

APE<sub>x</sub>



## Deliverable

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### D4.7 – State of the art report on METS and recommendations for its implementation in the Archives Portal Europe

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## ANNEXES – Overview

- Annex 1      apeMETS profile  
The whole profile as an XML file offers a detailed description of apeMETS and its use; furthermore it already contains example files.
- Annex 2      apeMETS encoding table  
All elements and attributes of apeMETS in a well-structured table.
- Annex 3      apeMETS schema  
The schema to be used for validating METS files against apeMETS.
- Annex 4      apeMETS examples  
Examples of apeMETS as constituent XML files.
- Annex 5      apeEAD2apeMETS transformation script (draft version to be further developed)  
This script offers partners the possibility to create a combination of an apeEAD file with apeMETS files out of their apeEAD files, in which various digital object links might be embedded per archival unit. The new apeEAD file will then only include one link to an apeMETS file per archival unit, while the links to the separate digital objects will then be embedded in apeMETS possibly allowing to also extend this with additional administrative metadata not codable in apeEAD. The version of the script delivered here is a first version which shall be improved together with Technical Team within the project life time.
- Annex 6      apeMETSRights encoding table  
All elements and attributes of apeMETSRights in a well-structured table.
- Annex 7      apeMETSRights schema  
The schema to be used for validating the administrative metadata section of METS files against apeMETSRights in combination with a validation against apeMETS.
- Annex 8      apeMETSRights example  
Example to learn and see more about how apeMETSRights can be used.

## 1 Introduction

In work package (WP) 4 - “Standards & Guidelines” – of the Archives Portal Europe network of excellence project (APE<sub>x</sub>), the use of standards for the Archives Portal Europe is defined and combined with technical recommendations for their implementation in the tools of the Archives Portal Europe. In August 2012 the Encoded Archival Guide (EAG) standard was reviewed and enhanced (EAG 2012, see “D4.1 State of the art report on EAG and recommendations for implementation in the Archives Portal Europe”<sup>1</sup>). The first version of the second standard report “D4.4 State of the art report on EAC-CPF (Encoded Archival Context – Corporate Bodies, Persons, and Families) and recommendations for implementation in the Archives Portal Europe”<sup>2</sup> in WP4 was concluded in July 2013. The implementation of EAG 2012 is almost finalised, while the EAC-CPF implementation is currently in progress.

The present third standard report deals with the Metadata Encoding and Transmission Standard (METS): “D4.7 State of the art report on METS and recommendations for implementation in the Archives Portal Europe”<sup>3</sup>.

This report is the result of the work of all partners of APE<sub>x</sub>, since all of them have provided information about the use of METS in their institutions. The apeMETS profile has been built by comparing and combining the METS profiles used in the constituent institutions. Furthermore, the options METS could offer to the Archives Portal Europe were discussed with the technical team.

In close cooperation with WP2 (Europeana Interoperability), an apeMETSRights profile and schema was created as well. Here the use of the apeMETS files with embedded rights information could ensure the interoperability with Europeana and the later use of these files by Europeana.

The following is a short resume of the structure of this report:

Following this introduction, chapter two explains how the apeMETS profile was developed within the APE<sub>x</sub> project, combining the joint and shared experience of all project partners. Section 2.3 is the main part of the profile, while other parts of the profile – like translations and examples – are in Annex 1, which is the complete apeMETS profile XML file.

The third chapter deals with how the apeMETSRights profile was built. Chapter four encodes the descriptions of 1) apeMETS and 2) apeMETSRights and helps in understanding the use of the different tags in the XML file.

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<sup>1</sup> All information on EAG 2012 and the deliverable D4.1 can be found at <http://www.apex-project.eu/index.php/en/outcomes/52-public/about-the-project/outcomes/35-tools-and-manuals> (last viewed 24 April 2014).

<sup>2</sup> All information on apeEAC-CPF and the deliverable D4.4 can be found at <http://www.apex-project.eu/index.php/en/outcomes/52-public/about-the-project/outcomes/35-tools-and-manuals> (last viewed 24 April 2014).

<sup>3</sup> All information on apeMETS and the deliverable D4.7 can be found at <http://www.apex-project.eu/index.php/en/outcomes/52-public/about-the-project/outcomes/35-tools-and-manuals> from early May 2014 onwards.

Chapters five and six describe further the use of apeMETS, including the local use of apeMETS besides the use in the portal. Chapter six presents different cases of using METS in conjunction with the Archives Portal Europe.

Chapter seven explains shortly how a conversion script was developed to transform an apeEAD file with several constituent links per archival unit into an apeEAD file plus newly-created apeMETS files in order to link to digital objects in a more structured way.

Chapter eight concludes this deliverable with some general ideas on how apeMETS could be developed into a topic for the planned Archives Portal Europe Foundation (APEF).



## 2 Developing a METS profile for the Archives Portal Europe

Following an account of the apeMETS profile development within the APE<sub>x</sub> project, this chapter presents the main elements of this profile. The entire apeMETS profile is in Annex 1, an encoding table is in Annex 2, the apeMETS schema is in Annex 3, while constituent apeMETS examples and a transformation script from apeEAD to apeEAD with apeMETS are in Annex 4 and Annex 5 respectively.

### 2.1 Collecting information about the use of METS within the partners of APE<sub>x</sub>

Different channels have been used to obtain the broadest information as possible about both the experience with METS as well as about our partner institutions' expectations for the use of METS within the Archives Portal Europe.

At the beginning of the APE<sub>x</sub> project a questionnaire was sent to all partner institutions asking about the use of METS in their institutions, their profiles and example files and about the METS key personnel identified to be worked with us in WP4. Thus, a team and a cadre of contact persons were established where some contributed as active participants while others served as observers or contact persons in the WP4 METS group. While very few institutions had been using METS, some answered that they want to know more about METS and that they would use it, just not knowing at the moment how to use it. Others answered that they were waiting for an apeMETS profile to be adapted directly to avoid later conversions from any METS profile to apeMETS.

During April and May 2013 a joint survey of WP2, 4 and 6 was distributed to all Country Managers; the survey included questions about METS and rights information.

26 Country Managers answered the question about the partners using METS: six stated that they are using METS, and twenty are not. Five Country Managers skipped this question.

27 Country Managers skipped the question whether they want METS to be used directly in the Archives Portal Europe or if they just want the possibility to link to a METS presentation within the apeEAD file. One Country Manager asked WP4 to contact a METS specialist at their institution, which WP4 did. This specialist works in the WP4 METS team. Four Country Managers asked for the possibility to link to their METS presentations. Linking to METS presentation within the apeEAD files is already possible and has been possible since the APE<sub>x</sub> predecessor APEnet.

The survey's questions on rights regarding digital content showed that apeMETS definitely needed a rights section. It was later decided to develop this as an apeMETSRights profile to be used within the apeMETS profile. Two particular questions led to this decision: the first was whether the institutions include extra rights information on accessibility as well as use/re-use of digital objects (both digitised material and born-digital material) within the descriptions (this questions has been answered positively only twice). The other question was on specific licensing for the digital objects (digitised material and born-digital material), eg Creative Commons (only one institution already has such a kind of specific licensing). In this situation the use of apeMETSRights in the Archives Portal Europe can foster the integration of such information which is especially relevant for exchanging (data on) digital objects and making them accesible and reusable.

## 2.2 Developing the first apeMETS profile draft and gathering feedback from the partners

The first phase of information gathering about the use of METS in the partner institutions has shown that the experience was relatively low and rare. Thus, WP4 started various tutorials about METS. The first was at the APE<sub>x</sub> Conference in Dublin in June 2013 followed by a virtual tutorial in September 2013, and finally at a joint WP2, 4 and 6 meeting in Berlin in November 2013. Karin Bredenberg, Riksarkivet, Sweden and member of METS Editorial Board,<sup>4</sup> led each of these tutorials. The option to participate was broadly offered and about 40 persons participated and learnt more about METS.

In parallel, three METS specialists worked jointly on the first apeMETS profile draft. During the tutorials, the then current ideas suggested for apeMETS have been described and feedback and comments were requested and gathered to later on be included in the further work with the apeMETS profile.

In August 2013 the first apeMETS draft was sent to all METS contact persons, observers and apeMETS team members. Generally, the feedback level was rather low, but the comments gathered were discussed within WP4 and resulted in some changes and further development of the profile. The apeMETS draft was published in October 2013. This was announced in the newsletter and feedback was requested. A thread on METS was opened in the forum of the APE<sub>x</sub> project website and some issues, particularly about the need of implementing METS and the use of METS files have been discussed. Furthermore an open document had been collecting different opinions on the implementation of METS, which had been discussed both there and via e-mail correspondence. As already mentioned above, the apeMETS profile was explained to the WP4 members at a WP4 meeting in the beginning of November 2013 where it was jointly approved. It was announced as apeMETS 1.0 and was sent to all METS contact persons in the project on 22 November 2013. Moreover it was published in a newsletter and is available for download at the APE<sub>x</sub> project website.<sup>5</sup>

In February 2014 the METS Editorial Board carried out minor amendments on the general METS schema. Accordingly some slight changes in the apeMETS profile have been done at the end of February.

By proofreading the draft deliverable and its annexes some very last changes have been done, especially rephrasing the use of apeMETS and adding of the attributes @XMLNS:XSII and @XMLNS:RTS in the root element <mets>.

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<sup>4</sup> The METS Board is the official METS standards committee.

<sup>5</sup> apeMETS profile, apeMETSRights profile and schemas can be found since November 2013 here: <http://apex-project.eu/index.php/outcomes/52-public/about-the-project/outcomes/35-tools-and-manuals> (viewed 28 April 2014).

## 2.3 The apeMETS profile

The METS profile is the users' way of documenting the rules of using METS within her/his context. The profile is created in an XML-document where all sections of METS are described with the keywords "must", "must not", "should", "should not" and "may". The creation of a profile, which in itself gives the rules to be followed in a more descriptive than technically serviceable way, requires the adaption of a METS XML-schema that aids in validation of the rules stated in the profile.

The METS Board welcomes registration of local profiles and by doing this the profiles can get a bigger audience and use.

The METS profile developed by the project is recommended to the content providers for describing digital archival objects representing archival units as described in an Encoded Archival Description (EAD) document. The use of METS is particularly recommended for aggregated archival objects, ie objects being represented by more than one file. The file format for the digital objects can be anything from image files (JPEG, PNG, TIFF, etc) to text files (eg for OCR texts), audio and audiovisual file formats. In the context of the Archives Portal Europe, content providers may implement this profile locally on their own systems and use it to provide access to their digital archival objects to the portal users, to aggregators like the Archives Portal Europe or national archival and/or cross-domain portals. The profile might also be used within the back-end of the Archives Portal Europe in combination with processing archival descriptions in apeEAD, ie the definition of EAD as used in the central application of the Archives Portal Europe. This also includes the exchange of data with Europeana, the European cross-domain portal for cultural heritage objects.

The whole profile is available in Annex 1, an encoding table is provided in Annex 2, the apeMETS schema in Annex 3, apeMETS examples as constituent XML files in Annex 4 while a transformation script from apeEAD to apeEAD with apeMETS is included in Annex 5. Two excerpts of the profile, a general description and the use of METS are outlined below. The use of METS will be described further in chapters five and six.

