**3GPP TSG-SA WG4 Meeting #127S4-240176**

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

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| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **26**.**966** | **CR** | **-** | **rev** | **-** | **Current version:** | **1.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | **[FS\_HEVC\_Profiles] Conclusions** | | | | | | | | | |
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| ***Source to WG:*** | Apple Inc. | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | **FS\_HEVC\_Profiles** | | | | |  | ***Date:*** | | | 15/01/2024 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | 18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
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| ***Reason for change:*** | | This CR provides conclusions and proposed future work. | | | | | | | | |
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| ***Summary of change:*** | | Conclusions are provided for scenario #1.1, #1.2, #1.3, #2, and #3 | | | | | | | | |
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| ***Consequences if not approved:*** | | Conclusions will be missing in the TR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

7 Conclusions and proposed next steps

7.1 Conclusions for scenario #1.1, #1.2:

Comparing solution #1.1 (HEVC simulcast), solution #1.2 (HEVC frame packing) and solution#1.3 (Multiview HEVC coding), following conclusions can be drawn for the stereoscopic content delivery scenarios:

* HEVC simulcast:
  + It is the most basic solution to address the stereoscopic HEVC delivery scenario.
  + It adds no new signalling.
  + Uses 2x HEVC encode/decode chains to provide stereoscopic video.
  + Exploits no inter-view redundancy.
  + Application addresses the needed signalling aspects to realize the immersive viewing.
* HEVC frame packing:
  + Reuses the decoding hardware,
  + Addresses signalling via SEI messages.
  + Exploits inter-view redundancy for referenced frames.
* MV-HEVC:
  + Reuses the same lower-layer decoding tools.
  + Exploits maximum inter-view redundancy by even allowing inter-view prediction from non-reference frames.
  + When used on a non-3D capable device, the content can be played back using only the base view for a 2D presentation.

Based on the assessment, MV-HEVC and HEVC frame packing are suitable solutions for addressing scenario#1.1 and #1.2 for stereoscopic content delivery, where MV-HEVC represents a more versatile tool. With HEVC simulcast and HEVC frame packing already included in SA4 specifications, it is recommended to add support for stereoscopic MV-HEVC to the related specifications.

7.2 Conclusions for scenario #2:

Solution #2.3 (native 4:4:4 coding) and solution #2.4 (derived 4:4:4 coding) can achieve better visual quality than the baseline solution #2.1 (HEVC 4:2:0 coding). Solution #2.4 (derived 4:4:4 coding) however can achieve this improvement by reusing existing hardware support, without a need for a specialised hardware (as is needed for solution #2.3). However, a higher profile/level may be needed for Solution #2.4. Currently, there are no documented performance enhancements achieved by Solution #2.2 (HEVC 4:2:2 coding).

At the time of drawing the conclusions, MPEG continues to work on solution #2.4 (derived 4:4:4 coding), and the need to do specification work can be revisited at a later point in time based on progress in MPEG.

7.3 Conclusions for scenario #3:

Solution #3.1 (scalable HEVC coding) shows improvement potential for enhancing the adaptive streaming experience by allowing more switchable representations to be made available, while optimising the storage overhead for this purpose. Scalable HEVC is also supported by MPEG specifications such as CMAF. The need to do normative work will be driven by industry interest in this direction.

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