

RTP with TCP Friendly Rate Control

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

~~RTP Profile for TCP Friendly Rate Control~~

draft-ietf-avt-tfrc-profile-06.txt

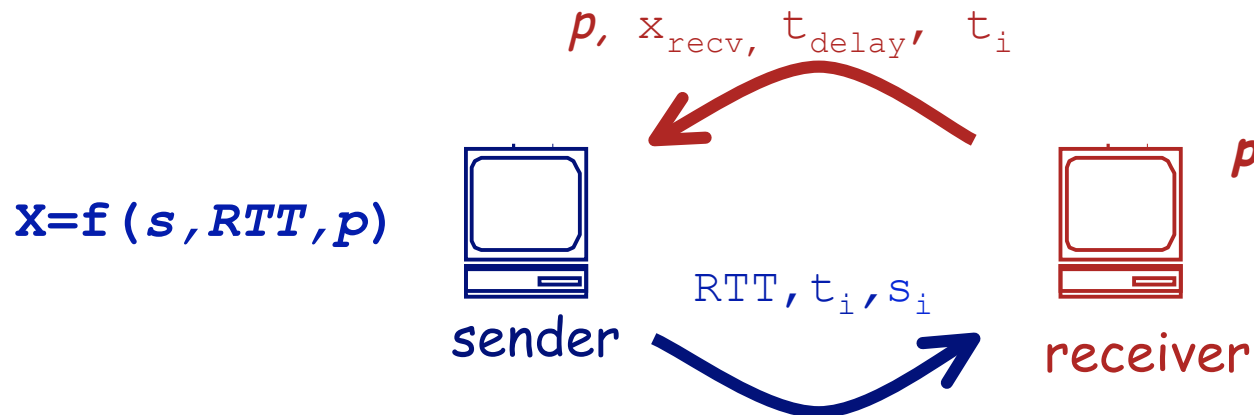
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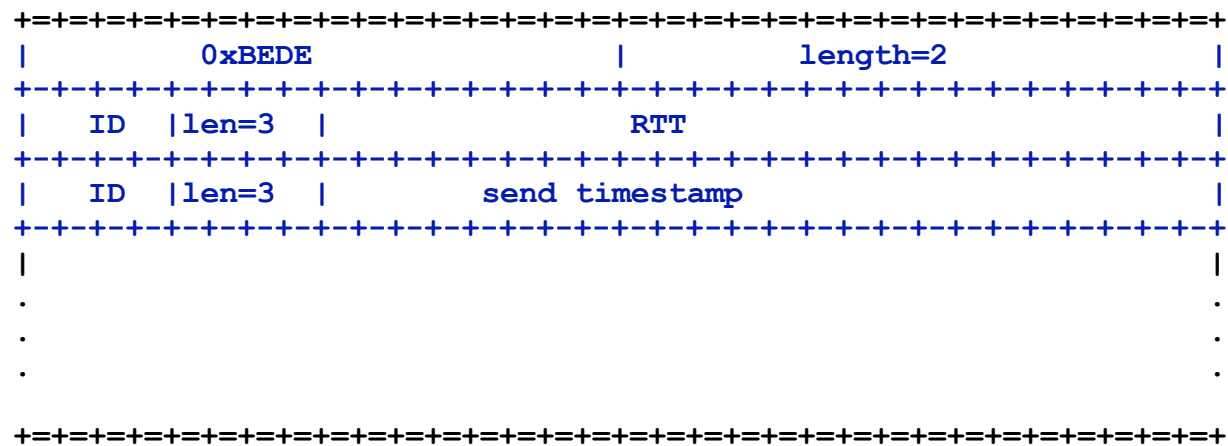
Overview

- draft-ietf-avt-tfrc-profile-07 details how the feedback and information exchange needed for the TFRC mechanism can be supported by RTP/RTCP
- Relies:
 - RFC 4585: Extended RTP Profile for RTCP-Based Feedback (RTP/AVPF)
 - RFC 3536: SDP Bandwidth Modifiers for RTCP Bandwidth
 - draft-ietf-avt-rtp-hdext (in IESG review): A General Mechanism for RTP Header Extensions



Sender to receiver

- o Previously:
 - Define a new profile and use RTP header additions (section 5.3, RFC 3550)
- o Currently:
 - Defines two new extensions: rtt, send-ts
 - RTT: 24 bit field measuring RTT in microseconds
 - Send timestamp: 24 bit field measuring time in microseconds

