



Developing Software Preservation and Emulation Practice at the University Library

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Digital Preservation @ University Library

- Preservation Service unit
- Most often work with special collections units
- Born-digital media reformatting lab
- Collections content recovery from fragile, obsolete computer media
- Wide variety of content recovered - each requiring respective rendering software



Fostering a Community of Practice



Software
Preservation
Network

- Guggenheim Museum
- University of Arizona
- Living Computers Museum & Labs
- Georgia Tech
- University of Illinois at Urbana
Champaign
- University of Virginia

Scaling Emulation and Software Preservation Infrastructure (EaaS)

- concurrent grant project under the Software Preservation Network administrative umbrella
- scaling the technological framework necessary for multiple institutions to configure, share, and access software and configured environments
- includes access to configured software environments

FCoP Cohort Role


- “kicking the tires” and providing feedback
- Making decisions and establishing workflows
- Requesting features and testing them



What is Emulation?

“ Emulation – combines software and hardware to reproduce in all essential characteristics the performance of another computer of a different design, allowing programs or media designed for a particular environment to operate in a different, usually newer environment”

<https://dpworkshop.org/dpm-eng/terminology/strategies.html>
(Digital Preservation Management - Digital Preservation Strategies)



```
Welcome to DOSBox v0.74
For a short introduction for new users type: INTRO
For supported shell commands type: HELP

To adjust the emulated CPU speed, use ctrl-F11 and ctrl-F12.
To activate the keymapper ctrl-F1.
For more information read the README file in the DOSBox directory.

HAVE FUN!
The DOSBox Team http://www.dosbox.com

Z:\>SET BLASTER=A220 I7 D1 H5 T6

Z:\>_
```

Image 3



Emulation Benefits

- good choice when the look and feel of digital content is important to retain
 - Digital artworks, complex digital objects, games, etc.
- Allows users to engage with a closer representation of the original environment
 - Maintaining some use context
- May facilitate access for appraisal

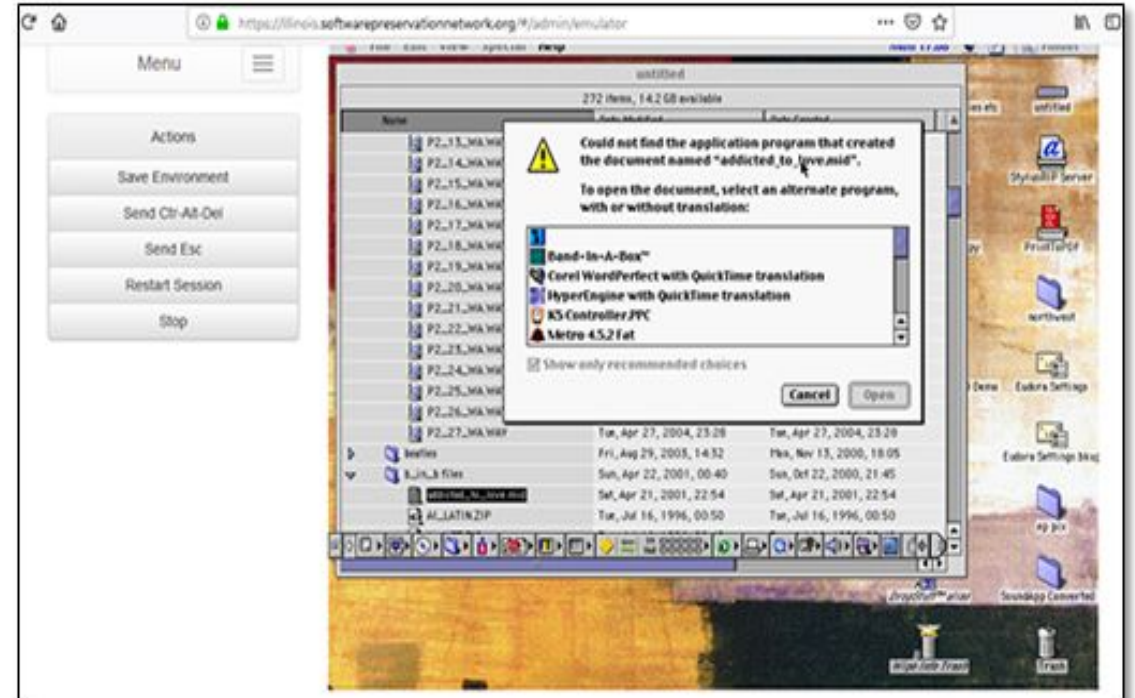


Illinois' FCoP Project

Contemporary music composers in
Sousa Archives and Center for
American Music (SACAM) collections

