Darwin's Storage: The Evolution of Solid State Storage in the Media and Entertainment Industry

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Digital storage is a key enabling technology for the media and entertainment industry. This industry has a use for almost every known digital storage technology for the various aspects of content capture, editing, distribution and archiving. Ever higher resolution content, larger libraries of content and new delivery technologies continually increasing the quantity and variety of digital storage used in this industry. There are some applications in content capture and content distribution that have proved to be viable niches for solid state storage in the Media and Entertainment industry. This article will explore the evolving role of solid state storage for these applications as well as explore possible future uses of solid state storage to enable the next generation of entertainment.

Content capture in a flash

Professional video content capture used to be done with analog magnetic tape. Today a combination of digital video tape, optical discs, hard disk drives and flash memory are used for content capture as shown in Figure 1 (Coughlin Associates survey results from mostly SMPTE members involved in professional media and entertainment). Flash memory is becoming increasingly important for this application due to its insensitivity to vibration and other environmental factors that can be important for video captured while in the field.

As the storage capacity of flash memory storage modules increases, more and more professional cameras will use flash as the primary internal memory in high resolution digital cameras. It is generally expected that flash memory and hard disk drives will eventually displace tape and optical media for many professional cameras. Panasonic, Sony and other high end video camera manufacturers are making flash memory-based
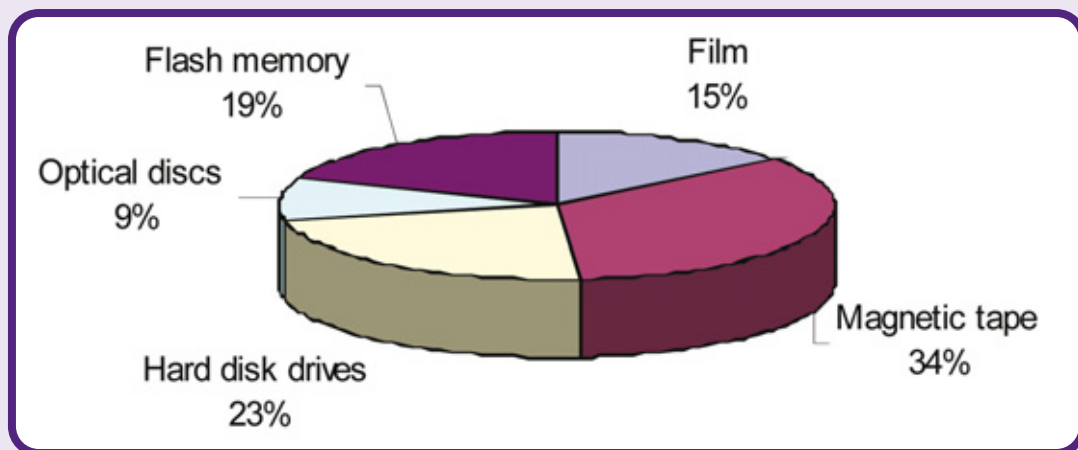

Figure 1. Percentage of various recording media used in professional video cameras

Figure 2. Sony and Panasonic professional video cameras using flash storage

professional mobile video cameras. Most of these flash-based video cameras use proprietary flash card formats. Figure 2 shows a couple of professional HD cameras using flash storage.

SSD storage on the edge

Edge servers to support video on demand (VOD) delivery using flash memory-based solid state drives (SSDs) are becoming a popular way to improve overall content delivery performance and reduce service costs. These solid state edge delivery systems provide more reliable remote edge operation with excellent read performance rates. These systems are available from many different vendors. The high performance possible for play-out makes flash-based solid state storage devices a good choice for active content in a content delivery system. Thus as flash memory capacities increase and reliabilities are proven in the field, flash may grow more popular for central content distribution facilities as well as in edge delivery.

More flash in more places

A high performance storage device has proven to be useful for many different applications in the media and entertainment industry. Besides content delivery flash-based storage could find a role as cache memory for real-time play out for digital non-linear editing systems. This cache would sit on top of lower performance but higher capacity and lower cost hard disk drives to provide fast access to high resolution assets. As the performance requirements of rich content increase at a

faster rate than the access time of hard disk drives such solutions may be more and more attractive. As mentioned before, flash memory will become more common in many content capture devices in the media and entertainment industry due to environmental ruggedness and lower power, particularly as the amount of flash memory available for a given price declines.

Besides greater use of flash memory in edge and central content servers there is an effort underway by some of the flash manufacturers to create flash memory as a physical content distribution media. SanDisk has been promoting micro-SD cards for music and video content delivery for several years. Its latest efforts are represented by its slot music initiative as well as pre-packaged music and video content on micro-SD cards. SanDisk has been successful in getting participation from several content owners to work with it to develop flash as another method of content distribution, particularly in mobile devices.

We expect that solid state storage will continue to find useful niches in the media and entertainment market as the technology develops. Flash looks poised to be one of the essential storage technologies in the media and entertainment industry for the future along with hard disk drives, tape and optical storage.

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