University of Glasgow

ECN for RTP over UDP/IP

draft-ietf-avt-ecn-for-rtp-02

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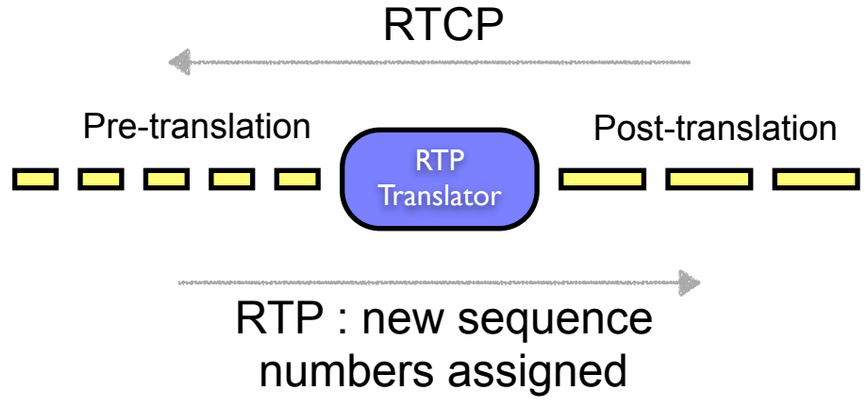
Changes Since -01

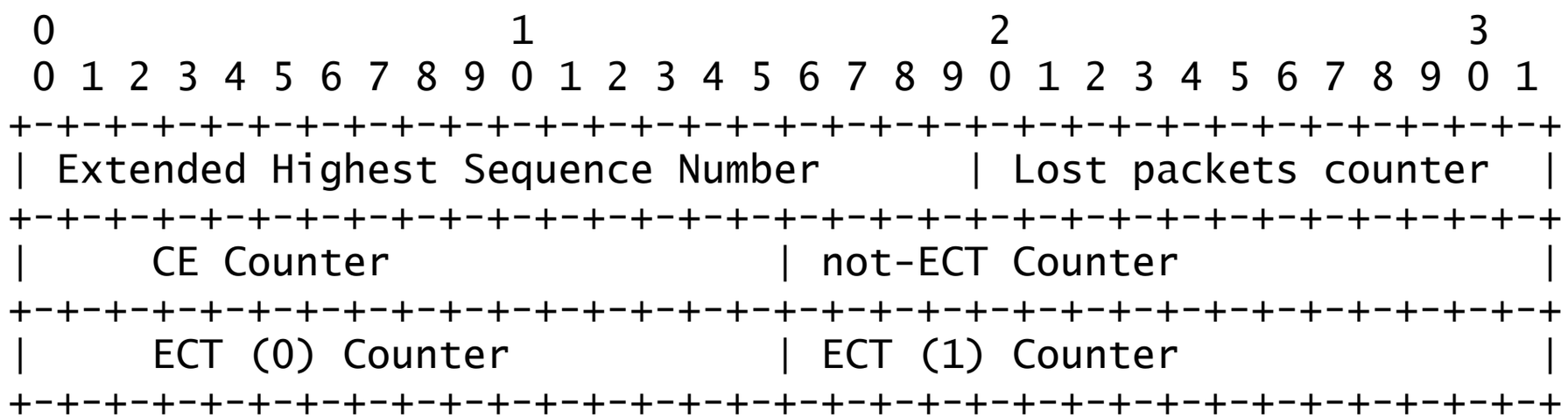
- Clarified that congestion response can be sender or receiver based, and that application awareness of ECN is expected
- Expanded use of RFC 2119 language
- Updated Section 6 on processing of RTCP ECN Feedback in RTP Translators and Mixers
  - Congestion-unaware fragmentation and reassembly
  - Media transcoders
  - Mixers
- Various editorial clarifications

Fragmentation and Reassembly

- Translators may fragment or reassemble packets, unaware of network congestion state
  - E.g., combine two VoIP packets into one
- Handling of ECN bits for RTP packets follows RFC 3168
  - Split → copy ECN marks
  - Combine → pick worst ECN mark
- Need to specify how RTCP is processed in the translator



