

Welcome to CARLI Digital Preservation Webinar Series: Store & Protect



We will begin the presentation at 10:00 am

If you have not already run the Audio Setup Wizard, you can do so now.

In this meeting room, go to the top left menu item called Meeting -> Audio Setup Wizard.

If you would like to ask a question during the presentation, please type your question into the Chat box on the left side of the screen

Digital Preservation: Store & Protect

*Considerations for long-term storage
and protection of digital objects*



Store, part 1

Laurie Sauer
Knox College

Six Steps of Digital Preservation

- **IDENTIFY** the types of digital content you have.
- **SELECT** what portion of your digital content will be preserved.
- **STORE** your selected content for the long term.
- **PROTECT** your content from everyday threats and emergency contingencies.
- **MANAGE** and implement requirements for long term management.
- **PROVIDE** access to digital content over time.

Store

Question

Digital objects may be stored, but are they being preserved?

Store

Requirements

- Multiple copies in at least 2 locations
- Common (or *normalized*) file formats
- Identification and description about each object: Metadata
- Controlled and known storage of content

Store

How many copies are enough for you?

Minimum: 2 copies in two locations

Optimum: 6 copies

Storage factors:

- Video files are too large to store 6 copies
- Possible legal restrictions
- Types of media used for storing the content

Follow recommendations set by leading organizations.

- NARA's *Technical Guidelines for Digitizing Archival Materials for Electronic Access* – TIFF format is the “‘De facto’ raster image format used for master files.”

<http://www.archives.gov/preservation/technical/guidelines.html>

- *Sustainability of Digital Formats Planning for Library of Congress Collections* -- The MP3 sound file format is “Generally used for final-state, end-user delivery.” And, “General preference for preservation-oriented recorded sound is WAVE_LCPM. For compressed sound, MP3 is acceptable, especially at data rates of 128 Kb/s (mono) or 256 Kb/s (stereo) or higher.”

<http://www.digitalpreservation.gov/formats/index.shtml>

Store

What is stored?

file

+ metadata

digital object

Store

Preservation metadata concepts

- **Environment** – information required to access, render and use the object
- **Rights management** – information that describes current and future use restrictions
- **Provenance** - descriptions of actions that have been taken to preserve the object over time, including actions that alter the content; includes information that validates object's authenticity, e.g., fixity checks

Store

**Metadata
relationships**

Preservation Metadata

Content (what), Fixity (unchanged), Provenance (life story),
Reference (this thing), Context (relationships)

Administrative
(manage)

Structural
(understand,
use)

Descriptive
(find, use)

Store

Preservation metadata



Navajo Wedding Basket, Knox College Special Collections and Archives

File	
Name	realia-73-22.tif
Item type	TIF File
Folder path	K:\C3\My Pictures\ART IM...
Date created	8/8/2013 5:39 PM
Date modified	8/7/2007 10:29 AM
Size	50.7 MB

Image	
Image ID	
Dimensions	4864 x 3648
Width	4864 pixels
Height	3648 pixels
Horizontal resolution	72 dpi
Vertical resolution	72 dpi
Bit depth	24
Compression	Uncompressed
Resolution unit	2
Color representation	sRGB

Store

Preservation metadata



Title	[Colombian Liberation]
Description	Various Colombian martyrs are portrayed in this mural. The background of this mural is the colors of the Colombian flag; text in the background is indistinct.
Photographer Identifier	Houser, Henry P. The Henry Houser Collection (Part 3 Folder 12:1)
Rights	U.S. and international copyright laws protect this digital image. Commercial use or distribution of the image is not permitted without prior permission of the copyright holder. For permission to use the digital image, please contact Knox College Special Collections & Archives at archives@knox.edu - http://www.knox.edu/library/special-collections-and-archives.html
Collection	Muralism in Revolutionary Nicaragua-The Henry Houser Collection (Knox College)

Store

Preservation metadata

Fixity checking allows you to know if a file has changed over time.



One-Way Encryption

b43efderwkl3jh7834



One-Way Encryption

845kjsnlkdrkjhdngiu5

Store

Preservation metadata

Minutes from trustees' meetings from the 1980s were migrated from MS Word to PDF/A.



