**3GPP TSG SA WG4-(AH) on Rel-20 Tdoc S4-251230rev of S4-251191**

**Online, 10 July 2025, 3-6pm CEST Revision of S4-251007**

**Source: Vodafone Group Plc.**

**Title: New SID on Avatar communication phase 2 (5G-A)**

**Document for: Approval**

**Agenda Item: 17.1**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>   
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on Avatar communication Phase 2

Acronym: FS\_Avatar\_Ph2

Unique identifier:

Potential target Release: Rel-20

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No |  |  | X |  | X |
| Don't know | X |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| NG\_RTC\_ph2 | SA2 | 1040026 | Stage 2 of System architecture for Next Generation Real time Communication services Phase 2 |
| FS\_AVATAR | SA4 | **1000019** | Study of Avatars in Real-Time Communication Services |
| AvCall | SA4 | 1070056 | Avatar Communications in AR Calls |
| MeCar | SA4 | 950015 | Media Capabilities for Augmented Reality |
| AI4Media | SA4 | 950011 | Study on Artificial Intelligence (AI) and Machine Learning (ML) for Media |
| IBACS | SA4 | 960042 | IMS-based AR Conversational Services |
| iRTCW | SA4 | 950014 | Immersive Real-time Communication for WebRTC |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 950015 | Media Capabilities for Augmented Reality | May reference formats and codecs that are relevant to Avatars. |
| 960044 | Generic architecture for RT and AR/MR | May reference architecture and procedures for the usage of Avatars in RTC. |
| 950014 | Immersive Real-time Communication for WebRTC | May reference transport protocols and payload formats for the distribution of Avatars. |
| 960042 | IMS-based AR Conversational Services | May reference IMS procedures for AR calls. |
| 950005 | Study on Localized Mobile Metaverse Services | May reference use cases and requirements that are related to Avatars. |

**Dependency on non-3GPP (draft) specification:**

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# 3 Justification

The previous studies and normative work on Avatars in 3GPP have established foundational elements for avatar integration in real-time communication (RTC) services, including defining interoperable base format which serves as base Avatar format as a reference point for the comprehensive study and potential specification of a proper avatar media format in Release 20, and initial signaling mechanisms. With the emergence and adoption of a standardized Avatar format, the focus now shifts toward enabling additionalvatar use cases and enhancing the avatar-based RTC services by emphasizing the quality of service and advanced animation features required for realistic and immersive user experiences.

In TR 26.813, beyond the work conducted in AvCall-MED, the following considerations are mentioned for future work beyond Release 19:

1. Conduct further studies on Advanced and Non-IMS avatar communication scenarios,

2. investigate additional deployment IMS-based use cases,

3. study support for more complex multi-user use cases for IMS and non-IMS scenarios,

4. document traffic characteristics for avatar communication and identify needs for more advanced QoS support,

5. study and document quality aspects and requirements of avatars in communication services,

6. study and document advanced rendering and animation techniques for avatars, including support for more advanced tracking frameworks and for gaussian splats.

This subsequent study phase aims to address the gaps identified by previous work, particularly concerning the acceptability and enhancement of user-perceived service quality, i.e. issues 4, 5 and 6. Understanding the critical parameters influencing quality, identifying comprehensive service quality requirements, and determining QoS needs across various deployment scenarios, including those beyond IMS-based frameworks, is essential. Further exploration into advanced animation techniques, AI-driven avatar animation, security frameworks, and efficient compression schemes will provide necessary insights and guidelines to realize realistic avatar experiences in next-generation communication services.

# 4 Objective

Phase 2 of the Study Item would follow below Objectives:

1. Document advanced avatar-based real-time communication use cases, such as the integration of avatars and AI/ML processing for real time speech to speech, text to speech and speech to text applications (within IMS and non-IMS),
2. Identify parameters for service quality of avatar-based RTC services,
3. Define Quality of Experience (QoE) metrics and Quality of Service (QoS) requirements specific to avatar communication services, and evaluate Avatar formats in this context.
4. Develop evaluation criteria and provide evaluations for advanced animation techniques to enhance realism and user interactivity, e.g., (AI-driven avatars animation, including voice control, and comparison to traditional capture-base animation). Coordinate with relevant SDOs (e.g., MPEG) and utilize existing evaluations where needed.
5. Study and document avatar creation process through external applications,
6. In collaboration with SA3, study security implications, focusing on authentication, privacy preservation, content protection (e.g. watermarking and DRM), and secure distribution mechanisms for avatar data,
7. Document existing compression methods for mesh formats and animation streams and identify suitable solutions for 3GPP.,
8. Identify gaps in existing specifications and provide guidance for potential normative work.

NOTE: Coordinate with relevant SDOs (e.g., MPEG) where needed when gaps are identified in external specifications.

Evaluate mechanisms to support more realistic and natural animation of some dynamic components (accessories, hair, clothes, etc.) of an avatar.

# 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| New specifications {One line per specification. Create/delete lines as needed} | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
| TR | 26.8xx | Study of Avatars in Real-Time Communication Services Phase 2 | TSG SA#109 | TSG SA#112 |  |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| ~~TR 33.790~~ | ~~Security aspects for Avatar management and authentication~~ |  |  |
| ~~TS 23.228~~ | ~~Avatar Call over IMS DC may need to collaborate for stage 2 changes~~ |  |  |
| ~~TS 26.264~~ | ~~Call flows, architectural diagrams, Avatar formats and adding AI aspects~~ |  |  |

# 6 Work item Rapporteur(s)

Ramazanirend, Elmira, Vodafone

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

SA2 may need to be involved for architectural aspects.

SA3 may need to be involved for security and privacy aspects.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Vodafone |
| Qualcomm |
| Huawei |
| Nokia |
| CMCC |
| InterDigital Communications |