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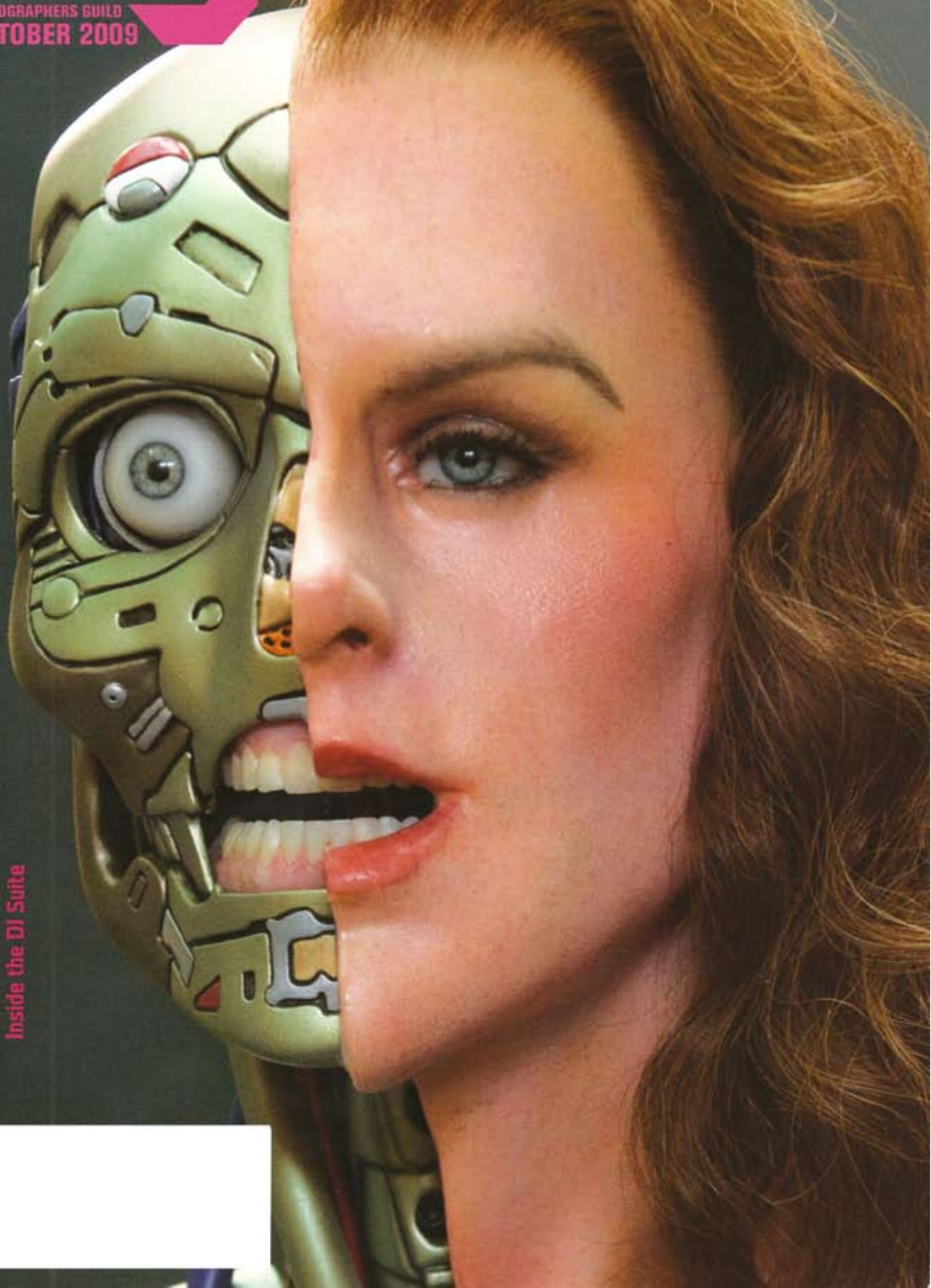
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# BASE CAMP DATA

Digital Cameras and Tapeless Workflows are Expanding the Content Pipeline Like Climbers Trekking up Everest. Is Critical Mass Within Sight?

By Carolyn Giardina

Photos courtesy of Sohonet / LIGHTIRON Digital / Sample Digital

The adoption of digital cameras, higher resolution imagery and tapeless workflows has a number of results. One of them is more data; lots more data — traveling all around during production from on-set original camera data to backup and dailies, then from the set to editorial, on down to VFX, postproduction, the DI and various stages of review before the final finish to film, tape, or in a not-so-distant universe, straight to your local multiplex as pure data over secure fiber optic lines.