### 2.3.1 apeMETS – General description

This profile is intended to give content providers of the Archives Portal Europe a way to describe and grant access to their digital archival objects if there is no local development for doing so. There would be several use cases, which are described in the following chapters, for implementing apeMETS locally as well as centrally. Each use case represents a specific combination of different aspects, such as

- using apeMETS locally for administration of metadata on digital objects;
- using apeMETS with a local viewer for showcasing the digital objects online;
- providing links to digital objects to the Archives Portal Europe;
- providing information on the digital objects to the Archives Portal Europe;
- processing data in apeEAD and apeMETS on the Archives Portal Europe;
- and exchanging data with the cross-domain portal of Europeana.

### 2.3.2 apeMETS – Use

#### 1. Local use

This profile can be used locally to administer and maintain information about digital archival objects being represented by more than one image, text or other type of digital file. It also includes different versions of the same representation, as for example high resolution images and their thumbnails. It is recommended to use a METS file based on the current profile together with EAD for the descriptive metadata of the archival object represented by the various digital items in the METS document. The profile can be seen as one way of locally describing the archival information packages saved in the digital preservation system and it can be used along-side other METS profiles currently in use in the institution.

#### 2. Local use with viewer

Moreover, this profile can be used locally in combination with an open source viewer. So far, several recommendations were made within the group about viewers, which could be of interest for content providers interested in this:

- <http://dfg-viewer.de/en/regarding-the-project/>
- [http://igelu.org/wp-content/uploads/2010/09/1632\\_Maurer\\_IGeLU2010.pdf](http://igelu.org/wp-content/uploads/2010/09/1632_Maurer_IGeLU2010.pdf)
- <http://sourceforge.net/projects/bnlviewer/>
- <http://dlib.nyu.edu/metstools/mets2smilviewer/>
- <http://dlib.nyu.edu/metstools/metsviewer/><sup>6</sup>.

#### 3. Local use and provision of information on and links to digital objects to the Archives Portal Europe

When this profile is used locally and for the provision of information on and links to digital objects to the Archives Portal Europe, the METS document file name (which according to the profile also is present in the <metsDocumentID> element) has to be referenced in the @xlink:href attribute of the <dao> element at the <c> level in the apeEAD file that corresponds to the digital objects.

This shall be used for correctly processing the apeMETS and the apeEAD file in the central application of the dashboard. One file element in apeMETS should be highlighted with the attribute @USE containing the value “DISPLAY”, so as to specify this link as the one primarily accessible from the Archives Portal Europe. See example below. Having this functionality in place in the Archives Portal Europe can later on also be of help with regard to providing digital archival objects to Europeana and feeding the carousel in the Europeana display.

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<sup>6</sup> All links last viewed 24 April 2014.

```
<mets:fileSec>
  <mets:fileGrp USE="DEFAULT">
    <!-- All default files -->
    <mets:file ID="FILE00_DEF" MIMETYPE="image/tiff" SIZE="43630" USE="DISPLAY">
      <mets:FLocat LOCTYPE="URL" xlink:href="http://link/to/default/image/00.tif" xlink:type="simple"/>
    </mets:file>
    <mets:file ID="FILE01_DEF" MIMETYPE="image/tiff" SIZE="63235">
      <mets:FLocat LOCTYPE="URL" xlink:href="http://link/to/default/image/01.tif" xlink:type="simple"/>
    </mets:file>
    <mets:file ID="FILE02_DEF" MIMETYPE="image/tiff" SIZE="225434">
      <mets:FLocat LOCTYPE="URL" xlink:href="http://link/to/default/image/02.tif" xlink:type="simple"/>
    </mets:file>
  </mets:fileGrp>
</mets:fileSec>
(Example of attribute USE="DISPLAY")
```

This means, that the second display for finding aids containing the links to digital material in the Archives Portal Europe, would then only contain one link to the main or most prominent or best representing digital object in relation to the archival unit, which would then provide access to all other digital objects connected to it.

This use case would be the most complex in terms of effects on the central system of the Archives Portal Europe, but would most likely also provide the most flexibility and options for users and exchange of data.

#### 4. Local use with viewer and providing links to digital objects to the Archives Portal Europe

When this profile is used locally with a viewer and for providing links to digital objects to the Archives Portal Europe, it is necessary to have the URL of the METS-based presentation referenced in the @xlink:href attribute of the <dao> element at the <c> level in the apeEAD file that corresponds to the digital objects.

This means, that the second display for finding aids containing the links to digital material in the Archives Portal Europe will only contain one link, which will then lead to the local METS-based presentation providing access to all other digital objects connected.

In this instance, only the apeEAD file will be provided to the Archives Portal Europe.

## 3 Developing a METSRights profile for the Archives Portal Europe

### 3.1 METSRights schema

METSRights, or RightsDeclarationMD Extension Schema, is an extension to the METS metadata standard. It enables the recording of information on rights associated with digital objects (files, parts of files, groups of files). Although it is designed to be used as an extension to the METS standard, it can be used also in other contexts and with non-digital objects. The schema is available at <http://cosimo.stanford.edu/sdr/metsrights.xsd> and <http://www.loc.gov/standards/rights/METSRights.xsd>.

METSRights documents can relate to various categories of rights (copyrighted, licensed, public domain, contractual, other). The schema is divided in three main sections:

1. **RightsDeclaration** is a broad declaration of the rights associated with digital objects. It describes briefly the nature and scope of the rights and may contain advice on the use of rights. Details that relate only to specific context or circumstances are described within the <Context> element.
2. **RightsHolder** contains information on persons or organisations holding some rights to a given digital object. Information on a rights holder includes name(s), contact details, comments, and references to contextual circumstances (declared in the Context section of the document).
3. **Context** describes specific circumstances, permissions and constraints applicable to the rights of specific categories of individuals, groups or institutions. The schema enables declaration of various types or classes of context (general public, academic user, repository manager, repository group, institutional affiliate, and any other). <Context> contains three elements, which describe properties of a context: <UserName>, <Permissions>, and <Constraints>. <Permissions> describes what actions a specified user may execute (discover, display, copy, duplicate, modify, delete, print, other), while <Constraints> declares and explain specific constraints that apply to rights declared (eg constraints related to the quality of objects, payment, re-use, time etc).

Compared to respective elements in EAD and EDM metadata specifications the METSRights declaration is very detailed and granular. The values of some data elements essential to the rights management are controlled by a list of values allowed for the use. Thus, METSRights is more suitable for automatic rights management data processing.

### 3.2 apeMETSRights profile

The apeMETSRights profile is a profile of the METSRights schema adapted for the use in connection with apeMETS. In the current apeMETSRights profile there are two important constraints on the use of schema:

- <RightsHolderName> is a mandatory element, not an optional one as in the general METSRights schema (consequently, the wrapper element <RightsHolder> is mandatory too). This means that in cases where there is no rights holder (public domain) or the rights holder(s) is not known (orphan works), the name shall be substituted by a proper statement.
- <Permissions> too is a mandatory element in apeMETSRights, unlike in the general schema. Consequently, a number of attributes become mandatory in the apeMETSRights declaration. Unlike rights declarations that conform only to the general schema, apeMETSRights declarations require explicit statements on user rights (whether it is allowed to discover, display, copy, duplicate, modify, delete, or print the object).

The apeMETSRights profile furthermore highly recommends the usage of some elements and attributes (@OTHERCATEGORYTYPE of the root element, <ConstraintDescription> and its @OTHERCONSTRAINTTYPE) that should enable straightforward mapping to the Europeana right statements.

As Annex 6 an apeMETSRights encoding table shows all elements and attributes of apeMETSRights in a well-structured table. Annex 7 provides the apeMETSRights schema and Annex 8 apeMETSRights examples.

## 4 Encoding the descriptions

The following chapters will show how the METS elements and attributes can be used for encoding metadata on digital objects:

- firstly for the apeMETS profile;
- secondly for the apeMETSRights profile.

For each profile, first the elements are listed in the order, in which they would appear within an apeMETS instance. The elements that can be used in various places are only described once, at their first appearance. Examples of encoded information are provided with each element.

For each element one can find the tag used, the element name (ie a human readable transliteration of the tag) and a brief description.

Only elements used in apeMETS are present in this documentation.

It is stated whether an element:

- is defined as mandatory or optional for its use in the Archives Portal Europe;
- can be repeated in the Archives Portal Europe;
- may contain text (#PCDATA).

In addition, there is an overview of:

- all sub elements that an element may contain;
- all attributes that an element may contain;
- all elements in which an element may occur.

Similarly an overview of the attributes with the data type (if specified) and all the elements in which an attribute can occur, is given.

General information on METS and all the elements present in the standard can be found at: <http://www.loc.gov/standards/mets/>.

### 4.1 The apeMETS profile

#### 4.1.1 The elements

##### 4.1.1.1. Root element

<b>&lt;mets&gt; – METS</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <mets> element is the root element and establishes the container for the information being stored and/or transmitted by the standard.		
Can contain following sub elements:		
<metsHdr> <amdSec> <fileSec> <structMap>		
Can contain following attributes:		



@XMLNS  
 @XMLNS:XSI  
 @XMLNS:XLINK  
 @XSI:SCHEMALOCATION  
 @XMLNS:RTS  
 @PROFILE  
 @LABEL

Can occur in following elements:

/

#### 4.1.1.2. METS header element

<b>&lt;metsHdr&gt; - METS header</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <metsHdr> element provides metadata about the METS document itself (not the digital object the METS document encodes), including such information as creator, editor, etc.		
Can contain following sub elements:		
<agent> <metsDocumentID> <altRecordID>		
Can contain following attributes:		
@CREATEDATE @LASTMODDATE @RECORDSTATUS		
Can occur in following elements:		
<mets>		

<b>&lt;agent&gt; - Agent</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <agent> element provides information about the different parties and their roles related to the METS record to be documented.		
Can contain following sub elements:		
<name>		
Can contain following attributes:		
@ROLE		
Can occur in following elements:		
<metsHdr>		

<b>&lt;name&gt; - Name</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The <name> element records the full name of the document agent.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<agent>		

#### **<metsDocumentID> - METS document identifier**

Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The < metsDocumentID > provides a unique identifier to be assigned to the METS document (which may be different from the digital object identifier represented by the METS document). The recommendation in the Archives Portal Europe is to have the file name present here. For the structure of the file name it would be recommended to use a combination of the ID of EAD file for the descriptive metadata and the identifier of the unit within the EAD which is represented by the METS document.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
< metsHdr >		

<b>&lt; altRecordID &gt; - Alternative record identifier</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The < altRecordID > element allows the use of alternative record identifier values for the digital object represented by the METS document.		
Can contain following sub elements:		
/		
Can contain following attributes:		
@TYPE		
Can occur in following elements:		
< metsHdr >		

#### 4.1.1.3. Administrative Metadata Section

<b>&lt; amdSec &gt; - Administrative metadata section</b>		
Repeatable:	Mandatory:	May contain text:
No	No	No
Brief description:		
The < amdSec > contains the administrative metadata pertaining to the digital object and its components. Though, the administrative metadata can in general be either external to the METS document or encoded internally, this section in apeMETS is to be used only in relation to intellectual property rights, according to the apeMETSRights specification, which would then be encoded internally via the element < xmlData >.		
Can contain following sub elements:		
< rightsMD >		
Can contain following attributes:		
/		
Can occur in following elements:		
< mets >		

