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The importance of storage

We all need a place to put our stuff.

By KEN McGORRY

Honestly, who doesn't need more storage these days?

"That's the whole meaning of life, isn't it?" George Carlin has said, "Trying to find a place for your stuff!"

Fact is, especially with the explosion in low-cost digital acquisition, the innumerable layers and elements that compositing and VFX afford (or require) and the almost endless variations and versions that today's NLEs allow, everybody's got more stuff, and everybody needs to find the best place to put their stuff.

What's more, you need to be able to find your stuff, immediately, when the occasion arises that you need more stuff to go with the stuff you already have.

It's amazing how much more stuff there is to store today — even for stop-motion animators. In this report, *Post* spoke with animators, indie producers, VFX specialists, music video producers, Webisode directors, commercial colorists, even feature film audio post pros. And they all have innovative ways to store their stuff.

Aardman has been using Max-T's Sledgehammer HD!O while producing work like the special *A Matter of Loaf and Death*.

AARDMAN'S *LOAF AND DEATH*

Ian Fleming, head of production technology at Bristol, England's Aardman Animations, the multi-Oscar-winning stop-frame animation studio, was instrumental last summer in the purchase of a new storage system from Maximum-Throughput. Since January

Ian Fleming: Aardman's next film will have an all-digital pipeline.

2008, this would be Aardman's third installation of a Sledgehammer HD!O file server and realtime, multi-format-video system. While Aardman (www.aardman.com) creates feature films and TV programs, this 2TB unit was headed for the company's facility devoted to commercial production. It fulfilled an array of roles: as a DDR play-out system; a fast NAS file server for edit bays; and as a format-conversion, media-processing and assembly solution.

The idea was to exploit Sledgehammer's versatility to streamline workflow. Even, or especially, in an art form as intricate as stop-motion animation, time is money.

Aardman animators shoot their multitudinous frames with Canon SLRs. From there, Fleming says, "The whole pipeline is IT — Linux scripts. The image sequences are scripted into the Sledge storage. This means you've got instant playback and review of what is coming off the studio floor at full quality, because the Sledgehammer doesn't need to render." In past productions, Fleming says, turning sequences which could be 200 to 300 frames into "huge QuickTimes was about as slow as you could get."

Aardman pioneered the new workflow on last year's half-hour TV special, *Wallace & Gromit in "A Matter of Loaf and Death"* (our heroes in a bakery), directed by Nick Park. There is however, something old school at work here that resembles the classic offline/online workflow. "We've gone for the offline model, where we use Sledgehammer's external software to produce standard def proxies to go back to Final Cut as just an offline edit," Fleming says.

Aardman subsequently conforms the sequences through Sledgehammer's Maxmedia by using the Final Cut EDLs. "Eventually, the movie builds up on the Sledgehammer," he says.

On *Loaf and Death,* the full half-hour, including lots of extraneous shots, did fit onto the 2TB system, although toward the end, the animation team began to archive off some material.

Thanks to Sledgehammer's video card, "you can play all these image sequences in realtime." Fleming adds, "It's basically a big NAS — network-attached storage — with high def play-out. We can access [sequences] over the network and pull stuff off."

(Max-T also champions its own multi-user collaborative editing solution, Maxedit, which users can access over the Internet without the need for dedicated workstations.)

Finally, Aardman gave Big Bang, a post house based here, DPX files of *Loaf and Death* for Baselight color grading and an HDCAM SR deliverable for broadcast.

A Matter of Loaf and Death attracted 14.3 million viewers in the UK alone during its broadcast on Christmas Day and was the highest rated show on any channel in 2008. Even in standard def, Fleming says, the show looked "beautiful," adding that it was Nick Park's "first digital project, and he loves it." The next Aardman feature film will also forsake film for an all-digital pipeline.

WE'RE GONNA NEED MORE STORAGE

LA-based writer/director/producer Patrick Read Johnson's 1970's coming-of-age movie tells of a film-obsessed teenager suspiciously similar to Johnson himself 30 years ago. His movie, *77,* premiered at the Hamptons Festival last year and took the Heineken Red Star Award. But before any of that could happen, Johnson needed storage. Lots of storage.

