

The UNTL Metadata: Preservation Metadata



**Information Technology Services,
Digital Projects Unit**

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FILE SIZE	
Label	File Size
Sub-Element	—
UNTL Definition	The size (in bytes) of the file or bitstream.
Comment	Size is necessary for managing the object within the archive system. It is also necessary for ensuring that an application has adequate space to process or move files. E.g. migration of storage media to CD-ROM might require this information, since standard CD-ROMs have a limited capacity.
Required	Mandatory
Repeatable	No
Data Type	Scalar

Input guidelines:

- Automatically obtained by the system.
- The file size must record the number of bytes as provided by the system. Do not convert file sizes to KB, MB, or other notation.

Examples:

- 156734
- 1268

FILE-NAME	
Label	File Name
Sub-Element	—
UNTL Definition	The file name (including its extension name) of the object.
Comment	This is the original name of the object as submitted to or harvested, before any renaming by the system. Necessary for managing the object within the archive system at the file level.
Required	Mandatory
Repeatable	No
Data Type	String

Input guidelines:

- This is the name of the file as designated in the original submission or harvest.
- The file may have other names in different contexts.

Examples:

- m013022.pdf
- blue_album-0004.tif

FORMAT NAME	
Label	Format Name
Sub-Element	1.1 Format Version
UNTL Definition	Identification and designation of the format of a file.
Comment	An accurate identification of format is essential for preservation purposes.
Required	Optional
Repeatable	Yes
Data Type	String

1.1 Format Version	
Label	Format Version
Sub-Element	—
UNTL Definition	The version of the format named in format name.
Comment	Provide sufficient information about the format version to facilitate access and preservation activities.
Required	Optional
Repeatable	Yes
Data Type	String

Input guidelines:

- The format of a file should be ascertained by the system.
- Even if format information is identified directly or indirectly (such as: the file name extension, other metadata, etc.), the recommended practice is to independently identify the format by parsing the file when possible.
- Format version value can be either a numeric or a chronological designation.
- If the format or version cannot be identified, it is valid to record that the format or version is unknown. However, efforts should be made to identify the format and version, even if manual intervention is required.
- If manual, recommended best practice is that value should be taken from a controlled vocabulary.
- If there is a unique situation, to support digital preservation activities, further information about the format can be provided by reference to an entry in a format registry (such as [Global Digital Format Registry](#) (GDFR)).

Examples:

- The most specific format should be recorded.
 - If an image is both a valid TIFF and GeoTIFF, it should be identified as a GeoTIFF.
- Format version value can be either a numeric or a chronological designation.
 - 3.2
 - 7.0
 - 2005

FILE DESCRIPTION	
Label	File Description
Sub-Element	1.1 Resolution 1.2 Dimension 1.3 Duration 1.4 Rate 1.5 Tonal-Resolution 1.6 Color 1.7 Compression 1.8 Other File Information
UNTL Definition	Technical specifications of the digital file.
Comment	Describe the details of digital files essential for managing preservation.
Required	Mandatory
Repeatable	No
Data Type	String

File Description Sub-Elements		
1.1 Resolution	Definition:	-The spatial resolution of the digital image, expressed as pixels per inch (ppi) or dots per inch (dpi). -For audio, it is the sampling frequency in kHz.
	Example:	-600 dpi; 300 dpi, -44.1kHz; 96kHz
1.2 Dimension	Definition:	The number of pixels along the vertical and horizontal dimensions.
	Example:	4096 x 6144 pixels
1.3 Duration	Definition:	The length of the audio and/or video recording in minutes and seconds, or minutes, seconds, hundredths of seconds, and frames.
	Example:	67 minutes 12 seconds; 03:12:24:20
1.4 Rate	Definition:	-For video: the standard frame rate per second of the video material. -For audio: word length used to encode the audio. Consequently an indication of dynamic range.
	Example:	25 fps
1.5 Tonal-Resolution	Definition:	Bit depth of each pixel, and whether multiple bits convey gray tones or color.
	Example:	8-bit grayscale; 24-bit color
1.6 Color	Definition:	The color space used for the image.
	Example:	CMYK; RGB
1.7 Compression	Definition:	The type and level of compression.
	Example:	zip file, CCIT 4, MPEG 3
1.8 Other File	Definition:	Any other relevant file information.

