

XenData6 Workstation User Guide



Version 6.22

© 2011-2018 XenData Limited. All rights reserved.

XenData is a trademark of XenData Limited.

Document last modified date: November 6, 2018

XenData6 Workstation User Guide

Version 6.22

Contents

1. Overview

1.1 Software Overview

1.2 About LTO

1.3 About LTFS and TAR

1.4 Software Licensing

1.4.1 About Licensing

1.4.2 How to License

1.5 Interchanging LTFS Formatted Tapes with Other Systems

1.6 Interchanging TAR Formatted Tapes with Other Systems

1.7 About Partial File Restore

1.8 About Logical Block Protection

1.9 About File Search

1.10 How to Obtain Software Version

1.11 Language Support

2. Volume Sets and Formatting Tapes

2.1 About Volume Sets

2.2 About Barcodes and Tape Volume Names

2.3 About Block Size

2.4 About File Fragmentation

2.5 About Tape Spanning

2.6 How to Configure a Volume Set

2.7 How to Format a Tape

2.8 How to Configure Logical Block Protection

- 3. Archiving and Restoring Files**
 - 3.1 Archiving Files to LTO**
 - 3.2 Restoring Files from LTO**

- 4. Offline Tapes**
 - 4.1 About Offline Tapes**
 - 4.2 How to Obtain LTO Cartridge Properties**
 - 4.3 How to Eject Cartridges from an LTO Drive**
 - 4.4 About LTO Shelf**
 - 4.5 How to Forget a Tape**

- 5. Tape Catalogs and Finalization**
 - 5.1 About Tape Catalogs**
 - 5.2 Build and Rebuild Catalog**
 - 5.3 About Finalizing Tapes**
 - 5.4 How to Finalize a Tape**

- 6. Report Generator**
 - 6.1 About the Report Generator**
 - 6.2 Starting the Report Generator**
 - 6.3 Creating, Saving and Restoring Reports**
 - 6.3.1 Creating Reports
 - 6.3.2 Saving Reports
 - 6.3.3 Restoring Reports
 - 6.4 Tape Contents Report**
 - 6.4.1 How to Run a Tape Contents Report
 - 6.4.2 How to Interpret a Tape Contents Report
 - 6.5 File Search Report**
 - 6.5.1 How to Run a File Search Report
 - 6.5.2 How to Interpret a File Search Report

6.6 Archive Status Report

- 6.6.1 How to Run an Archive Status Report
- 6.6.2 How to Interpret an Archive Status Report

7. Problem Diagnosis

7.1 About Problem Diagnosis

7.2 Tape Status: XenData Alert

7.3 The XenData Activity Display

1. Overview

1.1 Software Overview

XenData6 Workstation software provides high performance archiving to and restoring from LTO data tape using Windows Explorer. It supports one or more LTO tape drives attached to a computer running a Windows Operating system and manages an unlimited number of offline LTO tapes. Additionally, the software allows creation of reports for management of the archive, including the ability to list the contents of any tape, the ability to search for files and the generation of an archive status report.

For a list of the LTO drive types and Windows operating systems supported by this version of XenData6 Workstation software, please refer to the XenData web site at www.xendata.com.

Archive and restore operations are always performed using Windows Explorer. XenData6 extends Windows Explorer's capabilities to transfer files to and from LTO using drag and drop or copy and paste. Files may be archived to LTO from any accessible logical drive letter or network share. Similarly, files may be restored to any accessible drive letter or share. The system maintains file and folder structures, allowing the transfer of nested folders to and from LTO tape. Archive and restore operations are described in [Archiving Files to LTO \(3.1\)](#) and [Restoring Files from LTO \(3.2\)](#). XenData6 Workstation gives an option to copy to LTO only files that have changed or are new. This is an easy way to create an updated copy of project folders on LTO.

XenData6 Workstation can manage a large offline LTO tape archive as the files and folder structure stored on all tapes that have ever been inserted into the LTO tape drive (or drives) may be retained. The archive system will allow browsing of all the offline tapes that are retained 'on the shelf'. This is described further in [About LTO Shelf \(4.4\)](#). A file search report can generate a list of files that meet file search criteria specified by the user and will identify the tapes that contain each match.

