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Information technology — JPEG 2000 image coding system —

Part 12: ISO base media file format

Technologies de l'information — Système de codage d'images JPEG 2000 —

Partie 12: Format ISO de base pour les fichiers médias

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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.

ISO/IEC 15444-12 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This fourth edition cancels and replaces the third edition (ISO/IEC 15444-12:2008) of which it constitutes a minor revision. It also incorporates the Amendment ISO/IEC 15444-12:2008/Amd.1:2009 and the Technical Corrigenda ISO/IEC 15444-12:2008/Cor.1:2008, ISO/IEC 15444-12:2008/Cor.2:2009, ISO/IEC 15444-12:2008/Cor.3:2009, and ISO/IEC 15444-12:2008/Cor.4:2011.

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ISO/IEC 15444 consists of the following parts, under the general title *Information technology — JPEG 2000 image coding system*:

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— *Part 1: Core coding system*

— *Part 2: Extensions*

— *Part 3: Motion JPEG 2000*

— *Part 4: Conformance testing*

— *Part 5: Reference software*

— *Part 6: Compound image file format*

— *Part 8: Secure JPEG 2000*

— *Part 9: Interactivity tools, APIs and protocols*

— *Part 10: Extensions for three-dimensional data*

— *Part 11: Wireless*

— *Part 12: ISO base media file format*

— *Part 13: An entry level JPEG 2000 encoder*

— *Part 14: XML structural representation and reference*[1]

[1] To be published.

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Introduction

The ISO Base Media File Format is designed to contain timed media information for a presentation in a flexible, extensible format that facilitates interchange, management, editing, and presentation of the media. This presentation may be 'local' to the system containing the presentation, or may be via a network or other stream delivery mechanism.

The file structure is object-oriented; a file can be decomposed into constituent objects very simply, and the structure of the objects inferred directly from their type.

The file format is designed to be independent of any particular network protocol while enabling efficient support for them in general.

The ISO Base Media File Format is a base format for media file formats.

It is intended that the ISO Base Media File Format shall be jointly maintained by WG1 and WG11. Consequently, a subdivision of work created ISO/IEC 15444-12 and ISO/IEC 14496-12 in order to document the ISO Base Media File Format and to facilitate the joint maintenance.

This technically identical text is published as ISO/IEC 14496-12 for MPEG-4, and as ISO/IEC 15444-12 for JPEG 2000, and reference to this specification should be made accordingly. The recommendation is to reference one, for example ISO/IEC 14496-12, and append to the reference a parenthetical comment identifying the other, for example "(technically identical to ISO/IEC 15444-12)".

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The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents.

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

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Information technology — JPEG 2000 image coding system —

Part 12:
ISO base media file format

1 Scope

This part of ISO/IEC 15444 specifies the ISO base media file format, which is a general format forming the basis for a number of other more specific file formats. This format contains the timing, structure, and media information for timed sequences of media data, such as audio-visual presentations.

This part of ISO/IEC 15444 is applicable to JPEG 2000, but its technical content is identical to that of ISO/IEC 14496-12, which is applicable to MPEG-4.

2 Normative references

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The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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ISO 639-2:1998, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO/IEC 9834-8:2005, *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities: Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 Object Identifier components*

ISO/IEC 11578:1996, *Information technology — Open Systems Interconnection — Remote Procedure Call (RPC)*

ISO/IEC 14496-1:2010: *Information technology — Coding of audio-visual objects — Part 1: Systems*

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

ISO/IEC 14496-14, *Information technology — Coding of audio-visual objects — Part 14: MP4 file format*

ISO/IEC 15444-1, *Information technology — JPEG 2000 image coding system: Core coding system*

ISO/IEC 15444-3, *Information technology — JPEG 2000 image coding system: Motion JPEG 2000*

ISO/IEC 15938-1, *Information technology — Multimedia content description interface — Part 1: Systems*

