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AMENDMENT 3
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Information technology — Coding of audio-visual objects —

Part 1: **Systems**

AMENDMENT 3: JPEG 2000 support in MPEG-4

Technologies de l'information — Codage des objets audiovisuels —

Partie 1: Systèmes

AMENDEMENT 3: Support JPEG 2000 dans MPEG-4

Reference number
ISO/IEC 14496-1:2004/Amd.3:2007(E)

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

It specifies the mechanisms for enabling the use of JPEG 2000 pictures inside an MPEG-4 scene. It consists in defining the ObjectTypeIndication, the DecoderSpecificInfo and the Access Unit for JPEG 2000.

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Information technology — Coding of audio-visual objects —

Part 1: Systems

AMENDMENT 3: JPEG 2000 support in MPEG-4

In 7.2.6.6.2, Table 5, add the ObjectTypeIndication for JPEG 2000 as follows.

Replace:

Table 5 — objectTypeIndication Values

Value	`ObjectTypeIndication` Description
0x00	Forbidden
0x01	Systems ISO/IEC 14496-1 [a]
0x02	Systems ISO/IEC 14496-1 [b]
0x03	Interaction Stream
0x04	Systems ISO/IEC 14496-1 Extended BIFS Configuration [c]
0x05	Systems ISO/IEC 14496-1 AFX [d]
0x06	Font Data Stream
0x07	Synthesized Texture Stream
0x08	Streaming Text Stream
0x09-0x1F	reserved for ISO use
0x20	Visual ISO/IEC 14496-2 [e]
0x21	Visual ITU-T Recommendation H.264 | ISO/IEC 14496-10 [f]
0x22	Parameter Sets for ITU-T Recommendation H.264 | ISO/IEC 14496-10 [f]
0x23-0x3F	reserved for ISO use
0x40	Audio ISO/IEC 14496-3 [g]
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

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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	reserved for registration authority [i]
0x6E - 0x9F	reserved for ISO use
0xA0 - 0xBF	reserved for registration authority [i]
0xC0 - 0xE0	user private
0xE1	reserved for registration authority [i]
0xE2 - 0xFE	user private
0xFF	no object type specified [h]

[a] This type is used for all 14496-1 streams unless specifically indicated to the contrary. Scene Description scenes, which are identified with StreamType=0x03, using this object type value shall use the BIFSConfig specified in ISO/IEC 14496-11.

[b] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the BIFSv2Config specified in ISO/IEC 14496-11. Its use with other StreamTypes is reserved.

[c] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the BIFSConfigEx specified in subclause 7.2.6.7 of this specification. Its use with other StreamTypes is reserved.

[d] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the AFXConfig specified in subclause 7.2.6.7 of this specification. Its use with other StreamTypes is reserved.

[e] 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.

[f] 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 I.2.

[g] 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 subpart 1 subclause 6.2.1.

[h] Streams with this value with a StreamType indicating a systems stream (values 1,2,3, 6, 7, 8, 9) shall be treated as if the ObjectTypeIndication had been set to 0x01.

[i] The latest entries registered can be found in http://mp4ra.apple.com/object.html.

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with:

Table 5 — ObjectTypeIndication Values

Value	`ObjectTypeIndication` Description
0x00	Forbidden
0x01	Systems ISO/IEC 14496-1 [a]
0x02	Systems ISO/IEC 14496-1 [b]
0x03	Interaction Stream
0x04	Systems ISO/IEC 14496-1 Extended BIFS Configuration [c]
0x05	Systems ISO/IEC 14496-1 AFX [d]
0x06	Font Data Stream
0x07	Synthesized Texture Stream
0x08	Streaming Text Stream
0x09-0x1F	reserved for ISO use
0x20	Visual ISO/IEC 14496-2 [e]
0x21	Visual ITU-T Recommendation H.264 | ISO/IEC 14496-10 [f]
0x22	Parameter Sets for ITU-T Recommendation H.264 | ISO/IEC 14496-10 [f]
0x23-0x3F	reserved for ISO use
0x40	Audio ISO/IEC 14496-3 [g]
0x41-0x5F	reserved for ISO use
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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	reserved for registration authority [i]
0x6E	Visual ISO/IEC 15444-1
0x6F - 0x9F	reserved for ISO use
0xA0 - 0xBF	reserved for registration authority [i]
0xC0 - 0xE0	user private
0xE1	reserved for registration authority [i]

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0xE2 - 0xFE	user private
0xFF	no object type specified [h]

[a] This type is used for all 14496-1 streams unless specifically indicated to the contrary. Scene Description scenes, which are identified with StreamType=0x03, using this object type value shall use the BIFSConfig specified in ISO/IEC 14496-11.

