RTP Considerations for Endpoints sending Multiple Media Streams

`draft-lennox-avtcore-rtp-multi-stream-01`

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RTP Multi-source: Motivation

- Clarify usage of RTP/RTCP with multiple sources per session
- A number of use cases emerging where this is used
  - BUNDLE (or MMT)
  - CLUE
  - Multi-source Mixers

Changes from previous version

- Added explicit RTCP SDES item to describe RTCP reporting groups.
- Added calculations motivating use of reporting groups.
- Several additional open issues.

Reporting Groups

- A “Reporting Group” is a group of sources that all originate at the same interface of an endpoint, and so have the same view of an RTP session.
- Within a reporting group, only one SSRC sends reception reports about any given remote source.
  - That source also sends any XR or AVPF feedback about that remote source.
- No reception reports (or other feedback) are sent about sources within the same reporting group.

Reporting Group: motivation

- Semantic: sources are actually received by endpoints, not SSRCs, so gives better transparency about what's going on.
  - E.g., if one endpoint with 50 streams receives you fine, but 10 others with one stream each doesn't.
- Efficiency: use much less of your RTCP bandwidth sending redundant reception reports, meaning useful data is more timely.
  - See draft for example numbers.

Reporting group: details (1)

- New RTCP SDES item: RGRP, same syntax as CNAME (RFC6222/bis).
- All sources within a reporting group have the same RGRP.
- Only one reporting source within a group sends feedback about any given remote source.
  - The same reporting source can be used for all remote sources, or different local ones can be used for different remote ones.
  - Using different remote sources could be useful when the number of reports exceed an MTU.
- Other sources within the group send RTCP SR/RR packets without reception reports for that remote source.

Reporting group: details (2)

- For AVPF, a reporting source gets to use other group members' immediate or early feedback slots.
- The RGRP SDES item is included in any compound RTCP containing that source's SR or RR.
- Sources with the same RGRP need not have the same CNAME.
  - E.g. multiple synchronization contexts, or a source-projecting mixer.
- Sources with the same CNAME need not have the same RGRP.
  - E.g., a distributed endpoint.
- Open issue: how to signal/negotiate in SDP.

Multi-source open issue: avg_rtcp_size

- In RFC 3550, a source's transmission interval is proportional to (session size) * avg_rtcp_size / rtcp_bw.
- This calculation works if avg_rtcp_size measures compound RTCP packets sent by a single session member.
- However, the draft recommends aggregating several sources' RTCP into a single compound.
  - Also in 3550, and this is a good idea for bandwidth use.
- Do we need to change how avg_rtcp_size and/or the transmission interval is calculated?

Next steps

- Address open issues
- Does the WG want the multi-source clarifications for a WG item?
- Does the group think RGRP semantics is a reasonable approach?