XenData6 Workstation software writes to LTO tape using either the open standard TAR format or the LTFS exchange format. These alternative formats (also termed 'file systems') are discussed further in [About LTFS and TAR \(1.3\)](#). Tapes written with XenData6 Workstation software are interchangeable with server-based systems running XenData6 Server software. Additional capabilities provided by XenData6 Workstation software include the following.

- All file types are supported. This includes non-video files.
- Real time file verification is available for LTO-6 and LTO-7 drives. For more information, please see [About Logical Block Protection \(1.8\)](#).
- Both rewritable and non-erasable WORM LTO tape cartridges are supported. For more information, see [About LTO \(1.2\)](#).
- LTO tapes may be grouped into XenData Volume Sets. This is particularly useful when tapes are interchanged with server-based systems running XenData software.

1.2 About LTO

Linear Tape Open (LTO) is the leading tape format and uses technology developed by HP, IBM and Quantum Corporation. The latest generation of LTO is LTO-8 which provides high storage capacity, high speed file transfers and a long archival data life:

- **Huge storage capacity** Each LTO-7 tape cartridge stores 12 TB without any compression. For video files, this represents over 480 hours at a 50 Mbits/s recording rate.
- **High speed file transfers** LTO-8 tape drives write to and read from tape at up to 300 MBytes/s.
- **Long archival data life** LTO tape cartridges are available that specify a 30 year archival data life.

LTO-8 tape drives are fully read-write compatible with LTO-8 12,000 GB and LTO-7 6,000 GB tape cartridges.

LTO-7 tape drives are compatible with LTO-7 6,000 GB, LTO-6 2,500 GB and LTO-5 1,500 GB tape cartridges. LTO-7 and LTO-6 tapes are fully read-write compatible, whereas LTO-5 tapes cannot be written but can be read in LTO-7 tape drives.

LTO-6 tape drives are compatible with LTO-6 2,500 GB, LTO-5 1,500 GB and LTO-4 800 GB tape cartridges. LTO-6 and LTO-5 tapes are fully read-write compatible, whereas LTO-4 tapes cannot be written but can be read in LTO-6 tape drives.

LTO-5 tape drives are compatible with LTO-5 1,500 GB, LTO-4 800 GB and LTO-3 400GB tape cartridges. LTO-5 and LTO-4 tapes are fully read-write compatible, whereas LTO-3 tapes cannot be written but can be read in LTO-5 tape drives.

LTO tape cartridges are available as rewritable or WORM. WORM is an acronym for Write Once Read Many and the data written to WORM LTO tape cartridges cannot be altered. This means that WORM tapes cannot be reformatted and reused, unlike rewritable cartridges.



1.3 About LTFS and TAR

This version of XenData6 Workstation supports both LTFS (Linear Tape File System) and TAR (Tape ARchive) cartridge file system formats. These formats define how data is written to the tape media: LTFS and TAR use different data structures for the file data and file system metadata that are written to tape. When formatting an LTO cartridge, the user selects either TAR or LTFS as the cartridge file system format.

The LTFS format was developed by IBM and announced in 2010. Since then, it has been widely adopted, making it an exchange standard which allows cartridges to be moved between systems created by different vendors. LTFS uses two partitions on the LTO cartridge: a small index partition for maintaining the contents of the tape and a large data partition for the stored files. It is applicable to rewritable LTO-5 and later generations of LTO cartridges. A tape cartridge written using the LTFS format is self-describing and the contents of the cartridge can be determined quickly by reading an index partition on the tape. The following LTO drive and cartridge combinations support LTFS:

- LTO-8 drives and 12 TB LTO-8 rewritable cartridges
- LTO-8 drives and 6 TB LTO-7 rewritable cartridges
- LTO-7 drives and 6 TB LTO-7 rewritable cartridges
- LTO-7 drives and 2.5 TB LTO-6 rewritable cartridges
- LTO-7 drives and 1.5 TB LTO-5 rewritable cartridges in read-only mode
- LTO-6 drives and 2.5 TB LTO-6 rewritable cartridges
- LTO-6 drives and 1.5 TB LTO-5 rewritable cartridges
- LTO-5 drives that support dual partitions and 1.5 TB LTO-5 rewritable cartridges

LTO-4 rewritable cartridges and all generations of WORM LTO cartridges cannot be used with LTFS.

