
Information technology — Coding of
audio-visual objects —

Part 1:
Systems

AMENDMENT 7: Use of AVC (Advanced
Video Coding) in MPEG-4 systems

Technologies de l'information — Codage des objets audiovisuels —

Partie 1: Systèmes

*AMENDEMENT 7: Utilisation du codage vidéo avancé dans les
systèmes MPEG-4*

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 7 to ISO/IEC 14496-1:2001 was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Introduction

The Advanced Video Coding (AVC), jointly developed by the ITU-T SG 16 VCEG (Video Coding Expert Group) and ISO/IEC JTC 1/SC 29/WG 11, 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 standard specifies the usage of AVC within the ISO/IEC 14496-1 Framework (ISO/IEC 14496-1:2001 and its various amendments). This specification enables AVC video streams to:

- be used in conjunction with other media streams, such as audio; and
- be used in an MPEG-4 systems environment, if desired.

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AMENDMENT 7: Use of AVC (Advanced Video Coding) in MPEG-4 systems

Add the following to Clause 2 Normative references:

ISO/IEC 14496-10, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*

ISO/IEC 14496-15, *Information technology — Coding of audio-visual objects — Part 15: Advanced Video Coding (AVC) file format*

Insert the following definitions alphabetically:

AVC Parameter Set

either a sequence parameter set or a picture parameter set

NOTE This term is used to refer to both types of parameter sets.

AVC Access Unit

an access unit made up of NAL Units as defined in ITU-T Recommendation H.264 | ISO/IEC 14496-10 with the structure defined in 5.2.3 of ISO/IEC 14496-15

AVC Parameter Set Access Unit

an Access Unit made up only of sequence parameter set NAL units or picture parameter set NAL units having same timestamps to be applied

AVC Parameter Set Elementary Stream

an elementary stream made up only of AVC parameter set access units

AVC Video Elementary Stream

an elementary stream containing access units made up of NAL units for coded picture data

Add the following to Clause 5 Abbreviations and Symbols alphabetically:

| | |
|-----|--|
| AVC | Advanced Video Coding, ITU-T Recommendation H.264 ISO/IEC 14496-10 |
| HRD | Hypothetical Reference Decoder |
| IDR | Instantaneous Decoding Refresh |
| NAL | Network Abstraction Layer |
| SEI | Supplementary Enhancement Information |

Replace Table 6 with following table:

Table 6 - visualProfileLevelIndication Values

| Value | Profile | Level |
|-----------|--|-------|
| 0x00-0x7E | defined in ISO/IEC 14496-2 Annex G | - |
| 0x7F | ISO/IEC 14496-10 Advanced Video Coding | - |
| 0x80-0xFD | defined in ISO/IEC 14496-2 Annex G | - |
| 0xFE | no visual profile specified | - |
| 0xFF | no visual capability required | |

NOTE — Usage of the value 0x7F indicates the use of any profile and level of ISO/IEC 14496-10 AVC. For the real profile and level numbers for ISO/IEC 14496-10 refer to the DecoderSpecificInfo.

NOTE — Usage of the value 0xFE indicates that the content described by this InitialObjectDescriptor does not comply to any visual profile specified in ISO/IEC 14496-2 or -10. Usage of the value 0xFF indicates that none of the visual profile capabilities are required for this content.

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Replace Table 8 with the following table:

