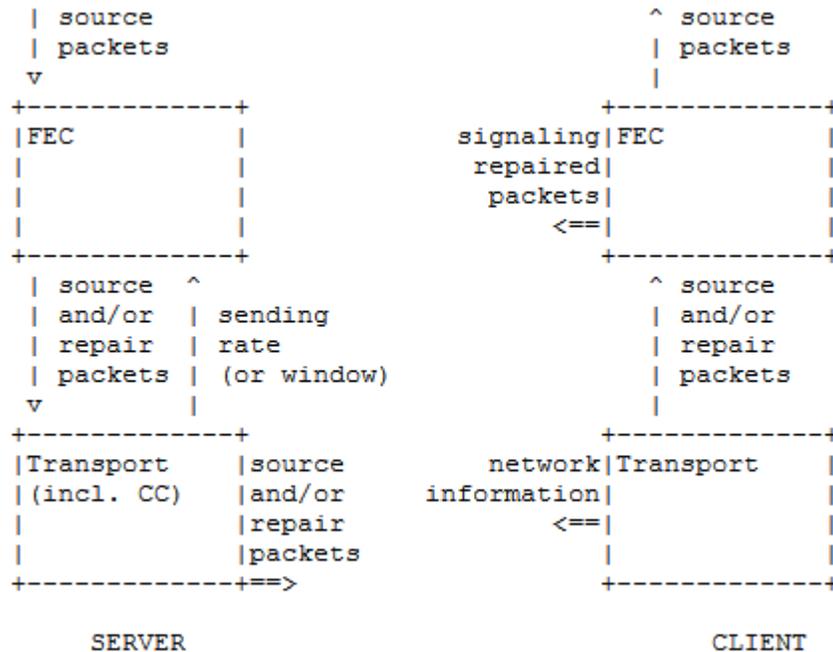


Figure 3: Separate entities (client-side)

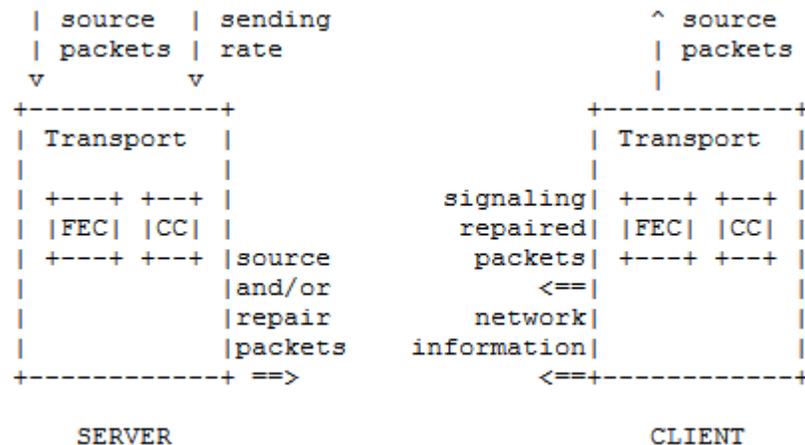
- CC channel carries
  - Source packets from a sender to a receiver
  - Packets signaling information about the network (number of packets received vs. lost, ECN marks, etc.) from the receiver to the sender
- FEC channel carries
  - repair packets (from the sender to the receiver)
  - potential information signaling which packets have been repaired (from the receiver to the sender).

# FEC above transport



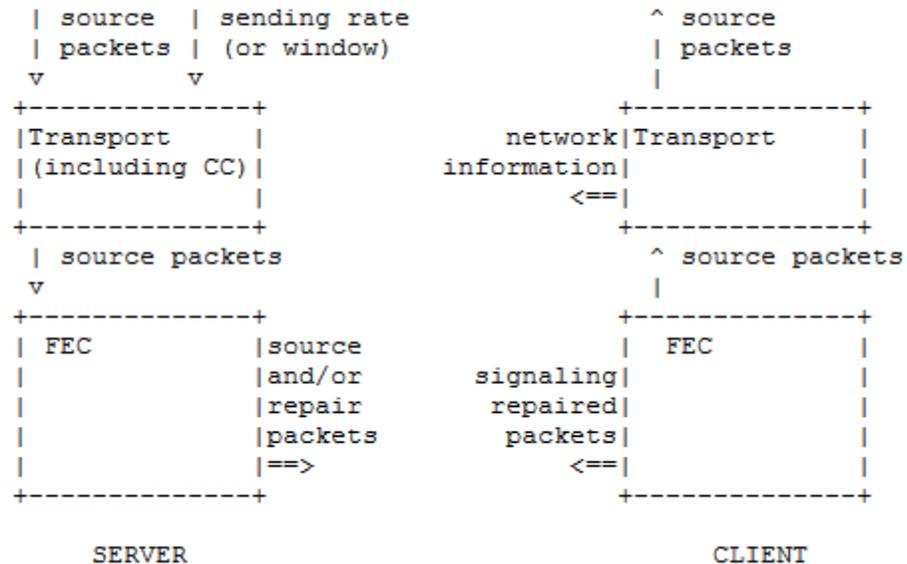
- Issue with reliable transport
  - Potential spurious transmissions
    - Unreliable transport is more relevant
- FEC does not contribute to add congestion with a congestion-responsive transport
  - Redundancy is sent within what CC allows
  - Impact on the goodput for large transfers

# FEC within transport



- Potential conjoint optimization of CC and FEC
- Low gain as opposed to classical retransmission mechanisms and impact on the BW
- Careful design on the coding ratio
- Example :
  - sending repair packets when there is no more data to transmit
  - preferably send repair packets instead of the following packets in the send buffer

# FEC below transport



- Performance gains when there are persistent transmission losses along the path
- Induce congestion in already congested networks
- The coding ratio needs to be carefully designed
  - Using a decoupled CC to define the coding ratio

# Discussion

- What we hope to do next
  - Present results with FEC below transport and FEC within transport
    - With TETRYS as a FEC scheme
    - With TCP CUBIC and QUIC as transport scheme
- The draft is currently a 'discussion draft'
  - Q : should it move towards a 'recommendation draft'?
  - Q: are there any points that should be extended ?
  - We need feedback from the group