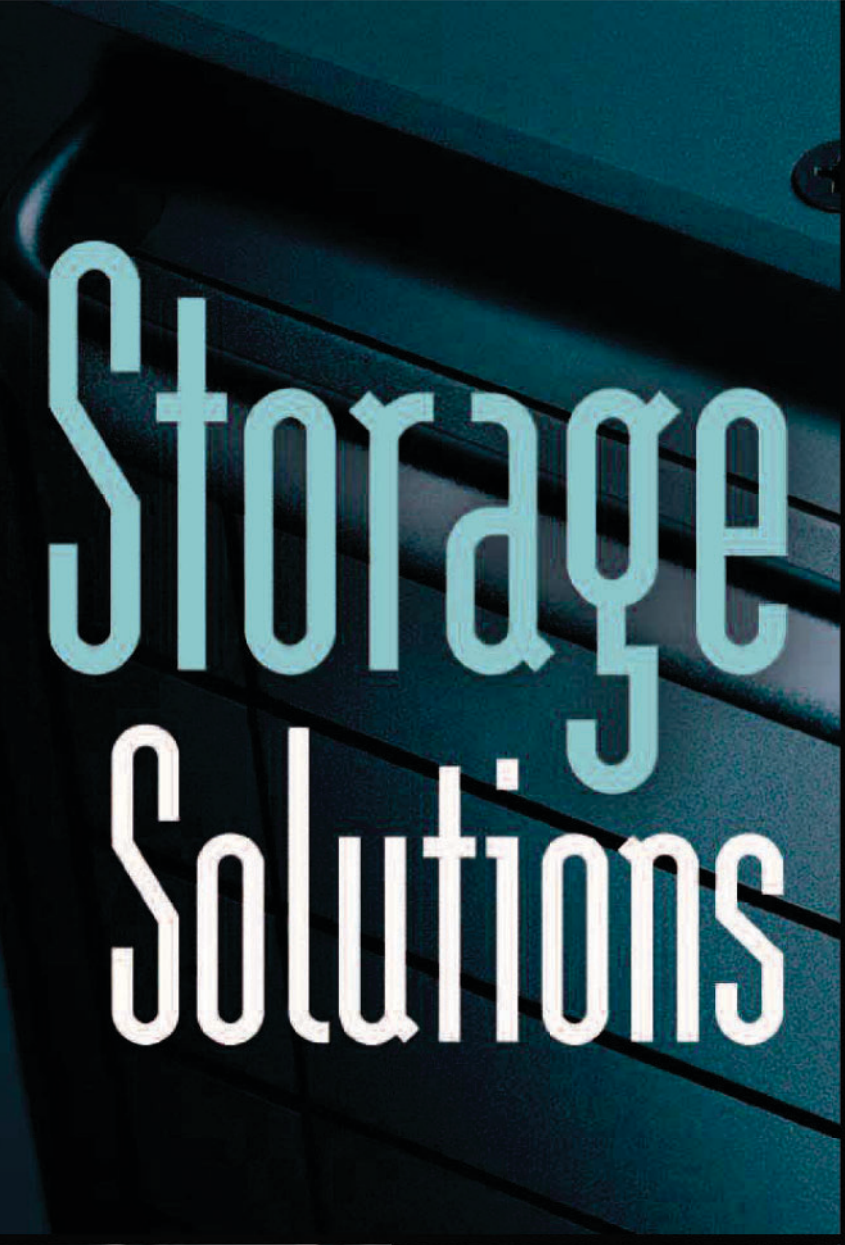
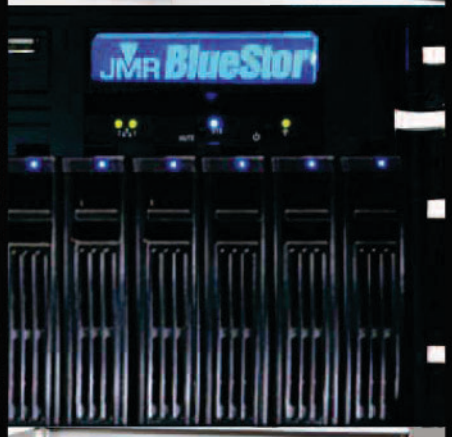
Storage Solutions





