RTP with TCP Friendly Rate Control

draft-ietf-avt-tfrc-profile-07.txt

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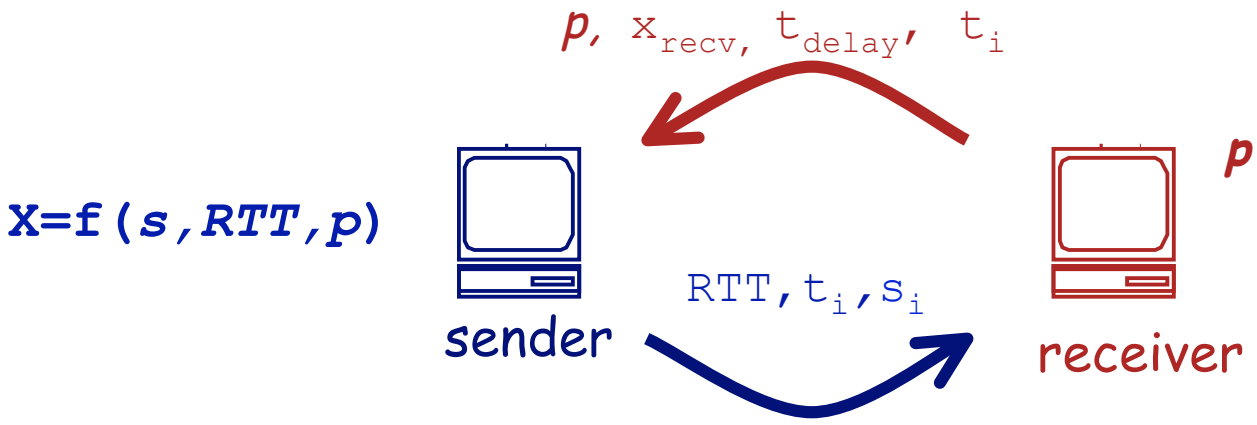
68 IETF Prague

Overview

- draft-ietf-avt-tfrc-profile-07 details how the feedback and information exchange needed by the TFRC mechanism can be supported RTP/RTCP

- Relies on:
  - RFC 4585: Extended RTP Profile for RTCP-Based Feedback (RTP/AVPF)
  - RFC 3536: SDP Bandwidth Modifiers for RTCP Bandwidth
  - draft-ietf-avt-rtp-hdrext (in IESG review): A general mechanism for RTP Header Extensions



Why use TFRC with RTP/UDP vs DCCP?

- Provides support for TFRC at the application layer vs in the kernel
  - This can be good or bad
    - There is some complexity in using TFRC at RTTs of 20ms and less - a kernel level implementation of TFRC alleviates these problems to some extent
    - Media applications have their own timing requirements (I.e: frame grabbing every 16ms), an application level TFRC can better merge the requirements of media and transport
- DCCP not widely deployed yet - applications wanting to use congestion control can use RTP/RCTP with TFRC right away
- There existing solutions for RTP/UDP traversing a NAT/firewall - this is not the case for DCCP yet
- Provides a means to experiment with TFRC and media applications and better understand how they interact together

RTP with TCP Friendly Rate Control

- Each RTP data packet includes:
  - The 16 bit RTP sequence number
  - A 24 bit field for the send timestamp
  - A 24 bit field for the current RTT

- Receiver feedback is sent via RTCP - a new AVPF RTCP packet is defined with four 32 bit fields:
  - Loss event rate: p
  - Receive rate: x_{recv}
  - The delay a packet experiences: t_{delay}
  - The send timestamp: t_i

