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Information technology — Coding of audio-visual objects —

Part 15:
Carriage of network abstraction layer (NAL) unit structured video in the ISO base media file format

AMENDMENT 1: Handling of unspecified NAL unit types and other improvements

Technologies de l'information — Codage des objets audiovisuels —

Partie 15: Transport de vidéo structuré en unités NAL au format ISO de base pour les fichiers médias

AMENDEMENT 1: Traitement des types d'unités NAL non spécifiés et autres améliorations

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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

A list of all parts in the ISO/IEC 14496 series can be found on the ISO website.

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AMENDMENT 1: Handling of unspecified NAL unit types and other improvements

5.2, Table 2

Change the first and last rows of Table 2 as follows (all other rows remain unchanged):

Value of nal_unit_type	Description	Video elementary stream (sample entry 'avc1' or 'avc2')	Video elementary stream (sample entry 'avc3' or 'avc4')	Parameter set elementary stream
0	Unspecified	See Annex F	See Annex F	See Annex F
24-31	Unspecified	See Annex F	See Annex F	See Annex F

Clause 4

Add the following new subclauses as 4.11 and 4.12:

4.11 SEI information box

4.11.1 Definition

Box Type: 'seii'

Container: Scheme Information box ('schi') or VisualSampleEntry

Mandatory: Yes (in the SchemeInformationBox), No (in a VisualSampleEntry)

Quantity: One (in the SchemeInformationBox), Zero or one (in a VisualSampleEntry)

The SEI Information box documents the SEIs in a stream. When contained in a VisualSampleEntry numRequiredSEIs shall be 0. By inspecting the SEI Information box a player will know which SEI messages it can assume to be present, and which are deemed necessary by the file author for correct playback. There might be other SEIs present in the bitstream that are not documented by this box.

4.11.2 Syntax

```
aligned(8) class SeiInformationBox extends Box('seii') {
      unsigned int(16) numRequiredSEIs;
      for (i = 0; i < numRequiredSEIs; i++) {
         unsigned int(16) requiredSEI_ID;
      }
      unsigned int(16) numNotRequiredSEIs;
      for (i = 0; i < numNotRequiredSEIs; i++) {
         unsigned int(16) notrequiredSEI_ID;
      }
}
```

4.11.3 Semantics

`requiredSEI_ID` takes on the value "payloadType" of an SEI message present in the bitstream that is deemed necessary by the file author for correct playback.

`notrequiredSEI_ID` takes on the value "payloadType" of an SEI message present in the bitstream that is not deemed necessary by the file author for correct playback.

4.12 Post-decoder requirements scheme for signalling of SEI

4.12.1 General

In order to handle situations where the file author requires certain actions on the player or renderer, the ISO base media file format specifies the restricted-video mechanism where sample entries are hidden behind the generic sample entry `'resv'`. The mechanism applies to all coding systems identified by chapters in this document. For the case of signalling of SEI, a file author can list occurring SEI message IDs (ISO/IEC 14496-10, ISO/IEC 23008-2) and classify them into two categories: those that are deemed required by the file author for correct playback, and others. The occurrence of either type of SEI messages can be signalled in the SEI Information box.

4.12.2 Definition

The scheme for signalling of SEI is defined here.

The SchemeType `'aSEI'` is used.

The SEI information box is mandatory in the SchemeInformationBox under the 'aSEI' scheme. In this case, it contains information about the SEI messages present in the bitstream. Although the SEI messages are not required for decoding, the file author may require certain actions for rendering or other purposes. The box distinguishes between an SEI that is required to be understood for correct playback and an SEI that is not required for correct playback (but may enhance playback).

The SEI messages listed here should be stored either in the bitstream or in the Configuration Record. The SEI Information box does not contain the actual SEI messages, it only lists those that occur in the bitstream.

6.2, Table 3

Change 1 row of Table 3 as follows (all other rows remain unchanged):

Value of nal_unit_type	Description	AVC video elementary stream	SVC video elementary stream (sample entry 'avc1', 'avc2', or 'svc1')	SVC video elementary stream (sample entry 'avc3', 'avc4', or 'svc2')	Parameter set elementary stream
24–31	Not specified	See Annex F	See Annex F	See Annex F	See Annex F

5.4.10

Delete 5.4.10 and its subclauses.

