Use of the Data Dictionary:
PREMIS Examples

This excerpt from

Data Dictionary for Preservation Metadata:
Final Report of the PREMIS Working Group

Contains Section 3. It does not include the final report itself or the Data Dictionary, both of which are also available as separate excerpts from the full report. For the complete report, see www.oclc.org/research/projects/pmwg/premis-final.pdf

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PREMIS Preservation Metadata: Implementation Strategies
A Working Group Jointly Sponsored By OCLC and RLG

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PREMIS working group Web site: www.oclc.org/research/projects/pmwg/.

PREMIS maintenance activity Web site: www.loc.gov/standards/premis/.

Please send comments and questions to premis@loc.gov.

3. EXAMPLES

These examples illustrate both simple and complex applications of PREMIS-conformant metadata. They are as real as possible—the objects being described do exist and the values for the semantic units are correct and plausible. In some cases the objects exist in a working preservation repository, and metadata used in the repository application were mapped to PREMIS semantic units.

Example 1 is a document that is complete in a single word-processing file, ingested into a repository that manages both representations and files. The values of PREMIS semantic units were supplied by mapping metadata actually recorded in the OCLC Digital Archive.

Example 2 is slightly more complex, describing a dissertation consisting of one PDF file and one MP3 file. Because MP3 is not one of the repository's preferred formats, it created a WAVE file from the MP3.

In Example 3, the archived object is a tar file that contains within it a file produced by the application QuarkXPress (file extension .qxp), which in turn contains (links to) an Encapsulated PostScript (EPS) file. The source file for the EPS file is a Macromedia FreeHand MX file also included in the tar file.

Example 4 shows one way of representing a harvested Web site, where the entire snapshot is considered a representation and each captured page is considered an equal part of the whole.

Example 5 shows only the semantic units pertaining to digital signatures, to illustrate how this information might be recorded. In this example, the values are formatted plausibly but are not necessarily real.

Example 6 shows PREMIS metadata for two files: a TIFF image and an XML file containing descriptive metadata for the image. Both files are stored in the preservation repository.

For additional examples, see the PREMIS maintenance activity Web site at www.loc.gov/standards/premis/.

Example 1: Microsoft Word Document Complete in One File

This example shows a mapping of metadata elements and values used by the OCLC Digital Archive to PREMIS. It does not represent all possible elements used in the Digital Archive, nor does it represent how the elements are stored in the Digital Archive. For a list of all OCLC Digital Archive elements see www.oclc.org/support/documentation/digitalarchive/da_metadata_elements/.

Metadata in the OCLC Digital Archive comes from a variety of sources. Some is ingested into the Archive with the object. Some is created by the Archive as a result of internal processes. For example, *formatVersion* is supplied for some format types by the Archive using JHOVE 1.0 software. Some values are not stored in the Digital Archive but can be supplied on output. These are noted as "Implicit" below. There is no Rights information because OCLC stores the Terms and Conditions outside the Digital Archive.

Example 1, Object 1: the representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			OCLC Object Identifier [implicit in OCLC]
objectIdentifier	objectIdentifierValue			0000009605
preservationLevel				store
objectCategory				representation
objectCharacteristics	compositionLevel			n/a
objectCharacteristics	fixity	messageDigestAlgorithm		n/a
objectCharacteristics	fixity	messageDigest		n/a
objectCharacteristics	fixity	messageDigestOriginator		n/a
objectCharacteristics	size			n/a
objectCharacteristics	format	formatDesignation	formatName	n/a
objectCharacteristics	format	formatDesignation	formatVersion	n/a
objectCharacteristics	format	formatRegistry	formatRegistryName	n/a
objectCharacteristics	format	formatRegistry	formatRegistryKey	n/a
objectCharacteristics	format	formatRegistry	formatRegistryRole	n/a
objectCharacteristics	significantProperties			n/a
objectCharacteristics	inhibitors	inhibitorType		n/a
objectCharacteristics	inhibitors	inhibitorTarget		n/a
objectCharacteristics	inhibitors	inhibitorKey		n/a

Example 1, Object 1: the representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
creatingApplication	creatingApplication Name			
creatingApplication	creatingApplication Version			
creatingApplication	dateCreatedBy Application			
originalName				http://www.archivesdept.org/annualreports2000.doc
storage	contentLocation	contentLocationType		Open URL [implicit in OCLC]
storage	contentLocation	contentLocationValue		http://digitalarchive.oclc.org/request?pid%3Dobjid%3A0000003174
storage	storageMedium			hard disk [implicit in OCLC]
environment	environment Characteristic			current [equivalent to “known to work”]
environment	environmentPurpose			render [implicit in OCLC]
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		MSWindows
environment	software	swVersion		2000
environment	software	swType		operating system
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swName		MSWord
environment	software	swVersion		2000
environment	software	swType		application
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Celeron

3. Examples

Example 1, Object 1: the representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		512 MB RAM
signatureInformation	signatureInformation Encoding			n/a
signatureInformation	signatureMethod			n/a
signatureInformation	signatureValue			n/a
signatureInformation	signatureValidation Rules			n/a
signatureInformation	signatureProperties			n/a
signatureInformation	keyInformation	keyType		n/a
signatureInformation	keyInformation	keyValue		n/a
signatureInformation	keyInformation	keyVerificationInformation		n/a
relationship	relationshipType			structural
relationship	relationshipSubType			has part
relationship	relatedObject Identification	relatedObjectIdentifierType		OCLC Object Identifier [implicit in OCLC]
relationship	relatedObject Identification	relatedObjectIdentifierValue		0000210958
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			OCLC Event Identifier [implicit in OCLC]
linkingEventIdentifier	linkingEventIdentifier Value			00000033393
linkingEventIdentifier	linkingEventIdentifier Type			OCLC Event Identifier [implicit in OCLC]

Example 1, Object 1: the representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Value			00000034287
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			OCLC Bibliographic Identifier [implicit in OCLC]
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			12345678
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 1, Object 2: the file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			OCLC Object Identifier [implicit in OCLC]
objectIdentifier	objectIdentifierValue			0000210958
preservationLevel				Store
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		Adler-32
objectCharacteristics	fixity	messageDigest		7c9b35da
objectCharacteristics	fixity	messageDigestOriginator		OCLC [implicit in OCLC]
objectCharacteristics	size			230400
objectCharacteristics	format	formatDesignation	formatName	MSWORD
objectCharacteristics	format	formatDesignation	formatVersion	2000
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	

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Example 1, Object 2: the file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			Microsoft Word
creatingApplication	creatingApplication Version			2000
creatingApplication	dateCreatedBy Application			unknown
originalName				
storage	contentLocation	contentLocationType		content management foldering system [implicit in OCLC]
storage	contentLocation	contentLocationValue		/0/0000009605/file.doc
storage	storageMedium			hard disk [implicit in OCLC]
environment	environment Characteristic			
environment	environmentPurpose			
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		
environment	software	swVersion		
environment	software	swType		
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		

Example 1, Object 2: the file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	keyVerificationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		OCLC Object Identifier [implicit in OCLC]
relationship	relatedObject Identification	relatedObjectIdentifierValue		0000009605
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			OCLC Event Identifier [implicit in OCLC]
linkingEventIdentifier	linkingEventIdentifier Value			00000034000
linkingEventIdentifier	linkingEventIdentifier Type			OCLC Event Identifier [implicit in OCLC]
linkingEventIdentifier	linkingEventIdentifier Value			00000034200
linkingEventIdentifier	linkingEventIdentifier Type			OCLC Event Identifier [implicit in OCLC]

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Example 1, Object 2: the file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Value			00000033893
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 1, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	OCLC Event Identifier [implicit in OCLC]
eventIdentifier	eventIdentifierValue	00000033393
eventType		Ingest
eventDateTime		2004-12-05 07:00:41.0
eventDetail		
eventOutcome Information	eventOutcome	Status_Success
eventOutcome Information	eventOutcomeDetail	[Contains database ID for XML-encoded data elements composing the ingest report: object ID, metadata record ID, files composing the object, fixity, and virus details.]
linkingAgentIdentifier	linkingAgentIdentifierType	OCLC Institution Number [implicit in OCLC]
linkingAgentIdentifier	linkingAgentIdentifierValue	28765
linkingAgentIdentifier	linkingAgentRole	Implementer [implicit in OCLC]
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 1, Event 2		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	OCLC Event Identifier [implicit in OCLC]
eventIdentifier	eventIdentifierValue	00000034000
eventType		Fixity check
eventDateTime		2004-12-05 07:00:55.0
eventDetail		
eventOutcome Information	eventOutcome	Status_Success
eventOutcome Information	eventOutcomeDetail	[Contains XML-encoded Date, object ID, any errors found.]
linkingAgentIdentifier	linkingAgentIdentifierType	OCLC Institution Number [implicit in OCLC]
linkingAgentIdentifier	linkingAgentIdentifierValue	0 [implicit in OCLC]
linkingAgentIdentifier	linkingAgentRole	Implementer [implicit in OCLC]
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 1, Event 3		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	OCLC Event Identifier [implicit in OCLC]
eventIdentifier	eventIdentifierValue	00000034200
eventType		Virus check
eventDateTime		2004-12-05 07:00:56.0
eventDetail		n/a
eventOutcome Information	eventOutcome	Status_Success
eventOutcome Information	eventOutcomeDetail	[Contains XML-encoded Date, object ID, any errors found.]
linkingAgentIdentifier	linkingAgentIdentifierType	OCLC Institution Number [implicit in OCLC]
linkingAgentIdentifier	linkingAgentIdentifierValue	0 [implicit in OCLC]
linkingAgentIdentifier	linkingAgentRole	Implementer [implicit in OCLC]