Information	Example:	2. Single Track, (The number of tracks and how they are related to each other).
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Input guidelines:

- The file description information is automatically recorded by the system.

FIXITY INFORMATION	
Label	Fixity Information
Sub-Element	1.1 Authentication Type , 1.2 Authentication Result , 1.3 Date , 1.3.1 First Created Date , 1.3.2 Last Checked Date
UNTL Definition	Information (authenticating data) that can be used to validate authenticity.
Comment	Further work is needed to define the range of attributes and values appropriate for a variety of authentication mechanisms.
Required	
Repeatable	
Data Type	See sub-elements

1.1 Authentication Type	
Label	Authentication Type
Sub-Element	—
UNTL Definition	Specific data describing the technique used to authenticate the digital resource.
Comment	Provide sufficient information about the tool (algorithm) used to construct the output message. If not automatic, the recommended best practice is that type value should be taken from a controlled vocabulary. (E.g. MD5, Adler-32, HAVAL, SHA-1, SHA-256, SHA-384, SHA-512, TIGER, WHIRLPOOL, etc.).
Required	Recommended
Repeatable	No
Data Type	String

1.2 Authentication Result	
Label	Authentication Result
Sub-Element	—
UNTL Definition	Result or output of the most recent use of this authentication type (message digest algorithm)
Comment	This must be stored so that it can be compared in future fixity checks, which provide the basis for assessing authenticity of the digital object.
Required	Mandatory
Repeatable	No
Data Type	String

1.3 Date	
Label	Date
Sub-Element	1.3.1 First Created Date, 1.3.2 Last Checked Date
UNTL Definition	Identify the first and last dates of authentication methods applied to the digital resource.
Comment	The UNTL uses the ISO 8601 standard for recording dates. (For further description, see also W3C standard below)
Required	Recommended
Repeatable	No
Data Type	Date/Time

1.3.1 First Created Authentication Date	
Label	First Created Date
Sub-Element	—
UNTL Definition	Date of very first application of an authentication method to the content digital resource.
Comment	Complete date plus hours, minutes, seconds and time zone: YYYY-MM-DDThh:mm:ssTZD (e.g. 1997-07-16T19:20:30+01:00)
Required	Mandatory
Repeatable	No

Data Type	Date/Time
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1.3.2 Last Checked Authentication Date	
Label	Last Checked Date
Sub-Element	—
UNTL Definition	Date of most recent use of this authentication type.
Comment	Establish temporal benchmark against which later version or copies of the digital resource can be compared.
Required	Mandatory
Repeatable	No
Data Type	Date/Time

Input guidelines:

- The fixity information is automatically calculated and recorded by the system.
- The output must be stored so that it can be compared in future fixity checks.
- According to the newest version of the [W3C](#) standard, the date and time format for the complete date plus hours, minutes, and seconds will be as follows:
 YYYY-MM-DDThh:mm:ssTZD (e.g. 1997-07-16T19:20:30+01:00)
 where:
 YYYY = four-digit year
 MM = two-digit month (01=January, etc.)
 DD = two-digit day of month (01 through 31)
 hh = two digits of hour (00 through 23) (am/pm NOT allowed)
 mm = two digits of minute (00 through 59)
 ss = two digits of second (00 through 59)
 TZD = time zone designator (Z or +hh:mm or -hh:mm)

Examples:

- **Authentication Type:**
 MD5,
 Adler-32,
 HAVAL,
 TIGER,
 WHIRLPOOL
 SHA-1, SHA-256, SHA-384, SHA-512, etc.
- **Authentication Result:**
 17ce4779782cbaf36a91fedc69b020d3,
 64365bc208481c9b6fba8a23ecf9c93c.
- **Date:**
 2005-04-05T08:14:30-05:00 (Corresponds to April 5, 2005, 8:14:30 am, US Eastern Standard

Time.)
 2005-04-03, 13:14:30 (Corresponds to the same instant.)

