
Princeton University Library Digital Preservation Action Plan

Building on existing digital preservation efforts, guided by the Digital Preservation Framework, and supported by Hydra, the Action Plan outlines four digital preservation priorities for the next two to three year period. Taken together, these priorities will help the Library 1) identify the nature of the digital objects we currently have, plan to collect, or reformat, 2) evaluate the storage and maintenance of the digital objects in our custody, 3) assess the ability of researchers to discover and access the digital objects in our collections, and 4) protect digital objects in the event of an emergency or disaster. In addition, we will continue to develop and implement preservation reformatting programs for brittle books and analog and magnetic media.

The Preservation Librarian and Digital Archivist will pursue—in collaboration with other library staff—the following four priorities:

- [Map the Library's digital preservation landscape](#)—what we're collecting and creating, how much of it we have, where it resides, how it's accessed, whether it's preserved;
- Develop and document policies, procedures, and workflows for [acquiring, managing, and providing access to born-digital objects](#);
- Develop and document policies, procedures, and workflows for [creating, managing and providing access to reformatted at-risk collection materials](#): brittle books, analog and magnetic media;
- [Create and maintain plans for disaster preparedness](#) and recovery of digital objects.

What follows in this Action Plan is tentative summary for each priority, including the priority's task, benefit, outcome, current or recommended staffing, and timeline.

MAPPING THE DIGITAL PRESERVATION LANDSCAPE AT PUL

- **Task:** Conduct an initial assessment of existing Library practices for selecting, managing, and providing access to digital objects.
- **Benefit:** The Library will be able to quantify the nature, extent, and volume of its digital objects, thereby enabling the Library to set priorities and determine appropriate courses of action. Further, the Library will be able to identify opportunities for more efficient management and access protocols of digital objects, resulting in more robust preservation activities and improved service to researchers.
- **Outcomes:**
 - Survey of selectors to learn what they collect and why. First draft under review. (spreadsheet);

- Survey of analog, magnetic, and digital media within collections. Survey of digital media held in Mudd complete. (see [Appendix A](#)) (database);
- For each unit with digital collections materials, analyze current practices using the NDSA Levels of Preservation (see below and [Appendix B](#));
- Follow the surveys with an analysis of our current landscape with an eye towards identifying gaps in digital practice and management and opportunities to create efficiencies across units, identifying at-risk digital objects, and prioritizing next steps in stewardship of digital collection materials (brief report for Department Heads).

➤ **Timeline:** 6 months

➤ **Staffing:**

- Selector survey: Grandinette and Drake to compose survey, AUL's to distribute to selectors for completion.
- Media survey: A survey for digital media was completed in Mudd Library in the summer of 2015. Based on the results of the selector survey, Grandinette and Drake to coordinate with relevant staff in the various units (format specialists, metadata specialists, and preservation specialists) to conduct further surveys throughout RBSC and within the special libraries.
- NDSA Levels of Preservation assessment: After completing the survey of selectors, Grandinette and Drake to lead in consultation with format, metadata, technology, and preservation specialists responsible for managing digital objects.
- Summary report for Department Heads: Grandinette and Drake.



Self-assessment example

= satisfied with implementation
 = implemented but could be improved
 = will be satisfied with implementation after current enhancement project
 = not implemented

	Level One	Level Two	Level Three	Level Four
Storage & Geographic Location				
File Fixity and Data Integrity				
Information Security				
Metadata				
File Formats				

DOCUMENTING THE ACQUISITION, MANAGEMENT, AND ACCESS OF BORN-DIGITAL OBJECTS

- **Task:** Assist each unit in developing and documenting policies, procedures, and workflows for acquiring, managing, and providing access to born-digital objects.

- **Benefit:** Born-digital objects are at extreme risk for loss. The Library will be secure in its knowledge that born-digital objects are brought into the Library's custody safely and securely as well as have confidence that appropriate methods are employed to further their longevity, integrity, and access. Library staff will receive training and education that will allow them to understand and ask appropriate questions about born-digital objects beginning with their selection and concluding with their access.
- **Outcomes:** Policy and procedural documentation that facilitates the acquisition, management, and access of born-digital objects (see Appendix [B](#) and [C](#)).
- **Timeline:** 6 months
- **Staffing:** Content, format, and metadata specialists whom Grandinette and Drake will identify following the selector survey. Examples include accessioning archivists, acquisition assistants, technical services managers (Thornbury and Antracoli), curators and selectors.

