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

**AMENDMENT 6: Extension to AVC video  
descriptor and signalling of operation points  
for MVC**

*Technologies de l'information — Codage générique des images  
animées et du son associé: Systèmes*

*AMENDEMENT 6: Extension à un descripteur video AVC et  
signallement des points de fonctionnement pour un MVC*

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Published by ISO in 2012

Published in Switzerland

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ISO/IEC 13818-1:2007/Amd.6 was prepared jointly by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*, in collaboration with ITU-T. The identical text is published as ITU-T Rec. H.222.0 (05/2006)/Amd.6.

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INTERNATIONAL STANDARD  
RECOMMENDATION ITU-TInformation technology – Generic coding of moving pictures and  
associated audio information: Systems

## Amendment 6

## Extension to AVC video descriptor and signalling of operation points for MVC

## 1) Clause 1.2.2

In 1.2.2, Paired Recommendations | International Standards equivalent in technical content, replace:

- ITU-T Recommendation H.264 (2009), *Advanced video coding for generic audiovisual services*.  
ISO/IEC 14496-10:2009, *Information technology – Coding of audio-visual objects – Part 10: Advanced video coding*.

with:

- Recommendation ITU-T H.264 (2010), *Advanced video coding for generic audiovisual services*.  
ISO/IEC 14496-10:2010, *Information technology – Coding of audio-visual objects – Part 10: Advanced Video Coding*.

## 2) Clause 2.1.83

At the end of 2.1.83, add the following Note:

NOTE – An MVC video sub-bitstream or MVC base view sub-bitstream based on a specific MVC view\_id subset may not include view components for all view\_id values included in that MVC view\_id subset. One or more view order index values may be skipped if the view associated with a missing view order index value is not required for decoding the transmitted views.

## 3) New clause 2.1.93

After 2.1.92, add the following:

**2.1.93 MVC operation point:** An MVC operation point is identified by a temporal\_id value representing a target temporal level and a set of view\_id values representing the target output views. One MVC operation point is associated with an AVC video stream which conforms to one or more profiles defined in Annex H of Rec. ITU-T H.264 | ISO/IEC 14496-10. The AVC video stream associated with an MVC operation point is re-assembled from a set consisting of one or more of the following items: AVC video sub-bitstream of MVC, MVC base view sub-bitstream, MVC video sub-bitstreams.

## 4) Clause 2.6.1

a) In 2.6.1, replace:

The following semantics apply to the descriptors defined in 2.6.2 through 2.6.34.

with:

The following semantics apply to all descriptors defined in 2.6.2 through the end of 2.6.

b) In 2.6.1, Semantic definition of fields in program and program element descriptors, replace Table 2-45 with:

**Table 2-45 – Program and program element descriptors**

descriptor_tag	TS	PS	Identification
0	n/a	n/a	Reserved
1	n/a	X	Forbidden
2	X	X	video_stream_descriptor
3	X	X	audio_stream_descriptor
4	X	X	hierarchy_descriptor
5	X	X	registration_descriptor
6	X	X	data_stream_alignment_descriptor
7	X	X	target_background_grid_descriptor
8	X	X	video_window_descriptor
9	X	X	CA_descriptor
10	X	X	ISO_639_language_descriptor
11	X	X	system_clock_descriptor
12	X	X	multiplex_buffer_utilization_descriptor
13	X	X	copyright_descriptor
14	X		maximum_bitrate_descriptor
15	X	X	private_data_indicator_descriptor
16	X	X	smoothing_buffer_descriptor
17	X		RECOMMENDATION_descriptor
18	X	X	IBP_descriptor
19-26	X		Defined in ISO/IEC 13818-6
27	X	X	MPEG-4_video_descriptor
28	X	X	MPEG-4_audio_descriptor
29	X	X	IOD_descriptor
30	X		SL_descriptor
31	X	X	FMC_descriptor
32	X	X	external_ES_ID_descriptor
33	X	X	MuxCode_descriptor
34	X	X	FmxBufferSize_descriptor
35	X		multiplexBuffer_descriptor
36	X	X	content_labeling_descriptor
37	X	X	metadata_pointer_descriptor
38	X	X	metadata_descriptor
39	X	X	metadata_STD_descriptor
40	X	X	AVC video descriptor
41	X	X	IPMP_descriptor (defined in ISO/IEC 13818-11, MPEG-2 IPMP)
42	X	X	AVC timing and HRD descriptor
43	X	X	MPEG-2_AAC_audio_descriptor
44	X	X	FlexMuxTiming_descriptor
45	X	X	MPEG-4_text_descriptor
46	X	X	MPEG-4_audio_extension_descriptor
47	X	X	Auxiliary_video_stream_descriptor
48	X	X	SVC extension descriptor
49	X	X	MVC extension descriptor
50	X	n/a	J2K video descriptor
51	X	X	MVC operation point descriptor
52-63	n/a	n/a	Rec. ITU-T H.222.0   ISO/IEC 13818-1 Reserved
64-255	n/a	n/a	User Private