Format Migration Event



Store, part 2

Mary Z. Rose

Southern Illinois University Edwardsville

Store

Storage Best Practices

1. Make multiple copies of your stuff

How many copies? 2 is good, 6 is best

2. Keep the copies in different geographic locations



Photo by djaquay on Flickr <http://www.fotopedia.com/items/flickr-1526855132>

Store

Storage media options



Offline

Near-line

Online

Store

Online storage

Good

1. Easy to keep up to date
2. Multiple copies are easy to achieve
3. Easy to access (or is this a Not So Good thing?)

Not So Good

1. More security issues from vandalism
2. Higher costs long-term

Store

Online storage options

Storage partners



CHRONOPOLIS



Hosted services (cloud)



Store

Doing it yourself

So you want to host your own digital asset preservation management repository?



greenstone digital
library software

Resources

General

Digital Preservation Coalition Technology Watch Reports

<http://www.dpconline.org/publications/technology-watch-reports>

Very readable reports by experts on issues of digital preservation

The Signal: Digital Preservation

<http://blogs.loc.gov/digitalpreservation/>

Library of Congress blog on technology and digital preservation topics

Reference Model for an Open Archival Information System

<http://public.ccsds.org/publications/archive/650x0m2.pdf>

More (a LOT more) information about digital preservation goals and standards

Resources

Preservation Metadata

***Preservation Metadata (2nd ed.)*, by Brian Lavoie and Richard Gartner**

<http://dx.doi.org/10.7207/twr13-03>

A DPC Technology Watch Report; very informative and readable

PREMIS

<http://www.loc.gov/standards/premis/>

The Library of Congress maintains the PREMIS Data Dictionary standard for preservation metadata

NC Preservation Metadata for Digital Objects

<http://digitalpreservation.ncdcr.gov/pmdo2013final.pdf>

An example from the State Library of North Carolina of PREMIS implementation.

Resources

Technical

About file formats:

- NARA's *Technical Guidelines for Digitizing Archival Materials for Electronic Access*
<http://www.archives.gov/preservation/technical/guidelines.html>
- *Sustainability of Digital Formats Planning for Library of Congress Collections*
<http://www.digitalpreservation.gov/formats/index.shtml>

PRONOM - <http://www.nationalarchives.gov.uk/PRONOM/Default.aspx>

A comprehensive resource for data file formats and associated software.

Digital POWRR Tool Grid -- <http://digitalpowrr.niu.edu/tool-grid/>

Evaluations of digital preservation tools.

Two good explanations of fixity checking:

- Checksum video: http://www.youtube.com/watch?v=Emom_ncMqu0
- "Hashing Out Digital Trust" – a Blog post on The Signal about hash functions
<http://blogs.loc.gov/digitalpreservation/2011/11/hashing-out-digital-trust/>

Store

Resources

Storage

Another DAM blog

<http://anotherdamblog.com/>

A vendor-neutral blog about digital asset management.

Review of Available Open Source DAM Software

(Naresh Sarwan August 10, 2013)

<http://www.opensourcedigitalassetmanagement.org/reviews/available-open-source-dam/>

Report on Digital Preservation and Cloud Services

(Minnesota Historical Society, April 1, 2013)

http://www.mnhs.org/preserve/records/docs_pdfs/Instrumental_MHSReportFinal_Public_v2.pdf

Storage Options

Near-line storage

- Amazon Glacier <http://aws.amazon.com/glacier/>

Networked storage cooperatives

- Meta-Archive <http://www.metaarchive.org/>
- Chronopolis <http://chronopolis.sdsc.edu/>

Hosted services for online digital preservation storage

- Preservica <http://preservica.com/>
- DuraCloud <http://www.duracloud.org/>

Storage Options (cont'd)

Open source digital asset management (DAM) software for preservation

- Concerto <http://concerto.sourceforge.net/>
- DSpace <http://www.dspace.org/>
- Fedora Commons <http://www.fedora-commons.org/>
- Greenstone <http://www.greenstone.org/>
- DAITSS <http://daitss.fcla.edu/>

Protect, part 1

Benn Joseph
Northwestern University Library

Protect

DPOE Baseline Modules

Identify - what digital content do you have?

