Martoska, FFV1 and FLAC for Audio-Visual Preservation

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Standardisation

SMPTE

- CineForm/VC-5, ProRes, AXF

ISO

- TI/A

IETF

- EBML, Matroska, FFV1 und FLAC

IETF

Internet **E**ngineering **T**ask **F**orce

- voluntary Internet standards
- open standard organisation
- volunteers

→ https://www.ietf.org

CELLAR

Codec **E**ncoding for **L**oss**L**ess **A**rchiving and **R**ealtime transmission

- EBML
- Matroska
- FFV1 and FLAC

➔ https://datatracker.ietf.org/wg/cellar/

EBML

Extensible **B**inary **M**eta **L**anguage

- binary XML format
- open source

➔ https://github.com/Matroska-Org/ebml-specification

Matroska (.mkv)

- «extensible media container»
- based on EBML
- open source

➔ https://github.com/Matroska-Org matroska-specification

FFV1

FFmpeg **V**ideo codec **1** [FF = **F**ast **F**orward]

- «simple and efficient lossless intra-frame only video codec»
- open source

➔ https://github.com/ffmpeg/ffv1

FLAC

Free **L**ossless **A**udio **C**odec

- «fastest and most widely supported lossless audio codec»
- open source

→ https://github.com/privatezero/flac_markdown

Data is anything but «raw».

$Y'C_BC_R$ 4:2:2

from:

- MOV / 10 or 8 bit «uncompressed»
- AVI / 10 or 8 bit «uncompressed»
- MP4 / 10 or 8 bit «uncompressed»

to:

- Matroska / FFV1

RGB or R′G′B′ 4:4:4

from:

- folder, TAR or ZIP / TIFF 16 bit
- MXF / DPX 16, 12 or 10 bit
- AXF / JPEG 2000

to:

- Matroska / FFV1

What is inside my DPX?

- log neg encoding
- log RGB encoding, quasi-log encoding
- gamma encoding, power function encoding
- scene-linear encoding

Today: Archive Master

Film
- folder, TIFF, 2K, RGB, 4:4:4, 16 bit
- TAR, DPX, 2K, R'G'B', 4:4:4, 10 bit

Video
- AVI, $Y'C_BC_R$, HD, 4:2:2, 10 bit
- Matroska, FFV1, HD, $Y'C_BC_R$, 4:2:2, 10 bit

Sound
- BWF, 96 kHz, 24 bit
- WAVE, 96 kHz, 24 bit

Today: Mezzanine

Video
- HD, Apple ProRes 4444
- HD, Apple ProRes 422 HQ
- HD, Avid DNxHD 175x

Sound
- BWF, 48 kHz, 24 bit
- WAVE, 48 kHz, 24 bit

Today: Access

MP4

Video
- HD, H.264, yuv420p, «lossy»

Sound
- AAC, 44.1 kHz, 16 bit

Archive [and Mezzanine]

Film

- Matroska, FFV1, 2K, «RGB», 4:4:4, 16 bit

Video

- Matroska, FFV1, HD, $Y'C_BC_R$, 4:2:2, 10 bit

Sound

- Matroska, FLAC, 96 kHz, 24 bit

Access

WebM (a subset of Matroska)

Video

- HD, «H.264», yuv420p

Sound

- «WAV», 48 kHz, 16 bit

Reading

- Reto Kromer: «Matroska and FFV1: One File Format for Film and Video Archiving?», in «Journal of Film Preservation», n. 96 (April 2017), FIAF, Brussels, Belgium, p. 41–45

→ https://retokromer.ch/publications/JFP_96.html

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