

# MediaConch

Implementation and policy checking  
on FFV1, Matroska, LPCM (and more)



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# MediaArea

Open source software company focused on digital media analysis

- **MediaInfo**  
Convenient unified display of the most relevant technical and tag data for video and audio files
- **MediaConch**  
Implementation checker, policy checker, & reporter
- **QCTools**  
Helps users analyze and understand their digitized video files through use of audiovisual analytics and filtering
- **BWF MetaEdit, AVI MetaEdit**  
(and MOV MetaEdit soon)  
Embedding, validating, and exporting of metadata



# What is MediaConch?

## Implementation and Policy reporter

[Check by file upload](#)
[Check online files](#)
[Check server files](#)

Policy: 
 Display: 
 Verbosity: 
[Check files](#)

**Results** × Close all results

Apply a policy to all results:

Show  entries Search:

Files	Implem	Policy	MediaInfo	MediaTrace	Status
ffv1_test_pixfmt-yuv444p10le...	✓ Valid	✗ Matroska is well described?			✓
ffv1_test_pixfmt-yuva422p_co...	✓ Valid	✗ Matroska is well described?			✓
ffv1_test_pixfmt-yuva444p_co...					
veraPDF test suite 6-1-10-t0...	✗ Not valid	✗ Matroska is well described?			✓
train1.tif	✗ Not valid	✗ Matroska is well described?			✓
buggy_header.pdf	✗ Not valid	✗ Matroska is well described?			✓


Showing 11 to 16 of 16 entries

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# What is MediaConch?

## Implementation report:

 MediaConch Report

File: C:/temp/FFV1+PCM\_WithChecksum\_Untouched.mkv

MediaConch EBML Implementation Checker

Toggle all verbosity:


- ▶ **EBML-ELEM-START** Tests run: 1 | Results: ✔
- ▶ **EBML-VER-COH** Tests run: 1 | Results: ✔
- ▶ **EBML-DOCVER-COH** Tests run: 1 | Results: ✔
- ▶ **EBML-ELEMENT-VALID-PARENT** Tests run: 87 | Results: ✔
- ▶ **EBML-ELEMENT-NONMULTIPLES** Tests run: 70 | Results: ✔
- ▶ **EBML-ELEMENT-CONTAINS-MANDATES** Tests run: 43 | Results: ✔
- ▶ **EBML-ELEMENT-IN-SIZE-RANGE** Tests run: 43 | Results: ✔
- ▶ **EBML-VALID-MAXID** Tests run: 1 | Results: ✔
- ▶ **EBML-VALID-MAXSIZE** Tests run: 1 | Results: ✔
- ▶ **HEADER-ELEMENTS-WITHIN-IDLENGTH-LIMIT** Tests run: 1 | Results: ✔
- ▶ **ELEMENTS-WITHIN-MAXIDLENGTH** Tests run: 1 | Results: ✔
- ▶ **HEADER-ELEMENTS-WITHIN-MAXSIZELENGTH** Tests run: 1 | Results: ✔
- ▶ **ELEMENTS-WITHIN-MAXSIZELENGTH** Tests run: 1 | Results: ✔
- ▶ **MKV-SEEK-RESOLVE** Tests run: 4 | Results: ✔
- ▶ **EBML-CRC-FIRST** Tests run: 6 | Results: ✔
- ▶ **EBML-CRC-VALID** Tests run: 6 | Results: ✔
- ▶ **MKV-VALID-TRACKTYPE-VALUE** Tests run: 2 | Results: ✔
- ▶ **MKV-VALID-BOOLEANS** Tests run: 3 | Results: ✔

MediaConch FFV1 Implementation Checker

- ▶ **FFV1-SLICE-CRC-VALID** Tests run: 4 | Results: ✔

MediaConch PCM Implementation Checker

## Policy report:

 MediaConch Report

File: C:/temp/FFV1+PCM\_WithChecksum\_Untouched.mkv

- ♥ **Example MKV FFV1 digitization policy** ✘ fail

Example of a digitization specification of analog SD video to FFV1 and Matroska.

