IAB / IRTF Workshop on Congestion Control for Interactive Real-Time Communication

Hannes Tschofenig <hannes.tschofenig@nsn.com>

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Workshop Material

Main Workshop Web page:

- http://www.iab.org/activities/workshops/cc-workshop/

Papers:

- http://www.iab.org/activities/workshops/cc-workshop/papers/

Agenda & Slides:

- http://www.iab.org/activities/workshops/cc-workshop/slides/

Meeting minutes:

- http://www.iab.org/wp-content/IAB-uploads/2012/10/Congestion-Control-Workshop-Minutes.pdf

Report will be published today. Snapshot can be found here:

- http://tools.ietf.org/html/draft-tschofenig-cc-workshop-report-00

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Status

- Long history of congestion control and application-independent QoS signaling in the IETF.
- Best-effort solutions saw deployment but QoS signaling didn’t.
- With RFC 3714 the IAB raised concerns regarding congestion control regarding voice traffic.
  - Fears regarding congestion collapse was seen in absence of congestion control for voice traffic.
  - Congestion collapse did not happen. Voice traffic is too small compared to other traffic.

Status, cont.

- More interactive real-time communication happening today.
  - Works most of the time just fine.
  - Problems are more related to buffering in network elements than due to congestion.
- Further increase in interactive real-time traffic (voice, video, data) expected (particularly due to WebRTC).
  - We are talking about non-operator provided services.

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Two Solution Tracks

Improve network entities for those cases where network is congested.

Examples

- Get ECN deployed
- New queuing algorithms (CoDel, stochastic queuing)
- QoS signaling

Problem: what are the incentives for operators to improve their network

→ Network measurements may provide the necessary incentives.

Avoiding self-inflicted queuing.

Approach: Ensure that the network does not get congested.

Congestion control for real-time media that browsers send.

Example:

- Change the way TCP is used in browsers (avoid opening many concurrent TCP connections, interworking with DASH, use SPDY)
- Single congestion manager on end host or browser
- Better congestion control algorithm for RTCWeb taking the following aspects into account:
  - Codec characteristics,
  - Combination of voice, video and data,
  - Startup behavior,
  - Various feedback signals

NSN Relevance

- End-to-end congestion control work is not directly relevant for NSN.
- The following aspects deserve an investigation:
  1. What test do we perform to check whether our equipment performs well with regular Internet traffic?
  2. What performance tests are being looked at by the European Commission and the Federal Communications Commissions? How does our equipment perform in those tests?
  3. Queuing:
     - What queuing mechanism do we use in our equipment?
     - How are the parameters set?
     - Are we using stochastic queuing?
     - Could we make use of CoDel?
     - How easy can we change the queuing algorithm for equipment in use / new equipment?
  4. How much memory do queues in our equipment have?
  5. Are operators interested to provide better service for over-the-top real-time interactive media?

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Recommended Papers

- Impact of TCP on Interactive Real-Time Communication Ilpo Järvinen, Binoy Chemmagate, Laila Daniel, Aaron Yi Ding, Markku Kojo, and Markus Isomäki
- There is No Magic Transport Wand John Leslie
- Towards Adaptive Congestion Management for Interactive Real−Time Communications D. Kutscher, M. Kuehlewind
- Position paper on CC for Interactive RT Matt Mathis
- Congestion Control for Interactive Real-Time Flows on Today's Internet Keith Winstein, Anirudh Sivaraman, and Hari Balakrishnan
- The Internet is Broken, and How to Fix It Jim Gettys

- Also interesting: Bauer and Beverly, "Measuring the current state of ECN support in server, clients, and routers", http://mirrors.bufferbloat.net/Talks/AIMS2011/bauer-ecn-aims-2011.pdf