**3GPP TSG-S4 Meeting # 128 S4-240927**

**Jeju, Korea, May 20th - 24th, 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **26.264** | **CR** |  | **rev** |  | **Current version:** | **1.1.0** |  |
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| *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:*** | CR on Network Rendering for AR Calls | | | | | | | | | |
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| ***Source to WG:*** | Qualcomm Inc. | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
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| ***Work item code:*** | IBACS | | | | |  | ***Date:*** | | | 13th May 2024 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | There are 3 different types of terminals: ones that have full AR capability and can render 3D scenes in the UE. Ones that are AR-aware but lack the capability to do 3D rendering on the UE. And others that are fully AR-unaware. The latter 2 types require network rendering to enable them to participate in an AR call. The terminal with partial support can still benefit from an XR experience by sharing its pose information and rendering the content on an HMD. The AR-unaware type requires the network to automatically perform network rendering on its behalf but will only see a 2D view (no XR experience). It is important for the network to be fully aware of which type the UE is. | | | | | | | | |
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| ***Summary of change:*** | | This CR defines information about the UE type and describes how it is shared with the network and how the network should handle each different type. | | | | | | | | |
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| ***Consequences if not approved:*** | | Support for AR calls for different types will not be possible. | | | | | | | | |
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| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First Change** |

7.2 Network media rendering configuration

The AR-MTSI client in terminal shall indicate its support for AR calls by including the “webrtc-datachannel” in the “+sip.sub-type” Contact header field.

A new Contact header field parameter, “+sip.3gpp-ar-support” is used to indicate the level of support for AR calls. The possible values for the “3gpp-ar-support” parameter are:

* “ar-capable”: indicates that the terminal is fully capable of receiving and rendering AR media as described by the capabilities in [TS26.119] clause 9.2.
* “ar-assisted”: indicates that the terminal is capable of transmitting AR metadata on the uplink. However, the UE has no support for processing and rendering a 3D scene. The participation in an AR call requires the deployment of network rendering. The rendered view(s) are controlled by the pose information that is shared by the terminal.

In the absence of the “+sip.3gpp-ar-support”, the “ar-none” value shall be assumed. For MTSI terminals with capability “ar-none”, the terminal has no support for AR calls. Participation in an AR call requires network rendering. The rendered view is expected to be a 2D view that is determined by the MF/MRF performing the network rendering.

An AR-MTSI terminal that wishes to participate in an AR call shall register with the “ar-capable” value for the “+sip.3gpp-ar-support” parameter and shall offer/answer an SDP that includes a data channel with the sub-protocol “mpeg-sd”. Any updates that the AR-MTSI terminal wishes to share, including pose updates, will be sent as scene updates to the AR AS.An AR-MTSI terminal that wishes to participate in an AR call with the support for network rendering shall register with the “ar-assited” value for the “+sip.3gpp-ar-support” parameter and shall offer/answer an SDP that includes a data channel with the sub-protocol “3gpp-sr-metadata”. Pose updates that are to be used for the rendering are shared as pose predictions with the MF/MRF.

As specified in Annex AC.9 of TS 23.228 [4], the AR application server may provide network assisted rendering. An AR-MTSI client in terminal can decide to request network media rendering based on its status such as power, signal, computing power, internal storage, etc. The AR-MTSI client in terminal shall complete an AR media rendering negotiation with the AR AS before it initiates subsequent procedures to activate the network media rendering.

An AR-assisted terminal that wishes to deploy network rendering for AR media rendering, shall use the negotiation processs between the AR-MTSI client in terminal and the AR AS to determine the split-rendering configuration. The split-rendering configuration shall be in JSON format as specified in clause 8.4.2 of TS 26.565 [6]. The exchange of the configuration information shall take place using the established MTSI data channel. The split rendering configuration message shall be formatted according to clause 8.4.2.2 of TS26.565 and shall have the type: “urn:3gpp:split-rendering:v1:configuration”. The output description message shall be formatted according to clause C.1.4 of TS26.565 and shall have the type: “urn:3gpp:split-rendering:v1:output”.

For a terminal that does not support AR calls, the IMS AS may trigger network rendering on behalf of the terminal upon receiving an (re)INVITE for an AR call. The output format for the rendered media shall be conformant to the 2D Pixel Streaming Profile in clause C.1.2 of TS26.565. The MF/MRF that performs the remote rendering shall select a suitable rendering viewpoint for the session, e.g. a selected viewpoint in the scene or the initial viewpoint for the participant as assigned by the AR AS in the scene description. In case no network rendering can be setup, the IMS AS should reject the call.

The IMS AS detects support for AR capabilities based on the presence or absence of the “+sip.3gpp-ar-support” parameter of the Contact Header Field in the REGISTER message.