**3GPP TSG SA WG4#125 S4-231565**

**Gothenburg, Sweden, 21 – 25 August 2023 revision of S4-231541**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26**.**119-PD** | **CR** | **pseudo** | **rev** | **-** | **Current version:** | **8.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | **[MeCAR] Audio Capabilities for MeCAR** | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | **MeCAR** | | | | |  | ***Date:*** | | | 15/08/2023 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | 18 |
|  | *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 can be 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Decoding capabilities were unclear and unaligned with TS 26.511 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Align with TS 26.511  Define multiple decoding instances | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | |  |  |  |  | | --- | --- | --- | --- | | [**S4-231215**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_125_Gotheneburg/Docs/S4-231215.zip) | [MeCAR] Split Rendering profile updates | Qualcomm Incorporated | Thomas Stockhammer |   **Presenter**: Thomas Stockhammer  **Online Discussion**:   * 2023/08/23: Thomas presents   + Thomas: ok to add IVAS instead of EVS. Same availability on common cloud gaming servers.     - Andre: also good     - Stefan: also ok   + Emmanuel: MeCAR is included in the device/UE, so it seems that this is about the information we can provide you. Also ok to work on IVAS according to work item plan   + Andre: do we have to differentiate audio and speech?     - Thomas: no, would be good to get rid of this audio/speech     - Stefan B: ok to also get rid of speech and do audio only   + Stephane: MECAR would be good to refer to speech   + Stefan: change capabilities to encode => decode     - Thomas: ok   + Thomas: is there a profile for IVAS that would refer to, for example 2 or 4 decoder instances for EVS     - Tomas: yes, this is the case. Supports HOA, objects, stereo   + Emmanuel: would be confusing to add IVAS now, we have a CR planned for MECAR that would address it.   + Some decisions:     - Refer to audio/speech     - Add a placeholder for IVAS     - Good baseline   + Emmanuel: can we support cross-codecs?     - Thomas: generally yes, but harder to document, use case     - Emmanuel: left and right eye HEVC, depth AVC     - Thomas: believe we can document something   + Clearly a set of revisions is needed | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== CHANGE =====**

[

## 6.7 Candidate audio function and capabilities

NOTE: While considering audio codec capabilities, it is necessary to identify the targeted services and clarify the associated requirements (e.g., for 5GMS, split rendering, pixel streaming…), in terms of bit rate operation, algorithmic delay vs. motion to sound delay, quality, complexity…

### 6.7.1 Introduction and Definitions

TS26.117 defines encoding and decoding capabilities for speech and audio codecs.

However, TS 26.117 does not yet define encoding and decoding capabilities for

- MPEG-4 Low Delay AAC v2 Profile (AAC-ELDv2) Level 2 bitstreams [AAC-ELDv2]

- Simultaneous encoding and decoding instances and rendering aspects for immersive formats other than stereo

- IVAS

Editor’s Note: Addition to 3GPP TS 26.117 [4] may be suitable

Based on this, temporarily the following capabilities are defined beyond those in TS 26.117 [4].

**- LD-AACv2:** the capability to decode MPEG-4 Low Delay AAC v2 Profile (AAC-ELDv2) Level 2 bitstreams [AAC-ELDv2] and to output it as binaural audio, possibly overlaid with other binaural audio.

**- IVAS:** the capability to decode an IVAS bitstream and to render and output it as binaural audio.

Editor’s Note: Some suitable sub-profile for IVAS is expected to be defined and also added to TS 26.117 [4]

Simultaneous decoding capabilities are defined as follows:

**- <Dec-Cap>-<N>:** the capability to support up to ***N*** simultaneous decoding instances, each supporting the decoding capability **<Dec-Cap>**.

**-** If **<Dec-Cap>** equals **EVS**, and N>=2, the output of odd decoder instances is mapped to left audio output channel and the output of right decoder instances is mapped to right audio output channels. In case of using a single instance, the decoder output shall be mapped to all audio output channels.

### 6.7.2 Audio/Speech Decoding Requirements

Editor’s Note: clarify rendering aspects for immersive formats other than stereo

The following requirements do not make a distinction between speech or audio; they apply interchangeably to both.

If the MeCAR Client supports the reception of audio/speech:

- the **EVS** decoding capability as defined in 3GPP TS 26.117 [4] clause 5.2, shall be supported

NOTE: EVS decoding capability may be fulfilled by the IVAS decoding capability

[- the **IVAS** decoding capability as defined in clause 6.7.1. should be supported]

- the **EVS-2** decoding capability as defined in clause 6.7.1 should be supported

- the **EVS-4** decoding capability as defined in clause 6.7.1 may be supported

Editor’s Note: The EVS simultaneous decoding capabilities should be replaced by with an IVAS decoding capability when IVAS is supported.

- the **LD-AACv2** decoding capability as defined in clause 6.7.1 shall be supported

- the **LD-AACv2-2** decoding capability as defined in clause 6.7.1 may be supported

### 6.7.3 Audio/Speech Encoding

The following requirements do not make a distinction between speech or audio; they apply interchangeably to both.

If the MeCAR Client supports the generation of audio/speech:

- the sender requirements for the EVS Operation Point as defined in 3GPP TS 26.117 [4] clause 6.2.4.3 shall be supported.[- the sender requirements for generating an IVAS bitstream compliant with the **IVAS** decoding capability should be supported]

- the sender requirements for generating an LD-AACv2 bitstream compliant with the **LD-AACv2** decoding capability shall be supported

]