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

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

**AMENDMENT 1: SHVC media profile and
additional audio media profiles**

*Technologies de l'information — Format pour application multimédia
(MPEG-A) —*

*Partie 19: Format CMAF (Common Media Application Format) pour
médias segmentés*

*AMENDEMENT 1: Profil média SHVC et profils médias audio
supplémentaires*



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

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Clause 2

Add the following normative references:

ISO/IEC 23008-3:—¹⁾, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 3: 3D audio*

ISO/IEC 23091-3, *Information technology — Coding-independent code points — Part 3: Audio*

ISO/IEC 23003-4:2015, *MPEG audio technologies — Part 4: Dynamic range control*

Clause 3

Add the following terms and definitions to subclause 3.2:

3.2.10

audio programme

complete collection of all audio programme components and, if present, a set of accompanying presets

3.2.11

audio programme component

smallest addressable unit of an audio programme

Clause 5

Add the following new paragraphs at the end of Clause 5:

Annex H specifies the CMAF media profile for scalable HEVC (SHVC).

Annex I specifies the CMAF media profile for multichannel AAC.

Annex J specifies the CMAF media profile for MPEG-H audio.

1) Under preparation. Stage at the time of publication: ISO/FDIS 23008-3:2018.

Subclause 9.1

Before the last paragraph in subclause 9.1, add a new paragraph:

An additional CMAF media profile for scalable HEVC (SHVC) is defined in Annex H.

Subclause 10.1

Replace the first sentence with:

This clause specifies CMAF audio tracks derived from the CMAF track format, with additional constraints specific to CMAF audio tracks and audio CMAF media profiles.

Additional CMAF media profiles are defined in

- Annex I for multichannel AAC, and
- Annex J for MPEG-H 3D audio.

Annex G

Following Annex G, add new Annexes H, I and J:

Annex H (normative)

Scalable HEVC media profile and track format

H.1 Dependent CMAF tracks

Dependent CMAF tracks can only be processed with the availability of one or more CMAF tracks. Specifically, CMAF fragments of dependent CMAF track can only be decoded and/or rendered if the corresponding CMAF fragment of all of the CMAF tracks it depends on are available. CMAF tracks that are not dependent CMAF tracks are regular CMAF tracks.

In a hypothetical CMAF receiver, the corresponding CMAF fragments of CMAF tracks depended on, are expected to be available prior to the CMAF fragments of the dependent CMAF track.

A manifest offering CMAF presentations with dependent CMAF tracks is expected to provide signalling of dependent and required CMAF tracks.

H.2 Scalable HEVC CMAF tracks

Scalable HEVC CMAF tracks shall conform to Clauses 7, 8, 9, and 12, and shall additionally conform to the constraints specified in this Annex.

Each scalable HEVC CMAF track that does not contain VCL NAL units with `nuh_layer_id` and `TemporalID` both equal to 0 is a dependent CMAF track and the constraints specified for dependent CMAF tracks in Clause H.1 shall apply. It is expected that the manifest provides signalling to express the dependency of a dependent CMAF track on another CMAF track, for example, using the `@dependencyID` in a DASH MPD.

H.3 CMAF switching set constraints for scalable HEVC CMAF tracks and media profiles

H.3.1 General

Subclause 9.2.3 applies, and additionally the following constraints apply:

- Each CMAF track with sample entry 'hev1' shall conform to the HEVC media profile and track format as specified in Annex B.
- Each CMAF track containing a scalable HEVC bitstream or part thereof shall contain exactly one ISO BMFF track.
- When multiple CMAF tracks are present for carrying a scalable HEVC bitstream, the corresponding ISO BMFF tracks shall use distinct track IDs.
- CMAF switching sets containing a media profile listed in Clause H.6 with sample entry 'hev2' and 'lhe1' shall conform to single initialization CMAF switching set constraints.

Each coded video sequence in a scalable HEVC bitstream shall contain the necessary sequence parameter set and picture parameter set NAL units to signal decoding parameters changes allowed between CMAF tracks in the same switching set.