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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  34th Meeting: Marrakech, MA, 12–18 Jan. 2019 | Document: JCTVC-AH0002-v1 |

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| *Title:* | **JCT-VC AHG report: HEVC test model editing and errata reporting (AHG2)** | | |
| *Status:* | AHG report input to JCT-VC | | |
| *Purpose:* | AHG report | | |
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| *Source:* | AHG | | |

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# Abstract

This document reports the work of the JCT-VC ad hoc group on HEVC test model editing and errata reporting (AHG2) between the 33rd meeting in Macao, CN (October 2018) and the 34th meeting in Marrakech, MA (Jan. 2019).

# Mandate

|  |  |  |
| --- | --- | --- |
| **Title and Email Reflector** | **Chairs** | **Meeting** |
| **HEVC test model editing and errata reporting (AHG2)**  ([jct-vc@lists.rwth-aachen.de](mailto:jct-vc@lists.rwth-aachen.de))   * Develop proposed improvements to the JCTVC-AB1002 HEVC Test Model 16 (HM 16) Update 9 of Encoder Description * Collect reports of errata for the HEVC and AVC specification and the published HDR-related technical reports. * Gather and address comments for refinement of these documents. * Coordinate with AHG3 on software development and software technical evaluation to address issues relating to mismatches between software and text. | B. Bross, C. Rosewarne (co‑chairs), J.‑R. Ohm, K. Sharman, G. J. Sullivan, Y.‑K. Wang (vice‑chairs) | N |

# Status of AHG2 work

## New HEVC and AVC draft texts

The following HEVC and AVC draft texts have been generated:

[JCTVC-AG1005](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=10830) Additional Supplemental Enhancement Information for HEVC (Draft 3) [J. Boyce, H.-M. Oh, G. J. Sullivan, A. Tourapis, Y.-K. Wang] (WG 11 preliminary draft for FDIS N 18095)

List of changes that have been integrated (based on JCTVC-AE1005; we did not issue JCTVC-AF1005 in Ljubljana):

* Latest changes made to N17728 (the Ljubljana MPEG output)
* Agreements from JCTVC-AG0002, JCTVC-AG0021 (the HEVC ones), and JCTVC-AG0022
* A bug reported by Chris in email sent out on 10/21/2018: In Table 9-48, for syntax elements last\_sig\_coeff\_[x|y]\_suffix, bin indices from 0 to >=5 are shown as ‘bypass’ whereas actually bin indices from 3 to >=5 are actually ‘na’ due to maximum range (cmax) of 0..7 of these syntax elements.

[JCTVC-AG1006](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=10862) Additional Supplemental Enhancement Information for AVC (Draft 4) [C. Fogg, W. Husak, G. J. Sullivan, A. M. Tourapis, Y.-K. Wang] (WG 11 FDAM N 18025)

List of changes that have been integrated (based on JCTVC-AF1006):

* Agreements from JCTVC-AG0021 (the AVC ones)

Remains valid – not updated [JCTVC-AE1012](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=10856) Annotated Regions SEI message for HEVC (Draft 1) (J. Boyce, Y.-K. Wang, G. J. Sullivan) (WG 11 N17622)

MPEG output document N 18023: Text of ISO/IEC 23008-2:201x/PDAM1 Additional supplemental enhancement information

List of changes integrated (based on JCTVC-AE1012; we did not issue JCTVC-AF1012):

* Same content as in JCTVC-AE1012

## New HEVC text bugs

An issue tracker (<https://hevc.hhi.fraunhofer.de/trac/hevc>) was used in order to facilitate the reporting of errata with the HEVC documents.