Fragmentation and Reassembly: RTCP



- Determine the sequence number range for post translation packets
- Derive pre-translation sequence number range
- Calculate ratio of packets across translator:

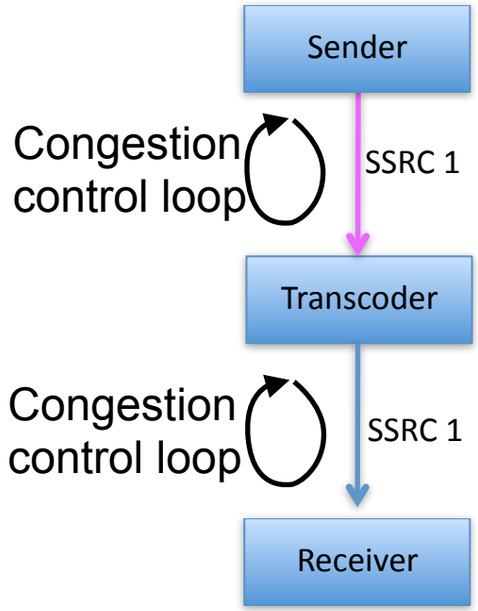
  R = numTrans / numOrig
- Rewrite extended RTP sequence number and scale counters by R, to match translation
- Rounding may be needed if scaling leads to non-integer counter values
  - Try to ensure sum of counters matches numOrig after scaling
  - Try to ensure no non-zero counter is rounded to zero – avoid losing events
  - If these goals conflict, avoiding rounding to zero more important

Fragmentation and Reassembly: RTCP

- Questions and open issues:
  - Is this scaling meaningful?
    - Believe so, if the level of congestion in the network is primarily driven by the number of packets sent. We assume this is the case where such translators are deployed
  - ECN nonce reports are not translated
    - But they’re not meaningful, since they relate to particular RTP packets that don’t exist on the other side of the RTP translator

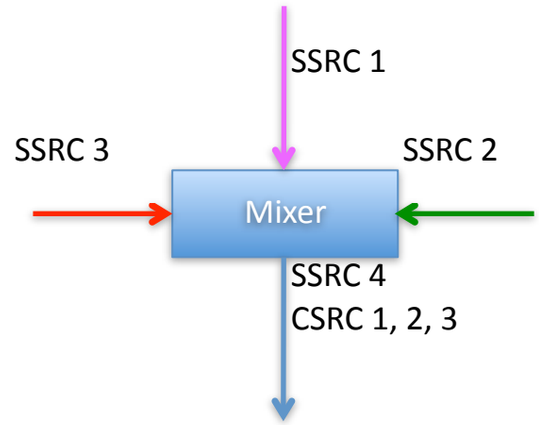
ECN Processing in Media Transcoders

- Transcoders are RTP translators
  - No SSRC; invisible to other RTP-layer entities
- Interpose into the RTCP session
  - Generate RTCP ECN feedback to the sender, as if it were the media receiver
  - Process RTCP ECN feedback received from the receiver, as if it were the media sender
  - Two separate congestion control loops run:
    - Between sender and transcoder
    - Between transcoder and receiver
    - MUST NOT forward RTCP ECN feedback across the transcoder, since the ECN feedback for one control loop is not relevant to the other



ECN Processing in Mixers

- An RTP mixer acts as an endpoint for ECN purposes
  - Treats all paths independently
  - For each path:
    - Negotiate capability and check path support
    - Generate RTCP ECN feedback for outgoing stream
    - Respond to ECN feedback from receiver, run congestion control loop
  - Possible that some paths support ECN, others don't



- MUST NOT forward RTCP ECN feedback across the mixer, since the ECN feedback for one path is not relevant to the other paths

Open Issues and Next Steps

- Feedback on RTCP ECN feedback handling from the group
- To do in next version:
  - Clarify how ECN is used in layered sessions
  - IANA considerations and assign parameters
  - Add SDP signalling example

- Aiming to be ready for WG last call by IETF 79