**3GPP TSG SA WG4 Meeting #122 S4-230320**

**Athens, Greece, 20th – 24th February, 2023 (revision of S4-220513)**

**Source: Ericsson LM, Facebook, Huawei, KPN N.V., Nokia Corporation, Samsung Electronics Co., Ltd., [Tencent], [AT&T], InterDigital, CMCC, Intel, ZTE, [China Unicom]**

**Title: Updated WID on IMS-based AR Conversational Services (IBACS)**

**Document for: Agreement**

**Agenda Item: 10.6 - IBACS**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: IMS-based AR Conversational Services

Acronym: IBACS

Unique identifier: TBA

Potential target Release: Rel-18

# 1 Impacts

*{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}*

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

# 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** |

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

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| --- |
| **Parent Work / Study Items**  |
| **Acronym** | **Working Group** | **Unique ID** | **Title (as in 3GPP Work Plan)** |
| N/A | N/A | N/A | N/A |

### 2.3 Other related Work Items and dependencies

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| --- |
| **Other related Work /Study Items (if any)** |
| **Unique ID** | **Title** | **Nature of relationship** |
| 770024 | EVS Codec Extension for Immersive Voice and Audio Services | Codec for spatial audio in conversational services |
| 810006 | Extended Reality (XR) in 5G | Relevant XR use cases in the conversational space |
| 820003 | Support of Immersive Teleconferencing and Telepresence for Remote Terminals | Previous work in MTSI related to 360-degree immersive communication in IMS |
| 850042 | Study on evolution of IMS multimedia telephony service | Feasibility study on AR call |
| 880011 | Study on 5G Glass-type AR/MR Devices | Feasibility study on 5G support of AR/MR devices including AR conversational services |
| 920029 | Stage 1 of Evolution of IMS Multimedia Telephony Service | Requirements to support AR telephony communication as specified in TS 22.261 |
| 940066 | Study on system architecture for next generation real time communication services | Study on the enhancement of the system architecture for next generation real-time communication in IMS. |
| 960046 | Real-time Transport Protocol Configurations (5G\_RTP) | The work in 5G\_RTC will cover generic RTP solutions covering both IMS and non-IMS related normative work in a new TS. Therefore, it is expected that IBACS and 5G\_RTP will align on any IMS-based RTP related topics and cross-feed each other’s work. |
| 950015 | Media Capabilities for Augmented Reality (MeCAR) | We expect that multiple relevant topics (like spatial descriptions, …) will be addressed in MeCAR and ultimately feed the work in IBACS |
| 950013 | Study on Smartly Tethering AR Glasses (FS\_SmarTAR) | FS\_SmarTAR will address the aspect of tethered AR devices that is currently not well defined in TR 26.998. Once the SmarTAR work is complete, IBACS will use the result as a basis for conversational services in IMS for tethered AR devices.  |
| 950014 | Immersive Real-time Communication for WebRTC (iRTCW) | IBACS currently has no direct dependency on iRTCW; however, the work items have some relation in scope, i.e. when it comes to RTP traffic and possibly some aspects on AR related metadata.  |
| 960044 | Generic architecture for RT and AR/MR (GA4RTAR) | IBACS currently has no direct dependency on GA4RTAR, however, any potentially overlapping work needs to be monitored in respect to its impact on normative work. |

# 3 Justification

Extended reality (VR (Virtual Reality), MR (Mixed Reality), AR (Augmented Reality)) applications and services need new standardized enablers in 3GPP. In SA4, work has been conducted during the past releases to address developments in this area. TR 26.928 (Extended Reality (XR) in 5G) identified multiple aspects of potential normative work with respect to conversational services (clause 7.6 & 7.8). TR 26.998 (5G Glass-type AR/MR) identified multiple aspects of normative work to support “5G/AR Real-time Communication” (clause 8.4). TR 26.998 identified the following normative work that will be addressed in IBACS: conversational AR services require real-time communication both in the downlink and in the uplink, need to support delivery of immersive media via RTP, support suitable control protocols for end-to-end adaptation, support capability exchange, and support any necessary session and connection establishment (based on SIP and SDP). Furthermore, the IBACS work will be driven by any existing and related functionalities defined in TS 26.114, including the basic unidirectional VR conferencing MTSI service.

The next standardization phase should be based on the above developments and proceed to Stage 3 specification. A new specification is planned to address AR conversational services for IMS and develop the necessary enablers to deploy new compelling applications and services based on extended reality experiences.

The new specification will leverage part of the existing TS 26.114 by importing/referencing part of its features and will also develop new ones. This work item will also leverage other work items within the same domain in the SA4 WG.

