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Sony Lays Down Ambitious Migration Path for Future of AIT

by John Woelbern

Can reliable and affordable tape keep re-inventing itself and maintain its leadership position within the data storage hierarchy? How dense and sophisticated can tape storage become over time? Will the market soon see new twists to tape storage? Where will it all wind up?

First introduced in the early 1950s, tape storage over the years has been expected to fall by the wayside with the introduction of competing storage technologies. Not so. In fact, it continues to prosper with new technological advances and continues to play a large role in the storage hierarchy as the superior backup and archival medium. Recent data from *Freeman Reports* points to growth in both midrange standalone tape drives and automated tape libraries. Acc-ording to its 2001 report, revenue for all classes of compact tape drives was expected to post a 6 percent increase last year, with the future looking equally bright for the burgeoning tape library automation market, which is expected to double units shipped in the next six years.

Tape has even assumed a new role within storage networking technologies and vendors, such as Sony, have even recently begun pairing their tape libraries with network-attached storage appliances to offer IT managers a more flexible backup and restore solution. In addition to the traditional IT use of tape storage for backing up and archiving data, the upsurge in the applications of rich media content has demanded more cost-effective storage capabilities that meet the needs of storing exabytes of multimedia, digital data. Primarily, this trend is being driven by new digital image storage and delivery applications in a variety of industries, including medical, broadcast, and security. With the ongoing and rapid expansion of digital content creation, the need for cost-effective storage has never been greater.

Companies involved in the development and manufacturing of leading tape formats agree that tape has far from reached its climax. Among those singing the praises of tape storage solutions is Sony Corp., which introduced its midrange AIT (Advanced Intelligent Tape) format in 1996 to complement its low-end DDS (Digital Data Storage) format, brought to market during the early 1990s.

Super Sizing Tape and Flouting Density Barriers

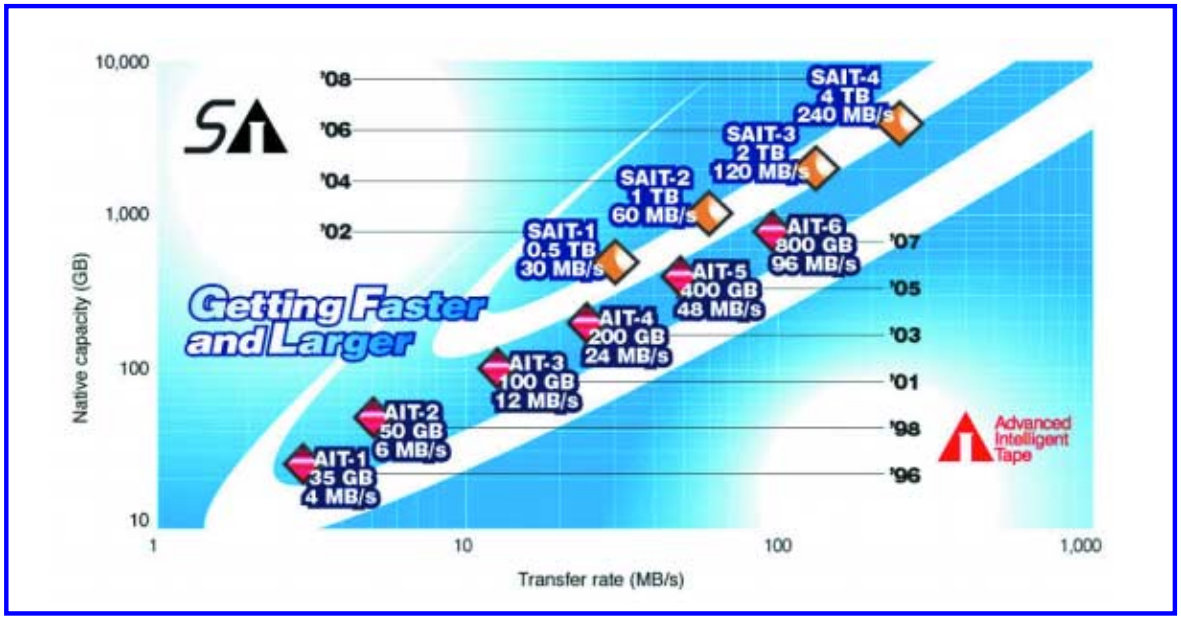
Sony has solidified its position in the tape storage market by the relentless, on-time, introduction of new AIT models, together with the commitment to double the capacity and performance of its AIT technology about every two years into the future.