SYSTEM ENVIRONMENT	
Label	System Environment
Sub-Element	1.1 <u>Software</u>, 1.2 <u>Hardware</u>
UNTL Definition	Hardware/software combinations supporting use of the object
Comment	<p>System Environment is both the technical environment that the digital resources are created and the means by which the user renders and interacts with content. Separation of digital content from its environmental context can result in the content becoming unusable.</p> <p>Different hardware and software environments can support different uses of objects. For example, the environment needed to edit and modify a file can be quite different than the environment needed to render it.</p> <p>Despite the difficulty of collecting and maintaining this information, this unit is recommended because of the critical importance of technical environment metadata for ensuring long-term access.</p>
Required	Recommended
Repeatable	
Data Type	String

Input guidelines:

Creating Application Software Name:

- Included manufacturer and title of the software and hardware application helps to identify or disambiguate the product, e.g. use “Adobe Photoshop” rather than “Photoshop”.
- Application name applies to both objects created external to the repository and subsequently ingested, and to objects created by the repository (for example, through migration events).
- Several different layers of software and hardware can be required to create and support an object. For example, a file could have been created by MSWord and later turned into a PDF using Adobe PhotoShop. Details of both the Word and PhotoShop applications could be recorded.

SOFTWARE	
Label	Software
Sub-Element	1.1 Creation Application SW , 1.2 Access Application SW , 1.3 Other SW Information
UNTL Definition	A description of the software environment required to create, access, or use the object.
Comment	The software environment is the means by which the user renders and interacts with content. Separation of digital content from its environmental context can result in the content becoming unusable.
Required	Recommended
Repeatable	
Data Type	String

1.1 Creation Application Software	
Label	Creation Application Software
Sub-Element	1.1.1 Creation Application SW Name , 1.1.2 Creation Application SW Version
UNTL Definition	Information about the application that created the object.
Comment	Information about the creation application, including the version of the application can be useful for problem solving purposes. For example, it is not uncommon for certain versions of software to be known for causing conversion errors or introducing artifacts.
Required	Recommended
Repeatable	Yes
Data Type	String

1.1.1 Creation Application Software Name	
Label	Creation Application Software Name
Sub-Element	—
UNTL Definition	The name of the software program that created the digital object.
Comment	<p>If the object was created outside the participant institutions, it might also be extracted from the file itself: the name of the creation application is often embedded within the file.</p> <p>The creation application software name sub-element is repeatable if more than one application processed the object in turn. For example, a file could have been created by MSWord and later turned into a PDF using Adobe PhotoShop. Details of both the Word and PhotoShop applications could be recorded.</p>
Required	Recommended
Repeatable	Yes
Data Type	String

1.1.2 Creation Application Software Version	
Label	Creation Application Software Version
Sub-Element	—
UNTL Definition	The version(s) of the application software program(s) referenced in the creation application software name sub-element.
Comment	<p>Provide sufficient information about the creation application, including the version of the application and the date the file was created, to facilitate access and preservation activities.</p>
Required	Recommended
Repeatable	Yes
Data Type	String

Input guidelines:

Creation Application Software Name:

- Despite the difficulty of collecting and maintaining creation software information, this element is recommended because of its critical importance in a technical environment where specialized software is required to create or use resources. See also [Analysis of System Environment](#).
- The creation application software name sub-element applies both to objects created external to the repository and subsequently ingested, and to objects created by the repository (for example, through migration events).
- Data will be manually entered, and recommended best practice is that the value should be taken from a controlled vocabulary.
- The name of the creation software is often embedded within the file, and it might be extracted from the file itself.
- Including both the manufacturer and title of the software application helps to identify or disambiguate the product, e.g. use “Adobe Photoshop” rather than “Photoshop.”
- Several different layers of software can be required to support an object. The creation application software sub-element is repeatable if more than one application processed the object in turn. For example, a file could have been created by MSWord and later turned into a PDF using Adobe PhotoShop. Details of both the Word and PhotoShop applications could be recorded.

Creation Application Software Version:

- Enter the version of the software listed in the creation application software name sub-element.
- If there is no formal version, the date of issuance can be used. Formulate the date as YYYY, YYYY-MM, or YYYY-MM-DD.

Examples:

For a file created with MSWord 2003.

Creation Application Software Name: Microsoft Office Word
Creation Application Software Version: 2003

For a file created with Photoshop 5.5.

