School of Computing Science

60 YEARS OF COMPUTING AT GLASGOW

RTCP Feedback for Congestion Control

draft-dt-rmcat-feedback-message-03

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Goals

- RMCAT design team building common congestion control feedback format:
  - Per-packet arrival times
  - Per-packet loss events
  - Per-packet ECN feedback
  - Desire to send feedback in both scheduled RTCP packets and as RTP/AVPF early transport layer feedback

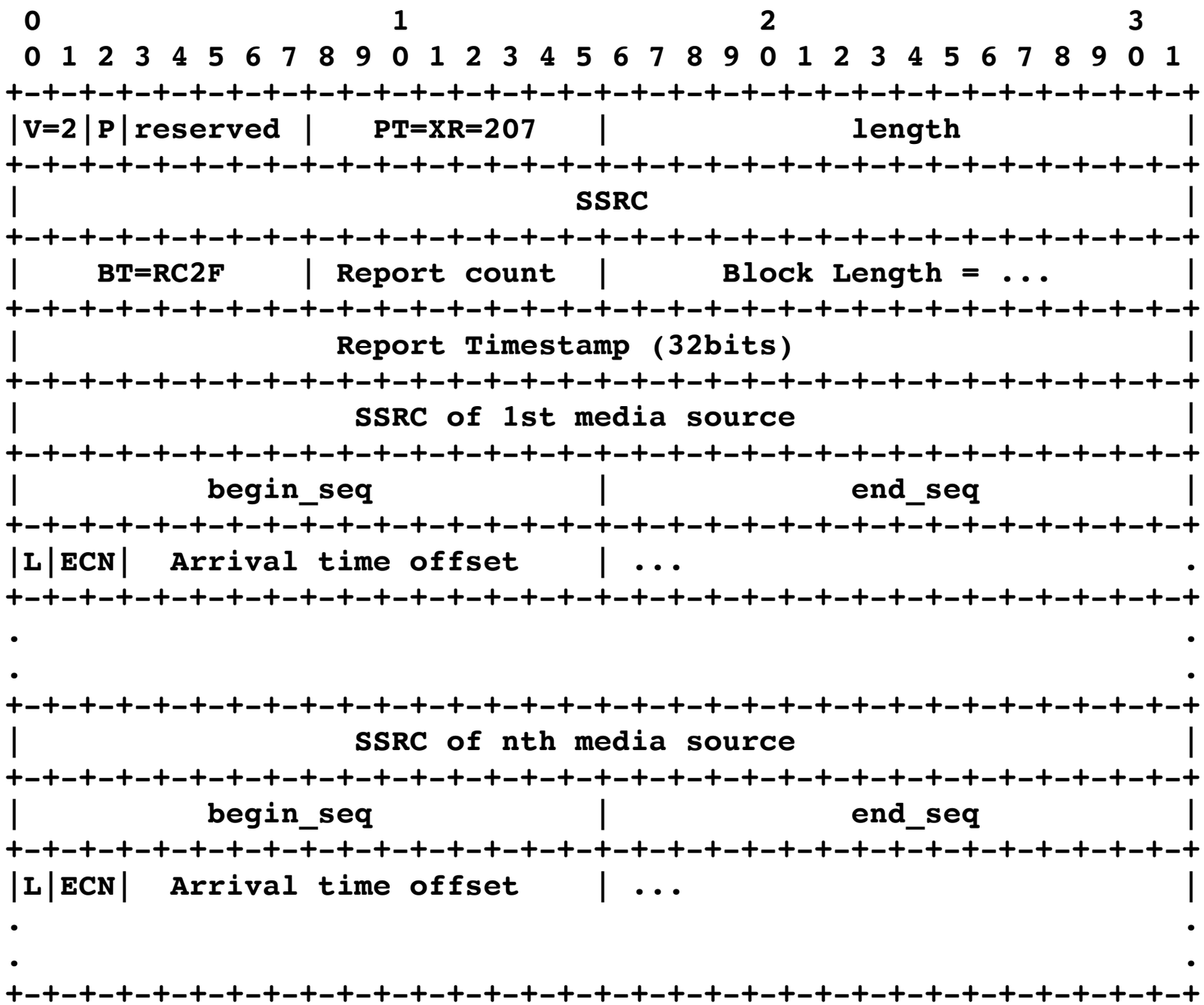
- Looking for input from AVTCORE on appropriate way to use RTCP to convey this feedback