In its Corporate Research labs last year, Sony provided the first demonstration of a breakthrough in tape storage areal density by achieving 6.5 Gigabits per square inch. Sony believes this proven density will enable the company to extend its long-range AIT roadmap to a sixth-generation member before the end of the decade. This sixth version, AIT-6, is expected to feature a native capacity of 800GB (2.08TB compressed) in a 8mm cassette, and provide a native data transfer rate of 96MB/sec.

The most current member of Sony's AIT family is AIT-3, which was announced in November of 2001 and began revenue shipments in December 2001. AIT-3 has a native capacity of 100GB (260GB compressed) and a native transfer rate of 12MB/sec. In keeping with the AIT technology roadmap, the next member of the family, the AIT-4, is in product development and will provide 200GB of native capacity (520GB compressed) and a native data transfer rate of 24MB/sec in early 2004.

In the fall of 2001, Sony also debuted a new 'super' tape storage product line, based on the AIT recording technology, which it expects to deliver to the market by the end of 2002. Dubbed S-AIT, this technology family is the latest embodiment of high-capacity and high-performance data recording targeted at enterprise storage markets. With the announcement of the S-AIT technology platform, Sony has now differentiated and positioned its tape products for broad market coverage—from the low-end (DDS) to the midrange (AIT) and also to the enterprise (S-AIT).

S-AIT technology uses a half-inch, single-reel cartridge and provides up to five times the capacity of current AIT and linear tape formats. The first implementation of S-AIT is expected to provide up to 500GB of uncompressed capacity (1.3TB compressed) and a transfer rate of up to 30MB /sec uncompressed (78MB/sec compressed). The S-AIT roadmap, which parallels the AIT fami-



ly, is planned out to a fourth-generation product for delivery by 2008. Both AIT and S-AIT leverage Sony's extensive R&D investments in high areal-density recording, including key components such as the read/write heads, to media and encoding components. In fact, AIT and S-AIT are the only industry roadmaps (see Figure) that are supported by R&D demonstrations of all key components developed and sourced from a single supplier.

Differentiation Through Superior Core Technologies

AIT is differentiated from others through its investment in underlying technologies and the benefits that result from them. Based on current Sony Corp. heads and media research, as well as testbed demonstrations, Sony believes its lofty goals can be accomplished. Its present helical-scan roadmap already calls for a 2TB (Terabyte), one-half inch cartridge capacity by 2006, and a 4TB capacity cartridge by 2008. Additional research results have also been presented by Sony Corp. that show a doubling of areal density to over 12Gbits/inch^2 before 2010. This density could provide a cartridge capacity of up to 10TB, thereby achieving Sony's tape storage roadmap goals.

History can Hint to the Future

One would expect that Sony, which has been involved in helical-scan tape recording for over 50 years now, would know a thing or two about tape technology. Sony and magnetic recording are nearly synonymous, as the company marketed the first magnetic recording tape in Japan in 1950. In fact, Sony not only produces key components for its own tape drive products, but is also a market leader in data media offerings for numerous other tape technologies. Much of Sony's leadership position in tape tech-nology is attributed to a history of innovating and creating new products and applications for tape data storage. It's apparent in the numbers as well.

According to *Freeman Reports*, 8mm tape revenue, as represented by AIT, is expected to rise through 2005 to $630 million. Analyst Bob Abraham even notes that Sony gained 4 percent points of tape storage market share in 2000 on the strength of its AIT family. Significant increases in unit shipments of AIT, which currently has over 250,000 drives in use, illustrates a solid demand trend, as well as a significant acceptance and adoption of the AIT format. Sony is also unique in that it provides its own media and has delivered approximately 5 million pieces of media to its customers for use with its AIT tape drives, autoloaders, and libraries.

While others promise the future and are critically dependent for the execution of their roadmaps on external suppliers, Sony has demonstrated the achievement of critical areal recording densities through investments in its own key component technologies and supply base. Sony's history of achievement in tape technology is unprecedented and positions it well to achieve the necessary capacity and performance points to be the leader in tape data storage, and thereby maintain tape's competitive advantage over other technologies well into the future. Both the AIT and S-AIT roadmaps are the embodiment of this capability, commitment, and leadership. ■

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Additional information on AIT and the AIT Forum, an industry consortium of hardware and software comp-anies dedicated to adv-ancing the art of data storage and protection through the wide spread adoption of AIT drive and format technology, can be found on the AIT Forum World Wide Web site at:

www.aittape.com