

# specialreport newmediatools

part two

## This Evolution Will Be Televised

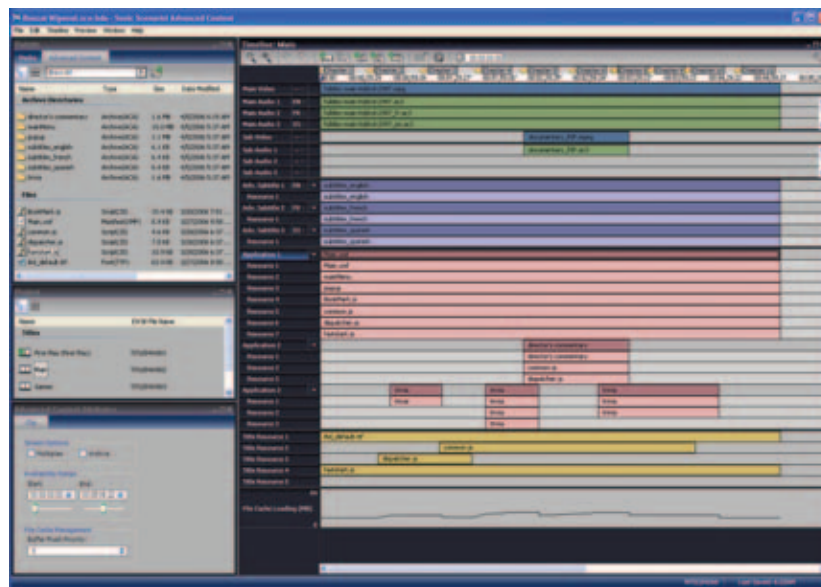
### Production Tools and Techniques for Blu-ray and HD DVD

by Michael Frondelli

Last month, in Part One of our "Tools for New Media" special report (available online at [www.prosoundnews.com](http://www.prosoundnews.com) by clicking on Web Bonus) we covered asset delivery, encoding software and quality control for Blu-ray and HD DVD discs. This month, we pick up our coverage with a discussion of storage, processed file delivery and authoring.

With the incredible file sizes necessary for 24-bit/48K audio streams and in the case of Blu-ray, linear PCM, the storage needs for assets has exponentially increased. At Post Haste Sound (Santa Monica, CA), owner Jim Allan explains, "When the project is finished, it lives in two places so it is safe, and then we back up the RAID to LTO (Linear Tape Open). The nightly rolling backup with anything new, which we circle around after three months, then there is the archive and they decide every 15 days what is to be archived different from the backup and those are client-appropriate."

Sony Picture Entertainment (Culver City, CA) supervising audio engineer, Tom McAndrew, takes it even further, "I would say our biggest hardware need is storage. We recently increased the size of our audio server up to a full terabyte, and that is just for our scratch base for what we locally encode, and then send to our authoring engineers and then backup. The server is all part of a Mac server system."



Advanced content control is available in the Sonic Scenarist authoring engine as shown in this HD DVD authoring screen shot.

#### DELIVERY

Steve Thompson, creative and technical director, Pacific Ocean Post (POP; Santa Monica, CA), states, "At POP, we are starting to see ourselves working in 6.1 and 7.1. Both BR and HD DVD will support 7.1 in a number of different configurations, for example, HD DVD 7.1 as DTS HD, as Dolby Digital Plus or Dolby TrueHD stream. In Blu-ray there are different parameters in the use ability of that stream."

According to Allan, "We have a couple of T1s here, but we deliver mostly AC3 streams and final Pro Tools sessions on DVD R and LTOs (Linear Open Tape). Post Haste's editor/mixer Randall Smith, addressing digital deliv-



Owner Jim Allan (left) and editor/mixer Randall Smith of Post Haste Sound, Santa Monica, CA

ery, adds, "You are sending 24-bit, 5.1 sessions at 6 Gig, in five languages you're trying to get up to [the customer or their duplicator]. Meanwhile, Post Haste operations manager, Ken Hansen, shares his experience: "We set

'em up overnight. [These file transfers] still take 4-5 hours, and they fail constantly. [The session files] are unencrypted, and [the transfers] were too dangerous. If we had fiber available, at the time, that was four or five times T1, it would have been that much better. However, there were politics and a 4 GB size limit, and we would have to break [the files] up into three parts. It kept turning into a bigger problem."

#### KEEPING TRACK OF THE DIFFERENCES

According to POP's Thompson, "Both formats do not necessarily use the same files. There are huge differences in what audio is supported in HD DVD and Blu-ray. Things that are guaranteed supported in HD DVD, for example, like Dolby Digital Plus, are not necessarily supported to the same extent in Blu-ray. So where a client wants a DDP stream for HD DVD, they may be simply doing a Dolby Digital stream for a Blu-ray disc.