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Example 1, Event 3		
EVENT		
semantic unit	**semantic unit**	**Value**
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 1, Event 4		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	OCLC Event Identifier [implicit in OCLC]
eventIdentifier	eventIdentifierValue	00000034287
eventType		Object validation
eventDateTime		2004-12-05 07:00:60.0
eventDetail		
eventOutcome Information	eventOutcome	Status_Success
eventOutcome Information	eventOutcomeDetail	[Contains XML-encoded Date, object ID, any errors found.]
linkingAgentIdentifier	linkingAgentIdentifierType	OCLC Institution Number [implicit in OCLC]
linkingAgentIdentifier	linkingAgentIdentifierValue	0 [implicit in OCLC]
linkingAgentIdentifier	linkingAgentRole	Implementer [implicit in OCLC]
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 1, Event 5		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	OCLC Event Identifier [implicit in OCLC]
eventIdentifier	eventIdentifierValue	00000033893
eventType		Annotation validation
eventDateTime		2004-12-05 07:01:02.0

eventDetail		
eventOutcome Information	eventOutcome	Status_Complete
eventOutcome Information	eventOutcomeDetail	[Contains XML-encoded Date, object ID, any errors found.]
linkingAgentIdentifier	linkingAgentIdentifierType	OCLC Institution Number [implicit in OCLC]
linkingAgentIdentifier	linkingAgentIdentifierValue	0 [implicit in OCLC]
linkingAgentIdentifier	linkingAgentRole	Implementer [implicit in OCLC]
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

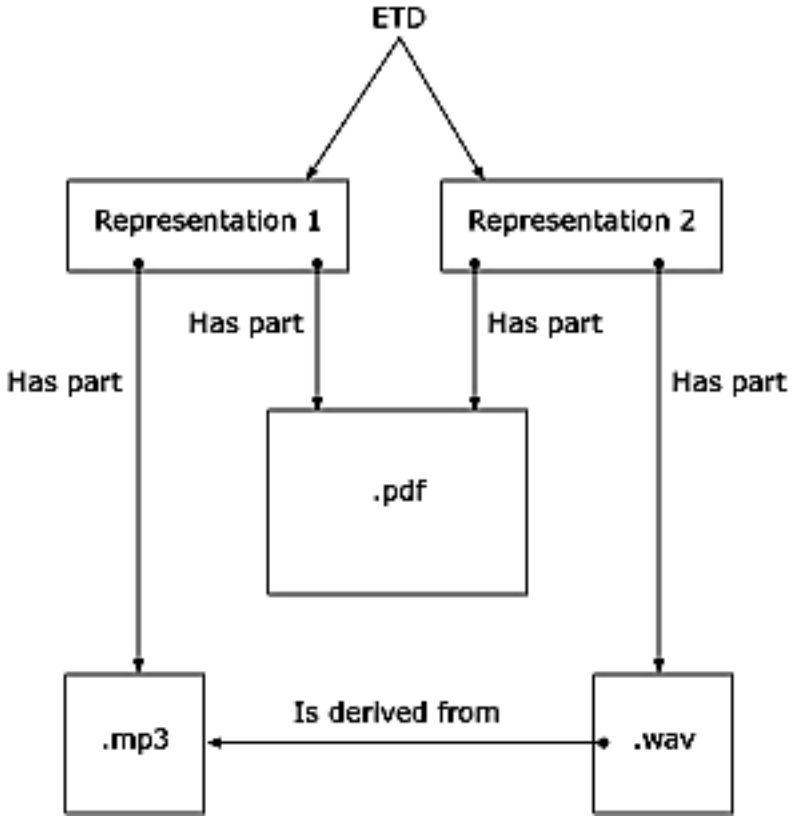
Example 1, Agent 1		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	OCLC Institution Number [implicit in OCLC]
agentIdentifier	agentIdentifierValue	0 [implicit in OCLC]
agentName		OCLC [implicit in OCLC]
agentType		Organization [implicit in OCLC]

Example 1, Agent 2		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	OCLC Institution Number [implicit in OCLC]
agentIdentifier	agentIdentifierValue	28765
agentName		Connecticut State Library [implicit in OCLC]
agentType		Organization [implicit in OCLC]

Example 2: ETD

This example is an electronic dissertation (ETD) stored in a repository called the Florida Digital Archive (FDA). The ETD consists of two files: a PDF and an MP3, which is actually an appendix to the dissertation. Because MP3 is not a format "preferred" by the repository, the FDA creates a WAVE file from the MP3.

On ingest, the FDA will create three Object descriptions: one for the representation (the dissertation as a whole), one for the PDF, and one for the MP3. When the WAVE file is created, the FDA creates an Object description for the new WAVE file and an object description for the new representation, which consists of the original PDF and the WAVE.



Example 2, Object 1: the original representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			FDA-R
objectIdentifier	objectIdentifierValue			R-2005-000217
preservationLevel				Mixed
objectCategory				representation
objectCharacteristics	compositionLevel			n/a
objectCharacteristics	fixity	messageDigestAlgorithm		n/a
objectCharacteristics	fixity	messageDigest		n/a
objectCharacteristics	fixity	messageDigestOriginator		n/a
objectCharacteristics	size			n/a
objectCharacteristics	format	formatDesignation	formatName	n/a
objectCharacteristics	format	formatDesignation	formatVersion	n/a
objectCharacteristics	format	formatRegistry	formatRegistryName	n/a
objectCharacteristics	format	formatRegistry	formatRegistryKey	n/a
objectCharacteristics	format	formatRegistry	formatRegistryRole	n/a
objectCharacteristics	significantProperties			n/a
objectCharacteristics	inhibitors	inhibitorType		n/a
objectCharacteristics	inhibitors	inhibitorTarget		n/a
objectCharacteristics	inhibitors	inhibitorKey		n/a
creatingApplication	creatingApplication Name			
creatingApplication	creatingApplication Version			
creatingApplication	dateCreatedBy Application			
originalName				n/a
storage	contentLocation	contentLocationType		n/a
storage	contentLocation	contentLocationValue		n/a
storage	storageMedium			n/a
environment	environment Characteristic			known to work

3. Examples

Example 2, Object 1: the original representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Mozilla Firefox
environment	software	swVersion		1.0
environment	software	swType		renderer
environment	software	swOtherInformation		requires swDependencies as plug-ins
environment	software	swDependency		Adobe Acrobat Reader 7.0
environment	software	swDependency		RealPlayer 10
environment	software	swName		Windows NT
environment	software	swVersion		5.0
environment	software	swType		operatingSystem
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			n/a
signatureInformation	signer			n/a
signatureInformation	signatureMethod			n/a
signatureInformation	signatureValue			n/a
signatureInformation	signatureValidation Rules			n/a
signatureInformation	signatureProperties			n/a
signatureInformation	keyInformation	keyType		n/a
signatureInformation	keyInformation	keyValue		n/a

Example 2, Object 1: the original representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
signatureInformation	keyInformation	keyVerificationInformation		n/a
relationship	relationshipType			structural
relationship	relationshipSubType			Has part
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001002 [the identifier of the stored PDF file]
relationship	relatedObject Identification	relatedObjectSequence		
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			structural
relationship	relationshipSubType			Has part
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001003 [the identifier of the stored MP3 file]
relationship	relatedObject Identification	relatedObjectSequence		
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			FDA-E
linkingEventIdentifier	linkingEventIdentifier Value			E-2005-863740 [the identifier of the Ingest event]

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Example 2, Object 1: the original representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			URL
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			www.fcla.edu/catalog/bibkey/AAA1234 [the URL of the MARC record describing the dissertation]
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 2, Object 2: the PDF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			FDA-DF
objectIdentifier	objectIdentifierValue			DF-2005-001002
preservationLevel				Full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		SHA-1
objectCharacteristics	fixity	messageDigest		7c9b35da4f2ebd436f1cf88e5a39b3a257edf4a22be3c955ac49da2e2107b67a1924419563
objectCharacteristics	fixity	messageDigestOriginator		submitter
objectCharacteristics	size			1132321
objectCharacteristics	format	formatDesignation	formatName	PDF
objectCharacteristics	format	formatDesignation	formatVersion	1.4
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	

Example 2, Object 2: the PDF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			Adobe Acrobat
creatingApplication	creatingApplication Version			5.0
creatingApplication	dateCreatedBy Application			2004
originalName				main.pdf
storage	contentLocation	contentLocationType		FDA
storage	contentLocation	contentLocationValue		fda/prod/data/out/classa/ DF-2005-001002
storage	storageMedium			3590 [a kind of tape unit]
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Adobe Acrobat Reader
environment	software	swVersion		6.1
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		Windows NT
environment	software	swDependency		Mozilla Firefox 1.0
environment	hardware	hwName		Intel Pentium II