Feedback in scheduled compound RTCP packets

- RTP endpoints send regularly scheduled RTCP packets
  - Frequency of reporting depends on allocated RTCP bandwidth – RMCAT will provide guidance on required RTCP bandwidth to provide sufficient feedback
- Scheduled reports are compound RTCP packets containing:
  - Sender report/receiver report (SR/RR)
  - Source description (SDES) containing CNAME item, other items optional
  - Other RTCP packets (e.g., XR)

- We propose to define an XR block for congestion control feedback

Proposed RTCP XR packet format



XR header

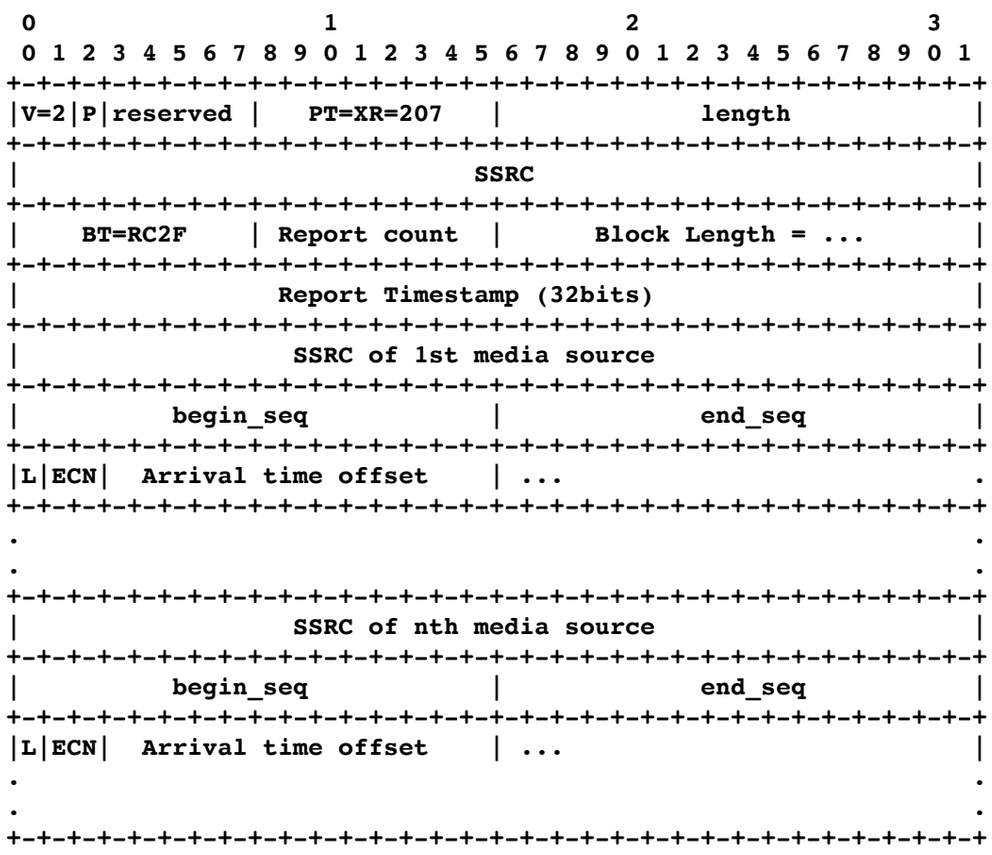
Congestion control report header

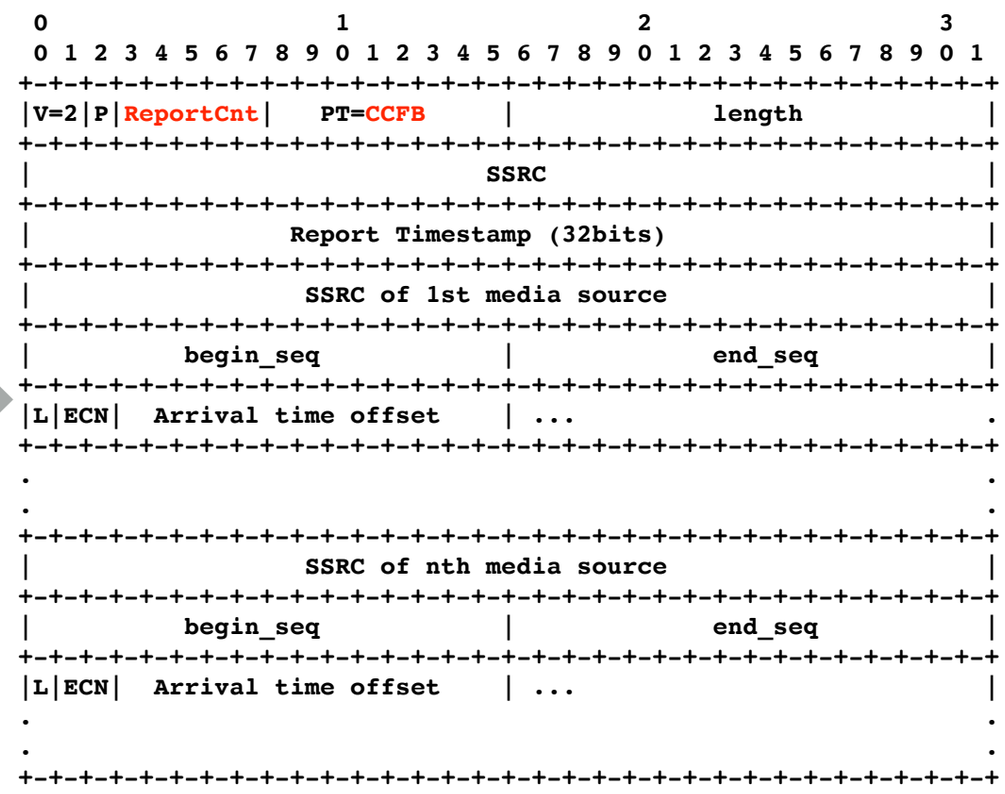
Congestion control report 1

Congestion control report *n*

Optimising the proposed RTCP XR packet format

- Could define as custom RTCP packet type, rather than XR block to save four octets:

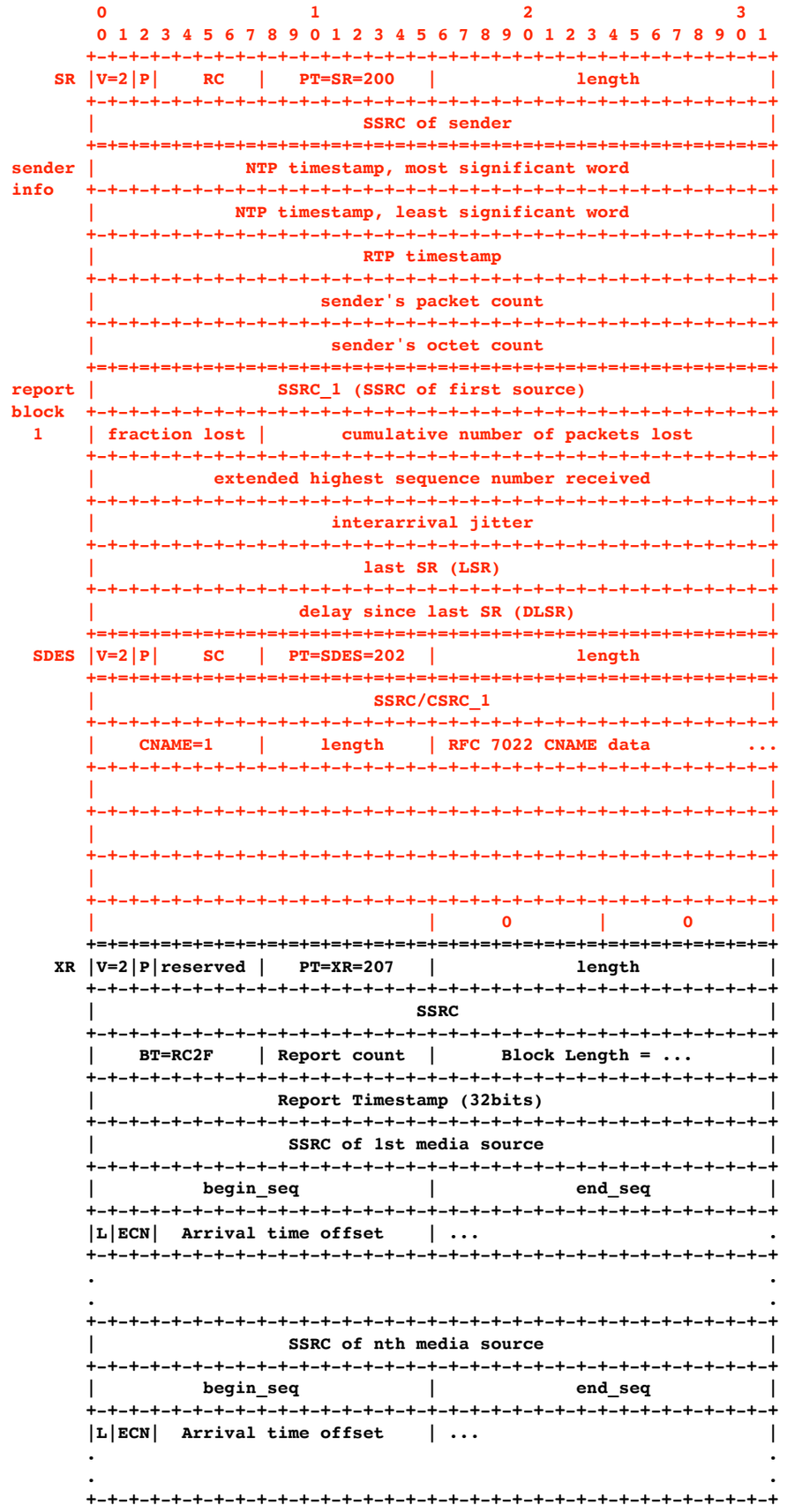




- Likely beneficial if can when use the same format for early feedback packets

Overhead of compound RTCP

- Compound RTCP packets MUST contain SR/RR and SDES CNAME
- Gives *minimum* 80 octets overhead per-report
  - SR comprising sender info (28 octets) + a reception report block (24 octets)
  - SDES + RFC7022 CNAME (28 octets)
  - Sessions with multiple streams have a higher overhead
- Implication: optimising the payload of the XR block likely not worthwhile

