

Musical METS

An Overview and Case Study

Scott Yeadon

IAML 2007 – Conservatorium of Music, Sydney (1-6 July)

What is METS?

- Metadata Encoding and Transmission Standard
- The METS schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library, expressed using the XML schema language of the World Wide Web Consortium.¹
- Schema created in 2001
- Digital Library Federation sponsored initial development
- Maintained by Library of Congress
- Governed by METS Editorial Board

¹ <http://www.loc.gov/standards/mets/>

What is METS? (2)

- Digital Object Packaging
- Content and/or content references and Metadata and/or metadata references
- Supported metadata schemas and allows flagging of unsupported schemas
- Describes the structure of the packaged object(s)

Is XML, Is Good

- eXtensible Markup Language
- Document description (archive/storage context)
- Information exchange (Internet/Business Systems context)
- Generally not tied to presentation concerns
- In a repository context, can be used to create self-describing packages using schemas such as METS and DIDL
- Could aid preservation in some instances

XML Example

```
<?xml version="1.1" encoding="UTF-8"?>
<score-partwise>
  <part-list>
    <score-part id="P1">
      <part-name>Music</part-name>
    </score-part>
  </part-list>
  <part id="P1">
    <measure number="1">
      <attributes>
        <divisions>1</divisions>
        <key>
          <fifths>0</fifths>
        </key>
        <time>
          <beats>4</beats>
          <beat-type>4</beat-type>
        </time>
        <clef>
          <sign>G</sign>
          <line>2</line>
        </clef>
      </attributes>
      <note>
        <pitch>
          <step>C</step>
          <octave>4</octave>
        </pitch>
        <duration>4</duration>
        <type>whole</type>
      </note>
    </measure>
  </part>
</score-partwise>
```

* taken from <http://en.wikipedia.org/wiki/MusicXML>

XML Example (2)

- A software package understanding MusicXML can interpret and render this in any way it chooses
- For example, one rendering could be:



- whereas another package may generate:



- and another package may simply play the piece

Major Structures

- METS Element and Header (profile and provenance)
- Administrative Metadata containers (amdSec)
 - techMD
 - rightsMD
 - sourceMD
 - digiprovMD
- Descriptive Metadata containers (dmdSec)
- File references and/or content (fileSec)
- Structural map of packaged object (structMap)
- Relationships between objects (structLink)
- Behaviours associated with objects (behaviourSec)

mets and metsHdr

```
<mets:mets xmlns:mets='http://www.loc.gov/METS/'
  OBJID="hdl:1885/342"
  PROFILE="NLA SIP/DIP 1.0"
  TYPE="Music Object">
  <mets:metsHdr CREATEDATE="2007-07-03T00:00:00">
    <mets:agent ROLE="CREATOR"
      TYPE="ORGANIZATION">
      <mets:name>The Australian National University</mets:name>
      <mets:note>Packaged by METSGenerator</mets:note>
    </mets:agent>
  </mets:metsHdr>
  ...
  ...
</mets:mets>
```


amdSec

```
<mets:amdSec ID="AMD1">
  <mets:digiprovMD ID="DP1">
    <mets:mdWrap MDTYPE="OTHER" OTHERMDTYPE="PREMIS">
      <METS:xmlData>
        <premis:premis xmlns:premis="http://www.loc.gov/standards/premis">
          <premis:event>
            <premis:eventIdentifier>INGEST</premis:eventIdentifier>
            <premis:eventType>REPOSITORY INGEST</premis:eventType>
            <premis:eventDateTime>2007-07-03T00:00:04</premis:eventDateTime>
            <premis:linkingAgentIdentifier>
              <premis:linkingAgentIdentifierType>Program</premis:linkingAgentIdentifierType>
              <premis:linkingAgentIdentifierType>ItemImport</premis:linkingAgentIdentifierType>
            </premis:linkingAgentIdentifier>
          </premis:event>
        </premis:premis>
      </mets:xmlData>
    </mets:mdWrap>
  </mets:digiprovMD>
</mets:amdSec>
```

dmdSec

```
<mets:dmdSec ID="DMD1">
  <mets:mdWrap MDTYPE="DC" LABEL="Dublin Core Metadata">
    <mets:xmlData>
      <oai_dc:dc xmlns:oai_dc="http://www.openarchives.org/OAI/2.0/oai_dc"
        xmlns:dcterms="http://purl.org/dc/terms/"
        xmlns:dc="http://purl.org/dc/elements/1.1/" >
        <dcterms:created>1810</dcterms:created>
        <dc:title>Bagatelle in A minor</dc:title>
        <dc:title>Für Elise</dc:title>
        <dc:description>a piece of music for solo piano by Ludwig van
Beethoven.</dc:description>
        <dc:type>Recording</dc:type>
        <dc:type>Image</dc:type>
        <dc:subject>Beethoven</dc:subject>
        <dc:subject>Bagatelle</dc:subject>
      </mets:xmlData>
    </mets:mdWrap>
  </mets:dmdSec>
```