DEVELOP PROGRAMS FOR DIGITAL REFORMATTING

- **Task:** Continue to develop programs to preserve and provide access to at-risk brittle books and analog and magnetic audio and audio-visual materials. Two initiatives, Brittle Books + Hydra and Media Preservation, will both employ Hydra but will do so in different capacities. Reformatting for brittle books will be done in-house in the Digital Studio; however reformatting of analog and magnetic media will be outsourced due to relatively small holdings of these media in our collections.
- **Benefit:** Transitioning from project-based to a program-based approach allows the Library to take a big-picture view and plan for the long-term resulting in the thoughtful provision and use of our resources and increased integration and coordination of digital preservation across the Library. Reformatting is a preservation strategy of last resort and necessary to provide continued access to materials in poor condition or where access is impossible due to obsolescence of playback equipment or software and hardware. Many analog and magnetic media materials held in RBSC are restricted from use for fear that the next playback may be the last. Reformatting of brittle books—primarily from the general collection—is being developed with Hathi Trust in mind. When the Library owns a brittle book that is also in Hathi, we are creating procedures to provide access; if the brittle book is not in Hathi, we plan to collaborate with them to contribute our digital copy.
- **Outcomes:**
 - Reformatted digital objects that will be deposited into Hathi Trust;
 - Reformatted digital objects that will be made available through Library infrastructure (not yet determined), thereby enabling researchers to access audio and audiovisual materials previously inaccessible;
 - Program documentation that includes scope, purpose, and plan for reformatting initiatives (see [Appendix E](#)).

- **Timeline:**
 - Brittle Books, 1 year
 - Media Pilot, 6-8 months
 - Media Program Development, 2-3 years

- **Staffing:**
 - Brittle Books + Hydra: Participants to date include: Magier, Gaspari-Bridges, Emanuel, selectors, Schulz, Wange-Connelly, Bell, Stroop, Jordan, Reiss, Hydra developers, Wulfman, Munoz, 1 filmer, Hobbs, and Grandinette.
 - Media Preservation Pilot: Participants to date included: Skemer, Thornbury, Arroyo-Ramirez, Grandinette, and Stroop. The pilot will need additional assistance on the RBSC side for quality control and on the technology side from Systems for life-cycle management of files including specifications, storage, preservation, and providing access.
 - Media Preservation Program: Recommended staff participants include Systems staff on the technology side, Technical Services staff to assist with metadata for materials held in non-RBSC units such as Mendel as well as transfer of originals to ReCAP where appropriate, RBSC technical service, and curatorial staff, collection development librarians who hold media in their collections, and Preservation staff.

DISASTER PREPAREDNESS AND RECOVERY PLANNING

- **Task:** Define what preparedness entails for digital objects and identify at-risk digital objects. Plan for recovery of at-risk objects and include these materials in the Collections Emergency Response Plan.

- **Benefits:** Planning for a disaster increases the likelihood of successful recovery of the Library's collections. In the case of digital objects, defining what preparedness looks like is a critical first step. Including digital objects in the Library's collection emergency response plan further integrates digital objects into the preservation process and the Library as a whole.

- **Outcomes:**
 - Define preparedness for digital objects: conduct literature review and reach out to our colleagues in Borrow Direct and Ivies +;
 - With this new understanding of emergency preparedness, produce a report that identifies at-risk digital objects. This will be, in part, a natural outcome of "Mapping the Digital Landscape."
 - Include recovery planning in the Collection Emergency Response Manual. This will be an outgrowth of our literature review and discussions with colleagues.

- **Timeline:** 2-3 months

- **Staffing:** Participating staff include: Hobbs, Drake, and Grandinette. Planning will build on findings of “Mapping the Digital Landscape,” which includes staff from throughout the organization.

