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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~~

AMENDMENT 1: Support for LCEVC

~~FDAM~~FDIS stage

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This document 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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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~~

AMENDMENT 1: Support for LCEVC

Normative references

Add the following reference:

ISO/IEC 23094-2:~~20XX~~2021, *Information technology – General Video Coding – Part 2: Low Complexity Enhancement Video Coding*

3.1 Terms and definitions

Add the following terms and definitions:

3.1.67
parameter sets for LCEVC
<LCEVC> sequence_configuration, global_configuration, or additional_info~~, as~~

Note 1 to entry: As defined in ISO/IEC 23094-2 ~~(clauses~~:2021, 7.3.4, 7.3.5, 7.3.10~~)~~.

3.1.68

picture dimensions for LCEVC

width and height of the decoded picture as specified by the referenced global_configuration ~~as defined in ISO/IEC 23094-2 (clause 7.3.5)~~

~~Abbreviated terms~~

~~LCEVC~~ ~~Low Complexity Enhancement Video Coding~~ [Note 1 to entry: As defined in ISO/IEC 23094-2~~]~~

~~GC~~ ~~Global Configuration for LCEVC [ISO/IEC 23094-2]~~

~~SC~~ ~~Sequence Configuration for LCEVC [ISO/IEC 23094-2]~~

~~AI~~ ~~Additional Information for LCEVC [ISO/IEC 23094-2]~~

~~Clause 4~~

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~~In 4.2~~:2021, 7.3.*~~3 semantics of NALUnit replace~~*5.ards.iteh.ai)

3.2 Abbreviated terms

Add the following abbreviated terms:

LCEVC   Low Complexity Enhancement Video Coding [ISO/IEC 23094-2]

GC   Global Configuration for LCEVC [ISO/IEC 23094-2]

SC   Sequence Configuration for LCEVC [ISO/IEC 23094-2]

AI   Additional Information for LCEVC [ISO/IEC 23094-2]

4.2.3.3

Replace

"The syntax of a NAL unit is defined in the appropriate specification (e.g. ISO/IEC 14496-10) and includes both the one byte NAL header and the variable length encapsulated byte stream payload."

with

"NALUnit contains a single NAL unit. The syntax of a NAL unit is defined in the appropriate specification (e.g. ISO/IEC 14496-10) and includes both the NAL unit header and the variable length NAL unit payload."

Clause 5

In

5.4.2.1.1, replace

Replace:

"The sample entry name `'avc1'` or `'avc3'` may only be used when the stream to which this sample entry applies is a compliant and AVC stream as viewed by an AVC decoder operating under the configuration (including profile and level) given in the AVCConfigurationBox. The file format specific structures that resemble NAL units (see Annex A) may be present but shall not be used to access the AVC base data; that is, the AVC data shall not be contained in Aggregators (though they may be included within the bytes referenced by the `additional_bytes` field) nor referenced by Extractors."

with:

"The sample entry name `'avc1'` or `'avc3'` may only be used when the stream to which this sample entry applies is a compliant and AVC stream as viewed by an AVC decoder operating under the configuration (including profile and level) given in the AVCConfigurationBox. Extractor and aggregator NAL-unit-like structures (see Annex A) shall not be present."

Clause 6

In

6.5.3.1.1 replace

Replace "Extractors or aggregators may be used for SVC VCL NAL units in 'avc1', 'avc2', 'avc3', 'avc4', 'svc1' or 'svc2' tracks."

" with

" "Extractors or aggregators may be used for SVC VCL NAL units in 'avc2', 'avc4', 'svc1' or 'svc2' tracks."

Clause 11

In

11.2.4.1.2 ~~and 11.2.4.1.3 replace~~

Replace "`ptl_multi_layer_enabled_flag`

" with

"`ptl_multilayer_enabled_flag`".

~~Clause 12~~

11.2.4.1.3

Replace "`ptl_multi_layer_enabled_flag`" with "`ptl_multilayer_enabled_flag`".

12.5.4.2

Replace subclause ~~Replace *clause*~~ 12.5.4.2 with the *~~followings (see numbering of N0234)~~*following:

12.5.4.2 Sample entry for EVC slice base track

12.5.4.2.1 Definition

~~Sample Entry Type: 'evm1'~~
~~Container: Sample   Table   Box   ('stbl')~~
~~Mandatory: An   'evm1'   sample   entry   is   mandatory   for   EVC   slice   base   track~~
~~Quantity: One or more sample entries may be present~~

Sample Entry Type: `'evm1'`

Container: Sample Table Box (`'stbl'`)

Mandatory: An `'evm1'` sample entry is mandatory for EVC slice base track

Quantity: One or more sample entries may be present

An EVC visual sample entry shall contain an EVC Configuration Box as defined in the subclause 12.4.1.1 when a track is an EVC slice base track. This includes an `EVCDecoderConfigurationRecord` defined in the subclause 12.3.3.

