**3GPP TSG-SA WG4 Meeting #127S4-240179**

**Sophia-Antipolis, France, 29 January - 2 February 2024**

**Source: Apple Inc., Qualcomm Incorporated, Dolby Germany GmbH**

**Title: New WID on immersive HEVC profiles and operating points**

**Document for: Approval**

**Agenda Item: 9.12**

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: Immersive HEVC profiles and operating points

Acronym: IHOP

Unique identifier: XXXXXX

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  |  |  |
| No | X |  | 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 …

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

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

## 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| FS\_HEVC\_Profiles | SA4 | 1000017 | Feasibility Study on new HEVC profiles and operating points |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1000017 | Feasibility Study on new HEVC profiles and operating points | Study identifying the needs for adding new video profiles. |
| 950015 | Media Capabilities for Augmented Reality | Harmonise with ongoing specification work on video capabilities. |
| 1000015 | 5G-Advanced media profiles for messaging services | Harmonise with ongoing specification work on video capabilities. |
|  |  |  |

# 3 Justification

TR 26.966 (Evaluation of new HEVC coding tools) identifies new scenarios and video applications that can be addressed by various HEVC tools and profiles that are currently not included in SA4 specifications. One of these scenarios is delivery of immersive video content for streaming and communication use cases. Several solutions including simulcast HEVC, frame-packed HEVC, stereo view (texture only) MV-HEVC, and MV-HEVC with a single or two texture layers and auxiliary depth and/or alpha layers were introduced and assessed. While simulcast and frame-packed HEVC are already included in video operation points for VR in TS 26.118, MV-HEVC has not yet been included. MV-HEVC is being considered for deployment in both mobile and immersive video ecosystems.

At the same time, it is noted that the SA4 operating points and media capabilities for video are already scattered around various specifications. Such include the Video profiles Operation Points in TS 26.116, which are intended for general video streaming, the Video Operation Points in TS 26.118, which are intended for VR applications, and the video encode and decode capabilities in TS 26.119, among others.

This work targets to update all relevant SA4 specifications to provide immersive HEVC encode/decode capabilities. At the same time, this work would address the scattering and fragmentation issue for video operating points in SA4 specifications and upgrade HEVC-based capabilities to align with current industry practice. Finally, this work will coordinate with related SDOs and industry fora such as MPEG, DASH-IF, CTA-WAVE, and IETF, and reference the related standards and guidelines, e.g., Common Media Application Format (CMAF) and the ISO base media file format (ISOBMFF), and DASH.

# 4 Objective

The objectives of this work are to:

1. Add and harmonize stereoscopic MV-HEVC (potentially with auxiliary alpha channels) encode/decode operating points, capabilities, and streaming aspects for 5G-media streaming profiles, codecs, and formats (TS 26.511).
2. Add and harmonize MV-HEVC (potentially with auxiliary depth and alpha channels) encode/decode operating points, capabilities, streaming (e.g., CMAF, DASH) and transport (e.g., RTP) aspects for:
	1. Media capabilities for AR devices (TS 26.119)
	2. Video messaging media profiles (TS 26.143)
	3. IMS video applications (TS 26.114).
3. Perform the above work in coordination with related SDOs and industrial fora such as MPEG, DASH-IF, CTA-WAVE, and IETF, and by referencing the related specifications, e.g., Common Media Application Format (CMAF) and the ISO base media file format (ISOBMFF), among others.
4. Harmonize and include as needed all the SA4 video operating points, such as Video profiles Operation Points, Video Operation Points, video encode and decode capabilities etc., which are currently scattered in various SA4 specifications (e.g., TS 26.116, TS 28.118, TS 26.119, TS 26.143, TS 26.511 etc.), into a new specification that will be home to all such video operating points and upgrade HEVC-based profile/levels based on industry practices.

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Editor |
| TS | 26.xxx[26.115] (New) | Media Delivery: Video Capabilities and Operating Points | SA#106 (Dec 2024) | SA#107 (Mar 2025) | Thomas Stockhammer (Qualcomm Incorporated) |

|  |
| --- |
| Impacted existing TS/TR |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 26.118 | Updates to video operation points (profile/levels, aspect ratios, framerates, etc.). Harmonisation with stereo/frame packed arrangements. Updates to file format and DASH signalling. Harmonisation with TS 26.116 operating points. | SA#107 (Mar 2025) |  |
| TS 26.119 | Impact on video encode- and decode-capabilities. Harmonisation with operating points specified elsewhere. | SA#107 (Mar 2025) |  |
| TS 26.143 | Impact on video messaging media profiles | SA#107 (Mar 2025) |  |
| TS 26.511 | Impact and harmonisation with video codecs and formats capabilities, also video encoding and decoding operation points referring to TS 26.118 operating points. | SA#107 (Mar 2025) |  |
| TS 26.114 | Impact on IMS applications. | SA#107 (Mar 2025) |  |

# 6 Work item Rapporteur(s)

Waqar Zia (waqar\_zia (at) apple.com)

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

None

# 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Apple Inc. |
| Qualcomm Incorporated |
| Dolby Germany GmbH |
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