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Handling New Media, MIAP Fall 05
Assignment #2
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DIGITAL STORAGE DEVICES

Device Name:
DLT (Digital Linear Tape) DRIVE

Primary Usage:
DLT Tape Drives are used exclusively for recording electronic data to DLT tapes for auxiliary storage purposes, where thousands of gigabytes of data are involved usually coming from servers. Used in conjunction with a company's Local Area Network, (LAN), and some Wide Area Networks (WAN) DLT tape drives are one of several kinds of backup drives which support various types of backup tape [others include DDS (Digital Data Storage), VXA, DAT (Digital Attached Storage)] to maintain archival copies of information generated in an enterprised network. Storage Area Networks (SAN) are created by linking multiple nodes of these type of storage drives which are connected through Fiber Channels. Early models of DLT drives were write only, while now they have read/write possibilities.
Drives record onto the tape using the tapes multiple tracks in a similar manner to analog video. DLT drives use optical as opposed to magnetic servos for track correction.

Date Introduced:
mid 1990s

Dates in Use:
late 1980s early 1990s to present

Dimensions:
Various.. Larger drives, libraries or autoloaders can house multiple drives.

Variations and/or Identifying Features:
DLT drives engage the tape much like a VCR does by pulling the tape physically out of the cartridge to read/write and to a take-up hub within the drive itself. Most other data storage tapes have the take-up hub within their cartridges. Uses traditional servo capstans and pinch-rollers.
Head Life: 30,000 hours.
5-12 Volts / 30-40 Watts

Common Manufacturers/Brands:
Quantum, Exabyte, StorageTek, Adic Archive, Dell, IBM, HP

Associated Hardware:
Depending on their need within a network they can be connected to various servers or individual arrayed hard-drives to capture data.

Associated Software:
Most basic software included on drives is for testing performance capacities and troubleshooting errors in write/read processes. Additional software will allow the drives to communicate with a variety of servers, provide maintenance and performance logs and data recovery applications. Brands include Veritas (Symantec),

Associated Media:
Only DLT Tapes (DLTI, DLTII, DLTIII, etc.)

Interface:
SCSI

Risks:
Same risk factors involved with other hard-drive technology, including temperature/overheating, strong magnetic fields, and dust free environment.

Conservation Actions:
Back up hardware or parts are currently widely available. For autoloaders and libraries, new blank cartridges to be kept on hand.

Resources:

http://h18006.www1.hp.com/storage/glossary.html
http://www.geek.com/news/geeknews/2001aug/gee20010802007099.htm
http://www.dlt.com/storage/resources-glossary.asp?ndx=T
http://info.ccone.at/INFO/FreeBSD/backups-tapebackups.html
http://www.ourbackpacks.com/dlt+tape+backup.html
http://www.dlt.com/storage/resources-whitepapers-quantum.asp
http://www.storagereview.com/guide2000/ref/hdd/geom/dataRLL.html

DIGITAL STORAGE MEDIA

Media Format:
DLT tape (Quantum)
[As opposed to LTO (Linear Tape Open) [started in 2000, manufacturer: Ultrium], AIT, DDS, VXA (Exabyte)]
1/2" (12.5mm) tape (metal particle 45%in a single spool cartridge.
Parallel track (linear serpentine) recording format (168 tracks)
Recording Density: 123kb/inch
Track Density 336 tpi (tracks per inch)
Data Compression Algorithm: DLZ (2:1)
Durability is rated in over 1 million passes (of tape, out of cartridge into drive, through rollers, over heads, etc)

Media Type:
Magnetic, analog tape

Date Introduced:
Circa mid 1980s

Dates in Use:
mid 1980s to present

Dimensions:
Varying. Approximate cartridge size 6-7" wide by 3-5" high by 9" long

Capacity:
Current high end of this format is the Super DLT tape which can store 600GB compressed and have a date transfer rate of 72MB per second. They are priced at $4,000 to $6,000.

Media Variations and/or Identifying Features:
Tape capacity and transfer rates have changed over time, with the biggest variation occurring in overall storage capacity as a result of improvements in compression rates and track density. Linear retrieval, not packet like with VXA or truly digital optical disk storage.

