3GPP TSG SA WG 4 Meeting #131-bis-e TDoc S4-250538

Online, 11th – 17th April 2025

**Title: LS on Avatar Security Aspects**

**Response to:**

**Release: Rel-19**

**Work Item: Avatar Communications in AR Calls (AvCall-MED)**

**Source: SA4**

**To: SA3**

**Cc: SA2**

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**Attachments:** DocNumber(s) [Description e.g.. Draft TS 29.414 v0.1.0].
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# 1 Overall description

SA4 is currently developing avatar communication enhancements within Augmented Reality (AR) calls under the Release 19 AvCall-MED work item. This work item will enable users participating in a call to offer and receive 2D and 3D avatars of the other participants and animate them in real-time.

A crucial part of this effort involves several security considerations, for which SA4 seeks support and collaboration from SA3.

Specifically, SA4 has identified the following security aspects requiring attention from SA3:

* Protection mechanisms for avatar assets within a Base Avatar Model, ensuring secure random access and selective asset retrieval. SA4 will define the container format for such base avatar, which stores all avatar assets. The selection and access has to typically be performed at the start of an AR call.
* Secure management practices for Base Avatars, which users will manage and host in a dedicated Base Avatar Repository (BAR). This includes the definition of BAR to UE interface for uploading and updating the base avatar models of the user.
* Robust access management during AR calls, allowing users precise control to grant temporary access limited to specific avatar assets for the duration of the AR call.

We propose collaboration with SA3 to work on a solution for the identification of Avatars and mapping Avatar IDs to network identifiers (SUPI/GPSI/PEI).Below we have a potential solution for the Identification and mapping of Avatar ID to network Identifiers for a certain user:

SA2 (23700-77 NG-RTC phase2) introduced A new Base Avatar Repository (BAR) which stores Avatar representation and related avatar ID to be used in identification and authentication. Avatar IDs would be assigned to registered Avatars by BAR and mapped to SUPI or GPSI, Avatar ID should be stored for Avatar representative (UE) within UDM/UDR and DC AS as part of UE subscription data.

When a user logs in to create an Avatar, authentication occurs using the Application ID and SUPI/GPSI/PEI in the Avatar creation application or client towards the network.

 NOTE 1: User application is an AF to the network and authentication would take place as 3rd party authentication to the NEF, using eg. TLS authentication.



Figure 1: Avatar application authentication

NOTE 2: This application may belong to an MNO network, a third party, or an AR/XR supporting device application, which must support authentication and registration with the BAR/UDM/UDR repository.

The Avatar representation can be animated using audio/video or metadata (such as action and facial expression data) by UE or network. The metadata can be generated by UE or the network.

When generated avatar is being submitted to network, during authentication with BAR/UDM/UDR. BAR assigns Avatar ID to the requested avatar and stores to BAR in Avatar profile which contains network identity of subscriber. And updates subscriber info in UDM/UDR) and IMS AS.

 

Figure 2. identification on Avatar

When an avatar is generated in app it’ll be submitted to Network to be saved in BAR assigned to the UE’s profile.

* The Avatar Registration request is sent from UE and application repository to the IMS AS .
* The IMS AS sends the User Info request to DCSF.  DCSF queries the subscription info from UDM/UDR. And response includes UE’s SUPI/GPSI/PEI and avatar ID list.
* The DCSF, after receiving information from UDR/UDM, sends Avatar Registration request to BAR through XR AS, containing the UE subscription information and Avatar ID list to get new ID from BAR.

NOTE 3: A new interface for signalling (DC6) will be defined for this communication between the XR (DC/AR) AS and BAR.

* BAR checks UE profile for Avatar ID list, generates the new ID and sends it back to DCSF.
* DCSF provides the Avatar ID in response to IMS AS registration request
* The IMS AS updates Avatar ID list in UDR/UDM and XR (DC/AR) AS. The communication towards XR (DC/AR) AS is executed via DC1 and DC4 interfaces. DC4 shall contain GPSI information to identify the UE.
* IMS AS confirms the ID to BAR and sends the new Avatar ID to the UE.
* The UE stores the new avatar in BAR with the corresponding Avatar ID.

SA4 anticipates collaborating closely with SA3 to define solutions addressing these security requirements effectively and looks forward to your support and expert insights. Given the stage 3 freezing date for release 19, SA4 would like to kindly request prompt action on these topics.

# 2 Actions

**To SA3**

**ACTION:** SA4 kindly asks SA3 to collaborate with SA4 on addressing the identified security needs for the base avatar management and secure sharing during AR calls.

# 3 Dates of next TSG SA WG 4 meetings

SA4 #131-bis-e 11 – 17 April 2025 Online

SA4 #122 19 – 23 May 2025 Fukuoka City, Japan