Mixed Distribution Package ISDCF Recommendation

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Introduction

As SMPTE DCP's start becoming available, there will be a strong need to allow the distribution of media containing a mixture of Interop DCP's and SMPTE DCP's. For example, when the first SMPTE DCP trailer is released, there may be a need to distribute it on a single hard drive along with several Interop DCP's. The duration during which this functionality will be needed will be a minimum of several months and may be several years.

The final goal of the ISDCF Mixed Distribution Package subcommittee was to propose a recommended practice that all vendors can follow in order to reliably use content on media with both SMPTE and Interop DCP's. The target audience of this document includes those that master DCP's, content distributors, player manufacturers, and theater management system manufacturers.

This subcommittee reviewed several methods for accomplishing this goal and decided on the method identified as *Multiple Top-level Directories*.

Multiple Top-level Directories

Advantages:
- The ability to allow multiple asset maps on a single disk has often been requested by to make it easier to combine content from multiple sources.
- This method avoids the need to merge asset map files which can introduce errors into the distribution package.
- Many systems already support this method.

Disadvantages:
- This would require a revision to the SMPTE standard 429-9.
- This adds the requirement of scanning multiple directories. However, this additional step is only necessary if there is not an asset map in the root. Additionally, a modern operating system caches disk access and should not be perceptibly slowed down by this.

Description:
In this method, the current Interop and SMPTE standards would be extended to also allow ASSETMAP or ASSETMAP.xml files in directories immediately below the root directory.

Example Directory Listing:
```
\MyInteropTrailer1\
      ASSETMAP
      VOLINDEX
      PKL1.xml
      CPL1.xml
      Video1.mxf
      Audio1.mxf
\MySMPTETrailer1\
      ASSETMAP.xml
      VOLINDEX.xml
      PKL1.xml
      CPL1.xml
      Video1.mxf
      Audio1.mxf
\MyInteropTrailers2and3\
      ASSETMAP
      VOLINDEX
      PKL2.xml
      CPL2.xml
      Video2.mxf
      Audio2.mxf
      PKL3.xml
      CPL3.xml
      Video3.mxf
      Audio3.mxf
```

Media without an asset map in the root but with top-level directories shall be treated as if each top-level directory were a different drive.

Only the root and the directories immediately within the root directory (top-level directories) need to be checked for asset maps. Directories within top-level directories do not need to be checked for asset maps, although they may contain assets referenced by an asset map. If an asset map exists in the root, no other directories must be searched for other asset maps. DCP's in top-level directories shall not refer to assets in other top-level directories.

Note that when asset maps are in subdirectories, referenced asset file names are relative to the directory containing the asset map file, not the root directory.

This directory structure can be used on media containing only SMPTE content, only Interop content, or any mixture of SMPTE and Interop content. Additionally, it can be used on media containing one or more DCP's.

As this directory structure has benefits beyond mixing Interop and SMPTE content on the same media, it is recommended that all Digital Cinema systems support this directory structure permanently and not just during the Interop to SMPTE transition period.

The pseudo-code to identify the content on media is recommended to be as follows:

1. If ASSETMAP.xml exists in the root, then parse it according to SMPTE standards and stop looking for additional asset maps on the media.
2. If ASSETMAP exists in the root, then parse it according to Interop standards and stop looking for additional asset maps on the media.
3. For all top-level directories in the root, perform the steps below.
    a. If the directory name is exactly lost+found or RECYCLER, then ignore the directory and process the next directory.
    b. If ASSETMAP.xml exists, then parse it according to SMPTE standards and process the next directory.
    c. If ASSETMAP exists, then parse it according to Interop standards and process the next directory.
    d. Otherwise (no asset map found), ignore the directory and process the next directory.

Different algorithms for parsing media for content are allowed provided that all correctly structured content is identified.