<b>&lt; rightsMD &gt;- Intellectual property rights metadata</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The < rightsMD > element records information about copyright and licensing pertaining to a component of the METS object.		
Can contain following sub elements:		
< mdWrap >		
Can contain following attributes:		
@ID		

Can occur in following elements:
<amdSec>

<b>&lt;mdWrap&gt;- Metadata wrap</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <mdWrap> element provides a wrapper around XML encoded metadata embedded within a METS document. In apeMETS this would be XML data encoded in apeMETSRights.		
Can contain following sub elements:		
<xmlData>		
Can contain following attributes:		
@MDTYPE		
Can occur in following elements:		
<rightsMD>		

<b>&lt;xmlData&gt;-</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <xmlData> serves as wrapper element for XML encoded metadata regarding rights information, here conforming to the apeMETSRights specification.		
Can contain following sub elements:		
apeMETSRights elements.		
Can contain following attributes:		
apeMETSRights attributes.		
Can occur in following elements:		
<mdWrap>		

#### 4.1.1.4. File section

<b>&lt;fileSec&gt; - File section</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <fileSec> provides an inventory of and the location for the content files that comprise the digital object being described in the METS document. This element contains one or more <fileGrp> elements, which allow files to be grouped together for various purposes (eg by format or use).		
Can contain following sub elements:		
<fileGrp>		
Can contain following attributes:		
/		
Can occur in following elements:		
<mets>		

<b>&lt;fileGrp&gt; - File inventory group</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <fileGrp> element allows to group the digital files comprising the content of a METS object for various purposes (eg by format or use). Within each <fileGrp> there is a <file> element for each file that comprises the digital object. The <fileGrp> elements may also be used to bring together related files that are relevant to the composition or rendering of the digital object being described.		
Can contain following sub elements:		
<file>		

Can contain following attributes:
@ID @USE
Can occur in following elements:
<fileSec>

<b>&lt;file&gt; - File</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <file> element provides access to the content files for the digital object being described by the METS document.		
Can contain following sub elements:		
<FLocat>		
Can contain following attributes:		
@ID @MIMETYPE @SIZE @USE		
Can occur in following elements:		
<fileGrp>		

<b>&lt; FLocat&gt; - File location</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
The <FLocat> element provides the pointer to a content file. It uses the XLink reference syntax to provide linking information indicating the actual location of the content file, along with other attributes specifying additional linking information.		
Can contain following sub elements:		
/		
Can contain following attributes:		
@LOCTYPE @xlink:type @xlink:href @USE @xlink:role @xlink:title		
Can occur in following elements:		
<file>		

#### 4.1.1.5. Structural map section

<b>&lt;structMap&gt; - Structural map section</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <structMap> section allows organising the digital content represented by the <file> elements in the <fileSec> of the METS document into a coherent hierarchical structure. It may be applied to any purpose requiring an understanding of the structural relationship of the content files or parts of the content files. The organisation may be specified to any level of granularity (logical and physical). Since the <structMap> element is repeatable, more than one organisation can be applied to the digital content represented by the METS document. In apeMETS at least a physical <structMap> is required. When a logical <structMap> is included in addition, the hierarchical structure specified in this case can be encoded as a tree of nested <div> elements.		
Can contain following sub elements:		
<div>		

Can contain following attributes:
@TYPE @LABEL
Can occur in following elements:
<mets>

<b>&lt;div&gt; - Division</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <div> element represents the structural divisions of the hierarchical organisation provided by a <structMap>. It represents either an intellectual (logical) division or a physical division, but only can be nested to any depth when used for logical divisions. Every <div> node in the structural map hierarchy may be connected (via subsidiary <fptr> elements) to content files which represent that div's portion of the whole document.		
Can contain following sub elements:		
<fptr> <div>		
Can contain following attributes:		
@ORDER @ORDERLABEL @LABEL @AMDID		
Can occur in following elements:		
<structMap> <div>		

<b>&lt;fptr&gt; - File pointer</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <fptr> element represents digital content that manifests its parent <div> element. The content represented by an <fptr> element must consist of integral files or parts of files that are represented by <file> elements in the <fileSec>. Should only be used in structMap of TYPE="PHYSICAL"		
Can contain following sub elements:		
/		
Can contain following attributes:		
@FILEID		
Can occur in following elements:		
<div>		

#### 4.1.2 The attributes

<b>@XMLNS</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @XMLNS attribute is used to provide the namespace for the METS profile. Default value is <a href="http://www.loc.gov/METS/">http://www.loc.gov/METS/</a>		
Data type:		
String: Uniform Resource Identifier (URI).		
Can occur in following elements:		
<mets>		

<b>@XMLNS:XSI</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @XMLNS:XSI attribute is used to provide the namespace for the XML schema. Default value is <a href="http://www.w3.org/2001/XMLSchema-instance">http://www.w3.org/2001/XMLSchema-instance</a>		
Data type:		
String: Uniform Resource Locator (URL).		
Can occur in following elements:		
<mets>		

<b>@XMLNS:XLINK</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @XMLNS:XLINK attribute provides the namespace for the XLink schema. Default value is <a href="http://www.w3.org/1999/xlink">http://www.w3.org/1999/xlink</a>		
Data type:		
String: Uniform Resource Locator (URL).		
Can occur in following elements:		
<mets>		

<b>@XSI:SCHEMALOCATION</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @XSI:SCHEMALOCATION attribute provides the location of the apeMETS and apeMETSxlink schemata. Default value is <a href="http://www.loc.gov/METS/">http://www.loc.gov/METS/</a> <a href="http://www.archivesportaleurope.net/Portal/profiles/apeMETS.xsd">http://www.archivesportaleurope.net/Portal/profiles/apeMETS.xsd</a> <a href="http://www.w3.org/1999/xlink">http://www.w3.org/1999/xlink</a> <a href="http://www.archivesportaleurope.net/Portal/profiles/apeMETSxlink.xsd">http://www.archivesportaleurope.net/Portal/profiles/apeMETSxlink.xsd</a>		
Data type:		
String: Uniform Resource Locator (URL).		
Can occur in following elements:		
<mets>		

<b>@XMLNS:RTS</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @XMLNS:RTS attribute provides the namespace of the apeMETSRights schema. It is only used, when apeMETS is also used to describe rights information for the digital archival objects. Default value is <a href="http://www.archivesportaleurope.net/Portal/profiles/rights/">http://www.archivesportaleurope.net/Portal/profiles/rights/</a>		
Data type:		
String: Uniform Resource Locator (URL).		
Can occur in following elements:		
<mets>		

<b>@PROFILE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes

<b>Brief description:</b>
The @PROFILE indicates to which of the registered profile(s) the METS document conforms.
<b>Data type:</b>
#PCDATA . Default values: "apeMETS"; local profiles: "apeMETS_[localProfileID]".
<b>Can occur in following elements:</b>
<mets>

<b>@LABEL</b>		
<b>Repeatable:</b>	<b>Mandatory:</b>	<b>May contain text:</b>
No	No /Yes	Yes
<b>Brief description:</b>		
In the <mets> element, the @LABEL attribute is a title string used to identify the object/entity being described in the METS document.		
The @LABEL attribute may also describe the <structMap> element. This would be useful where more than one <structMap> is provided for a single object. A descriptive LABEL value, in that case, could clarify the purpose of each of the available <structMap> elements.		
The @LABEL attribute may also be used to identify a <div> element. Thus a hierarchical arrangement of the <div>, @LABEL values could provide a table of contents to the digital content represented by a METS document and facilitate the navigation of the digital object. A <div> @LABEL should be specific to its level in the structural map. In the case of a book with chapters, the book <div> @LABEL should have the book title and the chapter <div> @LABEL should have the individual chapter title, rather than having the chapter <div> @LABEL combine both book title and chapter title.		
<b>Data type:</b>		
String. Text.		
<b>Can occur in following elements:</b>		
<mets>		
<structMap>		
<div>		

<b>@CREATEDATE</b>		
<b>Repeatable:</b>	<b>Mandatory:</b>	<b>May contain text:</b>
No	Yes	Yes
<b>Brief description:</b>		
The @CREATEDATE attribute records the date/time the METS document was created.		
<b>Data type:</b>		
Date. xsd:dateTime, <a href="http://www.w3.org/TR/xmlschema-2/#dateTime">http://www.w3.org/TR/xmlschema-2/#dateTime</a>		
The format for all date information in apeMETS follows the ISO standard 8601 (YYYY-MM-DD for dates, YYYY-MM-DDTHH:MM:SS+01:00 for date and time information in Central European Time)		
<b>Can occur in following elements:</b>		
<metsHDR>		

<b>@LASTMODDATE</b>		
<b>Repeatable:</b>	<b>Mandatory:</b>	<b>May contain text:</b>
No	Yes	Yes
<b>Brief description:</b>		
The @LASTMODDATE attribute indicates the date/time the METS document was last modified.		
<b>Data type:</b>		
Date. xsd:dateTime, <a href="http://www.w3.org/TR/xmlschema-2/#dateTime">http://www.w3.org/TR/xmlschema-2/#dateTime</a>		
The format for all date information in apeMETS follows the ISO standard 8601 (YYYY-MM-DD for dates, YYYY-MM-DDTHH:MM:SS+01:00 for date and time information in Central European Time)		
<b>Can occur in following elements:</b>		
<metsHDR>		

<b>@RECORDSTATUS</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @RECORDSTATUS attribute specifies the status of the METS document.		
Data type:		
Text. Default values: "DELETED", "DERIVED", "NEW", "REVISED".		
Can occur in following elements:		
<metsHDR>		

<b>@ROLE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @ROLE attribute specifies the function of the agent with respect to the METS record.		
Data type:		
Text. Default values: "EDITOR", "ARCHIVIST", "PRESERVATION", "DISSEMINATOR", "CUSTODIAN", "IPOWNER", "OTHER".		
Can occur in following elements:		
<agent>		

<b>@TYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	No /Yes	Yes
Brief description:		
The @TYPE attribute allows a description of the identifier type in the <altRecordID> element. The @TYPE attribute also identifies the type of structure - physical structure ("PHYSICAL") and logical structure ("LOGICAL") - represented by the <structMap> element. "PHYSICAL" would be the minimum requirement (eg page 1, page 2, page 3, etc. via the @ORDER attribute) and would be used with just one high level <div> including all constituent <fptr> elements; "LOGICAL" could be used in addition with the option to nest several <div> elements.		
Data type:		
Text. Default values: <altRecordID> element: "apeID". <structMap> element: physical structure ("PHYSICAL") and logical structure ("LOGICAL").		
Can occur in following elements:		
<altRecordID> <structMap>		

<b>@ID</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes / No	Yes
Brief description:		
The @ID attribute uniquely identifies the element within the METS document, and allows the element to be referenced unambiguously from another element or document via an IDREF or an XPTR.		
Data type:		
ID.		
Can occur in following elements:		
<rightsMD> <fileGrp> <file>		



<b>@MDTYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @MDTYPE attribute allows recording the type of the metadata being wrapped and is related with apeMETSRights.		
Data type:		
Text.		
Can occur in following elements:		
<mdWrap>		

