



Cache-A LTFS (Linear Tape File System) FAQs – Updated August 2011

- 1) What is LTFS?
 - LTFS (Linear Tape File System) provides a file system on an LTO-5 cartridge that appears as a hard disk-like file system when accessed with LTFS client-side software. It is based on open software with versions available for Mac OSX, Windows, Linux and Unix.
 - LTFS has been shipping standard in all LTO-5 based Cache-A products since July 2011
 - LTFS is available as a free software update to all existing customers with LTO-5 based Cache-A archive appliances.

- 2) What benefits does LTFS provide customers as compared to a standard data tape implementations?
 - *Faster access to data:*
When a tape is mounted, the stored tape files and directories can appear on the desktop in the same way as a disk-based file system directory listing.
 - *Simple drag and drop file operations:*
LTFS increases ease of use, allowing users to simply drag and drop files to and from the tape.
 - *Compatibility across customer environments:*
 - *Application independence:*
LTFS uses a non-proprietary data format file system that is independent of specific software applications.
 - *Operating system independence:*
LTFS can address long-term archive strategies by creating a self-describing tape that is not dependent on the operating system.
 - *Increased data mobility:*
LTFS allows users to easily share content with any LTFS-enabled system using open source software to increase data mobility.

Cache-A “tar” formatted tapes provide all of these benefits within a Cache-A environment; LTFS extends these advantages to any computer that has LTFS installed.

- 3) How does LTFS work on Cache-A archive appliances?
 - When initializing new tapes, users can select whether to format each tape as our original POSIX tar-based format or as LTFS – Cache-A stores its own table of contents on every tape and remembers those contents in its Catalog regardless of format.
 - LTFS works on stand-alone Cache-A appliances and those with Library options, with most of the same features as Cache-A “tar” formatted tapes. Note that LTFS does not inherently support libraries, Cache-A’s own extensions enable LTFS with our Library options.
 - LTFS does not support spanning (multiple tape volumes) and does require some overhead in terms of tape space and time to load and unload tapes.

- 4) What are the limitations of LTFS when not used in a Cache-A archive appliance?
 - LTFS cannot be used by itself in network or in multi-user environments because the open code or “base level” deployment requires that the LTO drive be dedicated to a single computer.
 - LTFS has inherent problems that cause long waits when used with file management tools like Windows Explorer or Finder. List views are generally OK, but Icon and other graphical views cause these programs to do painfully long seeks to read each file. Restoring more than one file at a time with Explorer or Finder will be very inefficient because such operations do not take into account the order of files on tape; restores can literally take days.

- LTFS should not be used like random access hard disk drive because, due to the inherent nature of tape, accesses must occur over a linear arrangement of data. If an application tries to update a file, it will be rewritten to the end of tape and can cause long delays when restoring such files.
 - None of these limitations exist when LTFS volumes are accessed from the Cache-A web user interface:
 - Cache-A appliances know where all files live on each tape and organize restores for efficient linear access.
 - Cache-A appliances allow users to employ hard disk drive caching for file transfers and protect them from the latencies and access issues associated with linear tape.
- 5) What is the difference between a Cache-A LTFS appliance and a standard LTFS-enabled tape drive?
- The Cache-A approach eliminates the need for client-side software as opposed to base level LTFS, which must be installed on each client system.
 - LTFS makes tape look like disk-based file system and Cache-A makes tape actually behave like disk because Cache-A's appliance provides networked hard disk storage and a layer of software that overcomes the inherent limitations of standard LTFS implementation.
 - Cache-A archive appliances are networked and available to an entire facility or workgroup, whereas LTFS on a workstation will only work on that workstation.
 - Cache-A archive appliances have a built-in server that does not tie up a user workstation to perform archive and restore tasks.
 - The Cache-A appliance includes a built-in catalog, maintained in a database, that enables users to keep track of every file, folder and tape ever seen by the device.
- 6) Where did LTFS come from?
- LTFS was initially developed by IBM and was released to the open source domain. All LTO consortium members, including IBM, HP and Quantum, now support LTFS.
 - HP engineers have developed their own modifications to the IBM code to implement the LTFS file system specifically for HP tape drives.
 - All three companies have made their code openly available at no charge to encourage adoption.
 - Tapes written on Cache-A's LTFS-based appliance will be able to be read by HP, IBM and Quantum LTFS-enabled LTO-5 tape drives.
- 7) What is the relationship between Cache-A and HP about LTFS
- Cache-A collaborated with HP to develop an LTFS-enabled Cache-A archive appliances and has released a solution based upon the HP open code base
 - HP provided primary support for the LTFS code and Cache-A integrated the LTFS file system as new feature in its archive appliances.
 - HP supplies the Original Equipment Manufacturer (OEM) tape drives and library mechanisms that go into Cache-A appliance products.
 - The two companies also collaborate on marketing programs and collateral.
- 8) What does Cache-A's LTFS implementation mean to professional media & entertainment customers?
- Cache-A's appliance approach simplifies deployment and offers features valued by M&E professionals, including an intuitive graphic user interface and a catalog to keep track of user content.
 - LTO and LTFS are powerful IT technologies that are being applied to the professional M&E market. Cache-A appliances are easy to deploy -- many creative shops do not have the IT staffs necessary to implement IT technology into creative workflows.
- 9) Will LTFS work on Cache-A LTO-4 products?
- LTFS requires the new partitioning capability of LTO-5 so it will not work on LTO-4 devices.
 - Cache-A has an upgrade program for Pro-Cache customers who want to upgrade from LTO-4 to LTO-5.