Select - what portion of that content will be preserved?

Store - what issues are there for long term storage?

★ **Protect** - what steps are needed to protect your digital content?

Manage - what provisions are needed for long-term management?

Provide - what considerations are there for long-term access?

Protect

What are we protecting content from?

- Change and loss – accidental and intentional
- Obsolescence – as technology evolves
- Inappropriate access – e.g., confidential data
- Non-compliance – standards and requirements
- Disasters – emergencies of all kinds

Protect

Dangers to digital objects!

Disasters –
emergencies of all kinds



Protect

Dangers to digital objects

Non-compliance—
standards and
requirements



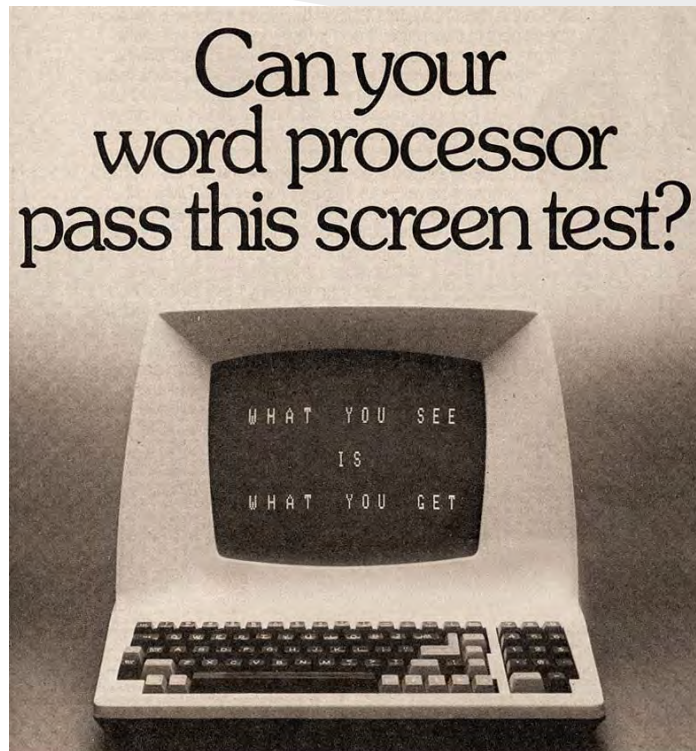
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Dangers to digital objects

Non-compliance—
standards and
requirements

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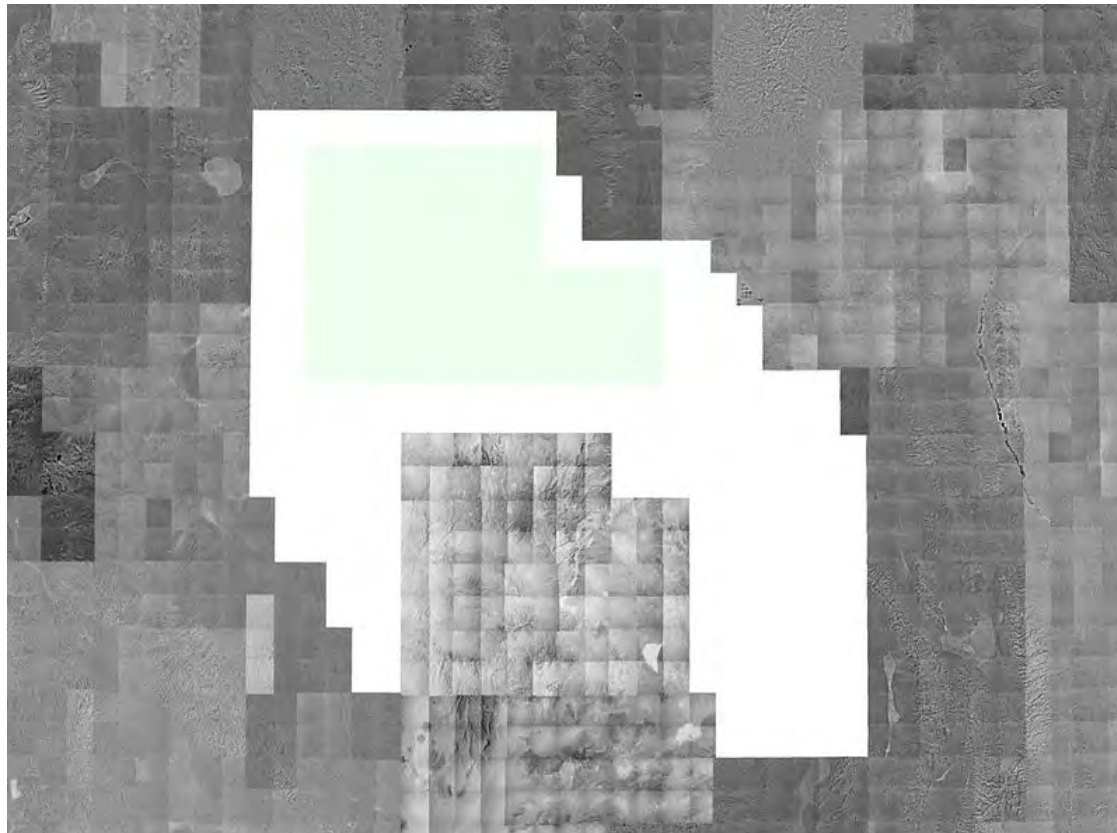
MicroPro International Corporation
1299 4th Street, San Rafael, CA 94901
(415) 457-8990 TELEEX 340388
Sold through authorized dealers and
distributors only. OEM inquiries invited.