As it turned out, as Johnson labored to get his project fully funded, unseen hands at CalDigit were working to improve workflow. But does a speedier

***77*'s production made use of CalDigit's HDPro and HDOne.**

"From deadline to bottom line ... BlueStor delivers"

Jack Fleming
President and CEO

Russell Ruggieri
Director of Engineering

Advanced Digital Services (ADS) in Hollywood is one of the largest leading global providers of post-production services to the media and entertainment industry around the world. When it came to adding storage, ADS picked JMR Electronics' BlueStor™ PeSAN™ line of RAID storage solutions.

Russell Ruggieri, Director of Engineering, ADS
"We needed to find the highest performing server and storage solutions for our Mac based editing suites and needed additional storage for our digital encoding and restoration services. What's more, we needed an affordable plug-and-play solution that could easily scale in performance and capacity, have a small footprint and was extremely reliable. Last, we wanted a system that delivered the highest consistent performance over a wide range of file types and sizes. JMR's BlueStor PeSAN delivered on all counts. In all, we purchased 128 TB and are planning to add more."

Jack Fleming, President and CEO, ADS
"JMR's BlueStor has significantly improved our post production workflow efficiency – the BlueStor products and the company are very impressive. The time savings alone from having the content readily accessible in real-time have helped to reduce our post production times and allows us to do more projects in the same amount of time that it took to do one, a win-win for all."

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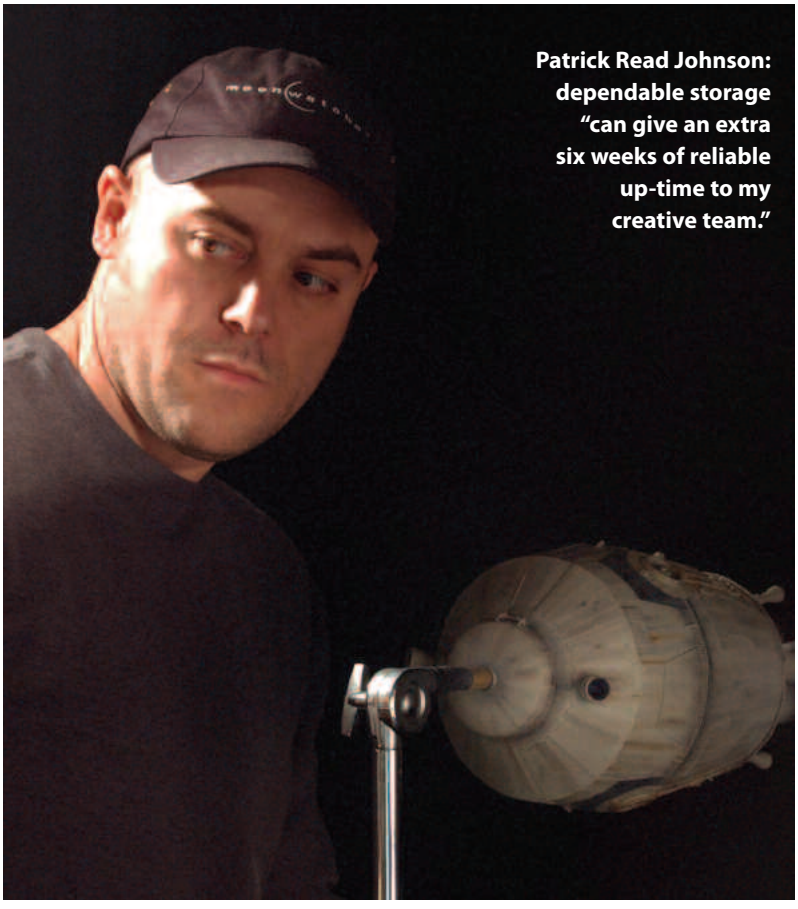

Patrick Read Johnson: dependable storage "can give an extra six weeks of reliable up-time to my creative team."

workflow truly speed things up?

"To the degree it allows more time to actually try things, and see these things actualized with faster render times, and fewer system failures, a smooth-running editorial pipeline is a godsend," says Johnson. "What I hate to see, however, is the misperception by some that just because the system is faster, you should automatically allow for less editing time. A director and editor still need time to feel and think and analyze the consequences of their post production choices."

