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Matroska Media Container Control Track Specifications

Abstract

This document defines the Control Track usage found in the Matroska container.

Status of This Memo

Copyright Notice

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1. Introduction

2. Status of this document

This document is a work-in-progress specification defining the Matroska file format as part of the [IETF Cellar working group](#). It uses basic elements and concept already defined in the Matroska specifications defined by this workgroup.

3. Security Considerations

This document inherits security considerations from the EBML and Matroska documents.

4. IANA Considerations

To be determined.

5. Notation and Conventions

The key words **"MUST"**, **"MUST NOT"**, **"REQUIRED"**, **"SHALL"**, **"SHALL NOT"**, **"SHOULD"**, **"SHOULD NOT"**, **"RECOMMENDED"**, **"NOT RECOMMENDED"**, **"MAY"**, and **"OPTIONAL"** in this document are to be interpreted as described in BCP 14 [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

6. Edition Flags

6.1. EditionFlagHidden

When the EditionFlagHidden flag is set to false it means the Edition
is visible and selectable in a Matroska Player. All ChapterAtoms
Elements **MUST** be interpreted with their own ChapterFlagHidden flags.

ChapterFlagHidden	False	True	visible
Chapter 1	X		yes
Chapter 2		X	no

Table 1: ChapterAtom visibility to the
user

When the EditionFlagHidden flag is set to true the Edition is hidden
and **SHOULD NOT** be selectable in a Matroska Player. If all Editions
EditionFlagHidden flags are set to true, there is no visible
Edition. In this case all ChapterAtoms Elements **MUST** also be
interpreted as if their ChapterFlagHidden flag is also set to true,
regardless with their own ChapterFlagHidden flags.

ChapterFlagHidden	False	True	visible
Chapter 1	X		no
Chapter 2		X	no

Table 2: ChapterAtom visibility in hidden
editions

6.2. EditionFlagDefault

It is **RECOMMENDED** that no more than one Edition have an
EditionFlagDefault Flag set to true. The first Edition with both the
EditionFlagDefault Flag set to true and the EditionFlagHidden Flag
set to false is the Default Edition. When all EditionFlagDefault
Flags are set to false, then the first Edition with the
EditionFlagHidden Flag set to false is the Default Edition. The
Default Edition is the edition that should be used for playback by
default.

6.3. Default Edition

The Default Edition is the Edition that a Matroska Player **SHOULD** use
for playback by default.

The first Edition with both the EditionFlagDefault flag set to true
and the EditionFlagHidden flag set to false is the Default Edition.
When all EditionFlagDefault flags are set to false and all
EditionFlagHidden flag set to true, then the first Edition is the

Default Edition. When all EditionFlagHidden flags are set to true, then the first Edition with the EditionFlagDefault flag set to true is the Default Edition. When all EditionFlagDefault flags are set to false, then the first Edition with the EditionFlagHidden flag set to false is the Default Edition. When there is no Edition with a EditionFlagDefault flag are set to true and a EditionFlagHidden flags are set to false, then the first Edition with the EditionFlagHidden flag set to false is the Default Edition.

In other words, in case the Default Edition is not obvious, the first Edition with a EditionFlagHidden flag set to false **SHOULD** be preferred.

Edition	FlagHidden	FlagDefault	Default Edition
Edition 1	true	true	
Edition 2	true	true	
Edition 3	false	true	X

Table 3: Default edition, some visible, all default

Edition	FlagHidden	FlagDefault	Default Edition
Edition 1	true	false	X
Edition 2	true	false	
Edition 3	true	false	

Table 4: Default edition, all hidden, no default

Edition	FlagHidden	FlagDefault	Default Edition
Edition 1	true	false	
Edition 2	true	true	X
Edition 3	true	false	

Table 5: Default edition, all hidden, with default

Edition	FlagHidden	FlagDefault	Default Edition
Edition 1	true	false	
Edition 2	false	false	X
Edition 3	false	false	

Table 6: Default edition, some visible, no default

Edition	FlagHidden	FlagDefault	Default Edition
Edition 1	true	false	
Edition 2	true	true	
Edition 3	false	false	X

Table 7: Default edition, some visible, some default

7. Chapter Flags

If a Control Track toggles the parent's ChapterFlagHidden flag to false, then only the parent ChapterAtom and its second child

ChapterAtom **MUST** be interpreted as if ChapterFlagHidden is set to false. The first child ChapterAtom, which has the ChapterFlagHidden flag set to true, retains its value until its value is toggled to false by a Control Track.

The ChapterFlagEnabled value can be toggled by control tracks.

7.1. ChapterFlagEnabled

If the ChapterFlagEnabled flag is set to false a Matroska Player **MUST NOT** use this Chapter and all his Nested Chapters. For Simple Chapters, a Matroska Player **MAY** display this enabled Chapter with a marker in the timeline. For Ordered Chapters a Matroska Player **MUST** use the duration of this enabled Chapter.

