**3GPP TSG-S4 Meeting # 128 *1098***

Jeju Island, KR, 20-24 May 2024 revision of S4-240475

**Source: InterDigital Europe, Nokia Corporation, Tencent, Vodafone, Vivo**

**Title: New SID on Haptics in 5G Media Services**

**Document for: Approval**

**Agenda Item: 3.11**

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 Haptics in 5G Media Services

Acronym: FS\_Haptics

Unique identifier: XXXXXX

Potential target Release: Rel-19

# 1 Impacts

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

# 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) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 1000019 | Study of Avatars in Real-Time Communication Services | May reference haptic requirements |
| 950015 | Media Capabilities for Augmented Reality | The candidate device to support haptic in its future extensions |
|  |  |  |
|  |  |  |

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

# 3 Justification

Haptic (force, motion, vibration) sensors and hardware market is growing exponentially. In 2022, over 90% of cell phones and game consoles include haptic technologies. Haptic is used for two purposes, user feedback and as one of the media (audio/visual/haptic) in immersive or communication experiences.

Today’s communication over cell phones is transmitting speech and/or video between UEs, or between UEs and application servers and applications. However, the cellphones have vibrotactile actuators built in. The information transmitted for using those actuators is generally proprietary. This is an interoperability issue when exchanging information between devices from different manufacturers or when these devices receive media services that include haptic experiences.

With the emergence of XR devices, the presence of haptics media in an immersive XR experience plays a significant role in improving the sense of presence and immersion. Real-time tactile sensations in response to user interactions with virtual objects make the user feel like they are genuinely touching and manipulating the virtual elements. Moreover, users with visual or auditory impairments can still engage with virtual content through haptic feedback.

TR 22.847 provides a study of the use of haptics and tactile use cases and requirements in communication services. In particular, this report identifies the 3 following modalities for immersive communications and services: a) video and audio media, b) information perceived by sensors about the environment, e.g. brightness, temperature, humidity, etc., and c) haptic data when touching a surface (e.g., pressure, texture, vibration, temperature), or kinaesthetic senses (e.g. gravity, pull forces, sense of position awareness). Furthermore, the study outlines the requirements for the following use cases:

1. Immersive multi-modal Virtual Reality (VR) application
2. Remote control robot, immersive VR games
3. Support of skillset sharing for cooperative perception and manoeuvring of robots
4. Haptic feedback for a personal exclusion zone in dangerous remote environments
5. Live Event Selective Immersion
6. virtual factory
7. Support for IEEE P1918.1 architecture

The potential of this type of media for immersive applications and services has also triggered the work on a new standard ISO/IEC 23090-31 within MPEG WG07 that specifies a coded representation of haptics covering a large range of use cases and taking into account device constraints to facilitate fast market adoption and deployment. The Draft International Standard (DIS) version of the specification was released in 2023, and the standard is expected to be published in 2024. Other organizations such as IEEE and Khronos have work on the standardization of different aspects of haptics.

The integration of haptic media, feedback, and communication in 3GPP services is proposed to be studied in this study item.

# 4 Objective

The study aims to investigate and identify the data format, and potential codecs, transport protocols suitable to enhance SA4 services and enablers with haptic capabilities.

The main objectives of this study include:

* Identify relevant use cases and requirements already defined in TS 22.847 and refine them as necessary.
* Identify and describe the candidate input formats for haptic experience, relevant to the above use cases
* Identify relevant device types with support for haptic playback and/or capture.
* Identify candidate technologies (codec, storage format, and transport protocols) that may be suitable for enabling haptic experiences.
* Identify the use of existing 3GPP network APIs to assist the QoS for the delivery of haptic experiences if necessary.
* Provide recommendations on the integration of haptic in various 3GPP services, including in 5GMS streaming, RTC communications, avatar representation, and broadcast.

# 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.XXX* |  | *SA#106* | *SA#107* |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
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# 6 Work item Rapporteur(s)

*Iraj Sodagar, Tencent (irajs@live.com)*

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

# 9 Supporting Individual Members

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| Supporting IM name |
| InterDigital Europe |
| Tencent |
| Vodafone |
| Vivo |
| Nokia Corporation |
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