Johnson does not relish giving away advances in workflow speed purely for the sake of budget. He'd like to tell film financiers that "it's worth investing in a faster, more capable system not because I can shave six weeks off my editing schedule, but because I can give an extra six weeks of reliable up-time to my creative team so they can really put the film through a proper creative shake-down cruise." To evoke *77's* small-town teen with big dreams of filmmaking, Johnson and crew shot a lot of Super-16mm 1:1.85 and reduced the frame and centered it in a 2.35 anamorphic frame: "That was the format that felt like Wadsworth, Illinois, in 1977." When our hero (who is obsessed with the recently released *Star Wars)* finally makes it to Hollywood the film format switches to Super-35 anamorphic. Home-movie sequences used Johnson's own original Super-8 camera. VFX were shot on anything from DV to HVX to CineAlta.

Johnson and crew were happy with their XServe RAID but, when they needed more HD storage, they went for something more portable — a low-cost CalDigit HDPro. Johnson's concern over the unit's portability were assuaged when he saw the FedEx delivery man show up with the box on his shoulder. When his team installed the new system they were shocked that it was up and operating in five minutes. It had already been pre-formatted to Johnson's RAID level by the CalDigit salesman.

(CalDigit's HDPro is an eight-drive hardware RAID with 20GB ultra-high bandwidth connectivity. You can connect together "as many HDPros as you want" and it's also a SAN-ready storage subsystem.)

"We were so happy with the HDPro that we soon bought two HDOne units as well," Johnson says. "And all three have worked flawlessly since we first turned them on."

Johnson also values the investment he made in converting all his footage, in all its many formats, to 1080 24p video on D-5 tapes. "Because of the 'aspect ratios within aspect ratios' format and '70s graininess we were going for, we knew we'd never really need better than that for our final material. When we finally got around to shooting 'The Hollywood Section' of the film, we did end up scanning all of the Super-35 anamorphic at 2K. But the rest of the picture — the Super-16 material — is now all QuickTime clips at Apple ProRes 4:2:2 resolution and it's absolutely beautiful."

FILMWORKSFX SPRUCES UP *MANURE*

Every once in a while you get a whole movie's worth of VFX dumped in your lap — like when a production abruptly decides to change vendors. Ken Locsmandi and FilmworksFX experienced something like this recently with a film that needed to make it to Sundance. This year's Sundance.

"We had to finish 123 bluescreen composites in four days," says Locsmandi, "from delivery of the material — with no VFX editorial." The comedy film, *Manure,* starring Billy Bob Thornton and Tea Leone, was shot on Red by producing brothers Michael and Mark Polish (Michael directed). Locsmandi and the Polish brothers grew up in the same hometown, and Locsmandi felt an obligation to give the film and all its VFX and environment shots his best shot despite the demands of the deadline. The film ultimately had 300 VFX shots — including 200 bluescreen shots for

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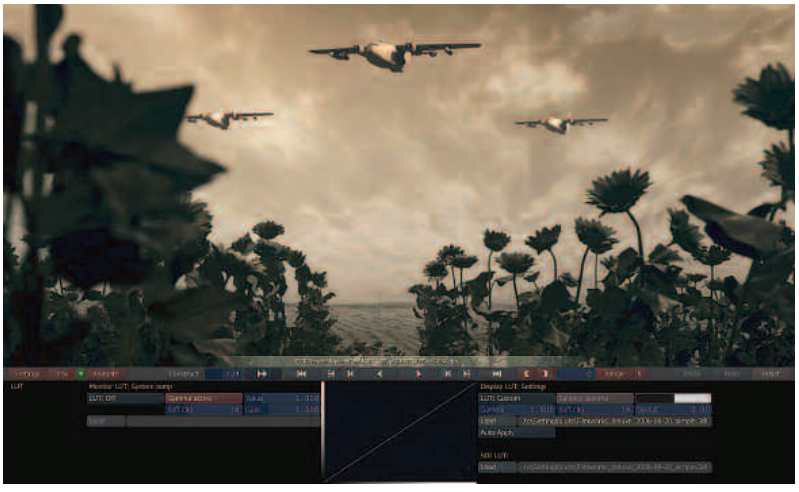

***Manure*: FilmworksFX provided VFX, including airplanes, on a super-tight deadline to make Sundance. They used JMR storage solutions.**

which FilmworksFX had to create backgrounds.

