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

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

**Source: Apple Inc., Qualcomm Incorporated, Dolby Germany GmbH, Ateme, Nokia Corporation, Fraunhofer HHI**

**Title: New WID on Video Operating Points - Harmonization and Stereo MV-HEVC**

**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: Video Operating Points - Harmonization and Stereo MV-HEVC

Acronym: VOPS

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 stereo MV-HEVC with a single or two texture layers and auxiliary alpha layers are introduced and assessed. Currently, the conclusion on using auxiliary depth data for MV-HEVC is not available in TR 26.966 and hence is not included here. Although simulcast and frame-packed HEVC are already included in video operation points for VR in TS 26.118, MV-HEVC is not. Stereoscopic MV-HEVC is currently being deployed 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 stereoscopic MV-HEVC encode/decode capabilities. At the same time, this work would address the scattered and fragmentated state of video operating points in SA4 specifications and upgrade to stereoscopic MV-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. the Common Media Application Format (CMAF), the ISO base media file format (ISOBMFF), and DASH.

# 4 Objective

The objectives of this work are to:

1. 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 26.118, TS 26.119, TS 26.143, and TS 26.511), into a new specification that will be home to all such video operating points and upgrade HEVC-based levels based on industry practices.
2. Define the MV-HEVC capability in this new specification.
3. Then add and harmonize stereoscopic MV-HEVC (potentially with auxiliary alpha channels) encode/decode operating points, capabilities, streaming (e.g. CMAF, DASH) and transport aspects for:
	1. 5G-media streaming profiles, codecs, and formats (TS 26.511)
	2. Media capabilities for AR devices (TS 26.119)
	3. Video messaging media profiles (TS 26.143)
4. 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. the Common Media Application Format (CMAF) and the ISO base media file format (ISOBMFF), among others.

# 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 26.116 | Updates to video operation points (profile/levels, aspect ratios, framerates, etc.). Updates to file format and DASH signalling. Harmonization with TS 26.xxx operating points. | SA#107 (Mar 2025) |  |
| TS 26.118 | Updates to video operation points (profile/levels, aspect ratios, framerates, etc.). Harmonization with stereo/frame packed arrangements. Updates to file format and DASH signalling. Harmonization with TS 26.xxx operating points. | SA#107 (Mar 2025) |  |
| TS 26.119 | Impact on video encode and decode capabilities, and device types. Adding support for MV-HEVC. Harmonization with TS 26.xxx operating points. | SA#107 (Mar 2025) |  |
| TS 26.143 | Impact on video messaging media profiles. Adding support for MV-HEVC. | SA#107 (Mar 2025) |  |
| TS 26.511 | Impact and harmonization with video codecs and formats capabilities, also video encoding and decoding operation points referring to TS 26.xxx operating points. Adding support for MV-HEVC. | 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 |
| Ateme |
| Nokia Corporation |
| Fraunhofer HHI |
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