RTP Media Congestion Avoidance Techniques BoF

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BoF Goals and Objectives

- IETF/W3C are developing standards for video conferencing in web browsers, using RTP-based media layer
- Problems expected, since RTP congestion control is not well-developed
  - Risk of causing Internet congestion collapse
  - Risk of disrupting own, and others, quality of experience due to bad interactions between systems

- Goal of this BoF is to clarify the problem, and agree a process for finding a solution
  - We have a tight deadline; need a good enough solution quickly
  - We cannot change the whole Internet; keep the scope limited

Agenda

13:00	Introduction	(Chairs)
13:05	Problem statement draft-jesup-rtp-congestion-reqs-00	(Alvestrand/Jesup)
13:25	Context: IAB/IRTF congestion control workshop	(Eggert)
13:35	Context: buffer bloat and AQM	(Gettys)
13:45	Context: competing traffic	(Mathis)
13:55	Outline proposals for potential solutions draft-alvestrand-rtcweb-congestion-02 draft-ohanlon-rmcat-dflow-00	(Alvestrand/O'Hanlon)
14:05	Proposed charter	(Chairs)
14:15	Discussion	
14:50	Wrap-up and next steps	(Chairs and ADs)

Presentations

http://rtp-congestion.alvestrand.com/bof-planning-page/wg-charter---input-to-vancouver

Proposed Charter (1)

- Description of Working Group
  - In today's current internet, part of the traffic is delivery of interactive real time media, often in the form of sets of media flows using RTP over UDP. There is no generally accepted congestion control mechanism for this kind of data flow. With the deployment of applications using the RTCWEB protocol suite, the number of such flows is likely to increase, especially non-fixed-rate flows such as video or adaptive audio. There is therefore some urgency in specifying one or more congestion control mechanisms that can find general acceptance.
  - The set of requirements for such an algorithm includes, but is not limited to:
    - Low delay for the case where there is no competing traffic using other algorithms
    - Fair share of bandwidth when there is competing traffic using other algorithms
    - Effective use of signals like packet loss and ECN markings to adapt to congestion
  - The working group will:
    - Develop a clear understanding of the congestion control requirements for RTP flows, and document deficiencies of existing mechanisms such as TFRC with regards to these requirements
    - Determine if there is an appropriate means to define standard RTP/RTCP extensions for carrying congestion control feedback, similar to how DCCP defines CCIDs, and if so, document such extensions as standards-track RFCs.
    - Define evaluation criteria for proposed mechanisms, and publish as Informational RFCs.

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Proposed Charter (2)

  - Find or develop candidate congestion control algorithms, verify that these can be tested on the Internet without significant risk, and publish one or more of these as Experimental RFCs.
  - Publish the result of experimentation with these Experimental algorithms on the Internet
  - Once an algorithm has been found or developed that meets the evaluation criteria, and has a satisfactory amount of documented experience on the Internet, publish this algorithm as a Standards Track RFC. There may be more than one such algorithm.
- The work will be guided by the advice laid out in RFC 5405 (UDP usage guidelines) and RFC 2914 (congestion control principles).
- The following topics are out of scope:
  - Circuit-breaker algorithms for stopping media flows when network conditions render them useless; this work is done in AVTCORE;
  - Media flows for non-interactive purposes like stored video playback; those are not as delay sensitive as interactive traffic;
  - Active queue management; modifications to TCP of any kind; and
  - Multicast congestion control (common control of multiple unicast flows is in scope).
- The working group is expected to work closely with the RAI area, including the underlying technologies being worked on in the AVTCORE and AVTEXT WGs, and the applications/protocol suites being developed in the CLUE and RTCWEB working groups. It will also liaise closely with other Transport area groups working on congestion control, and with the Internet Congestion Control Research Group of the IRTF.

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Proposed Charter (3)

- Deliverables
  - Evaluation criteria for CC algorithms for interactive real time media (informational)
  - RTCP extensions for use with congestion control algorithms (std-track)
  - Candidate congestion control algorithm for interactive real time media (experimental) Experimentation and evaluation results for candidate algorithms (informational)
  - Recommended congestion control algorithm for interactive real time media (std-track)
- Milestones
  - NN NNNA: (chartering + 1 month) Publish first draft of evaluation criteria
  - NN NNNB: Adopt first congestion control candidate as WG draft
  - NN NNNC: (A + 4 months) Submit evaluation criteria to IESG as Informational
  - NN NNND: (C + 1 month) Submit first congestion control candidate to IESG for Experimental publication
  - NN NNNE: (D + 3 months) First draft of evaluation results
  - NN NNNF: (=E) First draft of standards-track congestion control
  - NN NNNG: (F + 6 months) Submit congestion control to IESG for Proposed Standard
  - (time from chartering to end of charter is 15 months)

Discussion of proposed charter

Questions

- Do you think that the problem is clear, well-scoped, solvable, and worth solving?
- Do you support forming a WG with the charter outlined?
- Would you be willing to work on one or more of the drafts outlined?

Wrap Up

- Will discuss next steps with area directors and interested parties
- Thank you for your input!