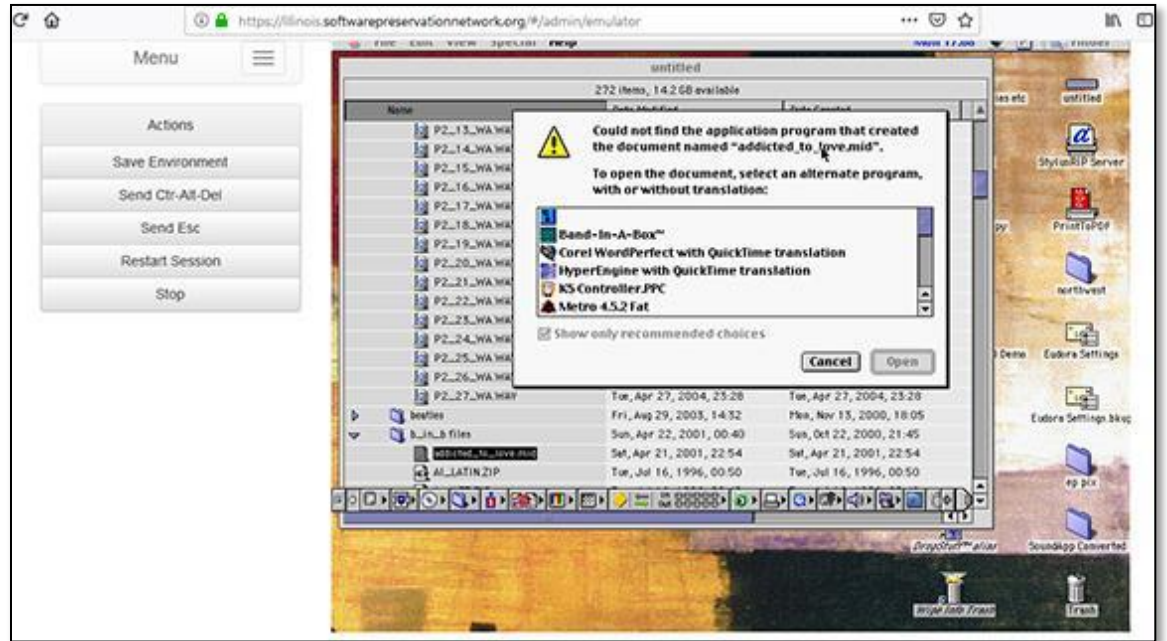
Project Goals:

- Piloting and prioritizing emulation research
- Improving preservation of and access to composers' collections
- Developing workflows