[b] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the BIFSv2Config specified in ISO/IEC 14496-11. Its use with other StreamTypes is reserved.

[c] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the BIFSConfigEx specified in subclause 7.2.6.7 of this specification. Its use with other StreamTypes is reserved.

[d] This object type shall be used, with StreamType=0x03, for Scene Description streams that use the AFXConfig specified in subclause 7.2.6.7 of this specification. Its use with other StreamTypes is reserved.

[e] 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.

[f] 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 I.2.

[g] 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, subpart 1, subclause 6.2.1.

[h] Streams with this value with a StreamType indicating a systems stream (values 1,2,3, 6, 7, 8, 9) shall be treated as if the ObjectTypeIndication had been set to 0x01.

[i] The latest entries registered can be found in http://www.mp4ra.org/object.html.

In 7.2.6.6.2, add the Access Unit format for JPEG 2000 as follows.

Replace:

"When the objectTypeIndication value is 0x6C (Visual ISO/IEC 10918-1, which is JPEG) the stream may contain one or more Access Units, where one Access Unit is defined to be a complete JPEG (as defined in Visual ISO/IEC 10918-1). Note, that that timing and other Access Unit and packetization information is to be carried in the transport layer such as the MPEG-4 Sync Layer."

with:

"When the objectTypeIndication value is 0x6C (Visual ISO/IEC 10918-1, which is JPEG) the stream may contain one or more Access Units, where one Access Unit is defined to be a complete JPEG (as defined in Visual ISO/IEC 10918-1). Note, that timing and other Access Unit and packetization information is to be carried in the transport layer such as the MPEG-4 Sync Layer.

When the objectTypeIndication value is 0x6E (Visual ISO/IEC 15444-1, which is JPEG 2000) the stream may contain one or more Access Units, where one Access Unit is defined to be a complete JPEG 2000 (as defined in Visual ISO/IEC 15444-1). Note, that timing and other Access Unit and packetization information is to be carried in the transport layer such as the MPEG-4 Sync Layer.

NOTE The format defined in ISO/IEC 15444-3 is preferred for the storage of JPEG 2000 sequences in file format of the ISO/IEC 14496-12 family, including MP4."

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In 7.2.6.7.2, add the DecoderConfigDescriptor for JPEG 2000 as follows.

Add at the end of the subclause:

"For values of `DecoderConfigDescriptor.objectTypeIndication` that refer to streams complying with ISO/IEC 15444-1, the decoder specific information is:

```
class JPEG2000_DecoderConfig extends DecoderSpecificInfo : bit(8)
tag=DecSpecificInfoTag {
   int(32) height;
   int(32) width;
   int(16) nc;
   int(8) BPC;
   int(8) C;
   int(8) UnkC;
   int(8) IPR;
}
```

The definition of the fields is extracted from ISO/IEC 15444-1 and is formulated as follows:

`height`: Image area height. The value of this parameter indicates the height of the image area. This field is stored as a 4-byte big endian unsigned integer.

`width`: Image area width. The value of this parameter indicates the width of the image area. This field is stored as a 4-byte big endian unsigned integer.

`nc`: Number of components. This parameter specifies the number of components in the codestream and is stored as a 2-byte big endian unsigned integer. The value of this field shall be equal to the value of the Csiz field in the SIZ marker in the codestream.

`BPC`: Bits per component. This parameter specifies the bit depth of the components in the codestream, minus 1, and is stored as a 1-byte field.

`C`: Compression type. This parameter specifies the compression algorithm used to compress the image data. The value of this field shall be 7. It is encoded as a 1-byte unsigned integer. Other values are reserved for ISO use.

`UnkC`: Colourspace Unknown. This field specifies if the actual colourspace of the image data in the codestream is known. This field is encoded as a 1-byte unsigned integer. Legal values for this field are 0, if the colourspace of the image is known and correctly specified in the Colourspace Specification boxes within the file, or 1, if the colourspace of the image is not known. A value of 1 will be used in cases such as the transcoding of legacy images where the actual colourspace of the image data is not known. In those cases, while the colourspace interpretation methods specified in the file may not accurately reproduce the image with respect to some original, the image should be treated as if the methods do accurately reproduce the image. Values other than 0 and 1 are reserved for ISO use.

`IPR`: Intellectual Property. This parameter indicates whether this JP2 file contains intellectual property rights information. If the value of this field is 0, this file does not contain rights information, and thus the file does not contain an IPR box. If the value is 1, then the file does contain rights information and thus does contain an IPR box as defined in I.6. Other values are reserved for ISO use.

The set of parameters defined above may all be extracted from the JP2 header box and are informal for setting up the JPEG 2000 decoder. However, if any conflict occurs with parameters from the JPEG 2000 header box in the Access Unit, the later have precedence.

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