- Feedback is sent with RCTP packets per TFRC's timing requirements

RTP with TCP Friendly Rate Control

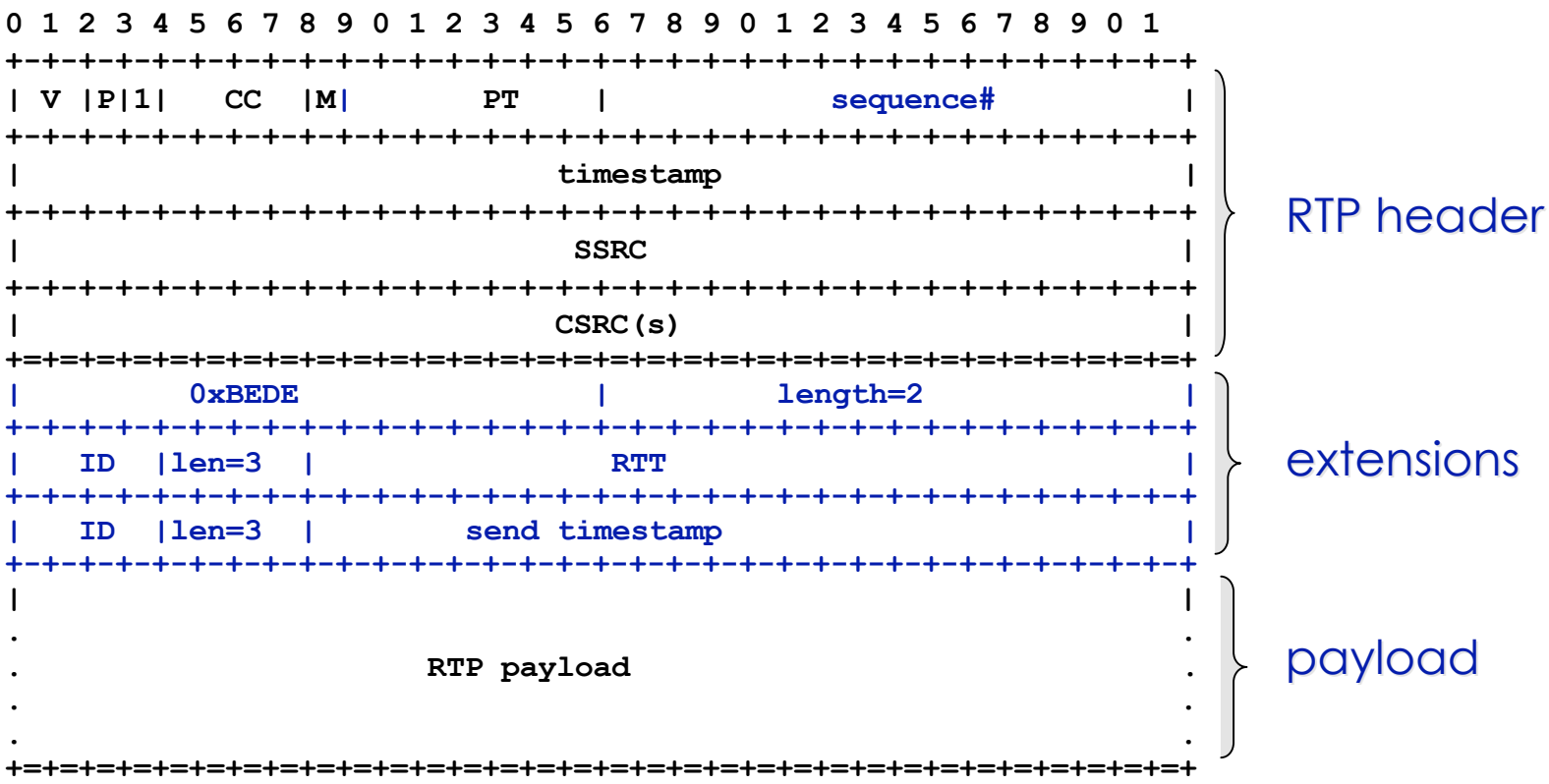
RTP with TFRC:

- 16 bit sequence number
- Only the calculated loss event rate sent as feedback
- A send timestamp is transmitted with every packet. Media applications can also use it for jitter calculations