fileSec

```
<mets:fileSec>
  <mets:fileGrp USE="AUDIO">
    <mets:file ID="F1" DMDID="DMD1" MIMETYPE="audio/x-wav">
      <mets:FLocat LOCTYPE="URL"
        xlink:ref="http://myarchive.com/beet/recs/felise.wav"/>
    </mets:file>
  </mets:fileGrp>
  <mets:fileGrp USE="IMAGE">
    <mets:file ID="F2" DMDID="DMD1" MIMETYPE="image/tiff">
      <mets:FLocat LOCTYPE="URL"
        xlink:ref="http://myarchive.com/beet/scores/felise.tif"/>
    </mets:file>
    <mets:file ID="F3" DMDID="DMD1" MIMETYPE="image/tiff">
      <mets:FLocat LOCTYPE="URL"
        xlink:ref="http://myarchive.com/beet/pics/comp.tif"/>
    </mets:file>
  </mets:fileGrp>
</mets:fileSec>
```

structMap

```
<mets:structMap>
  <mets:div TYPE="music object">
    <mets:div TYPE="recording" DMDID="DMD1"
      xlink:LABEL="1">
      <mets:fptr FILEID="F1"/>
    </mets:div>
    <mets:div TYPE="score" DMDID="DMD1"
      xlink:LABEL="DIV2">
      <mets:fptr FILEID="F2"/>
    </mets:div>
    <mets:div TYPE="composer" DMDID="DMD1"
      xlink:LABEL="DIV3">
      <mets:fptr FILEID="F3"/>
    </mets:div>
  </mets:div>
</mets:structmap>
```

structLink

```
<mets:structLink>  
  <mets:smLink xlink:from="DIV2" xlink:to="DIV1"/>  
</mets:structLink>
```

behaviourSec

```
<mets:behaviorSec>  
  <mets:behavior STRUCTID="DIV1" BTYPE="access">  
    <mets:interfaceDef LOCTYPE="URL"  
      xlink:href="http://streaming.org/wav/play"/>  
  </mets:behaviour>  
</mets:beahviourSec>
```

METS Profiles

- METS Profiles are intended to describe a class of METS documents in sufficient detail to provide both document authors and programmers the guidance they require to create and process METS documents conforming with a particular profile²
- As an analogy think of a profile as being the same as a musical form
- Set of rules/guidelines for packaging particular content types

² <http://www.loc.gov/standards/mets/mets-profiles.html>

APSR Context

- APSR is contributing funds to develop a set of METS profiles for various content types
- One of the content profiles is for music collections
- Core profile being developed by NLA
- Content profiles being developed by APSR partners in conjunction with NLA
- Scope is for submission and exchange of materials in a repository context

Example METS document and repository access

The Anthology of Australian Music

• A selection of twentieth century Australian piano music (CSM:40)

◦ A selection of twentieth century Australian piano music (CSM:41)

◦ Australian chamber orchestra/Canberra horn consort (CSM:9)

◦ Campbell/Fogg (CSM:15)

◦ Canberra wind soloists/Cubbin (CSM:14)

◦ Chamber music made and played in Australia 1945-1952 (CSM:23)

◦ Deep in my hidden country... featuring Marilyn Richardson (CSM:22)

◦ De Haan/Schiemer/Vine/Leak (CSM:13)

◦ Dramatic vocal music (CSM:32)

◦ Electroacoustic music (CSM:20)

◦ Electroacoustic music (CSM:26)

◦ Electroacoustic music (CSM:35)

◦ Electroacoustic music (CSM:4)

◦ Electroacoustic music (CSM:5)

◦ Electroacoustic music (CSM:6)

◦ Film music of the 1960s: from the film Australia collection (CSM:36)

◦ Fliederman (CSM:1)

◦ Herscovitch/Schneider: music for violin and piano (CSM:17)

◦ House Songs (CSM:31)

◦ Kain (CSM:11)

◦ Like Icarus ascending: violin and piano music (CSM:34)

◦ Mays (CSM:3)

◦ Mizu to Kori: Nova ensemble (CSM:29)



















◦ Morton (CSM:8)

◦ Music for film: Dorian Le Gallienne and John Antill (CSM:28)

◦ Music for flute, piano and computer-generated sounds (CSM:18)

◦ My world, this time (CSM:37)

A selection of twentieth century Australian piano music (CSM:40)

1 - 3	Sonata (Holland, Dulcie)		
	Brooding - rather slow - allegretto		7:59
	Andante - molto mosso		7:42
	Vivo		7:43
4	Andante tranquillo from Concerto no. 2 in C# minor (Hyde, Miriam)		6:31
5 - 7	Three Aboriginal dances (Hill, Mirrie)		
	Brolga (the dancer)		2:54
	The Kinkarunkara women		1:46
	Nalda of the echo		2:59
8	The lake (Holland, Dulcie)		5:38
9	Theme and variations - Passacaglia (Eagles, Moneta)		7:53
10 - 15	Six profiles (Sutherland, Margaret)		
	With animation		1:15
	Expressively		2:29
	Cool and detached		2:46
	A little fussily		2:32
	Quietly flowing		1:04
	Rhythmically		4:14
16 - 18	Fantasia no. 11 'E', in three movements (Sitsky, Larry)		
	1		6:12
	2		3:31
	3		4:02

Why Use METS?

- Open Standards
- Supported and Maintained by an International Community
- Mailing lists for technical support
- Useful for packaging compound digital objects
- Supported by repository software (longer term)

Links

- APSR web site: <http://www.apsr.edu.au/>
- METS web site: <http://www.loc.gov/standards/mets/>
- METS structure diagram:
<http://sunsite.berkeley.edu/mets/diagram/>
- METS Primer (draft):
<http://www.loc.gov/standards/mets/METS%20Documentation%20draft%20070310p.pdf>