Example 2, Object 2: the PDF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signer			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	keyverificationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			Has sibling
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001003 [the identifier of the MP3 appendix]
relationship	relatedObject Identification	relatedObjectSequence		
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			FDA-E
linkingEventIdentifier	linkingEventIdentifier Value			E-2005-863721 [the identifier of the Ingest event]
linkingEventIdentifier	linkingEventIdentifier Type			FDA-E

Example 2, Object 2: the PDF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Value			E-2005-863722 [the identifier of a format validation event]
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 2, Object 3: the MP3 file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			FDA-DF
objectIdentifier	objectIdentifierValue			DF-2005-001003
preservationLevel				Bit [repository will do only bit-level preservation on this “nonpreferred” format]
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		SHA-1
objectCharacteristics	fixity	messageDigest		[a message digest]
objectCharacteristics	fixity	messageDigestOriginator		submitter
objectCharacteristics	size			505059321
objectCharacteristics	format	formatDesignation	formatName	MP3
objectCharacteristics	format	formatDesignation	formatVersion	
objectCharacteristics	format	formatRegistry	formatRegistryName	

Example 2, Object 3: the MP3 file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			unknown
creatingApplication	creatingApplication Version			unknown
creatingApplication	dateCreatedBy Application			2004
originalName				appendix.mp3
storage	contentLocation	contentLocationType		FDA
storage	contentLocation	contentLocationValue		fda/prod/data/out/classa/ DF-2005-001003
storage	storageMedium			3590 [a kind of tape unit]
environment	environment Characteristic			[Because the FDA is not doing full preservation on this file, it is not recording environment information.]
environment	environmentPurpose			
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		
environment	software	swVersion		
environment	software	swType		
environment	software	swOtherInformation		

Example 2, Object 3: the MP3 file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	software	swDependency		
environment	software	swDependency		
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signer			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	keyVerificationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			Has sibling
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001002 [the identifier of the PDF file]
relationship	relatedObject Identification	relatedObjectSequence		
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			FDA-E

Example 2, Object 3: the MP3 file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Value			E-2005-863722
linkingEventIdentifier	linkingEventIdentifier Type			FDA-E
linkingEventIdentifier	linkingEventIdentifier Value			E-2005-863723
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 2, Object 4: the WAVE file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			FDA-DF
objectIdentifier	objectIdentifierValue			DF-2005-001013
preservationLevel				Full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		SHA-1
objectCharacteristics	fixity	messageDigest		[a message digest]
objectCharacteristics	fixity	messageDigestOriginator		FDA
objectCharacteristics	size			529885999
objectCharacteristics	format	formatDesignation	formatName	WAVE
objectCharacteristics	format	formatDesignation	formatVersion	

Example 2, Object 4: the WAVE file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			MP32WAV
creatingApplication	creatingApplication Version			1.1
creatingApplication	dateCreatedBy Application			20050704T071532-0500
originalName				
storage	contentLocation	contentLocationType		FDA
storage	contentLocation	contentLocationValue		fda/prod/data/out/classa/ DF-2005-001013
storage	storageMedium			3590 [a kind of tape unit]
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		RealPlayer
environment	software	swVersion		10
environment	software	swType		renderer
environment	software	swOtherInformation		RealPlayer10-5GOLD.exe
environment	software	swDependency		

Example 2, Object 4: the WAVE file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	software	swDependency		
environment	software	swName		Windows NT
environment	software	swVersion		
environment	software	swType		operating system
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swDependency		
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signer			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	keyVerificationInformation		
relationship	relationshipType			derivative
relationship	relationshipSubType			Derived from
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001003
relationship	relatedObject Identification	relatedObjectSequence		
relationship	relatedEvent Identification	relatedEventIdentifierType		FDA-E

Example 2, Object 4: the WAVE file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedEvent Identification	relatedEventIdentifierValue		E-2005-9963733 [the key of the derivation event]
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 2, Object 5: the new representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			FDA-R
objectIdentifier	objectIdentifierValue			R-2005-0002331
preservationLevel				Full
objectCategory				representation
objectCharacteristics	compositionLevel			n/a
objectCharacteristics	fixity	messageDigestAlgorithm		n/a

Example 2, Object 5: the new representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	fixity	messageDigest		n/a
objectCharacteristics	fixity	messageDigestOriginator		n/a
objectCharacteristics	size			n/a
objectCharacteristics	format	formatDesignation	formatName	n/a
objectCharacteristics	format	formatDesignation	formatVersion	n/a
objectCharacteristics	format	formatRegistry	formatRegistryName	n/a
objectCharacteristics	format	formatRegistry	formatRegistryKey	n/a
objectCharacteristics	format	formatRegistry	formatRegistryRole	n/a
objectCharacteristics	significantProperties			n/a
objectCharacteristics	inhibitors	inhibitorType		n/a
objectCharacteristics	inhibitors	inhibitorTarget		n/a
objectCharacteristics	inhibitors	inhibitorKey		n/a
creatingApplication	creatingApplication Name			
creatingApplication	creatingApplication Version			
creatingApplication	dateCreatedBy Application			
originalName				n/a
storage	contentLocation	contentLocationType		n/a
storage	contentLocation	contentLocationType		n/a
storage	storageMedium			n/a
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	

Example 2, Object 5: the new representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	software	swName		Mozilla Firefox
environment	software	swVersion		1.0
environment	software	swType		renderer
environment	software	swOtherInformation		requires swDependencies as plug-ins
environment	software	swDependency		Adobe Acrobat Reader 7.0
environment	software	swDependency		RealPlayer 10
environment	software	swName		Windows NT
environment	software	swVersion		5.0
environment	software	swType		operatingSystem
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			n/a
signatureInformation	signatureMethod			n/a
signatureInformation	signatureValidation Rules			n/a
signatureInformation	signatureProperties			n/a
signatureInformation	signatureValue			n/a
signatureInformation	signatureValidation Rules			n/a
signatureInformation	keyInformation	keyType		n/a
signatureInformation	keyInformation	keyValue		n/a
signatureInformation	keyInformation	keyVerificationInformation		n/a
relationship	relationshipType			structural
relationship	relationshipSubType			Has part
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF

Example 2, Object 5: the new representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001002
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			structural
relationship	relationshipSubType			Has part
relationship	relatedObject Identification	relatedObjectIdentifierType		FDA-DF
relationship	relatedObject Identification	relatedObjectIdentifierValue		DF-2005-001013
relationship	relatedObject Identification	relatedObjectSequence		2
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			URL
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			www.fcla.edu/catalog/bibkey/AAA1234
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			

Example 2, Object 5: the new representation				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 2, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-863721
eventType		validation
eventDateTime		20050704T071530-0500
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-DF
linkingObjectIdentifier	linkingObjectIdentifierValue	DF-2005-001002

Example 2, Event 2		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-863722
eventType		ingestion
eventDateTime		20050704T071531-0500

Example 2, Event 2		
EVENT		
semantic unit	**semantic unit**	**Value**
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-DF
linkingObjectIdentifier	linkingObjectIdentifierValue	DF-2005-001002

Example 2, Event 3		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-863723
eventType		validation
eventDateTime		20050704T071532-0500
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-DF
linkingObjectIdentifier	linkingObjectIdentifierValue	DF-2005-001003

Example 2, Event 4		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-863724
eventType		ingestion
eventDateTime		20050704T071533-0500
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-DF
linkingObjectIdentifier	linkingObjectIdentifierValue	DF-2005-001003

Example 2, Event 5		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-863740
eventType		ingestion
eventDateTime		20050704T071653-0500
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	

Example 2, Event 5		
EVENT		
semantic unit	**semantic unit**	**Value**
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-R
linkingObjectIdentifier	linkingObjectIdentifierValue	R-2005-000217

Example 2, Event 6		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	FDA-E
eventIdentifier	eventIdentifierValue	E-2005-9963733
eventType		migration
eventDateTime		20050705T077655-0500
eventDetail		
eventOutcome Information	eventOutcome	00 [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	FDA-DF
linkingObjectIdentifier	linkingObjectIdentifierValue	DF-2005-001013

Example 2, Agent 1		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	FDA-A
agentIdentifier	agentIdentifierValue	A-554
agentName		University of Florida, University Library
agentType		organization

Example 2, Rights 1			
RIGHTS			
semantic unit	**semantic unit**	**semantic unit**	**Value**
permissionStatement	permissionStatementIdentifier	permissionStatement IdentifierType	FDA-PS
permissionStatement	permissionStatementIdentifier	permissionStatement IdentifierValue	PS-4
permissionStatement	linkingObject		R-2005-000217
permissionStatement	grantingAgent		A-554
permissionStatement	grantingAgreement	grantingAgreementIdentification	UF-1 [a local designation for this agreement with the University of Florida]
permissionStatement	grantingAgreement	grantingAgreementInformation	
permissionStatement	permissionGranted	act	all necessary
permissionStatement	permissionGranted	restriction	none
permissionStatement	permissionGranted	termOfGrant/startDate	20050101
permissionStatement	permissionGranted	termOfGrant/endDate	9999
permissionStatement	permissionGranted	permissionNote	

Example 3: Newspaper Complex Object, *Los Angeles Times*

This is a compound object created in QuarkXPress 3.1, a vector program widely used by newspapers for creating pages and information graphics. Rendered within the Quark file is a visual element created in a second vector program, Macromedia FreeHand MX 7.0 and exported as an Encapsulated PostScript (EPS) file for placement in Quark.

