



Digital Dailies Flow Freely from Fountain

By Mark Fritz - Posted Apr 1, 2003

Matchframe Video, a Los Angeles-area post-production house, had a problem. One of its biggest customers was unhappy and poised to take its business elsewhere. The customer—a major Hollywood movie studio—was shooting a feature film in Miami, 3,000 miles away from Matchframe's facilities in Burbank, California. And the studio wasn't happy about the time being wasted waiting for each day's film footage (called "dailies" in the biz) to be couriered from Miami to Los Angeles, converted to digital video and couriered back to the Miami-based production staff for review. That process was taking nearly 24 hours.

The Holy Grail for film editors (like those on location in Miami) is the ability to review footage in digital format mere hours after it is shot. When the dailies process goes digital like this, ordinary analog dailies become "digital dailies." Hollywood is falling in love with digital dailies because they eliminate the longstanding method of having to manually ship film from far-flung locations to the desks of studio executives in Los Angeles. Moreover, they provide studios with the luxury of immediately correcting any problems while actors are still on location and film sets are still in place, thus making the entire filming more efficient and cost-effective. Quite simply, digital dailies are the difference between sending a letter by mail or quickly transferring it via email.

The ability to produce digital dailies is something every film production organization desires and is currently demanding from post houses like Matchframe. Once Matchframe receives film reels from clients, it transfers the film into digital files through a process known as telecine. The problem then is getting those files back to the client in a timely manner.

"Our major studio client no longer wanted to wait 24 hours before receiving dailies," says Jeff Bass, Matchframe's director of nonlinear operations. "They wanted to get dailies within eight hours for a project, even though the location was across the country."

Unless Matchframe came up with a solution to this time delay problem, it seemed obvious that the client studio would find another post house (probably one in Miami) to telecine their dailies.

When it came to digital dailies, however, Matchframe knew it had to look outside its own company for help. Matchframe found its answer in Digital Fountain. The Fremont, California-based company is deploying technologies that help media and entertainment companies make digital dailies a reality. Its flagship product, Transporter Fountain, is designed to save time and add certainty to the delivery of massive files like digital dailies over broadband Internet connections. Using patented "meta-content" technology, the Transporter Fountain can guarantee fast content delivery, regardless of packet loss, latency, and congestion on wide area networks.

Matchframe considered many solutions before choosing technology from Digital Fountain—including courier services—to deliver digital dailies throughout the country. However, none of the other solutions met all of their requirements. The cost of standard technology options, such as a Virtual Private Network, was too prohibitive—for both Matchframe and its clients. "Transporter Fountain was the only product that could solve our problem affordably and with complete reliability," says Bass. "We're now sending digital dailies safely and inexpensively over the Internet, and not on an airplane."

Bass also liked the way the Transporter Fountain fit seamlessly into Matchframe's existing technology infrastructure and integrated easily with their existing systems.

"Media and entertainment companies have long dreamed of shooting motion pictures and TV series anywhere in the world while still being able to use the very best post-production facilities in Los Angeles," says Cliff Meltzer,

CEO of Digital Fountain. "To date, however, producers and editors have had difficulty getting digital dailies back to L.A. for timely review. With Transporter Fountain, we're making daily review of digital dailies practical. For Matchframe, Digital Fountain can securely deliver data three to thirty times faster than traditional methods at a fraction of the cost."

Since Matchframe's studio client started shooting its latest project in Miami, it has managed to compress two-day cycles to one-day, which ultimately shaves many days off the entire post-production schedule. By using Transporter Fountain, Matchframe is able to beat their client's expectations and win new business from other customers who will demand the same level of efficiency. "We couldn't have won this business without Transporter Fountain," says Michael Levy, vice president/general manager of Matchframe. "It allowed us to meet the client's tight deadlines and transfer the digital dailies out of our Avid Unity storage systems in Burbank directly to the cutting room in Miami."

