**3GPP TSG-SA WG4 Meeting #128S4-241106**

**Jeju, Korea, 20 – 24 May 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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)* |
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| ***Reason for change:*** | Missing definitions and updates to reference architecture. |
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| ***Summary of change:*** | Adding missing definitions and updating the Figure 11 for the avatar reference architecture. |
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| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** | 3.2, 7 |
|  |  |
|  | **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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

FIRST CHANGE

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**Base Avatar:** A personalized avatar representation. The base avatar model conforms to a predetermined avatar representation format.

**Reference Avatar:** An instance of the avatar representation format that is used as a template that is used to generate the base avatar.

**Animated Avatar:** The resulting avatar model after applying animation data to the base avatar.

**Avatar Representation Format:** A format for a representation that describes a model for an avatar. The representation includes: the topology of the 3D mesh representing the avatar, the topology of the skeleton used to animate the mesh, as well as additional metadata describing semantic properties of the avatar.

**Animation Data:** Data used to generate the body pose and facial expressions of the base avatar model at each time frame. Avatar animation data are tied to a given base avatar model.

Second CHANGE

# 7 Reference Architecture

The following figure depicts the reference Architecture for Avatar:



Figure 11. Avatar Reference Architecture

The identified Avatar functions are:

* **Avatar Storage**: an entity that offers storage of base avatars. This entity may be offered by the 5G System, a 3rd party entity, or the local storage of the user’s devices. The Avatar Storage ensures proper access to the base avatar and any related data, including authorization of avatar usage rights. The Authentication functionality should be able to map and identify the ownership of an avatar.
* **Avatar Animation:** depending on the avatar representation format, this entity retrieves the base avatar, receives representation format-specific animation data streams, and performs the avatar animation to produce the animated avatar that will be used in the rendering process.
[Note that some animation approaches may not need to rely on the 3D base avatar, instead they directly produce rendered 2D view of the Avatar.]
* **Scene Management**: creates and composes the shared 3D scene for all participants. It integrates a description of the user’s Avatar and updates its position and orientation based on the user’s pose. The updated scene is shared with all participants.
* **Animation data generation:** generating animation data from raw signals. The raw signals may come from cameras, microphones, and specialized motion capturing devices, etc. For example, through the current functional element, the video captured by the camera can be converted into facial feature points, and the audio captured by the microphone can be converted into text, etc.
* **Base Avatar Generation:** generates the base avatar from the inputs such as captured video from camera and other sensors information, possibly in conjunction with a reference avatar. Note that this might be done online or offline.

End of CHANGEs