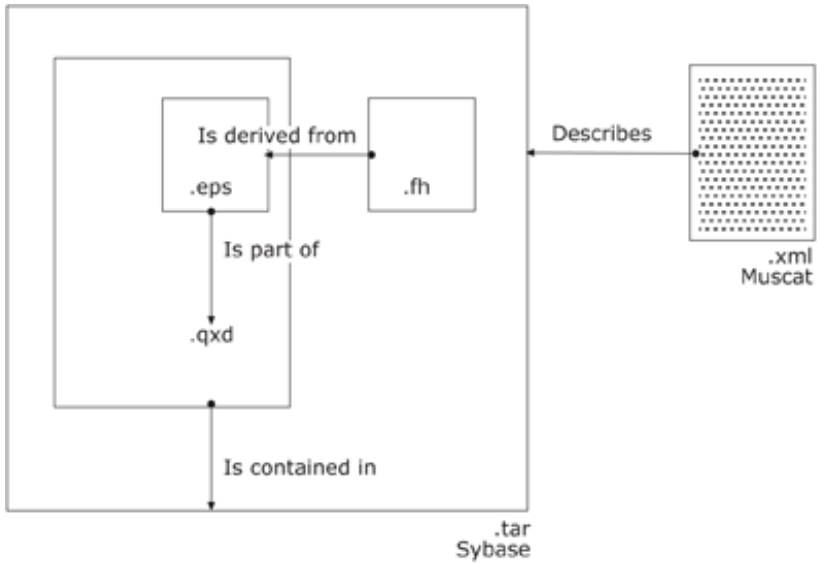
The Submission Information Package comprises a Quark file, the EPS file, and the native file used to create the EPS. At ingest, a UNIX tar file is created for the three objects (a lot of other events happen related to extracting metadata and PostScript, indexing text, and creation of thumbnail images supporting search and retrieval, but they aren't addressed here). The DIP comprises use copies of the original three objects.

In this example, these are treated as four separate file objects: the tar file (.tar), the Quark file (.qxp), the Encapsulated PostScript (.eps) and the native FreeHand file (.fh) from which the EPS was derived. The repository does not manage data at the representation level, but the tar file embeds all the filestreams that constitute the representation.

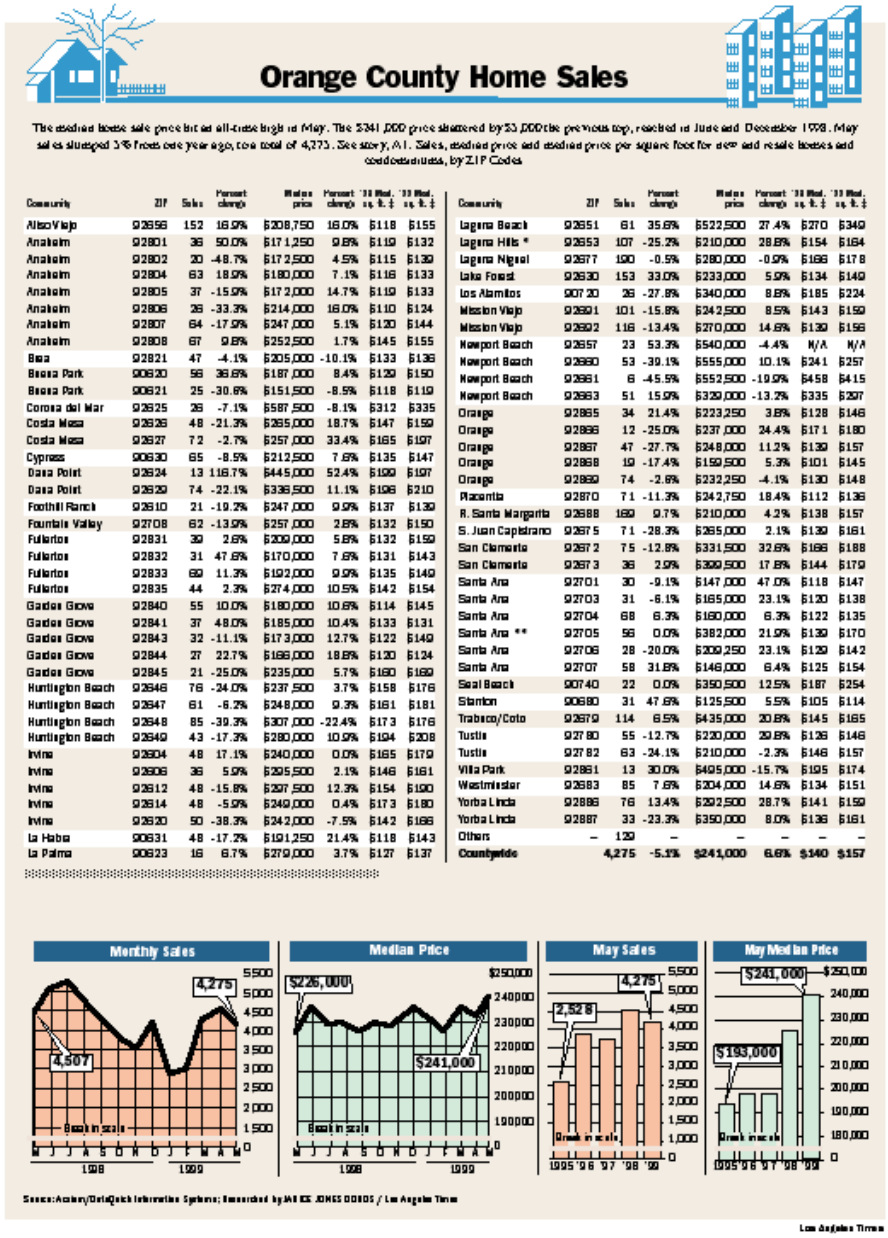
The tar file sits in a Sybase database called Mediasphere, and the metadata resides as a text file in a separate, proprietary database called Muscat. The tar file and metafile are linked by their common unique identifier assigned to the SIP. Metadata is structured in the Muscat metafile according to the news media standard known as IPTC.

All four formats appear in the format registry PRONOM, but there is a dearth of information about .qxd and .fh in particular. Some of the reasons for this are discussed in "Survey and Assessment of Sources of Information on File Formats and Software Documentation: Final Report," by the Representation and Rendering Project at the University of Leeds, www.jisc.ac.uk/uploaded_documents/FileFormatsreport.pdf.

About the repository: The Editorial Art Database contains about 26,000 similar complex objects dating as early as 1991. The contents of the SIP are based on a business case requiring retention of native files alongside derivative files and other files necessary for dissemination. This is subject to change in future iterations of the archive because of the difficulty of preserving proprietary vector formats. It is not an OAIS-compliant archive.



Above: diagram of relationships among files
Right: the rendered object



Example 3, Object 1: the tar file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			LATMD [a code indicating an ID assigned by the Los Angeles Times Mediasphere Editorial Art Database]
objectIdentifier	objectIdentifierValue			FD3OLGGY
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			
objectCharacteristics	format	formatDesignation	formatName	.tar
objectCharacteristics	format	formatDesignation	formatVersion	
objectCharacteristics	format	formatRegistry	formatRegistryName	PRONOM
objectCharacteristics	format	formatRegistry	formatRegistryKey	tar
objectCharacteristics	format	formatRegistry	formatRegistryRole	Basic
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			
creatingApplication	creatingApplication Version			
creatingApplication	dateCreatedBy Application			
originalName				
storage	contentLocationType			Pathname
storage	contentLocationValue			http://dali/stores/store11/FD3OLGGY

Example 3, Object 1: the tar file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
storage	storageMedium			server
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		Muscat metafile
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	Muscat
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	cat/tmp/FD3OLGGY.rec[5702]
environment	software	swName		Mediasphere
environment	software	swVersion		1.4b9
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swName		Unix
environment	software	swVersion		
environment	software	swType		operating system
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			None
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		

Example 3, Object 1: the tar file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			has part
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY/gr-zip 6/10
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			structural
relationship	relationshipSubType			has part
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY/FI.0610.homesales.eps
relationship	relatedObject Identification	relatedObjectSequence		2
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			structural
relationship	relationshipSubType			has part
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD

Example 3, Object 1: the tar file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY/Home sales/charts May.99
relationship	relatedObject Identification	relatedObjectSequence		3
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			LATMD
linkingEventIdentifier	linkingEventIdentifier Value			54780
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			TimesOnline
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			LA99/000052372
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 3, Object 2: the QuarkXPress file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			LATMD
objectIdentifier	objectIdentifierValue			FD3OLGGY/gr-zip 6/10
preservationLevel				Bit level; future migration not assured
objectCategory				file

Example 3, Object 2: the QuarkXPress file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		None
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			
objectCharacteristics	format	formatDesignation	formatName	.qxd
objectCharacteristics	format	formatDesignation	formatVersion	
objectCharacteristics	format	formatRegistry	formatRegistryName	PRONOM
objectCharacteristics	format	formatRegistry	formatRegistryKey	qxd
objectCharacteristics	format	formatRegistry	formatRegistryRole	Basic
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			Quark Xpress
creatingApplication	creatingApplication Version			3.1
creatingApplication	dateCreatedBy Application			19990609
originalName				
storage	contentLocationType			offset
storage	contentLocationValue			FD3OLGGY+256
storage	storageMedium			server
environment	environment Characteristic			known to work
environment	environmentPurpose			edit
environment	environmentPurpose			manipulate
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier	

