YOU CAN DO IT!

Empowering Archivists to Use Open Tools to Process A/VMaterials

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Homebrew

Ari

First step is installing Homebrew. Homebrew is very easy to install, but you may need to work with your IT or Systems Team to make sure that you have the necessary permissions to install it on your workstations. There is excellent documentation for how to install homebrew, so we'll link to those in our slides.

Homebrew is a package manager for the Mac operating system as well as Linux, which is used on PCs. Homebrew is used via your command line or terminal application. Homebrew installs hundreds of useful tools onto your workstation. It also tracks and manages updates for all the programs installed, so you can easily update all of the tools at the same time using very simple commands. You'll want to incorporate the commands "brew update", "brew upgrade", and "brew doctor" into your daily workflow to keep your packages up to date. At the very least, you'll want to run these commands before you begin digitizing.

brew tap amiaopensource/amiaos

pugetsoundandvision/pugetsoundandvision

download QCTools

BWFMetaEdit

Ari

Once you have Homebrew installed, the next command you'll need to know is "brew TAP" which allows you to identify additional repositories to add to your package manager. For this set up, you'll be tapping repositories from the Association of Moving Image Archivists and from Puget Sound and Vision. You'll also need to download QCtools and BWFMetaEdit from the links provided at the end of the presentation.

brew install vrecord
audiorecorder
ltopers
ltotools

brew install cask videotools
audiotools

Ari

The final command to know is "brew install", which allows you to define a specific package to install. All of the open source tools we're going to show you today have robust documentation and installation instructions, all of which we'll link to, so if you have any problems installing them, there's help!. Once you've got homebrew installed, as well as the packages above, you're ready to begin!
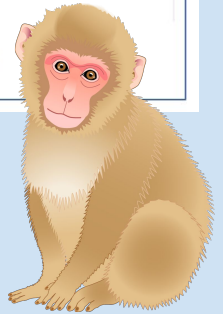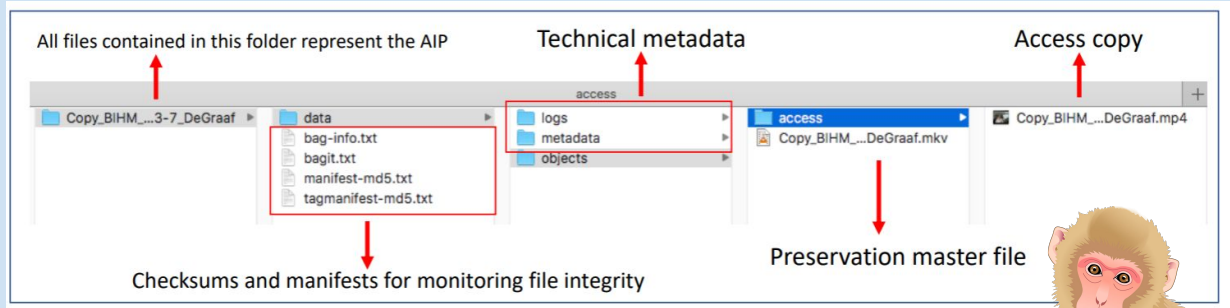
VideoAIP and AudioAIP are both open source tools for creating Archival Information Packages, or AIPS.

ANATOMY OF AN AIP

All files contained in this folder represent the AIP

Technical metadata

Access copy

access

| Copy_BIHM_...3-7_DeGraaf ▶ | data ▶ | logs ▶ | access ▶ | Copy_BIHM_...DeGraaf.mp4 |

bag-info.txt
bagit.txt
manifest-md5.txt
tagmanifest-md5.txt

logs
metadata
objects

access
Copy_BIHM_...DeGraaf.mkv

Checksums and manifests for monitoring file integrity

Preservation master file

Ari

AIPS are a critical component to any robust digital preservation plan. Inside an Archival Information Package, you can see we've got checksums and manifests for monitoring integrity, technical metadata, our preservation master, and our access copy.