Creation Application Software Name: Adobe Photoshop
Creation Application Software Version: 5.5

1.2 Access Application Software	
Label	Access Application Software
Sub-Element	<u>1.2.1 Access Application SW Name, 1.2.2 Access Application SW Version</u>
UNTL Definition	Name and version of the application software that is required to render and use the digital resources.
Comment	The access application software translates the digital byte stream into human-readable content. Suggested values for an environment include minimum and recommended, however, the criteria for "recommended" may be different for different users.
Required	Recommended
Repeatable	Yes
Data Type	String

1.2.1 Access Application Software Name	
Label	Access Application Software Name
Sub-Element	—
UNTL Definition	Name of the application software that is required to access the digital resource.
Comment	The name of the software that translates the archived byte stream into human-readable content.
Required	Recommended
Repeatable	Yes
Data Type	String

1.2.2 Access Application Software Version	
Label	Access Application Software Version
Sub-Element	—
UNTL Definition	The version(s) of the application software program(s) referenced in the access application software name sub-element.
Comment	Providing sufficient information about the access application software version facilitates long-term access to the resource. If there is no formal version, the date of issuance can be used.
Required	Recommended
Repeatable	Yes
Data Type	String

Input guidelines:

Access Application Software Name.

- Preface the software name with a consistent qualifier. Suggested values are:
 - **Renderer =**
Application that can display/play/execute the format instance. Examples are image viewers, video players, the Java virtual machine, etc.
 - **Ancillary =**
Required ancillary software, and it may also be a non-executable component such as a font or a stylesheet. Examples are run time libraries, browser plug-ins, compression/decompression routines, utilities, operating system emulators, etc.
 - **Operating System =**
Software that supports application execution, process scheduling, memory management, file systems, etc.
 - **Driver =**
Software with the primary function of communicating between hardware and the operating system or other software.
- Including both the manufacturer and title of the software application helps to identify or disambiguate the product, e.g. use “Adobe Acrobat” rather than “Acrobat.”

Access Application Software Version:

- Enter the version of the software listed in the creation application software name sub-element.
- If there is no formal version, the date of issuance can be used. Formulate the date as YYYY, YYYY-MM, or YYYY-MM-DD.

Examples:

For a .pdf file that must be viewed with Acrobat.

Access Application Name: Renderer = Adobe Acrobat

Access Application Software Version: 6.0

For a file that requires a Java plug-in to be accessed.

Access Application Name: Ancillary = Java Plug-in

Access Application Software Version: 1.4

1.3 Other Software Information	
Label	Other Software Information
Sub-Element	—
UNTL Definition	Other software-related information about a resource, component, or associated (dependent) file needed to use or render the digital resource or representation.
Comment	Use this sub-element to record additional software requirements or instructions necessary to render a file or representation.
Required	Optional
Repeatable	No
Data Type	String

Input guidelines:

Other Software Information.

- This note could be used to record the context of the environment information. For example, if a file can be rendered through a PC client application or through a browser with a plug-in, this note could be used to identify which situation applies.
- The text entered in the other software information sub-element can be supplemented in more rigorous form elsewhere, such as: a link to documentation, a schema, a DTD or an entity file declaration.
- For required software information, see [1.2.1 Access Application Software Name](#).

HARDWARE	
Label	Hardware
Sub-Element	1.1 Creation Hardware , 1.2 Access Hardware , 1.3 Other Hardware Information
UNTL Definition	Hardware components needed to create, access, and use the digital resource.
Comment	Recommended where specialized hardware is required to create or use the digital resource. Data will be manually entered.
Required	Recommended
Repeatable	
Data Type	See sub-elements

1.1 Creation Hardware	
Label	Creation Hardware
Sub-Element	—
UNTL Definition	Device and hardware components used to create the digital resource.
Comment	Manufacturer, model, and version (if applicable) of the hardware.
Required	Recommended
Repeatable	Yes
Data Type	String

1.2 Access Hardware	
Label	Access Hardware
Sub-Element	—
UNTL Definition	Hardware components required by the software referenced in the Access Application Software Name sub-element or needed by the human user of the referenced software
Comment	Manufacturer, model and version (if applicable) of the hardware.
Required	Optional
Repeatable	Yes
Data Type	String

1.3 Other Hardware Information	
Label	Other Hardware Information
Sub-Element	—
UNTL Definition	Additional Information (requirements, instructions, etc.) related to the hardware referenced in 1.1 Creation Hardware and 1.2 Access Hardware .
Comment	For hardware, the amount of computing resources required (such as memory, storage, processor speed, etc.) may need to be documented. In addition, more detailed instructions may be needed to install and/or operate the hardware.
Required	Optional
Repeatable	No
Data Type	String

Input guidelines:

- Hardware environment information can be very difficult to provide. Many different hardware environments may apply; there are a huge number of combinations of maker and type of cpu, memory, video drivers, and so on. Although at least one hardware environment should be recorded (particularly, if specialized hardware is required), it is not necessary to record them all. See also [Analysis of System Environment](#)
- Different environments can support different uses of objects. For example, the environment needed to edit and modify a file can be quite different from the environment needed to render it.
- The best practice is to provide both the manufacturer and version of the software application when this helps to identify or disambiguate the product.
- Specify if the software (name and version), is the minimum or recommended environment.
- In addition, for more detailed instructions, this could be linked to hardware documentation.