Chapter + Nested Chapter	ChapterFlagEnabled	used
Chapter 1	true	yes
+Nested Chapter 1.1	true	yes
+Nested Chapter 1.2	false	no
++Nested Chapter 1.2.1	true	no
++Nested Chapter 1.2.2	false	no
Chapter 2	false	no
+Nested Chapter 2.1	true	no
+Nested Chapter 2.2	true	no

Table 8

8. Matroska Schema

Extra elements used to handle Control Tracks and advanced selection features:

8.1. Segment

8.1.1. Chapters

8.1.1.1. EditionEntry

8.1.1.1.1. EditionFlagHidden Element

name: EditionFlagHidden

path: \Segment\Chapters\EditionEntry\EditionFlagHidden

id: 0x45BD

minOccurs: 1

maxOccurs: 1

range: 0-1

default:

　　0

type: uinteger

definition: Set to 1 if an edition is hidden. Hidden editions
　　SHOULD NOT be available to the user interface (but still to
　　Control Tracks; see [Section 7](#) on Chapter flags).

8.1.1.1.1.1. ChapterFlagEnabled Element

name: ChapterFlagEnabled

path: \Segment\Chapters\EditionEntry\
　　+ChapterAtom\ChapterFlagEnabled

id: 0x4598

minOccurs: 1

maxOccurs: 1

range: 0-1

default: 1

type: uinteger

definition: Set to 1 if the chapter is enabled. It can be enabled/
　　disabled by a Control Track. When disabled, the movie **SHOULD** skip
　　all the content between the TimeStart and TimeEnd of this
　　chapter; see [Section 7](#) on Chapter flags.

8.1.1.1.1.2. ChapterTrack Element

name: ChapterTrack

path: \Segment\Chapters\EditionEntry\+ChapterAtom\ChapterTrack

id: 0x8F

maxOccurs: 1

type: master

definition: List of tracks on which the chapter applies. If this
　　Element is not present, all tracks apply

8.1.1.1.1.3. ChapterTrackUID Element

name: ChapterTrackUID

path:
      \Segment\Chapters\EditionEntry\
   +ChapterAtom\ChapterTrack\ChapterTrackUID

id: 0x89

minOccurs: 1

range: not 0

type: uinteger

definition: UID of the Track to apply this chapter to. In the
   absence of a control track, choosing this chapter will select the
   listed Tracks and deselect unlisted tracks. Absence of this
   Element indicates that the Chapter **SHOULD** be applied to any
   currently used Tracks.

9. Menu Specifications

This document is a *draft of the Menu system* that will be the default
one in Matroska. As it will just be composed of a Control Track, it
will be seen as a "codec" and could be replaced later by something
else if needed.

A menu is like what you see on DVDs, when you have some screens to
select the audio format, subtitles or scene selection.

9.1. Requirements

What we'll try to have is a system that can do almost everything
done on a DVD, or more, or better, or drop the unused features if
necessary.

As the name suggests, a Control Track is a track that can control
the playback of the file and/or all the playback features. To make
it as simple as possible for Matroska Players, the Control Track
will just give orders to the Matroska Player and get the actions
associated with the highlights/hotspots.

9.1.1. Highlights/Hotspots

A highlight is basically a rectangle/key associated with an action
UID. When that rectangle/key is activated, the Matroska Player send
the UID of the action to the Control Track handler (codec). The fact
that it can also be a key means that even for audio only files, a
keyboard shortcut or button panel could be used for menus. But in
that case, the hotspot will have to be associated with a name to
display.

This highlight is sent from the Control Track to the Matroska
Player. Then the Matroska Player has to handle that highlight until
it's deactivated; see [Section 9.1.2](#).

The highlight contains a UID of the action, a displayable name
(UTF-8), an associated key (list of keys to be defined, probably up/
down/left/right/select), a screen position/range and an image to
display. The image will be displayed either when the user place the
mouse over the rectangle (or any other shape), or when an option of
the screen is selected (not activated). There could be a second
image used when the option is activated. And there could be a third
image that can serve as background. This way you could have a still
image (like in some DVDs) for the menu and behind that image blank
video (small bitrate).

When a highlight is activated by the user, the Matroska Player has
to send the UID of the action to the Control Track. Then the Control
Track codec will handle the action and possibly give new orders to
the Matroska Player.

The format used for storing images **SHOULD** be extensible. For the
moment we'll use PNG and BMP, both with alpha channel.

9.1.2. Playback features

All the following features will be sent from the Control Track to
the Matroska Player :

   *Jump to chapter (UID, prev, next, number)

   *Disable all tracks of a kind (audio, video, subtitle)

   *Enable track UID (the kind doesn't matter)

   *Define/Disable a highlight

   *Enable/Disable jumping

   *Enable/Disable track selection of a kind

   *Select Edition ID (see chapters)

   *Pause playback

   *Stop playback

   *Enable/Disable a Chapter UID

   *Hide/Unhide a Chapter UID

All the actions will be written in a normal Matroska track, with a
timestamp. A "Menu Frame" **SHOULD** be able to contain more that one
action/highlight for a given timestamp. (to be determined, EBML
format structure)

9.1.3. Player requirements

Some Matroska Players might not support the control track. That mean
they will play the active/looped parts as part of the data. So I
suggest putting the active/looped parts of a movie at the end of a
movie. When a Menu-aware Matroska Player encounter the default
Control Track of a Matroska file, the first order **SHOULD** be to jump
at the start of the active/looped part of the movie.

9.2. Working Graph

```
Matroska Source file -> Control Track <-> Player.
                     -> other tracks   -> rendered
```

10. Normative References

[**RFC2119**] Bradner, S., "Key words for use in RFCs to Indicate
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