APPENDIX A: MUDD DIGITAL MEDIA SURVEY

Aggregate Total of Digital Media at Mudd Library

564	3.5" floppy disk
93	5.25" floppy disk
3	8" floppy disk
651	CD
66	Digital Betacam
49	DVCAM
1	DVCPRO
122	DVD
58	Mini digital audio tape (DAT)
1	MiniCD
2	Other
2	Zip disk
Total Number of Digital Media	
1612	

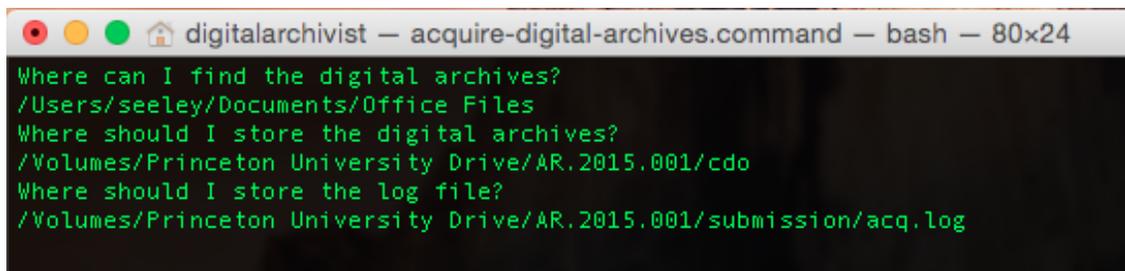
APPENDIX B: NDSA LEVELS OF PRESERVATION

Table 1: Version 1 of the Levels of Digital Preservation

	Level 1 (Protect your data)	Level 2 (Know your data)	Level 3 (Monitor your data)	Level 4 (Repair your data)
Storage and Geographic Location	<ul style="list-style-type: none"> - Two complete copies that are not collocated - For data on heterogeneous media (optical discs, hard drives, etc.) get the content off the medium and into your storage system 	<ul style="list-style-type: none"> - At least three complete copies - At least one copy in a different geographic location - Document your storage system(s) and storage media and what you need to use them 	<ul style="list-style-type: none"> - At least one copy in a geographic location with a different disaster threat - Obsolescence monitoring process for your storage system(s) and media 	<ul style="list-style-type: none"> - At least three copies in geographic locations with different disaster threats - Have a comprehensive plan in place that will keep files and metadata on currently accessible media or systems
File Fixity and Data Integrity	<ul style="list-style-type: none"> - Check file fixity on ingest if it has been provided with the content - Create fixity info if it wasn't provided with the content 	<ul style="list-style-type: none"> - Check fixity on all ingests - Use write-blockers when working with original media - Virus-check high risk content 	<ul style="list-style-type: none"> - Check fixity of content at fixed intervals - Maintain logs of fixity info; supply audit on demand - Ability to detect corrupt data - Virus-check all content 	<ul style="list-style-type: none"> - Check fixity of all content in response to specific events or activities - Ability to replace/repair corrupted data - Ensure no one person has write access to all copies
Information Security	<ul style="list-style-type: none"> - Identify who has read, write, move and delete authorization to individual files - Restrict who has those authorizations to individual files 	<ul style="list-style-type: none"> - Document access restrictions for content 	<ul style="list-style-type: none"> - Maintain logs of who performed what actions on files, including deletions and preservation actions 	<ul style="list-style-type: none"> - Perform audit of logs
Metadata	<ul style="list-style-type: none"> - Inventory of content and its storage location - Ensure backup and non-collocation of inventory 	<ul style="list-style-type: none"> - Store administrative metadata - Store transformative metadata and log events 	<ul style="list-style-type: none"> - Store standard technical and descriptive metadata 	<ul style="list-style-type: none"> - Store standard preservation metadata
File Formats	<ul style="list-style-type: none"> - When you can give input into the creation of digital files encourage use of a limited set of known open formats and codecs 	<ul style="list-style-type: none"> - Inventory of file formats in use 	<ul style="list-style-type: none"> - Monitor file format obsolescence issues 	<ul style="list-style-type: none"> - Perform format migrations, emulation and similar activities as needed

