3GPP TSG-SA4 Meeting SA4#113-e S4-210534

April 6th- April 14th 2021

Agenda item 12.5

Source: Tencent

Title: Signaling for Audio mixing gain

Document for Agreement

# Introduction

This contribution relates to the signaling of audio mixing gain for immersive and overlay streams so that the receiving device mixes the audio streams correctly and in a meaningful way. This is a follow-up of document S4-210202 (Update to Audio mixing of multiple streaming in ITT4RT), accepted in the SA4#112e Meeting.

# Proposal

The ITT4RT-Tx client may indicate the audio mixing gain value to the ITT4RT-Rx client via [SDP or] RTP header-extension based solution.

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## SDP based solution

The ITT4RT-Tx client may, in its SDP offer, indicate the mixing gain of the 360-degree audio and overlay audio by including a media-level attribute “3gpp\_audio\_mix\_gain”, in the description of each media stream, for describing the audio mixing gain, with the following ABNF:

a=3gpp\_audio\_mix\_gain:<audio-mixing-gain>

The audio mixing gain may be expressed in dBov via signed integer with values between “-128” and “127” and linear weighting between the extreme ends.

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## RTP based solution

For RTP based solution, the packet of each RTP audio stream can indicate, in an RTP header extension, the mixing level of that audio sample, carried in the RTP packet with the following RTP extension (RFC 8285).

 0 1

 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

 | ID | len=0 |audio-mixing-gain|

 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

Audio mixing gain using One-Byte Header Format

The 4-bit ID is the local identifier of this element. The 4-bit length is the number, minus one, of data bytes of this header extension element following the one-byte header. The URI for declaring the audio mixing gain header extension in a Session Description Protocol (SDP) extmap attribute and mapping it to a local extension header identifier is

 urn:3gpp:rtp-hdrext:audio-mixing-gain

 An example attribute line in the SDP for a conference is shown below. The presence of such an attribute in the SDP description indicates that RTP packets in that stream containing the header extension will be carrying such an extension with an ID 7.

 a=extmap:7 urn:3gpp:rtp-hdrext:audio-mixing-gain

The header extension may be present only in the first/ first few packets of the RTP audio stream and may be repeated when the mixing gain needs to be updated for optimality. The audio mixing gain may be expressed in dB via signed integer with values between “-127” and “0” and linear weighting between the extreme ends (hence the numerical values directly represent the gain in dB). The -128 value may be used for muting the channel.

# Proposal

The proposal is to add the above text to section 3.9 in the PD.

# References

1. IETF RFC 8285 (2017) “A General Mechanism for RTP Header Extensions”
2. IETF RFC 6465 (2011) “A Real-time Transport Protocol (RTP) Header Extension for Client-to-Mixer Audio Level Indication”