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

**Part 9:
Digital Multimedia Broadcasting
application format**

**AMENDMENT 2: Harmonization on
MPEG-2 TS storage**

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

*Partie 9: Format pour application de diffusion générale multimédia
numérique*

AMENDEMENT 2: Harmonisation sur stockage MPEG-2 TS

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Amendment 2 to ISO/IEC 23000-9:2008 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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Replace 6.5 with the following:

6.5 Storage and playback of transport stream

6.5.1 Introduction

A simple storage and playback method of MPEG-2 TS is defined by utilizing a subset of MPEG-2 TS Reception Hint Track functionalities defined in the ISO-FF (more specifically, ISO/IEC 14496-12:2008/Amd.1:2009, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format — AMENDMENT 1: General improvements including hint tracks, metadata support, and sample groups*). Thus, if otherwise mentioned in this standard, the restrictions in the ISO-FF shall apply.

6.5.2 File structure and track type definition

An MPEG-2 TS is stored sequentially (i.e., untouched) as a sample data. A sample can be the whole TS to be stored or a segment of it. All the sample boundaries shall be aligned with the TS packet boundaries.

A handler type of 'hint' (hint track) is used for the stored MPEG-2 TS and the matching media information header shall be 'hmhd' (hint media header). The `maxPDUsSize` and `avgPDUsSize` fields in the 'hmhd' of the TS hint track shall take the value of 188 (the TS packet size).

MPEG-2 TS hint tracks can be used in two contexts; one is to guide streaming servers to easily generate a transport stream from the stored MPEG-2 TS and the other is to guide players for local playback or preview of stored (or recorded) MPEG-2 TS. Note that this standard defines the latter one only.

In this standard, an MPEG-2 TS is always stored as 'already-prepared' samples regardless of whether it is from direct reception or from content providers. Thus the MPEG-2 TS hint track defined in this standard does not refer to other media tracks for dynamic composition of MPEG-2 TS from the media data. The track header flags in the `tkhd` (track header box) would normally be set as follows:

- `track_enabled` = 1
- `track_in_movie` = 1
- `track_in_preview` = 1.

6.5.3 Sample format

In this standard, the MPEG-2 TS sample format defined in the ISO-FF standard is restricted to be some group of complete MPEG-2 TS packets.

In case `stss` (sync sample box) is absent, a sample is defined as a group of TS packets containing independently decodable group of video or audio access units. More specifically, following rules apply;

- If video exist in the TS to be stored, then TS packets corresponding to a GOP (Group of Pictures) are defined as one sample. The `random_access_indicator` inside the `adaptation_field()` of TS packet can be used to identify the starting TS packet corresponding to a GOP; In this case, a sample starts from a TS packet having `random_access_indicator=1` and ends just before the firstly encountered another TS packet having `random_access_indicator=1`.
- If video does not exist in the TS to be stored, then TS packets corresponding to an audio frame are defined as one sample.

In case `stss` box exists, then the `entry_count` in the `stss` box shall take the value of 0, which means that the sync sample positions are unknown and a sample is defined as the whole TS packets.

Note that the Player should check the existence of `stss` box to determine which sample definition should be applied.

6.5.4 Sample description format

The MPEG-2 TS sample description format defined in ISO-FF shall apply except the following restrictions.

- `MPEG2TSServerSampleEntry` is not used and only `MPEG2TSReceptionSampleEntry` with code point of 'rm2t' is used for this standard.
- When using `MPEG2TSReceptionSampleEntry`, the following restrictions apply;
 - `precedingbyteslen = 0`
 - `trailingbyteslen = 0`
 - `precomputed_only_flag = 1`
 - Exactly one `PMTBox` and one `TSTimingBox` shall be included in `additionaldata[]`. At most one `ODBox`, `BIFSBox`, and `InitialSampleTimeBox` may be present in `additionaldata[]`. If other box appears in `additionaldata[]`, it may be ignored and discarded.
- The syntax of the `BIFSBox` is defined in this standard as follows:


```
aligned(8) class BIFSBox () extends Box ('tBFS') {
    uint(3) reserved;
    uint(13) PID;
    uint(8) sectiondata[];
```
- For the `ODBox` and `BIFSBox`, the following restrictions shall apply;
 - `PID` is the `PID` of the MPEG-2 TS packets correspond only to the non-dependent OD (BIFS) stream; The non-dependent OD (BIFS) stream is defined as the OD (BIFS) stream whose `streamDependenceFlag` value in the corresponding `ES_Descriptor/IOD/PMT` is set to 0.