Musical METS

An Overview and Case Study

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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
<?xml version="1.0" 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>
```

XML Example (2)

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

  ![Musical notation](image1)

- whereas another package may generate:

  ![Musical notation](image2)

- 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>
<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>
<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>  
      </oai_dc:dc>  
    </mets:xmlData>  
  </mets:mdWrap>  
</mets:dmdSec>
<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:file>
  </mets:fileGrp>
</mets:fileSec>
<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>
<mets:behaviorSec>
  <mets:behavior STRUCTID="DIV1" BTYPE="access">
    <mets:interfaceDef LOCTYPE="URL"
      xlink:href="http://streaming.org/wav/play"/>
  </mets:behavior>
</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 profile.\(^2\)
- 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
### A selection of twentieth century Australian piano music (CSM:40)

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