



International
Standard

ISO/IEC 23000-19

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

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

**AMENDMENT 1: Low complexity
enhancement video Coding (LCEVC)
and other technologies**

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

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

*AMENDEMENT 1: Codage vidéo d'amélioration de faible
complexité (LCEVC) et autres technologies*

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

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

Part 19:

Common media application format (CMAF) for segmented media

AMENDMENT 1: Low complexity enhancement video Coding (LCEVC) and other technologies

Clause 2, Normative references

Add the following document:

ISO/IEC 23094-2:2021, *Information technology — General video coding — Part 2: Low complexity enhancement video coding*

Clause 4

Add the following abbreviated terms:

EVC essential video coding

LCEVC low complexity enhancement video coding

VVC verstaile video coding

Clause 5

Add the following text:

Annex O describes packaging and codec constraints for some CMAF media profiles using the LCEVC video codec. Systems claiming conformance to CMAF using LCEVC shall conform to the provisions of Annex O.

Annex O

Add the following new annex after Annex N, before the Bibliography:

Annex O (normative)

LCEVC media profile and track format

0.1 Dependent CMAF tracks

The LCEVC media profile makes use of Dependent CMAF Tracks, as defined in Clause H.1.

0.2 LCEVC CMAF tracks

LCEVC CMAF tracks shall conform to Clauses 7, 8, 9, and 12 and shall additionally conform to the constraints specified in this annex.

Each LCEVC CMAF track that does not contain the Base Codec VCL NAL units 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 LCEVC CMAF track on a Base CMAF track, for example, using the @dependencyID in a DASH MPD.

0.3 CMAF switching set constraints for LCEVC CMAF tracks and media profiles

0.3.1 General

Subclause 9.2.3 shall apply with the following additional constraints.

- Each CMAF track with sample entry 'lvc1' shall conform to the LCEVC media profile and track format as specified in this annex.
- Each CMAF track containing a Base bitstream or an LCEVC bitstream or part thereof shall contain exactly one ISO BMFF track with a Base bitstream or an LCEVC bitstream, respectively.
- When two CMAF tracks are present for carrying Base and LCEVC bitstreams, the corresponding ISO BMFF tracks shall use distinct track IDs.
- CMAF switching sets containing a media profile listed in clause 0.6 with sample entry 'lvc1' shall conform to single initialization CMAF switching set constraints.

Each coded video sequence in an LCEVC bitstream shall contain the necessary parameter sets (Sequence Configuration, Global Configuration) to signal decoding parameters changes allowed between CMAF tracks in the same switching set.

0.3.2 Sample Description Box ('stds')

Subclauses 9.2.4 and 9.3.2.2 shall apply with the following additional restrictions.

A decoder configuration record:

- shall signal other parameter sets (Sequence Configuration, Global Configuration) fields used by the video track as specified in ISO/IEC 14496-15:2022, 13.7.4;
- for a visual sample entry with codingname 'lvc1', shall contain one or more decoding parameter sets (containing Sequence Configuration, Global Configuration NAL units for LCEVC video). Each video sample in the CMAF track shall reference a parameter set in the sample entry;