*Runs on most Z80/8080/8085 microcomputers with CP/M (TM of Digital Research), 48K, and terminal with addressable cursor.

Protect

Dangers to digital objects

Inappropriate access – e.g., confidential data



Protect

Dangers to digital objects

- Digital content must be subject to security measures just like analog materials



Protect

Dangers to digital objects

Obsolescence – as technology evolves



Protect

Dangers to digital objects

Obsolescence – as technology evolves

Save \$20. Now that you've got your VCR and TV, where are you going to put them? How about a good-looking hickory-grained vinyl island that holds both your TV and VCR? It's easy to set up in any room and has two wear-look doors that resist so-called "finger prints". Holds 19" or 21" TVs (or compact stereos). Holds 29" or 32" VCRs. **Was \$89.99 in '83 Fall Big Sale, is \$69.99.**
57E45301—Wt. 30 lbs.\$69.99

Put your holiday memories on tape, either Beta (L) or VHS (T)

Tape	Hours	Category	Wt. or	Price
model	min.	number	or	each
L5001 274	2	1975302	8	\$ 8.99
L700 3x4.5	2	1975375	8	11.99
L800 3x5	2	1975383	8	9.99
L100 2x4.5	2	1978291	14	10.99
L150 2x5.5/7.5	2	1978242	14	10.99

(A) Video Tape Storage Case. Sturdy plastic base holds 12 Beta or VHS tapes. Removable see-through cover. 5 1/2" x 10 1/2" x 10 1/2". **Was \$59.99 in '83 Fall Big Sale, is \$39.99.**
57E 5630—Wt. 4 lbs. 4 oz.\$39.99
Dustcover. Plastic. ©Matsushita 1984.

(B) Attach TV Camera Case is now 19" high. Securely holds your camera in soft urethane foam and protects it with a rugged plastic shell. Lockable. 14 1/2" x 15 1/2" x 10 1/2" in. standing up. **Was \$59.99 in '83 Fall Big Sale, is \$49.99.**
57E 5393—Shpg. wt. 6 lbs. \$34.99

(C) Storage Case for 20 audio or 10 video tapes, or 20 video games. Plastic. 10 1/2" x 11 1/2" x 1 1/2" in. **Was \$19.99 in '83 Fall Big Sale, is \$19.99.**
57E 56032—Wt. 5 lbs. 4 oz.\$19.99

Cut \$110

Beta format VCR with 3-day/1-program capability, BetaScan plus up to 5 hours of recording time \$379.95
NEVER PRICED LOWER

