RTP Payload Format for Interleaved Packets

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Recap: Interleaving Payload

• A proposed common RTP payload format for interleaved media.
• Independent of any codec.
• Useful for network environment where interference is an issue, e.g., DSL and wireless network.
  – some European operators are still using DSL because the cost of updating network is quite high. They are still considering to dig out the potentiality of their legacy network.
• Applicable for non-interactive applications where certain delay is allowable, e.g., IPTV.
Changes to Version 00

• Specified “interleaving length” and “interleaving depth”.
  – Interleaving length is the packet number of an interleaving separation between packets or data originally adjacent.
  – Interleaving depth is the interleaving separation count of an interleaver output buffer.

• Specified “packet interleaving” and “data interleaving”
  – Packet interleaving simply permutes the RTP packets for transmission.
  – Data interleaving segments RTP packets into pieces, disarranging them, and reassembling into new RTP packets. The number of separations of one packet is equal to the interleaving depth.
  – Interleaving may change the number of RTP packets during transmission. But the number of RTP packets will be recovered after de-interleaving.

• IANA registration for Interleaving Payload.

• Some clarifications
  – Only the packets of the same on RTP stream are allowed to be interleaved in one interleaving stream.
How does Interleaving Help

- It can work with FEC to increase the recovery possibilities.

It disperses continuous packet losses into isolated ones so that FEC can work well to recovery these losses.
Interleaving Experiment Result (Quality)

When working with FEC, I frame interleaving has better recovery performance than full interleaving and non-interleaving. It can get better quality.
Interleaving Experiment Result (Delay)

- Interleaving: \( m=5; \ n=5; \) RTP packet length = 1316(7*TS packets);
- The I frame percentage is 12%

<table>
<thead>
<tr>
<th></th>
<th>Maximum Delay(us)</th>
<th>Minimum Delay(us)</th>
<th>Average Delay(us)</th>
<th>Total time for interleaving(ms)</th>
<th>total time of video(ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interleaving</td>
<td>44798</td>
<td>55</td>
<td>1241</td>
<td>59205</td>
<td>59205</td>
</tr>
<tr>
<td>Selective Interleaving (Only I frame)</td>
<td>18171</td>
<td>54</td>
<td>159</td>
<td>6092</td>
<td>65276</td>
</tr>
</tbody>
</table>

Selective interleaving reduces the processing delay by 90%.
Next Step

• Welcome reviews and suggestions.
THANK YOU