**3GPP TSG SA WG4#119e S4-220749**

**E-meeting, 11th – 20th May 2022 revision of S4-220610**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26**.**955** | **CR** | pseudo | **rev** | **-** | **Current version:** | **1.6.1** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | **[FS\_5G\_Video] Proposed Updated Conclusions** | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated (as Rapporteur), Tencent | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_5GVideo | | | | |  | ***Date:*** | | | 04/05/2022 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | 17 |
|  | *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:*** | | Updates from 611r01 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updates conclusions | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***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:*** | | The agreements from S4-220749 are accepted. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

# 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 the evaluation of the performance of existing 3GPP codecs, and also permits the identification of potential benefits of 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. For each scenario, a version of their respective reference software is identified and configurations as close as possible to the anchor configurations are defined.

The framework clearly has some limitations; for example, encoder configurations for each scenario may have not been stringent enough in the definition, leading to results that may not be fully comparable. Further, the encoders used for the evaluation of the various codecs have different maturity and features. Results in this document should always be considered 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.

One important outcome of the work documented in this Technical Report is the characterization and evaluation of H.265/HEVC against relevant scenarios and its characterization against H.264/AVC. Also, a first understanding of H.265/HEVC performances versus new codecs was collected. From the scenarios and results in this Technical Report it is observed that:

* H.265/HEVC does not show any functional deficiencies or gaps, nor does it lack any relevant features.
* In terms of compression efficiency, H.265/HEVC, evaluated based on the HM, performs sufficiently well for all the scenarios in this technical report.

Providing consistent HEVC-based interoperability in 3GPP services, for traditional and new scenarios, is definitely beneficial. It is recommended to upgrade 3GPP specifications to support profiles, levels, and possibly features available in HEVC. Features may include better support for screen content and computer-generated content, XR/AR type of services, as well as low and very low latency services.

The framework and the initial results for new codecs, while demonstrating coding performance improvements over H.265/HEVC, are not mature enough to support concrete recommendations.

The potential addition of a new codec in 3GPP services and specifications requires diligent preparation, including the identification of needs and requirements for different scenarios, as well as a complete characterization against existing codecs. The information in this TR, as well as any new developments in 3GPP with respect to codecs in latest specifications, could serve as a baseline for future work. Such an effort may lead to conclusions on the potential addition of a new codec in 3GPP services and specifications. However, no immediate need has been identified to initiate such follow-up work.