<b>@USE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes / No	Yes
Brief description:		
The @USE tagging attribute allows indicating the intended use of: files within the <fileGrp> element; all copies of the file aggregated by the <file> element.		
Data type:		
Text. Standard values: <fileGrp> and <file> elements: "DEFAULT", "MIN", "MAX", "THUMBS", "DOWNLOAD", "TEXT", "DISPLAY", "SOUND", "VIDEO".		
Can occur in following elements:		
<fileGrp> <file>		

<b>@MIMETYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @MIMETYPE attribute corresponds to the IANA MIME media type for the file.		
Data type:		
Text. Internet Assigned Numbers Authority, Official list of all Multipurpose Internet Mail Extensions media type.		
Can occur in following elements:		
<file>		

<b>@SIZE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @SIZE attribute corresponds to the size of the file in bytes.		
Data type:		
Numeric.		
Can occur in following elements:		
<file>		

<b>@LOCTYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @LOCTYPE attribute specifies the locator type used in the @xlink:href attribute.		
Data type:		
Text.		
Can occur in following elements:		

<FLocat>

<b>@xlink:type</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @xlink:type attribute specifies the type of the link.		
Data type:		
Text. Default value: "Simple".		
Can occur in following elements:		
<FLocat>		

<b>@xlink:href</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @xlink:href attribute provides the URI indicating where the content file represented by the parent file can be located.		
Data type:		
String: Uniform Resource Identifier (URI).		
Can occur in following elements:		
<FLocat>		

<b>@xlink:role</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @xlink:role attribute has a semantic purpose. It specifies the URI of a resource that describes the role or function of the @xlink:href link.		
Data type:		
Text. Default values: "IMAGE", "TEXT", "SOUND", "VIDEO", "3D".		
Can occur in following elements:		
<FLocat>		

<b>@xlink:title</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @xlink:title attribute has a semantic purpose. It describes the meaning of a link or resource in a human-readable fashion.		
Data type:		
Text.		
Can occur in following elements:		
<FLocat>		

<b>@ORDER</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @ORDER attribute corresponds to a representation of the <div> element's order among its siblings (eg its absolute, numeric sequence).		

Data type:
Numeric.
Can occur in following elements:
<div>

<b>@ORDERLABEL</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @ORDERLABEL attribute corresponds to a representation of the <div> elements order among its siblings (eg “xii”), or of any non-integer native numbering system.		
Data type:		
Text.		
Can occur in following elements:		
<div>		

<b>@AMDID</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @AMDID attribute points to the <rightsMD> element that pertain to the <div>. Only used in structMap of @TYPE="PHYSICAL".		
Data type:		
ID.		
Can occur in following elements:		
<div>		

<b>@FILEID</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @FILEID attribute provides the XML ID identifying the <file> element that links to and/or contains the digital content represented by the <fptr>.		
Data type:		
ID.		
Can occur in following elements:		
<fptr>		

## 4.2 The apeMETSRights profile

### 4.2.1 The elements

#### 4.2.1.1 Root element

<b>&lt;rts:RightsDeclarationMD&gt; – Rights declaration MD</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	No
Brief description:		
Root element following <mets.xmlData>. Allows the documentation of minimal administrative metadata about the intellectual rights associated with a digital object or its parts.		
Can contain following sub elements:		

<rts:RightsDeclaration>
<rts:RightsHolder>
<rts:Context>
Can contain following attributes:
@xmlns @xmlns:xsi @xsi:schemaLocation @RIGHTSDECID @RIGHTSCATEGORY @OTHERCATEGORYTYPE
Can occur in following elements:
<amdSec>

#### 4.2.1.2 Rights declaration element

<b>&lt;rts:RightsDeclaration&gt; – Rights declaration</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsDeclaration> element allows a broad declaration of the rights associated with the digital asset providing a public notice of the intellectual property rights associated with a given asset or part thereof to the user community.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

#### 4.2.1.3 Rights Holder element

<b>&lt;rts:RightsHolder&gt; Rights holder</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <rts:RightsHolder> element describes the characteristics of a person or institution holding some rights with respect to a given digital asset or part thereof.		
Can contain following sub elements:		
<rts:RightsHolderName> <rts:RightsHolderComments> <rts:RightsHolderContact>		
Can contain following attributes:		
@RIGHTSHOLDERID @CONTEXTIDS		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>&lt;rts:RightsHolderName&gt; Rights holder name</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	Yes
Brief description:		
The <rts:RightsHolderName> element provides the name of rights holder, as identified by the @RIGHTSHOLDERID.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		

<rts:RightsHolder>

<b>&lt;rts:RightsHolderComments&gt; Rights holder comments</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsHolderComments> element allows any comments required to explain the holder's rights, not covered elsewhere.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:RightsHolder>		

<b>&lt;rts:RightsHolderContact&gt; Rights holder contact</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	No
Brief description:		
The <rts:RightsHolderContact> element provides information about the contact point for rights holder, as identified by the @RIGHTSHOLDERID; the contact point for a resource may be an agency or organisation representing the rights holder rather than the rights holder per se.		
Can contain following sub elements:		
<rts:RightsHolderContactDesignation> <rts:RightsHolderContactAddress> <rts:RightsHolderContactPhone> <rts:RightsHolderContactEmail>		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:RightsHolder>		

<b>&lt;rts:RightsHolderContactDesignation&gt; Rights holder contact designation</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsHolderContactDesignation> provides the name or the title of a contact person or institution holding rights to a given digital asset, as identified by the @RIGHTSHOLDERID.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:RightsHolderContact/>		

<b>&lt;rts:RightsHolderContactAddress&gt; Rights holder contact address</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsHolderContactAddress> provides the mailing address of the contact person, or the contact institution, holding rights with respect to a given digital asset, as identified by the @RIGHTSHOLDERID.		
Can contain following sub elements:		

/
Can contain following attributes:
/
Can occur in following elements:
<rts:RightsHolderContact>

<b>&lt;rts:RightsHolderContactPhone&gt; Rights holder contact phone</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsHolderContactPhone> provides the telephone number of contact person, or institution, holding rights with respect to a given digital asset or part thereof, as identified by the @RIGHTSHOLDERID.		
Can contain following sub elements:		
/		
Can contain following attributes:		
@PHONETYPE		
Can occur in following elements:		
<rts:RightsHolderContact>		

<b>&lt;rts:RightsHolderContactEmail&gt; Rights holder contact email</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:RightsHolderContactEmail> provides the e-mail address of contact person, or institution, holding rights with respect to a digital asset or part thereof, as identified by the @RIGHTSHOLDERID.		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:RightsHolderContact>		

#### 4.2.1.4 Context

<b>&lt;rts:Context&gt; Context</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <rts:Context> element describes to whom certain permissions and constraints apply within a specific set of circumstances.		
Can contain following sub elements:		
<rts:UserName>		
<rts:Permissions>		
<rts:Constraints>		
Can contain following attributes:		
@CONTEXTID		
@RIGHTSHOLDERIDS		
@CONTEXTCLASS		
@OTHERCONTEXTTYPE		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>&lt;rts:UserName&gt; User name</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:UserName> allows naming the typical user or group who would use the digital object within the described context.		
Can contain following sub elements:		
/		
Can contain following attributes:		
@USERTYPE		
Can occur in following elements:		
<rts:Context>		

<b>&lt;rts:Permissions&gt; Permissions</b>		
Repeatable:	Mandatory:	May contain text:
Yes	Yes	No
Brief description:		
The <rts:Permissions> element corresponds to a set of uses to which a digital object or part thereof can be put as defined by the rights holder in a given context. Can be used in combination with <Constraints> and its attributes to match with the CC licences and Europeana Rights statements. <sup>7</sup>		
Can contain following sub elements:		
//		
Can contain following attributes:		
@DISCOVER @DISPLAY @COPY @DUPLICATE @MODIFY @DELETE @PRINT @OTHER @OTHERPERMITTYPE		
Can occur in following elements:		
<rts:Context>		

<b>&lt;rts:Constraints&gt; Constraints</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	No
Brief description:		
The <rts:Constraints> element describes any restrictions that need to be placed upon a set of permissions.		
Can contain following sub elements:		
<rts:ConstraintDescription>		
Can contain following attributes:		
@CONSTRAINTTYPE @OTHERCONSTRAINTTYPE		

<sup>7</sup> Note that this will need to be adapted accordingly to the newly released and updated Europeana rights statements, see <http://pro.europeana.eu/available-rights-statements> as announced in the Europeana Pro Blog at [http://pro.europeana.eu/pro-blog/-/blogs/2078411/maximized?p\\_p\\_auth=7eSmMiJ0](http://pro.europeana.eu/pro-blog/-/blogs/2078411/maximized?p_p_auth=7eSmMiJ0) on 26 February 2014. Both links last viewed 10 April 2014.

Can occur in following elements:
<rts:Context>

<b>&lt;rts:ConstraintDescription&gt; Constraint description</b>		
Repeatable:	Mandatory:	May contain text:
Yes	No	Yes
Brief description:		
The <rts:ConstraintDescription> element provides additional information about the constraint. Can only contain one of the following values to represent the according CC licences: SA, NC, ND, NC-SA, NC-ND. <sup>8</sup>		
Can contain following sub elements:		
/		
Can contain following attributes:		
/		
Can occur in following elements:		
<rts:Constraints>		

#### 4.2.2 The attributes

<b>@xmlns</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @xmlns attribute is used to provide the namespace for the Archives Portal Europe profiles, including apeMETSRights.		
Data type:		
URL (Uniform Resource Locator).		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>@xmlns:xsi</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @xmlns:xsi attribute is used to provide the namespace for the XML Schema Instance.		
Data type:		
URL (Uniform Resource Locator).		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>@xsi:schemaLocation</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The location @xsi:schemaLocation attribute is used to provide the location of the apeMETSRights schema.		
Data type:		
URL (Uniform Resource Locator).		

<sup>8</sup> Same as for <rts:Permissions>, this will probably need to be adapted to the new and revised Europeana rights statements as published on 26 February 2014.



Can occur in following elements:
<rts:RightsDeclarationMD>

<b>@RIGHTSDECID</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @RIGHTSDECID attribute is used to provide the unique identifier for the right declaration described.		
Data type:		
Standard value: unique identifier.		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>@RIGHTSCATEGORY</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @RIGHTSCATEGORY attribute specifies whether the resource is COPYRIGHTED, LICENSED, in the PUBLIC DOMAIN, CONTRACTUAL, or OTHER. <sup>9</sup>		
Data type:		
Standard values: COPYRIGHTED, LICENSED, PUBLIC DOMAIN, CONTRACTUAL, OTHER.		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>@OTHERCATEGORYTYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	No (Yes, if the attribute @RIGHTSCATEGORY="OTHER").	Yes
Brief description:		
The @OTHERCATEGORYTYPE attribute is used to fully describe other rights categories.		
Data type:		
Standard values: CCO, FREE ACCESS and UNKNOWN <sup>10</sup> .		
Can occur in following elements:		
<rts:RightsDeclarationMD>		

<b>@RIGHTSHOLDERID</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @RIGHTSHOLDERID attribute specifically lists the unique identifiers of one or more rights holders.		
Data type:		
Standard values: ISIL codes; any other universally unique identifier for the institution holding the rights; do not use with other types of identifiers (ie local identifiers) or – generally – with persons, except if they have official and unique		

<sup>9</sup> Same as for <rts:Permissions>, this will probably need to be adapted to the new and revised Europeana rights statements as published on 26 February 2014.