VIDEOAIP

Ari

VideoAIP creates archival information packages from video files. VideoAIP creates an exact copy of the preservation master file, an MP4 access file, as well as checksums and manifests. It works on .MKV, .DV, .MOV, .MP4s. VideoAIP was developed and is maintained by Andrew, with testing and documentation support from Libby and myself, so if there is another type of file you want to use with VideoAIP, ask us about that afterwards and we can give you some feedback.

videoaip **-e**

videoaip **-l auto** */PATH/TO/VideoFile.mkv*

videoaip **-c** */PATH/TO/VideoFile.mkv*

Ari

The basic format for videoaip commands is "videoaip [the flag] [path to your file]". The first command will open up a dialog box where you can select your settings, there are multiple options here for syncing additional copies of the AIPs, as well as an option for syncing an additional copy of just the access file. So if your workflow is such that you will be uploading all of your access files onto a digital platform, it is nice to have them available right on your desktop.

Videoaip -l auto will incorporate into the AIP any .LOG or .FRAMEMD5 files that have the same name as your video input. These files are generated by VRecord.

Videoaip -c offers an option for cropping and trimming your access copy.
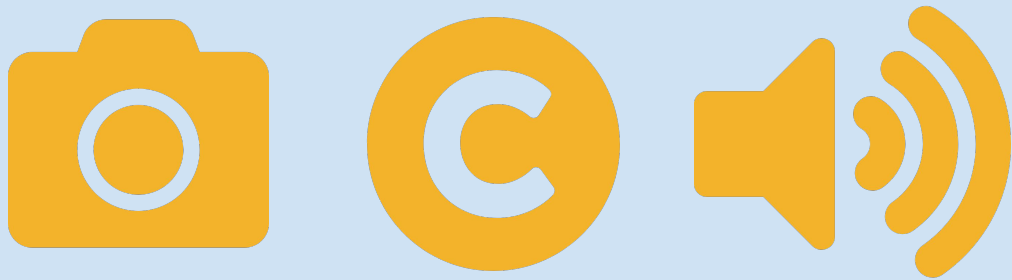
AUDIOAIP

audioaip *-e*

audioaip */PATH/TO/YOUR.WAV*

audioaip *-p* */PATH/TO/YOUR.WAV*

Ari

AudioAIP is essentially the same tool, but designed to create AIPS from .WAV files. AudioAIP syncs your original WAV master, then creates a FLAC mezzanine file, an mp3 access file, as well as PBCore metadata (.xml), checksums, and manifests. Commands are much the same. Audioaip -e allows you to configure your settings. audioaip [PATH TO WAV] creates an AIP, Audioaip -p [PATH TO .WAV] allows you to enter photo mode.

Ari

AudioAIP ctd:

- Is able to utilize your webcam! It can work with the webcam on your computer to take pictures of the physical item (case), which often has very important metadata about the file that you want to make sure gets packaged with this new digital version. These pictures will be saved as .TIFF files in the AIP.

- Offers an option to append a specified mp3 to each access copy, so you may include an audio copyright notice if your organization uses one.

- Performs automatic dynamic loudness normalization on the mp3 access copies, so these access copies are basically ready to go live right away, without any post processing.
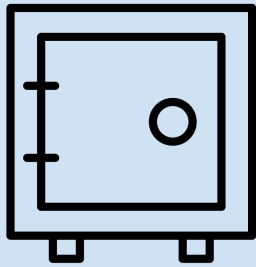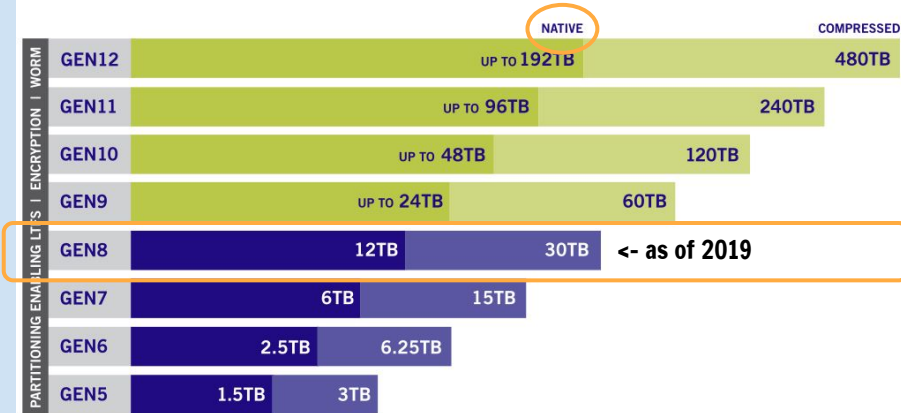
LTOPERS
& LTOTOOLS