The TAR format was introduced in 1979 and is a widely adopted open standard supported by many operating systems including most versions of UNIX, Linux and Microsoft Windows Services for UNIX. It is applicable to all data tape types including all generations of rewritable and WORM LTO. A tape cartridge written using the TAR format is self-describing. However, when using a basic TAR implementation, the whole tape must be scanned to determine its contents. XenData6 Workstation software extends the TAR format by maintaining a catalog of the cartridge contents and writing this catalog to the end of the tape in a finalization operation.

When a finalized tape cartridge written using the TAR format is moved to another XenData system, the contents are quickly determined because the system automatically reads the catalog.

1.4 Software Licensing

1.4.1 About Licensing

XenData6 Workstation is licensed under the terms of the End-User License Agreement (EULA) which must be accepted when the software is installed. You may only use the XenData6 Workstation software to access, read data from or write data only to specific tape drives which have been assigned to an authentic and valid license.

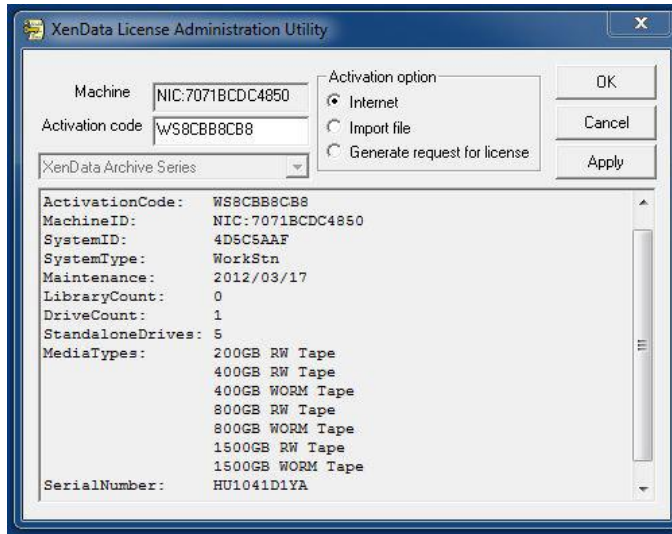
Under the terms of the EULA, if you have purchased one XenData6 Workstation license for use with one tape drive, you will assign a specific tape drive to that license. Then, you may install the XenData6 Workstation software on multiple computers and use the specific assigned tape drive on any of those computers.

1.4.2 How to License

You will need a XenData Activation Code to be able to use XenData6 Workstation software. The software is activated by using the XenData License Administration Utility which may be displayed during installation. It may also be launched after software installation as follows.

- Windows 7:
 - Click 'Start', then 'All Programs', then 'XenData'.
 - Click 'License Administration'.
- Windows 8.1 and Windows 10:
 - Open the 'Start' screen, then open the Apps view by clicking on the down-arrow near the lower-left corner of the Start screen
 - Click 'License Administration' located under the XenData section.

The License Administration Utility is shown below.



If Internet access is available for the computer being licensed, enter the Activation Code, click on 'Apply' and then 'OK' to activate.

If Internet access is not available for the computer being licensed but is available on another machine, perform the following steps to activate the software.

- Enter the Activation Code.
- Select the 'Generate request for license' option and click Apply.
- The License Administration program prompts you for a file name. Choose a convenient name for the file and click Save.
- Transfer the file that you have just saved to a different machine that has Internet access.
- Open the file in your Web browser by double clicking on it.
- Right-click on the link in the file you have just opened and select 'Save target as...' and select a location to save your license file.
- Copy the saved license file back to the notebook or workstation that is being licensed.
- In the license administration utility, select the 'Import file' option and click Apply.
- Browse to the saved XML license file and open it.

1.5 Interchanging LTFS Formatted LTO Cartridges with Other Systems

The main advantage of LTFS is the ability to exchange LTO cartridges between systems, including those from different vendors:

- **Transferring from another system to XenData6 Workstation** This includes transferring an LTFS cartridge from a non-XenData system. Simply insert the cartridge in the attached tape drive. The software will perform the following operations automatically: the cartridge will be recognized as LTFS; the file and folder contents will be obtained from the index partition; a tape catalog will be created and stored on the hard drive of the workstation computer. Files can then be written to and restored from the cartridge.
- **Transferring to another system from XenData6 Workstation** This includes transferring an LTFS cartridge to a non-XenData system. Simply eject the cartridge from the tape drive and transfer to the new system.