A supplement to the March 2010 issue of

Post Magazine

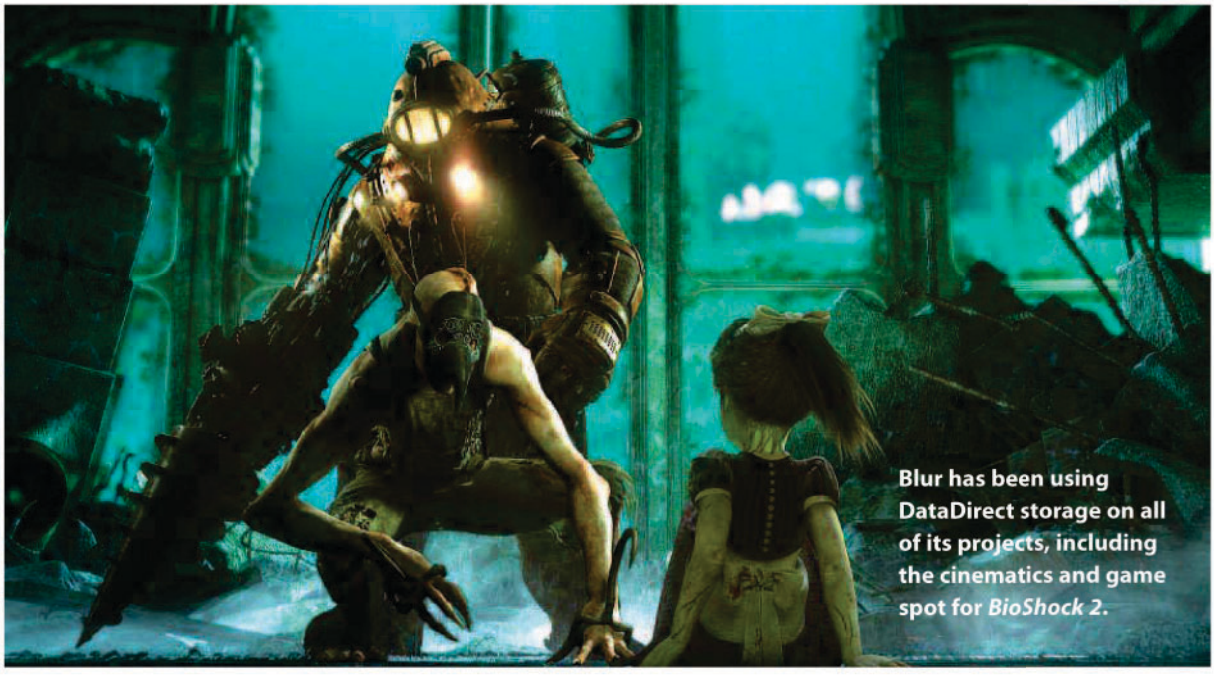
Communications
"Our Goal Is Your Success"

Today's vendors offer ***solutions*** *tailor-made for editorial, grading, VFX and audio.*

By Christine Bunish

In our industry, the need for storage seems to increase almost daily. We need to bolster collaborative workflows, offer asset access to a growing pool of people, and manage those assets as content is pushed across more platforms.

Although storage requirements for editorial, color grading, VFX and audio recording differ widely from company to company, there are solutions tailored to meet the demands of everyone today.



Blur has been using DataDirect storage on all of its projects, including the cinematics and game spot for *BioShock 2*.

BLUR STUDIO

In 2004, VFX company Blur Studio (www.blur.com) in Venice Beach, CA, was tasked with creating 45 minutes of animation for Disney's *Twice Upon a Christmas*, and CTO Duane Powell discovered that "our current storage wouldn't cut it." He remembers that "back then, the technology was self-built; we had direct-attached RAID storage."

But the Disney workload prompted him to research other storage solutions and Blur acquired a DataDirect Network (DDN) S2A8000 that's "still running today, reliably serving content."

It's Powell's philosophy to embrace "white box hardware and open-source software. I abhor vendor lock in," he says. "I don't want to be forced into a proprietary file system. I'm an open-source zealot."

Since he's taken that posture he's "been free to leverage Lustre, an open-source clustered file system, and the DDN for all the effects work we've done," Powell reports. "We expanded our storage with another 8500, and our last purchase was the S2A9900, DDN's premier product. Originally, the DDNs were fibre; the 9900 is InfiniBand. We have partially populated the 9900's 300 slots with 2TB drives, leaving lots of room for growth."