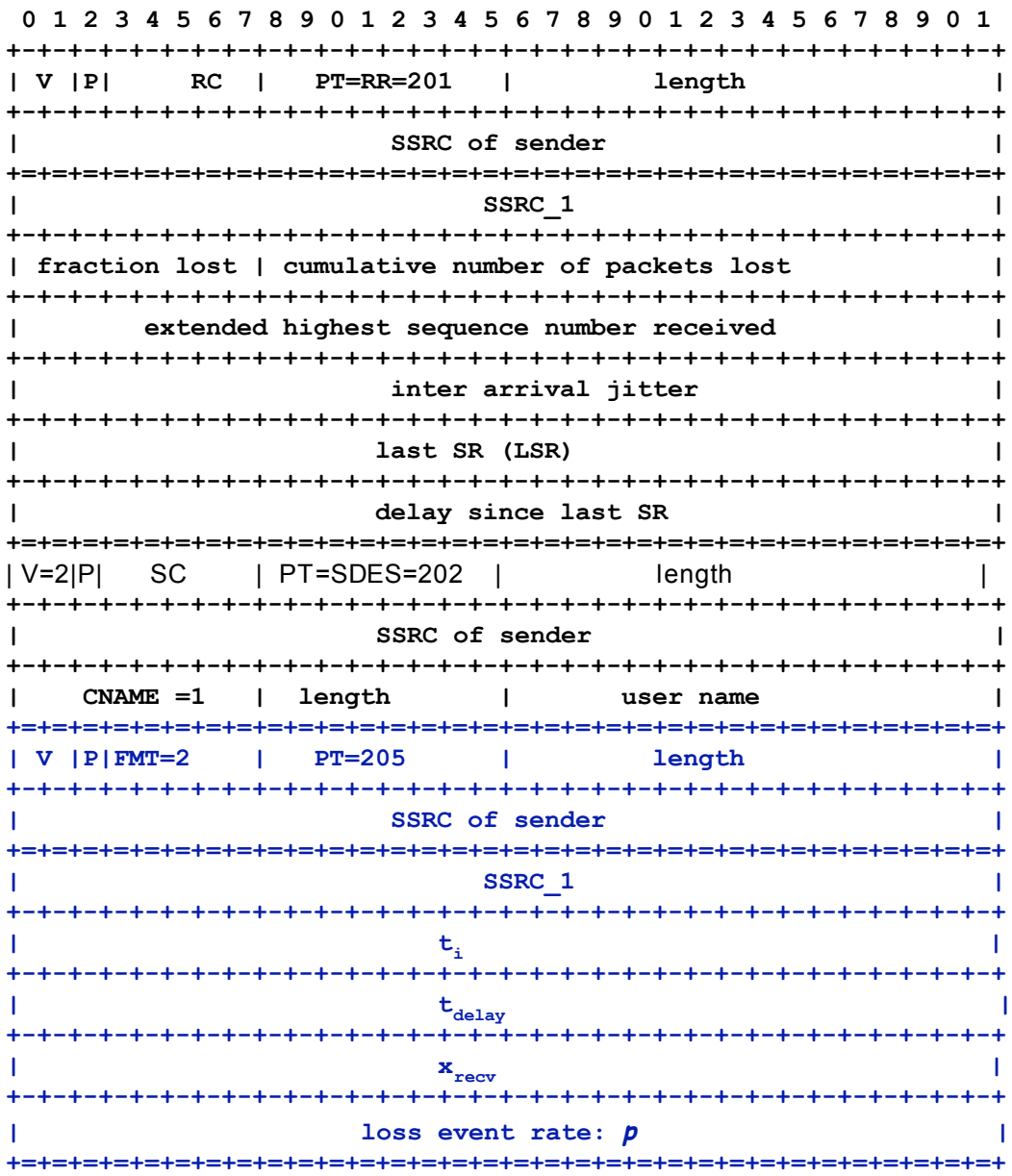
DCCP/CCID3:

- Both 24 and 48 bit sequence number
- Senders can receiver either the calculated loss event rate or the Loss Intervals
- Only a quad RTT counter used

RTP packet with extensions



An AVPF RTCP TFRC feedback packet



IP/UDP(28) +
RTCP header(8) +
RR(24) +
TFRC-FB(28) +
SDES(12) = 100 bytes

TFRC Feedback

SDP Example

v=0
o=alice 2890844526 2890844526 IN IP4 host.isi.example.edu
s=congestion control with TFRC
m=video 54000 RTP/AVPF 112
a=rtpmap:112 raw/90000
a=extmap:4 urn:ietf:params:rtp-hdrext:rtt
a=extmap:4 urn:ietf:params:rtp-hdrext:send-ts
a=rtcp-fb ack tfrc
b=AS:400
b=RS:800
b=RR:40000

Questions, Comments?