Data is written to LTO tape each time a file is written, deleted or renamed.

1.6 Interchanging TAR Formatted LTO Cartridges with Other Systems

Tape cartridges written using TAR may be exchanged between XenData6 Workstation systems and other XenData systems.

- **Transferring from one XenData6 Workstation system to another XenData6 Workstation system** When a finalized tape is moved to another XenData6 Workstation system for the first time, the tape catalog is automatically read by the other system and the tape catalog data is automatically stored on the c: drive. With a finalized tape the contents become automatically available for restore in the other system. However, if the tape has not been finalized, the tape catalog data must be built by scanning the tape. This is performed by using the [Build Catalog \(5.2\)](#) operation.
- **Transferring from a XenData6 Workstation system to a XenData6 Server system** For a finalized tape, the tape catalog is automatically read by the server system and the administrator must use the 'Import Folder Structure' option to make the contents of the tape available in the server archive file system. If the tape is not finalized, the catalog must first be built on the server system using the 'Build Catalog' operation.
- **Transferring from a XenData6 Server system to a XenData6 Workstation system** For a finalized tape, the tape catalog is automatically read by the workstation system. The tape cartridge contents become automatically available for restore in the workstation system. If the tape is not finalized, the catalog must first be built on the workstation system using the [Build Catalog \(5.2\)](#) operation.
- **Transferring from a XenData6 Workstation system to a Version 5 XenData server system** Finalized tapes created on a XenData6 Workstation system cannot be transferred to a version 5 XenData server system. However, non-finalized tapes may be transferred. If the tape is not finalized, the catalog must first be built on the server system and then the 'Import Folder Structure' operation should be used.
- **Transferring from a Version 5 XenData server system to a XenData6 WorkStation system** For a finalized tape, the tape catalog is automatically read by the workstation system. The tape cartridge contents become automatically available for restore in the workstation system. If the tape is not finalized, the catalog must first be built on the workstation system using the [Build Catalog \(5.2\)](#) operation.

Data is written to LTO tape each time a file is written, deleted or renamed. After writing data to a TAR formatted tape on a different system and then returning it to a XenData6 Workstation system that already knows about it, the following steps should be followed:

- use the '[Forget the Tape](#)' (4.5) operation before inserting it back in the system
- insert it in the tape drive and
- rebuild the catalog using the [Rebuild Catalog \(5.2\)](#) operation.

1.7 About Partial File Restore

XenData6 Workstation cannot restore partial files. However, it can be used to archive files to LTO cartridges which support partial file restores when the cartridges are moved to a system running XenData6 Server. To provide the ability to partially restore, the tape must be formatted using a Volume Set that has file fragmentation enabled. This is described further in [About File Fragmentation \(2.4\)](#), [About Volume Sets \(2.1\)](#) and [How to Configure a New Volume Set \(2.6\)](#).

1.8 About Logical Block Protection

End to end Logical Block Protection (LBP) provides verification of data written to LTO in real time. The XenData6 Workstation software calculates and inserts a cyclic redundancy check (CRC) value at the end of each logical block of data to be written to LTO. This is compared in real time with the CRC value determined by the read-after-write head within the LTO drive to ensure that files are written without corruption.

End to end LBP uses a capability first introduced into LTO-5 drives by IBM and LTO-6 drives by HP. Consequently, it is not available with earlier drive generations. To enable or disable end to end LBP, please refer to [How to Configure Logical Block Protection \(2.8\)](#).

1.9 About File Search

This version of XenData6 Workstation does not support use of the Windows Explorer search function to search for files stored on LTO tape. Please use the [File Search Report \(6.5\)](#).

1.10 How to Obtain Software Version

To determine the version of XenData6 Workstation, follow the steps described below.

- Right click on 'LTO Drives' in the left navigation pane of Windows Explorer.
- Select 'Properties'.
- Select the 'General' tab.

The version will be displayed.

1.11 Language Support

This version of XenData6 Workstation is available only in English.

2. Volume Sets and Formatting Tapes

2.1 About Volume Sets

A Volume Set is a group of tapes that are treated in the same way by the system. When a tape is formatted using XenData6 Workstation, it is allocated to a selected Volume Set and the following properties are defined:

- Volume Set name
- Media type: Rewritable or WORM
- File System: LTFS or TAR
- Block Size. For more information, refer to [About Block Size \(2.3\)](#).
- Enabling of File Fragmentation and Fragment File size. For more information, refer to [About File Fragmentation \(2.4\)](#).

