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Information technology — Multimedia application format (MPEG-A) —

Part 19: Common media application format (CMAF) for segmented media

AMENDMENT 2: Additional structural CMAF brand profile

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Clause 3, Terms and definitions

3.2.1
CMAF track
Add the following note:

Note 1 to entry: In addition to a *primary media track* (3.2.14), the CMAF track can also contain *supplementary metadata tracks* (3.2.15).

Add 2 new terms to Clause 3.2:

3.2.14
primary media track
main content track that carries the audio, video, or audiovisual data, essential for the core playback experience and always present in the `MovieBox`

3.2.15
supplementary metadata track
metadata track that is directly related to the media data of the primary media track (3.2.14) within the same CMAF track (3.2.1).

Note 1 to entry: This track uses a handler type equal to `'meta'` and provides metadata that enhances or describes the associated primary media content.

Add 2 new terms to Clause 3.3:

3.3.19
texture picture
picture that carries pixel data corresponding to information that can be rendered on a screen or some other device, either directly or indirectly after the consideration of additional information, such as alpha, depth, display, colour format, colour processing, and/or other information that can be associated with such pixel data

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3.3.20
alpha picture
picture that contains a video signal representing information indicating the opacity level of each pixel in an associated foreground picture and how that associated picture should be blended with other pictures for purposes of alpha blending

Clause 4, Abbreviated terms

Add the following abbreviated terms:

MV multi-view

Clause 7

7.1 Overview

Replace the two paragraphs with the following text:

The CMAF track format is derived from the ISO base media file format in this clause and structural brands are specified. At this point, the `'cmfc'`, the `'cmf1'`, and the `'cmf2'` CMAF structural brands are defined. The `'cmf2'` brand further restricts the `'cmfc'` brand. The `'cmf1'` brand both extends and restricts the `'cmfc'` brand.

Several CMAF media objects are derived from the CMAF track format.

7.2

Replace Table 1 with:

Table 1 — CMAF brands

Brand	Location	Conformance requirements
`cmfc`	`FileTypeBox` and `SegmentTypeBox`	7.6
`cmf2`	`FileTypeBox` and `SegmentTypeBox`	7.7
`cmf1`	`FileTypeBox` and `SegmentTypeBox`	7.8
`cmfs`	`SegmentTypeBox`	7.3.3.1
`cmfl`	`SegmentTypeBox`	7.3.3.2
`cmff`	`SegmentTypeBox`	7.3.2.3
`cmfr`	`SegmentTypeBox`	7.3.2.4

Replace Table 2 with:

Table 2 — Common media application format file extensions

Track type	File extension	Internet media type (MIME type)
Video	`.cmfv`	`video/mp4`
Audio	`.cmfa`	`audio/mp4`
Text (subtitle)	`.cmft`	`application/mp4`
Metadata	`.cmfm`	`application/mp4`

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7.3.1

Replace 4th row of Table 3 with:

	trak					+	ISO/IEC 14496-12	CMAF 7.5.21	Container for each track

Replace 32nd row of Table 3 with:

		trex				+	ISO/IEC 14496-12	CMAF 7.5.14	Track extends box

Replace 7th row of Table 5 with:

	traf					+	ISO/IEC 14496-12	CMAF 7.5.21	Track fragment

7.3.2.1

Replace the bullet point c)4) with:

4) The MovieBox shall contain exactly one primary media track containing media data as specified in subclause 7.3.2.2.

NOTE Timed metadata tracks can be provided as separate CMAF timed metadata tracks in a separate selection set. Alternatively, supplementary metadata tracks can be included in the same CMAF selection set.

7.3.2.2

Replace the bullet point d with:

d) Each CMAF track contains a single primary media track and TrackBox for the media data, as determined by the CMAF header constraints specified in subclause 7.3.2.1. A CMAF track can contain additional TrackBoxes if it carries supplementary metadata tracks.

7.3.2.3

Replace the bullet points b), c) and f) with:

b) The MovieFragmentBox shall conform to the constraints of the structural CMAF brand constraints specified in Table 5 and clause 7.5.21. The MovieFragmentBox shall contain only one TrackFragmentBox of the primary media track and can contain TrackFragmentBoxes of the supplementary metadata tracks.

c) The MediaDataBox shall contain all media samples referenced by the TrackRunBox. The MediaDataBox should follow the TrackRunBox in byte order unless another TrackFragmentBox follows within the same MovieFragmentBox. If multiple TrackFragmentBoxes are present within a MovieFragmentBox, the MediaDataBox shall follow the last TrackFragmentBox in that MovieFragmentBox, ensuring all samples referenced by the TrackRunBoxes are contained in the corresponding MediaDataBox.

f) A CMAF chunk shall contain a TrackFragmentBaseMediaDecodeTimeBox containing the baseMediaDecodeTime of the first media sample.

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7.3.3.3

Replace the bullet points d) and e) with:

d) A CMAF track can use an offset edit list as specified in subclauses 7.5.13, 10.2.6 and 9.2.7.

e) A video CMAF track can use version 1 `TrackRunBoxes` using negative composition offsets to adjust the composition time of the earliest presented video media sample in each CMAF fragment to its `baseMediaDecodeTime` and the earliest video media sample in the CMAF track file to zero, without using an offset edit list.

7.5.14

Replace the entire text with:

At least one `TrackExtendsBox` shall be present in a CMAF track since it is a fragmented file as defined in ISO/IEC 14496-12.

7.5.21

Add a new subclause:

7.5.21 Constraints on the number of tracks in a single CMAF track

A single primary media track shall always be present in a CMAF track.

Additional supplementary metadata tracks can be present, and if present, shall use the track reference box with at least one track reference type box that describes the association of the supplementary metadata track to the primary media track. If a specific track reference type is not defined to link the metadata track to the primary media track it describes, the `'cdsc'` track reference type should be used.

7.6

Replace the entire text with:

A CMAF track conforming to the CMAF structural brand `'cmfc'` shall conform to the CMAF track constraints defined in subclauses 7.1, 7.2, 7.3, 7.4, and 7.5. In addition, no supplementary metadata tracks shall be present.

7.7.2

Replace both paragraphs with:

For video CMAF tracks that are not video CMAF track files, the `EditBox` and, in particular, the `EditListBox` shall not be present.

For other CMAF tracks and for video CMAF track files as well as any other media types, the `EditListBox` can be present following the constraints in subclause 7.5.13.

7.8

Add a new subclause, 7.8.

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