Resolution, to be sure, is impacting the volume of data. 4K - representing four times the size of a 2K file - is gaining momentum in areas including DI and digital cinema projection, for example with *X-Men Origins: Wolverine* and *Angels & Demons*. Meanwhile, 6K and 8K resolutions are starting to find their way into the discussion. RED is talking 6K and higher, while NHK in Japan recently debuted a new 8K capture system. Restoration is also looking in this direction. Warner Bros., for instance, restored and remastered its classic *A Star is Born* in 6K. Couple that with the use of digital cameras and the data pipeline is beginning to rival those built by the international oil conglomerates!

"The shooting ratios have a habit of going up as people are capturing digitally," observes Dave Scammell, President and CEO of Sohonet, a London-based firm that builds and oversees data networks for the entertainment industry. "We are seeing ratios go from 30:1 to 70:1, which is becoming the norm for a lot of productions, and even a few as high as 100:1."

Scammell says the trend is especially pronounced in television. "We have seen the use of digital cameras escalate dramatically in the last 12 months and inevitably TV shows have conflicting requirements of lower budgets and even more data than features, often with a faster turnaround."

Advances in consumer technology, along with a crash course in Moore's Law — Intel founder Gordon Moore's belief

that computer performance doubles roughly every two years — are also having an impact. Storage and workflow tools are becoming faster, cheaper and more powerful, which means more data can be moved more places, more quickly than ever. "For a production, it is not unusual to be moving 200-300 gigabytes of data a day," Scammell says. "There are people that are moving terabytes of data daily!"

And in many cases, Scammell points out, that data is traveling longer distances, including between countries, which is why high-speed private networks like the type Sohonet builds, as well as in some examples, the less secure but more readily wired Internet, are gaining momentum in the world of data workflow.

"We just did film outs for *District 9*," explains EFILM Vice President of Business Development Michael Cooper. "They finished in New Zealand and sent the entire movie to us (in Hollywood) electronically. It's become so commonplace to send full features around the world (via secure data networks); that used to only be (the case) if there was a massive crunch of time."

Cooper suggests the reason for the shift is twofold.

"The studios demand it and the costs have come down. We have wider band (width) and more facilities have the capabilities." EFILM uses third-party services including Aspera, Pix, Sample Digital, Smartjob and Sohonet.

Yet another outgrowth of the tapeless workflow boom are new production services like collaborative data management, which is about adding efficiencies to tapeless workflows and not just moving data from point A to point B.

Below are just three of the players in the tapeless workflow space — with varying degrees of expertise and specialties — who have all pitched their tents at Base Camp Data to help facilitate the long and steady information climb ahead.



## Sohonet

London-based Sohonet – originally founded by a group of postproduction houses – offers secure and private high-speed fiber optic networks that connect leading production centers around the world, such as Los Angeles, New York, Sydney and London. Brisbane, Melbourne and San Francisco are among the newer hubs for Sohonet's 10 gigabit Ethernet and MPLS network.

The company has also started offering what it calls its "Vessel" digital negative management service, which aims to assist productions with managing data workflows.

Explains Scammell, "We make sure data moves very efficiently to all the areas where it needs to go. Even if you are dealing with several hundred terabytes." This includes backing up data on set, sending data to editorial, and sending dailies. It is also being designed for use throughout postproduction.

Vessel came out of the custom work that Sohonet did for 2008 releases *Quantum of Solace* and *Speed Racer*. "We get involved with the production, talk about where their locations are going to be, and Vessel is customized for each production," Scammell shares. "Rather than the production having to deal with mountains of data that they are going to capture, we provide an efficient, well-structured system that actually makes it seem like they are working with much less data."

To that point, he describes Vessel as an intelligent system

that knows what data you are interested in, and when you are interested. "It keeps track of everything the production needs, and can effectively reduce the online storage requirement by about 10:1 without using compression," Scammell explains. "All of the original data is still there. We are clever about what data is held on disc and what data is backed up."

Recent theatrical releases that employed Sohonet include Warner Bros.' *Harry Potter and the Half-Blood Prince*, which shot in the U.K. and was supplied a network for the multiple visual effects houses working on the production, linking them to the DI as well as to Warner executives back in Burbank, California. Upcoming productions using Sohonet include *Sherlock Holmes* for Warner Bros. and *Gulliver's Travels* for Fox.