APPENDIX C: STEPS FOR UNIVERSITY ARCHIVES OF ACQUISITION OF DIGITAL RECORDS

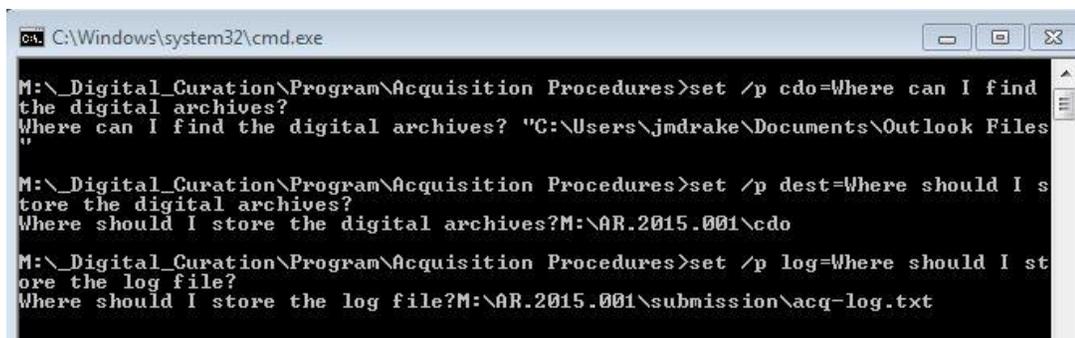
1. Mount the Mudd portable drive to the machine containing the Content Data Object.
2. From the Mudd portable drive, open and run Digital Record and Object Identification (DROID) tool on the Content Data Object.
3. Save DROID profile, directory, and report to the Mudd portable drive's **submission** directory as **acq-profile.droid**, **acq-directory.csv**, and **acq-report.pdf** respectively.
4. For **Unix** or **Linux** systems:
Double-click on the file **acquire-digital-archives.command**. When prompted, enter the full path to the source, destination, and log file, pressing enter after each response.



```
digitalarchivist - acquire-digital-archives.command - bash - 80x24
Where can I find the digital archives?
/Users/seeley/Documents/Office Files
Where should I store the digital archives?
/Volumes/Princeton University Drive/AR.2015.001/cdo
Where should I store the log file?
/Volumes/Princeton University Drive/AR.2015.001/submission/acq.log
```

In this example, the contents of the **Office Files** folder (the source) will be synced with the **cdo** folder (the destination) and the log file **acq.log** will be created.

5. For **Windows**:
Double-click on the file **acquire-digital-archives.cmd**. When prompted, enter the full path to the source, destination, and log file, pressing enter after each response.