7.3, Table 6

Change 1 row of Table 6 as follows (all other rows remain unchanged):

Value of nal_unit_type	Description	AVC video elementary stream	MVC video elementary stream (sample entry 'avc1', 'avc2', 'mvc1', or 'mvc2')	MVC video elementary stream (sample entry name 'avc3', 'avc4', 'mvc3', or 'mvc4')	MVD video elementary stream (sample entry name 'mvd1', 'mvd2', 'a3d1', or 'a3d2')	MVD video elementary stream (sample entry name 'mvd3', 'mvd4', 'a3d3', or 'a3d3')	Parameter set elementary stream
24–31	Not specified	See Annex F	See Annex F	See Annex F	See Annex F	See Annex F	See Annex F

9.6

Add a new subclause 9.6.4:

9.6.4   Decoding time hint sample group

9.6.4.1 Definition

Each decoding time hint sample group description entry ('opth') records a delta time in terms of the clock ticks (given by timescale of the MediaHeaderBox). The corrected decoding time is defined as the sum of the delta time associated with a sample through the SampleToGroupBox of type 'opth' and the decoding time of the sample. The corrected decoding times conform to the hypothetical reference decoder of ISO/IEC 23008-2 operating according to a partitioning scheme where each layer is in its own bitstream partition, as defined in ISO/IEC 23008-2.

All SampleToGroupBoxes for the decoding time hint sample group shall include grouping_type_parameter. The grouping_type_parameter field is specified for the decoding time hint sample group as follows:

```
unsigned int(16) reserved = 0;
unsigned int(16) operating_point_index;
```

operating_point_index specifies the index of the operating point, as given in the associated OperatingPointsInformation sample group description, for which this sample group provides

the corrected decoding times. A value of 0 indicates the first operating point in that sample group description.

9.6.4.2 Syntax

```
class OperatingPointDecodeTimeHint()
extends VisualSampleGroupEntry ('opth')
{
        signed int(32) delta_time;
}
```

9.6.4.3 Semantics

delta_time plus the decoding time (derived from the `TimeToSampleBox` and `TrackRunBoxes`, if any) provides the corrected decoding time of the associated sample. Time-scale units, as given by `timescale` of the `MediaHeaderBox` of this track, are used for the calculation of `delta_time`.

A.1

Replace the text with the following:

A.1   General

Aggregators and Extractors are file format internal structures enabling efficient grouping of NAL units or extraction of NAL units from other tracks.

Aggregators and Extractors use a syntax that is similar to the NAL unit syntax but does not follow the start code emulation prevention mechanism required for the NAL unit syntax as specified in ISO/IEC 14496-10 or ISO/IEC 23008-2. These NAL-unit-like structures are seen as NAL units in the context of the sample structure. While accessing a sample, Aggregators shall be removed (leaving their contained or referenced NAL units) and Extractors shall be replaced by the data they reference. Aggregators and Extractors shall not be output by file parsers.

These structures use NAL unit types reserved for the application/transport layer by ISO/IEC 14496-10 or ISO/IEC 23008-2.

See Annex F for more information about use of "reserved", "unspecified", "not specified" and "registrant-defined" nal_unit_type values.

Add a new Annex F:

Annex F
(informative)
Unspecified nal_unit_type value management

This Annex describes the required management mechanism for the nal_unit_type fields that are defined in ISO/IEC 14496-10 (AVC), and ISO/IEC 23008-2 (HEVC), for use 'as determined by the application'[1]. Some values are defined in this document and some (either marked as "registrant defined" in Table F.3 and Table F.6, or as "Reserved" in Table F.1, Table F.2, Table F.4 and Table F.5) are available for use under the conditions specified below.

Table F.1 — 'avc1' and 'avc3' nal_unit_type value assignments

nal_unit_type **value**	assignment
0	Reserved
24–31	Reserved

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1)   See ISO/IEC 14496-10:2014, 7.4.1 and ISO/IEC 23008-2:2015, 7.4.2.2.