**3GPP TSG SA WG4#112-e meeting *S4-210014***

**1th – 10th Feburary 2021**

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| *CR-Form-v12.0* |
| **Pseudo CHANGE REQUEST** |
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|  | **26.998** | **CR** | **-** | **rev** | **-** | **Current version:** | **0.2.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Editorial corrections of the use cases on AR Conversational |
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| ***Source to WG:*** | Huawei Technologies Co. Ltd |
| ***Source to TSG:*** | SA4 |
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| ***Work item code:*** | FS\_5GSTAR |  | ***Date:*** | 2021-01-25 |
|  |  |  |  |  |
| ***Category:*** | **D** |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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)* |
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| ***Reason for change:*** | There are some underlined texts which do not fulfil the restrictions in TR 21.801. |
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| ***Summary of change:*** | Editorial modifications were made to correct typos and inconsistencies. |
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| ***Consequences if not approved:*** | Readers can find it difficult to understand the technical specitications. |
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| ***Clauses affected:*** | 2, A.2, A.3 |
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|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | **None** |

**===== Start change=====**

# A.2 Use Case 16: AR remote cooperation

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| **Use Case Name** |
| AR remote cooperation |
| **Description** |
| As described in Annex A.9 of 3GPP TR 26.928 [x], a remote expert makes AR actions (e.g. overlaying graphics and drawing of instructions) to the received local video streams. This use case highlights that both parties can share their own video streams and overlay 2D/3D objects on top of these video streams compared with the scenario from TR 26.928. For example, a car technician contacts the technical support department of the car components manufacture by phone when he has some difficulty in repairing a consumers' car. The technical support department can arrange an engineer to help him remotely via real-time communication supporting AR.The car technician makes a video call with the remote engineer, uses his camera to capture the damaged parts of the car and shares them with the remote engineer in-call. And he marks possible points of failure by drawing instructions on the top of these video contents in order that the remote engineer can see the marks and make a detailed discussion. Also, they have respectively FOVs on their sides to check the failure. Likewise, the remote engineer can also overlay graphics and animated objects based on these shared video contents to adjust or correct the technician's operations. Furthermore, if the maintenance procedures are complex, the remote engineer can show the maintenance procedures step by step which are captured in real-time to the local technician. Therefore, the local technician can follow the operations. Finally, they find out the problems and fix them. It looks like that the remote engineer is beside the technician, discusses and solves the problems together.In the extension to this use case, it the remote engineer enables front-facing and back-facing cameras at the same time, the car technician can see a small video stream, which is captured by the front-facing camera of the remote engineer to achieve more attentive experiences.  |
| **Categorization** |
| **Type: AR, MR****Degrees of Freedom: 3DoF+, 6DoF****Delivery: Interactive, Conversational****Device: XR5G-P1, XR5G-A2, XR5G-A3, XR5G-A4, XR5G-A5, others** |
| **Preconditions** |
| <provides conditions that are necessary to run the use case, for example support for functionalities on the end device or network>Both parties on the device with the following features- Support for conversational audio and video- Collect and delivery of AR actions and viewer information- Enabling of the front-facing and back-facing cameras at the same timeThe network with the following features- Rendering of overlying AR actions and viewer information- Rendering of virtual and real superposition of different video contents |
| **Requirements and QoS/QoE Considerations** |
| <provides a summary on potential requirements as well as considerations on KPIs/QoE as well as QoS requirements>QoS:- conversational QoS requirements - sufficient bandwidth to delivery compressed 2D/3D objectsQoE: - Synchronized rendering of overlay AR actions and pose information- Synchronized rendering of audio and video- Fast and accurate positioning information |
| **Feasibility and Industry Practices** |
| <How could the use case be implemented based on technologies available today or expected to be available in a foreseeable timeline, at most within 3 years?- What are the technology challenges to make this use case happen?- Do you have any implementation information?- Demos- Proof of concept- Existing services- References- Could a reduced experience of the use case be implemented in an earlier timeframe or is it even available today?>Enhancements in media processing for multiple video streams both from different parties and/or the same party together with all kinds of AR actions may be performed in the network (e.g. by a media gateway) and in order to enable richer real-time experiences. Accordingly, the extensive hardware capabilities (e.g. multi-GPU) are required. |
| **Potential Standardization Status and Needs** |
| <identifies potential standardization needs>- MTSI regular audio and video call between both parties- Standardized format for AR actions (e.g. static and/or dynamic 2D/3D objects) and posture information- Delivery protocols for AR actions and posture information- Rendering of more than one video stream |