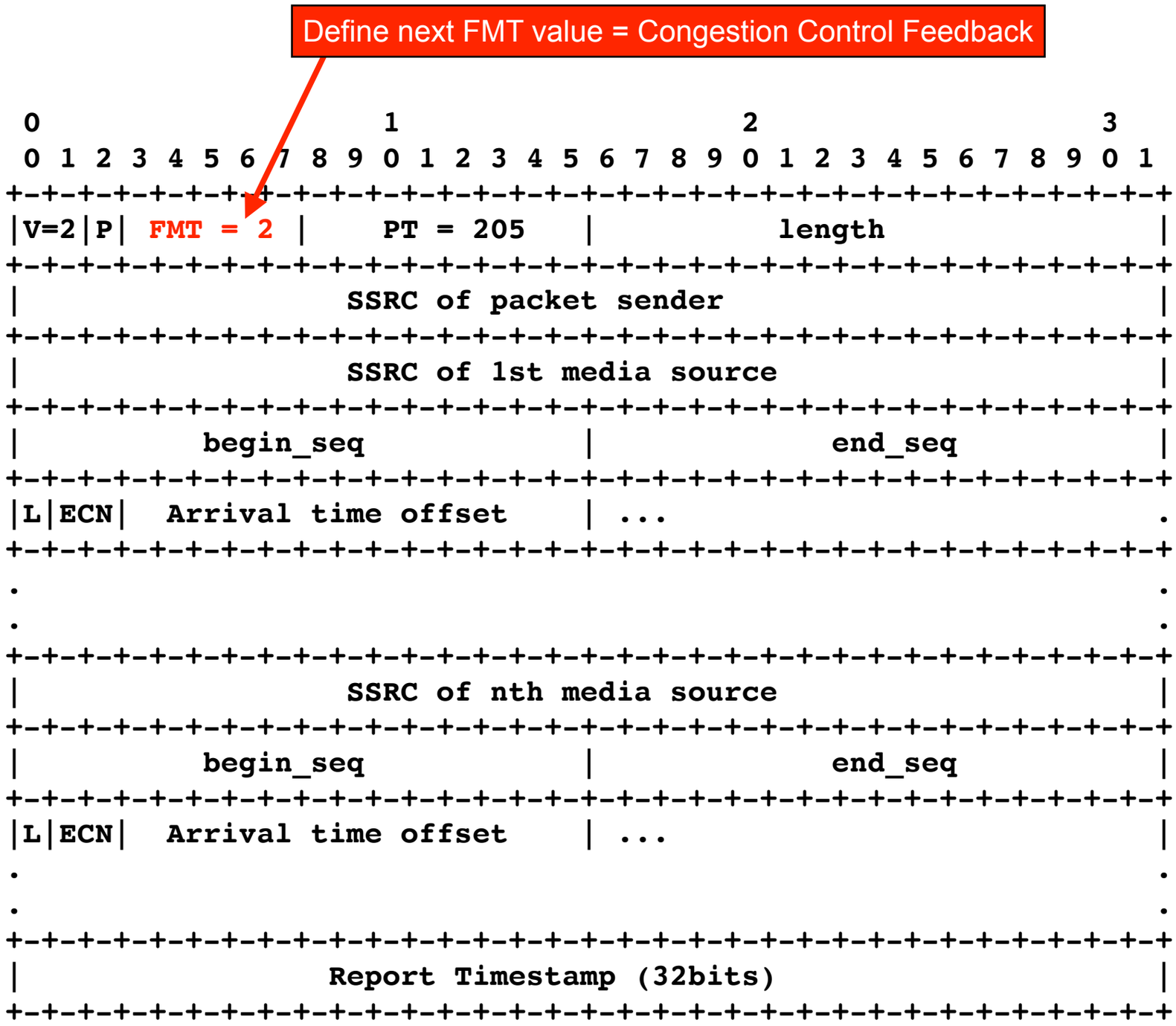


Non-compound RTP/AVPF transport layer feedback

- Most effective approach to reducing feedback overhead → send non-compound RTCP using RTP/AVPF
  - See presentation from RMCAT earlier this week
- Still need to send scheduled compound RTCP packets
- But, can *also* send non-compound packets in between – these contain just a transport layer RTCP feedback packet containing congestion feedback

Proposed RTP/AVPF Transport Layer Feedback Packet

Define next FMT value = Congestion Control Feedback



Same information as in the XR block, formatted to fit in a transport layer feedback packet

Sent as a non-compound RTCP, without SR/RR or SDES packets

Status and Discussion

- Proposed simple way of encoding required feedback
  - As XR block in a scheduled compound RTCP packet
  - As transport layer feedback in a non-compound RTCP packet sent between scheduled reports
  - The format has not been optimised – can trade complexity for some space saving, but unclear if this is worthwhile:
    - Likely to report on <16 packets per report – per packet saving small
    - Use of non-compound packets gives *much* greater per-packet saving

- Questions for the working group:
  - Is encoding this using RTCP XR and transport layer feedback appropriate?
  - Should this work be done in AVTCORE or RMCAT?
    - If AVTCORE, adapt as working group draft?