5) **Clause 2.6.7**

In 2.6.7, replace the semantics of *hierarchy\_embedded\_layer\_index* from:

**hierarchy\_embedded\_layer\_index** – The *hierarchy\_embedded\_layer\_index* is a 6-bit field that defines the *hierarchy\_layer\_index* of the program element that needs to be accessed and be present in decoding order before decoding of the elementary stream associated with this *hierarchy\_descriptor*. This field is undefined if the *hierarchy\_type* value is 15 (base layer).

to:

**hierarchy\_embedded\_layer\_index** – The *hierarchy\_embedded\_layer\_index* is a 6-bit field that defines the *hierarchy\_layer\_index* of the program element that needs to be accessed and be present in decoding order before decoding of the elementary stream associated with this *hierarchy\_descriptor*. This field is undefined if the *hierarchy\_type* value is 15.

6) **Clause 2.6.64**

Replace 2.6.64 with:

**2.6.64 AVC video descriptor**

For Rec. ITU-T H.264 | ISO/IEC 14496-10 video streams, the AVC video descriptor provides basic information for identifying coding parameters of the associated AVC video stream, such as on profile and level parameters included in the SPS of an AVC video stream.

The AVC video descriptor also signals the presence of AVC still pictures, AVC 24-hour pictures as well as 3D rendering assistance SEIs such as frame packing arrangement SEI message or stereo video information SEI message in the AVC video stream. If this descriptor is not included in the PMT for an AVC video stream in a transport stream or in the PSM, if present, for an AVC video stream in a program stream, then such AVC video stream shall not contain AVC still pictures, shall not contain AVC 24-hour pictures and may or may not contain frame packing arrangement SEI message or stereo video information SEI message (see Table 2-89).

7) **Table 2-89**

Replace Table 2-89 with:

**Table 2-89 – AVC video descriptor**

Syntax	No. of bits	Mnemonic
AVC_video_descriptor() {		
<b>descriptor_tag</b>	8	<b>uimsbf</b>
<b>descriptor_length</b>	8	<b>uimsbf</b>
<b>profile_idc</b>	8	<b>uimsbf</b>
<b>constraint_set0_flag</b>	1	<b>bslbf</b>
<b>constraint_set1_flag</b>	1	<b>bslbf</b>
<b>constraint_set2_flag</b>	1	<b>bslbf</b>
<b>constraint_set3_flag</b>	1	<b>bslbf</b>
<b>constraint_set4_flag</b>	1	<b>bslbf</b>
<b>constraint_set5_flag</b>	1	<b>bslbf</b>
<b>AVC_compatible_flags</b>	2	<b>bslbf</b>
<b>level_idc</b>	8	<b>uimsbf</b>
<b>AVC_still_present</b>	1	<b>bslbf</b>
<b>AVC_24_hour_picture_flag</b>	1	<b>bslbf</b>
<b>Frame_Packing_SEI_not_present_flag</b>	1	<b>bslbf</b>
<b>reserved</b>	5	<b>bslbf</b>
}		

8) **Clause 2.6.65**

a) In 2.6.65, *Semantic definition of fields in AVC video descriptor*, replace:

**profile\_idc, constraint\_set0\_flag, constraint\_set1\_flag, constraint\_set2\_flag, constraint\_set3\_flag, AVC\_compatible\_flags and level\_idc** – These fields, with the exception of AVC\_compatible\_flags shall be coded according to the semantics for these fields defined in ITU-T Rec. H.264 | ISO/IEC 14496-10. The semantics of AVC\_compatible\_flags are exactly equal to the semantics of the field(s) defined for the 4 bits between the constraint\_set3 flag and the level\_idc field in the Sequence Parameter Set, as defined in ITU-T Rec. H.264 | ISO/IEC 14496-10. The entire AVC video stream to which the AVC descriptor is associated shall conform to the profile, level and constraints signalled by these fields.

with:

**profile\_idc, constraint\_set0\_flag, constraint\_set1\_flag, constraint\_set2\_flag, constraint\_set3\_flag, constraint\_set4\_flag, constraint\_set5\_flag and AVC\_compatible\_flags and level\_idc** – These fields, with the exception of AVC\_compatible\_flags, shall be coded according to the semantics for these fields defined in Rec. ITU-T H.264 | ISO/IEC 14496-10. The semantics of AVC\_compatible\_flags are exactly equal to the semantics of the field(s) defined for the 2 bits between the constraint\_set5 flag and the level\_idc field in the sequence parameter set, as defined in Rec. ITU-T H.264 | ISO/IEC 14496-10. The entire AVC video stream to which the AVC descriptor is associated shall conform to the profile, level and constraints signalled by these fields.

b) In 2.6.65, add:

**Frame Packing\_SEI\_not\_present\_flag** – If this flag is set to '0', then the AVC video stream shall contain either the frame packing arrangement SEI message or stereo video information SEI message. If the AVC video descriptor is present and this flag is set to '1', then the presence of either of these SEI messages is unspecified.