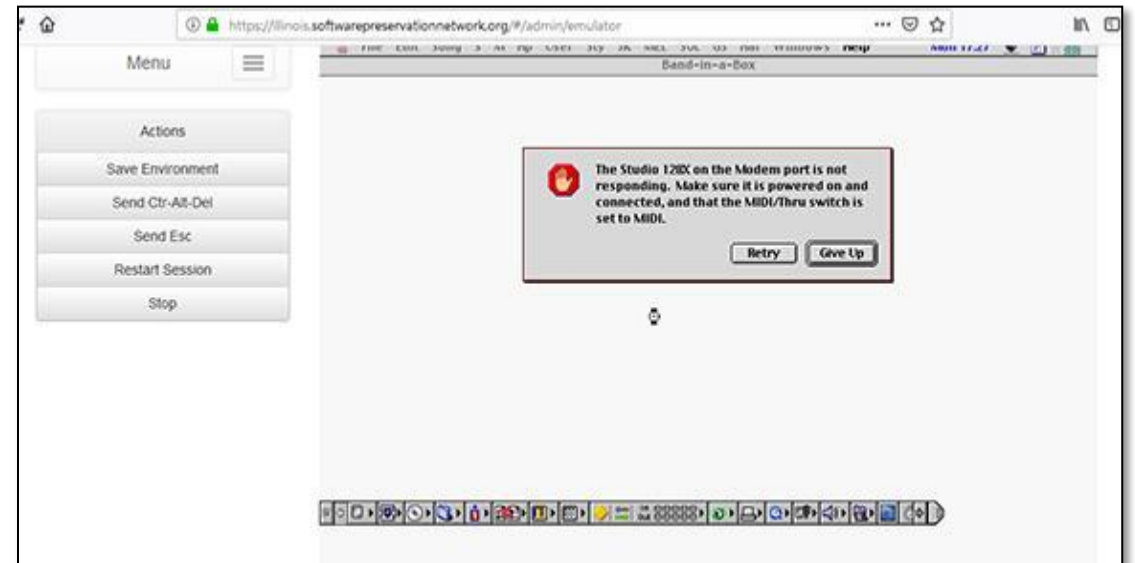
Local FCoP Activities

- Lots of activities happening concurrently
- Currently:
 - core work of the project
 - Intensive collection curation work on Manion collection
 - emulated environment generated from an .E01 forensic disk image



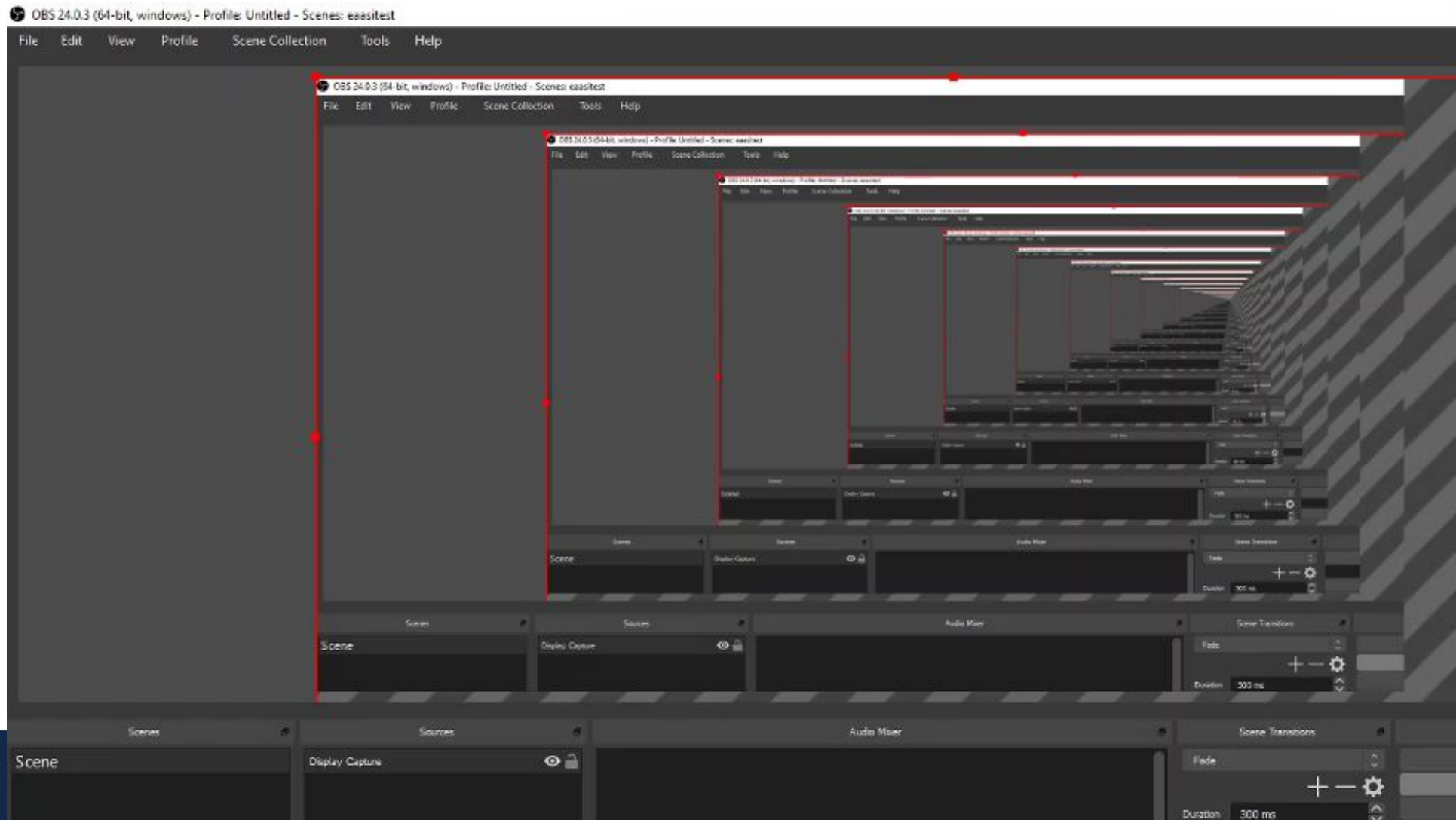
About the Emulated Environment

- Important milestone, but only tip of workload iceberg
- At this point the environment is most useful for appraisal
- Content has not been processed
- Technical issues