The main goal is to enhance IMS communication with new functionalities that support AR media and experiences (e.g., AR conferencing).

3GPP SA4 is working on the development of the EVS Codec Extension for Immersive Voice and Audio Services (IVAS) codec. It targets encoding/decoding/rendering of speech, music, and generic sound, with low latency operation and support of high error robustness under various transmission conditions, The IVAS codec is expected to provide support for a range of service capabilities, e.g., from mono to stereo to fully immersive audio, implementable on a wide range of UEs. Spatial audio is also an essential component that will be integrated into TS 26.114 in the context of the IVAS work item. IVAS will also be considered in the new planned specifications.

# 4 Objective

The objective of this work item is to create a new specification for IMS-based AR conversational services. The features for RTP-based real-time communication, which can be used by IMS and non-IMS (AR) conversational services, will be specified in another new specification (as part of the 5G\_RTP work). The relevant features and functional components specified for MTSI in TS 26.114 will be referenced and/or enhanced, if required.

More specifically, this work item aims to conduct normative work to specify the following aspects:

1. Terminal architectures for standalone, edge-assisted, and wireless tethered UEs integrated with an MTSI client (as defined in TS 26.114).

NOTE1: The work done for FS\_5GSTAR [and the result of Rel-18 WI MeCAR] should be taken into consideration. Work on tethered UEs heavily depends on SmarTAR, thus any work on tethered UEs in IBACS will be aligned on the readiness and timeline of SmarTAR.

1. IMS session setup, control, capability negotiation procedures for traditional and AR media, including the support of multiple device-types in one IMS communications session and network assisted split-rendering.

NOTE2: This relates to the potential normative work identified in TR 26.998 (5GSTAR): “Conversational AR services require real-time communication both in the downlink and in the uplink” & “A protocol stack and content delivery protocol for real-time communication based on RTP” & “A common session and connection establishment framework, with instantiations based on SIP and SDP for IMS”

1. Real-time transport of traditional as well as AR media, scene description, and metadata via IMS media path including Data Channel. Transport can be either one-way or bi-directional.

NOTE3: With the term AR media we refer to AR media as defined in Section 4.4 in 26.998 (including volumetric media).

NOTE4: Media capabilities will be defined in MeCAR and subsequently integrated/adopted in IBACS.

NOTE5: RTP-based media transport will be defined in 5G\_RTP and subsequently integrated/adopted in IBACS.

NOTE6: This relates to the potential normative work identified in TR 26.928 (5GXR): “Support of static/dynamic 3D objects’ formats and transport for real-time sharing” Further this relates to the identified potential normative work in TR 26.998 (5GSTAR): “Social XR Components – Merging of avatar and conversational streams to original media (e.g., overlays, etc.)”

1. Support of spatial descriptions needed to support spatial computing (as per TR 26.998) for conversational IMS communications.

NOTE7: This objective is subject to the conclusion of FS\_5GSTAR and will be based on the spatial descriptions that will be defined in MeCAR.

NOTE8: This relates to the potential normative work identified in TR 26.928 (5GXR): “6DOF metadata framework and a 6DOF capable renderer for immersive voice and audio.” & “Proper annotation and metadata for each object to place it into scene.” & “Description and rendering of multiple objects into a Social XR experience.”

1. Specify the integration of the IVAS spatial audio codec in the new planned specification, in coordination with the integration into TS 26.114 to be done in the IVAS work item and IVAS integration into the MeCAR work item.

# 5 Expected Output and Time scale

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| --- |
| **New specifications** |
| **Type**  | **TS/TR number** | **Title** | **For info at TSG#**  | **For approval at TSG#** | **Spec Editor** |
| TS | 26.264 | IMS-based AR Real-Time Communication | TSG#101 (after SA4#125) | TSG#102 (after SA4#126) | Yang, Hyunkoo, Samsung Electronics Co., Ltd., hyunkoo.yang@samsung.com  |

|  |
| --- |
| **Impacted existing TS/TR** |
| **TS/TR No.** | **Description of change**  | **Target completion plenary#** | **Remarks** |
|  |  |  |  |

# 6 Work item Rapporteur(s)

Rapporteur: Gunkel, Simon, KPN N.V., Simon.Gunkel@tno.nl

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

Coordination with SA1, SA2, and RAN groups may be necessary.

# 9 Supporting Individual Members

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| --- |
| **Supporting IM name** |
| Ericsson LM |
| Huawei |
| KPN N.V. |
| Nokia Corporation |
| Samsung Electronics Co., Ltd. |
| Facebook |
| Tencent |
| AT&T |
| InterDigital |
| CMCC |
| Intel |
| ZTE |
| [China Unicom] |