# A.3 Use Case 17: AR remote advertising

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| **Use Case Name** |
| AR remote advertising |
| **Description** |
| Compared with the use cases described in Annex A.8 and A.12 of 3GPP TR 26.928 [x], this use case emphasizes that the shared video contents between two parties of a session are from a third party. Furthermore, the shared video contents may be 3D model objects, 360 degree and even free-viewpoint in order to help people have more interactive and immersive experiences. For example, a real estate salesman initiates an audio call to a client by his smartphone to advertise houses remotely. The real estate salesman can request some video contents which are restructured 3D objects for houses to be sold/rent in advance from the third content provider and then switch a video call. The real estate salesman and the client can receive the video contents from the third content provider simultaneously. The real estate salesman can introduce via audio while he rotates the model. At the same time, the client can hear the introduction and see the rotational model via the touch-screen of his smartphone. And vice versa, the client is able to ask what he cares via audio while he is marking in different colours on the shared model, the client can hear the questions and see the colourful marks in real-time. In an extension to the use case, if the video content is free-viewpoint and embed some 3D objects representing furniture, the client wearing an AR-glass is able to see layouts and furnishings of the virtual houses which can rendered following his posture. It seems that the client is just inside the advertised and virtual house, and is able to walk around different rooms (e.g., dining room and living room). Furthermore, the client can draw a 3D object for a small couch back and forth in the living room using his hand. In addition, the real estate salesman can insert his 3D animated model in the virtual house and it can move following the view scope of the client as if he is just beside the client and introduces the house to the client.In another extension to the use case, the client can invite his friend to see the virtual house together. They can see it from their respectively viewpoint. They can also walk around the virtual house when wearing an AR-glass and communicate with each other via audio. |
| **Categorization** |
| **Type: AR, MR****Degrees of Freedom: 6DoF****Delivery: Interactive, Conversational, Download, Streaming****Device: XR5G-P1, XR5G-A2, XR5G-A3, XR5G-A4, XR5G-A5, others** |
| **Preconditions** |
| <provides conditions that are necessary to run the use case, for example support for functionalities on the end device or network>the devices with the following features- Support for conversational audio and video- Support for receiving the video contents from the third party- Collecting of AR actions (e.g. rotation and mark) and posture information- Support of depth location technologies (e.g. SLAM for AR-glasses)the network with the following features- Rendering of overlying AR actions and posture information- Delivery of AR actions and posture information- Support for establishing a connection the third party  |
| **Requirements and QoS/QoE Considerations** |
| <provides a summary on potential requirements as well as considerations on KPIs/QoE as well as QoS requirements>QoS:- conversational QoS requirements - sufficient bandwidth to delivery compressed 2D/3D objects- Accurate user positioning informationQoE: - Synchronized rendering of overlay AR actions and posture information- Synchronized rendering of audio and video- High-quality depth video captured from both parties |
| **Feasibility and Industry Practices** |
| <How could the use case be implemented based on technologies available today or expected to be available in a foreseeable timeline, at most within 3 years?- What are the technology challenges to make this use case happen?- Do you have any implementation information?- Demos- Proof of concept- Existing services- References- Could a reduced experience of the use case be implemented in an earlier timeframe or is it even available today?>Enhancements in media processing for the media contents from the third party together with all kinds of AR actions and 2D/3D model objects may be performed in the network (e.g. by a media gateway) and in order to enable richer interactive and immersive experiences. |
| **Potential Standardization Status and Needs** |
| <identifies potential standardization needs>- Delivery protocol of the shared media contents from the third party- Standardized format and delivery protocols of AR actions and 2D/3D objects- Standardized format and delivery protocols of posture information- More than one communication channels can be setup |

**===== End change=====**