Ticket# #1504 reports two bugs in the profile\_tier\_level( ) syntax, which should be fixed as follows (removal of an instance of ' )' and addition of "[ i ]"):

|  |  |
| --- | --- |
| profile\_tier\_level( profilePresentFlag, maxNumSubLayersMinus1 ) { | **Descriptor** |
| if( profilePresentFlag ) { |  |
| **general\_profile\_space** | u(2) |
| **general\_tier\_flag** | u(1) |
| **general\_profile\_idc** | u(5) |
| for( j = 0; j < 32; j++ ) |  |
| **general\_profile\_compatibility\_flag**[ j ] | u(1) |
| **general\_progressive\_source\_flag** | u(1) |
| **general\_interlaced\_source\_flag** | u(1) |
| **general\_non\_packed\_constraint\_flag** | u(1) |
| **general\_frame\_only\_constraint\_flag** | u(1) |
| if( general\_profile\_idc = = 4 | | general\_profile\_compatibility\_flag[ 4 ] | |  general\_profile\_idc = = 5 | | general\_profile\_compatibility\_flag[ 5 ] | |  general\_profile\_idc = = 6 | | general\_profile\_compatibility\_flag[ 6 ] | |  general\_profile\_idc = = 7 | | general\_profile\_compatibility\_flag[ 7 ] ~~)~~ | |  general\_profile\_idc = = 8 | | general\_profile\_compatibility\_flag[ 8 ] | |  general\_profile\_idc = = 9 | | general\_profile\_compatibility\_flag[ 9 ] | |  general\_profile\_idc = = 10 | | general\_profile\_compatibility\_flag[ 10 ] ) {  /\* The number of bits in this syntax structure is not affected by this condition \*/ |  |
| **general\_max\_12bit\_constraint\_flag** | u(1) |
| **general\_max\_10bit\_constraint\_flag** | u(1) |
| **general\_max\_8bit\_constraint\_flag** | u(1) |
| **general\_max\_422chroma\_constraint\_flag** | u(1) |
| **general\_max\_420chroma\_constraint\_flag** | u(1) |
| **general\_max\_monochrome\_constraint\_flag** | u(1) |
| **general\_intra\_constraint\_flag** | u(1) |
| **general\_one\_picture\_only\_constraint\_flag** | u(1) |
| **general\_lower\_bit\_rate\_constraint\_flag** | u(1) |
| if( general\_profile\_idc = = 5 | | general\_profile\_compatibility\_flag[ 5 ] | |  general\_profile\_idc = = 9 | | general\_profile\_compatibility\_flag[ 9 ] | |  general\_profile\_idc = = 10 | | general\_profile\_compatibility\_flag[ 10 ] ) { |  |
| **general\_max\_14bit\_constraint\_flag** | u(1) |
| **general\_reserved\_zero\_33bits** | u(33) |
| } else |  |
| **general\_reserved\_zero\_34bits** | u(34) |
| } else if( general\_profile\_idc = = 2 | | general\_profile\_compatibility\_flag[ 2 ] ) { |  |
| **general\_reserved\_zero\_7bits** | u(7) |
| **general\_one\_picture\_only\_constraint\_flag** | u(1) |
| **general\_reserved\_zero\_35bits** | u(35) |
| } else |  |
| **general\_reserved\_zero\_43bits** | u(43) |
| if( ( general\_profile\_idc >= 1 && general\_profile\_idc <= 5 ) | |  general\_profile\_idc = = 9 | |  general\_profile\_compatibility\_flag[ 1 ] | | general\_profile\_compatibility\_flag[ 2 ] | |  general\_profile\_compatibility\_flag[ 3 ] | | general\_profile\_compatibility\_flag[ 4 ] | |  general\_profile\_compatibility\_flag[ 5 ] | | general\_profile\_compatibility\_flag[ 9 ] )  /\* The number of bits in this syntax structure is not affected by this condition \*/ |  |
| **general\_inbld\_flag** | u(1) |
| else |  |
| **general\_reserved\_zero\_bit** | u(1) |
| } |  |
| **general\_level\_idc** | u(8) |
| for( i = 0; i < maxNumSubLayersMinus1; i++ ) { |  |
| **sub\_layer\_profile\_present\_flag**[ i ] | u(1) |
| **sub\_layer\_level\_present\_flag**[ i ] | u(1) |
| } |  |
| if( maxNumSubLayersMinus1 > 0 ) |  |
| for( i = maxNumSubLayersMinus1; i < 8; i++ ) |  |
| **reserved\_zero\_2bits**[ i ] | u(2) |
| for( i = 0; i < maxNumSubLayersMinus1; i++ ) { |  |
| if( sub\_layer\_profile\_present\_flag[ i ] ) { |  |
| **sub\_layer\_profile\_space**[ i ] | u(2) |
| **sub\_layer\_tier\_flag**[ i ] | u(1) |
| **sub\_layer\_profile\_idc**[ i ] | u(5) |
| for( j = 0; j < 32; j++ ) |  |
| **sub\_layer\_profile\_compatibility\_flag**[ i ][ j ] | u(1) |
