**3GPP TSG-SA WG4 Meeting #133-eS4-251410**

**Online, 18 – 25 July, 2025**

**Source: InterDigital Canada**

**Title: [FS\_ARSpatial] Pseudo-CR on Conclusions and Proposed Next Steps**

**Spec: 3GPP TR 26.819 v1.0.0**

**Agenda item: 9.7**

**Document for: Agreement**

**1. Introduction**

The Study on Spatial Computing for AR Services (FS\_ARSpatial) was approved during SA#104 meeting. The objectives of the study include identifying where spatial computing functions run and which media, metadata, and description formats are used for exchange between these elements based on the architecture defined in the TS 26.506, notably in split processing scenarios.

**2. Reason for Change**

Clause 7.1 on Conclusions needs to be updated based on the recent studies on the edge computing support (clause 6.5.1), on potential prerequisites for a spatial computing Media Service Enabler (MSE) (clause 6.5.2), and on potential mapping to Generalized IMS DC Architecture (clause 6.5.3).

Clause 7.2 on proposed next steps is currently empty.

This document provides an update for the conclusion and proposes potential next steps related to the Spatial Computing for AR Services.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TR 26.819 v1.0.0.

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\* \* \* First Change \* \* \*

## 7.1 Conclusions

Augmented reality (AR) composites virtual objects with reality. Knowledge of the real world is essential for the localization of the AR device and for a seamless insertion of virtual content into the user’s real environment. The generation of information about the real world from the processing of sensor data may be done on the UE or delegated to a server in some cases for a number of reasons (e.g., in the case of UE devices with limited computational capabilities or low battery levels, the need for a central network function in some multi-user applications, etc.).

To support such Spatial Computing services, the following aspects have been documented in this report:

- A set of relevant Spatial Computing functions have been identified based a number of AR use cases. For each Spatial Computing function, the input sensor data and the output Spatial Description are identified. Some examples of Spatial Description formats have also been documented.

- A number of existing Quality-of-Experience (QoE) metrics have been identified as relevant for Spatial Computing services and a mapping of these QoE metrics to the Spatial Computing functions has been documented. In particular, the anchoring and re-localization functions are mapped to the relevant metrics, but no QoE metrics or delay requirements and constraints have been documented for other functions. Additional mappings and requirements may be further studied in the future.

- The related standardization works in 3GPP and other standardization bodies and the relevant of these works to Spatial Computing services in general, and the spatial computing functions identified in this report in particular, has been studied, leading to the identification of some gaps:

- Some functions are not well addressed, in particular 3D model reconstruction, segmentation and labelling, light extraction, and collider generation, described in clause 4.2, as existing standardization works mainly address the world tracking (e.g., in ETSI ARF), re-localization, and anchoring functions (e.g., in ETSI ARF and TS 23.437).

- The UE device capabilities related to Spatial Computing is not defined in TS 26.119. This can include capabilities on the supported spatial computing functions, spatial description formats, and, based on the device capabilities, the format for requests and metadata for in-network support for spatial computing functions.

- The support of AR is not addressed in a split rendering architecture as specified in TS 26.565

- The mapping to 5G services. A spatial computing architecture is provided based on the reference architecture for Media Delivery (clause 4.1.2.2 of TS 26.506). Call flows for spatial computing session set-up and operation involving a Spatial Computing client and the remote Spatial Computing functions located in a Media Application Server are also described. In addition, an extension to this architecture for edge-enablement (defined in TS 23.558 and TS 26.501) and a potential mapping to the generalized IMS DC architecture are documented. Guidance on the pre-requisites on the 5G system and device APIs to host and run spatial computing functions is also provided.

## 7.2 Proposed next steps

 Based on the details in the report, the following next steps can be envisaged for defining a spatial computing Media Service Enabler (MSE):

* Identify a selected set of spatial compute functions that may benefit from off-device processing based on existing deployments and current industry practices,
* For the identified set of spatial compute functions that may benefit from off-device processing:
	+ Specify the signaling and negotiation of exchanged media, sensor and control data
	+ Select interoperable formats for the media, sensor and control data
	+ Specify the configuration, and delivery of the media and sensor data, potentially identifying existing compression for that data
	+ Add UE Spatial Computing capabilities to TS 26.119
	+ Specify procedures and APIs to access the spatial compute MSE

In a future release, a spatial computing enabler may be developed independently, or with support from some of the work done on the 3GPP Service Enabler Architecture Layer for Verticals (SEAL) on spatial map and spatial anchor management (TS 23.437).

\* \* \* End of Changes \* \* \* \*