

## To Realize a “Flexible Linking” between AV Material and its Metadata

— metaFrontier.jp proposes a new activity to SMPTE to enhance the UMID Applications —

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metaFrontier.jp, LLC announced that a new activity is proposed to SMPTE (Note 1) to enhance the UMID applications to realize a flexible linking between audiovisual (AV) material and its metadata.

UMID (Unique Material Identifier) is an industry standard globally unique identifier of AV material used in the media productions. The UMID was introduced by SMPTE in 2000 as a basic tool to link an AV material to its metadata, enabling such an application scenario as demonstrated in Figure 1.

In this figure, AV materials are stored on various kinds of servers, and metadata associated with the AV materials are collected and separately stored altogether in the Metadata Database. The separation of the management of metadata from their target AV materials is because of the huge difference in their data sizes, i.e., although it is common for an AV material whose data size is more than several hundred GB, data size of metadata is at most the order of several hundred KB. As a result, uniform management of metadata separately from the AV materials brings system simplicity and higher efficiency.

In addition, this also realizes a substitution from the AV material search to their metadata search, resulting in achieving significant performance gains. Suppose an Application such as a video editing seeks an AV material that captures the “Ichiro Homerun” scene. The Application gives the request to the Metadata Database (①). Because the Metadata Database does not contain the AV material itself, it is the UMID value (“UA” in this case) which will be responded to the Application (②). Because data sizes of metadata are relatively small, this sort of search can be carried out very quickly.

But because the UMID by itself does not locate the desired AV material, the Application needs to search for the AV material by using the UMID value (UA) as a hint. In the Figure 1 example, the Application distributes a query such as “Do you have an AV material with the UMID value as UA?” (③) and then the Ingest Server replies “Yes I have!”, and returns its URL (④)(Note 2), which can be used by the Application to access the desired AV material. The message exchange invoked in order to convert a given UMID into its corresponding URL is called the UMID resolution protocol.

This UMID application can be further generalized as shown in Figure 2, which schematically illustrates the media production system divided into two layers: The upper layer, in which light weight data such as metadata and/or workflow information is however treated in very flexible ways to address the purpose and/or the workflow change, is called the (Workflow) Application layer, while the lower layer, where heavy weight data such as AV materials are efficiently processed, is called the Media (Manipulation) layer, and UMID is used to associate those two layers. The upper Application layer is based on the SOA policy (Note 3) that enables a flexible system design by orchestrating independent media services as needed. The FIMS Task Force (Note 4) has been studying those media services that should be industry standardized. At the time of writing, because the direct link by using a URL is commonly used between the upper Application layer and the lower Media layer, a flexible support such as the backup replacement in the event of any system problem or the material server reinforcement needed to cover an increase of AV materials can be hardly achieved.

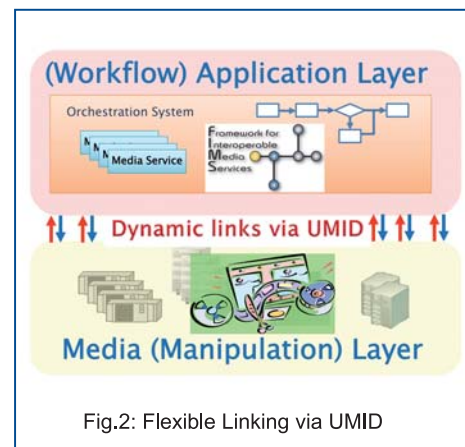
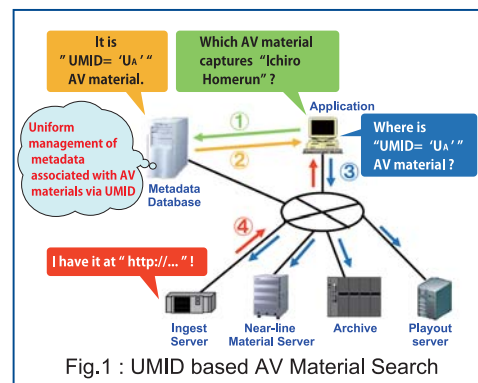
The evolution of the URL based direct link into the indirect linking by using the UMID and its dynamic resolution to the URL can enhance system capability not only to address those supports automatically but also to meet the demand for a flexible integration of multiple media production systems.

Because the UMID has been introduced as a core component of the industry standard MXF (Note 5) and AAF (Note 6) technologies, many existing professional AV products have already adopted the UMID. However, its originally intended use as a globally unique identifier has seldom been seen in practice. This is partly because of a lack of an industry common UMID resolution protocol that could be supported by multiple vendors. Furthermore, there needs to be a clarification of the fundamental rules every product must follow to appropriately manage their AV materials based on their UMID.

In the SMPTE 2011 Annual Technical Conference held at Hollywood last October (Note 7), metaFrontier.jp described the importance of the UMID as a media IT infrastructure tool in “best-of-breed” media system for the advanced file-based media production workflow. It is also claimed that some fundamental rules for the UMID applications need to be standardized in SMPTE in order to realize the intended UMID application scenario. This presentation was well received, resulting in its introduction to the SMPTE main homepage in November 2011. In addition, a related paper has been recently re-published on the SMPTE Journal in March 2012 (Note 8).

Based on the above, metaFrontier.jp has made a proposal for a new activity for UMID application to SMPTE at the SMPTE standards community meetings in Atlanta 2012. Their proposal include a survey of existing UMID applications, the study of UMID application principles to realize the UMID based AV material management as well as to explore new technologies that need to be standardized such as the UMID resolution protocol.

In summary, metaFrontier.jp will continue their effort to boost the usefulness of the UMID for the more advanced file-based media production environments. Those interested in this activity are kindly requested to contact the organization using the details below.



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(Note 1) Society of Motion Picture and Television Engineers: [www.smpte.org](http://www.smpte.org)

(Note 2) Uniform Resource Locator: The globally unique address of various resources (such as files) existing over the Internet

(Note 3) Service Oriented Architecture: A system design policy to realize an application by orchestrating functionally independent modules called “Service”

(Note 4) Framework for Interoperable Media Services: <http://wiki.amwa.tv/ebu>

(Note 5) Material eXchange Format: The industry standard media format developed by SMPTE

(Note 6) Advanced Authoring Format: The industry standard technology developed by AMWA as a superset of MXF with editing information

(Note 7) <http://www.smpte.org/2011-smpte-annual-technical-conference-exhibition>

(Note 8) Yoshiaki Shibata and Jim Wilkinson, “UMID Applications in Practices”, SMPTE Motion Imaging Journal, Vol.121, No.2, pp.58-67 (March 2012), also available at <http://metafrontier.jp/drupal/sites/default/files/papers/umidApp4SmpteJournal201203.pdf>