Manion EaaSI environment – error due to missing external hardware

EaaSI in Action



Scaling and Documenting Curation

The screenshot shows a web browser window with the URL https://medusa.library.illinois.edu/file_formats/271. The page title is "Digital Content Format: Digidesign / Avid Pro Tools Format". Below the title, there is a section for "Name: Digidesign / Avid Pro Tools Format" and a "Policy Summary" section. The "Policy Summary" includes "Logical Extensions: pts, ptl, pbx, tfx, wfm" and "Related Digital Content Formats: Digidesign / Avid Pro Tools Session File, Digidesign / Avid Pro Tools TFX Plug-in Setting File, Digidesign / Avid Pro Tools WaveCache File". Below this is a "Rendering Profiles" section with a table of 3 entries. The table has columns for Name, Status, Software (Version), OS (Version), Content Types, and File Extensions. The entries are:

Name	Status	Software (Version)	OS (Version)	Content Types	File Extensions
Pro Tools 1-6 (.PTS) Session in Pro Tools 6+ on Windows/Mac	active	Pro Tools (6, or higher)	Windows / Mac ()		pts
Pro Tools 10 (.PTX) Session and TFX Plug-in Settings in Pro Tools 10+ on Windows/Mac	active	Pro Tools (10, or higher)	Windows / Mac ()		pbx, tfx
Pro Tools 7 (.PTF) Session and .WFM WaveCache in Pro Tools 7+ on Windows/Mac	active	Pro Tools (7, or higher)	Windows / Mac ()		ptf, wfm

https://medusa.library.illinois.edu/file_formats/271

Example file format registry entry

- Digital Content Format Registry
Local effort to record knowledge about challenging file formats with the goal of improving access
- Built as part of the Medusa Digital Preservation Repository Collection Registry
- Publicly viewable:
https://medusa.library.illinois.edu/file_formats



Engaging Archivists and Curators

- Emphasize need for archivists and curators to:
 - Gather as much information as possible
 - about the creation context and files of interest
 - document the creator or donor walking through the software interface if possible
 - Identify content of value
 - Engage early with digital preservation specialists
 - Don't necessarily want to encourage transfer to a secondary storage medium
 - Get clear permissions on use and access



Making the Work Visible and Sharing Experiences

- Making the work scalable includes
 - Engagement and training
 - Articulating and documenting the work and processes
 - Identifying responsibility
 - Outreach is important for information sharing and building support!
 - Creating documents to share as part of FCoP project



Future Work

- Creating migration pathways
- Developing a more formalized software preservation practice
- Determining if we will have continued access to EaaS
- User testing of the EaaS environment
- Outreach and building capacity
- Continue working with the Software Preservation Network



Select Resources

- **About EaaS:** <https://www.softwarepreservationnetwork.org/eaasi/> (accessed 11/19/19)
- **About FCoP:** <https://www.softwarepreservationnetwork.org/fcop/> (accessed 11/19/19)
- **Code of Best Practices for Fair Use in Software Preservation:**
<https://www.softwarepreservationnetwork.org/bp-fair-use/> (accessed 11/19/19)
- **EaaS Handbook:** https://eaasi.gitlab.io/eaasi_user_handbook/ (accessed 11/19/19)
- **EaaS Sandbox:** <https://www.softwarepreservationnetwork.org/eaasi-sandbox/> (accessed 11/19/19)
- **On the Rushdie project** from Personal Digital Archiving 2017: “one of the biggest lessons learned noted by Waugh was the need to document everything the software engineers do as their work is just as ephemeral as the born digital information they wished to preserve”:
<https://ws-dl.blogspot.com/2017/04/2017-04-17-personal-digital-archiving.html> (accessed 11/19/19)
- **Software Preservation Network:** <https://www.softwarepreservationnetwork.org/> (accessed 11/19/19)
- **SPN EaaS SAA 2019 Multithreading Software Preservation Workshop notes:**
bit.ly/swpres-emulation (accessed 11/19/19)



Thank You!

Questions?

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