With the 9900 as Blur's core storage system, it plays a key role on every project — from shots for *Avatar* to the *Dante's Inferno* videogame spot that aired during the Super Bowl — from storyboards and animatics through VFX delivery.

"I know we made the right decision because DDN now offers a turnkey solution with Lustre or GPFS; you don't have to configure it yourself," says Powell. "That validation feels good."

From the start the DDN systems were "the right price point, had more than enough performance and offered a path for growth," he points out. "I can't speak to customer service — I've never had to call them! Blur expects to continue growing and plans to use DDN to do it."

POWDERHOUSE

Named for the colonial American powder magazine nearby, Somerville, MA's Powderhouse Productions (www.powderhouse.net) is something of a powerhouse in non-fiction TV content. The independent production company develops factual and alternative enter-

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***Build it Bigger*: Powderhouse uses Avid ISIS for its TV show workflow.**

tainment for TV and emerging media. Its TV work includes *Build It Bigger* for the Science Channel; *Mega-Engineering* for Discovery; *Cats 101*, *Dogs 101*, *Super Fetch* and a new show for cat lovers for Animal Planet; a new series for The History Channel; and four episodes of *Stuff* for PBS's Nova.

Supporting all these projects is a 14,000 square-foot facility featuring 20 Avid Media Composer video editing systems for creative offline, an Avid Symphony and two Media Composer Nitris DX systems for online finishing, and a full-fledged graphics workstation running the Adobe suite of software, plus Maxon's Cinema 4D.

Powderhouse was using FireWire and local drives when it moved into its new space five years ago. The company invested in a Fibre Channel storage solution that VP of post Rob Kirwan says "worked pretty well to meet our needs for a couple of years," then "started to show its limitations" as Powderhouse took on more TV series.

"We've been growing at the rate of 30 to 40 percent for the last three years," he reports. "With the amount of media coming through this place, we knew we didn't have enough storage." Avid reseller HB Communications suggested that Kirwan look at Avid Unity ISIS, an Ethernet-based system and a shared storage solution more often found at broadcast stations and networks. The ISIS system proved to be "an eye-opener" for Kirwan. "I was shocked that Ethernet could handle the amount of work we'd put through it. We jumped in early in '09 and have three crates (chassis), each with 16 1TB drives or sleds. Our goal is to keep growing. We needed something that would scale with us."

The three crates have System Director and Fail Over System Director for redundancy. "The drives are built to

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be mirrored and redundant so data loss is almost unheard of with ISIS," Kirwan reports. "If you feed it really good, steady power and clean, cool air, it's designed never to shut down."

The idea behind Powderhouse's shared storage is to maximize efficiencies in post by enabling assistants to digitize footage, string out edits and cut in narration so the editors can concentrate on the creative storytelling and treatment.

Kirwan found ISIS to be "very intelligent on its own" with the ability to have multiple people writing to a single work share simultaneously and the system instantly providing access to the latest updates. "You can scale the size of the partitions as you're writing to it," he notes, "and dial up the bandwidth required for each room."

Adding Avid Interplay, billed as a nonlinear workflow engine, on top of ISIS has boosted efficiencies and collaboration even more. "Interplay allows producers to look at all the media on their desktops or laptops without going into the edit suite," Kirwan explains. "The producer opens a folder on the database, looks at the original field footage, makes notes — he can even do cuts-only string outs. Once he checks the sequence in, the editor can see it, grab it and start working on it."

Doing a search for the latest sequence or all of its iterations is "really easy and fast," he says. "You're searching media by the metadata attached to every clip." Interplay also allows staff to sift through media and archive what's not needed so it's offline but retrievable at a moment's notice. "Powderhouse is looking to move more toward content ownership, so we'll want to use Interplay and ISIS solutions to manage our assets and remonetize and reuse them," he adds.

Kirwan points out that Massachusetts's production tax credit has played a key role in enabling the company to acquire ISIS and Interplay. "Getting a tax credit at the end of the year for what we've spent in Massachusetts has allowed us to make these infrastructure investments."