Santa Monica's FilmworksFX (www.filmworksfx.com) has a long list of VFX credits on many feature films including *Apocalypto,* which was shot on Genesis and film.

On *Manure,* Locsmandi and company employed two JMR BlueStor units. One was for editorial, since FilmworksFX was also acting as VFX editorial, and the other handled conversions and viewing and Assimilate Scratch work. This way, when working on shots in DI in Scratch with material converted to DPX files, Locsmandi did not need to halt editorial.

"Every time we finished a VFX shot, we'd look at it in the DI but then we'd have to make sure there was continuity so we'd have to load it back into

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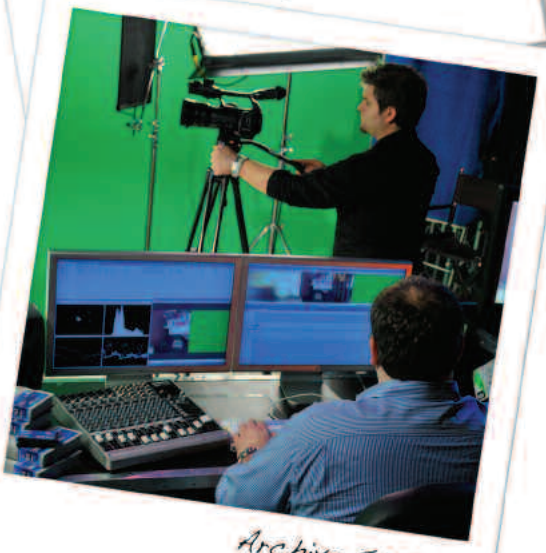

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PureDV's Lester Cohn uses an Enhance RAID T5 U320 when working on editorial and visual effects for music videos.

editorial [Final Cut HD], convert it to ProRes and watch it in the edit. It was fast and furious and just crazy; there was so much conversion going on, both ways!"

Locsmandi says he "ended up doing some VFX shots in Scratch right off the system. One thing that was really nice was that we maintained all the original Red file names when we did our render and I could easily go back and find [material] really fast on the machine, like if I had to make a shot longer."

Locsmandi says that some filmmakers wrongly believe that Red is like any videotape with immediate digitizing and editing. "It's not that straightforward. You're doing a lot of conversion and trying to figure everything out — it's a big step." FilmworksFX ultimately delivered *Manure* to Warner Bros. as 10-bit log DPX files. The Sundance screening was on HDCAM SR.

As to the one-two punch of combining Scratch and BlueStor, Locsmandi says, "This movie would not have been finished if I did not have their hardware. I was able to view the 4K fast enough and convert it quickly enough to keep up with the production schedule." While the case of *Manure* was extreme, it was not unique. Locsmandi cautions that digital acquisition is causing "more and more chaos" in post compared to the relative strictness of a film production. "With digital acquisition, you just shoot and say, 'Well we'll figure it out later.' The burden is on post now, and it's not necessarily saving [producers] money."

PUREDV ROCKS

Ten-year-old PureDV (www.puredv.com) in Chicago was founded by Lester Cohn, a producer who loves music and made his name shooting unsigned local bands. Today PureDV shoots, edits (on Avid and Final Cut), provides effects (such as After Effects), graphics, audio post and DVD authoring among other services. Recent rock acts that have gotten the PureDV treatment include Fallout Boy and Taking Back Sunday. Another is country-pop singer Charissa's HD music video, *Come on Now*.

Cohn, originally a fine art student, was an early adopter on the Chicago rock-club scene, shooting on Canon Opturas and cutting on Canopus. Compared to fine art, video production was "instant gratification."

Cohn went on to shoot for major labels like Warner Bros. who wanted well produced concert footage of certain rock acts for Internet promotion and other uses. Today PureDV will shoot multi-cam with Sony F-900s, Sony EX or on Panasonic P2s and uses Enhance Technology storage products.

