RTP Congestion Control Feedback

Colin Perkins

Reporting on draft-ietf-avtcore-cc-feedback-message-03, which is is co-authored with Zahed Sarker, Varun Singh, and Michael A. Ramalho

Changes since Bangkok meeting

- Implementation experience during hackathon in Bangkok – results discussed in AVTCORE and RMCAT at IETF 103

- Submitted -03 to reflect those experiences

  - Final – hopefully! – minor change to packet format
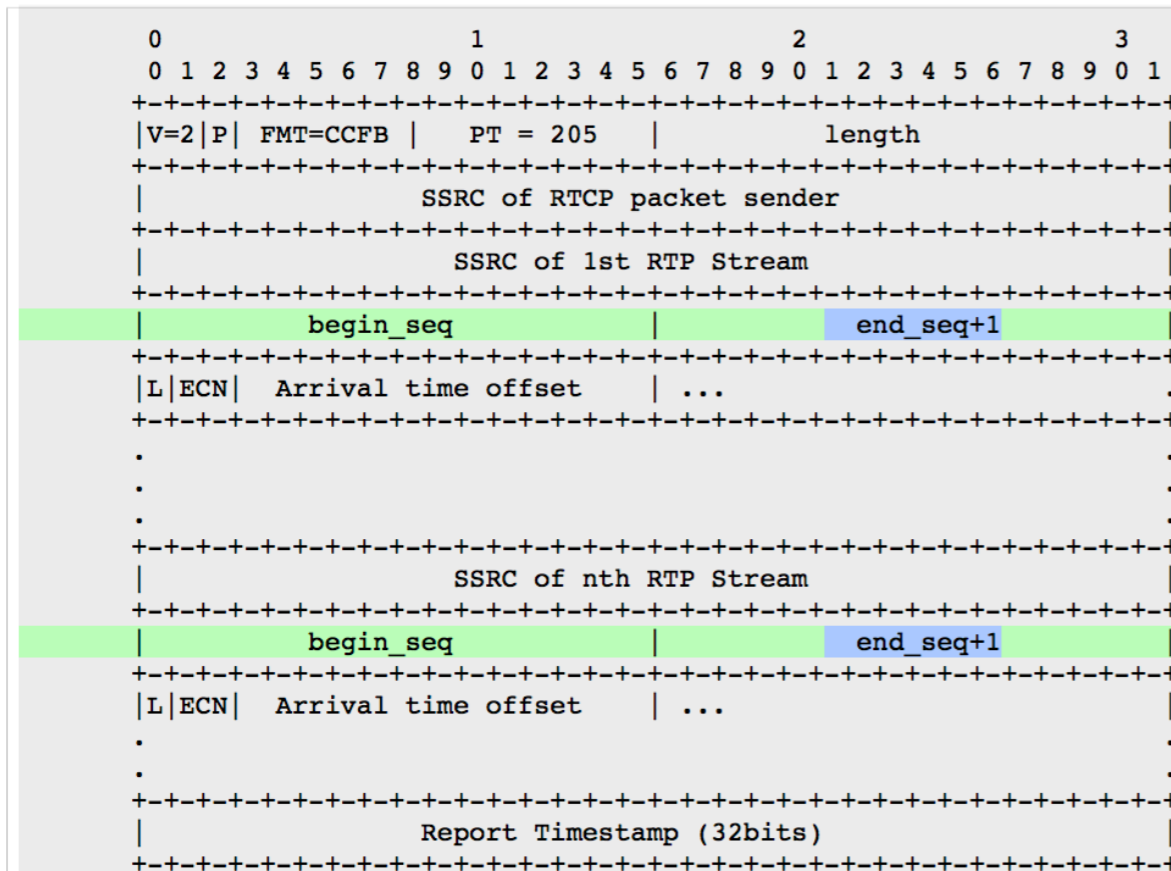
  - Several clarifications
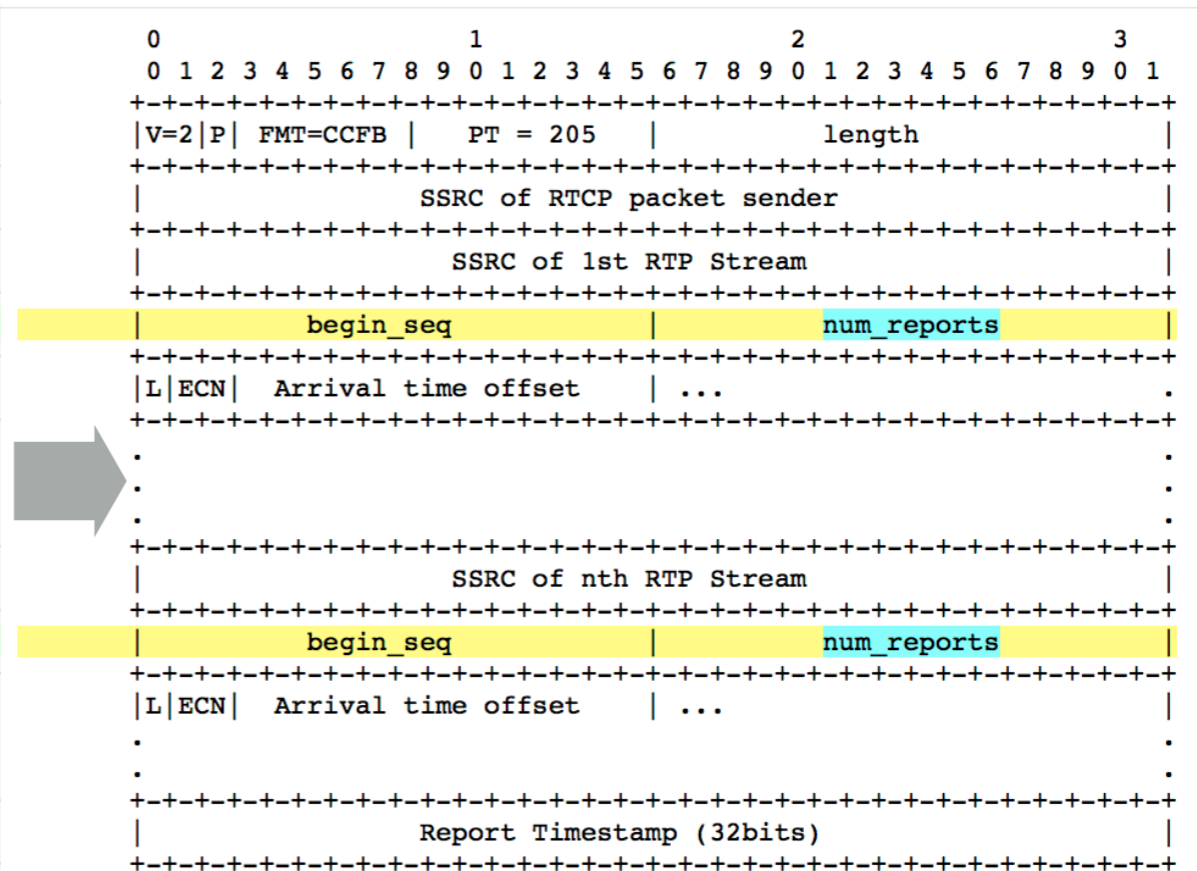
Packet Format Change