When tapes from the same Volume Set are transferred to a system running XenData6 Server, all the tapes will appear grouped in that same Volume Set when displayed in the XenData Management Console.

After initial XenData6 Workstation software installation, the system has two pre-configured Volume Sets:

- Default LTFS
- Default TAR

These pre-configured Volume Sets will meet most user's requirements. However, to configure a new Volume Set, refer to [How to Configure a Volume Set \(2.6\)](#).

2.2 About Barcodes and Tape Volume Names

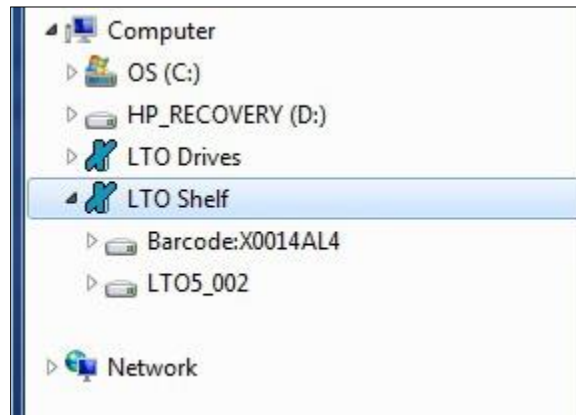
Barcode labels may be attached to LTO tape cartridges, as shown below.



Barcode labels are the preferred method for keeping track of tapes when in a tape library, as most tape libraries include a barcode reader. However, stand-alone tape drives do not have the capability of reading barcode labels but they are able to read the in-cartridge memory chip that is present in all LTO tape cartridges. When an LTO tape having a barcode label is formatted in a tape library under control of XenData6 Server, the software writes the barcode information to the in-cartridge memory chip which allows the barcode information to be displayed in Explorer by XenData6 Workstation.

When a tape cartridge is formatted using XenData6 Workstation, it is given a Volume Label. In this case, the Volume Label is displayed in Explorer. This is further described in [How to Format a Tape \(2.7\)](#).

The image below shows how two tapes are displayed in Explorer. The first is identified by its barcode as this was originally formatted in a tape library managed by XenData6 Server. The second was formatted using XenData6 Workstation and was given the Volume Label 'LTO5_002'.



2.3 About Block Size

Data is written to LTO in blocks. Block size refers to the size of these blocks.

The LTFS standard defines the block size which is variable up to 524,288 bytes. For LTFS, default block size is always used and this adheres to the LTFS standard.

The TAR format may use a range of block sizes. When an LTO cartridge is formatted as TAR using XenData6 Workstation, the block size is defined by the selected Volume Set. We recommend using the default block size as this provides high transfer rates for both archiving and restoring while maximizing the usable capacity.

2.4 About File Fragmentation

File fragmentation on LTO tape allows partial file restore when a tape is moved to a system running XenData6 Server. When file fragmentation is enabled, any file larger than the fragment size is 'sliced' into multiple fragment files before being written to tape. When restored, the fragment files are transparently concatenated by XenData software to recreate the original archived file.

XenData6 Workstation does not support partial restore, but XenData6 Server does. File fragmentation should be enabled for tapes that may be moved to a tape library under control of XenData6 Server when partial file restores are required.

File fragmentation is enabled for a Volume Set and, when enabled, the fragment size must be defined. Typically, a good value is in the range 5GB to 10GB. Configuring file fragmentation is described in [How to Configure New Volume Sets \(2.6\)](#).

2.5 About Tape Spanning

The option to span file transfers across multiple tapes is not supported in this release of XenData6 Workstation.

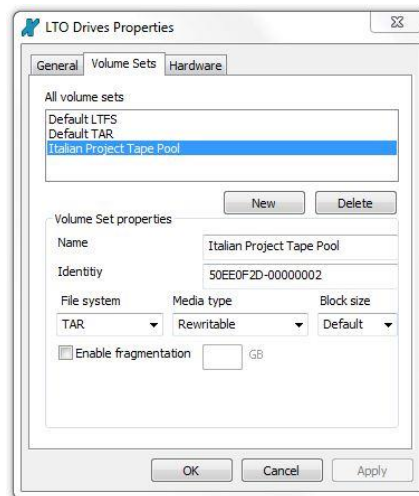
2.6 How to Configure a Volume Set

Volume Sets are described in [About Volume Sets \(2.1\)](#). The properties defined for a Volume Set are applied to a tape when it is formatted. This is described in [How to Format a Tape \(2.7\)](#).