"To make matters even more complicated, most of the studios doing both formats are not doing their compression and authoring in the same place for both formats. We may have different start times and delivery requirements based on who is doing Compression and Authoring (C & A) for each format. We work with studios very closely, and we are in direct communication with most C & A facilities, or, in most cases, there is a studio producer."

Thompson goes on to say that his foremost challenge is, "Keeping track of the differences. The tools and skills are not necessarily mature within these two formats, with different release schedules, technical requirements and quality in terms of audio. It is frustrating for our clients that they can't just make, for example, one Dolby Digital file and use the same stream in both formats. In DVD, if they know there are no picture changes to that disk and they may be only adding special features, they can

## Tenacious Remixing: A Case Study

by Steve Harvey

As the high-resolution Blu-ray Disc and HD DVD disc formats have started to roll out, they have presented new challenges to audio post houses. Chief among those is the ability of the hi-res formats to deliver 7.1-channel audio. It's not a question of tools—production and authoring software from companies

such as Dolby, DTS and Sonic has been available since before the new discs began manufacturing—but rather the creative decisions that must now be made.

As Brant Biles of L.A.'s Mi Casa Multimedia explains, he and partner, Robert Margoueff, specialize in remixing theatrical movie releases for home consumption and so far have been using

the DTS Master Audio encoding software. The suite supports seven different speaker configurations.

"The first is the one we're using, with three at the front, two at the sides, and two at the rear," he enumerates. "The second is three at the front, two in the rear, and a left and right height channel in the front. The

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use the same stream. That is not the case between these two formats. The streams are not necessarily interchangeable when you move into the advanced audio formats. To make matters worse, sometimes they are and sometimes they are not. The support, for example, for audio in HD DVD, in my opinion, is much more advanced than in Blu-ray. There are more options, except for the fact that Blu-ray does support multichannel uncompressed. If you don't have space for that, you are limited in the quality level that you can achieve."

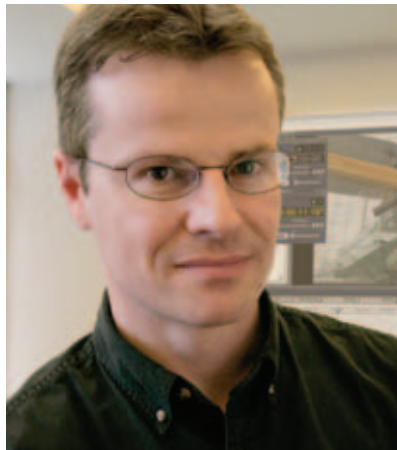
## AUTHORING

While many audio post-production facilities, like POP and Post Haste, are exclusively focused on audio excellence and integrity, creative opportunities abound in authoring. However, of the facilities PSN visited, only Sony Pictures Entertainment (SPE) and Deluxe Digital were immersed in the end-to-end process. The major players in authoring software are Blu-print, by Sony Media Software and Sonic Scenarist, although at Deluxe Digital software, engineers work closely with Toshiba for HD DVD authoring solutions.

Developed by Sony Pictures Entertainment, Blu-print runs on most high-end, Windows-powered workstations and enables post-production facilities and movie production studios to utilize the advanced features of the BD-ROM format. In addition to ensuring proper encoding, users can employ Blu-print to create menu navigation for their Blu-ray discs. They can also utilize the advanced

features of the format, such as BDMV (Blu-ray Disc Movie) "popup" menus and BD-J (Blu-ray Disc Java) interactivity. Sony's Blu-print is available for \$50K per license. Additionally, Sony Media Software also provides technical support and maintenance agreements.

Sonic Scenarist supports HD DVD as well as Blu-ray, and Sonic is committed to *mission critical care* customer service and education, explains Rolf Hartley, senior vice president and general manager of Sonic's professional products group. "We have a diamond level of support, where we investigate codec issues or advanced content code ques-



**Rolf Hartley, senior vice president/general manager of Sonic's professional products group**

tions, with a dedicated field service team to provide one-on-one customer title development assistance."

With gaming platforms (such as the Playstation 3 supporting Blu-ray, and XBOX 360 supporting HD DVD) blurring the lines of media convergence, authoring is developing into a technical art form with the highest impact to the end-user/consumer experience. Hartley states, "It is pretty clear that the next-generation formats can't simply rely on



**Sony Pictures Entertainment houses an extensive equipment inventory for managing and manipulating media assets.**

HD video if they really want consumers to be excited about spending a lot of money on a player. The Consumer Electronics industry is interested in putting out a new player to generate new opportunity. HD needs to have some extra value, like advanced interactivity."

According to Don Eklund, executive vice president, Sony Pictures Home Entertainment, Advanced Technologies, "What Blu-ray and PS3 have in common is that Blu-ray is a storage container."