<sup>10</sup> Same as for <rts:Permissions>, this will probably need to be adapted to the new and revised Europeana rights statements as published on 26 February 2014.

identifiers coming from eg VIAF, ISNI or similar.
Can occur in following elements:
<rts:RightsHolder> <rts:Context>

<b>@CONTEXTID</b>		
Repeatable:	Mandatory:	May contain text:
No	No	Yes
Brief description:		
The @CONTEXTIDS attribute provides a way to specifically link one or more context situations as described within the <Context> element.		
Data type:		
Standard value: unique identifier for the described circumstance.		
Can occur in following elements:		
<rts:RightsHolder> <rts:Context>		

<b>@PHONETYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @PHONETYPE attribute provides the type of the telephone number.		
Data type:		
Standard values: BUSINESS, FAX, MOBILE.		
Can occur in following elements:		
<rts:RightsHolderContactPhone>		

<b>@CONTEXTCLASS</b>		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
The @CONTEXTCLASS attribute defines the group to which a given context relates.		
Data type:		
Standard values: ACADEMIC USER, GENERAL PUBLIC, REPOSITORY MGR, MANAGED GRP, INSTITUTIONAL AFFILIATE, OTHER.		
Can occur in following elements:		
<rts:Context>		

<b>@OTHERCONTEXTTYPE</b>		
Repeatable:	Mandatory:	May contain text:
No	No (Yes, if the attribute @CONTEXTCLASS = "OTHER").	Yes
Brief description:		
The @OTHERCONTEXTTYPE attribute allows specifying local extensions of context classes.		
Data type:		
Local standard values.		
Can occur in following elements:		
<rts:Context>		

<b>@USERTYPE</b>		
Repeatable:	Mandatory:	May contain text:

No	Yes	Yes
Brief description:		
The @USERTYPE attribute allows characterising the type of user or user group.		
Data type:		
Standard values: INDIVIDUAL, GROUP, BOTH, UNDEFINED.		
Can occur in following elements:		
<rts:UserName>		

@DISCOVER		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @DISCOVER attribute is TRUE, it means that the resource is available for searching or other discovery activities.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@DISPLAY		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @DISPLAY attribute is TRUE, it means that rendering, playing, executing the resource is possible.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@COPY		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @COPY attribute is TRUE, it means that making verbatim copy for purposes of re-use of whole or part of the resource and creation of new resource is allowed.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@DUPLICATE		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @DUPLICATE attribute is TRUE, it means that making an exact copy of the resource for file or repository management purposes is allowed.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@MODIFY		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @MODIFY attribute is TRUE, it means that it is allowed to annotate, edit, excerpt, embed, extract the resource for purposes of re-use or preservation.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@DELETE		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @DELETE attribute is TRUE, it means that it is allowed to remove the resource from the repository for the purposes of resource or repository management.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@PRINT		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @PRINT attribute is TRUE, it means that rendering the resource onto paper or hard copy is allowed.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@OTHER		
Repeatable:	Mandatory:	May contain text:
No	Yes	Yes
Brief description:		
When the value of the @OTHER is TRUE, it means that there are additional localised types of permission.		
Data type:		
Standard values: FALSE, TRUE.		
Can occur in following elements:		
<rts:Permissions>		

@OTHERPERMITTYPE		
Repeatable:	Mandatory:	May contain text:
No	No (Yes, if the attribute @OTHER="..." is used).	Yes
Brief description:		
The @OTHERPERMITTYPE attribute names the localised permission type.		
Data type:		
Standard local values.		
Can occur in following elements:		
<rts:Permissions>		

<rts:Permissions>

<b>@CONSTRAINTTYPE</b>		
<b>Repeatable:</b>	<b>Mandatory:</b>	<b>May contain text:</b>
No	Yes	Yes
<b>Brief description:</b>		
The @CONSTRAINTTYPE attribute characterises the type of restrictions.		
<b>Data type:</b>		
Standard values: QUALITY, FORMAT, UNIT, WATERMARK, PAYMENT, COUNT, ATTRIBUTION, RE-USE, TIME, TRANSFERPERMISSIONS, OTHER.		
<b>Can occur in following elements:</b>		
<rts:Constraints>		

<b>@OTHERCONSTRAINTTYPE</b>		
<b>Repeatable:</b>	<b>Mandatory:</b>	<b>May contain text:</b>
No	No (Yes, if the attribute @CONSTRAINTTYPE="OTHER").	Yes
<b>Brief description:</b>		
The @OTHERCONSTRAINTTYPE attribute names the localised restriction type.		
<b>Data type:</b>		
Standard value: RESTRICTED ACCESS.		
<b>Can occur in following elements:</b>		
<rts:Constraints>		

## 5 Use of METS in the context of the portal

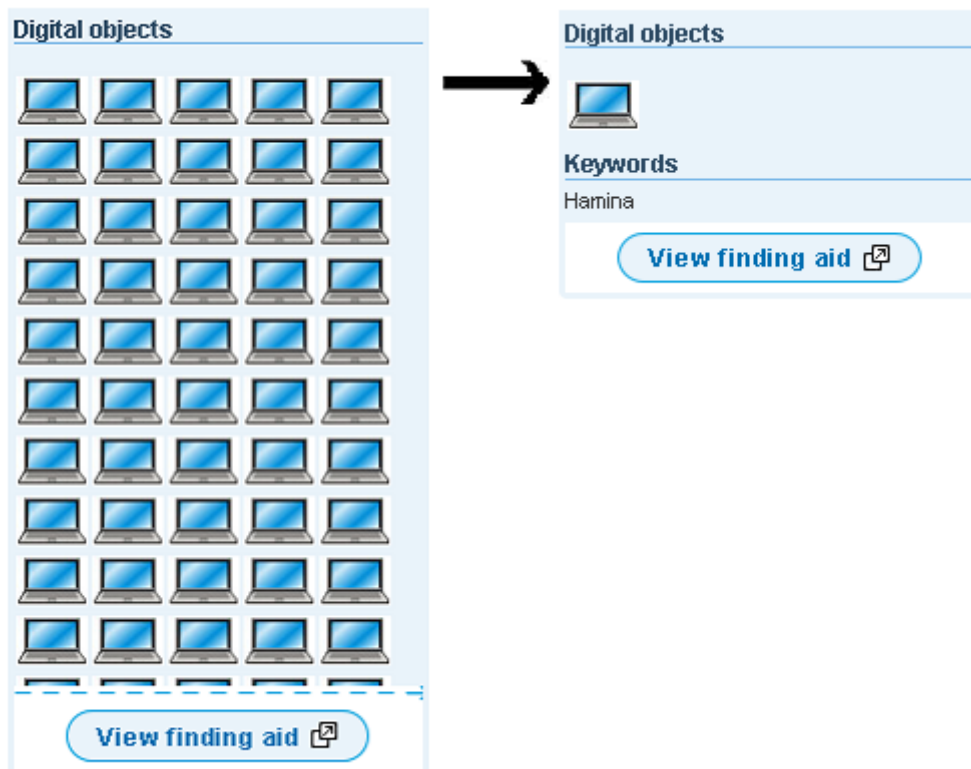
One may group the reasons to use the Metadata Encoding and Transmission Standard in the context of providing access to digital objects into four:

- a) Identify: digital objects should contain all necessary information to allow an unambiguous identification of the digital object itself and the source. The digital object is identified in three ways: by its technical characteristics, by the characteristics of the source and by the relations linking the object to other digital objects. With this data every digital object may be identified perfectly and can therefore be protected and preserved.
- b) Manage: metadata supports the management of digital objects within a digital repository. Metadata is essential in all technical procedures and future partnerships, reproduction and copying, quality control, preservation and maintenance of the digital file. Metadata makes it easier to enumerate, describe and maintain the relationships between digital objects and digital repositories as well as allows for wider interoperability and the handling of other issues, eg the rights management of the source documents.
- c) Ensure: metadata is a guarantee of control, security and authenticity with respect to the source of the digital object. The digital object should not be only a reproduction of its original source, but also, through coding, must certify the digital object's authenticity as a true reflection of its source. Manipulation or alteration of the digital object must – and can – be controlled with according metadata.
- d) Reuse: METS offers possibilities to make statements about the rights of the digital objects. By this it can be declared if and how a digital object is reusable.

### 5.1 What can METS offer to the portal?

METS is a standard for encoding structural, descriptive, and administrative metadata on digital objects, and for locating objects identified and described in a METS document. The heart of a METS document is the representation of the hierarchical structure of an object or collection of objects. While the elements and properties of the structure are defined in detail, there is no METS definition of descriptive or administrative metadata: implementers may use any external schema, endorsed or not by the METS Board for the use with METS, to be referenced or integrated in the METS document itself. In the context of the Archives Portal Europe descriptive metadata will be encoded in EAD, while administrative (here: rights) metadata will be encoded in apeMETSRights

METS is designed to enable the representation, management, and exchange of complex multipart digital objects and the structural relationships among them. As the objects representing archival units are usually of this kind, METS could add value to their presentation and to the user experience (see example below).



(Mock-up showing one example how the presentation could be improved based on a METS file using the attribute @USE with the value “DISPLAY”)

As a tool for structuring digital objects, METS has the potential to complement the standard currently used for structuring archival content in the portal.

As a metadata standard that enables integration of various external descriptive and administrative metadata specifications, METS can be used to upload and make use of information on archival content and specifically its digital representations that cannot otherwise be properly encoded in apeEAD or apeEAC-CPF formats (eg specific descriptive metadata related to the type or format of digital object, technical metadata<sup>11</sup>, some rights metadata (see chapters 3.2, 4.2 and 5.5 for the recommended use of apeMETSRights together with apeMETS for the Archives Portal Europe)).

## 5.2 METS and metadata standards already implemented in the portal, here: EAD

The apeMETS format, as defined in this document, will be integrated in a system that uses other metadata standards and – depending on the extent of its integration (see chapter six on possible use cases) – should be properly integrated in the tools used for content upload and management in the portal. The data on archival content will continue to be uploaded and managed in apeEAD, and apeMETS should fit well in that process.

<sup>11</sup> Such technical metadata could be future extensions of apeMETS and can be related eg to preservation, commonly encoded in PREMIS, or specific metadata related to certain types of material, such as MIX, audioMD, videoMD, etc.

While it is the role of apeEAD to structure complex information resources, more information about digital objects with apeMETS can be provided. EAD does not offer many possibilities for details in this respect, because it does not report about technical data or rights – or better put: it does not provide dedicated elements or attributes for doing so. While the use of a “logical” <structMap> element is allowed in the profile, the focus is on a flat “physical” structural map, which is mandatory in the profile. The element <structMap> is the only mandatory element in the standard and having the physical structural map as mandatory in the apeMETS profile also results in the element section <fileSec> being mandatory, while the section <amdSec> will be optional in apeMETS and only used for rights metadata.

