**3GPP TSG Meeting #**

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| *CR-Form-v12.2* |
| **Pseudo CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *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:***  |  [IBACS] AR metadata messages and formats |
|  |  |
| ***Source to WG:*** |   |
| ***Source to TSG:*** | SA4 |
|  |  |
| ***Work item code:*** | IBACS |  | ***Date:*** | 23rd Jan 2023 |
|  |  |  |  |  |
| ***Category:*** | C |  | ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Addition of message formats for pose, action and scene description support, and exchange of information required to create a scene at the MF/MRF.  |
|  |  |
| ***Summary of change:*** |  |
|  |  |
| ***Consequences if not approved:*** | Metadata cannot be exchanged between AR-MTSI clients |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  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:*** |  |

1. Start of Change 1

# 2 References

…

[X] Khronos glTF 2.0, [glTF™ 2.0 Specification (khronos.org)](https://registry.khronos.org/glTF/specs/2.0/glTF-2.0.html)

[X2] ISO/IEC 23090-14 AMD 2, Information technology — Coded representation of immersive media — Part 14: Scene description — Amendment 2: Support for haptics, augmented reality, avatars, Interactivity, MPEG-I audio, and lighting

1. Start of Change 2

##

## 6.2 Metadata data channel message format

For the carriage of metadata defined in this clause the AR-MTSI clients shall use the data channel. The data channel sub-protocol shall be identified as “3gpp-ar-metadata”, which shall be included in the dcmap attribute of the SDP.

The transmission order for the data channel shall be set to in-order and the transmission reliability shall be set to reliable.

The metadata message format shall be set to text-based and the messages shall be UTF-8 encoded JSON messages.

A data channel message may carry one or more AR metadata messages as defined in Table 6.2-1.

Table 6.2-1 AR Metadata Messages Format

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Cardinality** | **Description** |
| messages | Array(Message) | 1..n | A list of AR metadata messages. Each message shall be formatted according to the Message data type as defined in Table 6.2-2 |

Each metadata message shall follow the format specified in Table 6.2-2.

Table 6.2-2 AR Metadata Message Data Type

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Cardinality** | **Description** |
| id | string | 1..1 | A unique identifier of the message in the scope of the data channel session. |
| type | string | 1..1 | A urn that identifies the message type.  |
| payload | object | 1..1 | The message payload depends on the message type. |
| sendingAtTime  | number | 0..1 | The wall clock time when the AR metadata message is transmitted. (ref. T1’) |

Editor’s Note: T1’ is used in Mecar, it should be updated with correct reference once TS 26.119 defines it.

## 6.3 Spatial descriptions

### 6.3.1 Spatial description format

#### 6.3.1.1 General

A spatial description format is used for defining the physical space around a UE or trackable in which virtual content can be inserted. This section includes the supported formats and the method for exchanging the information between AR-MTSI clients.

#### 6.3.1.2 Available visualization space and user position

An AR-MTSI client in terminal may send available visualization space, user position and other trackable posesto the AR MF/MRF for scene creation and update. Trackable is a real-world object (e.g., the UE, floor, controllers, table etc.) that the UE can detect, which can be used as a reference to anchor virtual objects to the real world.

The available visualization space defines an occlusion-free space around the user for rendering the AR scene as a geometric primitive. The format for available visualization space is defined in clause 6.2.4 of [3]. The type of the message containing visualization space as a payload shall be “**urn:3gpp:ar:v1:visualization-space**”. The availableVisualizationSpace object [3] shall contain a xrSpaceId. The xrSpaceId is used for determining the local coordinate axis of the visualization space. The xrSpaceId shall be a unique identifier for an XR space of one AR-MTSI client in terminal.

The AR-MTSI client in terminal that sends the available visualization space may also send at least one pose for a trackable e.g., to determine the position of the user within the visualization space. The AR-MTSI client in terminal may send additional poses for anchoring virtual objects. The poses shall be sent using the format defined in clause 6.2.2 of [3]. The poseInfo (as defined in Table 6.2.2-1 [3]) shall contain an xrSpaceId that is the same as the one used for visualization space. The poses may additionally contain a label string to identify the type of anchor. The labels are application-dependent, but for example, user, floor, left controller etc., can be used as labels. The type of the message for a pose sent for scene creation shall be set to “**urn:3gpp:ar:v1:initial-pose**”.The format for initial user pose shall be as defined in the table below. If an initial pose is not signalled with a visualization space, the space is assumed to be anchored to the viewer pose, assumed to be the center of the visualization space, i.e., orientation [x,y,z,w] = [0,0,0,1] and position [x,y,z] =[0,0,0].

## 6.4 Scene descriptions

An AR-MTSI client in terminal [shall] comply with the capabilities requirements for scene description as described in clause 10 of TS26.119 for their respective device type.

A scene description of an AR session is sent from the AR MF/MRF to the AR-MTSI clients in terminal. An MF that supports exchange of scene description shall support the following:

* glTF 2.0 scenes as specified in [X].
* MPEG\_media extension as defined in [X2] to refer to RTP media streams. The external media shall be RTP media streams supported by an AR-MTSI client and signalled in the SDP.
* MPEG\_anchor\_extension as defined in [X2] to anchor objects in the real-world.

The scene description shall be sent by the AR MF/MRF to the AR-MTSI client in terminal over the data channel. The type of the message shall be set to “**urn:3gpp:ar:v1:sd**”.

An AR MF/MRF that supports scene descriptions should create and distribute the scene for an AR call with audio and video streams based on the visualization space, viewer position and AR media properties. The AR MF/MRF should create the scene description for each participant (AR-MTSI client in terminal) such that the shared experience is symmetrical for the different users in the call, e.g., to maintain relative position of users and objects.

Editor’s Note: To be aligned with Mecar.

6.5 Network media rendering

### 6.5.1 General

The AR-MTSI client in terminal supporting network media rendering shall support metadata formats for split rendering as specified in clause 8.2.2 of TS 26.565 [6].

[Editor’s Note: It is FFS whether AR-MTSI client in terminal specific extension is required.]

[Editor’s Note: The following clauses will potentially reference the corresponding format in TS 26.119]

### 6.5.2 Pose Format

When the network media rendering is activated, the AR-MTSI client in terminal periodically transmits a set of pose predictions to the AR AS. The pose prediction format shall conform to the payload of the message whose type [is "**urn:3gpp:split-rendering:v1:pose**" as specified in clause 8.3.2.2 of TS 26.565 [6]. ]

Editor’s Note: The clauses should be aligned with Mecar.

### 6.5.3 Action Format

The action sets and actions are negotiated during the AR media rendering negotiation. The AR-MTSI client in terminal reports any changes to action state as it occurs by sending updated actions to the AR AS after the network media rendering is activated. When the AR-MTSI client in terminal sends updated actions to the AR AS, the action format shall conform to the payload of the message whose type [is "**urn:3gpp:split-rendering:v1:action**" as specified in clause 8.3.2.3 of TS 26.565 [6]. ]

Editor’s Note: The clauses should be aligned with Mecar.

1. End of Changes