Today, authoring is no longer just the creation of the user-friendly GUI menu; it is a specialized, creative skill, driven by consumer demands. Hartley elaborates, "It's a challenge for facilities to jump right in and be able to just automatically understand how to create advanced content like HD DVD and BD-J (Blu-ray Disc); there is definitely a learning curve that is associated with joining this new evolution. It is also important to note that along with these challenges comes huge opportunity."

The Sonic support philosophy has been the key to its success, providing technical resources for the creative applications of their new tools. Sonic has a facility in Burbank providing a classroom environment for HD authoring education to its authoring facility partners, where it trains and certifies Sonic authors for Blu-ray and HD DVD.

When asked what qualifications and experience he felt a potential authoring engineer candidate should possess today, Hartley responded, "Facilities hiring personnel with strong backgrounds in Java, XML, HTML programming and ROM design experience. Today's HD content producers will also benefit from knowledge of each of the new HD codecs supported in the formats. Sonic is helping in this endeavor with ongoing training at its regional offices, which is free of charge to its customers."

Eklund gave his take on the current reality: "Blu-print is a more user-friendly tool for Java development. Java is in its infancy; authoring Blu-ray movies with heavy interactivity needs a different skill level. To date, there are very few of these titles."

## HDAA—THE HIGH DEFINITION AUTHORING ALLIANCE

In a proactive move, to create solutions to help Hollywood and its authoring partners prepare for the launch of the Blu-ray and HD DVD next-generation formats, in 2005, Sonic formed the High Definition Authoring Alliance (HDAA). Hartley best describes the focus of the HDAA: "Both high-definition formats create a very challenging workflow environment, one that fuses traditional ROM authoring and DVD video authoring. We knew our customers would look to us for solutions and guidance with this workflow, and we undertook to create a collaborative effort in cooperation with the authoring industry. The HDAA is a representation of the very best authoring facilities in the industry, and Sonic partnered with them to identify new workflow concepts and provide early access to our authoring systems as they developed, discussion forums, training 'how-to's' and an extensive white-paper library on advanced content creation. The goal was to involve our customers in this process rather than develop in a vacuum to avoid the incompatibilities that DVD-Video suffered in its early days."

"Sonic has released comprehensive white papers on our website," notes Paul Lefebvre, senior director of marketing, Sonic professional products group, "that provide in-depth authoring information for Blu-ray and HD DVD."

The work of the HDAA has resulted in the production of the industry's first discs to make use of advanced interactivity for both Blu-ray Disc and HD DVD. Hartley continues, "Sonic's authoring systems are continuing to evolve, and it is especially important during the early days of HD title development that we continue to work with our customers who are delivering their first title releases for their studio clients. As we do this, we reset development priorities based on the realities of title development requirements. The HDAA is the perfect platform for engaging with the authoring community to provide them with the solutions they need at this stage of a format launch."



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# Tenacious

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third has left and right side height channels. The fourth is like 6.1, but instead of a mono center surround it's stereo, so there are four channels behind you. The fifth is a 6.1 with a mono center height channel. The sixth is a 6.1 configuration with a center right over your head, and seventh is similar to the SDDS configuration, with five speakers across the front. The difference being that the two additional channels (beyond standard 5.1) are placed outside the standard left and right and are referred to as left wide and right wide."

For motion picture production company marketing departments, the new hi-res discs have a distinct advantage: "They can say it's 7.1," says Biles, "But, there are so many different configurations that I think it's going to be confusing to the consumer. We need to dictate to home-theater users what the speaker layout should be and just go with it. I feel the most immersive setup in the home is one with three front channels, two sides at 90 degrees, and two rear channels. Another one that I think is interesting is the 6.1 configuration with the single overhead, but you have to have information specific to that channel." In daily life there is usually relatively little going on overhead, he points out. "The five across the front is nice, but maybe a little overkill."

Mi Casa's recently reworked *Tenacious D: The Pick of Destiny* for an upcoming New Line Cinema disc release. "It's the first movie that's come through here where we've been asked to prepare a 7.1 mix from 5.1 stems," Biles reveals.

Figuring that they would keep the 5.1 mix relatively intact but extract some common information from the music and backgrounds, he adds, "The initial thought was that we would utilize the overhead stereo pair option, so we mounted a set of Tannoys onto our cloud over the tops of our heads."

To extract information, Mi Casa employed a pair of Dolby decoders together with tools by SADIe, as well as TC Electronic's equivalent. "We took the respective front and rear channels and spread them to about 160 percent, then ran them through the decoder and extracted just the center information of a 2:3-channel decoder. We only grabbed the stuff that was truly phase-correlated."

However, he says, "When we put the extracted information into the overheads, we now had people walking on top of our heads. It became apparent that this was a bad idea." The only way it was going to work was with a different speaker configuration, says Biles, so the extra two speakers were placed at 90 degrees to the mix position.