To configure a new Volume Set, follow the steps described below.

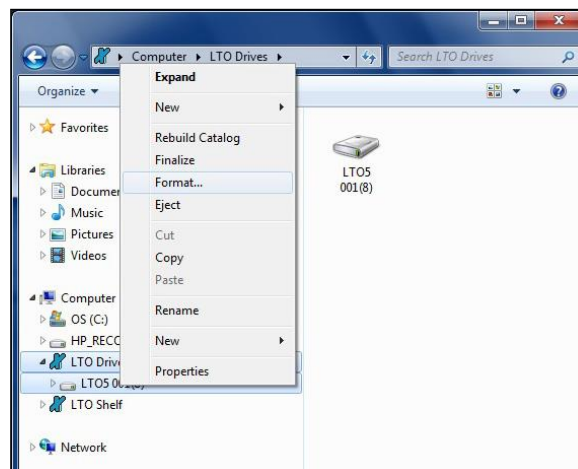
- Right click on 'LTO Drives' in the left navigation pane of Windows Explorer.
- Select 'Properties'.
- Select the 'Volume Sets' tab.
- Click 'New' and select the new Volume Set shown in the 'All Volume Sets' panel.
- Configure the Name, LTFS or TAR, Block Size, Fragmentation and Rewritable or WORM settings.
- Click 'Apply'.

This is illustrated below.

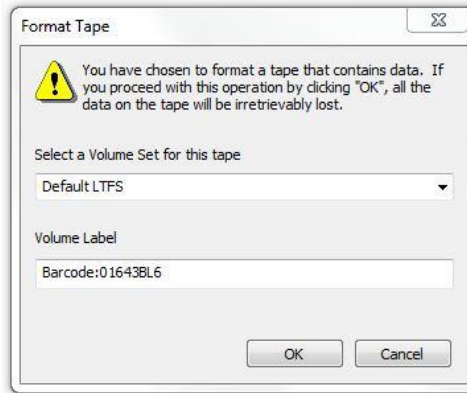


2.7 How to Format a Tape

Insert the LTO tape cartridge that is to be formatted into an available tape drive. After about two minutes, the tape cartridge will be identified in the left navigation pane of Explorer. Right click on the cartridge and select 'Format...'. .



A window will appear as shown below which allows selection of a Volume Set and a Volume Label.

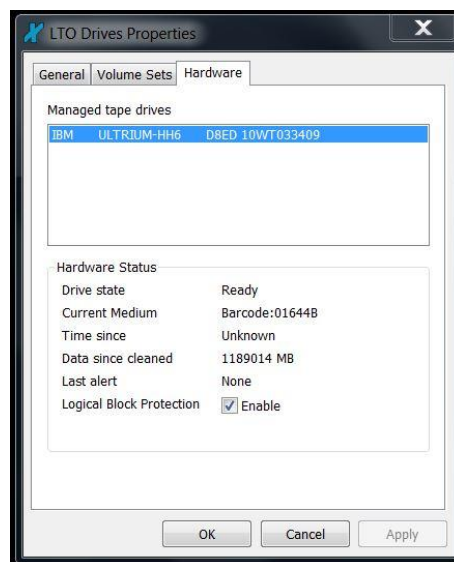


The Volume Set determines the format parameters including the use of the LTFS or TAR file system, tape block size and enabling of file fragmentation. More information about Volume Sets is provided in [About Volume Sets \(2.1\)](#) and [How to Configure New Volume Sets \(2.6\)](#). After selecting the Volume Set and defining the Volume Label, click 'OK'. The system will then format the tape.

2.8 How to Configure Logical Block Protection

Logical Block Protection is described in [About Logical Block Protection](#). To enable or disable Logical Block Protection, follow the steps described below.

- Right click on 'LTO Drives' in the left navigation pane of Windows Explorer.
- Select 'Properties'.
- Select the 'Hardware' tab.
- Select the applicable tape drive.
- Click the Logical Block Protection box to enable or disable. The enabled state is illustrated below.
- Click 'Apply'.