ISO/IEC 23001-1, *Information technology — MPEG systems technologies — Part 1: Binary MPEG format for XML*

ISO/IEC 23002-3, *Information technology — MPEG video technologies — Part 3: Representation of auxiliary video and supplemental information*

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ISO/IEC 29199-2:2012, *Information technology — JPEG XR image coding system — Part 2: Image coding specification*

ISO 15076-1:2010, *Image technology colour management — Architecture, profile format and data structure — Part 1: Based on ICC.1:2010*

IETF RFC 2045, *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*, FREED, N. and BORENSTEIN, N., November 1996

IETF RFC 2046, *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types*, FREED, N. and BORENSTEIN, N., November 1996

IETF RFC 3550, *RTP: A Transport Protocol for Real-Time Applications*, SCHULZRINNE, H. et al., July 2003.

IETF RFC 3711, "*The Secure Real-time Transport Protocol (SRTP)*", BAUGHER, M. et al., March 2004

IETF RFC 5052, *Forward Error Correction (FEC) Building Block*, WATSON, M. et al., August 2007

IETF RFC 5905, *Network Time Protocol Version 4: Protocol and Algorithms Specification*, MILLS, D., et al, June 2010

SMIL 1.0 "*Synchronized Multimedia Integration Language (SMIL) 1.0 Specification*", <http://www.w3.org/TR/REC-smil/>

Rec. ITU-R TF.460-6, *Standard-frequency and time-signal emissions (Annex I for the definition of UTC.)*

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3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

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For the purposes of this document, the following terms and definitions apply.

3.1.1
box
object-oriented building block defined by a unique type identifier and length

NOTE Called 'atom' in some specifications, including the first definition of MP4.

3.1.2
chunk
contiguous set of samples for one track

3.1.3
container box
box whose sole purpose is to contain and group a set of related boxes

NOTE Container boxes are normally not derived from 'fullbox'

3.1.4
hint track
special track which does not contain media data, but instead contains instructions for packaging one or more tracks into a streaming channel

3.1.5
hinter
tool that is run on a file containing only media, to add one or more hint tracks to the file and so facilitate streaming

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3.1.6
ISO Base Media File
name of the files conforming to the file format described in this specification

3.1.7
leaf subsegment
subsegment that does not contain any indexing information that would enable its further division into subsegments

3.1.8
media data box
box which can hold the actual media data for a presentation (`'mdat'`)

3.1.9
movie box
container box whose sub-boxes define the metadata for a presentation (`'moov'`)

3.1.10
presentation
one or more motion sequences, possibly combined with audio

3.1.11
random access point (RAP)
sample in a track that starts at the ISAU of a SAP of type 1 or 2 or 3 as defined in Annex I

NOTE Informally, a sample, from which when decoding starts, the sample itself and all samples following in composition order can be correctly decoded.

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3.1.12
random access recovery point
sample in a track with presentation time equal to the TSAP of a SAP of type 4 as defined in Annex I

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NOTE Informally, a sample, that can be correctly decoded after having decoded a number of samples that is before this sample in decoding order, sometimes known as gradual decoding refresh.

3.1.13
sample
all the data associated with a single timestamp

NOTE 1 No two samples within a track can share the same time-stamp.

NOTE 2 In non-hint tracks, a sample is, for example, an individual frame of video, a series of video frames in decoding order, or a compressed section of audio in decoding order; in hint tracks, a sample defines the formation of one or more streaming packets.

3.1.14
sample description
structure which defines and describes the format of some number of samples in a track

3.1.15
sample table
packed directory for the timing and physical layout of the samples in a track

3.1.16
sync sample
sample in a track that starts at the ISAU of a SAP of type 1 or 2 as defined in Annex I

NOTE Informally, a media sample that starts a new independent sequence of samples; if decoding starts at the sync sample, it and succeeding samples in decoding order can all be correctly decoded, and the resulting set of decoded

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