Near-line Storage

Near-line storage refers to material that is stored in a manner that is more cost effective than on-line storage, but at the expense of a time delay required to retrieve it. This means, for a Video On Demand system for example, that if a user requests a video title that is not stored within the on-line storage facility the data is transferred from the much larger near-line storage unit to the on-line storage unit, and is then delivered to the user. The delay depends on the type of system used, and can be as little as a matter of minutes for a robotic system.

The near-line storage facility must be significantly cheaper than the on-line storage unit as it is used to archive much more material. Generally less than 10% of material would be stored on-line and the remaining 90% of the collection would be stored near-line.

For such huge storage requirements a jukebox style setup or robotic tape library is usually employed with the data stored on CD ROM, DAT tape, Digital Linear Tape medium (DLT) or other tape format. In the future, the Digital Versatile Disk (DVD) will also be used.

The disadvantages of magnetic tape are

- there can be no random access to the data because of the serial nature of the medium
- the rates can be quite slow

The advantages of magnetic tape are that

- they are a relatively cheap storage medium
- each tape can hold a significant amount of data

CD ROMs have the advantage that they are random access devices but the disadvantage is that each CD cannot hold enough material to make it viable. A CD ROM can hold about 640 Mbytes of data, a one hour movie encoded at 2Mbit/s requires 900Mbytes of storage. CDs are also write-once devices which makes them considerably less flexible than tape. Newer technologies will address this problem, however, and read-write DVD-RAMs are supposed to become available in 1998 with capacity of about 3 Gigabytes. Read only DVDs with capacity up to 15.9G are becoming available now.

Table 1 summarises the speed and capacity specifications for various offline data archiving media.

Device	Capacity	Data Access Speed	Media Lifetime	Write once or Write many
DAT DDS2	4-8 Gbyte	510 Kbyte/s	10-25 Yrs	WM
DAT DDS3	12-24 Gbyte	1 Mbyte/s	10-25 Yrs	WM
CD-ROM	640 Mbyte	X times 1.5 Mbits/s to Read	10 Yrs Plus	WO
CD-RW	640 Mbyte	X times 1.5 Mbits/s to Read	10 Yrs Plus	WM
Exabyte	20-40 Gbyte	3-6 Mbyte/s	10-25 Yrs	WM
DLT	35 Gbyte	5 MByte/s	30 Yrs	WM
DVD	up to	Not Known	Not Known	WO

	15Gbyte			
DTF	42Gbyte	12 Mbyte/s	10-25 Yrs	WM
Data D3	50 Gbyte	12 Mbyte/s	10-25 Yrs	WM
DVD-RAM	up to 3 Gbyte	Not Known	Not Known	WM
Magneto-optical	2.6-5.6 Gbyte	Not Known	Not Known	WM

Table 1 Device Parameters