Figure 1: RTCP Congestion Control Feedback Packet Format

- Include `num_reports` rather than end sequence number
- Simplifies logic when nothing to report – discussed at Montréal IETF

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Clarifications around timestamps

- Better explain the value of the ATO field:

  - An offset *before* the report timestamp, in units of 1/1024 seconds

  - Explain what to report for packets known to have arrived *after* the report timestamp

- Better explain the value of the Report Timestamp:

  - "This denotes the time instant on which this packet is reporting, and is the instant from which the arrival time offset values are calculated" – changed from "the time instant when the report packet was generated"

Clarifications around reported SSRCs

- Clarify that the receiver has to report on "every active SSRC" not "every SSRC that is being congestion controlled"

  - Sender performs congestion control

  - Receiver can't tell what congestion control is being done, so must report on all

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Clarifications around reported packets

- Clarify that overlapping reports MAY be sent
  - If a packet is reported as received, it MUST also be reported as received in any overlapping reports sent later that cover its sequence number range

- Clarify reporting on duplicate packets
  - Report arrival time of first copy
  - If any copy is ECN-CE marked, report ECN-CE; else report ECN mark of first copy

Clarifications around behaviour after outages

- Don't try to explain how to recover after an outage, since recovering state in that case is a general RTCP problem and not specific to this report block

Clarifications around SDP signalling

- Clarify that wild card payload types need to be used in the SDP signalling

  - i.e., signal `a=rtcp-fb: * ccfb`

  - Don't specify particular payload type

Clarify relation to RFC 6679

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6.  Relation to RFC 6679

   Use of Explicit Congestion Notification (ECN) with RTP is described
   in [RFC6679].  That specifies how to negotiate the use of ECN with
   RTP, and defines an RTCP ECN Feedback Packet to carry ECN feedback
   reports.  It uses an SDP "a=ecn-capaable-rtp:" attribute to negotiate
   use of ECN, and the "a=rtcp-fb:" attributes with the "nack" parameter
   "ecn" to negotiate the use of RTCP ECN Feedback Packets.

   The RTCP ECN Feedback Packet is not useful when ECN is used with the
   RTP Congestion Control Feedback Packet defined in this memo since it
   provides duplicate information.  Accordingly, when congestion control
   feedback is to be used with RTP and ECN, the SDP offer generated MUST




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      include an "a=ecn-capable-rtp:" attribute to negotiate ECN support,
      along with an "a=rtcp-fb:" attribute with the "ack" parameter "ccfb"
      to indicate that the RTP Congestion Control Feedback Packet is to be
      used for feedback.  The "a=rtcp-fb:" attribute MUST NOT include the
      "nack" parameter "ecn", so the RTCP ECN Feedback Packet will not be
      used.
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Next Steps

- No open issues at this time

- Will submit update shortly to clarify relation to alternative solutions in this space, and highlight benefits and trade-offs with the approach – expect to then be ready for AVTCORE WG last call