(4) Going away for the weekend and you'll have to miss your favorite show? Not any more. Just press this VCR to start when your show begins and to stop when it's over and you won't have to miss a minute of any show up to 5 hours long. You can do this up to 3 days in advance. Easy pre-recorded movies anytime or make your own with optional camera. Any way you use it, finding your favorite segment is easy with forward and reverse fastScan. Our chat helpline really step out of bounds? ... freeze the action with stop motion and see for yourself. And if you're busy but enjoy daytime drama, set this VCR to come on the same time everyday. Electronic tuner. You also get a clock, instructions and TV hook-up hardware. 5.4x17.7x14.1/3.5 D in. See Note p. 406. Reduced from our 1983 Spring Big Book p. 654. Wt. 22 lbs.
57E 5309N—Was \$489.95,\$379.95

COMPARE!

VHS VCR has 1-day/1-program capability with up to 8 hours of recording plus pause/still remote control \$439.99

(5) Of course you can pre-program this VCR up to 24 hours in advance to start recording at the beginning of your show, and to shut off up to 8 hours later. But what's really nice about this VCR is that you can freeze the action to further inspect that touchdown as well as edit while recording without getting up from your chair. The remote control lets you do this up to 20 feet away. You can also watch great pre-recorded movies or make your own with optional camera. To find your favorite segment, just press forward or reverse visual search on the deck. You decide at which speed to watch. Slow Play, Long Play or Extended Play. Electronic tuner. You get a convenient clock and operating instructions and all necessary hardware for TV hook-up. 5.9x17.7x14.1/3.5 D in. See Note p. 406.
57E 5307N—Shpg. wt. 23 lbs.\$439.99

Alt. 407

Protect

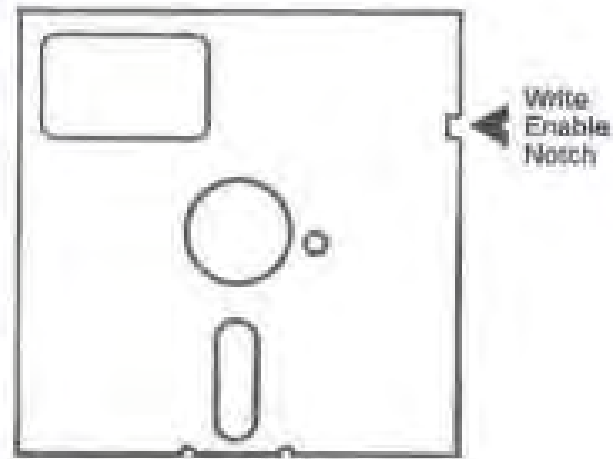
Dangers to digital objects

Change and loss – accidental and intentional



These black Write Protect Tabs should be used when you do not want stored information on your disk to be changed or lost accidentally.

Simply cover the Write Enable Notch by taking 1 black tab and wrapping it around the notch.



Protect

Dangers to digital objects

Change and loss – accidental and intentional

- Mary Shelly's *Frankenstein*
- Mona Lisa

Protect

Dangers to digital objects

How digital things are the same

- Formal sense: same ones and zeroes
- Forensic sense: how the bits are physically encoded and inscribed on an object