Example 3, Object 2: the QuarkXPress file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
			Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Quark Xpress
environment	software	swVersion		3.1
environment	software	swType		creator
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swName		MAC 0S
environment	software	swVersion		9.5.1
environment	software	swType		operating system
environment	software	swOtherInformation		9.5.1 or lower required
environment	software	swDependency		
environment	hardware	hwName		Apple PowerMac 8600
environment	hardware	hwType		cpu
environment	hardware	hwOtherInformation		monitor resolution 1172 x 870
signatureInformation	signatureInformation Encoding			None
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			has part
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD
relationship	relatedObject	relatedObjectIdentifierValue		FD3OLGGY/FI.0610.homesales.eps

Example 3, Object 2: the QuarkXPress file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	Identification			
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 3, Object 3: the EPS file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			LATMD
objectIdentifier	objectIdentifierValue			FD3OLGGY/FI.0610.homesales.eps
preservationLevel				Bit level; future migration not assured
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics				file

Example 3, Object 3: the EPS file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			
objectCharacteristics	format	formatDesignation	formatName	.eps
objectCharacteristics	format	formatDesignation	formatVersion	2.0
objectCharacteristics	format	formatRegistry	formatRegistryName	PRONOM
objectCharacteristics	format	formatRegistry	formatRegistryKey	eps
objectCharacteristics	format	formatRegistry	formatRegistryRole	Basic
objectCharacteristics	significantProperties			Editable eps
objectCharacteristics	inhibitors	inhibitorType		None
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			Macromedia Freehand
creatingApplication	creatingApplication Version			7.0
creatingApplication	dateCreatedBy Application			19990609
originalName				
storage	contentLocationType			offset
storage	contentLocationValue			FD3OLGGY+8755
storage	storageMedium			server
environment	environmentPurpose			render
environment	environment Characteristic			known to work
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier	

Example 3, Object 3: the EPS file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
			Value	
environment	software	swName		Macromedia Freehand
environment	software	swVersion		7.0
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swName		Mac OS
environment	software	swVersion		9.5.1
environment	software	swType		operating system
environment	software	swOtherInformation		9.5.1 or lower required
environment	software	swDependency		
environment	hardware	hwName		Apple PowerMac 8600
environment	hardware	hwType		cpu
environment	hardware	hwOtherInformation		Monitor resolution 1172 x 870
signatureInformation	signatureInformation Encoding			None
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY
relationship	relatedObject	relatedObjectSequence		0

Example 3, Object 3: the EPS file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	Identification			
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			derivative
relationship	relationshipSubType			is derived from
relationship	relatedObject Identification	relatedObjectIdentifierType		FD3OLGGY
relationship	relatedObject Identification	relatedObjectIdentifierValue		Home sales/Charts May.99
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 3, Object 4: the Macromedia FreeHand file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			LATMD
objectIdentifier	objectIdentifierValue			FD3OLGGY/Home sales/Charts May.99
preservationLevel				Bit level; future migration not assured
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		None
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			
objectCharacteristics	format	formatDesignation	formatName	.fh
objectCharacteristics	format	formatDesignation	formatVersion	
objectCharacteristics	format	formatRegistry	formatRegistryName	PRONOM
objectCharacteristics	format	formatRegistry	formatRegistryKey	fh
objectCharacteristics	format	formatRegistry	formatRegistryRole	Basic
objectCharacteristics	significantProperties			
objectCharacteristics	inhibitors	inhibitorType		None
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			Macromedia Freehand
creatingApplication	creatingApplication Version			7.0
creatingApplication	dateCreatedBy Application			19990609
originalName				
storage	contentLocationType			offset
storage	contentLocationValue			FD3OLGGY+14243
storage	storageMedium			server

Example 3, Object 4: the Macromedia FreeHand file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	environment Characteristic			known to work
environment	environmentPurpose			edit
environment	environmentNote			Business case for retention of this object
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Macromedia Freehand
environment	software	swVersion		7.0
environment	software	swType		Creator
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Apple PowerMac 8600
environment	hardware	hwType		Desktop computer
environment	hardware	hwOtherInformation		Monitor resolution 1172 x 870
signatureInformation	signatureInformation Encoding			None
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			Is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD

Example 3, Object 4: the Macromedia FreeHand file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
relationship	relationshipType			derivative
relationship	relationshipSubType			Is source of
relationship	relatedObject Identification	relatedObjectIdentifierType		LATMD
relationship	relatedObject Identification	relatedObjectIdentifierValue		FD3OLGGY/FI.0610.homesales.eps
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			
linkingEventIdentifier	linkingEventIdentifier Value			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			

Example 3, Object 4: the Macromedia FreeHand file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 3, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	LATMD
eventIdentifier	eventIdentifierValue	54780
eventType		Ingest
eventDateTime		199906101330
eventDetail		
eventOutcome Information	eventOutcome	1 [ingestion successful]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 3, Agent 1		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	Mediasphere
agentIdentifier	agentIdentifierValue	pjohnson
agentName		Peter Johnson
agentType		Person

Example 3, Rights 1			
RIGHTS			
semantic unit	**semantic unit**	**semantic unit**	**Value**
permissionStatement	permissionStatementIdentifier	permissionStatementIdentifierType	Los Angeles Times rights declaration
permissionStatement	permissionStatementIdentifier	permissionStatementIdentifierValue	1999-14
permissionStatement	linkingObject		LATMD:FD3OLGGY/gr-zip 6/10
permissionStatement	grantingAgent		Los Angeles Times LLC
permissionStatement	grantingAgreement	grantingAgreementIdentification	
permissionStatement	grantingAgreement	grantingAgreementInformation	
permissionStatement	permissionGranted	act	Disseminate
permissionStatement	permissionGranted	restriction	Tribune Co. properties only without prior approval by Los Angeles Times LLC
permissionStatement	permissionGranted	termOfGrant/startDate	1999
permissionStatement	permissionGranted	termOf Grant/endDate	9999
permissionStatement	permissionGranted	permissionNote	

Example 4: Web Site

This example is a single snapshot of a Web site harvested by HTTrack on 2003-04-17 and stored on a UNIX file system. Subsequent snapshots of the same Web site exist in the repository. The relationships among the archived snapshots are documented by a METS Aggregator object that has descriptive metadata for the Web site and represents the intellectual entity.

This Web site belongs to the Women's Division of the All Progressives Grand Alliance Party in Nigeria. It consists of a Flash-enhanced splash page which functions as an entry to a non-Flash home page. This is a site containing eight HTML pages and two linked Microsoft Word documents. For brevity, the example shows metadata for only two of the HTML pages and a few linked images and Flash files.

All files that are necessary to render the page are handled as equivalent in terms of hierarchy with one file designated as the root of the others in the metadata for the representation. The representation of the Web site snapshot as a whole includes a number of files: the entry page with its domain URL as its identifier and all related objects with relationship "has part." The files that make up the Web site each have metadata with an "is part of" relationship to the Web site. Although there are reciprocal relationships in this example, a repository might choose to explicitly encode the relationship one way or the other, i.e. either in the metadata for the representation with "has part" for each file object or in each file object with "is part of" for the representation.

There are several other ways a Web site could be modeled. For example, there could be a representation object for each page included in the site in addition to a representation for the Web site as a whole, with all files having an "is part of" relationship to the representation and one file designated as root object. For more information and for diagrams illustrating these options, see "Preservation metadata for Web sites and Web pages," page 6-4.

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/ [note that a persistent identifier would be preferable]
preservationLevel				General look and feel
objectCategory				representation
objectCharacteristics	compositionLevel			n/a
	fixity	messageDigestAlgorithm		n/a
		messageDigest		n/a
		messageDigestOriginator		n/a
	Size			n/a
	Format	formatDesignation	formatName	n/a
			formatVersion	n/a
		formatRegistry	formatRegistryName	n/a
			formatRegistryKey	n/a
			formatRegistryRole	n/a
	significantProperties			n/a
	inhibitors	inhibitorType		n/a
		inhibitorTarget		n/a
		inhibitorKey		n/a
creatingApplication	creatingApplication Name			
	creatingApplication Version			
	dateCreatedBy Application			
originalName				
storage	contentLocation	contentLocationType		n/a

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	contentLocation	contentLocationValue		n/a
	storageMedium			n/a
environment	environment Characteristic			known to Work
	environmentPurpose			render
	environmentNote			
	dependency	dependencyName		
		dependencyIdentifier	dependencyIdentifier Type	
			dependencyIdentifier Value	
	software	swName		Mozilla Browser
		swVersion		1.x.x
		swType		renderer
		swOtherInformation		
		swDependency		Javascript Plugin
		swDependency		Shockwave-Flash Plugin
		swDependency		MS Word Reader Plugin
	software	swName		Mac OS X
		swVersion		10.2.3
		swType		Operating System
		swOtherInformation		
		swDependency		
	software	swName		Sun Java Virtual Machine
		swVersion		1.4
		swType		ancillary
		swOtherInformation		
		swDependency		
	hardware	hwName		Intel Pentium II
		hwType		processor
		hwOtherInformation		

