INTERNATIONAL STANDARD

ISO/IEC 14496-15

First edition
2004-12-15

AMENDMENT 1
2006-03-01

Information technology — Coding of audio-visual objects —

Part 15: Advanced Video Coding (AVC) file format

AMENDMENT 1: Support for FRExt

Technologies de l'information — Codage des objets audiovisuels —

Partie 15: Format de fichier de codage vidéo avancé (AVC)

AMENDEMENT 1: Support pour FRExt

Reference number
ISO/IEC 14496-15:2004/Amd.1:2006(E)

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Published in Switzerland

Foreword

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Amendment 1 to ISO/IEC 14496-15:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This amendment to the AVC File Format (ISO/IEC 14496-15) introduces explicit support for the fidelity range extensions ('FRExt') of advanced video coding (ISO/IEC 14496-10).

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Advanced Video Coding (AVC) file format

AMENDMENT 1: Support for FRExt

In subclause 5.1 Elementary Stream Structure, replace 3rd paragraph (Parameter set elementary streams) with the revised definition below:

- **Parameter set elementary stream** shall contain only sequence parameter sets, picture parameter sets and sequence parameter set extension NAL units.

In Table 1, subclause 5.1, replace the row for 13-23 with the following rows:

Value of nal_unit_type	Description	Video Elementary Stream	Parameter Set Elementary Stream
13	Sequence parameter set extension seq_parameter_set_extension_rbsp( )	No. If parameter set elementary stream is not used, Sequence Parameter Set Extension shall be stored in the Decoder Specific Information.	Yes
14…18	Reserved	No	No
19	Coded slice of an auxiliary coded picture without partitioning slice_layer_without_partitioning_rbsp( )	Yes	No
20…23	Reserved	No	No

In subclause 5.2.4.1, add the following at the end of the section:

Explicit indication can be provided in the AVC Decoder Configuration Record about the chroma format and bit depth used by the avc video elementary stream. The parameter '`chroma_format_idc`' present in the sequence parameter set in AVC specifies the chroma sampling relative to the luma sampling. Similarly the parameters '`bit_depth_luma_minus8`' and '`bit_depth_chroma_minus8`' in the sequence parameter set specify the bit depth of the samples of the luma and chroma arrays. The values of `chroma_format_idc`, `bit_depth_luma_minus8`' and '`bit_depth_chroma_minus8`' must be identical in all sequence parameter sets in a single AVC configuration record. If two sequences differ in any of these values, two different AVC configuration records will be needed. If the two sequences differ in color space indications in their VUI information, then two different configuration records are also required.

Replace the Syntax definition in subclause 5.2.4.1.1 with the following:

```
aligned(8) class AVCDecoderConfigurationRecord {
   unsigned int(8) configurationVersion = 1;
   unsigned int(8) AVCProfileIndication;
   unsigned int(8) profile_compatibility;
   unsigned int(8) AVCLevelIndication;
   bit(6) reserved = '111111'b;
   unsigned int(2) lengthSizeMinusOne;
   bit(3) reserved = '111'b;
   unsigned int(5) numOfSequenceParameterSets;
   for (i=0; i< numOfSequenceParameterSets;  i++) {
      unsigned int(16) sequenceParameterSetLength ;
      bit(8*sequenceParameterSetLength) sequenceParameterSetNALUnit;
   }
   unsigned int(8) numOfPictureParameterSets;
   for (i=0; i< numOfPictureParameterSets;  i++) {
      unsigned int(16) pictureParameterSetLength;
      bit(8*pictureParameterSetLength) pictureParameterSetNALUnit;
   }
   if( profile_idc  ==  100  ||  profile_idc  ==  110  ||
       profile_idc  ==  122  ||  profile_idc  ==  144 )
   {
      bit(6) reserved = '111111'b;
      unsigned int(2) chroma_format;
      bit(5) reserved = '11111'b;
      unsigned int(3) bit_depth_luma_minus8;
      bit(5) reserved = '11111'b;
      unsigned int(3) bit_depth_chroma_minus8;
      unsigned int(8) numOfSequenceParameterSetExt;
      for (i=0; i< numOfSequenceParameterSetExt; i++) {
         unsigned int(16) sequenceParameterSetExtLength;
         bit(8*sequenceParameterSetExtLength) sequenceParameterSetExtNALUnit;
      }
   }
}
```

Include the following semantic definitions at the end of subclause 5.2.4.1.2:

`chroma_format` contains the chroma_format indicator as defined by the chroma_format_idc parameter in ISO/IEC 14496-10.

`bit_depth_luma_minus8` indicates the bit depth of the samples in the Luma arrays. For example, a bit depth of 8 is indicated with a value of zero (BitDepth = 8 + bit_depth_luma_minus8). The value of this field shall be in the range of 0 to 4, inclusive.

`bit_depth_chroma_minus8` indicates the bit depth of the samples in the Chroma arrays. For example, a bit depth of 8 is indicated with a value of zero (BitDepth = 8 + bit_depth_luma_minus8). The value of this field shall be in the range of 0 to 4, inclusive.

`numOfSequenceParameterSetExt` indicates the number of Sequence Parameter Set Extensions that are used for decoding the AVC elementary stream.

`sequenceParameterSetExtLength` indicates the length in bytes of the SPS Extension NAL unit as defined in ISO/IEC 14496-10.

`sequenceParameterSetExtNALUnit` contains a SPS Extension NAL unit, as specified in ISO/IEC 14496-10.

In subclause 5.3.6, add the following:

b) template field 'depth' in the VisualSampleEntry to document the presence of alpha.

`depth` takes one of the following values

`0x18` – the video sequence is in colour with no alpha

`0x28` – the video sequence is in grayscale with no alpha

`0x20` – the video sequence has alpha (gray or colour)