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Information technology — Generic coding of moving pictures and associated audio information —

Part 1: Systems

AMENDMENT 8: Signaling HDR and WCG video content in MPEG-2 systems

Technologies de l'information — Codage générique des images animées et du son associé
<https://standards.iteh.ai/catalog/standards/sist/45556552-a71e-4feb-8a59-67c821111111/iso-iec-13818-1-2015-fdam-8>

Partie 1: Systèmes

AMENDEMENT 8: .

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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Information technology — Generic coding of moving pictures and associated audio information —

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1.2.3

Replace the following

- Recommendation ITU-R BT.601-6 (2007), *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*.

with

- Recommendation ITU-R BT.601-6 (2007), *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*.
- Recommendation ITU-R BT.709-6 (06-2015), *Parameter values for the HDTV standards for production and international programme exchange*.
- Recommendation ITU-R BT.1886, *Reference electro-optical transfer function for flat panel displays used in HDTV studio production*.
- Recommendation ITU-R BT.2100, *Image parameter values for high dynamic range television for use in production and international programme exchange*.

2.6.95

Replace 2.6.95 with the following:

For an HEVC video stream, the HEVC video descriptor provides basic information for identifying coding parameters, such as profile and level parameters of that HEVC video stream. For an HEVC temporal video sub-bitstream or an HEVC temporal video subset, the HEVC video descriptor provides information such as the associated HEVC highest temporal sub-layer representation contained in the elementary stream to which it applies. This descriptor can also be used to indicate presence of WCG and HDR video components in the associated PID as well as additional parameters to assist decoders with HDR capability to render intended video data on HDR capable display devices. In addition, this can assist non-HDR capable decoders to use the information appropriately.

NOTE 1 In case that the video characteristics change over time, the descriptor will be updated accordingly.

Table 2-109

Replace Table 2-109 with the following:

Table 2-109 — HEVC video descriptor

Syntax	No. of bits	Mnemonic
HEVC_descriptor() {		
descriptor_tag	8	uimsbf
descriptor_length	8	uimsbf
profile_space	2	uimsbf
tier_flag	1	bslbf
profile_idc	5	uimsbf
profile_compatibility_indication	32	bslbf
progressive_source_flag	1	bslbf
interlaced_source_flag	1	bslbf
non_packed_constraint_flag	1	bslbf
frame_only_constraint_flag	1	bslbf
copied_44bits	44	bslbf
level_idc	8	uimsbf
temporal_layer_subset_flag	1	bslbf
HEVC_still_present_flag	1	bslbf
HEVC_24hr_picture_present_flag	1	bslbf
sub_pic_hrd_params_not_present_flag	1	bslbf
reserved	2	bslbf
HDR_WCG_idc	2	uimsbf
if (temporal_layer_subset_flag == 1) {		
temporal_id_min	3	uimsbf
reserved	5	bslbf
temporal_id_max	3	uimsbf
reserved	5	bslbf
}		
}		

2.6.96

Replace 2.6.96 with the following:

2.6.96 Semantic definition of fields in HEVC video descriptor

profile_space, tier_flag, profile_idc, profile_compatibility_indication, progressive_source_flag, interlaced_source_flag, non_packed_constraint_flag, frame_only_constraint_flag, level_idc – When the HEVC video descriptor applies to an HEVC video stream or to an HEVC complete temporal representation, these fields shall be coded according to the semantics defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 for *general_profile_space, general_tier_flag, general_profile_idc, general_profile_compatibility_flag[i], general_progressive_source_flag, general_interlaced_source_flag, general_non_packed_constraint_flag, general_frame_only_constraint_flag, general_level_idc*, respectively, for the corresponding HEVC video stream or HEVC complete temporal representation, and the entire HEVC video stream or HEVC complete temporal representation to which the HEVC video descriptor is associated shall conform to the information signalled by these fields.

When the HEVC video descriptor applies to an HEVC temporal video sub-bitstream or HEVC temporal video subset of which the corresponding HEVC highest temporal sub-layer representation is not an HEVC complete temporal representation, these fields shall be coded according to the semantics defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 for *sub_layer_profile_space*, *sub_layer_tier_flag*, *sub_layer_profile_idc*, *sub_layer_profile_compatibility_flag[i]*, *sub_layer_progressive_source_flag*, *sub_layer_interlaced_source_flag*, *sub_layer_non_packed_constraint_flag*, *sub_layer_frame_only_constraint_flag*, *sub_layer_level_idc*, respectively, for the corresponding HEVC highest temporal sub-layer representation, and the entire HEVC highest temporal sub-layer representation to which the HEVC video descriptor is associated shall conform to the information signalled by these fields.

NOTE 1 In one or more sequences in the HEVC video stream, the level may be lower than the level signalled in the HEVC video descriptor, while also a profile may occur that is a subset of the profile signalled in the HEVC video descriptor. However, in the entire HEVC video stream, only subsets of the entire bitstream syntax that are included in the profile signalled in the HEVC video descriptor are used, if present. If the sequence parameter sets in an HEVC video stream signal different profiles, and no additional constraints are signalled, then the stream may need examination to determine which profile, if any, the entire stream conforms to. If an HEVC video descriptor is to be associated with an HEVC video stream that does not conform to a single profile, then the HEVC video stream should be partitioned into two or more sub-streams, so that HEVC video descriptors can signal a single profile for each such sub-stream.

copied_44bits – When the HEVC video descriptor applies to an HEVC video stream or to an HEVC complete temporal representation, this bit field shall be coded according to the semantics of the syntax elements defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 for the 44 bits found in the *profile_tier_level()* syntax element between *general_frame_only_constraint_flag* and *general_level_idc* for the corresponding HEVC video stream or HEVC complete temporal representation, and the entire HEVC video stream or HEVC complete temporal representation to which the HEVC video descriptor is associated shall conform to the information signalled by these fields.