Table 8 — objectTypeIndication Values

| Value | ObjectTypeIndication Description |
|---|---|
| 0x00 | Forbidden |
| 0x01 | Systems ISO/IEC 14496-1 ^a |
| 0x02 | Systems ISO/IEC 14496-1 ^b |
| 0x03-0x1F | reserved for ISO use |
| 0x20 | Visual ISO/IEC 14496-2 |
| 0x21 | Visual ITU-T Recommendation H.264 ISO/IEC 14496-10 ^e |
| 0x22 | Parameter Sets for ITU-T Recommendation H.264 ISO/IEC 14496-10 ^e |
| 0x23-0x3F | reserved for ISO use |
| 0x40 | Audio ISO/IEC 14496-3 ^d |
| 0x41-0x5F | reserved for ISO use |
| 0x60 | Visual ISO/IEC 13818-2 Simple Profile |
| 0x61 | Visual ISO/IEC 13818-2 Main Profile |
| 0x62 | Visual ISO/IEC 13818-2 SNR Profile |
| 0x63 | Visual ISO/IEC 13818-2 Spatial Profile |
| 0x64 | Visual ISO/IEC 13818-2 High Profile |
| 0x65 | Visual ISO/IEC 13818-2 422 Profile |
| 0x66 | Audio ISO/IEC 13818-7 Main Profile |
| 0x67 | Audio ISO/IEC 13818-7 LowComplexity Profile |
| 0x68 | Audio ISO/IEC 13818-7 Scaleable Sampling Rate Profile |
| 0x69 | Audio ISO/IEC 13818-3 |
| 0x6A | Visual ISO/IEC 11172-2 |
| 0x6B | Audio ISO/IEC 11172-3 |
| 0x6C | Visual ISO/IEC 10918-1 |
| 0x6D - 0xBF | reserved for ISO use |
| 0xC0 - 0xFE | user private |
| 0xFF | No object type specified |
| <p>^a This object type shall be used for all streamTypes defined in ISO/IEC 14496-1 except IPMP streams.</p> <p>^b Includes associated Amendment(s) and Corrigendum(a).</p> <p>^c Includes associated Amendment(s) and Corrigendum(a). The actual object types are defined in ISO/IEC 14496-2 and are conveyed in the DecoderSpecificInfo as specified in ISO/IEC 14496-2, Annex K.</p> <p>^d Includes associated Amendment(s) and Corrigendum(a). The actual object types are defined in ISO/IEC 14496-3 and are conveyed in the DecoderSpecificInfo as specified in ISO/IEC 14496-3, 6.2.1.</p> <p>^e Includes associated Amendment(s) and Corrigendum(a). The actual object types are defined in ITU-T Recommendation H.264 ISO/IEC 14496-10 and are conveyed in the DecoderSpecificInfo as specified in this amendment, subclause 14.2.</p> | |

Add the following after Clause 13:

14 Usage of ITU-T Recommendation H.264 | ISO/IEC 14496-10 AVC

14.1 SL packet encapsulation of AVC Access Unit

The definition of AVC Access Unit is specified in 7.4.1.2 of ITU-T Recommendation H.264 | ISO/IEC 14496-10. Following restrictions and recommendation are applied when it is encapsulated as an SL packet.

- Start Codes shall not be present in the stream. The field indicating the size of each following NAL unit shall be added before NAL unit. The size of this field is defined in DecoderSpecificInfo.
- SL packet whose randomAccessPointFlag in the header is set to '1' and subsequent SL packets shall carry access units that parameter sets required to decode are provided prior to their use.
- The Picture Timing SEI message that defines the timing information may be present in the video elementary stream, as this message contains other information than timing, and may be required for conformance testing of decoder. However, when it is encapsulated as SL packets, those time information carried by the Picture Timing SEI message shall not be used to decide decoding time or composition time of access unit. Timing information for decoding and composition shall be provided by SL packet header.
- It is recommended encapsulating one NAL unit in one SL packet when it is delivered over lossy environment.

14.2 Handling of Parameter Sets

14.2.1 Usage of DecoderSpecificInfo

Parameter Sets of AVC contents may be updated dynamically. However, DecoderSpecificInfo carrying Parameter Sets shall not be changed through the session. Parameter Sets carried in the DecoderSpecificInfo shall be updated by one of two way as follows:

- Sequence or Picture Parameter Set NAL units may be inserted in the video stream;
- A parameter set elementary stream, containing only parameter set access units, may be used to carry parameter sets separately from AVC video elementary stream. When the parameter set elementary stream is used, access units in AVC video elementary stream shall not carry parameter sets. The parameter sets shall be updated when the decoding time defined in the header of SL packet carrying those parameter sets is reached.

14.2.1.1 Decoder Specific Information

This subclause defines the DecoderSpecificInfo descriptor for an AVC elementary stream.

14.2.1.1.1 Syntax

```
aligned(8) class AVCDecoderSpecificInfo extends DecoderSpecificInfo : bit(8)
tag-DecSpecificInfoTag {
    AVCVideoConfigurationRecord config;
}
```

14.2.1.1.2 Semantics

The decoder specific information for an AVC stream contains an AVC video stream decoder configuration record, which is defined in ISO/IEC 14496-15 subclause 5.2.4.

`config` contains the decoder configuration record for the AVC elementary stream decoder configuration.