9) **New clauses 2.6.82 and 2.6.83**

Insert the following new clauses after 2.6.81:

**2.6.82 MVC operation point descriptor**

The MVC operation point descriptor (see Table AMD6-1) provides a method to indicate profile and level for one or more operation points each constituted by a set of one or more MVC video sub-bitstreams. If present, the MVC operation point descriptor shall be included in the group of data elements following immediately the program\_info\_length field in the program\_map section. If an MVC operation point descriptor is present within a program description, at least one hierarchy descriptor shall be present for each MVC video sub-bitstream present in the same program.

NOTE – In order to indicate different profiles, one MVC operation point descriptor per profile is needed.

**Table AMD6-1 – MVC operation point descriptor**

Syntax	No. of bits	Mnemonic
MVC_operation_point_descriptor() {		
<b>descriptor_tag</b>	8	<b>uimsbf</b>
<b>descriptor_length</b>	8	<b>uimsbf</b>
<b>profile_idc</b>	8	<b>uimsbf</b>
<b>constraint_set0_flag</b>	1	<b>bslbf</b>
<b>constraint_set1_flag</b>	1	<b>bslbf</b>
<b>constraint_set2_flag</b>	1	<b>bslbf</b>
<b>constraint_set3_flag</b>	1	<b>bslbf</b>
<b>constraint_set4_flag</b>	1	<b>bslbf</b>
<b>constraint_set5_flag</b>	1	<b>bslbf</b>
<b>AVC_compatible_flags</b>	2	<b>bslbf</b>
<b>level_count</b>	8	<b>uimsbf</b>
for ( recommendation =0; recommendation < level_count; i++ ) {		
<b>level_idc</b>	8	<b>uimsbf</b>

Table AMD6-1 – MVC operation point descriptor

Syntax	No. of bits	Mnemonic
<b>operation_points_count</b>	8	<b>uimsbf</b>
for ( j =0; j< operation_points_count; j++ ) {		
<b>reserved</b>	5	<b>bslbf</b>
<b>applicable_temporal_id</b>	3	<b>uimsbf</b>
<b>num_target_output_views</b>	8	<b>uimsbf</b>
<b>ES_count</b>	8	<b>uimsbf</b>
for ( k =0; k< ES_count; k++ ) {		
<b>reserved</b>	2	<b>bslbf</b>
<b>ES_reference</b>	6	<b>uimsbf</b>
}		
}		
}		

### 2.6.83 Semantic definition of fields in MVC operation point descriptor

**profile\_idc** – This 8-bit field indicates the profile, as defined in Rec. ITU-T H.264 | ISO/IEC 14496-10, of all operation points described within this descriptor for the MVC bitstream.

**constraint\_set0\_flag, constraint\_set1\_flag, constraint\_set2\_flag, constraint\_set3\_flag, constraint\_set4\_flag, constraint\_set5\_flag** – These fields shall be coded according to the semantics for these fields defined in Rec. ITU-T H.264 | ISO/IEC 14496-10.

**AVC\_compatible\_flags** – The semantics of AVC\_compatible\_flags are exactly equal to the semantics of the field(s) defined for the 2 bits between the constraint\_set2 flag and the level\_idc field in the sequence parameter set, as defined in Rec. ITU-T H.264 | ISO/IEC 14496-10.

**level\_count** – This 8-bit field indicates the number of levels for which operation points are described.

**level\_idc** – This 8-bit field indicates the level, as defined in Rec. ITU-T H.264 | ISO/IEC 14496-10, of the MVC bitstream for the operation points described by the following groups of data elements.

**operation\_points\_count** – This 8-bit field indicates the number of operation points described by the list included in the following group of data elements.

**applicable\_temporal\_id** – This 3-bit field indicates the highest value of the temporal\_id of the VCL NAL units in the re-assembled AVC video stream.

**num\_target\_output\_views** – This 8-bit field indicates the value of the number of the views, targeted for output for the associated operation point.

**ES\_count** – This 8-bit field indicates the number of ES\_reference values included in the following group of data elements. The elementary streams indicated in the following group of data elements together form an operation point of the MVC video bitstream. The value 0xff is reserved.

**ES\_reference** – This 6-bit field indicates the hierarchy layer index value present in the hierarchy descriptor which identifies a video sub-bitstream.

NOTE – The profile and level for a single operation point, e.g., the entire MVC video bitstream, can be signalled using the AVC video descriptor. Beyond that, MVC allows for decoding different view subsets which can require different profiles and/or levels. The specification of the MVC operation point descriptor supports the indication of different profiles and levels for multiple operation points.