

The Bright Side of Data Migration!

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Filmkonservierung und -restaurierung
Bern, 13.–14. Dezember 2018

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Data Migrations

2014

- our internal archive from LTO-4 to LTO-6 (5.7 PB)

2014–[2019?]

- [...]

[2019?]

- our internal archive from LTO-6 to LTO-8

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```
Terminal — less · man openlto

migratelto {-D desk [-I identifier] [-N name]} [-x path] -d desk [-i
identifier]
migratelto -h
Migrate from one LTO generation to another LTO generation.

-D one or more source desk's identifiers

-I one or more source cartridge's identifier

-N one or more source cartridge's name

-x path to script to execute

The data are read from the source desk, piped to the script, piped
to writing onto the destination desk:
read | script | write

-d destination desk's identifier

-i destination cartridge's identifier

-n destination cartridge's name
```

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```
Terminal — less · man openlto

-D one or more source desk's identifiers

-I one or more source cartridge's identifier

-N one or more source cartridge's name

-x path to script to execute

The data are read from the source desk, piped to the script, piped
to writing onto the destination desk:
read | script | write

-d destination desk's identifier

-i destination cartridge's identifier

-n destination cartridge's name

-h display a help message

This function may also be used to copy files from one LTO cartridge to
another, when data transformation is needed, even between the same LTO
generation.
```

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read | script | write

script to modify

- container
- codec
- both container and codec

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Examples

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#1: ProRes-born Content

from:

- ProRes stored inside QuickTime (.mov)

to:

- ProRes stored inside Matroska (.mkv)

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Update the Container

→ read file from source LTO

→ demultiplex file

- ProRes 422, 10 bit [yuv422p10le]
- ProRes 4444, 10 bit [yuv444p10le or yuva444p10le] or 12 bit [yuv444p12le]

→ multiplex file

→ write file to destination LTO

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SMPTE REGISTERED DISCLOSURE DOCUMENT

Apple ProRes Bitstream Syntax and Decoding Process



Page 1 of 39 pages

The attached document is a Registered Disclosure Document prepared by the sponsor identified below. It has been examined by the appropriate SMPTE Technology Committee and is believed to contain adequate information to satisfy the objectives defined in the Scope, and to be technically consistent.

This document is NOT a Standard, Recommended Practice or Engineering Guideline, and does NOT imply a finding or representation of the Society.

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The screenshot shows a web browser window displaying an Apple Newsroom article. The browser's address bar shows the URL: <https://www.apple.com/newsroom/2018/04/final-cut-pro-x-update->. The article title is "Final Cut Pro X update introduces ProRes RAW and advanced closed captioning", dated "APRIL 5, 2018". The article includes social media sharing icons for Facebook, Twitter, Email, and a link icon.

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Apple ProRes RAW

White Paper
April 2018

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#2: Video

from:

- AVI / 8-bit and 10-bit uncompressed
- MOV / 8-bit and 10-bit uncompressed
- MP4 / 8-bit and 10-bit uncompressed

to:

- Matroska / FFV1

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Container and Codec

- read file from source LTO
- demultiplex file
- decode file
 - $Y'CbCr$, 4:2:2, 8 bit, «raw» [uyvy422]
- encode file
- multiplex file
- write file to destination LTO

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Container and Codec

- read file from source LTO
- demultiplex file
- decode file
 - $Y'CbCr$, 4:2:2, 10 bit, «raw» [yuv422p10le]
- encode file
- multiplex file
- write file to destination LTO

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#3: Old Experimentations

from:

- AVI / HuffYUV
- AVI / FFV1 version 1

to:

- Matroska / FFV1 [version 3]

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#4: Mid Experimentations 1

from:

- AVI / CineForm (VC-5) with Bayer
- MOV / CineForm (VC-5) with Bayer
- MOV / ProRes

to:

- Matroska / FFV1 after de-mosaicking
- Matroska / ProRes

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#5: Mid Experimentations 2

from:

- AVI / CineForm (VC-5) with Bayer
- MOV / CineForm (VC-5) with Bayer
- MOV / ProRes

to:

- Matroska / FFV1 version 4 [with Bayer]
- Matroska / ProRes with 12-bit support

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#6: New Experimentations

from:

- MXF / OpenEXR
- flavour of NUT / multispectral imaging
- flavour of NUT / RGB72 or Y'CbCr 24-bit
- flavour of NUT / expanded OpenEXR

to:

- Matroska / FFV1 version 4 using RGB48, RGB72, floats and additional metadata

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Reading

Reto Kromer: **On the Bright Side of Data Migrations**, in «IASA Journal», n. 49 (September 2018), IASA, p. 14–18

→ https://retokromer.ch/publications/IASA_49.html

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