Source-Specific SDP Attributes:
RTP Issues

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draft-lennox-mmusic-sdp-source-attributes-00.txt
Source-Specific Attributes: Review

- RTP allows multiple sources in an RTP session, but SDP has no way to signal this.
- Solution: define an SDP attribute for characteristics of a source.

```
m=video 49170 RTP/AVP 96
a=rtpmap:96 H264/90000
a=ssrc:12345 cname:user@example.com
a=ssrc:12345 information:Main camera
a=ssrc:67890 cname:user@example.com
a=ssrc:67890 information:Alternate camera
```

- Map SDP “source-specific” attributes into the `ssrc` attribute.
- This generalizes material that was previously in the RTP Single-Source Multicast draft.
Motivation

• Avoid clashes with the SSRC id of a single media sender.
  – This is needed for Single-Source Multicast.

• Make SSRC multiplexing explicit.
  – Describe, and differentiate between, multiple SSRCs from the same participant in the same RTP session.
  – Examples:
    • Multiple cameras
    • FEC
    • Retransmission
    • Layered codecs
Terminology Confusion: SDP vs. RTP

• SDP and RTP terminology is inconsistent.
• An SDP Media Stream describes an RTP Session.

<table>
<thead>
<tr>
<th>SDP</th>
<th>RTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimedia Session</td>
<td>–</td>
</tr>
<tr>
<td>Media Stream, Media Description, m= line</td>
<td>RTP Session</td>
</tr>
<tr>
<td>Media Source</td>
<td>(Audio/Video) Stream, RTP Stream, RTP Source, ssrc</td>
</tr>
</tbody>
</table>

• Introduce the term Media Source for SDP.
Implications for RTP: Collisions

• SSRCs can change due to collision.
• This draft: signaled SSRCs MUST NOT be re-used by other entities.
• However, collisions can still happen:
  – Race conditions.
  – Endpoints that don’t understand this draft.
• Thus, endpoints MUST be prepared to handle collisions:
  – Receive packets with non-signaled SSRCs.
  – Receive RTCP mapping a SSRC to a CNAME other than the one signaled.
Implications for RTP: Collisions (2)

• If a signaled source collides with a non-signaled source, the signaled one should “win”:
  – It waits $5 \times 1.5 \times T_d$ before executing collision resolution.
  – It only changes its SSRC if the other colliding source doesn’t go away.

• Colliding signaled sources resolve normally.
  – Shouldn’t ever happen, assuming SDP transport protects from offer/answer glare.

• If you do have to change your SSRC, you can send updated SDP with a previous-ssrc attribute.
  – If you’re distributing SDP over a channel which supports updated descriptions.
Backward Compatibility

• Many (point-to-point) endpoints won’t correctly handle RTP sessions with more than one source.
• Even endpoints which correctly interpret multiple sources might not have the resources to decode them.
• Does there need to be a way to indicate “I can receive multiple sources”?
• If so, recommend that if your receiver doesn’t indicate this, you SHOULD send only one source at a time.
Source grouping

• Signaled sources are useful for groups of RTP sources.
  – E.g. FEC, RTX, layered codecs.
  – Associate supplemental source with main source.

• Mechanism is analogous to SDP media grouping (a=group).

• Senders still need to be prepared for receivers that don’t understand signaled sources.
  – E.g., for SSRC-multiplexed RTP retransmission (RFC 4588) of multiple sources, the mapping between the original source and the retransmission source is initially ambiguous without source signaling.
  – Senders can choose the original sources’ RTP sequence numbers so that NACKers won’t have NACKs outstanding for the same sequence number in two streams.
RTP Architectural Issues

• Still MUST NOT multiplex (e.g.) audio and video streams on a single RTP session.
• Still a single set of payload type numbers per RTP session.
• If you only know about a source from SDP, it doesn’t count for group size estimation, and you don’t send SR/RR report blocks for it.
**AVT Working Group**

- Have any RTP architectural issues been overlooked?
- Are there any AVT objections to this proceeding in MMUSIC?
- AVT will remain responsible for reviewing the draft.
- RTCP-SSM will normatively depend on this.