In the current version of the apeMETS profile, an apeMETS file is a container of references to files that belong to only one <c> element in an apeEAD file, which may be enriched by more granular information on rights and restrictions with regard to access and use. The implementation of METS can therefore add one level of structure below the one defined in EAD files by adding a way of expressing the digital objects in its own hierarchical structure with the help of the structMap section of METS.

```
<mets:structMap LABEL="PHYSICAL" TYPE="PHYSICAL">
  <mets:div LABEL="physSequence">
    <mets:div ID="PHYS001" ORDER="1" ORDERLABEL="I" LABEL="First object">
      <mets:fptr FILEID="ID21129606DEF" />
      <mets:fptr FILEID="ID21129606THB" />
    </mets:div>
    <mets:div ID="PHYS002" ORDER="2" ORDERLABEL="II" LABEL="Second object">
      <mets:fptr FILEID="ID21129607DEF" />
      <mets:fptr FILEID="ID21129607THB" />
    </mets:div>
  </mets:div>
</mets:structMap>
```

(Example for <structMap>)

**Metadata.** Another important issue is to determine what metadata will be delivered to the portal using METS, since some degree of overlapping with EAD encoded metadata is possible. For instance, if METSRights, as specified in the current version of the apeMETSRights profile, is used for the exchange of rights information, some thirteen discrete data elements are to be used in order to comply with the profile, most of them with predefined value sets and suitable for automatic processing. At the same time the same information in EAD format would be encoded in one or two data elements in a more narrative form intended to be read users.

EAD is focused on descriptive and (some) administrative metadata common to most archival material. As to descriptive metadata, the use of additional externally defined data elements is not encouraged, although it is possible to some degree. On the contrary, METS doesn't define its own set of descriptive or administrative metadata, but uses externally defined metadata sets appropriate to the resource described, which includes information encoded in EAD format. The use of capacities of the two standards to transfer metadata may be interrelated in different ways, including:



- a) Metadata are delivered to the portal only in EAD format. The administrative metadata section in apeMETS, focusing on rights metadata, is not used. In this scenario, METS is used on the portal to group and organise links to digital object files avoiding a very frequent use of <dao> elements in EAD files, and thereby reducing the size of these files. This way of using of the standard should be justified by functionalities based on the structure of links transferred by apeMETS, ie by the possibility to preview and manage the display of digitised representations of an archival unit composed of several image files or documents. This seems to be more favourable from the perspective of what could be offered in the central system of the Archives Portal Europe in comparison to the use of (adapted) METS viewers developed by other projects or institutions.
- b) Descriptive metadata are delivered to the portal in EAD format, while the administrative metadata section in apeMETS with a focus on rights information is used to provide additional and more detailed information about the digital objects. In this approach, METS data is an addition to the EAD data and cannot be ingested independently. METS would then be used as a kind of auxiliary format, if some metadata cannot be properly encoded in EAD. The future functionalities of the portal in need of such metadata that cannot be properly encoded in EAD should be defined and evaluated in the long run. The APE<sub>x</sub> deliverable D2.2 “Report on best practices regarding the administration of rights at the local level in the context of aggregation to an European level” already provided some suggestions with regard to making use of rights information also in the Archives Portal Europe for searching and refinement of search results.
- A further development, based on solid use cases and requirements from the Archives Portal Europe community and the possible existence of sets of metadata other than rights information, could be to also have these metadata transmitted via METS to make use of possibly added value to the Archives Portal Europe.

**Locating content files.** Both standards have mechanisms to locate external resources, eg digital representations of archival units. Both can be used to enable the display of pictures or the browsing of the content of archival units, when an appropriate viewer is available or the XSLT scripts for HTML display are set up accordingly. The <fileSec> element in the current apeMETS profile is mandatory as the use of METS is directed at storing links to files relating to <c> elements in EAD, be it one or more links, and at using these links on the portal to support access and to improve the quality of the presentation of content.

### 5.3 Local uses of METS in archival institutions

The information collected by WP4 on the use of METS by partner institutions has shown very different levels of experience in using METS and in the capacity to provide METS encoded content in a relatively short period of time. The same is true for the “rest” of the archival community in Europe. On the other hand, many institutions have plans to implement METS, in some way, in their own information systems or to further develop their METS-based tools and services.

The current level of the use of METS in partner institutions and in other archival institutions in Europe has at least the following consequences for the implementation of METS on the portal:

- The portal should continue to offer all the functionalities without any use of METS encoded information. Whatever might be the future implementation strategy for METS in the portal,

it should enable the publishing of information on, and access to, archival material via the Archives Portal Europe and Europeana without using METS.

- The use of METS on the portal will contribute to dissemination of good practice in the field of digital content management and access, during the APE<sub>x</sub> project and after its completion, in archival institutions in Europe.
- Even if there is no implementation of METS in the portal for the time being, the issue of the implementation of METS in European archival institutions is important for the future development of the Archives Portal Europe and in general for the accessibility of digitised archival material.

The APE<sub>x</sub> Description of Work (DoW) already specifies a deliverable D2.3 for an Archives Portal Europe apeMETS – EDM conversion tool (local and central). As to the scope of local implementation of METS, this can imply different contexts and scenarios:

- The data provider already uses METS. Local METS is converted to apeMETS, and then included in the EDM conversion together with apeEAD.
- The creation and conversion of METS files is integrated in the processing of EAD files. apeMETS files are created from apeEAD files as an option. As above, the conversion to EDM is then done for bundles of EAD and METS files.

The current apeMETS profile is focused on specific uses of METS in the context of the portal, and therefore is rather restrictive. As indicated above, the descriptive metadata section is not used (this is done via apeEAD), and the administrative metadata section concentrates on rights metadata only.

As this may not correspond to the needs of some data providers for their local systems – some may want to use METS to store and manage eg technical metadata, digital provenance metadata, or additional descriptive metadata that cannot be properly encoded in EAD – the apeMETS profile is mainly recommended as a common basis for implementation of the METS standard in the archival institutions. Of course, it can be extended in any way possible with the general METS standard. Thus it is recommended to implement METS in local environments with the specific requirements of apeMETS in mind and in a way that would enable an easy export of data in the apeMETS format, while each institution is free to create their own apeMETS\_[localProfile] as an extension for additional local use cases.

#### 5.4 Central use of METS in the Archives Portal Europa

While the Archives Portal Europe will continue to be fully functional without METS, its use can be beneficial to the portal in many ways. As already stated in the DoW, benefits include providing structured administrative and technical information on digital images, adapting and developing interoperability with Europeana (eg the option to provide rights statements on the digital objects in more detail than currently possible based on apeEAD and the EDM conversion form), and improved usability in general (eg by enabling rights based display and search functionalities also in the Archives Portal Europe).

As the portal is not intended to be a place for storage and management of digital archival material itself, the implementation of METS on the portal may include:

- support to local implementation of METS (maintenance of the apeMETS profile, implementation guidelines, viewer recommendations, support in data mapping), and/or
- use of apeMETS for transmission and conversion of data (apeMETS to EDM conversion as mentioned in the chapter 3.1), without METS based services or content provision, and/or
- using METS, and possibly a METS-based viewer, to enable preview or some limited access to digitised material (small or medium quality).

The implementation of METS on the portal may evolve over the time, especially with respect to sustainability and continuity issues.

## 5.5 apeMETSRights implementation

### 5.5.1 Objects of apeMETSRights statements

Rights-related information may refer to one or more instances or views of the same archival record, while different views or instances may require different rights statements.

Within EAD, the differences may be simply expressed in narrative form. METS and Europeana are more sensitive to differences that may be a consequence of the existence of various representations of the “same” object, including the possibility that different rights should be applied. apeMETSRights information can relate to:

1. High quality digital representations identified by <div> elements in respective apeMETS files (the current version of the apeMETS profile implies that rights statements are referenced by the attribute @AMDID of <div> elements), and probably accessible without additional rights clearance (eg digital copies accessible in the local system of the data provider, or in the system of some other service provider).
2. Full quality digital representations “behind” preview copies identified by <div> elements. Full quality representations and originals may have a different rights status (eg the rights statement “Paid access” while preview copies are accessible in the local system and/or Archives Portal Europe/Europeana for free).
3. Preview copies accessible in the local system or Archives Portal Europe/Europeana. Preview copies (in the local system or elsewhere) are usually accessible without additional rights clearance, and mostly for free.
4. A subset of representations while some representation(s) have different rights status.

In theory EDM enables different rights statements for different representations of a CHO and the current EDM conversion of the Archives Portal Europe also does support that. In practice, the use of EDM in the Europeana portal is much simpler and one rights statement is taken as sufficient. Current usage implies mostly that the rights statement refers to a good quality representation accessible in the local system, and to previews accessible in the local system and/or Europeana. When the rights related to the preview copy differ from the rights relevant for the good-to-high quality copy, the rights statement relates to the good-to-high quality copy, while the preview copy

is accessible and would always be licensed as CC0<sup>12</sup> in accordance to Europeana's Data Exchange Agreement.

With the option to have apeMETSRights encoded data embedded in apeMETS files, the already existing conversion could even be made more specific than it is currently with apeEAD, though the question of how Europeana could deal with this in their portal would remain pending.

The same applies for the possibility to use apeMETS for transmission of rights metadata for non-digital archival material, which could be of interest in the context of providing hierarchically structure Cultural Heritage Objects (CHO) to Europeana, where not all levels within this hierarchy might actually have a digital object attached. Such levels, consisting only of metadata, would then also need to be labelled as CC0.

**Recommendation 1a:** Enable generation of apeMETS as an option for content providers for finding aids with digital objects in a 1:n-relation between archival unit and digital representations as a step before the conversion to EDM.

**Recommendation 1b:** Providing this option already when converting from local data to APE data, in case we would want to make use of the rights information also already within the Archives Portal Europe itself.

### 5.5.2 Source of rights metadata and the process of its enrichment

The metadata necessary for the METSRights format may already exist in the local data provider's database, partly or in full extent (which is less probable), or it may be generated during the process of converting/enriching the data for the Archives Portal Europe and/or Europeana. Good practice in metadata management indicates that the same data is entered only once, and that existing data is re-used when appropriate.

Rights metadata may be first stored in a data provider's local database. The data contained here may be more or less detailed; sometimes it may be missing at all. On the other hand, Europeana requires a very clear statement on the rights for every object published on their portal. In this way, rights metadata is enriched with a certain focus and more useful tools for rights management, in an online environment, could be required and developed on this basis. Since the METSRights schema is a more complex, more descriptive and more structured expression of rights than the relatively simple rights statements included in the EDM data, it represents further enrichment of the rights metadata.

If a data provider's local database already contains rich and structured rights metadata, the provider is to enable the export of this data in METSRights format. The Archives Portal Europe should be able to import, convert and validate METS encoded information, including METSRights data, alongside with corresponding EAD-encoded information uploaded by the provider. It should also provide guidelines on how to set up an export format that could be used in this context.

This scenario corresponds to use cases three, four and five as described below allowing to include – in one way or another – more detailed information from METS files to data available as EAD.

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<sup>12</sup> See <https://creativecommons.org/publicdomain/zero/1.0/> (last viewed 24 April 2014).

**Recommendation 2:** Enable processing (upload, conversion, validation) of (ape)METS files, which already contain apeMETSRights data, and enable adding apeMETSRights data if wanted during conversion (similar to current option to add information on the <dao> type during conversion from local data to apeEAD).

In many cases, the process of creating apeMETSRights encoded information will create new or more usable rights information. The data provider may be interested in downloading this information and using it to improve the rights management in her/his own information system.

