

# Addendum: Insert ID3 Tags into a CMAF Stream

Nielsen ID3 tags are commonly inserted into HTTP Live Streaming (HLS) and MPEG-DASH content. In the near future, Nielsen ID3 tags will begin to appear in Common Media Application Format (CMAF) content as well. If you plan to package the Nielsen ID3 Tags in a CMAF or fragmented MP4 (fMP4) container, follow the guidelines in “Timed Metadata in the Common Media Application Format (CMAF),” a document that is still in draft format, subject to revision by the Alliance for Open Media.

This addendum describes how you should customize your CMAF container to include Nielsen ID3 tags. As the Alliance for Open Media updates its recommendation, we will update this document as well.

## Event Message (emsg) Box, Version 1

Your CMAF package should carry each Nielsen ID3 tag in the event message (emsg) box of the segment to which it applies. If audio segments are carried separately from video segments, then the Nielsen in-band event message should be carried with the audio segment.

CMAF introduces a new version of the emsg box, version 1 (previous version was 0). Between versions 0 and 1, the Alliance for Open Media modified both the layout and the meaning of the emsg box fields.

The syntax of the emsg boxes that carry ID3 tags is defined in “Timed Metadata in the Common Media Application Format (CMAF).” The following byte-aligned fields must follow the box length (4 bytes), type (“emsg”), version (1), and flags (0):

- **Timescale (4 bytes):** The emsg box timescale setting should match the timescale used for the segment. If the segment includes a sidx box, then the timescale of the emsg box and the timescale of the sidx box should match. Otherwise, the timescale can be deduced from the CMAF audio playlist (m3u8) file.
- **Presentation\_time (8 bytes):** The 8-byte presentation\_time represents the earliest presentation time in this segment. If a sidx box is present in the segment, then the emsg box presentation\_time should be set to the earliest\_presentation\_time of the sidx box. Otherwise, the emsg box presentation\_time should be derived from the tfdt box base\_media\_decode\_time. Divide the base\_media\_decode\_time by the timescale to derive the presentation\_time as the offset, in seconds, from the beginning of the content.
- **Event duration (4 bytes):** The event\_duration must be set to 0xffff, indicating an unknown duration.

- **ID (4 bytes):** The event ID may be used to identify this instance of the message; for example, you could use a “clock” value that advances by 1 for each second of processed audio. However, the ID field has no functional use and may be set to 0 or 1.
- **Scheme\_id\_uri (29 bytes):** The scheme\_id\_uri is a null-terminated ASCII string set to “https://aomedia.org/emsg/ID3”.

**Note** For MPEG-DASH manifests, this string matches the stream\_id\_uri in the MPD; this requirement is specified in section 5.10.3.3.1 of ISO/ID3 23009-1:2019.

- **Value (23 bytes):** a null-terminated ASCII string, set to “www.nielsen.com:id3:v1”.
- **Message\_data (271 bytes):** The complete 271-byte ID3 tag, starting with the ID3 tag header and ending with the ASCII character “A.” Whenever the PCM-to-ID3 SDK ResultCallback() function returns an ID3 tag, you must copy the entire 271-byte tag into the emsg box message-data. If there are two or more ID3 tags to be inserted into the emsg box, they may be separated by the ASCII EOL character; however, this is a suggestion, not a requirement.

See section 5.10.3.3 of ISO/IEC 23009-1:2019 for a complete description of event message boxes. See section 5.10.3.2 for a description of MPD signaling.

For requirements pertaining to the manifest (HLS M3U8 playlist or MPEG-DASH Media Presentation Description), refer to Appendix D of the *Nielsen PCM-to-ID3 SDK Developer Guide*.

## ID3 Tag Timing

It is essential that each Nielsen ID3 tag be placed in the emsg box that holds the last second of audio (or video) data to which the ID3 tag corresponds.

## Normative References

### [CMAF]

The Alliance for Open Media, “Timed Metadata in the Common Media Application Format (CMAF)”, Editors Draft, 25 June 2019. <https://aomediacodec.github.io/av1-id3/>. Accessed 2019-09-25.

### [DASH]

International Organization for Standardization, “Information technology – Dynamic adaptive streaming over HTTP (DASH) – Part 1: Media presentation description and segment formats”, ISO/IEC 23009-1:2019: Third edition, 2019-08.

### [HLS]

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Revision History

<b>Revision</b>	<b>Date</b>	<b>Description</b>
1	2019-09-24	Initial version
2	2019-09-25	Put document into template
3	2019-09-26	Updated references to ISO/IEC 23009-1