**3GPP TSG- Meeting #**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | The IVAS RTP payload format has not defined the transport of “Processing Information (PI)” using standard mechanisms such as RTP header extensions (HDREXT). Depending on the application it may be preferable to have those outside the RTP payload. |
|  |  |
| ***Summary of change:*** | In addition to transmission of Processing Information (PI) as part of the IVAS RTP payload, all PI frames can be transmitted as RTP header extensions (HDREXT) as described in the CR. The mechanism is based on the general mechanism for RTP header extensions specified in [RFC8285]. |
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| ***Consequences if not approved:*** | Only in-payload PI data is allowed. In-payload PI data may have issued like lack of access when SRTP encryption is in use. |
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| ***Clauses affected:*** | A.5 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 26.114, CR26253-0009 |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | This CR introduces the concept based on the PI data in CR26253-0009 and may not reflect the final set of PI data elements defined for IVAS. The concept is however extensible and should also work for most other potential PI data elements. |
|  |  |
| ***This CR's revision history:*** | Revision 0: Initial revision provided for information at SA4#131-bis-eRevision 1: Fixed field separators in structure example |

CHANGE 1

# A.5 RTP Header Extensions

## A.5.1 General

In addition to transmission of Processing Information (PI) as part of the IVAS RTP payload, all PI frames can be transmitted as RTP header extensions (HDREXT) as described in the following clauses. The mechanism is based on the general mechanism for RTP header extensions specified in [RFC8285]. The use of one-byte header format is prefered over two-byte header format. The two-byte header format is required when PI frames with a size larger than 16 bytes or when more than 14 header extension types are to be transported.

Editor’s Note: The PI frames are rather small in general with just a few bytes. ISMs are the notable exception (with up to 24 bytes) and it may make sense to revisit those (as e.g. it would be 2.4kbps/ISM if the extended ISM metadata is provided as PI for e.g. position per ISM).

## A.5.2 Supported RTP Header Extensions for PI

Table A.5.2-1: List of supported RTP header extensions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PI Frame Type | Clause | RTP HDR\_EXT URN | Payload Size (bytes) | Payload Format | Total (incl. 1‑byte header) |
| SCENE\_ORIENTATION | A.3.5.6.1.2 | urn:3gpp:ivas:fsco | 8 | Quaternion: 4 × int16 (Q15: W, X, Y, Z) | 9  |
| DEVICE\_ORIENTATION\_COMPENSATED | A.3.5.6.1.3 | urn:3gpp:ivas:fdoc | 8 | Quaternion: 4 × int16 (Q15) | 9  |
| DEVICE\_ORIENTATION\_UNCOMPENSATED | A.3.5.6.1.3 | urn:3gpp:ivas:fdou | 8 | Quaternion: 4 × int16 (Q15) | 9 |
| ACOUSTIC\_ENVIRONMENT | A.3.5.6.2 | urn:3gpp:ivas:face | 1, 5, or 8 | AE identifier (1 byte) or compact AE parameters (5 or 8 bytes) | (payload+1)  |
| AUDIO\_DESCRIPTION | A.3.5.6.3 | urn:3gpp:ivas:faud | 1 to 4 | Audio Identifier(s) (1 byte per identifier) | (payload+1)  |
| ISM\_NUM | A.3.5.6.4.2 | urn:3gpp:ivas:finm | 1 | ISM count: 2 bits for number (with 6 bits reserved) | 2 ( |
| ISM\_ID | A.3.5.6.4.3 | urn:3gpp:ivas:fiid | N (1 byte per ISM) | List of ISM IDs (1 byte each) | 1+N |
| ISM\_GAIN | A.3.5.6.4.6 | urn:3gpp:ivas:figa | N (1 byte per ISM) | Gain factors (1 byte per ISM) | 1+N  |
| ISM\_ORIENTATION | A.3.5.6.4.7 | urn:3gpp:ivas:fiso | 8×N | For each ISM: Quaternion (4 × int16, Q15) | 1+(8×N)  |
| ISM\_POSITION | A.3.5.6.4.8 | urn:3gpp:ivas:fipo | 6×N | For each ISM: Position vector (3 × int16, Q15) | 1+(6×N)  |
| ISM\_DISTANCE\_ATTENUATION | A.3.5.6.4.4 | urn:3gpp:ivas:fida | 3 or 3×N | Attenuation parameters (3 bytes globally or per ISM) | (payload+1)  |
| ISM\_DIRECTIVITY | A.3.5.6.4.9 | urn:3gpp:ivas:fidr | 2 or 2×N | Directivity parameters (2 bytes globally or per ISM) | (payload+1) |
| DIEGETIC\_TYPE | A.3.5.6.5.1 | urn:3gpp:ivas:fdit | 1 | Diegetic type indicator (full byte) | 2  |
| PLAYBACK\_DEVICE\_ORIENTATION | A.3.5.7.1 | urn:3gpp:ivas:rpdo | 8 | Quaternion: 4 × int16 (Q15) | 9  |
| HEAD\_ORIENTATION | A.3.5.7.2 | urn:3gpp:ivas:rhor | 8 | Quaternion: 4 × int16 (Q15) | 9 |
| LISTENER\_POSITION | A.3.5.7.3 | urn:3gpp:ivas:rlip | 6 | Position vector: 3 × int16 (Q15) | 7  |
| DYNAMIC\_AUDIO\_SUPPRESSION | A.3.5.7.4 | urn:3gpp:ivas:rdas | 2 | Suppression parameter (2 bytes) | 3 |
| AUDIO\_FOCUS\_DIRECTION | A.3.5.7.5 | urn:3gpp:ivas:rafd | 8 | Quaternion: 4 × int16 (Q15) | 9 |
| PI\_LATENCY | A.3.5.7.6 | urn:3gpp:ivas:rlat | 4 | 32‑bit latency value | 5  |
| NO\_PI\_DATA | A.3.5.5 | urn:3gpp:ivas:nopi | 0 |  |  |

## A.5.3 SDP Negotiation

SDP negotiation for RTP header extensions shall use the mechanisms described in [RFC8285], i.e. using the extmap attribute.

## A.5.4 Examples

The following example illustrates the SDP part for negotiation of two RTP header extensions for head orientation and listener position:

a=extmap:3 urn:3gpp:ivas:rhor

a=extmap:4 urn:3gpp:ivas:rlip

The resulting complete header extension is illustrated in Figure A.5.4-1 where the generic RTP header extension signaling for one-byte header extensions is followed by the specific header extensions for listener orientation (ID=3) and position (ID=4). No additional padding is required in this example.

0                   1                   2 3

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

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|         Profile = 0xBEDE      |           Length = 0x0004     |

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|  ID=3 | len=7 |     W\_OR (16 bits)     | X\_OR (16 bits)|

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|      ...      |       Y (16 bits)         | Z\_OR (16 bits)|

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|      ...      |  ID=4 | len=5 |  X\_POS (16 bits)          |

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|      Y\_POS (16 bits)          |    Z\_POS (16 bits)   |

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**Figure A.5.4-1: Structure of complete RTP header extension for listener orientation and position**

END OF CHANGES