On a concert DVD for Paul Stanley (of Kiss) Cohn used a compact EnhanceRAID T5 U320 SCSI desktop RAID storage array and got the job done with 1.5 TB. He used an Apple G5 dual 2.7 with 8GB of RAM and an AJA

PureDV's Cohn shot country-pop singer Charissa's music video, *Come on Now*, in high definition.

Kona card. Cohn shot the show with 12 cameras, but they were a "mish-mash" of formats, determined by a tight budget, without matching timecode.

Before acquiring the EnhanceRAID T5, Cohn set about editing his Paul Stanley footage uncompressed on Final Cut HD. But trying to edit material from the concert's 12 cameras on FCP with its (then new) multi-cam feature "was like pushing elephants through a straw. When you're working with uncompressed footage you need more bandwidth for editing," he says, "especially if you're doing multiple streams at one time. This is where the Enhance product comes in."

Once Cohn started running the T5, "it was like night and day. It made my life so much easier. I left that thing running for weeks on end and it never had a problem."

Today, he says, "a lot of things I'm working with are multiple streams from 720 P2 card cameras." Recently Cohn was bidding a concert shoot where he planned on using three Panasonic HPX-2000s with additional coverage from handheld Panasonic camcorders. His finished work may appear on MTV2, on value-added DVDs or, increasingly, on the Internet. "You're giving the client so much more bang for the buck by shooting 720 —

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it's still high def and on an HD network it will still look fantastic." Cohn was a pioneer of the value-added DVD footage that often accompanies a music release. "Now you have to be as creative as possible about finding new ways to present media to fans."

Cohn now has his eye on Enhance's newer external SATA product line. "I'm constantly trying to find out what is the newest, fastest drive I can have. That's because you want your creativity to fully come out. You buy these products because they allow you the reliability to have the fastest throughput speed, which allows you to do more and be more creative."

STORAGE IN WONDERLAND

The multiple-Emmy-winning team at NYC's Wonderland Productions (www.wonderlandnyc.com) has lots of sports-oriented productions to their credit, many shown on HBO, ESPN and SNY. Director/editor Bill McCullough is partnered with producer Dan Klein in the company and John Wiggins,

Wonderland's Bill McCullough uses G-RAIDs and TerraBlocks.

owner/partner in audio sister company Wonderland Sound, also collaborates with McCullough on scoring their productions.

McCullough cuts on both Avid and Final Cut and recently completed editing an HBO documentary, *Breaking the Huddle* (concerning the integration of college football). But Wonderland is into something new — and demanding — for HBO. *Ring Life* is a series of shorts documenting the lives of up-and-coming boxers (who may or may not eventually hit the big time with major bouts televised on HBO). McCullough shoots and edits these mini-docs on the road all around the country. Each fighter's story is presented in three segments covering the fighter and his family life (if any); the final installment covers fight night. Each segment is five to seven minutes.

"HBO is the gold standard for boxing," McCullough says, "and this is a look at some of the guys who are on the undercards."

McCullough shoots the fighters and their fights on a Canon XL-H1 using handy HDV cassettes. He can easily shoot six hours of tape on the fly to dramatize each boxer's story. "When we're on these road trips, I'll bring my drive with me, I'll digitize right there and I'll cut." On some fight nights, McCullough needs to turn around the segment quickly. "I'll go shoot the fight, then go back to my hotel room with my laptop, camera and my G-RAID drive, and digitize it and cut right there."

Fight night can still add up to three hours of tape and McCullough digitizes the footage in realtime. "The cool thing is, as I'm shooting, I kind of know my selects and where I'm going to put them."

McCullough's G-Tech G-RAIDs each store 1TB and he was able to hold six boxers' stories on the one he dedicates to *Ring Life*. (He also archives copies in case there is any loss.) "It's a good workhorse and it's portable and reliable. I use all G-RAIDs."

For work on a longform, McCullough allows that you want multiple editors sharing footage. Wonderland has its 7TB Facilis TerraBlock networked to four FCP edit rooms but often today the TerraBlock serves as an aid to mixing and scoring projects at the facility. "It's a great kind of intranet for us to get back and forth and store things and get things mixed."

