



# Information technology — Coding of audio-visual objects — Part 15: Carriage of network abstraction layer (NAL) unit structured video in ISO base media file format

## TECHNICAL CORRIGENDUM 1

*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*

*RECTIFICATIF TECHNIQUE 1*

Technical Corrigendum 1 to ISO/IEC 14496-15:2014 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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### ***In section 5.3.2, replace:***

- **Sub-sequence and layering SEI messages.** Sub-sequence or layering SEI messages shall not occur in the AVC elementary stream. Specifically, the sub-sequence information, sub-sequence layer characteristics, and sub-sequence characteristics SEI messages shall not occur in the stored AVC video elementary stream.

### ***with:***

- **Sub-sequence and layering SEI messages.** Sub-sequence or layering SEI messages should not occur in the AVC elementary stream. Specifically, the sub-sequence information, sub-sequence layer characteristics, and sub-sequence characteristics SEI messages should not occur in the stored AVC video elementary stream.

**In section 5.3.3.1.2 replace:**

```
aligned(8) class AVCDecoderConfigurationRecord {
    unsigned int(8) configurationVersion = 1;
    unsigned int(8) AVCProfileIndication;

[...]
```

if( profile\_idc == 100 || profile\_idc == 110 ||  
 profile\_idc == 122 || profile\_idc == 144 )

**with:**

```
aligned(8) class AVCDecoderConfigurationRecord {
    unsigned int(8) configurationVersion = 1;
    unsigned int(8) AVCProfileIndication;

[...]
```

if( AVCProfileIndication == 100 || AVCProfileIndication == 110 ||  
 AVCProfileIndication == 122 || AVCProfileIndication == 144 )

**In section 5.4.7 replace**

The reserved field is defined for AVC as follows:

**with**

The `codec_specific_parameters` field of the Subsample Information box is defined for AVC as follows:

**In section 6.5.9 replace**

The reserved field is defined for SVC as follows:

**with**

The `codec_specific_parameters` field of the Subsample Information box is defined for SVC as follows:

**Modify section 8 as follows:**

## 8 HEVC elementary streams and sample definitions

### 8.1 Introduction

The High Efficiency Video Coding (HEVC) standard, jointly developed by the ITU-T and ISO/IEC JTC 1/SC 29/WG 11 (MPEG), offers not only increased coding efficiency and enhanced robustness, but also many features for the systems that use it. To enable the best visibility of, and access to, those features, and to enhance the opportunities for the interchange and interoperability of media, this part of ISO/IEC 14496-15 defines a storage format for video streams compressed using HEVC.

This clause of ISO/IEC 14496-15 specifies the storage format for HEVC (ISO/IEC 23008-2) video streams.

The storage of HEVC content uses the existing capabilities of the ISO base media file format but also defines extensions to support the following features of the HEVC codec.

— Parameter sets:

The video, sequence and picture parameter set mechanism decouples the transmission of infrequently changing information from the transmission of coded block data. Each slice containing the coded block data references the picture parameter set containing its decoding parameters. In turn, the picture parameter set references a sequence parameter set that contains sequence level decoding parameter information, and the sequence parameter set references a video parameter set that contains global decoding parameter information (across layers or view in potential scalable and 3DV extensions).

This specification includes the following tools for supporting of HEVC contents:

— Temporal scalability sample grouping:

a structuring and grouping mechanism to indicate the association of access units with different hierarchy levels of temporal scalability.

— Temporal sub-layer access sample grouping:

a structuring and grouping mechanism to indicate the identification of access units as temporal sub-layer access (TSA) samples.

- Step-wise temporal sub-layer access sample grouping: a structuring and grouping mechanism to indicate the identification of access units as step-wise temporal sub-layer access (STSA) samples.

## 8.2 Elementary Stream Structure

A video stream is represented by one video track in a file.

Two types of elementary streams are defined for storing HEVC content:

- **Video Elementary Stream** that does not contain any parameter sets; all parameter sets are stored in a sample entry or sample entries;
- **Video and Parameter set elementary stream** that may contain parameter sets, and may also have parameter sets stored in their sample entry or sample entries.

## 8.3 Sample and configuration definition

### 8.3.1 Introduction

HEVC sample: An HEVC sample is an access unit as defined in ISO/IEC 23008-2.

### 8.3.2 Canonical order and restrictions

The canonical stream format is an HEVC elementary stream that satisfies the following conditions in addition to the general conditions in 4.3.2

- **Access unit delimiter NAL units:** The constraints obeyed by access unit delimiter NAL units are defined in ISO/IEC 23008-2.
- **Parameter sets:** A parameter set to be used in a picture must be sent prior to the sample containing that picture or in the sample for that picture. For a video stream that a particular sample entry applies to, the video parameter set, sequence parameter sets, and picture parameter sets, shall be stored only in the sample entry when the sample entry name is 'hvc1', and may be stored in the sample entry and the samples when the sample entry name is 'hev1'.

**NOTE** Storing parameter sets in the sample entries of a video stream provides a simple and static way to supply parameter sets. Storing parameters in samples on the other hand is more complex but allows for more dynamism in the case of parameter set updates (a particular parameter set's content is changed but using the same ID) and in the case of adding additional parameter sets. A decoder initializes with the parameter sets in the sample entry, and then updates using the parameter sets as they occur in the stream, starting from any sample marked as a sync sample. Such updating may replace parameter sets with a new definition using the same identifier. Each time the sample entry changes, the decoder re-initializes with the parameter sets included in the sample entry.

- **SEI messages:** SEI messages of declarative nature may be stored in the sample entry; there is no prescription about removing such SEI messages from the samples.
- **Filler data.** Video data is naturally represented as variable bit rate in the file format and should be filled for transmission if needed. Filler Data NAL units and Filler Data SEI messages shall not be present in the file format stored stream when the sample entry does not also permit parameter sets.

**NOTE** The removal or addition of Filler Data NAL units, start codes, SEI messages or Filler Data SEI messages may change the bitstream characteristics with respect to conformance with the HRD when operating the HRD in CBR mode as specified in ISO/IEC 23008-2, Annex C.