Examples:

For creation or access hardware.

Suggested values:

- Capturing Device:
 - Scanner:
 - Flatbed scanner (Canon Canoscan FS 4000US, Fujitsu Fi-4340C Simple/Duplex Scanner, UMAX Powerlook 2100XL Scanner, etc.)
 - Wide-format scanner (Vidar Wide-format scanner)
 - Book Scanner (Zeutschel book scanners)
 - Film scanner (Canon Canoscan FS 4000US)
 - Camera:
 - Digital still camera (BetterLight Super 8k, Canon EOS D30, etc.)
 - Video camera (Sony DCCR-PC120bt Camcorder, etc.)

- Processor: (Intell Pentium 3, etc.)
- RAM: (32MB minimum, etc.)
- Hard drive (CPUs, etc.)
- Input/Output device (Mouse, Monitor, Joystick, etc.)

For other hardware information.

- Required RAM for Apache is unknown.

DOCUMENTATION	
Label	Documentation
Sub-Element	—
UNTL Definition	Any standards, procedures, or supporting documentation necessary or useful for the management of the digital resource.
Comment	Link the digital resource to any relevant supporting documentation.
Required	Recommended
Repeatable	No
Data Type	String

Input guidelines:

- Link the digital resource to supporting documentation useful for rendering and understanding its content.

Examples:

- Manual, Procedure, Glossary, etc.

STRUCTURAL COMPOSITION	
Label	Structural Composition
Sub-Element	—
UNTL Definition	Internal structure of a complex digital resource that is bundled with other files. That is, an enumeration of the components of a complex object, along with their interrelationships.
Comment	Managing preservation requires knowing and managing the structure of complex digital resources as well as their components
Required	Recommended (Mandatory for complex objects)
Repeatable	No
Data Type	String

Input guidelines:

- It will be system provided. The system will have to attempt to identify the composition from the object itself or from associated metadata.
- This file describes the individual files that comprise a complex object, including the overall hierarchical position of each file, to enable component files of a preservation master to be reassembled in their correct structure.

Examples:

- Web page (consists of one ASCII HTML file, along with three embedded static GIF files and one embedded audio WAV file).
- CD-ROM containing 22 files (14.gif image files, 3.wav audio files, 3.txt files and 2.ex executables assembled in accordance with ISO 9660).

STORAGE MEDIUM	
Label	Storage Medium
Sub-Element	—
UNTL Definition	The physical medium on which the bit stream is recorded.
Comment	Knowing the medium on which an object is stored helps to know how and when to do media refreshment and media migration.
Required	Optional
Repeatable	Yes
Data Type	String

Input guidelines:

- Any replication on different media must be managed.
- Because multiple storage media are possible, this unit is repeatable.

Examples:

- Magnetic tape
- Hard disk
- CD-ROM
- DVD

ACCESS INHIBITORS	
Label	Access Inhibitors
Sub-Element	1.1 Inhibitor Key
UNTL Definition	Description of any features of the digital resources intended to inhibit access.
Comment	Features of the object intended to inhibit access, copying, dissemination, or migration. Common inhibitors are encryption and password protection.
Required	Optional
Repeatable	Yes
Data Type	String

1.1 Inhibitor Key	
Label	Inhibitor Key
Sub-Element	—
UNTL Definition	The tools (decryption key, password, etc.) that enable access to the digital resources.
Comment	It is possible that without this information the digital resource may not be accessed, copied or migrated.
Required	Optional
Repeatable	Yes
Data Type	String

Input guidelines:

Input guidelines for Access Inhibitors

- Access inhibitors information may indicate whether a file is password-protected or encrypted.
- When encryption is used, the type of encryption should be specifically indicated, e.g. “DES”, for “encryption” type.

