RTP Media Congestion Avoidance Techniques (rmcat)

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Agenda

13:00   Administrativa & WG Overview (*Chairs*)

           http://trac.tools.ietf.org/wg/rmcat/trac/wiki/RearrangedCharter

13:20   Architectural Overview (*Michael Welzl*)

13:45   Congestion Control Requirements For RMCAT (*Randell Jesup*)

           draft-jesup-rmcat-reqs

14:10   Evaluating Congestion Control for Interactive Real-time Media (*Varun Singh*)

           draft-singh-rmcat-cc-eval

IF TIME PERMITS

           Congestion control algorithm for lower latency and lower loss media transport (*Piers O'Hanlon*) **draft-ohanlon-rmcat-dflow**

           A Google Congestion Control Algorithm for Real-Time Communication on the World Wide Web (*Harald Alvestrand*) **draft-alvestrand-rtcweb-congestion**

           NADA: A Unified Congestion Control Scheme for Real-Time Media (*Xiaoqing Zhu*) **draft-zhu-rmcat-nada**

Motivation

- Number of RT flows is likely to increase, e.g. using RTCWEB protocol suite
- No congestion control mechanism for interactive real-time media available (using RTP over UDP)

→ **Goal:** Specifying one or more congestion control mechanisms that can find general acceptance

Requirements (not limited to)
- Low delay and low jitter
- Reasonable share of bandwidth when competing with other protocols (also TCP)
- Use of signals like packet loss and ECN

rmcat charter

In-scope

- Requirements and evaluation criteria
- Identify interactions between applications and RTP flows
- Extensions to RTP/RTCP if needed for carrying congestion control feedback
- Techniques to detect, instrument or diagnose failing to meet RT schedules
- Identifying shared bottlenecks
- CC candidates and evaluation leads to Standard Track or Historic status

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Out-of-scope

- Circuit-breaker algorithms
- Media flows for non-interactive/non-delay sensitive traffic
- Active queue management algorithms or modifications to TCP of any kind
- Multicast congestion control (common control of multiple unicast flows is in scope)
- Topologies other than point-to-point connections; implications on multi-hop connections will be considered at a later stage

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The working group is expected to work closely with
- RAI area, mainly AVTCORE and AVTEXT WGs
- CLUE and RTCWEB WGs (applications/protocol suites)
- Transport area groups working on congestion control and ICCRG

Goals and Milestones

cc-requirements

Charter title	Requirements for congestion control algorithms for interactive real time media
Intended status	Informational RFC
Goals	Adopt Dec 2012, Submit Mar 2013

Develop a clear understanding of the congestion control requirements for RTP flows, and document efficiencies of existing mechanisms such as TFRC with regards to these requirements. This must be completed prior to finishing any Experimental algorithm specifications (#cc-cand).

The set of requirements for such an algorithm includes, but is not limited to:
- Low delay and low jitter for the case where there is no competing traffic using other algorithms
- Reasonable share of bandwidth when competing with RMCAT traffic, other real-time media protocols, and ideally also TCP and other protocols. A 'reasonable share' means that no flow has a significantly negative impact [RFC5033] on other flows and at minimum that no flow starves.
- Effective use of signals like packet loss and ECN markings to adapt to congestion

The work will be guided by the advice laid out in **RFC 5405** (UDP Usage Guidelines), **RFC 2914** (congestion control principles), and **RFC5033** (Specifying New Congestion Control Algorithms).

Goals and Milestones

eval-criteria

Charter title   Evaluation criteria for congestion control algorithms for interactive real time media

Intended status   Informational RFC

Goals   Adopt Dec 2012, Submit Mar 2013

Define evaluation criteria for proposed congestion control mechanisms, and publish these as an Informational RFC. This must be completed prior to finishing any Proposed Standard algorithm specifications (#cc-rec).

Goals and Milestones

rtcp-requirements

Charter title   Requirements for RTCP extensions for use with congestion control
                      algorithms

Intended status   ?

Goals   If needed: Adopt Dec 2012, Submit Mar 2013

Determine if extensions to RTP/RTCP are needed for carrying congestion control
feedback, using DCCP as a model. If so, provide the requirements for such extensions to
the AVTCORE working group for standardization there.

Only a work item if the WG in consultation with AVTCORE decides on the need.

Goals and Milestones

app-interactions

Charter title	Interactions between applications and RTP flows
Intended status	Informational RFC
Goals	If needed: Adopt ?, Submit May 2013

Identify interactions between applications and RTP flows to enable conveying helpful cross-layer information such as per-packet priorities, flow elasticity, etc. This information might be used to populate an API, but the WG will not define a specific API itself.

Goals and Milestones

group-cc

Charter title	Identifying and controlling groups of flows
Intended status	Proposed Standard
Goals	Adopt Jan 2013, Submit Jul 2013

Develop a mechanism for identifying shared bottlenecks between groups of flows, and means to flexibly allocate their rates within the aggregate hitting the shared bottleneck. *(Probably needs to wait until #cc-cand are described in sufficient detail.)*

The work will be guided by the advice laid out in RFC 5405 (UDP Usage Guidelines), RFC 2914 (congestion control principles), and RFC5033 (Specifying New Congestion Control Algorithms).

Goals and Milestones

detect-sched-failures

Charter title   Techniques to detect, instrument or diagnose failing to meet RT
                     schedules
Intended status   Informational RFC or Standards Track
Goals   Adopt Sep 2013, Submit Mar 2014

Develop techniques to detect, instrument or diagnose failing to meet RT schedules due to failures of components outside of the charter scope, possibly in collaboration with IPPM.

If needed for interoperability or other aspects that would justify it.

Goals and Milestones

cc-cand-X

Charter title   Candidate congestion control algorithm for interactive real time media
Intended status   Experimental RFC
Goals   Adopt Jan 2013, Submit Jun 2013 (first candidate)

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.

Likely more than one.

#cc-requirements must be submitted to the IESG first!

The work will be guided by the advice laid out in **RFC 5405** (UDP Usage Guidelines), **RFC 2914** (congestion control principles), and **RFC5033** (Specifying New Congestion Control Algorithms).

Goals and Milestones

eval-results

Charter title	Experimentation and evaluation results for candidate congestion control algorithms
Intended status	Informational RFC
Goals	Adopt Sep 2013, Submit ?

Publish evaluation criteria and the result of experimentation with these Experimental algorithms on the Internet. This must be completed prior to finishing any Proposed Standard algorithm specifications (#cc-rec).

#eval-criteria must be finished first!

Goals and Milestones

cc-rec-X

Charter title   Recommended congestion control algorithms for interactive real time media

Intended status   Proposed Standard

Goals   Adopt Sep 2013, Submit May 2014

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 algorithm; in this case it will be one of the objects of the experimentation to determine the applicabilities and relative merits of the algorithms.

One or more.

#eval-results must be finished first!

Goals and Milestones

cc-cand-X-historic

Charter title	-
Intended status	Informational RFC
Goals	Adopt ?, Submit ?

For each of the Experimental algorithms that have not been selected for the Standards Track, the working group will review the algorithm and determine whether there are significant flaws, such as ones that turn out to be harmful to flows using or competing with them. If so, the WG will write a document describing the issues encountered and recommending to the IESG to move the specification to Historic status.

Not clear at this stage whether we will have these work items.

Media Transport in RTCweb

- Data Congestion Control
- Differentiated Treatment of Flows (using DiffServ)