Common Manufacturers/Brands:
Fuji, Quantum, Exabyte, StorageTek, Adic Archive, Dell, IBM, HP

Associated Hardware:
DLT tape drives, various models, various manufacturers (Quantum, Exabyte, StorageTek, Adic Archive, Dell, IBM, HP)

Associated Software:
Used in conjunction with various software.

Primary Usage:
To store large amounts of back-up data, the archival copy from a server.

Risks:
Backwards compatibility may run out after three generations of versions of tape.

Conservation Actions:
Keep cartridges stabilized to guard against knocking and jarring. Store vertically in cool dry location. Keep away from sources of magnetic fields, sunlight and moisture. Do not apply adhesives labels to cartridge case. Do not touch tape or leader. Tapes themselves can be backed up themselves.

Resources:

http://www.enterprisestorageforum.com/continuity/features/article.php/3366591
http://64.233.161.104/search?q=cache:M_sltIve4pUJ:www.qualstar.com/tapetechcomp.pdf+%22dlz+compression%22&hl=en&ie=UTF-8, or
www.qualstar.com/tapetechcomp.pdf

FILE FORMATS

File Format Name:
ShockwaveFlash file format

File Extension(s):
.swf

Date Introduced:
late 1990s

Dates in Use:
late 1990s to present

Variations:
File format is binary based, and not human readable. Most current version of files run with Flash 7 or Flash MX. Similar vector animation file formats include SVG.

Developers:
Macromedia

Open Source/Proprietary:
.swf files are open format. However the coding for the Flash Player is proprietary.

Associated Operating System:
As a carrier file it is cross-platform, and can be embedded (as a plug in) in html or in full web interactivity. If in full, the local web browser needs to have FlashPlayer installed.

Associated Application(s):
Flash developing tools, and FlashPlayer

Associated Media: (storage):
Is not storage media specific. Flash .swf files are made to run Flash content on websites and in effect are the storage/delivery file for final Flash projects (.fla)

Compression:
Very good.

Primary Usage:
Delivery of vector graphics and animation over the web to be displayed on local browsers enabled with FlashPlayers. The .swf format is designed to be small (utilizing bit-packing) which frees it from being dependent on limited operating system protocols for readability. The .swf file is only the end product transfer file. The Flash project files are designated as .fla.

Risks:
The file format is tagged and can be backward compatible with earlier FlashPlayers.

Conservation Actions:
As the .swf is not the original source file, all assets going into creating the original project .fla file and the .fla file itself should be kept so that a new .swf can be rendered or generated in the event of its loss.

Resources:
http://www.oreillynet.com/pub/a/javascript/2002/05/24/swf_not_flash.html
http://sswf.sourceforge.net/SWFalexref.html#about_history

FILE FORMATS

File Format Name:
Advanced Streaming (or Systems) Format

File Extension(s):
.asf

Date Introduced:
1995

Dates in Use:
2000 to present

Variations:
File is binary based and not human readable. Similar file formats include QuickTime (.mov), and Audio Video Interleave (.avi), and .asx (.asf help file containing information on when and how to start the stream, interface file between web browser and internet protocols)

Developers:
Microsoft

Open Source/Proprietary:
Proprietary

Associated Operating System:
Microsoft Windows

Associated Application(s):
Windows Media Player

Associated Media: (storage):
.asf files are in a sense the shell file for portability, supposedly across players, of multi-media (motion and sound) source files.

Compression:
Original codec or sampling rates of video and audio content is key to actual compression of the source file, as asf treats only already compresed files. Asf files treat the compressed content in packets to be sent and reassembled on the client's web browser.

Primary Usage:
Delivery of audio and/or video files, most usually Windows Media Audio (.wma), and Windows Media Video (.wmv) as streams over the internet. Has the ability to contain metadata as well about the content files it is carrying.

Risks:
Compression is a variable and can be modulated at the beginning of the file creation process with use of a variety of codecs. Backwards compatibility, or obsolescence after multiple generations does not seem to be an issue currently, though it can become one if the support application changes (Windows Media Player) changes drastically. In that case a newer format would probably replace the current one entirely.

Conservation Actions:
Save all source files separately, this is usually done and maintained on the server side, and cannot be done on the client's side without special software. Continuous update of Windows Media Player is also recommended.

Resources:
http://www.microsoft.com/windows/windowsmedia/format/asfspec.aspx
http://www.afterdawn.com/glossary/terms/asf.cfm
http://avifile.sourceforge.net/asf-1.0.htm