3. Examples

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
signatureInformation	signatureInformationEncoding			n/a
	signatureMethod			n/a
	signatureValue			n/a
	signatureValidation Rules			n/a
	signatureProperties			n/a
	keyInformation	keyType		n/a
		keyValue		n/a
	validationInformation			n/a
relationship	relationshipType			structural
	relationshipSubType			has root
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/index.html
		relatedObjectSequence		
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/notjust.swf
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/enterarrow.gif

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/apgawnew.swf
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/home.htm
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/welcome.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/allprogressives.swf
relationship	relationshipType			structural
	relationshipSubType			has part

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/apgawomenb.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/sidelink.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/quote.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/apganews.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/links.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/contact.gif
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/ojeozi1.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/newsarchives.htm
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/officers.htm

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/officers.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/calender.htm
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metetestest/20030417/apgawomen/www.apgawomen.org/calender.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/projects.htm
relationship	relationshipType			structural
	relationshipSubType			has part

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/projects.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/membership.htm
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/membership.jpg
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/about%20us.htm
relationship	relationshipType			structural
	relationshipSubType			has part
	relatedObject Identification	relatedObjectIdentifierType		URI

3. Examples

Example 4, Object 1: the entire Web site (representation level)				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
		relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/about%20us.jpg
linkingEventIdentifier	linkingEventIdentifierType			
	linkingEventIdentifierValue			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			URI
	linkingIntellectual EntityIdentifierValue			http://dlib.nyu.edu:8083/xmldev/apgawomen-root.xml [the METS aggregator document]
linkingPermission StatementIdentifier	linkingPermissionStatementIdentifierType			
linkingPermission StatementIdentifier	linkingPermissionStatementIdentifierValue			

Example 4, Object 2: an HTML file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
objectIdentifier	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/index.html
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			1656
objectCharacteristics	format	formatDesignation	formatName	HTML

Example 4, Object 2: an HTML file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	format	formatDesignation	formatVersion	unknown
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			Two embedded Flash files and a hard link wrapped around an arrow image for navigation to the non-Flash homepage
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			unknown
creatingApplication	creatingApplication Version			unknown
creatingApplication	dateCreatedBy Application			20030101
originalName				
storage	contentLocation	contentLocationType		URI
storage	contentLocation	contentLocationValue		http://dlibdev.nyu.edu/webarchive/0417/apgawomen/www.apgawomen.org/index.htm
storage	storageMedium			Hard disk
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	

Example 4, Object 2: an HTML file				
OBJECT				
semantic unit	semantic unit	semantic unit	semantic unit	Value
environment	software	swName		Mozilla Browser
environment	software	swVersion		1.x.x
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		Shockwave-Flash Plugin
environment	software	swDependency		Javascript Plugin
environment	software	swName		Sun Java Virtual Machine
environment	software	swVersion		1.4
environment	software	swType		ancillary
environment	software	swOtherInformation		
environment	software	swDependency		
environment	software	swName		Mac OS X
environment	software	swVersion		10.2.3
environment	software	swType		operating system
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
relationship	relationshipType			structural
relationship	relationshipSubType			is part of

Example 4, Object 2: an HTML file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedObject Identification	relatedObjectIdentifierType		URI
relationship	relatedObject Identification	relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/ [the representation]
relationship	relatedObject Identification	relatedObjectSequence		0
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermision StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermision StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 4, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	NYU-A
eventIdentifier	eventIdentifierValue	WCR-2004-12345
eventType	eventType	ingestion
eventDateTime	eventDateTime	20040528T070531-0500
eventDetail	eventDetail	
eventOutcome Information	eventOutcome	SC [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	

Example 4, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
linkingAgentIdentifier	linkingAgentIdentifierRole	
linkingObjectIdentifier	linkingObjectIdentifierType	
linkingObjectIdentifier	linkingObjectIdentifierValue	

Example 4, Object 3: a Flash file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
objectIdentifier	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/0417/apgawomen/www.apgawomen.org/notjust.swf
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			21688320
objectCharacteristics	format	formatDesignation	formatName	flash
objectCharacteristics	format	formatDesignation	formatVersion	unknown
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			One of two embedded Flash files for splash page
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		

Example 4, Object 3: a Flash file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
creatingApplication	creatingApplication Name			MIX-FX
creatingApplication	creatingApplication Version			unknown
creatingApplication	dateCreatedBy Application			20030101
originalName				
storage	contentLocation	contentLocationType		URI
storage	contentLocation	contentLocationValue		http://dlibdev.nyu.edu/webarchive/0417/apgawomen/www.apgawomen.org/notjust.swf
storage	storageMedium			Hard disk
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Mozilla Browser
environment	software	swVersion		1.x.x
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		Shockwave-Flash Plugin
environment	software	swName		Mac OS X
environment	software	swVersion		10.2.3
environment	software	swType		operating system
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II

Example 4, Object 3: a Flash file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	keyInformation	keyType		
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		URI
relationship	relatedObject Identification	relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			NYA-A
linkingEventIdentifier	linkingEventIdentifier Value			WCR-2004-12346
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			

Example 4, Object 3: a Flash file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 4, Event 2		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	NYU-A
eventIdentifier	eventIdentifierValue	WCR-2004-12346
eventType		ingestion
eventDateTime		20040528T070531-0500
eventOutcome Information	eventOutcome	SC [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	

[Metadata for other Flash files left out for brevity.]

Example 4, Object 4: a GIF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
objectIdentifier	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/enterarrow.gif
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			1724
objectCharacteristics	format	formatDesignation	formatName	GIF
objectCharacteristics	format	formatDesignation	formatVersion	unknown
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			Necessary icon for navigation to non-Flash home page
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplicationName			unknown
creatingApplication	creatingApplicationVersion			unknown
creatingApplication	dateCreatedByApplication			20030101
originalName				
storage	contentLocation	contentLocationType		URI

Example 4, Object 4: a GIF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
storage	contentLocation	contentLocationValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/enterarrow.gif
storage	storageMedium			Hard disk
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Mozilla Browser
environment	software	swVersion		1.x.x
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	keyInformation	keyType		
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		

Example 4, Object 4: a GIF file				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relationshipType			structural
relationship	relationshipSubType			is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		URI
relationship	relatedObject Identification	relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/20030417/apgawomen/www.apgawomen.org/
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			NYA-A
linkingEventIdentifier	linkingEventIdentifier Value			WCR-2004-12389
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 4, Event 3		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	NYU-A
eventIdentifier	eventIdentifierValue	WCR-2004-12389
eventType		ingestion
eventDateTime		20040528T090231-0500
eventDetail		
eventOutcome Information	eventOutcome	SC [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	
linkingAgentIdentifier	linkingAgentIdentifierValue	
linkingAgentIdentifier	linkingAgentIdentifierRole	

Example 4, Object 5: the HTML home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
objectIdentifier	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/home.htm
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			15606
objectCharacteristics	format	formatDesignation	formatName	HTML

Example 4, Object 5: the HTML home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectCharacteristics	format	formatDesignation	formatVersion	unknown
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			cgi-enabled poll can not be activated
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			unknown
creatingApplication	creatingApplication Version			
creatingApplication	dateCreatedBy Application			20030101
originalName				
storage	contentLocation	contentLocationType		URI
storage	contentLocation	contentLocationValue		http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/home.htm
storage	storageMedium			Hard disk
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Mozilla Browser
environment	software	swVersion		1.x.x
environment	software	swType		renderer

Example 4, Object 5: the HTML home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		Intel Pentium II
environment	hardware	hwType		processor
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			structural
relationship	relationshipSubType			is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		URI
relationship	relatedObject Identification	relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		NYU-A
relationship	relatedEvent Identification	relatedEventIdentifierValue		WCR-2004-12346
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			NYU-A

Example 4, Object 5: the HTML home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Value			WCR-2004-12346
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 4, Event 4		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	NYU-A
eventIdentifier	eventIdentifierValue	WCR-2004-12346
eventType		ingestion
eventDateTime		20040529T060231-0500
eventDetail		
eventOutcome Information	eventOutcome	SC [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
relatedAgentIdentifier	relatedAgentIdentifierType	
relatedAgentIdentifier	relatedAgentIdentifierValue	
relatedAgentIdentifier	relatedAgentIdentifierRole	

Example 4, Object 6: an HTML file linked to from home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			URI
objectIdentifier	objectIdentifierValue			http://dlibdev.nyu.edu/webarchive/metestest/apgawomen/20030417/www.apgawomen.org/ about%20us.htm
preservationLevel				full
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		
objectCharacteristics	fixity	messageDigest		
objectCharacteristics	fixity	messageDigestOriginator		
objectCharacteristics	size			1543
objectCharacteristics	format	formatDesignation	formatName	HTML
objectCharacteristics	format	formatDesignation	formatVersion	unknown
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			cgi-enabled poll can not be activated
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			unknown
creatingApplication	creatingApplication Version			unknown
creatingApplication	dateCreatedBy Application			20030101
originalName				
storage	contentLocation	contentLocationType		URI