When not on the road and not physically working at Wonderland, McCullough uses a G-RAID to work from his home. "I can take my MacBook and my G-RAID drive and go home and cut HD. That's a wonderful thing."

McCullough worked with HBO producer Thomas Huffine, who created the *Ring Life* series. Huffine says, "There's no doubt that the proliferation and mobility of digital storage has allowed the business to change. And the business has reacted by saying, 'This is great — how much faster and how much better can you do it again?' So the ability to take the material that you need digitally on the road and work is a light-speed step up from just a few years ago when you were stuck to whatever desktop situation you were editing in."

Huffine adds, "*Ring Life* is right out on the edge of the industry as far as being a completely digital production. People in the industry are expecting more for less these days. HBO is embracing digital with open arms in every aspect from shooting digitally to going all the way to the end digitally. Shooting physical film is going to be left up to the major studios."

COLOR FOR SPOTS

Post production veterans Bob Festa, Clark Muller and Darby Walker opened Santa Monica's NewHat here last year with an all-British array of color grading systems, including Pandora Platinum systems and, recently, a Filmlight Baselight Four. Richard Alcala came on board at NewHat as senior engineer last August.

The shop (www.newhat.tv) specializes in color correction for TV commercials. Big-budget spots for big national advertisers. The automakers alone that NewHat has done color work for say a lot: Alfa Romeo, Dodge Ram, Jeep, Land Rover, Lexus, Lincoln and Mazda.

It's all digits, of course, and that means they need storage. Besides pushing digits around the shop, Alcala

Francis Hamada of The Marlowe-Pugnetti Company, Inc.

NewHat, which houses two Thomson Grass Valley Spirit 4K Datacines, uses a DataDirect SAN for its DI work.

says, it's about "doing it in realtime, full resolution and in multiple streams, and that's what the DataDirect SAN allows us to do." For film-acquired commercials, and NewHat clients tend to be film people, NewHat scans on two Spirit 4K DataCines. But they work in 2K — for now. The 2K workflow on the DataDirect Networks 300TB xSTREAMScaler SAN "allows us to have three rooms running simultaneously, playing back off the storage without any dropped frames. They can essentially be coloring, be playing back and previewing the shot; changing the color and previewing the shot, coming off the same centralized storage without affecting each other." Their work being TV spots, NewHat colorists work on their own separate projects in a nonlinear fashion.

"We scan full-ap 35mm negative at full 2K resolution and now we have the full image that, when you bring it into the color corrector, we can pan, push in, we can tilt up and down and frame it the way we want."

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When color grading is finished NewHat colorists typically play out to high def tape — about 90 percent of the time. "There are some clients who want to walk away with a FireWire drive," Alcala says. These clients want to keep their media as uncompressed, full bit-depth data files for additional VFX work or other processing. "In which case we can apply the color to files, put them back onto the SAN, then pull them off the SAN on a workstation and deliver them on a FireWire drive."

Another thing the xSTREAMScaler SAN allows NewHat to do is, "when we scan the film in, we can then take an EDL, load it into the color correction system, and it basically pulls in those specific shots with handles. We could actually do the conform within the color correction system.

"Formatted, we have about 220 TB of real storage area," Alcala says. "That's broken down into multiple volumes and that's how we're able to sustain the bandwidth and the streams we have."

Alcala comes to NewHat from Technicolor's Burbank DI facility where they were color grading feature films in 2K resolution using data files transferred to DVS Clipster local attached storage. Using the SAN at NewHat is a new paradigm. When seeking a file on a SAN, Alcala says, "You just point to it. It's really very convenient. There's a lot more flexibility having all of the elements residing on one large pool of storage."

LOTS OF DIGITAL ASSETS

If you saw *Post's* February cover story on the hit stop-motion feature film *Coraline,* you've seen just some of what animation house Laika does.

The reality of painstaking stop-motion production is such that it does not actually generate a whole lot of digits in a day's work. Or even a week's. But if you look at the whole of Portland, OR's Laika (www.laika.com) — including its CG entertainment department and its cel, Flash and motion graphics work — you understand the company's claim that it makes "every kind of animation for every medium."