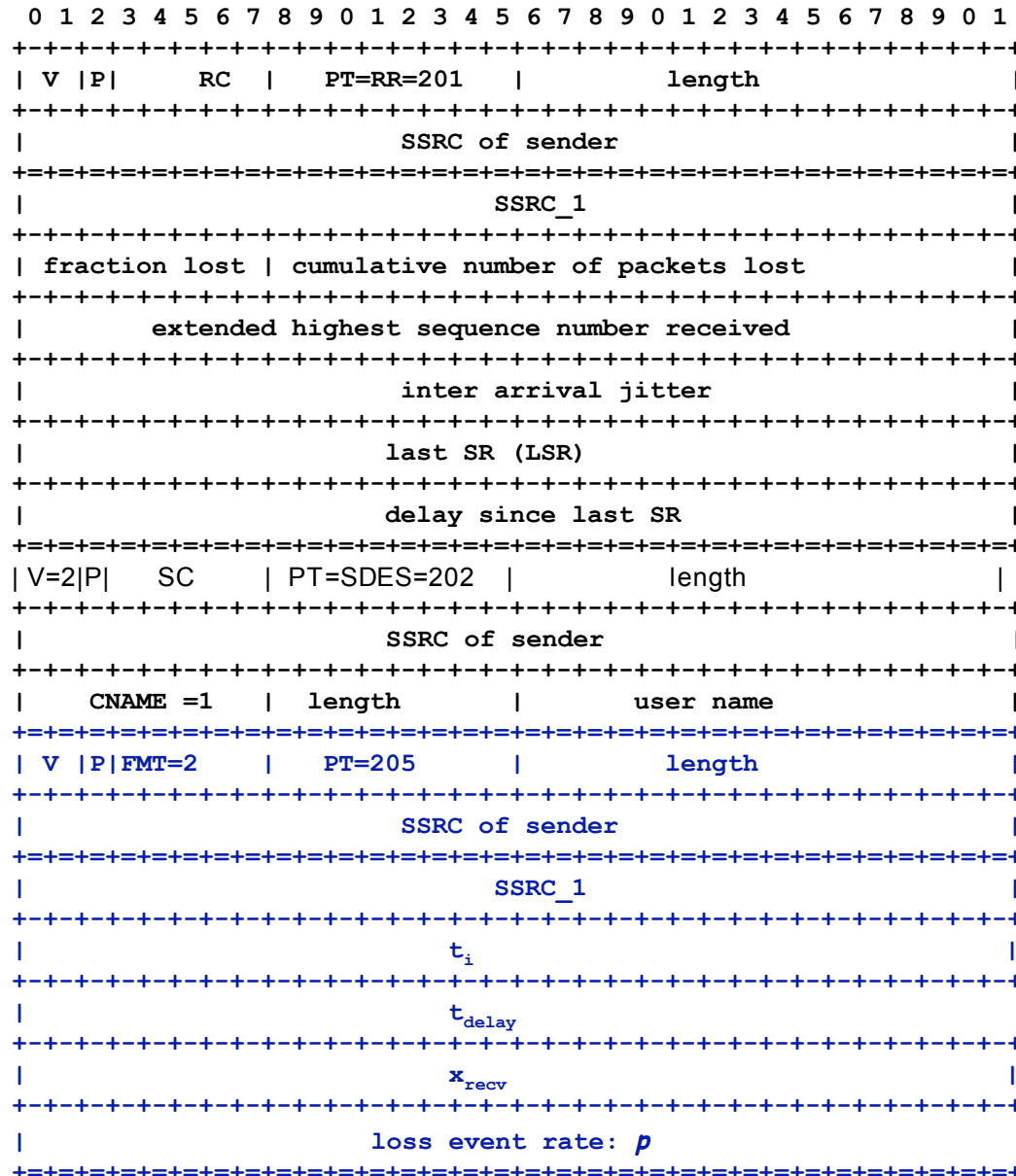


Receiver Feedback

- o Receivers send feedback using the early feedback (AVPF) profile
- o A new transport layer feedback message is defined: TFRC-FB
 - TFRC-FB is defined by PT=RTFB and FMT=2

```
+++++
| V | P | FMT=2 | PT=205 | length |
+++++
| SSRC of sender |
+++++
| SSRC_1 |
+++++
| ti |
+++++
| tdelay |
+++++
| xrecv |
+++++
| loss event rate: p |
+++++
```

... and a minimal AVPF RTCP compound packet



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

RTCP Bandwidth Constraints

- o RFC3550 recommends that the fraction of the session bandwidth added for RTCP be fixed at 5%.
- o For some combinations of RTTs and data rates, TFRC's feedback requirements can exceed the recommended 5% (Table 1). Such flows should use the RR and RS bandwidth modifiers defined in RFC 3556.
- o Example: A 400 kbps video flow at RTT=20ms

.....
b=AS:400
b=RS:800
b=RR:40000

.....

RTT	RTCP (X)	RTP (X)
20 ms	40 kbps	0.8 Mbps
10 ms	80 kbps	1.6 Mbps
5 ms	160 kbps	3.2 Mbps
2 ms	400 kbps	8.0 Mbps

Table 1: $RTCP(X) < (0.05) * RTP(X)$

RTCP Transmission Intervals

- o The AVPF profile has a number of safe guards to prevent feedback implosions in multi-point scenarios.
- o When using AVPF with TFRC (to accommodate TFRC's feedback requirements):
 - allow_early= true at all times (no toggling)
 - T_rr_interval must not be set to a value larger than the current RTT
 - T_dither_max = 0

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-hdext:rtt

a=extmap:4 urn:ietf:params:rtp-hdext:send-ts

a=rtcp-fb ack tfrc

b=AS:400

b=RS:800

b=RR:40000

Questions, Comments?
