|  |  |
| --- | --- |
| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11**  4th Meeting: Daegu, KR, 20-28 January, 2011 | Document: JCTVC-D082 |

|  |  |  |  |
| --- | --- | --- | --- |
| *Title:* | **On SEI messages** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | **Ye-Kui Wang** **Zhenyu Wu** Huawei Technologies 400 Crossing Blvd, 2nd Floor Bridgewater, NJ 08807, USA | Tel: Email:  Tel: Email: | +1 908 541 3518 [yekui.wang@huawei.com](mailto:yekui.wang@huawei.com)  +1 908 541 3531 [zhenyu.wu@huawei.com](mailto:zhenyu.wu@huawei.com) |
| *Source:* | Huawei Technologies Co., Ltd. | | |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Abstract

This document discusses the topic of reusing the SEI messages defined in AVC (as well as in SVC and MVC) in HEVC. A table is provided with a comment for each SEI message, which includes opinions on whether an SEI message should be supported (if not, the reason), revisited, or changed, and so on.

It is proposed to study the applicability of the AVC (including its SVC and MVC extensions) SEI messages in HEVC, and reuse those that are applicable. It is further proposed to use the table in this document as the starting point for the study.

Handling of AVC, SVC and MVC SEI messages in HEVC

It was agreed to basically reuse AVC high-level syntax, as documented in JCTVC-B121, as a starting point. Consensus was also reached to keep the SEI message mechanism, but the details related to which HEVC SEI messages can be inherited from AVC have not been mentioned. *Thus, we propose to study the applicability of the AVC (including the SVC and MVC extensions) SEI messages to HEVC, and reuse those that are applicable.* This document presents such an initial study. *We further propose to use the table provided in this document as the starting point for further related study.*

For all the HEVC SEI messages to be inherited from AVC (including its SVC and MVC extensions), the syntax and semantics should be carefully checked and adapted to the HEVC context as needed.

The table below lists all the SEI messages defined in AVC, SVC and MVC, and provides a comment for each SEI message, on whether it should be supported in HEVC (and the reason if it should not), suggestions about whether its use case should be revisited, and which aspects of the SEI message should be changed, and so on.

|  |  |
| --- | --- |
| **SEI message in AVC, SVC and MVC** | In HEVC? |
| buffering\_period | Yes. |
| pic\_timing | Yes. Some interlace related semantics should be dropped unless interlace coding is to be supported. |
| pan\_scan\_rect | Yes. |
| filler\_payload | Revisit the use case. Why is this needed given that there is filler data NAL unit? |
| user\_data\_registered\_itu\_t\_t35 | Revisit the use case. |
| user\_data\_unregistered | Revisit the use case. |
| recovery\_point | Yes. The syntax element changing\_slice\_group\_idc is not needed unless slice group is to be supported. |
| dec\_ref\_pic\_marking\_repetition | Yes. The syntax elements original\_field\_pic\_flag and original\_bottom\_field\_flag are not needed unless interlace coding is to be supported. |
| spare\_pic | Yes. The syntax elements spare\_field\_flag, target\_bottom\_field\_flag, and spare\_bottom\_field\_flag[ i ] are not needed unless interlace coding is to be supported. |
| scene\_info | Yes. |
| sub\_seq\_info | Probably not needed due to the inclusion of temporal\_id in NAL unit header. |
| sub\_seq\_layer\_characteristics | Yes. SEI message name, syntax, and semantics should be adapted based on temporal\_id, and should be aligned with the scalability\_info SEI message for SVC but excluding dependency\_id, quality\_id and other unneeded aspects. |
| sub\_seq\_characteristics | Probably not needed due to the inclusion of temporal\_id in NAL unit header. |
| full\_frame\_freeze | Revisit the use case. |
| full\_frame\_freeze\_release | Revisit the use case. |
| full\_frame\_snapshot | Revisit the use case. |
| progressive\_refinement\_segment\_start | Revisit the use case. |
| progressive\_refinement\_segment\_end | Revisit the use case. |
| motion\_constrained\_slice\_group\_set | No, unless slice group is to be supported. |
| film\_grain\_characteristics | Probably yes. Film grain experts should revisit it, and check the exact syntax and semantics. |
| deblocking\_filter\_display\_preference | Probably yes. De-blocking experts should revisit it, and check the exact syntax and semantics. |
| stereo\_video\_info | No (use frame packing arrangement SEI message instead, as suggested in AVC) |
| post\_filter\_hint | Probably yes. Post-processing experts should revisit it, and check the exact syntax and semantics. |
| tone\_mapping\_info | Probably yes. Tone mapping experts should revisit it, and check the exact syntax and semantics. |
| frame\_packing\_arrangement | Yes. |
| scalability\_info //SVC | No. However some temporal scalability specific features should be considered to be integrated into the sub\_seq\_layer\_characteristics SEI message (after adapted to the new context based on temporal\_id). |
| sub\_pic\_scalable\_layer //SVC | No, unless slice group is to be supported. |
| non\_required\_layer\_rep //SVC | No. Only relevant for spatial and quality scalabilities. |
| priority\_layer\_info //SVC | No. Only relevant when priority\_id is present in NAL unit header. |
| layers\_not\_present //SVC | No. The SEI message was primarily for spatial and quality scalabilities. |
| layer\_dependency\_change //SVC | No. The SEI message was primarily for spatial and quality scalabilities. |
| scalable\_nesting //SVC | No. Temporal subset specific SEI messages can be identified by including temporal\_id into NAL unit header for SEI NAL units. |
| base\_layer\_temporal\_hrd //SVC | No. However, the HRD parameters for temporal subsets should be included into VUI. |
| quality\_layer\_integrity\_check //SVC | No. Only relevant for quality layers (the so-called medium-grain scalability) in SVC. |
| redundant\_pic\_property //SVC | No. Only relevant when redundant slices are supported and when there is inter-layer prediction between spatial and/or quality layers. |
| tl0\_dep\_rep\_index //SVC | Probably yes. Temporal scalability experts should revisit it, and check the exact syntax and semantics. |
| tl\_switching\_point //SVC | Probably yes. Temporal scalability experts should revisit it, and check the exact syntax and semantics. |
| parallel\_decoding\_info //MVC | No. Only relevant within multiview context. |
| mvc\_scalable\_nesting // MVC | No. Same as for scalable nesting SEI message. Temporal subset specific SEI messages can be identified by including temporal\_id into NAL unit header for SEI NAL units. |
| view\_scalability\_info // MVC | No. Temporal scalability features are all covered in scalability information SEI message. |
| multiview\_scene\_info //MVC | No. Only relevant within multiview context. |
| multiview\_acquisition\_info //MVC | No. Only relevant within multiview context. |
| non\_required\_view\_component //MVC | No. Only relevant within multiview context. |
| view\_dependency\_change // MVC | No. Only relevant within multiview context. |
| operation\_points\_not\_present // MVC | No. Only relevant within multiview context. |
| base\_view\_temporal\_hrd //MVC | No. Same as base\_layer\_temporal\_hrd SEI message, the HRD parameters for temporal subsets should be included into VUI. |

# Patent rights declaration(s)

Huawei Technologies Co., Ltd. may have IPR relating to the technology described in this contribution and, conditioned on reciprocity, is prepared to grant licenses under reasonable and non-discriminatory terms as necessary for implementation of the resulting ITU-T Recommendation | ISO/IEC International Standard (per box 2 of the ITU-T/ITU-R/ISO/IEC patent statement and licensing declaration form).