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Information technology — Coding of audio-visual objects —

Part 4: Conformance testing

AMENDMENT 24: File format conformance

Technologies de l'information — Codage des objets audiovisuels —

Partie 4: Essai de conformité

AMENDEMENT 24: Conformité de format de fichier

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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 24 to ISO/IEC 14496-4:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Information technology — Coding of audio-visual objects —

Part 4: Conformance testing

AMENDMENT 24: File format conformance

Rename the title of 4.7:

4.7 MP4 File Format

to:

4.7 File Format

In 4.7 insert the following subclause: renumbering existing Subclauses 4.7.1 and 4.7.2 as 4.7.2 and 4.7.3 respectively:

4.7.1 Introduction

This subclause describes the conformance suite for the file format standards in MPEG-4. Since these standards share a lot of technology, their conformance program is being handled together. These standards are:

1) ISO/IEC 14496-12 (technically identical to ISO/IEC 15444-12): ISO base media file format
2) ISO/IEC 14496-14: MP4 file format
3) ISO/IEC 14496-15: Advanced Video Coding (AVC) file format (Storage of AVC in ISO files)

The purpose of the conformance suite is to cover the set of valid features that may be exercised in the file format. Media conformance is not covered, though of course in order to exercise the file format features, media has to be stored.

In order to assure coverage of features, the associated spreadsheet is used to list the features in groups, and to document which files exercise each feature. Features not currently covered by any file are marked with the sign "---".

After 4.7.3: Reading, add the following subclauses:

4.7.4 Process

Those wishing to check the conformance of their implementation should perform the following checks. First, all conformance should check the "basic box handling" section of the tests, as this is common to all

specifications. Then, the mandatory features of the selected specification should be checked, and finally, of course, those optional features that the implementation being checked also covers.

The suite of conformance tests do not currently cover deliberately errored files. However, such files do occur in practice and implementations should be written to be resilient.

There is no tool provided to check the conformance of files. However, such tools do exist; the reference software can be used to open files in 'debug' mode and provide a listing of what it finds, and other trade associations and standards bodies may have validation tools tailored to their areas.

4.7.5 Areas tested

The attached Excel document has two spreadsheets. The first briefly lists the areas and features covered, and then has a column for each proposed file. The second sheet provides a brief description of each area and feature, by line.

4.7.6 File Documentation

4.7.6.1 a1

This file is about as simple as it gets. It has an MPEG-4 video part 2 visual track, and an AAC track, interleaved; and an ISMA minimal scene and OD track, with an IOD.

4.7.6.2 a2

This file is basically the same as a1, but hinted for RTP transmission.

4.7.6.3 a3

This file uses the protected stream structures, in the ISMACryp 1.0 use of them. The keys are also supplied, and the result of de-protection (for comparison).

4.7.6.4 a4

This uses movie fragments. The initial 1-second movie is followed by a 1-second movie fragment. Fragment-aware readers should play 2 seconds of content, fragment-unaware readers only 1 second.

4.7.6.5 a5

This is a very simple video-only main profile AVC file. Since it is the main profile, composition offsets are used.

4.7.6.6 a6

This is the same tone as used in test 3, but the actual access units are stored in a separate file, referenced by a relative URL "./myData.dat " from the main file.

4.7.6.7 a7

This file also uses the 1-second tone. However, it has both UUID and a 'junk' atom in it (which should be ignored), free space (also ignored), and the compact sample size table, and a padding bits table (though the padding bits are all set to zero). The mdat atom has an implied length (the length in the file is zero, meaning to end of file).

4.7.6.8 a8

This file has the foreman 10 second of video, with 5 seconds before and after, of “container”. However, the edit list should select only foreman; the container ship should not appear. Note that the I-frames do not land on the edit boundaries; a player will have to pre-roll the video from an I-frame to work correctly.

4.7.6.9 a9

This file demonstrates the suggested way of handling AAC: it has a pre-roll sample group, and a track edit that is not aligned at either start or end with an AAC sample boundary.

4.7.6.10 a10

This file contains ‘raw’ (YUV420) video. Since this is an unregistered codec type (it’s actually supported in QuickTime movie files) this is an unrecognized codec type from an MP4 reader’s point of view.

4.7.6.11 a11

This file tests handling of very large (>4GB) files. Be careful, when unzipped, it expands to just over 4GB. It is double-zipped, because it's much smaller that way.

The ‘mdat’ atom has a large (64-bit) size, and all the samples are at the end, preceded by 4GB of zeroes. Therefore the chunk offset table is also a co64, not an stco. The actual media data is a simple AAC tone.

4.7.6.12 f1

This file is a simple AVC + AAC file. It has an MPEG-4 AVC Baseline visual track (including the optional BitrateBox), and an AAC track.

4.7.6.13 f2

This file is a protected AVC + AAC file according to ISMACryp [1]. The 128-bit key for the decryption process is 0x01020304050607080102030405060708 for both tracks. The salt (counter offset) is 0x0000000000000001 for the audio and 0x0000000000000002. Because of the usage of proteced streams, “isom” was replace with “iso2” in the list of compatible brands.

All files are 3GP files containing AMR speech at 12.2 or 6.7 kbps, with or without DTX (silence frames). In addition, 3GP files with hint tracks (produced by Helix) are provided.

4.7.6.14 male_amr122.3gp

AMR 12.2kbps, no DTX

4.7.6.15 male_amr122DTX.3gp

AMR 12.2kbps, DTX

4.7.6.16 female_amr67_hinted.3gp

AMR 6.7kbps, no DTX, hint track

4.7.6.17 female_amr67DTX_hinted.3gp

AMR 6.7kbps, DTX, hint track

4.7.6.18 01-simple.mp4

Simple AV file (MPEG-4 ASP video, AAC audio), BIFS+OD scene, 2 timelines (BIFS/OD and A/V), interleaved

4.7.6.19 02-dref_edts_img.mp4

image track, audio track with edit list, with media data located outside the file

4.7.6.20 03-hinted.mp4

Simple video file with MPEG-4 ASP visual, hinted for RTP (RFC 3640 payload)

4.7.6.21 04-bifs_video.mp4

Video (MPEG-4 ASP visual) + BIFS text (reading 'unprotected video'), with a single timeline

4.7.6.22 05-bifs_video_protected.mp4

Protected Video (MPEG-4 ASP visual) + BIFS text (reading 'protected video'), with a single timeline. Protection is done according to ISMACryp. Keys are described in an item located in a meta box at the file root level, ISMA KMS URI refering

to this item. Keys are:

key 0x2b7e151628aed2a6abf7158809cf4f3c

salt 0xf8f9fafbfcfdfeff

Only video I-frames are encrypted.

4.7.6.23 06-bifs.mp4

Simple animation with a single BIFS track. File moov box is located after mdat box.

4.7.6.24 07-bifs_sprite.mp4

Simple looping animation with two BIFS tracks, exercising decoding dependency and synchronization track references.

Animation track uses ShadowSync samples in-between regular samples.

4.7.6.25 08-bifs_carousel.mp4

Simple animation with a single BIFS track. Random Access Samples are inserted in-between the samples for the BIFS carsousel, and signaled with a sample dependency type box.

4.7.6.26 09-text.mp4

Sample MPEG-4 Streaming Text file, stored in 3GPP text track format, with 2 sample descriptions.

4.7.6.27 10-fragments.mp4

Simple AV file (MPEG-4 ASP video, AAC audio), BIFS+OD scene, stored as a sequence of 500 ms fragments.