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Study Group 15 Version 1.0
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SOURCE :Ofer Shapiro/Radvision¹.

TITLE : H.225 Annex F: new audio packetization - Framework.

PURPOSE: Proposal.

This document outlines the new annex F to H.225 "new audio packetization". It contains both draft framework for annex F and first "Fill-in" for G.728 packetization

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1. Scope.

This document contains new packetization information regarding audio coding that is not covered in H.225.

2. New audio coding.

2.1 G.723.1

Payload information as will be approved.

2.2 G.728

2.2.1 Option A.

1. Frame packetization:

G.728 frame (4 vectors: V1-V4, 10 bit each, V1 is the older - first to be played) is organized into 5 bytes (B1-B5).

Referring to figure below, the principle for bit order is "maintenance of bit significance". Bits from older vector are more significant than bit from newer vectors. the MSB of the frame goes to MSB of B1 and the LSB of the frame goes to LSB of B5.

```

      1      2      3      3
      0      0      0      9
+++++
<---V1---><---V2---><---V3---><---V4--->
<--B1--><--B2--><--B3--><--B4--><--B5-->
<-----Frame 1----->
```

For example:

B1 contain 8 most significant bits of V1, MSB of V1 is MSB of B1.

B2 contain 2 Least Significant bits of V2, the more significant of the two in its MSB, and 6 most significant bits of V2, the most significant of them is more significant at B2 also.

B1 Shall be put first to the packet (most significant byte in RTP) and B5 last.

2. Multi Frame packetization.

Sending single frame in RTP packet might cause considerable network overhead. Therefor sending multi frame packet is allowed in the following manner.

RTP G.728 packet shall contain whole number of frames.

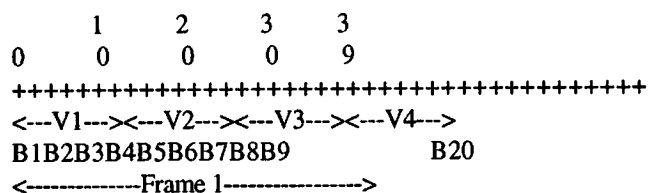
older frames (to be played first) shall be put first into the RTP packet.

The time stamp would reflect the capturing time of the first sample, in the first vector (V1) of the first frame (the oldest information in the packet).

2.2.2 Option B.

1. Frame packetization.

G.728 frame (4 vectors: V1-V4, 10 bit each, V1 is the first to be played) is organized into 20 bytes (B1-B20). Each byte containing two bits, the more significant bit in the vector at the MSB.



B1 Shall be put first into the packet (most significant byte in RTP) and B20 last.

2. Multi Frame packetization.

RTP G.728 packet shall contain whole number of frames.

older frames (to be played first) shall be put first into the RTP packet.

The time stamp would reflect the capturing time of the first sample, in the first vector (V1) of the first frame.

Option B consume 48Kbit/sec more than Option A. Option A is therefor recommended.

2.3 G.729

Packetization scheme to be defined.

2.4 GSM ?

Packetization scheme to be defined.

3. Silence suppression

H.225 state that coders may send silence frame before the stop transmission during silence period. Since not all audio encoding have in-band signaling for silence, A general mechanism at the RTP level should be defined. Example of which might be sending an empty RTP packet.