

Industry continues to grapple with digital file interoperability

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The Entertainment Technology Center at the University of Southern California (ETC@USC), has released details of a voluntary Interoperable Master File (IMF) specification that it hopes will help content creators and distributors streamline the handling of audio and video content as digital files. The organization, whose members include some of the biggest motion picture studios in the world, has been working independently for about two years to try to establish a "universal way" of receiving and processing content for different users, different media consumption platforms and different parts of the world.

Once standardized by the Society of Motion Picture and Television Engineers (SMPTE) "perhaps as early as mid-2011" this Master File specification would help content creators save their files in various wrappers and compression formats that would make digitally encoded content immediately useable by others. It would also reduce the time and effort now required to create different versions of a single movie title to accommodate different language tracks, parental controls and various other unique elements that have cost the studios significantly.

The rather ambitious initiative to create a master file spec is not a new one. In fact, people like Clyde Smith, senior vice president Global Broadcast Technology and Standards at Turner Broadcasting System in Atlanta, sometimes cited as the "godfather of interoperability," has been promoting the idea since at least 2002, through his work with the Material eXchange Format (MXF) within the Advanced Media Workflow Association (AMWA). The organization previously released a similar yet slightly different spec called ASO2.

Building upon previous efforts

According to AMWA, MXF ASO2 is a mastering tool that details use of the MXF toolkit to efficiently carry essence (pictures, sound and metadata) through the processes needed to create deliverables and versioning. As a media asset passes through a company (or companies) it can carry the essence and metadata with minimum data overheads.

Each initiative has built upon the one preceding it. However, with such a wide scope and a variety of organizations that all complete their workflows differently, it has taken many years to nail down a set of content creation variables that universally appeals to everyone who needs it.

"Our work kind of runs in parallel to what the ETC is now doing," Smith said. "It takes a good year to document the use cases and workflows needed to overcome the challenges of interoperability and increase

productivity. Do I wish it happened sooner? No doubt. □

The issue is close to Smith's heart because his company has been dealing with hundreds of different program producers that deliver content in different ways □ from a Fed Ex package to a digital file with dozens of metadata tags that have to be deciphered. So, establishing a standard way to ensure that content is properly ingested is critical to Turner's operations. At the NAB convention in 2007, Smith, and a team of manufacturers along with Turner and AMWA staff, demonstrated the ASO2 format and got people's attention.



The proposed Interoperable Master File (IMF) specification will help streamline the handling of multiple versions of the same content.

Understanding that other organizations have been working on similar initiatives, David Wertheimer, CEO and executive director of the ETC, said the goal with the new IMF spec is to use as much existing technology and standards work as possible to reach a consensus sooner.

□ We have no intention of reinventing wheels that already exist, □ Wertheimer said. □ There is a great body of work to build on, including what Clyde and team have done with ASO2, and our specification that we will deliver to SMPTE will build on many of these established standards and best practices. □

Some key differences

A key difference in the work at the ETC, he said, is that while they are leveraging some of the file wrapping methods (e.g., MXF), also used by AMWA, that's only one piece of the puzzle.

□ These wrappers offer great flexibility, □ Wertheimer said, □ but what we're trying to do is, rather than create a generic wrapper that you can put anything into, we're actually trying to do the reverse and say, □ how can we leverage that capability but constrain what people put in them so that we can ensure that the receiver will be able to use what he or she was given? □ This way, when I hand you a package of files associated with a single piece of content, you know exactly what it is and how to use it in your operation, systems and workflows.

□ Right now in the industry we have people creating masters but when they want to distribute them downstream [DVDs, mobile, iTunes, etc.], they have to create a new master package for every one of those platforms. It becomes completely unwieldy, □ Wertheimer said, adding that he knows of some movie studio members that are storing 250 versions of the same film.

□ Our goal is to create a single intermediate or mezzanine-level package of files from which you could derive those 250 versions, but you store it once, send it once to everyone that needs it, □ he said. □ Those recipients can then transcode it into whatever format they need, but you as the content owner don't have to go through

all of that trouble and file management.