Ari

The next major step in the digital preservation of these recordings is to make multiple backup copies onto a more stable media. At MIPoPS, we write to LTO, or Linear Tape Open. UW Special Collections Film Archive, the Library of Congress, the University of Indiana, CUNYTV all use or recommend LTO as a storage solution for libraries and archives. Outside of Archives-land, many, many entertainment and media organizations also utilize LTO, so you're in good company if you decide to make the switch. LTO tape has a large storage capacity, relatively low cost after the initial investment, and it's very reliable. Unlike cloud storage, LTO tapes are inherently offline, meaning they're not susceptible to some of the dangers that can affect connected storage solutions. LTOpers and LTOTools are two open source tools for reading and writing to LTO.

LTO ULTRIUM ROADMAP
ADDRESSING YOUR STORAGE NEEDS

		NATIVE	COMPRESSED
GEN12		UP TO 192TB	480TB
GEN11		UP TO 96TB	240TB
GEN10		UP TO 48TB	120TB
GEN9		UP TO 24TB	60TB
GEN8		12TB 30TB	<- as of 2019
GEN7		6TB 15TB	
GEN6		2.5TB 6.25TB	
GEN5		1.5TB 3TB	

PARTITIONING ENABLING LTFS I ENCRYPTION I WORM

NOTE: Compressed capacity for generation 5 assumes 2:1 compression. Compressed capacities for generations 6-12 assume 2.5:1 compression (achieved with larger compression history buffer).
SOURCE: The LTO Program. The LTO Ultrium roadmap is subject to change without notice and represents goals and objectives only. Linear Tape-Open, LTO, the LTO logo, Ultrium, and the Ultrium logo are registered trademarks of Hewlett Packard Enterprise, IBM and Quantum in the US and other countries.

Ari

As of 2019, LTO is at Generation 8, so you can see thats 12TB of uncompressed data. At MIPoPS we currently operate at Generation 7, but both the tapes and the decks are backwards compatible one generation, so an LTO 8 Deck could read and write both LTO 8 and LTO 7. Earlier decks can also READ a second generation back, so a Gen 7 Deck can read and write Gen 7 and Gen 6, and READ Gen 5 tapes. So just like with other formats, you will want to plan for data migration in the future.

DECK
$1,900-3,000

ATTO THUNDERLINK DRIVE
$1,600-2,100

TAPES
~$70/tape

Ari

LTO infrastructure does require a significant initial investment. You'll need a deck - $1,900-3,000, an ATTO Thunderlink drive - $1,600-2,100, and Tapes = Average $70 per tape, need TWO tapes for each set of data (A1 B1, A2 B2, etc)

WHAT LTOPERS CAN DO FOR YOU

Format LTO

Mount LTO

Make manifest

Write to LTO

Confirm manifest

Read LTO

Ari

LTOpers lets you control your LTO tape and drive via the command line. It can format your tape, mount it into the drive, generate a manifest of all of the items you'll be transferring to tape. It can write your data to tape, then confirm with the manifest after you've written your data to the tape., and of course, it can show you what is on the tape via the read command!

- **Homebrew -** https://github.com/Homebrew
- **QCTools -** https://bavc.org/preserve-media/preservation-tools
- **VRecord -** https://github.com/amiaopensource/vrecord
- **Audiorecorder -** https://github.com/amiaopensource/audiorecorder
- **BWF Metaedit -** https://mediaarea.net/BWFMetaEdit
- **VideoAIP -** https://github.com/pugetsoundandvision/videotools
- **AudioAIP -** https://github.com/pugetsoundandvision/audiotools
- **LTOpers -** https://github.com/amiaopensource/ltopers
- **LTOtools -** https://github.com/pugetsoundandvision/lto_tools