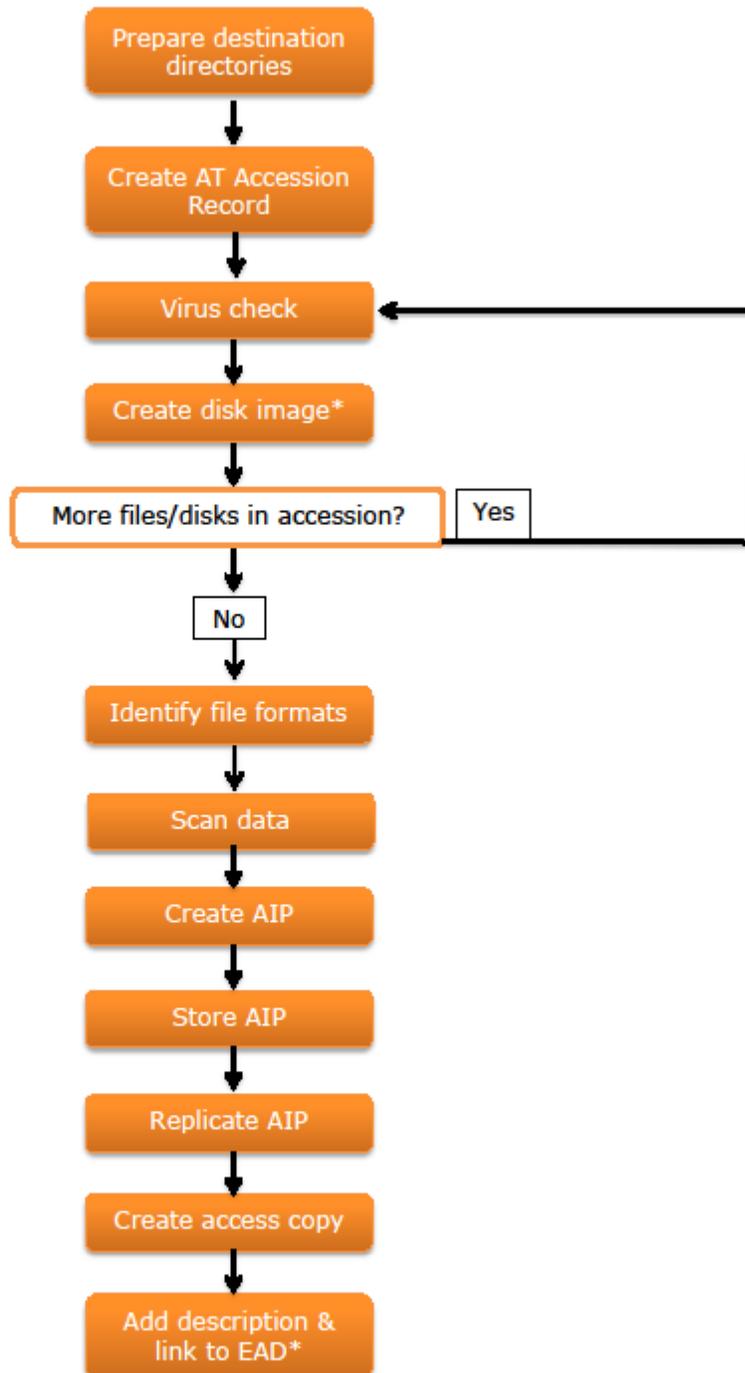
```
C:\Windows\system32\cmd.exe
M:\_Digital_Curation\Program\Acquisition Procedures>set /p cdo=Where can I find
the digital archives?
Where can I find the digital archives? "C:\Users\jmdrake\Documents\Outlook Files
"
M:\_Digital_Curation\Program\Acquisition Procedures>set /p dest=Where should I s
tore the digital archives?
Where should I store the digital archives?M:\AR.2015.001\cdo
M:\_Digital_Curation\Program\Acquisition Procedures>set /p log=Where should I st
ore the log file?
Where should I store the log file?M:\AR.2015.001\submission\acq-log.txt
```

In this example, the contents of the **Outlook Files** folder (the source) will be synced with the **cdo** folder (the destination) and the log file **acq-log.txt** will be created.

6. Review log file and safely unmount the Mudd portable drive.
7. Upon returning to Mudd, mount the Mudd portable drive on the Forensic Recovery of Evidence Device (FRED) and complete the accessioning process.
8. Notify the Transmitting Office of the results of the accessioning process.

APPENDIX D: PRINCETON UNIVERSITY ARCHIVES DIGITAL RECORDS ACCESSIONING PROCEDURES

Princeton University Archives
Digital records accessioning
Workflow overview
v. 5_1
2015 June 30



APPENDIX E: DOCUMENTATION FOR REFORMATTING INITIATIVES

Brittle Books + Hydra: This program is under development.

Hydra development is underway to meet the Minimum Viable Requirements as defined by Collection Development, Systems, Preservation, Metadata, and Digital Studio staff.

Preservation, Collection Development, and Technical Services staff are developing protocols for access to brittle materials that have been digitized and exist in Hathi, as well as contributing new material to Hathi.

To accomplish this task, Preservation, the Digital Studio, and Collection Development are experimenting with a case study in which 1 FTE digital photographer reformats brittle materials. This experiment will help us understand the type and amount of effort required across units and to structure our program accordingly.

Media Preservation Pilot Project: This project is under development.

The Latin American Processing Archivist conducted an inventory of 81 Latin American author's collections, eighteen of which contain media. Seven collections were selected and approved for a pilot project.

Next steps include creation of the RFP and the RFP review process, followed by selection of the vendor and migration of materials, and the development of post-migration procedures including, quality control, file management, and providing access.

Upon completion of the pilot, a stakeholder review will point the way towards building an on-going program for media collections that will be applicable to collections in other units and departments within the Library.