Walt Disney rep leads the way

Under the direction of Howard Lukk, technical committee chairman and vice president of production technology for Walt Disney Studios, the ETC @ USC has been working at it about 18 months and now has an [early draft](#) for industry review and feedback.

“So far, so good,” Lukk said of the draft spec. “I think this is a tough problem to solve quickly, but the work we’re doing will go a long way and hopefully be used for many years to come.”

The draft has been available since September, and Lukk said several in the industry have already sent comments, many looking for clarification and raising some interesting points about the challenges of implementation.

“In general, the feedback has been very positive, and people are excited about the idea of having this kind of spec that would make everyone’s jobs a lot easier in terms of sharing files between content producers, post houses, distributors and anyone involved in the process,” Lukk said.

Movie studios and ETC member companies most closely involved with the IMF work include Paramount, Sony, Fox, NBC/Universal, Walt Disney Company, Warner Bros. and Sony Pictures, which all have similar needs in their file-based workflows. Many of the members also oversee (own) broadcast television operations, such as Disney (ABC), Fox (Fox Broadcasting) and NBC. There’s no question that this spec is applicable to anyone who makes high-quality content and wants to get it in lots of different places without creating lots of versions.

Everyone shares the same workflow problems

“This is an issue that most everyone agrees is vitally important, but the biggest debate has revolved around what types of image resolutions we needed to include to satisfy the most general needs,” Lukk said.

“Mezzanine-level compression and color space were also important issues to many members. I think we now have a pretty good consensus on most of the important elements of the IMF.”

Lukk said the work at AMWA has been incorporated into the new IMF spec, which accommodates ASO2-type wrapping for the core files. It also includes shims that allow for customization and variation among the various content providers and how they like to work individually.



Clyde Smith, senior
vice president Global
Broadcast Technology

and Standards at Turner Broadcasting System in Atlanta, has been working on the problem of file incompatibility for many years.

“We fight for a balance all the time between universal interoperability through a highly-specific set of parameters, and flexibility, which is less restrictive and allows different organizations to handle content in slightly different ways. With this new IMF specification, we are trying to hit the middle ground. We leave some room for us here at Disney to do things a bit differently than what, say, Warner Bros. does with its content. But we will have a baseline that makes interoperability between us and our service providers and customers possible. That’s the key goal,” said Lukk.

Lukk said Disney has begun to do interoperability testing at its Burbank lot. The company’s ABC cable networks group is aware of the IMF work but has not been fully involved to this point. However, it’s clear the IMF will have significant benefits for sharing content between divisions within the Disney family.

“They’ve had to run a bit faster than we have in terms of delivering content on-air all the time, so [the ABC Station Group] is keeping track of what we’re doing,” Lukk said, “but at the same time they are looking at our work from a distance and saying, ‘when you get your work done on this, come back and talk to us.’”

Promising results

Turner’s Smith and his team have seen the ETC’s draft document and like what they see thus far.

“I’m hopeful that we can do something that is truly interoperable that is beyond the scope of what either one of us had originally envisioned,” Smith said.

Turner is currently making extensive use of the MXF ASO2 specification to develop up to 25 different elements for a single piece of content to accommodate its various domestic and international platforms.

“Thus far we’ve only done the simplest of implementations, but this grows in importance when you think about the emerging mandates that we must implement, based on the accessibility bill that President Obama signed into law and what that means in terms of the return of video description tracks and closed captioning across all broadband products,” Smith said. “When you start thinking about all of the interfaces that we now have and the ones we still need to establish and put in place, the repurposing of content gets to be a larger and larger portion of this issue.

“We started our work to solve problems only for our domestic and international content for television, but now as we begin to look at all of the alternative distribution platforms that have become available since we began our work, there’s still work that needs to be done, so groups like the ETC are filling the void nicely,” he said. “It forms a big part of our and everyone else’s ‘TV everywhere’ strategy.”

“I think it’s safe to say that many of our members are using the range of currently existing file wrappers and format compatibility tricks and still feel this is not a solved problem,” said the ETC’s Wertheimer. “As technology has gotten more sophisticated, we’re recognizing that there is a better way, and we’re working to find it.”

The [ETC @ USC’s Interoperable Master File](#) (IMF) specification can be viewed online.