And these investments have also proved to be an asset to the college interns working at Powderhouse. "We have 20 interns here on any given day," says Kirwan. "They tend to be well-versed in Avid and some schools are looking at buying ISIS and Interplay if they haven't already. With the collaborative workspace we have, with roles defined at each level, we can bring young people right into our system and get them to work."

PIXEL PLANTATION

With both longform reality shows and promos for ABC Family and Disney XD on its project roster, Burbank-based Pixel Plantation (www.pixelplantation.com) required a storage solution to fit an array of offline and online needs. The post house boasts nine offline rooms with Avid Media Composer Nitris DX systems and three online suites outfitted with

Avid Symphony Nitris; Pixel Plantation also has a pair of Digidesign Pro Tools systems.

Owner/editor Rick Greenwald believes Pixel Plantation was one of the first post houses to acquire Facilis Technology's TerraBlock shared file system about five years ago. "We had a basic need for shared storage and compared the prices of the products available," he recalls. "TerraBlock looked like the answer so we jumped on it with fingers crossed: There were not a lot of people to talk to at that point who had used it, but we were happy with TerraBlock right off the bat."

Pixel Plantation started with 8TB of TerraBlock storage for use with standard definition video. "As time went on and they developed the product, the software got better, the sharing functions improved," notes Greenwald. "The benchmark for shared storage tends to be Avid Unity, which has its own limits. It was frustrating to have people call and ask if we had Unity. We had to explain that we had TerraBlock, and it would do the trick for their particular project."

Although Greenwald was pleased with TerraBlock's performance, his company eventually purchased a Unity at a client's request. So today Unity is employed almost exclusively for offline shared storage while a 24TB TerraBlock system is dedicated to the Symphony Nitris suites where a lot of HD projects and multiple episodes of series are onlined.

"In our case, we can use one of our Symphony systems for digitizing and the other two rooms share footage for editorial and color correction," he explains. "TerraBlock adds functionality across multiple Symphony systems, and its flexibility is a huge bonus. I can't imagine having to wait for access to footage. It does exactly what you expect a shared storage system to do."

For example, Pixel Plantation recently began work on VH1's *Celebrity Fit Club* series. "We digitize as soon as the tapes come in, and editing and color correction can start in another Symphony room without waiting for digitizing to finish," Greenwald points out. "As soon as fixes come in for an episode, we can work on them and still proceed with other episodes on another system."

Likewise, multiple Symphony systems can simultaneously edit and address producers' notes for ABC Family promos "without missing a beat," he says. "The HD streaming capabilities are great on TerraBlock, and we do HD for the Disney XD promos as well, so it's all pretty fluid," he adds. "The firepower is perfect for our needs."

Pixel Plantation can boost its TerraBlock storage relatively inexpensively "as more and more of our work goes to HD," Greenwald says.

Most important is that the company has had "zero down days in five years" with the system. "It's a simple, straightforward, well-made shared storage device that doesn't require a dedicated engineer to understand the box," observes Greenwald. "We don't need fancy bells and whistles — we need something that's going to work all the time, and we've never lost any data with TerraBlock.

SAVAGE PICTURES

When *Touched By An Angel* ended production in Salt Lake City,

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For the doc *Learning From Light*, Savage employed Rorke's Galaxy HDX2s.

editors Steve Haugen and Michael Fox, who worked on the popular series, had an opportunity to move to Los Angeles, but instead chose to remain in Utah and open Savage Pictures (www.savagepictures.net). Today they work on feature films and digital cinema projects, as well as post feature-length documentaries such as *The Edge of Never*, about big mountain skiing on Chamonix, which debuted on Showtime in February, and *Learning From Light*, about architect I.M. Pei's new museum of Islamic Art in Doha, Qatar.

The partners made their equipment decisions based on their experience working in Los Angeles selecting four Avid Media Composers with Unity shared storage, an Avid DS for DI and mastering and Autodesk's Lustre for color grading. "When we added Lustre we needed storage, so we added Rorke Data's Galaxy HDX2 for a one-two punch," says Haugen. "We knew Galaxy was a product that would meet our needs now and was scalable as we grow. It's been a workhorse for us, super solid in performance."

The RAID storage solution is currently configured with dual 4Gb fibre "so it's able to pull enough bandwidth to handle our usual 2K DPX workflow," he points out. "When we bought the Galaxy we got the 8TB version so we'd have enough storage for multiple projects. We just recently felt the crunch with three films on Lustre simultaneously. We thought we hit the threshold."