Input guidelines for Inhibitors Key

- The decryption key or password should be provided if known. (However, it is not advisable to actually store the inhibitor keys in plaintext in an unsecured database).

Examples:

Examples of Access Inhibitors

Password protected

Cannot be printed

DES Encryption

PGP Encryption

Blowfish Encryption

Examples of Inhibitor Key

The password is XXXXXXXX.

DES decryption key

FUNCTIONALITY	
Label	Functionality
Sub-Element	—
UNTL Definition	Description of any significant functional properties or “look and feel” attributes of the rendered digital resource (in regards to its current manifestation).
Comment	Digital objects that have the same technical properties may still differ in terms of the properties that should be preserved for future presentation or use.
Required	Recommended
Repeatable	No
Data Type	String

Input guidelines:

- Functionality may be objective technical characteristics subjectively considered to be particularly important. For example, a PDF may contain internal links which are not considered important and JavaScript which is considered important.
- Functionality may also be subjectively determined characteristics, and the option chosen would depend upon a metadata cataloger's judgment of the significant properties of the digital object. For example, future migrations of a TIFF image may require optimization for line clarity or for color.
- Listing functionality implies the desire to preserve these significant properties in future preservation actions. If preservation actions or decisions result in loss of functionalities or modification of significant properties, then they should be recorded in the [Exception](#) element.
- More experience with digital preservation is needed to determine the best ways of representing both [Exception](#) and functionality information.

Examples:

- Web page: contains an interactive JavaScript application and embedded animations.

EXCEPTION	
Label	Exception
Sub-Element	—
UNTL Definition	Any characteristic that may appear as a loss in functionality or change in the look and feel of the digital resource resulting from preservation processes and procedures.
Comment	This element describes peculiarity or exceptions that occur as a result of migration or other preservation actions. It helps to assess the relative success of a preservation strategy and prevents time lost to trying to solve problems that were inherent in the object at the time the strategy was applied.
Required	Optional
Repeatable	No
Data Type	String

Input guidelines:

- This element describes peculiarity or exceptions that occur as a result of preservation actions.
- Exception can be considered the “negative” of [Functionality](#). Functionality metadata records all of the attributes, which existed in the original digital object. Conversely, the exception element (some call it "quirks") lists all of the attributes which no longer exist as part of the current digital object.
- More experience with digital preservation is needed to determine the best ways of representing both [Functionality](#) and exception information.

Examples:

- Digital object has been migrated from HTML to PDF (as a result, hyperlinks are broken; embedded JavaScript application no longer functional).
- The text format tag is no longer supported by many browsers due to changes in HTML 4.
- The Shockwave files could not be captured from the source document.

ALTERATION HISTORY	
Label	Alteration History
Sub-Element	1.1 Action Taken , 1.2 Date of Alteration , 1.3 Person/Agency Performing Alteration , 1.4 Other Information
UNTL Definition	This element documents what has happened to a particular digital resource. It describes any changes made, from the time of creation of the digital resource.
Comment	All relevant details of any process applied to a digital resource, including specific settings or actions that were required to produce the digital resource should be recorded here. This information is essential to document the preservation methods that have been applied to the digital resource and how the various copies or formats of the digital resource might differ from each other. This field probably stores information such as how the element was disintegrated into its integral parts or changed in format.
Required	Optional
Repeatable	Yes
Data Type	String

1.1 Action Taken	
Label	Action Taken
Sub-Element	—
UNTL Definition	This element describes significant steps involved in the process of changing the original digital resource.
Comment	This field stores information on the specific process applied to the digital resource. (To list hardware and software used to make changes to a digital resource, use System Environment). The series of linked records pertaining to the digital resource builds up a change history over time.
Required	Optional
Repeatable	Yes
Data Type	String

1.2 Date of Alteration	
Label	Date of Alteration
Sub-Element	—
UNTL Definition	This element identifies the sequence of processes and provides a record of dates significant to the history of the digital resource.
Comment	Records the date, or range of dates, if relevant, of the process being carried out. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format.
Required	Optional
Repeatable	Yes
Data Type	String

1.3 Person/Agency Performing Alteration	
Label	Person/Agency Performing Alteration
Sub-Element	—
UNTL Definition	The individual(s), agency, or institution that carried out the alteration process.
Comment	The individual(s), business unit, or institution that approved the process can be added here (if different).
Required	Optional
Repeatable	Yes
Data Type	String