**Type:** and | **Rules run:** 17 | **Fail count:** 5 | **Pass count:** 12

- ▶ **Is it Matroska?** ✔ pass
- ▶ **Matroska version 4 or greater?** ✔ pass
- ▶ **Unique ID is present?** ✔ pass
- ▶ **Is the video FFV1?** ✔ pass
- ▶ **FFV1 is version 3.4 or later?** ✔ pass
- ▶ **FFV1 is encoded in GOP size of 1?** ✘ fail
- ▶ **FFV1 uses slice crcs?** ✔ pass
- ▶ **Display Aspect Ratio is 4/3?** ✘ fail (Actual: 1.222)
- ▶ **Frame Rate is Constant?** ✔ pass
- ▶ **ColorSpace is YUV?** ✘ fail (Actual: RGB)
- ▶ **Chroma Subsampling is 4:2:2?** ✘ fail
- ▶ **Audio is PCM?** ✔ pass
- ▶ **Audio is 48000 Hz?** ✔ pass
- ▶ **Is this NTSC or PAL SD?** ✘ fail
- ▶ **Bit Depth is 8 or 10?** ✔ pass
- ▶ **Audio is Stereo or Mono?** ✔ pass
- ▶ **Bit Depth is 16 or 24?** ✔ pass



# What is MediaConch?

## General information about your files

Key	Value
C:/Programmation/PreFormaMediaInfo/SampleTestFiles/FFV1/ffv1_3.mkv	
General	
UniqueID	88323790047680325859674626238128084708
Format	Matroska
Format_Version	4
FileSize	126167
Duration	1.000
OverallBitRate	1009336
FrameRate	25.000
FrameCount	25
StreamSize	2511
Video	
StreamOrder	0
ID	1
UniqueID	1
Format	FFV1
Format_Version	3.4
CodecID	V_MS/VFW/FOURCC / FFV1
Duration	1.000
BitRate	989250
Width	320



# What is MediaConch?

Inspect your files

Offset	Key	Value
0x00000000	EBML (30 bytes)	
0x0000001e	Segment (35726 bytes)	
0x0000001e	Header (12 bytes)	
0x0000002a	SeekHead (115 bytes)	
0x0000009d	Void (88 bytes)	
0x000000f5	Info (139 bytes)	
0x00000180	Tracks (112 bytes)	
0x00000180	Header (5 bytes)	
0x00000185	CRC-32 (6 bytes)	
0x0000018b	TrackEntry (101 bytes)	
0x0000018b	Header (2 bytes)	
0x0000018d	CRC-32 (6 bytes)	
0x00000193	TrackNumber - 1 (3 bytes)	
0x00000196	TrackType - 1 (3 bytes)	
0x00000199	CodecID - V_FFV1 (8 bytes)	
0x000001a1	TrackUID - 1 (4 bytes)	
0x000001a5	FlagLacing - 0 (3 bytes)	
0x000001a8	Language - und (7 bytes)	
0x000001af	DefaultDuration - 40000000 (8 bytes)	
0x000001b7	Video (12 bytes)	
0x000001c3	CodecPrivate (45 bytes)	
0x000001c3	Header (3 bytes)	
0x000001c6	version	3 (0x3)
0x000001c6	micro_version	4 (0x4)
0x000001c6	coder_type	0 (0x0)



# What is MediaConch?

## Policy editor

**Policy list:**

Q Search

- User policies
  - Video file is MKV + FFV1-Intra + PCM or FLAC with CRC32 everywhere (or)
    - MKV, FFV1 Intra, PCM/FLAC, error detection (and)
      - Container is MKV**
      - Video is FFV1
      - GOP size of 1
      - Container uses error detection
      - Video uses error detection
      - Audio is PCM or FLAC (or)
    - Has no video track
  - matrix\_coefficients not same (and)
- System policies
  - Is this NTSC or PAL SD? (and)
  - Example MKV FFV1 digitization policy (and)
  - Matroska is well described? (and)
  - CAVPP Preservation Master (and)
  - Memoriav Video files Recommendations (or)

**Rule type** MediaInfo MediaTrace

**Rule name** ⓘ  
Container is MKV

**Track type** ⓘ \*  
General

**Field** ⓘ \*  
Format

**Occurrence** ⓘ

**Validator** ⓘ  
Is equal (=)

**Content** \*  
Matroska

Save Duplicate Delete



# What is MediaConch?

## Public policies

Public policies page lists policies our users would like to share with you.