Haugen spent 14 weeks cutting *The Edge of Never*, from Salt Lake City-based writer/director William A. Kerig. Multiple rooms processed, digested and logged footage shot in "just about every format and aspect ratio" of film and video. New

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dailies were created in 1080 23.98 for Haugen's offline in Media Composer. Then "we used Avid AFE to conform in DS; it was extremely seamless," Haugen reports. "We created DPX files to export to Lustre for color correction by Joe Parisella, who flew in from LA; he rendered out new DPX files to take back to the DS where Mike [Fox] helped me finish the titling, mastering and layback to HDCAM SR."

Fox followed a similar process for *Learning From Light*, co-directed by Bo Landin and Sterling Van Wagenen, and now on the film festival circuit. Over several years, as I.M. Pei built the Doha museum, the documentary was offlined on Media Composer then conformed and finished in DS, with Lustre color correction by Chicago colorist Tom Rovak. Fox was challenged in his edit by large quantities of 50i PAL HDCAM footage, the primary shooting format selected by the producers with an eye for international distribution

"We've hooked up DS so it's much like a traditional SAN workflow," says Fox. "Instead of offloading to drives, we've configured the Galaxy storage so we can access it directly from the DS and Lustre. It saves tremendous time and space, and Galaxy has been rock solid with fast throughput."

Colorists like Rovak, who required lots of windowing for the I.M Pei doc shot both in the desert and in the architect's New York City office, need realtime playback on Lustre, Fox points out. But that means "you need the storage and pipeline to keep up with it. Realtime performance becomes a function of Lustre and the storage. You need the proper combination or it won't benefit the system."

THESANDBOX

Todd Sali, owner of Venice, CA's Thesandbox (www.sandboxla. com), describes his company as a "solar-powered production and post boutique" with a focus on eco- and socially-conscious projects that range from feature-length documentaries to museum installations to branding.

Thesandbox is currently equipped with three workstations running Apple's Final Cut Pro, Adobe After Effects and Apple's Color. The company enlisted SANtech to create a SAN environment with a 24TB Hitachi G-Tech G-Speed FC XL and Apple's Xsan software, ATTO HBAs and a Q-logic switch.

"We grew into a SAN," says Sali. "For a boutique, it's pretty amazing: relatively low cost with G-Tech, but high performance. We're now using G-Tech's 2TB drives so we can have several feature-length films on the system at once."

And Thesandbox is likely to be working on multiple films simultaneously. It co-produced, provided post finishing, managed color correction and furnished motion graphics and titles for *Fuel*, a documentary about energy independence, which was a Sundance winner in 2008, enjoyed a successful film festival and theatrical run, and is coming out on DVD in June (look for it on Netflix). The company has begun shooting and editing its own doc about Cuba, called *Embargoed?*, and after performing the online for *The Woodmans*, it's now color correcting the documentary, which has been accepted in the Tribeca Film Festival.

Thesandbox used G-Tech solutions while working on the doc *Fuel*.

Other Thesandbox projects include *Bhutto*, a collaboration with DNA about Benazir Bhutto of Pakistan, which premiered at Sundance 2010, and *Paper or Plastic*, concerning the disaster plastics pose for life on the planet. A focus for the company is "always taking complex issues to a popular audience by making them immensely engaging and entertaining, as audiences found when *Fuel* won Sundance with 11 standing ovations," Sali reports.

One of the latest documentaries is *The Woodmans*, about a family of artists that suffers a tragedy. Their daughter, Francesca, has become one of the most acclaimed contemporary photographers since her suicide 28 years ago. "Everything was stored on the G-Speed XL SAN, so we could take a batch of frames and reverse telecine them on one of our machines to get them back to 23.98 while another machine was rendering and another was color grading," Sali explains. "Everything was glitch-free and very smooth, technically speaking."

Thesandbox uses G-Speed eS systems for local storage on its workstations. "They're fast, small, quiet and high capacity, and we can move them from machine to machine," he says. In addition, the company deploys G-Drives to shuttle media back and forth to DNA, a frequent partner on projects, and to clients like *The Woodmans'* director Scott Willis, a multi-Emmy winner from Frontline and Nova. The *Woodmans* was "offlined by Jeff Werner on G-Drives, then brought into our G-Speed for online," says Sali.