That includes lots of commercials — as many as 40 in the past year for such major advertisers as Apple, Levi's, Ubisoft and M&M's. And that means lots of digits.

Alvaro Cubillas is VP and head of technology at Laika. It's his responsibility to support activities at both Laika Entertainment (feature films, etc.) and Laika House, a bustling division busy with commercials, branded entertainment and more. Laika House was created in 2005 with the purchase of Will Vinton Studios, the Portland pioneers of stop-motion and CG.

The whole Laika operation is spread across three buildings in three locations. "We have datacenters in all three buildings," Cubillas says, and all the storage therein is from NetApp. One building's datacenter primarily supports the corporate offices and Laika House projects. Nearby is the building with the largest data center — it serves Laika's many CG efforts.

The third facility, designed for stop-motion feature production, such as *Coraline*, has its own datacenter with NetApp storage. The stop-motion

Laika's *Coraline* and Al Cubillas (inset): The studio's datacenters all house NetApp gear.

operation, which used 50 sets just for *Coraline*, is, at least for now, located about 20 minutes away on the freeway. About 30 animators worked on Henry Selick's *Coraline*. The film's digitally captured still frames were shot in stereo at 24fps and cached in the local stage's NetApp storage.

"The digital effects on *Coraline* were done by Laika Entertainment folks," Cubillas says. And all effects — rig removal is a big deal — were stored up at the datacenter housed in the corporate offices known as the Conway building. Each night the data stores of the day's stop-motion work and the digital effects/rig-removal work are synced there.

"We've had an exclusive relationship with NetApp for seven years," Cubillas says, although Laika would look at different vendors over that time. "That has not been due to blind loyalty but due to the fact that their products met

Laika produced this Oregon Lottery spot recently for agency BPN, Inc.

— and exceeded, in a lot of cases — our data-services needs for commercials, corporate storage, CG work and stop-motion feature work." Over the years, NetApp products became "the backbone of where all our frames are stored for all of our work."

Laika currently maintains over 200TB across all three datacenters, all on NetApp gear, including their tradi-

tional Data ONTAP-managed systems and Data ONTAP GX systems used for CG and VFX work. NetApp's Data ONTAP GX allows for easy expansion of storage and increase of performance behind the scenes, and without interrupting source service, which is key to animation. "Their GX technology allows us to have the kind of control where we can do live 'data shuffling.' We can tune and optimize during the film to make sure that the artists are working as fast as they can," Cubillas says. "Not interrupting production at the height of production is a holy grail when you're on the data side. You try to get as much as you can out of the studio's very precious resources."

And that's Cubillas's biggest challenge. However, he stresses, "We're a company of filmmakers. We're not a company of technologists. We're making cartoons and having a lot of fun!"

***Wanted*: Universal Studios Sound mixed this Angelina Jolie film. They use ICON and Harrison boards and SNS storage.**

UNIVERSAL SPEED

How important is quality audio to a quality picture today? One HDTV consumer experiment a few years ago asked civilians which of two video clips they were shown was in HD. Which was better? Almost always the consumers claimed the video with the superior audio tracks was high def — even when it was actually SD.

They understand this at Burbank's Universal Studios Sound (www.filmmakersdestination.com) This is the venerable 18-stage facility where classic movies and TV programs have gotten sophisticated audio post since they had sound. Today, Universal offers mixing, sound editorial and design, ADR, Foley (and the original Jack Foley stage), audio preservation and restoration, digital mastering, and sound transfer for feature films, television, trailers, and independent projects and it's all digital. They do big pictures here, like *300* and *Watchmen*. And there are plenty of TV programs — Universal's parent, since 2004, is NBC Universal.

Universal's Chris Jenkins and Frank A. Montaño (along with freelance production mixer Petr Forejt) mixed the Oscar-nominated sound for Universal's *Wanted* here at the Hitchcock Theater. "We're really proud of them," says David "Doc" Goldstein, VP of post production engineering, Universal Studios Sound. "The movie sounds really amazing — they did a great job of carrying the sound to the visuals in that show, which are pretty striking."

