TFRC for Voice: the VoIP Variant

Sally Floyd, Eddie Kohler.

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draft-ietf-dccp-tfrc-voip-06.txt

DCCP Working Group, IETF

Slides: http://www.icir.org/floyd/talks.html

Graphics:

http://www.icir.org/floyd/papers/voipimages-06.pdf

VoIP: fairness in Bps.

- In the TCP throughput equation, use the measured loss event rate and a packet size of 1460 bytes.
- Reduce the allowed transmit rate to account for the fraction of the VoIP bandwidth that would be used by 40-byte headers:
- Enforce a Min Interval between packets of 10 ms.
- For short loss intervals (at most two RTTs), count the actual packet loss rate (but don't increase the number of loss intervals).

Changes from this WG Last Call:

- Added a restriction that the most recent loss interval is not included in the calculation of the average loss interval if the most recent loss interval is short.
- Added a discussion to Section 8 on "Fairness with different packet header sizes".
- Added Appendix C on "Exploring Possible Oscillations in the Loss Event Rate" .
- Added a paragraph about "TFRC-SP" and "TFRC-PS".
- Moved simulations to the appendix.
- Various editing changes, rephrasing, and bug fixes.

Adding a restriction:

- "Section 5.4 of RFC 3448 specifies that the calculation of the average loss interval includes the most recent loss interval only if this increases the calculated average loss interval.

- TFRC-SP adds the restriction that the calculation of the average loss interval can include the most recent loss interval only if more than two round-trip times have passed since the beginning of that loss interval."

Exploring Possible Oscillations in the Loss Event Rate:

- What happens when the loss interval size oscillates between short and not-short?
- Are there oscillations in the estimate of the average packet drop rate?
- In simulations, we didn't see any problems.
  - So we decided not to change the method for estimating the loss interval size for short intervals.

“TFRC-SP” and “TFRC-PS”.

- TFRC-SP: the variant of TFRC specified by this internet-draft.
- TFRC-PS: from RFC 3448, for TFRC-PacketSize.
  - Refers to a variant of TFRC for applications with a fixed rate, but that can vary their packet size in response to congestion.
  - The questions of how an adaptive application would use TFRC-SP, varying its packet size, are beyond the scope of this document.
  - This needs to be addressed in a document that is more application-specific.

“TFRC-SP” and “TFRC-PS”.

- “RFC 3448, the protocol specification for TFRC, stated that TFRC-PS (for TFRC-PacketSize), a variant of TFRC for applications that have a fixed sending rate but vary their packet size in response to congestion, would be specified in a later document.
- This document instead specifies TFRC-SP, a variant of TFRC designed for applications that send small packets, where applications could either have a fixed or varying packet size or could adapt their packet size in response to congestion.
- However, as discussed in Section 6 of this document, there are many questions about how such an adaptive application would use TFRC-SP that are beyond the scope of this document, and that would need to be addressed in documents that are more application-specific.”

Still to do, from recent email:

- Add pseudocode about the change of not using the current interval in estimating the loss event rate if the current interval is short.
  - Email from Ladan Gharai.
- Say more about TFRC-SP on paths where the MTU is less than 1500 bytes.
  - Email from Gorry Fairhurst.
- Say more about apps gaming about the packet size.
  - Email from Gorry.

Thanks.

- Thanks to Lars Eggert, Gorry Fairhurst, Ladan Gharai, and Mark Handley for feedback on this round.