Already a year into production, *Embargoed?* is largely being shot by Thesandbox with a Canon 5D Mark II camera. "We shoot all data so there are lots of files. That means the reliability

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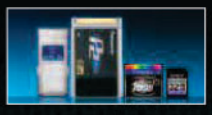

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and redundancy of the system are very important because we have no tape to turn to if something fails. We back up the offline but we don't want to have to turn to that," Sali notes. "So being confident in your system is key. We want our drives humming powerfully and quietly on the sidelines without us thinking about them."

With G-Tech's 2TB drives just out Thesandbox was able to turn its 6TB XL into a 24TB system for "greater firepower and a huge, redundant storage pool," he points out. "We have a strong and robust system that's expanded our possibilities."

PITTSBURGH PENGUINS

With surveys showing that the NHL has the most tech-savvy fans in pro sports, it's not surprising that the league "has made new media a big target," notes Chris DeVivo, director of media technology for the Pittsburgh Penguins (www.penguins.nhl.com). The Penguins "probably produce more content than anyone else in the NHL," he says, with content spanning all new media, scoreboard video, the in-arena pre-game show, digital signage, three 30-minute TV shows airing weekly on Fox Sportsnet Pittsburgh, plus corporate sales and marketing videos.

This fall the team will move from the Mellon Arena, with "Eisenhower-era technology we've pushed to the limits," to the new Consol Energy Center across the street, where DeVivo is building a "self-sustaining" video control room. "With all we do, the key is to make the control room and our video operation the central nervous system that will reach out to everyone," he says.

About three years ago the Penguins' video operation switched to Sony XDCAM HD cameras and EditShare storage for its eight Final Cut Pro workstations, two of them also running Adobe After Effects. "We had portable FireWire drives everywhere and were always searching for things," DeVivo recalls. "Digital video technology opens many new horizons but also creates new issues. With EditShare, projects share assets from a centralized location; it brings consistency to the organization. We can create flexible user spaces and have perhaps nine editors and compositors pulling from EditShare at once."

The Penguins "blew through" the initial 18TB system and added 12TB more last year. DeVivo also "MacGyver'd" the system to help the director of the arena's pre-game show. He hooked the director's MacBook Pro to EditShare and created a Final Cut timeline that allowed him to pull roll-ins off the server and play them out while editors were busy in the control room.

DeVivo says he's been "100 percent satisfied" with EditShare's performance. He's also happy with the system's security features that protect media and assets from disaster.

The sandbox posted Scott Willis' *The Woodmans.*

When the Penguins move to the Consol Energy Center he'll keep the existing EditShare system and add a 32TB EditShare XStream from reseller Texolve and deploy them for production and nearline storage. DeVivo will also add Dalet Digital Media Systems' DaletPlus Media Asset Management (MAM) framework from control room integrator Diversified Systems.

"With all the investment in new technology at Consol Energy Center we

needed a way to push content out everywhere," including LED boards and arena-based IPTV, he says. "We needed a tool to proliferate content, keep track of it and enable our senior executives to browse through video clips."

The Dalet MAM is designed to ensure a more efficient workflow for editors and compositors, and make the best use of their time. "We don't have a lot of assistant editors and interns, so when editors have to search footage and scrub through it, it really slows us down. Transcoding is a four-letter word," he notes. "We want to manage our assets better to maximize the editors' time, make us less of a silo for the rest of the organization, and deliver our assets to multiple platforms. Our goal is not to have files sitting in bins but to have organized assets at people's fingertips."

In development is the ability to use the Dalet MAM for video coaching. "We're going to bring the coaches into the flow," says DeVivo. "They used to have just one clean truck feed to work with, but with the Dalet MAM they can tap into 10 cameras like we can." He has partnered with local metadata company, Content Vision, to develop an interface for the coaches that will permit them to access footage of every second a particular player is on the ice. "They used to have to physically go through and pull every appearance. It took three hours per player to prepare a DVD. Now, with the video on central storage with metadata, you'll be able to click the mouse and shift-by-shift watch all of that player on the ice."