Storage and workflow for audio have undergone important changes here in recent years. "Our [audio] files aren't usually as big, but we have a lot more of them," says Goldstein. "We have three tiers of storage here. We have a SAN that is our working storage — we work on Pro Tools systems and the Pro Tools thinks that the SAN is local storage. At the end of the day, we drag that off to our nearline storage, which is about 100TB of RAID storage. And in the middle of the night that's backed up to our LTO-3 tape library."

With 18 soundstages to serve, Universal's sound department has two separate areas. "We have the main post production area which houses all but

two of our mixing stages," says chief engineer Jeff Taylor, "and we have our BluWave Audio Building." The BluWave Building is new and was designed by Taylor to house a sophisticated storage operation, including a new SNS SAN, along with many other activities. It houses digital mastering (or "post-post production") doing foreign releases, DVD audio prep, and other aftermarket work. Restoration and preservation of Universal's (and third parties') classic films also take place here. Digital transfer represents the third group in the building and, acting as a "Swiss Army knife" of digital audio, they can transfer any sound medium to any other. Among others, Taylor works in the new building with Jeremy Ayers, Gary Gorman and Andy Peach.

"All these various areas are attached to the storage," Goldstein points out, "which means it's easy for different people in different areas to get the same files and work on them. It's really great in sound editorial when you have more than one person working on a project."

Universal's mixing team on *Wanted* was nominated for an Oscar.

"With the three tiers of storage," Taylor says, "we have approximately 70TB of online 4GB-attached fibre SAN architecture within the department." At least half of the department's 200 or so Pro Tools systems are fibre attached to the SAN backbone and that number is likely to grow. "In addition, we have a Gigabit Ethernet fabric sitting underneath that is our own private LAN. We have our own servers and manage the storage on that through an active directory environment."

That's how the sound department manages the security of all the work passing through. And that includes third-party work — movies that are just visiting. The idea is to serve up media to working creative profession-

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als while curtailing opportunities for piracy at the same time. In fact, security may be "job one" at Universal Sound.

Outside editors working on the lot, for instance, need full and unfettered access to their material, but no access to other shows. Editors have their credentials for their particular job but, within the configuration of the fabric, that's the only material they can see or hear. "We have people, Eddie Bydalek, Rob Carr, who do the lion's share of the management for us," Taylor says.

"Some of our competitors are still carrying FireWire drives around from room to room," Goldstein says. "The advantage to the way we're doing it is it's much more secure. Everything can be locked down by the administrators. You don't have a zillion copies because everybody can work off the same files off the SAN."

Universal's new SAN is from Studio Network Solutions (SNS) and it first came online in spring of 2008. The solution for the soundstages includes over 80 seats of SNS's SANmp with Fibre Channel switches and 12 IBM DS4200 enterprise-class storage arrays. The FC fabric is connected via 10GB Ethernet, allowing the mapping of any FC resource to a specific user as needed.

Universal's new storage has really made it easier to protect filmmakers' work, Goldstein says. "You can centralize your picture files and limit access to the very few people who have to have it." When they're done working, permissions and access are removed, and files can be deleted at the end of the project, obviating the need for copies that could fall into the wrong hands.

Universal Sound runs a combination of Digidesign ICON boards and traditional Harrison MPC and Series Twelve consoles. But even on the projects being mixed on the Harrisons "all of the tracks are being played back from Pro Tools systems, and the recorders are Pro Tools systems," Goldstein says. "That's because they're edited on Pro Tools systems and we have to have a very transparent workflow to and from the editors as they're working on a mix stage because films are always changing."

The picture changes even during the audio post process. "Versioning is a huge deal," Taylor says. "It's another reason that our storage environment has been very beneficial, because we can track and manage lots and lots of versions. We keep only the current version on the Fibre Channel storage array and we keep all the version history in our nearline environment so that the filmmakers can go back very quickly if they need to."

Filmmakers working at Universal expect speed. "The ping pong tables don't get as much action as they used to," Goldstein says. "Filmmakers [have] a lot more to deal with — DI, special effects and sound — and it's all happening at the same time." ■

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