## **Source: Samsung Electronics Co., Ltd.**

## **Title: Proposed updates on AR communication architecture and basic call flow**

## **Document for: Discussion and Agreement**

## **Agenda Item: 10.6**

1. **Introduction**

This contributions proposes updates on AR communication architecture and basic call flow in IBACS PD considering related works in SA2.

1. **Proposed updates on IBACS PD**

3 AR IMS Communication Architecture

3.1 Potential Reference Architecture (SA2)

[Editor’s Note: this section needs further updates aligned with the work in SA2]

[ The following diagram is captured from S2-2301450 which is a CR on TS 23.228 for supporting AR Telephony Communication endorsed at SA2#154-AH-e and depicts a potential reference architecture that is being discussed by SA2 as part of NG\_RTC.



**Figure 3.1.1 Potential Reference Architecture**

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4 IMS AR Sessions and transport

4.1 Call Flows

**4.1.1 Basic Call Flow**

The figure shows the call flow for a basic AR call. Enhanced MRF consists of both the Data channel media function and the AR media function. The figure may be updated later based on SA2 work.



Figure 4.1.1.1 Basic AR Call Flow

The steps are as follows:

A. Call Setup

1. The calling UE, in this case UE1, sends a SIP INVITE to S-CSCF through P-CSCF to initiate the call
2. The S-CSCF identifies this as an AR call and forward the INVITE request to the IMS AS
3. The IMS AS notifies the DCSF the call event for an AR call
4. The DCSF determines the policy on the AR call and, based on its policies, prepares media information and instructs the IMS AS to connect an Enhanced MRF both for originating and terminating side.
5. The IMS AS selects an Enhanced MRF and instruct the Enhanced MRF to allocate media resources for the AR call.
6. The IMS AS then sends the INVITE which includes the updated SDP offer adding media information of the Enhanced MRF to originating S-CSCF and then to UE2 possibly through UE2’s network entities.
7. UE2 returns an 18X response with SDP answer. Based on the SDP answer, the IMS AS interacts with the DCSF and the Enhance MRF for media resource modification, modifies SDP answer according to the media resource modification and returns the 18X response to UE1 through S-CSCF and P-CSCF. The remaining session establishment procedures are performed

B. Scene description distribution

1. Enhanced MRF prepares the scene description based on media descriptions and assets for the call.
2. Enhanced MRF delivers the scene description to the UEs.

C. Scene description update

1. A UE may trigger a scene update e.g., when a new object is added/removed in the scene, or a spatial information update is sent. The figure shows the update is triggered by UE1, but this can be either UE.
2. The Enhanced MRF will process the new information and creates a scene description update. It is also possible for the Enhanced MRF to initiate an update without an update from the UEs.
3. Enhanced MRF distributes scene description update to all UEs.

NOTE: Spatial data related updates may be required for collaborative AR calls, e.g., when multiple users are physically collocated and also part of the same AR experience. The type of spatial description updates is FFS.

D. AR Media and Metadata Exchange

1. Both UEs will send and receive the AR media required (and negotiated) for the call as part of the call setup and scene description information received. Prestored media can be fetched from the Enhanced MRF. Real-time conversational media can flow via the Enhanced MRF. The Enhanced MRF may process the AR media before delivery.
2. Related metadata (e.g. User Pose) may be needed during the AR session. The metadata may be delivered as RTP header extension, RTCP feedback or over data channel; this aspect is FFS.

NOTE 1: Delivery of real-time media over data channel is FFS.

NOTE 2: split rendering for UE1 and/or UE2 needs to adhere to the procedures and formats that are defined by the SR\_MSE work item. The Enhanced MRF may be the entity that performs the split rendering for the UE.

NOTE 3: The interactions between AR Application Server and other entities including IMS AS, Enhanced MRF and DCSF is FFS and not shown in Figure 4.1.1.1.

1. **Proposal**

We propose to integrate the text in clause 2 to the next version of the IBACS PD.