**Recommendation 3:** Enable downloading apeMETS files including apeMETSRights data.

### 5.5.3 Different rights statements in the same finding aid

Some archival fonds and collections contain digitised material that is accessible and re-usable under the same conditions. In this case, the same rights statement applies to the representations of all archival units in the same way.

When different rights statements apply to archival units described in the same finding aid or to different representations of the same archival unit (e.g. for sound files, where there also exists a transliteration), relevant statements can be taken from a local source, if existing, or entered manually by editing descriptive units at lower levels.

**Recommendation 4:** Enable adding apeMETSRights data if wanted during conversion (similar to current option to add information on the <dao> type during conversion from local data to apeEAD) or during generation of apeMETS from (ape)EAD.

This is the second part of Recommendation 2, which could be dealt with separately if considered more appropriate for the implementation steps.

### 5.5.4 Rights related to other content represented in apeMETS files

A basic set of apeMETSRights elements is mandatory in the current version of the apeMETSRights profile, when used in conjunction to apeMETS. However, this is not the only purpose for using apeMETS files. apeMETS is expected to store links to content files locations in a structured way, that would facilitate the access to, and management of, the content.

Archival fonds and collections may contain a big number of units on lower levels and their digital representations. Metadata on these representations could then be encoded in several METS files (eg one per digital representation), in order to avoid possible problems when working with relatively big XML files. In that case, the same rights information can relate to digital representations of archival units represented in different apeMETS files related to the same apeEAD file.

**Recommendation 5:** Information on rights related to the digitised material described in the same finding aid should be managed in an integrative way.

Another recommendation to consider with regards to administrative metadata, particularly the elements of rights, is the possible need to report about the legislation regulating rights management or intellectual property in each country, given that:

- Archives Portal Europe involves 32 countries, with different rights management laws; and
- Portal users must be able to meet the specific legal framework that applies to each of the digital objects.

## 6 apeMETS use cases

This overview of possible use cases, not necessarily all of them being recommended, is based on the use contexts suggested in the notes within the profile specification and options discussed in the process of developing the profile.

### 6.1 Local use of METS

The profile specification<sup>13</sup> explains that the “profile can be used locally to administer and maintain information about digital archival objects being represented by more than one image, text or other type of digital file. This also includes different versions of the same representation as for example high-resolution images and their thumbnails. It is recommended to use a METS file based on the current profile together with EAD for the descriptive metadata of the archival object represented by the various digital items in the METS document”.

The current version of the apeMETS profile, focused on links to such files and according rights metadata, concentrates on aspects necessary – or at least recommended – for the central use within the Archives Portal Europe. Nevertheless it doesn't specify the use of METS apart from that for various local purposes that may be relevant in specific contexts. In the case of local use only, with no changes in the portal, dashboard or DPT, the objectives of the use of METS are to be achieved by the voluntary effort of partner institutions, possibly based on apeMETS, though specified and/or extended for the partners' own use cases which cannot be easily predicted. Examples would include the storage of technical, preservation or digital provenance metadata and the addition of descriptive metadata that cannot be properly encoded in EAD format. However, the reason to introduce METS in the APE<sub>x</sub> project would be to build the potential for future development of new functionalities, based on standardised formats of rights and the identification and linking of metadata on digital objects. Therefore the main use of the apeMETS profile in this use case would be the transfer and processing of specific metadata on the portal (by its tools).

#### 6.1.1 Viewer options for local use

Based on using METS locally, it would also be an option for content providers, who don't have other presentation models already at hand, to use a METS-based viewer for showing their digital objects online. In the profile specification it therefore is stated that the “profile can additionally be used locally in combination with an open source viewer”.

So far, several recommendations for a viewer were given to be used locally within the group:

- <http://dfg-viewer.de/en/regarding-the-project/>
- [http://igelu.org/wp-content/uploads/2010/09/1632\\_Maurer\\_IGeLU2010.pdf](http://igelu.org/wp-content/uploads/2010/09/1632_Maurer_IGeLU2010.pdf)
- <http://sourceforge.net/projects/bnlviewer/>
- <http://dlib.nyu.edu/metstools/mets2smilviewer/>
- <http://dlib.nyu.edu/metstools/metsviewer/>

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<sup>13</sup> See Annex 1.

Such viewers have, or would allow the implementation of, some basic tools:

1. To display images (eg the Monasterium viewer: <http://monasterium.net/> or the PARES viewer: <http://pares.mecd.es>):

- Zoom, either progressively or in at least four positions starting from 100%;
- 90° turn;
- Print button;
- Local save button;
- Increased brightness and contrast;
- Pointer displacement;
- Moving backwards and forwards between the images;
- A marginal view of all the images connected in a file.

2. To display video:

- Play, Pause and Stop buttons;
- Sound volume control;
- Expanded view.

3. To display audios:

- Play, Pause and Stop buttons;
- Sound volume control.

### 6.1.2 Local use with viewer and providing links to digital objects to the Archives Portal Europe

Local use with a viewer is an option for the local use case that doesn't affect the portal, as METS data is not transmitted to, and processed by the portal. In this case, it is recommended to provide the links to the local viewer's interface, instead of the links to the METS files within the (ape)EAD finding aids for direct access.

In the profile specification it is explained that "When this profile is used locally with a viewer and for providing links to digital objects to the Archives Portal Europe, it is necessary to have the URL of the METS-based presentation referenced in the @xlink:href attribute of the <dao> element at the <c> level in the apeEAD file that corresponds to the digital objects. This means, that the second display for finding aids, containing the links to digital material in the Archives Portal Europe will only contain one link, which will then lead to the local METS-based presentation providing access to all other digital objects connected. Only the apeEAD file will be provided to the Archives Portal Europe in this instance".

This solution could be the easier way to implement METS in Archives Portal Europe, as actual implementation and changes would rather happen at the content providers and their local systems in order to use (ape)METS locally. With this solution, it wouldn't be necessary to change the upload functionality or any other workflow within the central system. While the different archives implement the METS or apeMETS schema in their systems, they send their information to the Archives Portal Europe within the finding aids in EAD (or apeEAD), including a link to the images in their own viewers.

### Use case 1. Local use of apeMETS with a local viewer

1. An archival institution is already using EAD for its archival descriptions and might either already be using METS for managing the metadata on its digital objects or is now thinking about doing so. It has several digital objects for the same archival unit, and the use of METS would be recommended to manage better the structure of these digital archival objects and to include some additional properties (eg the rights information). The institution uses – or develops – its own tools to create METS or possibly apeMETS files. For presenting the digital objects online, the institution uses a METS-based viewer (eg one of the ones recommended by the APE<sub>x</sub> project).
2. The archive will only send the apeEAD file to the Archives Portal Europe. In this EAD file there will be the link to the METS-based presentation from the local viewer in order to see the digital objects on the different viewers of any local system.
3. If the archival institution isn't using METS yet and wouldn't have the facilities to develop a tool itself, apeMETS could be created from the apeEAD file, like it's the purpose of the use case 2 below.

### Use case 2. Create apeMETS from apeEAD files

This use case could be an option for local use in case of apeEAD files with several <dao> per <c> level and where the content provider hasn't (and doesn't intend to have) METS implemented. The use case also could form one possible basis of the use cases described in the following chapters.

In order to enable linking of this kind using the current apeMETS profile, there should be at least one <file> element in the <fileSec>.

1. Create apeMETS from the apeEAD file. <file> elements in <fileSec> and according <div> elements in <structMap> would be created from (ape)EAD during conversion. The form for conversion is accordingly modified to allow for input of rights metadata (useful if the same rights apply to many or all <c> elements and their digital representations). This part would then be compliant with the apeMETSRights profile.
2. The conversion output would be an apeEAD file plus one or more apeMETS files.
3. Edit apeMETS. apeMETS files are edited (only the rights metadata) in case different rights apply to some of the digital representations.
4. Save apeMETS files.
5. From here onwards, the workflow of either of the local or central use cases could be followed.

### 6.1.3 Local use of (ape)METS with harvesting information for use in the central system

In this use case, there might also be a local viewer in place, however, the information provided to the Archives Portal Europe would be coming directly from the (ape)METS XML files, which would be linked within the (ape)EAD finding aids.

### Use case 3. Harvesting local METS files

The portal may collect and use information stored in local METS or apeMETS files, provided that the local system enables this, and includes the information to access the locally stored (ape)METS files in apeEAD finding aids that are uploaded to the portal. The goal is to enable preview of the content on the portal without implementing a full solution for processing and displaying information encoded in METS format.



In this case the portal is not expected to manage the content or to enable access to detailed information: this is the role of the local system. For the use of administrative metadata (including rights metadata) it would be more appropriate to implement METS on the portal directly. Here however, the portal would only collect data on digital representations organised in a structured way within METS and/or on copies of these files. The collected links could then be used to access and copy content files and generate previews. Preview files could be integrated in display of search results, used to access the presentation of the archival unit in the local system, or, if more than one preview file is used, as a showcase of the content of the archival unit.

1. Data provider uploads EAD file. <dao> elements reference local resources – no changes to current upload procedure.
2. EAD file is converted and validated – no changes to the procedure in general.
3. Addition to the conversion process: nature and validity of <dao> links are checked. Some links may refer to METS, or apeMETS files, some to a page of digital object presentation under the control of the local system, some may refer to other file types for direct access to the digital archival objects, and some may be broken. The tool should be able to ‘recognise’ valid METS/apeMETS resources, which may imply temporarily storing target files and checking for validity against METS and/or apeMETS schema – new task.

To support recognition of links to (ape)METS files different options could be suitable: either the dashboard profiles could be used to specify that EAD files include links to local METS files, or it could be a requirement for (ape)EAD files with links to (ape)METS files to use the value “METS” for the @xlink:title attribute in <dao>, similar to what already is done with @xlink:title=“thumb” to identify thumbnails.

Some additional checks may be necessary (eg if two or more <c> elements are linked to the same target file) in order to avoid misleading attribution of content files to <c> elements (this could be the case if METS files contain information on more than one archival descriptive unit).

This step may involve manual intervention if the relationship between <c> elements and METS files is not 1:1.

4. Central system accesses local (ape)METS files and copies links. Some structural information will be lost since <dao> elements in apeEAD cannot express all structural relationships typical for METS – new task.
5. Copied links are included as <dao> elements within the apeEAD finding aid. The connection of these links with the single <c> elements will be based on the relation given in the originally uploaded file (METS XML reference) – new task.

It might in this context be necessary to allow the content provider to decide the display order, since <div> elements in METS files can point to files in various <fileGrp> elements (groupings and sequence of files in groupings may be different). Ideally, this should be done automatically, based on the use of certain attributes and attribute values (eg @USE).

6. In addition to the automatic transfer of links from METS to (ape)EAD, a structural view of the fonds/collection is opened – a new task. The user inspects <c> elements in order to check the processing of links and target files joined to them.

Any operation that implies displaying, checking, or editing data transmitted from, or via, METS format, would require according adaptation of tools.

This scenario preferably is based on local METS formats already having been converted to the apeMETS (which would also include a conversion of METS to apeMETS), and that these local apeMETS files are referenced by <dao> elements. The general workflow of the portal however wouldn't change: publication, conversion to EDM and delivery to Europeana would still be based on apeEAD only.