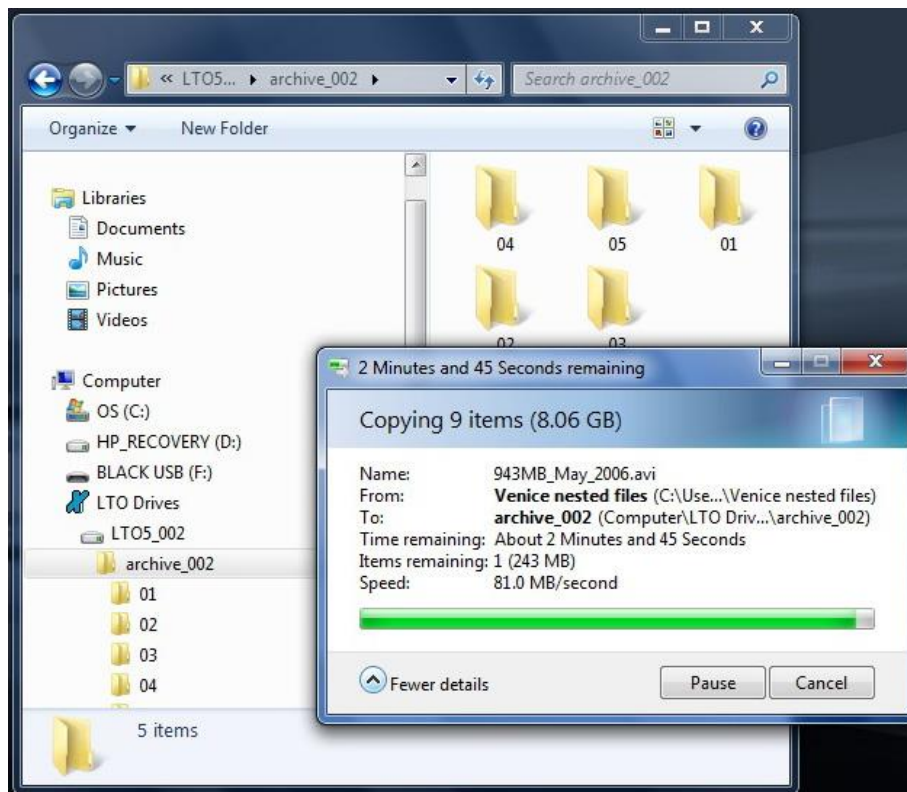
3. Archiving and Restoring Files

3.1 Archiving Files to LTO

Archive and restore operations are always performed using Windows Explorer. This means that files cannot be directly archived to LTO using other programs. XenData6 Workstation extends Windows Explorer's capabilities to transfer files to and from LTO using drag and drop or copy and paste. The system maintains file and folder structures, allowing the transfer of nested folders to and from LTO tape.

Before copying a file or folder to tape, ensure that the required tape cartridge is in a tape drive. The tape will appear under 'LTO Drives' in the left navigation pane of Explorer and the existing folder structure may be expanded and displayed in the left and right panes of Explorer.

To archive to LTO, simply copy or cut the required files or folders from any accessible logical drive letter or network share and paste to the LTO tape folder structure. Alternatively drag and drop the required files or folders. A progress bar will be displayed during the archive operation, as illustrated below. Note that the time remaining, as calculated by Windows Explorer, is often greatly over-estimated.



When archiving multiple files to LTO, the operation may be paused or cancelled by clicking on the 'Pause' or 'Cancel' buttons as shown above. Note that this does not affect the current file being written to LTO.

XenData6 Workstation supports overwriting of files, file deletion and file rename using standard Windows Explorer operations. Files on tape may be overwritten by copying and pasting or dragging and dropping a file of the same name to the same position in the folder structure. In this case, a Window will appear which gives the option to either 'Copy and Replace' or 'Don't Copy'. When files

are overwritten, new versions are saved to tape and only the latest version will be available for restore.

Empty folders may be copied to LTO, and are supported for both TAR and LTFS.