Example 4, Object 6: an HTML file linked to from home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
storage	contentLocation	contentLocationValue		http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/ about%20us.htm
storage	storageMedium			Hard disk
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Mozilla Browser
environment	software	swVersion		1.x.x
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		

Example 4, Object 6: an HTML file linked to from home page				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relationshipType			structural
relationship	relationshipSubType			Is part of
relationship	relatedObject Identification	relatedObjectIdentifierType		URI
relationship	relatedObject Identification	relatedObjectIdentifierValue		http://dlibdev.nyu.edu/webarchive/metstest/apgawomen/20030417/www.apgawomen.org/ [the representation]
relationship	relatedObject Identification	relatedObjectSequence		0
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			NYU-A
linkingEventIdentifier	linkingEventIdentifier Value			WCR-2004-16233
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Value			

Example 4, Event 5		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	NYU-A
eventIdentifier	eventIdentifierValue	WCR-2004-16233
eventType		ingestion
eventDateTime		20040529T060231-0500
eventDetail		
eventOutcome Information	eventOutcome	SC [code meaning “successfully completed”]
eventOutcome Information	eventOutcomeDetail	
relatedAgentIdentifier	relatedAgentIdentifierType	
relatedAgentIdentifier	relatedAgentIdentifierValue	
relatedAgentIdentifier	relatedAgentIdentifierRole	

Other files detailed in the metadata for the representation with relationship “has part” would also have separate metadata.

Example 5: Digital Signature

signatureInformation	signatureInformation Encoding		base64
signatureInformation	signer		Florida Digital Archive
signatureInformation	signatureMethod		RSA-SHA1
signatureInformation	signatureValue		MC0CFFrVLtRlkMc3Daon4BqqnkhCOTFEALE =
signatureInformation	signatureValidation Rules		T1=C1
signatureInformation	signatureProperties		2003-03-19T12:25:14-05:00
signatureInformation	keyInformation	keyType	x509v3-sign-rsa2
signatureInformation	keyInformation	keyValue	<DSAKeyValue> <P> imup6lmki4rAmUstKb/xdBRMWNtQ+pDN97ZnLA9X3lKbkEHtYFyj Q3uActgVSJ75iVRuKxz4Cb5RzVm25EaKmKq8rif1MtBIi6jjDJxmIdN aEKG9zVTf9giJx1N9I0t3oh1fAVZDSrzKzJGQ2WvDfIfFHdJMtB3C0 VKGmLZR7Xk= </P> <Q> xDve3j7sEnh4rIzM5gK+5/gxxFU= </Q> <G> NLugAf6IZJxo3BCOi5yrGEVwtlEzXcnndXhd0Tz38CnQKc4SEupm4P yP5TmLvK64TDfOD7sno/W5oI1KZdimfW2c4r/6waNzZSvicMOWhL YY621Nn6njBc8VNwoxWpzCXhKm70b8+D4YZMn/eU5DN8dvhTv/b NK21FfJqjp033U= </G> <Y>W7dOmH/vWqocVCiqaxj6soxVXfR8XpMdY2Zv4Amjr3n81geyO Lb6IZ+l7MUbdp8529DQzuoVTthVpB9X4JKCprZIzifOTM1PFflTBzjx 7egJwJWAIVdWyiIPjke6Va+wuV2n4Rl/cgCvrXK5cTov5C/Bpaf6o+qrr DGFBLLZTF4= </Y> </DSAKeyValue>

3. Examples

signatureInformation	keyInformation	keyVerificationInformation	MIICMzCCAaCgAwIBAgIQYCEyPdEvhYNJPDnlIUVUVjAJBgUrDgMCHQUAME0xEzARBgNVBAMTCnByaXNjaWxsYTExDDAKBgNVBAcTA0VGUzEoMCYGA1UECxMfRUZTIEZpbGUgRW5jcnlwdGlvbiBDZXJ0aWZpY2F0ZTAgFw0wMzAzMTkxNzI1MTRaGA8yMTAzMDIyMzE3MjUxNFowTTETMBEGA1UEAxMKcHJpc2NpbGxhMTEMMAoGA1UEBxMDRUZTMSgwJgYDVQQLEx9FRlMgRmlsZSBFbmNyeXB0aW9uIENlcnRpZmljYXRlMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQD3f4ybaySN36xq7PEHgrVY9plRiUqqJZDGH8aoYwDcdMaV+6kJeXS/J1HMtH3FDW2ImCI6X/z2DIvQoiQ8fEUcQx19QK/ACWabAolPZn0RkDXLkg7ZOrX3zg7AV9+oAtg5oAILgQ8Vb0BGeFpEJ5xBQjh1WhfGJz7unW7ea3zfMQIDAQABoxowGDAWBgNVHSUEDzANBgsrBgEEAYI3CgMEATAJBgUrDgMCHQUAA4GBABUYv/SXRCGnSyqMClcyMScTY2jxmAMFn+OvrYYxArcO0rqP0GXg035Yawn1l9QKXrKYzK/CNLvCygM7QeWGxAfrQgU1CK3nZd/fUm0diHqwHhVJiP/6xBCL0GYzPJ8zNJMpzUlA38jF9Oz87ynWoaNClcItLQtmSp4kpjGS3KVh

Notes:

- *signer*: The preservation repository chose to use the company name of the signer.
- *signatureInformation*: Made up for this example. The repository has a shorthand for representing successive transformation on content before hashing. The example “T1=C1” should be take to mean the first transformation is by canonicalization algorithm 1, which is presumably documented elsewhere. Second and subsequent tranformations could be indicated with T2= etc.
- *signatureProperties*: The repository records only the date/time of signing.
- *keyValue*: The repository uses an XML-structured value for DSA keys. The same structure could as easily have been represented by defining local subcomponents of the semantic unit keyValue.
- *keyVerificationInformation*: The base64 representation of an X509 certificate. The certificate’s reformatted content in XML is:

```
<Certificate>
<version>v3</version>
<serialnumber>6021 323D D12F 8583 493C 39E5 2145 5456</serialnumber>
<signatureAlgorith>sha1RSA</signatureAlgorithm>
<issuer ou=”Florida Digital Archive” c=”us” cn=”Chris Franco”/>
<validFrom>Wednesday, March 19, 2003 12:25:14 PM</validFrom>
<validTo>Friday, February 23, 2103 12:25:14 PM</validTo>
<subject ou=”Florida Digital Archive” c=”us” cn=”Chris Franco”/>
<publicKey>3081 8902 8181 00F7 7F8C 9B6B 248D DFAC 6AEC F107 82B5 58F6 9951 894A AA25 90C6 1FC6 A863 00DC 74C6 95FB A909 7974 BF27
51CC B47D C50D 6D88 9822 3A5F FCF6 0C8B D0A2 243C 7C45 1C43 1D7D 40AF C009 669B 0289 4F66 7D11 9035 CB92 0ED9 3AB5 F7CE 0EC0 57DF
A802 D839 A002 0B81 0F15 6F40 4678 5A44 279C 4142 3875 5A17 C627 3EEE 9D6E DE6B 7CDF 3102 0301 0001</publicKey>
<thumbprintAlgorithm>sha1</thumbprintAlgorithm>
<thumbprint>DA25 71B8 DE03 ADDB A321 8B4C 1EC2 CACC 368A 15B3</thumbprint>
</certificate>
```

Example 6: Photograph

In this hypothetical example, the repository is archiving one image (an archival master in TIFF format) and one XML file (descriptive metadata for the image) from a Getty Research Institute Digitized Library Collection. Both the image and the metadata file are treated as independent file objects.

Example 6, Object 1: the TIFF image				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			handle
	objectIdentifierValue			hdl:jpgt.gri/grl_2001pr3-f10-1.tif
preservationLevel				Fully supported with future migrations
objectCategory				file
objectCharacteristics	compositionLevel			0
	fixity	messageDigestAlgorithm		MD5
	fixity	messageDigest		aa68a8e56165bdafc9693f4a7273ab86
	fixity	messageDigestOriginator		GDAM [Getty Digital Asset Management System]
	size			45362176
	format	formatDesignation	formatName	TIFF
	format	formatDesignation	formatVersion	6.0
	format	formatRegistry	formatRegistryName	
	format	formatRegistry	formatRegistryKey	
	format	formatRegistry	formatRegistryRole	
	significantProperties			Color Accuracy (Adobe RGB 1998)
	inhibitors	inhibitorType		
	inhibitors	inhibitorTarget		
	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			ScanXact
	creatingApplication Version			II

Example 6, Object 1: the TIFF image				
OBJECT				
semantic unit	semantic unit	semantic unit	semantic unit	Value
	DateCreatedBy Application			2002-02-11
	creatingApplication Name			Adobe Photoshop
	creatingApplication Version			6.0.1
	DateCreatedBy Application			2002-02-11
originalName				2001PR3_10
storage	contentLocation	contentLocationType		filename
	contentLocation	contentLocationValue		grl_2001pr3-f10-1.tif
	storageMedium			disk
storage	contentLocation	contentLocationType		physical location
	contentLocation	contentLocationValue		grl_2001pr3-f10-1, CD 1, Box 1, 2001pr3, Vault 4
	storageMedium			CD-ROM
environment	environment Characteristic			known to work
	environmentPurpose			Search, render, transform, attach metadata
	environmentNote			
	dependency	dependencyName		
	dependency	dependencyIdentifier	dependencyIdentifier Type	
	dependency	dependencyIdentifier	dependencyIdentifier Value	
	software	swName		Artesia TEAMS
	software	swVersion		5.1
	software	swType		Digital Asset Management System
	software	swOtherInformation		
	software	swDependency		ImageAlchemy
	software	swDependency		Oracle 9i

