

<b>The University of British Columbia Library</b>		Document No.	###
		Approval Date	<i>May 5, 2016</i>
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<b>Title</b>	Levels of Digital Preservation		

## OBJECTIVES

- Aid in organizing and mitigating digital preservation risks
- Levels can be applied to specific collections and/or system wide
- Levels are content and system agnostic

### LEVEL 1

Resources preserved at this level are subject only to bit-level preservation activities. Under this level, a resource will be subject to virus checks and regular backups. Only select metadata is archived along with the resource. This is a basic level of preservation which ensures stores copies of resources and regular backups of the resources. Multiple copies of a resource are retained to encounter the perils of media decay. This level of preservation lacks advanced preservation activities like format normalization, format migration, validation checks and full metadata.

### LEVEL 2

Level 2 preservation is intended for resources that require medium to long-term preservation but are currently being preserved elsewhere and/or have lower projected preservability. Resources within this plan undergo virus checks, integrity checks, file normalization, and include extended metadata. Active monitoring is not part of this plan, and it also lacks any normalization or migration strategies. Multiple copies help to encounter the problem of media decay and ensure bit-level preservation.

### LEVEL 3

Resources preserved at this level are subject to a rich set of preservation actions for long-term accessibility. Upon ingest, a resource

will go through virus checking, fixity checking, file validation, format normalization and archival packaging processes. Level 3 resources are archived with full metadata to capture information about the resource, provenance, authenticity, preservation activity, technical environment and rights. To prevent a loss of access to files due to file format obsolescence, all resources at Level 3 are subject to a file format migration strategy, which helps to keep the content stored in formats that are readable by the current technology.

	<b>Level 1: Basic Preservation</b>	<b>Level 2: Bit-level Plus Preservation<sup>1</sup></b>	<b>Level 3: Full Preservation</b>
<b>Type of content</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> external digitization requests</li> <li><input type="checkbox"/> legacy digitized content</li> <li><input type="checkbox"/> selected/licensed research data sets</li> <li><input type="checkbox"/> in copyright material</li> <li><input type="checkbox"/> file format conversion projects</li> <li><input type="checkbox"/> licenced data sets</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> other locally digitized resources (e.g., retrospectively scanned newspapers)</li> <li><input type="checkbox"/> low quality files</li> <li><input type="checkbox"/> material of lower projected preservability</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> flagship digitization projects representing collections of local strength</li> <li><input type="checkbox"/> locally created born digital collections</li> <li><input type="checkbox"/> externally created resources for which we have stewardship responsibilities i.e. Chinese Canadian Stories Community Collections</li> <li><input type="checkbox"/> COPPUL PLN content (200 GB)</li> <li><input type="checkbox"/> CGI PLN content (consortial)</li> <li><input type="checkbox"/> select research data sets (DataVerse)</li> </ul>
<b>Storage and Geographic Location</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> 2 complete copies</li> <li><input type="checkbox"/> transfer from heterogeneous media to storage system</li> <li><input type="checkbox"/> Document your storage system(s) and storage</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> 3 complete copies</li> <li><input type="checkbox"/> 1 copy in different geographic location</li> <li><input type="checkbox"/> document storage system</li> <li><input type="checkbox"/> Start an obsolescence monitoring process for your</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> crash consistent snapshot is taken every morning at 3am and vaulted over to a remote location at midnight the same day</li> <li><input type="checkbox"/> Have a comprehensive plan</li> </ul>

<sup>1</sup> UBC Library currently implements Level 1 and Level 3 Preservation, but intends on employing Level 2 as appropriate when the need arises.

	media and what you need to use them	storage system(s) and media	in place that will keep files and metadata on currently accessible media or systems.
<p><b>File Fixity and Data Integrity</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Virtual Server storage (Backup snapshots to disk are performed daily and weekly. Daily backups are stored for 28 days while weekly snapshots are kept for 12 weeks.)</li> <li><input type="checkbox"/> No Fixity Checking, No Data Integrity</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check fixity on ingest if it has been provided with the content</li> <li><input type="checkbox"/> Create fixity info if it wasn't provided with the content</li> <li><input type="checkbox"/> check fixity on all ingests at fixed intervals</li> <li><input type="checkbox"/> use write-blockers when working with originals</li> <li><input type="checkbox"/> maintain logs of fixity info; supply audit on demand</li> <li><input type="checkbox"/> ability to detect corrupt data</li> <li><input type="checkbox"/> virus check all content (Bag-it or some other tool)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Snapshots allow you to preserve the state of the virtual machine so you can return to the same state repeatedly.</li> <li><input type="checkbox"/> Please note that snapshots are not backup systems – they only contain deltas of changes between the time the snapshot was taken and current state.</li> <li><input type="checkbox"/> Archivematica micro-services/tools: fixity checks, specifically Transfer micro-service “Assign file UUIDs and checksums” (which assigns a sha-256 checksum to each transfer) and Ingest micro-service “Verify checksums.” Archivematica micro-services use md5deep to generate and verify</li> </ul>

			<p>checksums</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Materials stored in Archivematica are subject to regular fixity checks – comparisons of checksum values calculated at a given point in time with those generated at time of ingest. To check fixity of AIPs in storage, Artefactual has a separate command-line app called Fixity (further user documentation for Fixity is pending).</li> </ul>
<b>Information Security</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> identify who has read, write, move and delete authorization to individual files</li> <li><input type="checkbox"/> restrict who has authorizations to individual files</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> document access restrictions for content</li> <li><input type="checkbox"/> maintain logs of who accessed, edited files, including deletions and preservation actions</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Maintain logs of who performed what actions on files, including deletions and preservation actions</li> <li><input type="checkbox"/> perform audit of logs</li> </ul>
<b>Metadata</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> inventory of content and its storage location</li> <li><input type="checkbox"/> ensure backup and non-collocation of inventory</li> <li><input type="checkbox"/> create minimal metadata for access</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> store administrative metadata</li> <li><input type="checkbox"/> Store transformative metadata and log events</li> <li><input type="checkbox"/> store standard technical and descriptive metadata</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> store standard preservation metadata</li> </ul>

<b>File Formats</b>	<ul style="list-style-type: none"> <li>❑ encourage use of archival and open formats and codecs</li> </ul>	<ul style="list-style-type: none"> <li>❑ inventory of file formats in use</li> <li>❑ Validate files against their file formats</li> <li>❑ monitor file format obsolescence issues on an on-going basis</li> </ul>	<ul style="list-style-type: none"> <li>❑ perform format migrations, emulation and similar activities as needed</li> </ul>
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#### Sources Consulted

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Library of Congress' Levels of Digital Preservation: A tool for mitigating technical digital preservation tools  
<https://blogs.loc.gov/digitalpreservation/files/2012/09/Levels-of-Digital-Preservation-draft-handout-v3.pdf>

University of Alberta's Tiered Preservation Model  
[http://purl.pt/24107/1/iPres2013\\_PDF/TAP%20A%20Tiered%20Preservation%20Model%20for%20Digital%20Resources.pdf](http://purl.pt/24107/1/iPres2013_PDF/TAP%20A%20Tiered%20Preservation%20Model%20for%20Digital%20Resources.pdf)