## 6.2 Use of METS in the portal (back-end)

While the previous chapters describe use cases, where the METS files would be used and kept locally, the following use cases relate to actively using apeMETS within the central portal. apeMETS is used to transmit information to the portal, which would be needed for some of functionalities offered by the portal but cannot be properly encoded in the apeEAD format. Such functionalities include: access (including rights to use), search, presentation of search results, access to data provider's system, and publication towards Europeana.

There are different possibilities to connect (ape)METS with apeEAD for this purpose as may be seen in use case four and its sub-cases below.

### Use case 4. Connect METS with apeEAD

In this use case, apeMETS is used to transmit more detailed structural information and to improve accessibility of content files for archival fonds/finding aids.

#### 4.a. Upload METS files to already existing EAD files

Thousands of finding aids already are converted to apeEAD and published on the portal, which would be a good candidate for METS implementation. These apeEAD files may be without links to METS files since they were generated before METS implementation on the portal. METS files may however be stored in the local system; therefore the content provider would want to attach one or more METS files to an apeEAD file.

1. Select apeEAD file
2. Upload METS files to this apeEAD file
3. Save uploaded METS files

METS files are uploaded and linked to the apeEAD file in general, but links in <dao> elements are not changed yet. Without the general connection between apeEAD file and METS files, the next step would not be available.

4. Select METS files (linked to selected apeEAD file)
5. Convert METS files
6. Validate apeMETS files
7. Save apeMETS files

apeMETS files are ready for the next step: linking apeMETS to <c> elements in the apeEAD file.

8. The goal of this step is to join apeMETS files to <c> elements, respectively the according <dao> element, in the finding aid. The <c> elements may already link to METS or other files (content files), or contain no <dao> elements. To make linking as simple as possible, some constraints could be applied: METS files can be referenced for the lowest level <c> elements only, or one METS file only can be referenced by no more than one <c> element. These constraints are not

implemented in the apeEAD profile and would need to be checked in other ways. The alternative could be special treatment of relationships other than 1:1.

Preview the structure of the fonds. The system displays the structure, as already implemented in the “View finding aid” form, or in another appropriate way. On the right side for each <c> element its <dao> links are shown. Links created by a previous process of linking METS files are marked or highlighted.

Preview links. When a link is activated, the content of the linked file is displayed. The preview helps the user to decide on subsequent actions.

Delete links. The user selects some or all links in a <c> element and deletes these links (ie <dao> elements) after confirmation.

Move links. The user selects some or all links in a <c> element and moves them to another level in the finding aid (there may be a need to move links to correct previous errors in linking).

Add links. The user selects a descriptive unit in the finding aid and then goes to the list of apeMETS files linked to the finding aid or some of the parent <c> elements. For selected apeMETS files <dao> links to apeMETS files are created.

Save apeEAD/apeMETS links. Changes are saved in apeEAD files.

Links, preview files and rights information stored in apeMETS files are available for the use on the portal.

9. With the above, there would also be the necessity for a functionality to delete these apeMETS links and files. Therefore, the goal of this step is to remove apeMETS files from the portal and to delete <dao> links to apeMETS files from the apeEAD file.

Preview the structure of the fonds. The system displays the structure, as already implemented in the “View finding aid” form or in another way. On the right side for each <c> element its <dao> links are shown. Links to apeMETS files are marked or highlighted.

Preview links. When a link is activated, content of the linked file is displayed.

Select apeMETS files for deleting. The user selects some or all apeMETS files for deleting.

Delete selected apeMETS files. Selected apeMETS files and links to them are deleted.

Save changes. Changes are saved to the apeEAD file.

#### 4.b. Upload apeEAD/apeMETS bundle

The data provider already uses EAD and METS in her/his local system and wants to upload them as a bundle. The EAD file already contains <dao> links to METS files.

1. Upload, convert and validate EAD.
2. Upload, convert and validate METS.
3. Save both EAD and METS files.

In order for this to work, the links between the EAD and the METS files need to be relative, ideally based on identifiers only, so that the links in <dao> elements would not be changed when moving from local EAD and METS usage to apeEAD and apeMETS.

#### 4.c. Create apeMETS files for EAD

This sub-scenario would be the equivalent to use case 2 in the central system. The data provider already uses EAD but not METS. The structure of EAD files can be used to generate METS files which will 'host' links to content files and, as an option, additional rights information encoded in apeMETSRights format.

1. Select apeEAD file.
2. Convert apeEAD to apeEAD/apeMETS bundle and create apeMETS from the apeEAD file. <file> elements in <fileSec> and according <div> elements in <structMap> would be created from (ape)EAD during conversion. The form for conversion is accordingly modified to allow for input of rights metadata (useful if the same rights apply to many or all <c> elements and their digital representations). This part would then be compliant with the apeMETSRights profile. A bundle of apeMETS files is created based on <c> elements on the lowest level.
3. Edit apeMETS. apeMETS files are edited (the rights metadata) in case different rights apply to some of the digital representations. The user can also add new files to the apeMETS file (files stored in the local system, but not linked from the EAD file).
4. Save apeMETS files. apeMETS files are saved, <dao> links to these files are created and stored in the apeEAD file.
5. Download apeEAD/apeMETS files.

#### Use case 5. Upload METS with EAD to the portal

Although with a different approach but still connected to the first step of uploading data to the Archives Portal Europe, this use case refers to the scenario when some data providers may use METS as main format for structuring – and exchanging – information on digital objects. In this use case, descriptive metadata in EAD format may be referenced by, or stored in, the descriptive metadata section of such METS files.

1. Upload METS files.
2. Select METS files for further processing. The user selects all METS files that are to be converted to an apeEAD file with a bundle of apeMETS files referenced by that file.
3. Create apeEAD based on the descriptive metadata section in METS. A form is used for input of mandatory metadata in EAD (fonds level, header) that could not be generated automatically.
4. Save apeEAD. Data are saved. The structure of apeEAD is generated from METS files, with <div> elements referencing descriptive information in the descriptive metadata section further structuring the EAD file (<div> elements without descriptive metadata don't generate <c> elements).
5. <dao> links to METS files for the digital representations are generated and saved as apeMETS.
6. Save apeEAD/apeMETS files.
7. Download apeEAD/apeMETS files.

As this use case is sort of the other way round than all other use cases and for now only a theoretical option in the context of the Archives Portal Europe, it would have a lower priority for further steps towards an implementation.

### 6.3 Use of METS in the portal (front-end)

The following refers to scenarios, where the use of information that can be encoded and provided in METS within the Archives Portal Europe is sought (ie to use data that can be provided in METS only, but cannot be encoded in apeEAD and thus a conversion including information from METS in EAD files would not provide the necessary output). They therefore would only be possible based on use cases 4 and 5.

#### **Use case 6. Make use of specific rights information provided in METS**

1. One of these uses could be having different/specific rights assigned to each digital object and making use of this in the Archives Portal Europe display, in search functionalities, surely in EDM conversion. This information cannot be encoded as precisely in EAD as it can be in METS.
2. It would be necessary to have METS files available in the central system for processing. The apeMETS file must be sent to the Archives Portal Europe in one way or another (see sub-scenarios of use case 4 and use case 5 above).
3. This solution would allow the introduction of some interesting changes and new functionalities in Archives Portal Europe, such as:
  - a) Extended search functionalities based on rights assigned to digital objects.
  - b) More specific EDM conversion, when apeMETS would be included in the conversion.
  - c) Preconditions:  
A conversion from METS to apeMETS and an extra section for apeMETS in the Content Manager of the dashboard, with an option to monitor the relations between the apeMETS and the apeEAD files.

#### **Use case 7. Make use of apeMETS to share digital objects (depending on the rights)**

1. One other use could be to provide the possibility (depending on the rights) to share digital objects or to save them as part of a registered user's saved searches or personal research space.
2. This would require having persistent identifiers for each object, which at the moment would be easier to encode in METS than in EAD.
3. It would be necessary to have METS files available in the central system for processing. The apeMETS file must be sent to the Archives Portal Europe in one way or another (see sub-scenarios of use case 4 and use case 5 above).
4. This solution would allow the introduction of some interesting changes and new functionalities in Archives Portal Europe, like:
  - a) Special exhibitions, related to featured documents and similar.
  - b) The specific inclusion of the digital objects in functionalities like sharing and saving in one's personal research space.

If later-created connections between apeEAD and apeMETS files would prove too complicated, alternatives could be considered, for example sending the apeEAD file with a link to our viewer and additionally sending the apeMETS file(s). The two files have a relation, but with one way only to see the digital objects (the link to a viewer in apeEAD), while the data included in apeMETS files could be used for searches and EDM conversions.

## 7 The script for the creation of apeMETS files out of apeEAD files

To facilitate the lowering of the number of <dao> elements present in an apeEAD document and thereby decreasing the apeEAD file in size, an additional conversion script using an apeEAD file as input, creates a new apeEAD with links to one or more apeMETS documents created by running the script (use cases 2 and 4 above). The file created by the script will require the content provider to make manual additions done to ensure that the correct information regarding for example the deliverer is included in the resulting apeMETS documents. Making these changes and creating the new apeEAD and the apeMETS documents requires the content provider to have access to an XML editor with an XML engine and also some knowledge on how to make changes in an XSLT transformation script. All the values that should be changed are clearly marked and can be found in the beginning of the transformation script.

The script, in its initial phase, only handles the removing of <dao> elements from the apeEAD files to create one or more METS <file> elements and does not include any creation of any rights information. In a future development of the script the rights information could be added semi-automatically or automatically.

This script can be found in Annex 5 (apeEAD2apeMETS transformation script).

The version of the script delivered here is a first version, which shall be improved together with Technical Team within the project life-time.

## 8 Conclusions and further recommendations

As a METS implementation in the Archives Portal Europe is not required neither to present digital objects in the Archives Portal Europe nor to forward EDM files to Europeana, the METS discussion in WP4 and within the whole APE<sub>x</sub> team started completely open regarding the necessity of implementing METS centrally and regarding the question how METS could be used effectively in the Archives Portal Europe itself.

The first use case established in favour of at least having an apeMETS profile recommended to be used within the context of the Archives Portal Europe was evoked by the experience of various partners looking for a general way of dealing with having multiple digital objects linked to their descriptive units and of providing this information together with the archival descriptions.

That this profile should integrate rights metadata on the digital objects became obvious very soon: presenting digital objects within the content providers' websites was usually done without giving information on the rights of these digital objects. This is due to the fact, that the user generally would be using the site according to the general terms of use on the content providers website. The ease of using digital objects found in portals makes it necessary to provide the rights information of these digital objects. Therefore the need for an apeMETSRights profile, which could be used within an apeMETS file or any other METS file, was developed in close cooperation between WP4 and WP2.

With the aim to make the realisation of presentations of digital objects easier for the content providers and the use of digital objects more user friendly and contemporary for all users, apeMETS and apeMETSRights implementations are being recommended for the Archives Portal Europe's central system based on the negotiations and experiences during the process of developing the present report.

Looking ahead to the Archives Portal Europe Foundation (APEF) WP4 recommends to consider providing a viewer and a storage system for digital objects – possibly with the correspondent archival descriptions – and thus offering smaller archives without any technical infrastructure a complete presentation platform. This could be offered as an additional service against payment depending on the storage space required to store these digital objects within the Archives Portal Europe.