| **sub\_layer\_progressive\_source\_flag**[ i ] | u(1) |
| **sub\_layer\_interlaced\_source\_flag**[ i ] | u(1) |
| **sub\_layer\_non\_packed\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_frame\_only\_constraint\_flag**[ i ] | u(1) |
| if( sub\_layer\_profile\_idc[ i ] = = 4 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 4 ] | |  sub\_layer\_profile\_idc[ i ] = = 5 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 5 ] | |  sub\_layer\_profile\_idc[ i ] = = 6 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 6 ] | |  sub\_layer\_profile\_idc[ i ] = = 7 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 7 ] | |  sub\_layer\_profile\_idc[ i ] = = 8 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 8 ] | |  sub\_layer\_profile\_idc[ i ] = = 9 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 9 ] | |  sub\_layer\_profile\_idc[ i ] = = 10 | | sub\_layer\_profile\_compatibility\_flag[ i ][ 10 ]  ) {  /\* The number of bits in this syntax structure is not affected by this condition \*/ |  |
| **sub\_layer\_max\_12bit\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_max\_10bit\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_max\_8bit\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_max\_422chroma\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_max\_420chroma\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_max\_monochrome\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_intra\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_one\_picture\_only\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_lower\_bit\_rate\_constraint\_flag**[ i ] | u(1) |
| if( sub\_layer\_profile\_idc[ i ] = = 5 | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 5 ] ) { |  |
| **sub\_layer\_max\_14bit\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_reserved\_zero\_33bits**[ i ] | u(33) |
| } else |  |
| **sub\_layer\_reserved\_zero\_34bits**[ i ] | u(34) |
| } else if( sub\_layer\_profile\_idc[ i ] = = 2 | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 2 ] ) { |  |
| **sub\_layer\_reserved\_zero\_7bits**[ i ] | u(7) |
| **sub\_layer\_one\_picture\_only\_constraint\_flag**[ i ] | u(1) |
| **sub\_layer\_reserved\_zero\_35bits**[ i ] | u(35) |
| } else |  |
| **sub\_layer\_reserved\_zero\_43bits**[ i ] | u(43) |
| if( ( sub\_layer\_profile\_idc[ i ] >= 1 && sub\_layer\_profile\_idc[ i ] <= 5 ) | |  sub\_layer\_profile\_idc[ i ] = = 9 | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 1 ] | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 2 ] | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 3 ] | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 4 ] | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 5 ] | |  sub\_layer\_profile\_compatibility\_flag[ i ][ 9 ] )  /\* The number of bits in this syntax structure is not affected by this condition \*/ |  |
| **sub\_layer\_inbld\_flag**[ i ] | u(1) |
| else |  |
| **sub\_layer\_reserved\_zero\_bit**[ i ] | u(1) |
| } |  |
| if( sub\_layer\_level\_present\_flag[ i ] ) |  |
| **sub\_layer\_level\_idc**[ i ] | u(8) |
| } |  |
| } |  |

Another issue relates to the in profile, tier and level semantics in subclause 7.4.4. This was discussed as in the attached email below, but it has not been concluded yet:



# Recommendations

The recommendations of the HEVC test model editing and errata reporting AHG are for JCT-VC to:

1. Add Alexis Tourapis as a co-chair of this AHG.
2. Encourage the use of the issue tracker to report issues with the text of both the HEVC specification and the encoder description.
3. Confirm resolution of the ticket#1504, and other open tickets (if any), in the issue tracker and close them.
4. Discuss and conclude the above-mentioned issue related to the in profile, tier and level semantics in subclause 7.4.4.