KTA PRODUCTIONS

When digital recordist Kevin Globerman of KTA Productions in Los Angeles was called upon to record the score for *Avatar* on The Newman Scoring Stage at 20th Century Fox, he tapped a Digidesign Pro Tools|HD system, devised by Advanced Audio and featuring ATTO Technology's SAS (Serial Attached SCSI) host bus adapter cards. He was tasked with recording up to 48 individual mics, from more than 100 musicians, into Pro Tools.

"In the past, SATA has typically worked with internal drives connected for storage," Globerman points out. "This card is a new solution. Its advantage is that it takes the duties of data copying and file management away from the CPUs so the computer can handle the Pro Tools software more efficiently. The SAS card does all the data transfer to a set of external SATA drives."

He also had an ATTO R380 RAID card running four RAID-1 groups for data security. "With a 100-piece orchestra, you don't want to risk data loss," he notes. "I usually do large back-ups periodically, like during breaks, but with the ATTO cards back-ups were done in the background while I was performing my recording duties."

Globerman says rental and support company Advanced Audio "is known for pushing the envelope and making systems as efficient and bullet-proof as possible: They have systems on high-profile

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jobs. The ATTO SAS/SATA solution was a really great experience. It will now be the standard set-up for Advanced Audio's rigs: mirrored eSATA drives into the computer through the card."

Once the score was recorded he controlled three Pro Tools running in tandem: one to play back the orchestra, a second to play back a "pretty dense amount of pre-recorded, non-orchestral elements, like custom synthesized sounds and electronic drum loops," and a third to play back the picture and record the stems. He delivered eight 5.1 stems to the dubbing stage to combine with sound effects and dialogue.

Globerman says that with drive capacity getting larger, file fragmentation becomes an issue. Advanced Audio tackled that issue by creating a three-partition scheme to limit fragmentation and increase seek time performance. Using Apple's Disk Utility, the volume is divided into A, B and C partitions. "The A portion is the outer ring, really fast and efficient," he explains. "That's where we achieve the most efficient and fastest read and write times. It's the most expensive real estate on the hard drive, the hot spot. The B and C partitions are used for non-essential back-up where you don't need really fast performance.

DP MICHAEL LOHMANN

Director of photography Michael Lohmann became the first to implement a JMR Electronics' BlueStor set-up for production when he tapped the newly-released BlueStor DigiLab Video Server with 32TB storage capacity for the Disney Channel movie *Sixteen Wishes*.

Lohmann established what amounted to an on-location digital lab with the compact (3x3-foot), portable system remaining largely in the camera truck as he shot with his Red Digital Cinema Red One camera. The BlueStor system came under the domain of the DIT or the media wrangler, or both.

"When the BlueStor DigiLab was combined with a color timing system — we used Assimilate's Scratch — we found we could color time, store and process footage and create dailies right on the set, and be fast enough to be practical," Lohmann reports.

The system took Red's raw R3D files and stored them in the 32TB array, automatically backing them up four times once they were entered. Then DNX36 files were rendered for Avid editorial; editors offsite received drives of both the DNX files and a copy of the original R3D files.

At the same time a Blu-ray disc was burned for dailies with viewing LUTs applied. "We produced much higher-quality dailies than the SD viewing dailies we'd typically get from editorial," Lohmann notes.

He likes the fact that with this workflow "dailies are not out of your hands. You can make sure the dailies look the way they intend to look. I was able to walk to the truck, say 'pick up this scene, make it darker, lighter, add gamma, increase or decrease the color saturation' — as opposed to someone I never get to speak to at a lab guessing what I wanted it to look like."

Dailies can be ready 45 minutes to an hour after wrapping on the set, when creative intentions are still fresh in mind. "You don't have to remind yourself the next day what you wanted to do," he says. "We're so much closer to production with immediate dailies."

Editors could also be moved on location and begin editing scenes "an hour or two after" dailies, Lohmann points out. "If you want to work with an Avid or Final Cut system on-site, the system can serve up to two editors at the same time."

He believes that "huge cost savings" can be realized with the BlueStor system "because it essentially eliminates the lab from the dailies process which usually costs $12-15,000."

Although the BlueStor DigiLab set-up had not been tested previously in production, Lohmann found it to be "rock solid in performance." Everything was linked to the phenomenal storage capacity and power of the BlueStor RAID. The 32TB of total storage was more than we'd ever need, but we wanted it for the multiple file back-ups."

■POST

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