When the HEVC video descriptor applies to an HEVC temporal video sub-bitstream or HEVC temporal video subset of which the corresponding HEVC highest temporal sub-layer representation is not an HEVC complete temporal representation, this bit field shall be coded according to the semantics of the syntax elements defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 for the 44 bits found in the *profile_tier_level()* syntax element between *sub_layer_frame_only_constraint_flag* and *sub_layer_level_idc* for the corresponding HEVC highest temporal sub-layer representation, and the entire HEVC highest temporal sub-layer representation to which the HEVC video descriptor is associated shall conform to the information signalled by these fields.

temporal_layer_subset_flag – This 1-bit flag, when set to ‘1’, indicates that the syntax elements describing a subset of temporal layers are included in this descriptor. This field shall be set to 1 for HEVC temporal video subsets and for HEVC temporal video sub-bitstreams. When set to ‘0’, the syntax elements *temporal_id_min* and *temporal_id_max* are not included in this descriptor.

HEVC_still_present_flag – This 1-bit field, when set to ‘1’, indicates that the HEVC video stream or the HEVC highest temporal sub-layer representation may include HEVC still pictures. When set to ‘0’, then the associated HEVC video stream shall not contain HEVC still pictures.

NOTE 2 According to Rec. ITU-T H.265 | ISO/IEC 23008-2, IDR pictures are always associated with a *TemporalId* value equal to 0. Consequently, if the HEVC video descriptor applies to an HEVC temporal video subset, HEVC still pictures can only be present in the associated HEVC temporal video sub-bitstream.

HEVC_24_hour_picture_present_flag – This 1-bit flag, when set to ‘1’, indicates that the associated HEVC video stream or the HEVC highest temporal sub-layer representation may contain HEVC 24-hour pictures. For the definition of an HEVC 24-hour picture, see 2.1.97. If this flag is set to ‘0’, the associated HEVC video stream shall not contain any HEVC 24-hour pictures.

sub_pic_hrd_params_not_present_flag – This 1-bit field, when set to ‘0’, indicates that the VUI in the HEVC video stream shall have the syntax element *sub_pic_hrd_params_present_flag* set to ‘1’. When the *sub_pic_hrd_params_not_present_flag* is set to ‘1’, the associated HEVC video stream may not contain *sub_pic_hrd_params_present_flag* in the VUI or the flag may be set to ‘0’.

NOTE 3 Decoders that support the sub-picture processing mode are expected to manage the T-STD using the appropriate delay values in the HEVC video stream specified in the relevant SEI messages defined in ISO/IEC 23008-2:2015, and in particular C.2.3, instead of the time stamp values in the PES header.

HDR_WCG_idc – The value of this syntax element indicates the presence or absence of high dynamic range (HDR) and/or wide colour gamut (WCG) video components in the associated PID according to Table 2-109bis. HDR is defined to be video that has high dynamic range if the video stream EOTF is higher than the Rec. ITU-R BT.1886 reference EOTF. This field also shall not be set to 2 unless bit_depth_luma_minus8 as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 in the associated video is greater than or equal to 2. WCG is defined to be video that is coded using colour primaries with a colour gamut not contained within Rec. ITU-R BT.709. This field also shall not be set to 1 or 2 unless bit_depth_chroma_minus8 as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 in the associated video is greater than or equal to 2.

temporal_id_min – This 3-bit field indicates the minimum value of the *TemporalId*, as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2, of all HEVC access units in the associated elementary stream.

temporal_id_max – This 3-bit field indicates the maximum value of the *TemporalId*, as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2, of all HEVC access units in the associated elementary stream.

Table 2-109bis — Semantics of HDR_WCG_idc

HDR_WCG_idc	Description
0	SDR, i.e. video is based on the Rec. ITU-R BT.1886 reference EOTF with a colour gamut that is contained within Rec. ITU-R BT.709 with a Rec. ITU-R BT.709 container (see Note 1)
1	WCG only, i.e. video colour gamut in a Rec ITU-R BT.2020 container that exceeds Rec ITU-R BT.709 (see Note 2)
2	Both HDR and WCG are to be indicated in the stream (see Note 3)
3	No indication made regarding HDR/WCG or SDR characteristics of the stream

NOTE 1 An example where it would be desirable to set HDR_WCG_idc to 0 would be when the colour_description_present_flag, as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2, is set to '0', with colour_primaries and transfer_characteristics not present in the video stream.

NOTE 2 An example where it would be desirable to set HDR_WCG_idc to 1 would be when colour_primaries as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 is equal to 9 to indicate Rec. ITU-R BT.2020.

NOTE 3 An example where it would be desirable to set HDR_WCG_idc to 2 would be when transfer_characteristics as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 is equal to 16 to indicate BT.2100 PQ EOTF or equal to 18 to indicate BT.2100 HLG EOTF, and when colour_primaries as defined in Rec. ITU-T H.265 | ISO/IEC 23008-2 is equal to 9 to indicate Rec. ITU-R BT.2020.

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