Protect

Dangers to digital objects



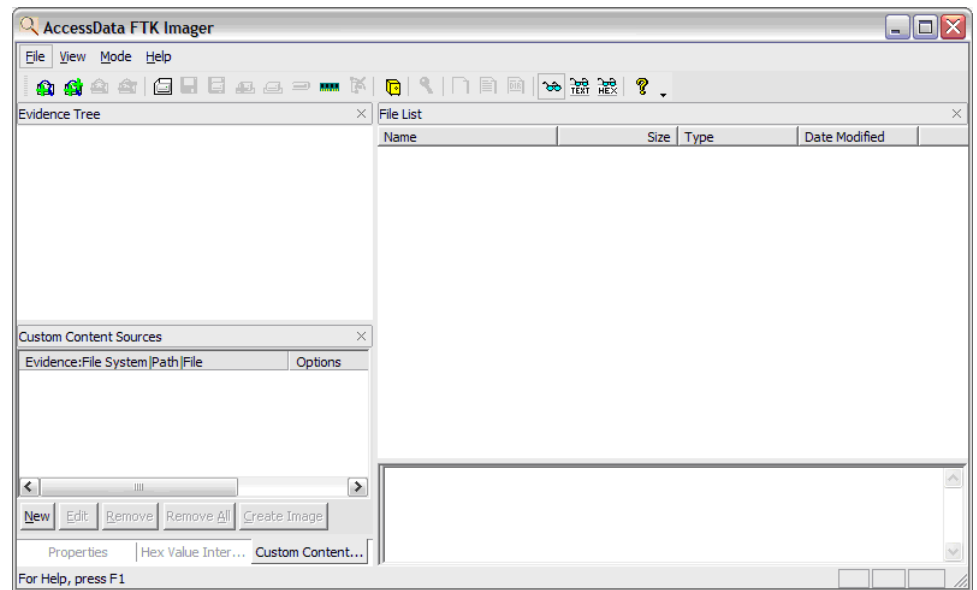
Protect

Dangers to digital objects

Forensic tools



Hardware write-blocker



FTK Imager

Protect

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Manuscript Librarian

Northwestern University Library

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Protect, part 2

Adam Strohm
Newberry Library

Protect

Everyday Protection

Know where your content is located

- onsite vs. offsite, online vs. offline (via administrative metadata)

Know who can have access to it

- Which staff members? Which departments? (via permissions)

Know who accesses your secure information

- Staff, depositors, users? (via authentication)

Know about your users to improve service

- Web use, internal use, user activities, maintenance (via user data)

Protect

Readiness

Proper planning should allow you to:

- **Prevent** undesirable outcomes
- **Predict** the most likely risks and threats
- **Detect** errors, problems, and damage
- **Respond** with appropriate measures
- **Repair** damage or possible loss

CAUTION

CAUTION

CAUTION

CAUTION

Steps to protect your content

- Identify possible risks
- Define those risks (in nature and scope)
- Assess potential impact and possible damage
- Develop appropriate, feasible response plans
- Respond to risks and threats (implementation)



Engage in ongoing disaster planning

- Establish a committee and share information
- Develop and maintain documents
- Update plans regularly

Identify possible outcomes and prepare

- e.g., server failure, media damage, data loss
- Practice! (simulations and drills)

Protect

Priorities in an Emergency

What needs to be available soonest?

- Identify core functions as part of planning
- Determine allowable downtime for each
- Consider steps to re-establish each function
- Develop relevant documents
- Make sure planning documents are accessible



dPlan

- Free online disaster planning tool from the NEDCC and MBLC

TRAC (Trusted Repository Audit and Checklist)

- Criteria and checklist from CRL

TDR (Trusted Digital Repository checklist)

- ISO standard based largely on TRAC

DRAMBORA (Digital Repository Audit Method Based On Risk Assessment)