Mi Casa had previously tried unusual speaker configurations when creating the DVD mix of *Final Destination 3*. "The first experiments that I did with 7.1 were 6.1 with a mono speaker over your head. In the scenes that I chose to experiment with, there's a roller coaster that goes awry and the train comes off the tracks. There's a guy hanging onto the roller coaster as it goes through a corkscrew. It was great, because I could take the sound design and go over the listener's head. I played that to New Line and said I thought it would be cool to try stereo overheads. They said go for it," he reports.

Ultimately, the choice of a 7.1 configuration is dependent on the program information. "The 5.1 setup with the left and right side surround is the most ubiq-

uitous that we're going to find," Biles believes. "I think it be the easiest for somebody to install. People listening to their systems at ear level—which I think they should—won't mind placing speakers at left and right, but they might mind going into the roof and mounting speakers overhead."

The side information in *Pick of Destiny* is especially apparent at the beginning of the film, he shares. "It starts with animation of Jack Black and Kyle Gass getting prepared to do a Tenacious D soundcheck. One of them smokes a doobie and eats a bean and cheese burrito and the cartoon character, while farting, flies off the screen and around your head, and lands. Instead of it saying, 'THX, the audience is listening,' it says 'THC, the audience is baking!'"

The extra channels would have compromised a folded-down 5.1 mix, he continues, "So I figured, for this film, we'd consider them additions to the existing 5.1 mix and not include them in the 5.1 fold-down." As for a separate Lt Rt mix: "Both Dolby and DTS Encoders make mix down to Lt Rt parameters available to the encoding engineer."

Guillermo del Toro's *Pan's Labyrinth* (*El Labarinto del Fauno*), a Picturehouse film, offers Mi Casa a little more latitude with those extra channels. "There's all this stuff with a bug that flies around and leads the girl into the labyrinth. Holger Thiele, senior engineer at Mi Casa, talked to Guillermo about editing stuff discretely into these side channels. We worked with him on *Blade II* and he said, 'That sounded fantastic, so do what you need to do.' So it will be a much more discrete situation with this movie where we will be able to fold down these two extra channels into the 5.1."

The new hi-res disc formats pose more than a creative challenge to audio houses like Mi Casa. "How are we going to take these projects done in standard-definition and not have to end up with a D-5 master and drop \$120,000 on a hi-def video machine that we, as an audio house, would just use for playback?" asks Biles.

The answer is elegantly simple, it turns out: "The two timecode formats of 29.97 non-drop and 23.976 are actually compatible with each other on a timeline. If you have something on a timeline in 29.97 drop frame and you switch the frame rate, the whole timeline will shift but your audio will stay still, and you'll be off by a number of seconds, depending upon how many hours down the road you are.

"But 23.976 and 29.97 non-drop run in sync throughout a 24-hour period. What we've been doing is getting Digibetas down-converted from the D-5 to 29.97 non-drop. We will have a timecode burn of that in the bottom left, and we'll also have a timecode burn of the 23.976 timecode in the bottom right. Although the frames within the seconds are running at a different rate, the seconds drop at the



Mi Casa Multimedia's Brant Biles

same point in time. In standard-definition mode, we use this dual master and do our conforms to the 29.97 non-drop; then it's simply a matter of changing the timecode format to 23.976 when we encode for the hi-def release."

When it comes to encoding, the file-based DTS Master Audio Suite and Dolby's Media Producer save time over the previous hardware encoders, Biles notes. Plus, he says, "I find the workflow quite a bit simpler than before. But there are so many different formats and file types that you have to make sure your file names are correct and descriptive. For instance, '*Pick of Destiny* deleted scenes 7.1 English 48k 24-bit 23.976 tc hi-def DTS/DMA left side surround'—that's the name of one file."

One limitation of some of the authoring software, or muxers (multiplexers), as they are called, that it is not possible to jump in and out of the bit stream, he reports, requiring each segment within a larger piece, such as a 50-minute deleted scene sequence for *Pick*, to be encoded separately. "It has to be a separate encoded chunk for each scene." But with DTS Master Audio, he says, "Authoring gives me an in and out list—an EDL [edit decision list]—for the individual pieces. Using the DTS stream tools, I can load my master encode file, then input the EDL times, and it will give me the individual scenes. Dolby's software will do this, too. These guys got this stuff wired!"

A final QC stage is critical. Biles adds, "Once we've captured our 7.1 mix, we'll listen back. We'll take the 7.1 and fold it down to 5.1 and, in turn, fold that down to stereo. I prefer doing stereo fold-downs as opposed to Lt Rt encodes, because the twisting of the phase can sometimes get a little weird. At this stage of the game, if you've got someone who's purchased a high-definition disk playback setup, chances are they've got at least a 5.1 monitor system. I don't think there are going to be too many people watching a high-definition disk and decoding the Lt Rt track into 5.1 surround."

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