Example 6, Object 1: the TIFF image				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
	software	swName		Sun Solaris
	software	swVersion		9
	software	swType		Operating system
	software	swOtherInformation		
	software	swDependency		
	hardware	hwName		SunFire
	hardware	hwType		cpu
	hardware	hwOtherInformation		V series
signatureInformation	signatureInformation Encoding			None
	signatureMethod			
	signatureValue			
	signatureValidation Rules			
	signatureProperties			
	keyInformation	keyType		
	keyInformation	keyValue		
	keyInformation	validationInformation		
relationship	relationshipType			local
	relationshipSubType			has metadata
	relatedObject Identification	relatedObjectIdentifierType		handle
	relatedObject Identification	relatedObjectIdentifierValue		hdl:jpgt.gri/grl_2001pr3-f10-1.xml
	relatedObject Identification	relatedObjectSequence		1
	relatedEvent Identification	relatedEventIdentifierType		
	relatedEvent Identification	relatedEventIdentifierValue		
	relatedEvent Identification	relatedEventSequence		

Example 6, Object 1: the TIFF image				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
linkingEventIdentifier	linkingEventIdentifier Type			GDAM-E
	linkingEventIdentifier Value			Ingest Object 20050209 2:12:05 PM
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			handle
	linkingIntellectual EntityIdentifierValue			hdl:jpgt.gri/grl_2001pr3-f10-1.xml
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			GRMS [Getty Research Institute Resource Management System]
	linkingPermission StatementIdentifier Value			2001.pr.3.f10.1

Example 6, Event 1		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	GDAM-E
	eventIdentifierValue	Ingest Object 20050209 2:12:05 PM
eventType		Ingestion
eventDateTime		20050209T141205-0500
eventDetail		
eventOutcome Information	eventOutcome	Successful
	eventOutcomeDetail	
linkingAgentIdentifier	linkingAgentIdentifierType	GDAM-A
	linkingAgentIdentifierValue	shubbard
	linkingAgentRole	Implementor
	linkingObjectIdentifierType	handle
	linkingObjectIdentifierValue	hdl:jpgt.gri/grl_2001pr3-f10-1.tif

Example 6, Agent 1		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	GDAM-A
	agentIdentifierValue	shubbard
agentName		Sally Hubbard
agentType		Person

Example 6, Rights 1				
RIGHTS				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
permissionStatement	permissionStatementIdentifier	permissionStatement IdentifierType		GDAM-R
	permissionStatementIdentifier	permissionStatement IdentifierValue		2001.pr.3.f10.1-1
	linkingObject			hdl:jpgt.gri/grl_2001pr3-f10-1.tif
	grantingAgent			Public Domain
	grantingAgreement	grantingAgreement Identification		
	grantingAgreement	grantingAgreement Information		
	permissionGranted	act		Replicate, Migrate, Modify, Use, Disseminate
	permissionGranted	restriction		None
	permissionGranted	termOfGrant	startDate	0000
	permissionGranted	termOfGrant	endDate	9999
	permissionGranted	permissionNote		

Example 6, Object 2: the XML metadata				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
objectIdentifier	objectIdentifierType			handle
objectIdentifier	objectIdentifierValue			hdl:jpgt.gri/grl_2001pr3-f10-1.xml
preservationLevel				Fully supported with future migrations
objectCategory				file
objectCharacteristics	compositionLevel			0
objectCharacteristics	fixity	messageDigestAlgorithm		MD5
objectCharacteristics	fixity	messageDigest		6df23dc03f9b54cc38a0fc1483df6e21
objectCharacteristics	fixity	messageDigestOriginator		GDAM
objectCharacteristics	size			7457
objectCharacteristics	format	formatDesignation	formatName	XML
objectCharacteristics	format	formatDesignation	formatVersion	1.0
objectCharacteristics	format	formatRegistry	formatRegistryName	
objectCharacteristics	format	formatRegistry	formatRegistryKey	
objectCharacteristics	format	formatRegistry	formatRegistryRole	
objectCharacteristics	significantProperties			UTF-8
objectCharacteristics	inhibitors	inhibitorType		
objectCharacteristics	inhibitors	inhibitorTarget		
objectCharacteristics	inhibitors	inhibitorKey		
creatingApplication	creatingApplication Name			BlastRadius XMetal
creatingApplication	creatingApplication Version			3.1
creatingApplication	DateCreatedBy Application			20021119
originalName				grl_2001pr3-f10-1.xml
storage	contentLocation	contentLocationType		filename
storage	contentLocation	contentLocationValue		grl_2001pr3-f10-1.xml
storage	storageMedium			Hard Disk

Example 6, Object 2: the XML metadata				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
environment	environment Characteristic			known to work
environment	environmentPurpose			render
environment	environmentNote			
environment	dependency	dependencyName		GettyVRA DTD 4.0
environment	dependency	dependencyIdentifier	dependencyIdentifier Type	
environment	dependency	dependencyIdentifier	dependencyIdentifier Value	
environment	software	swName		Microsoft Internet Explorer
environment	software	swVersion		6.0 SP1
environment	software	swType		renderer
environment	software	swOtherInformation		
environment	software	swDependency		Xalan
environment	hardware	hwName		
environment	hardware	hwType		
environment	hardware	hwOtherInformation		
signatureInformation	signatureInformation Encoding			
signatureInformation	signatureMethod			
signatureInformation	signatureValue			
signatureInformation	signatureValidation Rules			
signatureInformation	signatureProperties			
signatureInformation	keyInformation	keyType		
signatureInformation	keyInformation	keyValue		
signatureInformation	keyInformation	validationInformation		
relationship	relationshipType			local
relationship	relationshipSubType			Is metadata for

Example 6, Object 2: the XML metadata				
OBJECT				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
relationship	relatedObject Identification	relatedObjectIdentifierType		handle
relationship	relatedObject Identification	relatedObjectIdentifierValue		hdl:jpgt.gri/grl_2001pr3-f10-1.tif
relationship	relatedObject Identification	relatedObjectSequence		1
relationship	relatedEvent Identification	relatedEventIdentifierType		
relationship	relatedEvent Identification	relatedEventIdentifierValue		
relationship	relatedEvent Identification	relatedEventSequence		
linkingEventIdentifier	linkingEventIdentifier Type			GDAM-E
linkingEventIdentifier	linkingEventIdentifier Value			Update Object Descriptive Metadata 20050216 4:32:05 PM
linkingIntellectual EntityIdentifier	linkingIntellectual EntityIdentifierType			
	linkingIntellectual EntityIdentifierValue			
linkingPermission StatementIdentifier	linkingPermission StatementIdentifier Type			GDAM-R
	linkingPermission StatementIdentifier Value			2001.pr.3.f10.1-2

Example 6, Event 2		
EVENT		
semantic unit	**semantic unit**	**Value**
eventIdentifier	eventIdentifierType	GDAM-E
eventIdentifier	eventIdentifierValue	Update Object Descriptive Metadata 20050216 4:32:05 PM
eventType		Modification of display
eventDateTime		20050216T163205-0500
eventDetail		Ran XLST TRNFM2.1
eventOutcome Information	eventOutcome	Successful
eventOutcome Information	eventOutcomeDetail	Revise concatenation
linkingAgentIdentifier	linkingAgentIdentifierType	GDAM-A
linkingAgentIdentifier	linkingAgentIdentifierValue	KBoughida
linkingAgentIdentifier	linkingAgentRole	executor
linkingObjectIdentifier	linkingObjectIdentifierType	handle
linkingObjectIdentifier	linkingObjectIdentifierValue	hdl:jpgt.gri/grl_2001pr3-f10-1.xml

Example 6, Agent 2		
AGENT		
semantic unit	**semantic unit**	**Value**
agentIdentifier	agentIdentifierType	GDAM-A
agentIdentifier	agentIdentifierValue	KBoughida
agentName		Karim Boughida
agentType		Person

Example 6, Rights 2				
RIGHTS				
semantic unit	**semantic unit**	**semantic unit**	**semantic unit**	**Value**
permissionStatement	permissionStatementIdentifier	permissionStatement IdentifierType		GDAM-R
	permissionStatementIdentifier	permissionStatement IdentifierValue		2001.pr.3.f10.1-2
	linkingObject			hdl:jpgt.gri/grl_2001pr3-f10-1.xml
	grantingAgent			Getty Research Library, Special Collections Cataloging
	grantingAgreement	grantingAgreement Identification		
	grantingAgreement	grantingAgreement Information		
	permissionGranted	act		Replicate, Migrate, Modify, Use, Disseminate
	permissionGranted	restriction		Core descriptive metadata not to be changed without referral to Special Collections Cataloging
	permissionGranted	termOfGrant	startDate	0000
	permissionGranted	termOfGrant	endDate	9999
	permissionGranted	permissionNote		

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