- Interactive digital auditing tool from the Digital Curation Centre

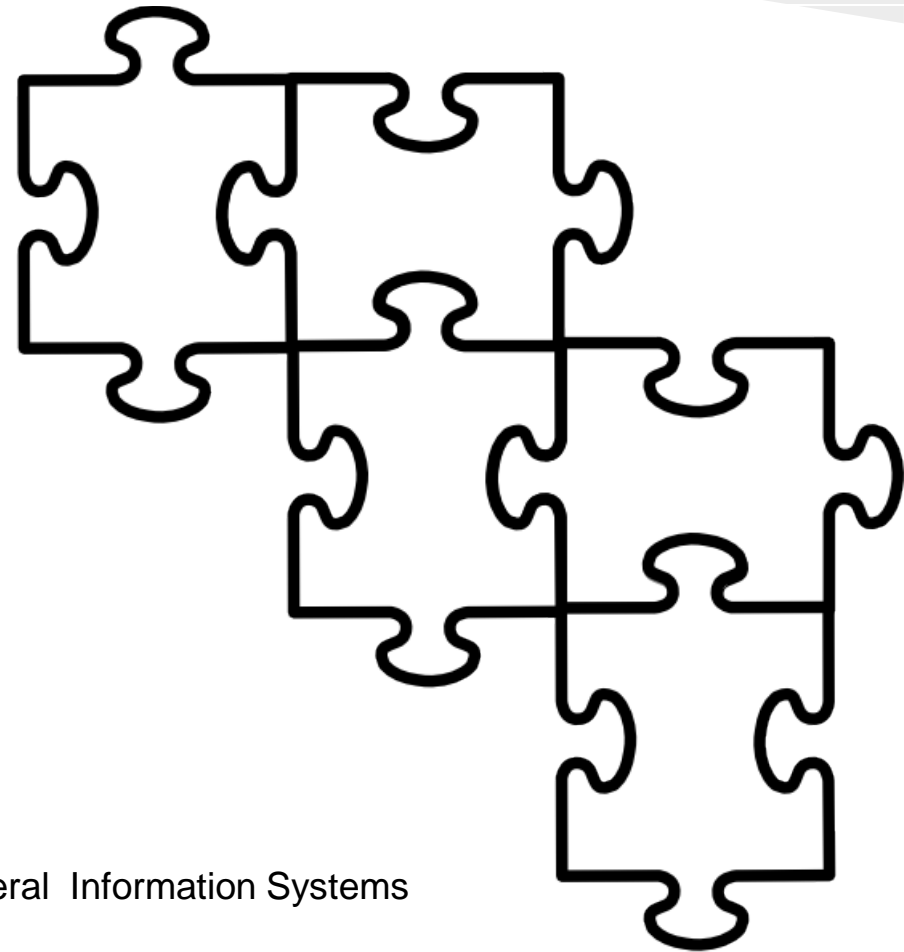
DIGITAL POWRR (Preserving Digital Objects with Restricted Resources)

- Ongoing collaborative assessment of digital preservation planning for smaller institutions

Protect

Planning Components

- IT contingency
- Staff coverage
- Crisis communication
- Operational continuity
- Hacking/virus response
- Disaster recovery



Protect

Disaster Planning Resources



Protect

Outcomes

Good practice should result in

- Practices in place to manage day-to-day protection
(an implemented preservation policy)
- Disaster planning in place to prevent, predict, respond, and repair
(preparation in the event of an emergency)



Protect

Additional Resources

- “Authentication,” Government Printing Office, 2010
<http://www.gpo.gov/authentication>
- Data Seal of Approval: <http://www.datasealofapproval.org/>
- MetaArchive Trusted Repository Audit (2010):
http://www.metaarchive.org/sites/metaarchive.org/files/MetaArchive_TRAC_Checklist.pdf
- Edinburgh Data Audit Implementation Project Final Report (2009):
http://ie-repository.jisc.ac.uk/283/1/edinburghDAFfinalreport_version2.pdf

Protect

Additional Resources

- Trevor Owens, “The Is of the Digital Object and the Is of the Artifact,” *The Signal: Digital Preservation*, October 25, 2012. <http://blogs.loc.gov/digitalpreservation/2012/10/the-is-of-the-digital-object-and-the-is-of-the-artifact/>
- Trevor Owens, “Respect des Bits: Archival Theory Encounters Digital Objects and Media,” *The Signal: Digital Preservation*, June 24, 2013. <http://blogs.loc.gov/digitalpreservation/2013/06/respect-des-bits-archival-theory-encounters-digital-objects-media/>
- Julianna Barrera-Gomez and Ricky Erway, “Walk This Way: Detailed Steps for Transferring Born-Digital Content From Media You Can Read In-House,” OCLC Research. <http://www.oclc.org/content/dam/research/publications/library/2013/2013-02.pdf>

Protect

Additional Resources

- dPlan: www.dplan.org
- Drambora: www.repositoryaudit.eu
- NIST Contingency Planning Guide for Federal Information Systems:
http://csrc.nist.gov/publications/nistpubs/800-34-rev1/sp800-34-rev1_errata-Nov11-2010.pdf
- TRAC & TDR:
www.crl.edu/archiving-preservation/digital-archives/metrics-assessing-and-certifying-0
- Digital POWRR
digitalpowrr.niu.edu/

Thank you!

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Thank you for attending!

Please complete the online evaluation:

https://www.surveymonkey.com/s/digipres_storeprotect

The CARLI Digital Preservation Trainers will use your feedback when planning future webinars and events.

