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Shared Bottleneck Detection for Coupled Congestion Control for RTP Media Update (draft-ietf-rmcat-sbd-03)

David Hayes (UiO)
Simone Ferlin (SRL), Michael Welzl (UiO), and Kristian Hiorth (UiO)

[simula . research laboratory]

R/TE
Reducing Internet Transport Latency

SEVENTH FRAMEWORK PROGRAMME

Mechanism based on Summary Statistics

Why summary statistics?

- To limit feedback from receivers
- To deal with noise
- To deal with differing path lags

Statistics Used

- a measure of delay variability (**var_est**)
- a measure of delay skewness (**skew_est**)
- a measure of delay oscillation (**freq_est**)
- a measure of packet loss (**pkt_loss**), a supplementary measure.
- *not a closed list*

Key changes in WG-02/3

Revisions

- Some terminology improvements based on Kristian's implementation work
- Removed PDV based estimator for variability. MAD based estimator is used instead.

Additions

- Outline of the initial setup messages
- Step by step incremental method of calculating the weighted skew_est
- Mention of implementation work in Chromium

Example wrt skew_base calculation description

For each packet in T

if (OWD < mean_delay) skew_base_T++
if (OWD > mean_delay) skew_base_T−−

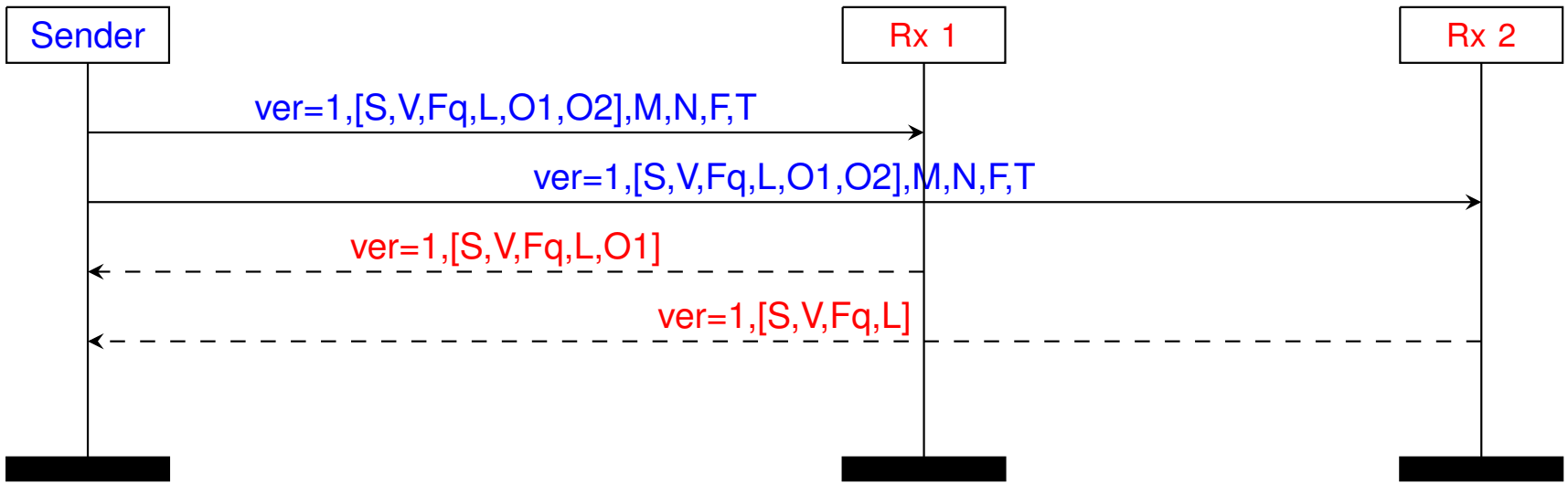
Summary Stat

$$\text{skew\_est} = \frac{\text{sum\_MT(skew\_base\_T)}}{\text{num\_MT(OWD)}}$$

where skew_est is a number between -1 and 1

Initial setup messages

msc SBD Initialisation (within SDP)



- SDP and RTP message formats TBD

Chromium Implementation

- August 2015 version with GCC (at the moment)
- SBD mechanism has been implemented in the receiver
  - No sender/receiver signalling yet
- Inbuilt simulator useful for quick testing
  - introduces delay artefacts
  - now using a small testbed
- preliminary WIFI tests (sender link)
  - strange loss patterns, but very low loss rate (layer 2 retransmission).
  - SBD doesn't use low loss rates, delay seems to reflect congestion
- Initial experience with tests with 2 flows
  - Of key interest is CC responses reflected in SBD stats
  - Often we have one flow at < 1 pps $\rightarrow$ No stats
    - Not sure exactly what is happening here yet
  - Investigations ongoing

Conclusions

What we think remains to finalise the draft

- Define packet formats for sender receiver interaction
- Specify sender receiver interaction

Other on going work

- paper publication related
  - document algorithm refinements (clustering, clock skew, etc)
  - quantitative tests (mostly done)
  - comparisons with alternatives (mostly done)
- Chromium implementation related tests

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Extra slides

(An example of quantitative statistic calculations)