An optional `BitRateBox` may be present in the EVC visual sample entry to signal the bit rate information of the EVC slice data in this track.

Multiple sample entries may be used, as permitted by the ISO Base Media File Format specification, to indicate sections of video that use different configurations or parameter sets.

12.5.4.2.2 Syntax

```
class EVCSampleEntry() extends VisualSampleEntry('evm1'){
        EVCConfigurationBox    config;
        MPEG4ExtensionDescriptorsBox();    // optional
}
```

12.5.4.2.3 Semantics

~~`Compressorname` in the base class `VisualSampleEntry` indicates the name of the compressor used with the value "\012EVC Coding" being recommended (\012 is 10, the length of the string in bytes).~~

~~`EVCDecoderConfigurationRecord` is defined in subclause 12.3.3.~~

— `Compressorname` in the base class `VisualSampleEntry` indicates the name of the compressor used with the value "\012EVC Coding" being recommended (\012 is 10, the length of the string in bytes).

— `EVCDecoderConfigurationRecord` is defined in subclause 12.3.3.

Clause 13

Add the following clause after Clause 12, before Annex A:

13 LCEVC elementary streams and sample definitions

13.1 Overview

The Low Complexity Enhancement Video Coding (LCEVC) standard, specified in ISO/IEC 23094-2:2021, is a low complexity solution to apply enhancement to existing video coding bitstreams generated using other video coding systems (e.g. AVC, HEVC, EVC, VVC).

Since the LCEVC elementary streams carry enhancement to a "base" codec such as the ones listed above, the LCEVC elementary stream in its own track makes reference to a "base" codec elementary stream in a separate track, so that the LCEVC stream can be decoded in conjunction with the "base" stream, while the "base" stream can be decoded independently of the LCEVC stream.

This clause defines the carriage of LCEVC elementary streams in the ISO base media file format as defined in this specification.

The *Elementary Stream Structure* is provided in ~~clause 13.2.~~subclause 13.2.

The *Sample and Configuration Definitions* are provided in ~~clause 13.3.~~subclause 13.3.

Deviations from ISO base media file format are provided in ~~clause 13.4.~~subclause 13.4.

Internet media applications require defined values for the Codecs parameter specified in IETF RFC 6381 for ISO BMFF Media tracks. The **'codecs' parameter string** for the LCEVC codec is defined in subclause E.10.

13.2 Elementary stream structure

LCEVC elementary streams are structured as NAL units and their storage in the ISO Base Media File Format follows principles similar to other NAL structured video formats.

The storage of LCEVC elementary streams is subdivided into two parts: static information that is globally used in the elementary stream and dynamic information that may vary per sample.

The sequence_configuration (SC), global_configuration (GC), and additional_info (AI), are considered to be part of the information that rarely changes and is considered to be static.

In case these parameter sets change in the elementary stream, a sample grouping is defined that indicates at which sample the parameter sets change.

13.3 Sample and configuration definitions

13.3.1 Overview

An LCEVC Sample follows the same structure of the "General Definitions" as defined in clause 4.2.3 of this specification.

The only additional constraint is that the `DecoderConfigurationRecord` shall follow the syntax and semantics specific for LCEVC, i.e. `LCEVCDecoderConfigurationRecord`.

An LCEVC Sample contains an access unit as defined in clause 3.1 of ISO/IEC 23094-2:2021, 3.1.

13.3.2 Canonical order

The canonical stream format is an LCEVC elementary stream that satisfies the general conditions in clauses subclauses 6.1 and 7.3 of ISO/IEC 23094-2:2021.

The following additional constraints apply:

— **SC, GC, AI**: sequence_configuration, global_configuration, and additional_info to be used in a picture must be sent prior to the sample containing that picture or in the sample for that picture. At least the one sequence_configuration and one global_configuration must be stored in the sample entry of the track that contains the LCEVC elementary stream. The sequence_configuration and global_configuration, when carried in a sample for a specific picture, shall be present at least in each sync sample.

— **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.

13.3.3 Decoder Configuration Information

13.3.3.1 Definition

This subclause specifies the Decoder Configuration Information for ISO/IEC 23094-2:2021 video content.

This record contains a version field. This version of the specification defines version 1 of this record. Incompatible changes to the record will be indicated by a change of version number. Readers shall not attempt to decode this record or the streams to which it applies if the version number is unrecognised.

Compatible extensions to this record will extend it and will not change the configuration version code. Readers should be prepared to ignore unrecognised data beyond the definition of the data they understand.