**3GPP TSG SA WG4#119e S4-220610r01**

**E-meeting, 11th – 20th May 2022**

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| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **26**.**955** | **CR** | pseudo | **rev** | **-** | **Current version:** | **1.6.1** |  |
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| *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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** | **[FS\_5G\_Video] Initial Conclusions** | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated (as Rapporteur) | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_5GVideo | | | | |  | ***Date:*** | | | 04/05/2022 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Sections 9 (gaps and optimization potential) and 10 (conclusion) are empty and text is needed to ensure completion of the TR | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
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| ***Consequences if not approved:*** | | the TR would not be complete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== CHANGE =====**

# 9 Gaps and Optimization Potential

## 9.1 Identified Gaps and Deficiencies with Existing Codecs

Based on the scenarios that were defined in this Technical Report, the existing 3GPP codecs H.264/AVC and H.265/HEVC have been benchmarked and evaluated.

H.264/AVC is still widely used in services and due to its install base and ubiquity remains a fallback solution for basic use cases. However, H.264/AVC clearly lacks compression efficiency and flexibility to address more advanced use cases, such as HDR, gaming sequences and screen content sharing.

H.265/HEVC provides, at least for the considered scenarios, a full feature set and is broadly and versatily applicable. As H.265/HEVC is part of 3GPP specifications since quite some time, its install base has matured and is almost ubiquituous.

Based on this, a successor to H.264/AVC or H.265/HEVC would be interesting if it provides greater flexibility and feature set coverage with improved compression efficiency over H.265/HEVC.

The performance of H.265/HEVC for higher spatial resolutions, such as 8K, has not been evaluated.

## 9.2 Potential Requirements for New Codecs

From the collected scenarios, no explicit new requirements for new codecs have been identified.

However, flexibility to different applications, feature coverage and compression efficiency are key functionalities for a codec in 3GPP. A new codec is expected to differentiate from H.265/HEVC in at least one, preferably several dimensions.

It is encouraged to study in more details on potential requirements for new codecs.

# 10 Conclusions and Proposed Next Steps

The Technical Report provides a full characterization framework for video codecs in the context of 5G services. This framework permits to evaluate the performance of existing 3GPP codecs, and also permits to identify benefits of potential new codecs.

The framework fulfils the following aspects:

* A comprehensive set of scenarios relevant to 3GPP services is described in clause 6. For each scenario the anchor(s), the version of the reference software for the anchor(s) and their configuration(s) are defined.
* A set of reference sequences is identified per scenario and each sequence is described in more details in Annex C.
* For each scenario, one or more performance metrics are defined. Each metric is described in more details in clause 5.5
* The overall characterization framework process is defined in clause 5 and in Annex B, D, E, F and G.
* New codecs are identified in clause 8 and for each scenario, a version of their respective reference software are identified and configurations as close as possible to the anchor configurations are defined.

The framework clearly has deficiencies, for example encoder configurations for scenarios may have not been stringent enough in the definition, leading to results that may not be fully comparable. Further, encoders used for the various codecs have different maturity and features. Results in this document should always be consider with caution, and the reader should understand how these results were derived. The framework does not include subjective evaluation, it is purely based on objective metrics.

Results are complete for 3GPP codecs - H.264/AVC and H.265/HEVC - for all scenarios, while for new codecs, only initial results are provided.

The framework and the initial results are not mature enough to come up with concrete proposed next steps.

Follow-up studies are encouraged.

<add some conclusions based on input S4-220611>