If you want to share yours, go to [policy editor page](#) (don't forget to [login](#) in order to associate your policy to your account), select the policy you want so share and set the "policy visibility" field to "public".

### Video file is MKV + FFV1-Intra + PCM or FLAC with CRC32 everywhere

Test that the video file is suitable for archiving purposes from my point of view ;-).  
- Container format is Matroska with error detection (CRC)  
- Video format is FFV1 with error detection (CRC) and with Intra mode (each frame is independent)  
- Audio format is PCM (unfortunately it can not contain error detection) or FLAC (it has CRC by design)

Maintainer: Jérôme Martinez (MediaArea)  
License: CC-BY-SA-4.0+

Add to my policies

Export

### PDF is PDF/A

Test that a PDF is suitable for archives.  
Note: for the moment, test that it is marked as PDF/A. Other ideas?

Maintainer: Jérôme Martinez (MediaArea)  
License: CC-BY-SA-4.0+

Add to my policies

Export

### TIFF is Raw

Test that a TIFF file is suitable for archive.  
Note: for the moment, test that it is raw. Other ideas?

Maintainer: Jérôme Martinez (MediaArea)  
License: CC-BY-SA-4.0+

Add to my policies

Export

### Austrian Mediathek: Preservation Master (Video)

PAL/NTSC, FFV1 version 0/1, PCM 44.1/48kHz in AVI

Maintainer: Peter B.  
License: CC-BY-4.0+

Add to my policies

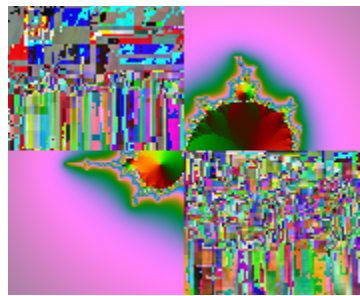
Export



# What is MediaConch?

## Fixer

- Segment sizes in Matroska
- Matroska “bit flip” correction
- FFV1 “bit flip” correction





# Integration

Archivematica is an integrated suite of open-source software tools that allows users to process digital objects from ingest to access in compliance with the ISO-OAIS functional model

The screenshot shows the Archivematica web interface. The top navigation bar includes: archivematica, Transfer, Ingest (with a red notification bubble containing '17'), Backlog, Archival storage, Preservation planning, Access, Administration, and test. Below the navigation bar is a breadcrumb trail: Format Policy Commands. The main heading is 'Format Policy Command Information'. On the left is a sidebar menu with links for Formats, Groups, Identification, Tools, Rules, Commands, Format policy registry, and Tools. The main content area features a 'Create New Command' link, a 'Show 10 entries' dropdown, and a search box. A table displays the following data:

Description	Usage	Tool	Enabled	Actions
Check against policy NYULibraries_MKVFFV1-MODIFIED using MediaConch	Validation	MediaConch	True	<a href="#">View</a>   <a href="#">Replace</a>   <a href="#">Disable</a>
Validate using JHOVE	Validation	JHOVE	True	<a href="#">View</a>   <a href="#">Replace</a>   <a href="#">Disable</a>
Validate using MediaConch	Validation	MediaConch	True	<a href="#">View</a>   <a href="#">Replace</a>   <a href="#">Disable</a>

Showing 1 to 3 of 3 entries

Navigation: ◀ Previous Next ▶



# MediaConch interfaces

- Graphical interface
- Web interface
- Command line
- Server (REST API)
- (Work in progress) a library (.dll/.so/.dylib)



# CELLAR: IETF workgroup

- Open standards group
- Goal to IETF-standardize Matroska/FFV1/FLAC
- A lot of progress, especially with Matroska/EBML specs
- <https://datatracker.ietf.org/wg/cellar/charter/>



# And after PREFORMA sponsorship?

It depends on you!

- This is open source
- Driven by user requests
- Everyone can develop or sponsor a development
- Potential features:
  - Support of tests for your preferred format  
(MOV? MXF? JP2k? WAV?)
  - Support of other checkers  
(BWF MetaEdit? QCTools?)
  - Integration in your workflow
  - ...



# Stay in touch

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Slides: <https://mediaarea.net/Events>

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