

I.t Assignment by:

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OPTICAL

DISK

STORAGE

Definition:

★ An optical disk is an electronic data storage medium that can be written to and read using a low-powered laser beam.

History:

- ★ Optical disk was originally developed in late 1960s. First optical disk was created by James T. Russel, which stored data as micron-wide dots of light and dark. A laser read the dots, and the data was converted to an electrical signal, and finally to audio or visual output.

Some major types of optical disks:

- ★ Read only disks
- ★ Recordable disks
- ★ Erasable disks

1. Read only disk (factory pressed):

★ Read only disks are used for the distribution of standard program and data files. They are mass-produced by mechanical pressing from a master die and cannot be erased.

E.G.:

★ Music CD, CD-ROM, DVD-ROM, DVD-Video and BD-ROM (Blu-ray)

Read only disk (CD-ROM):

★ In PC the most commonly used optical storage technology is Compact Disk Read-Only Memory (CD-ROM).

★ A standard CD-ROM disk can store up to 650 MB of data, or about 70 minutes of audio.

★ CD-ROM drives can now transfer data up to speed of 7800 KBps. Data transfer speeds are getting faster.

Read only disk (DVD-ROM):

- ★ A variation of CD-ROM is called Digital Video Disk Read-Only Memory (DVD-ROM), and is being used in many newer PC's.
- ★ Standard DVD disks store up to 9.4 GB of data, enough to store an entire movie.
- ★ Dual-layer DVD can store up to 17 GB.

2. Recordable disks:

Some optical disks can be recorded once. Originally WORM (Write-Once Read-Many) disks were the only type of recordable optical disks. The information stored on these disk cannot be changed or erased. Generally the disk has a thin reflective medium deposited on the surface. These disks cost more than 10 dollars each and are not compatible with CD-ROM drives.

Recently a less expensive CD-R format became available which is compatible with CD-ROM drives. As a result, personal computer users with CD-R drive can create a permanent disk that can act as a master for CD-ROM.

Optical disk Recording modes:

Optical disks can be recorded in *the following* modes. Each mode serves different purposes.

- ★ **DISK AT ONCE:** writes the entire disc in one pass, preferred for duplication masters.
- ★ **TRACK AT ONCE:** writes individual tracks with a gap between them, used for audio CDs.

★ **SESSION AT ONCE:** writes and finalizes multiple sessions on one CD, usually not supported for CD Audio and is not universally supported by authoring software.

★ **PACKET WRITING:** writes data to the medium on demand.

3.ERASABLE DISKS:

An erasable optical disk is the one which can be erased and then loaded with new data content all over again. It is also known as rewriteable or write-many read-many (WMRM) disk. It allows information to be recorded and erased many times. Usually, there is a separate erase cycle, although this may be transparent to the user.

Erasable disk importance:

With the development of erasable disk, the most obvious limitation of optical storage systems is removed. Optical disks can now functionally replace other recording storage media. In applications where large amount of data have to be stored, but read/write access times are not stringent, this is in fact beginning to take place.

At present magneto-optical recording is the main technology used in WMRM (write-many read-many) disks

magnetic

tape storage

Magnetic tape data storage uses digital recording on to magnetic tape to store digital information. Modern magnetic tape is most commonly packaged in cartridges and cassettes. The device that performs actual writing or reading of data is a tape drive. Autoloaders and tape libraries are frequently used to automate cartridge handling.

Some important types of magnetic tape storage:

★ Reel to reel tapes

★ Tape cartridges

1. REEL TO REEL TAPE:

The reel-to-reel format was used in the very early tape recorders. Originally this format had no name, since all forms of magnetic tape recorders used it. The name arose only with the need to distinguish it from several kinds of tape cartridges or cassettes.

Reel-to-reel tape was also used in early tape drives for data storage on mainframe computers, video tape recorder machine and high quality analog audio recorders.

DIGITAL REEL-TO-REEL TAPE:

As professional audio evolved from analog magnetic tape to digital media, engineers adapted magnetic tape technology to digital recording, producing digital reel-to-reel magnetic tape machines. Digital reel-to-reel tape eliminated all the traditional quality limitations of analog tape, including background noise, high frequency roll-off, wow and flutter, pitch error, nonlinearity etc.

2. TAPE CARTRIDGES:

The term cartridge means a single reel of tape in a plastic enclosure. A tape drive that uses a single reel cartridge has a take-up reel in the drive.

A different type of tape cartridge has a continuous loop of tape wound on a special reel that allows tape to be withdrawn from the center of the reel and then wrapped up around the edge. This type is similar to cassette in that there is no take-up reel inside the tape drive.

Early tape cartridges were available before personal computers have affordable disk drives, and could be used as random access devices, automatically winding and positioning the tape, albeit with access time of many seconds.

Most modern magnetic tape systems use reels that are fixed inside the cartridge to protect the tape and facilitate handling.

Advantages of optical disks storage over magnetic tape storage:

Optical disk offers a number of advantages over magnetic storage media.

- ★ An optical disk holds much more data. The greater control and focus possible with laser beams (in comparison to tiny magnetic heads) means that more data can be written into smaller space.
- ★ Optical disks are inexpensive to manufacture.

- ★ Data stored in optical discs is relatively impervious to most environmental threats, such as power surges or magnetic disturbances.
- ★ Optical disks weigh less and did not subject to head crashes or corruption from stray magnetic fields.
- ★ Optical disks have a 30 years life time and are less vulnerable to extremes of hot and cold.

Thank u for your
consideration