RTP and the Datagram Congestion Control Protocol

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draft-perkins-dccp-rtp-01.txt
Overview of Draft

- RTP widely used for transport of real-time media on IP networks initiated by a control protocol such as SIP
- DCCP is a desirable transport service for real-time applications
- This draft combines them, defining:
  - A framing mechanism to allow transport of RTP over DCCP
  - Extensions to SDP to allow negotiation of RTP over DCCP sessions
Framing RTP over DCCP: Basics

• RTP sessions comprise two flows:
  – Media data packets: one RTP data packet ↔ one DCCP datagram
  – Control packets: one compound RTCP packet ↔ one DCCP datagram

• Keep DCCP connection open for duration of RTP session
  – Send periodic zero-length DCCP-Data packet as NAT keep-alive

• MAY use partial checksum if supported by payload format, but checksum MUST cover DCCP and RTP header
Framing RTP over DCCP: RTP and RTCP

- RTP and RTCP typically flow over separate UDP connections
  - Wasteful of ports
  - Complicates NAT traversal

- It is RECOMMENDED that RTP and RTCP share a single DCCP flow, multiplexed by payload type
  - Safe to multiplex if RTP payload types 64...65 and 72...79 avoided
  - Not a concern in practice ⇒ recommend always multiplex

Initial segment of RTP header; 7 bit payload type; values 0...35 and 96...127 usually used

Initial segment of RTCP header; 8 bit packet type; values 192, 193, 200...208 used
Framing RTP over DCCP: Open Issues

• Provide advice on implementation of congestion control within RTP applications

• Discuss how RTCP interval affected by congestion control:
  – RTP uses nominal “session bandwidth” to calculate RTCP interval
  – Not clear appropriate when using DCCP, since actual session bandwidth can vary widely
  – Two options:
    • Use nominal bandwidth, accepting that RTCP interval may be inaccurate
    • Modify RTCP rules to account for actual session bandwidth ⇒ complex
  – For future study
Signalling RTP over DCCP

- Register new protocols for use on m= line
- Add `a=dccp-service-code`: attribute
  - Now aligned with definition in DCCP spec
  - Now register four service codes: `SC:RTPA`, `SC:RTPV`, `SC:RTPT`, `SC:RTPO`
    - Standard service codes for typical RTP media types
- Allow `a=rtcp`: to signal separate RTP and RTCP flows
  - Consequence of recommending multiplexed transport by default

Usual SDP + comedia signalling

```
v=0
o=alice 1129377363 1 IN IP4 192.0.2.47
s=-
c=IN IP4 192.0.2.47
t=0 0
m=video 51370 DCCP/RTP/AVP 99
a=rtpmap:99 h261/90000
a=dccp-service-code:SC=x52545056
a=setup:passive
a=connection:new
```
Summary and Future Directions

• Seek comments on design choices:
  – Recommendation to always multiplex RTP and RTCP
  – Registration of standard service codes for RTP media

• Future directions:
  – Add discussion of congestion control for media
  – Add discussion of impact of congestion control on RTCP interval
  – Implementation?

• Accept as working group draft?
Detailed List of Changes Since -00

• Extensive editorial changes and clarifications
• Clarify that the DCCP connection remains open for the duration of the RTP session.
• Update discussion of multiplexed RTP and RTCP in section 4.3
• Clarify signalling of the RTCP port.
• Align the syntax of the “a=dccp-service-code:” SDP attribute with that defined in section 8.1.2 of the DCCP specification.
• Register standard service codes for RTP sessions.
• In section 4.5, explicitly document which profiles can be used with DCCP.
• In section 4.1, mandate that partial checksums cover the RTP and DCCP headers (SHOULD → MUST)
• Rewrite normative language in section 4.4