Moving forward, Matchframe is installing wide area network connections with more bandwidth so it can send multiple files simultaneously, thus enabling them to transition the company towards an increasingly tapeless environment. In the future, Matchframe plans to deploy Transporter Fountain to service multiple national and international film projects. "We are constantly working to streamline the post-production process," says Rand Gladden, president of Matchframe. "Transporter Fountain fits well into our 'smarter post' workflow by striking a balance between cost and efficiency."

Digital Fountain sells its Transporter Fountain in four different models. The most popular, the rack-mounted TF 1000, delivers an output capacity of 10Mbps and costs around \$50,000. The recently introduced Transporter Fountain "Branch" is a more portable desktop model that is designed for on-location shooting. It delivers an output capacity of 2Mbps at a cost of around \$15,000.

So what's so different about the Transporter Fountain network appliance, and how does it do what it does?

The Transporter Fountain takes a completely different approach to transporting large files over TCP networks, says Charlie Oppenheimer, vice president of business development and marketing for Digital Fountain. The conventional way of sending large files (such as video clips) is by FTP. The problem with that is that no matter how much bandwidth you throw at it, it just can't do the job quickly enough.

"It is not a widely known fact that conventional FTP file transport is more readily constrained by roundtrip time and amount of packet loss than by bandwidth," says Oppenheimer. He gives as an example the challenge of sending a 2GB file from New York to Washington, DC. When you use FTP, your throughput tops out at about 30Mbps no matter how much bandwidth you have, says Oppenheimer. When distances increase, the problem gets even worse. For example, when you try to send the same file from London to Los Angeles, throughput tops out at about 5Mbps, regardless of bandwidth, according to Oppenheimer.

When you use Digital Fountain technology, however, greater bandwidth gives you proportionally better throughput. Oppenheimer claims that Transporter Fountain users can get a "93 percent savings" over FTP when sending a 2GB file from London to Los Angeles (assuming 10Mbps of bandwidth). Using FTP, it would take 7 hours to send that file that distance. In comparison, a Transporter Fountain could send that same file that same distance in 28 minutes.

Oppenheimer says most clients decide how much bandwidth they can afford and then set their Transporter Fountain to maximize throughput based on that bandwidth. "With our software it's like having a knob you can use to set the rate to use at the maximum bandwidth you have," Oppenheimer says, referring to the product's tunable rate control, which lets you dial relative priority and a set maximum transmission rate across critical network links.

Oppenheimer claims the Transporter Fountain delivers "100 percent, bit-for-bit copies," and "is so predictable you can set your watch by it."

The secret behind the Transporter Fountain is the company's "patented meta-content technology." This technology is "difficult to understand," says Oppenheimer, and guaranteed to make you scratch your head and to "make the eyes glaze over" on anyone but a mathematician. Rather than sending the actual original data, the Transporter Fountain sends a mathematical representation of the data, or as Oppenheimer puts it: "a precise, authenticated mathematical recipe that describes the original data." The recipe is called meta-content, and the

process uses "simultaneous linear equations," Oppenheimer says. To use a simple analogy, he compares this "recipe" to DNA. Then using an even simpler analogy, and for the benefit of Trekkies, he explains that the product takes its name from the transporter used on *Star Trek's* Enterprise.

With Digital Fountain's meta-content technology, it doesn't matter which packets are received, in what order they are received, or if some packets are lost, says Oppenheimer. All that matters is that the client receives enough packets and that content is perfectly reconstructed. Think of data as water and data packets as drops of water, says Oppenheimer, and think of a Transporter Fountain as a water fountain. "With a water fountain, it doesn't matter which drops you get. It doesn't matter which drops are lost. It only matters that the cup is filled."

But if the meta-content recipes that flow into your cup only fill it halfway, is the cup half full or half empty? Now, there's a head scratcher for you.

(For more on Transporter Fountain and digital dailies, see Geoff Daily's article, "Daily Planet,"
www.emedialive.com/r18/2003/daily0603.html)