1.4 Other Information	
Label	Other Information
Sub-Element	—
UNTL Definition	Any information relevant to the management of the digital resource will be added here.
Comment	Complete this field only if the Action Taken sub-element is insufficient to provide necessary information regarding the process/action, e.g. Why was the particular action necessary? Are there any noteworthy hardware/software used in performing the process? etc. Any standards or procedures used when performing the alteration process will be recorded in the Documentation element.
Required	Optional
Repeatable	Yes
Data Type	String

Input guidelines:

- Any history of actions performed on the digital object during its lifetime will be recorded here.
- List of values can be compiled for common actions (see examples below). The list below is likely to expand as additional preservation and related actions are determined.

Examples:

For action taken, describe:

- Creation of first preservation master from original.
- Creation of subsequent preservation master through migration.
- Creation of subsequent preservation master through emulation.
- Creation of new object from original.

METADATA INFORMATION	
Label	Metadata Information
Sub-Element	1.1 Metadata Editor/Modifier , 1.2 Date of Modification , 1.3 Metadata Modification Action , 1.4 Other Information
UNTL Definition	The details of metadata creation and modification.
Comment	<p>The metadata information entity records information about the metadata creation and the history of changes made:</p> <ul style="list-style-type: none"> • what: detailed information about the changes • by whom: name of the person doing the revision • when: date/time that this change to the metadata information was completed. <p>Note: recording information about changes to the metadata record underscores the importance of the metadata record itself as a component of the digital object that requires continuous management over time.</p>
Required	Recommended
Repeatable	Yes
Data Type	String

1.1 Metadata Editor/Modifier	
Label	Metadata Editor/ Modifier
Sub-Element	—
UNTL Definition	The name of the person and/or institution that has modified or updated the metadata record.
Comment	This element records responsibility for metadata modification.
Required	Recommended
Repeatable	Yes
Data Type	String

1.2 Metadata Modification Date	
Label	Modification Date
Sub-Element	—
UNTL Definition	This element identifies and records dates significant to the history of the metadata creation and modification.
Comment	Records the date, or range of dates the modification is carried out. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format.
Required	Recommended
Repeatable	Yes
Data Type	String

1.3 Modification Action	
Label	Modification Action
Sub-Element	—
UNTL Definition	This element describes the specific steps involved in the process of changing the original metadata records.
Comment	This field stores information on changes to the metadata, including a list of elements with content different from the original values. The description of action taken pertaining to the metadata records of the digital resources builds up a change history over time.
Required	Recommended
Repeatable	Yes
Data Type	String

1.4 Other Information	
Label	Other Information
Sub-Element	—
UNTL Definition	Any other information relevant to the management of the metadata record will be added here.
Comment	
Required	Optional
Repeatable	Yes
Data Type	String

Input guidelines:

- System-generated log would be used for recording metadata editor/modifier information.
- Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format. See the [Date](#) element
- The description of action taken pertaining to the metadata records of the digital resources builds up a change history over time.

Examples:

Examples of Metadata Editor/Modifier.

- Daniel Alemneh, University of North Texas
- Nancy Reis

Examples of date of Modification.

- 2005-04-18
- 2005-03-26

Examples of Action Taken.

- The Date field was corrected and 'Digital Creation Date' changed from 1988 to 1998.
- Creator Name was checked in Name Authority Files (NAF) and modified from Kathy to Cathy.
- Application Software Version information was checked and modified from 3.1 to 3.2.

COMMENTS	
Label	Comments
Sub-Element	—
UNTL Definition	Any other information relevant to the digital object's preservation.
Comment	Information in the comments element will not be displayed to the public.
Required	Optional
Repeatable	No
Data Type	String

Input guidelines:

- Any information that is relevant to the preservation of the object, but that cannot be entered in other elements, should be added here.
- For descriptive notes, use the [Note](#) element. For preservation and metadata management-related information, please use the "Other Information" sub-elements in the [Alteration History](#) and/or [Metadata Information](#) elements.

Examples:

For a photograph with unknown provenance.

Comments: Coverage date determined by analysis of clothing and hairstyle of the subject in the photograph: Hair is worn back and up. Bell-skirt, narrow waist. Feathered hat on chair next to her from 1890s-1900s style.