**3GPP TSG SA#104 SP-xxxxxx**

**Budapest, June 2022**

**Source: 3GPP SA4**

**Title: EVS Codec Extension for Immersive Voice and Audio Services Ph2**

**Document for: Approval**

**SA Agenda Item: x.x**

3GPP WG-SA4 Meeting #128 S4-24xxxx

Jeju, Korea, 20 – 24 May, 2024

**Source: Dolby Laboratories Inc., Ericsson LM, Fraunhofer IIS, Huawei Technologies Co Ltd., Nokia Corporation, NTT, Orange, Panasonic Corporation, Philips International B.V., Qualcomm Incorporated, VoiceAge Corporation, Xiaomi**

**Title: WID on EVS Codec Extension for Immersive Voice and Audio Services Phase 2**

**Document for: Approval**

**Agenda Item: x.x**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: WID on **EVS Codec Extension for Immersive Voice and Audio Services Phase 2**

## Acronym: IVAS\_Codec\_Ph2

## Unique identifier: 770024

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  | X |  |
| **No** | X |  | X |  |  |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a …

|  |  |
| --- | --- |
| x | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 770024 | IVAS\_Codec | *Same functionality codec based on floating point C-code*  |
|  |  |  |
|  |  |  |
| 470030 | EVS\_Codec | *Basis for the Codec* |
| 830005 | ATIAS | *ATIAS interfaces with IVAS on capture and on renderer sides*  |
| 990025 | ISAR | *Split Rendering operation is integrated into the IVAS codec* |

## 3 Justification

## The overall objective of the IVAS\_Codec work item was to develop a single general-purpose audio codec for immersive 4G and 5G services and applications including the XR use cases envisioned in 3GPP TRs 26.918 and 26.928 and possibly relying on devices described in 26.998. In order to achieve such versatile goals, the result of the IVAS\_Codec work item is a solution consisting of low-delay speech and audio coding techniques and rendering targeting to address services with interactive stereo or immersive audio communication. It comprises an encoder, a decoder, a renderer and several auxiliary functions associated with the support of stereo and immersive audio formats beyond EVS mono coding, defined in the 3GPP specifications TS 26.250, ....

While the IVAS\_Codec work item is completed, enabling services with immersive audio communication, several aspects that enhance the codec were identified that should be separated from the IVAS\_Codec work item. In addition, given the scope of IVAS\_Codec is significantly more extensive than any other speech/audio codecs developed by 3GPP in the past, the conversion of the selected floating-point C-code to fixed-point C-code is also much more challenging. This conversion task is being handled by a 3rd party, and would require more time to be completed, debugged and verified. Therefore initiating a Phase 2 development for IVAS\_Codec is necessary.

## 4 Objective

The overall objective of this work item is to enhance the set of IVAS specifications. The following objectives should be achieved with the work item:

* A fixed-point C-code that is expected to deliver the same functionalities and similar performances as the floating point C-code in TS 26.258.
	+ Verified interworking performances between floating point and fixed-point C-codes, i.e. fl-fl, fl-fx, fx-fl, fx-fx all should have comparable performances.
* Conduct the characterization tests on the fixed-point C-code and complement the TR 26.997.
* Enhancements to the code conformance test procedure and requirements
* Define relevant tiers to be implementable on a wide range of UEs and other end-user devices to address various needs in terms of balancing user experience and implementation complexity / cost. The tiers can be functionality levels with increasing complexity/memory requirements.
* Enhancements to the RTP payload formats and SDP negotiation
* Definition of the RTP Payload Format for the split rendering operation
* Integration of the enhancements into the relevant system specifications such as 26.114, 26.119, ...

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | Series | Title | For info at TSG#  | For approval at TSG# | Remarks |
|  |  |  |  |  |  |
| TS | 26.251 | Codec for Immersive Voice and Audio Services - ANSI C code (fixed-point) | SA#107 (March 2025) | SA#108 (June 2025) |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# |
| *26.114* | *Additional support for the IVAS Codec* | SA#108 (June 2025) |
| *26.119* | *Additional support for the IVAS Codec* | SA#108 (June 2025) |
| *26.249* | *Moving out ISAR Fixed-Point Code to 26.251* | SA#108 (June 2025) |
| *26.250* | *Definition of relevant tiers for implementation* | SA#108 (June 2025) |
| *26.253* | *Enhancements to the RTP Payload Format* | SA#108 (June 2025) |
| *26.997* | *Performance characterization of the IVAS Codec in fixed-point* | SA#108 (June 2025) |

## 6 Work item Rapporteur(s)

Su, Huan-yu, Huawei Technologies Co Ltd.,su.huanyu@huawei.com

## 7 Work item leadership

*SA4*

## 8 Aspects that involve other WGs

*None*

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Ericsson LM |
| Qualcomm Incorporated |
| Huawei Technologies Co Ltd |
| LG Electronics Inc. |
| Dolby Laboratories Inc. |
| Nokia Corporation |
| Fraunhofer IIS |
| VoiceAge Corporation |
| Orange |
| Samsung Electronics Co., Ltd |
| ZTE Corporation |
| Philips International B.V. |
| Xiaomi |
| Panasonic |
| NTT |