"The Internet is probably the only real competitor to what we do, but a competitor that is very morphous," Scammell suggests. "The Internet business model is breaking down because of demands from consumers for streaming and downloading high volumes of content. You might have a fast download speed with your ISP (Internet Service Provider), but that's only when it's not being used very often. If a consumer is trying to download so much content every evening, say, because it is replacing a TV, at that point you need your own dedicated connection, and the Internet doesn't have the infrastructure to support that."



Patrick Macdonald-King, CEO / Allison Knox, Client Services Coordinator

## Sample Digital

Not all data wrangling firms eschew the Internet. Los Angeles-based Sample Digital is in the process of moving its clients to its new D3 System, offering web-based production workflow services, which include digital dailies and media asset management delivered via a system that combines the Internet (generally a minimum DSL 1 Mb/s for desktop service) and a set-top box that enables HD viewing on a television set or screening room. Users exchange, manage, share and distribute digital content in real time throughout the course of the production. The system will support up to 14 Mb/s 1080p, and offers security features including software encryption, digital rights management and watermarking.

"The TV networks have been the drivers of our service, but that's changed," says Patrick Macdonald-King, Sample Digital's president and CEO. "Now it's the production itself, which has been able to significantly reduce costs by doing work – traditionally done at postproduction facilities – on set or at the production office. They use (Sample Digital) as a distribution tool to get the content out to sound facilities, VFX and so forth."

Macdonald-King reports that Marvel recently used DAX/D3 during its *Iron Man 2* production to move dailies on set, for studio approvals, and for marketing needs such as to send material to trailer houses or gaming divisions.

Showtime's *The Tudors* has been using the DAX service for multi-location needs.

Macdonald-King says that the production can, for instance, send the material from postproduction in Toronto to the location shooting in Ireland, to the Showtime promo department in New York, and to executives in Los Angeles for approvals.

Additional clients include CBS Films, 20th Century Fox, Lionsgate, Disney, Miramax, Scott Free Productions, Spike TV, AMC and Fox Searchlight.

"Private networks are always going to be faster, but they are also going to be a lot more expensive and unnecessary," MacDonal-King reports. "We feel we can use the Internet to provide the same level of service as well as the security (at a lower price point)."



## LIGHTIRON Digital

Michael Cioni, the former chief "knowledge" officer and co-founder of Hollywood-based PlasterCITY Digital Post, recently co-founded a new company named LIGHTIRON, which he describes as having two distinct parts: Ironwork, a file-based bureau offering services such as DI and 2K/4K postproduction, and Lightwork, essentially a consulting arm that "advises and integrates so production can internalize some of the process," such as backup, dailies and online.

"Many clients don't know how much power they have in some of these more affordable systems," explains Cioni, who serves as LIGHTIRON'S CEO. "Clients are getting smarter, computers are getting faster, and software is getting more powerful, resulting in many services leaving the post houses. The whole notion of working offline is going away, as is the idea of needing post houses for the creation of dailies, as people are starting to do their own processing and even sometimes their own color correction. To (many) companies, this type of change can be scary, but I believe the evidence all around us," Cioni admits. "This change is hardest in L.A., but in Ohio they are starting to love it. In Prague they are learning to use it. And in Warsaw they desperately need it."

LIGHTIRON projects use physical storage to move data from set. Internet connection, Cioni suggests, "is too small and slow to push these big files around," while private high-speed networks can be prohibitively expensive, as Sample Digital's Macdonald-King indicated. "Being able to move that (amount of data) through fiber optics channels is doable, but many city infrastructures need five to 10 years before they are all lit," Cioni estimates. "As the fiber optic potential continues to get more saturated, it is likely that file sizes will continue to increase as well due to Moore's Law. It might be difficult for fiber to catch up, because by the time fiber can do 4K, we will be acquiring images beyond 4K. That is why I believe file sizes, i.e. shooting uncompressed versus compressed, is the real issue."

Cioni suggests that dailies for a single feature can come in around 40 terabytes uncompressed. But he suggests that newer codecs will result in more efficient data management, transport and storage.

"The nice thing about some file-based systems is they are shooting compressed with a new breed of efficient codecs," Cioni relates. "Those files are often under 10 terabytes (for a single feature)."

"As the price per gigabyte continues to go down, the demand for drives and solid-state devices continues to go up, and that market is driven by the consumer," he concludes. "So as consumers buy more digital file-based video and still cameras, Hollywood directly benefits. Consumers are driving the market. More data? Bring it on." ☘

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