When compared to writing to an NTFS disk volume, the following three limitations apply:

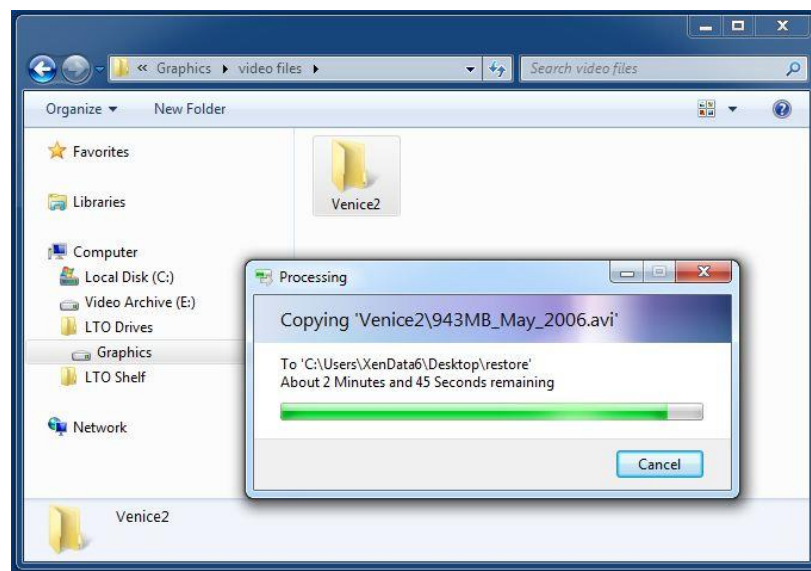
- Alternate Data Streams (ADS) are not written to LTO. ADS allows one or more extra streams of data to be attached to a file in addition to the main data stream. When files with ADS are archived to LTO using XenData6 Workstation, the main data stream is written to LTO but any Alternate Data Streams are not.
- It is not possible to rename a folder on LTO after files or sub-folders have been added to it.
- Copying zero-size files is not supported.

3.2 Restoring Files from LTO

Archive and restore operations are always performed using Windows Explorer. This means that files cannot be directly restored from LTO using any other program. XenData6 Workstation extends Windows Explorer's capabilities to transfer files to and from LTO using drag and drop or copy and paste. The system maintains file and folder structures, allowing the transfer of nested folders to and from LTO tape.

Before restoring a file or folder from tape, ensure that the required tape cartridge is in a tape drive. The tape will appear under 'LTO Drives' in the left navigation pane of Explorer and the existing folder structure may be expanded and displayed in the left and right panes of Explorer.

To restore from LTO, simply copy the required files from the LTO tape folder structure and paste to any accessible logical drive letter or network share. Alternatively drag and drop the required files or folders. A progress bar will be displayed during the restore operation. Note that the time remaining, as calculated by Windows Explorer, is often greatly over-estimated.



4. Offline Tapes

4.1 About Offline Tapes

When a tape is ejected from a drive, it becomes offline. XenData6 Workstation retains information about the file and folder structure for all offline tapes. Of course, files cannot be restored until the offline tape is inserted back into a tape drive.

Offline tapes are shown in the left navigation pane of Windows Explorer under 'LTO Shelf'. The folder and file structure stored on each offline tape may be displayed in the left and right panes of Windows Explorer. This is described further in [About LTO Shelf \(4.4\)](#).

Reports may also be run to list the contents of any offline tape, list the offline tape locations for files that meet specified file search criteria and to list the status of all offline tapes.

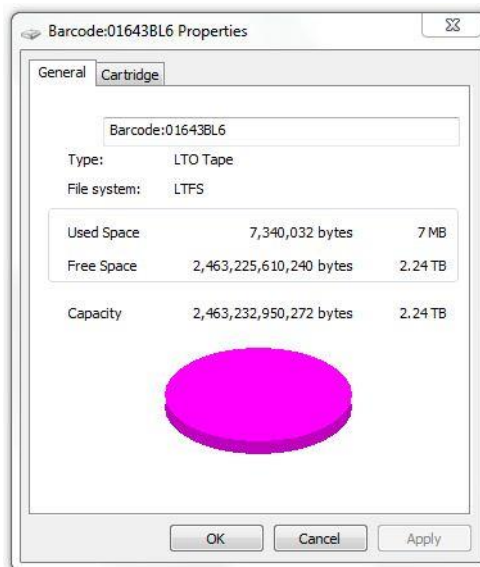
There is an option to remove the data about an offline tape. This operation is performed by using the '[Forget this Tape \(4.5\)](#)' function.

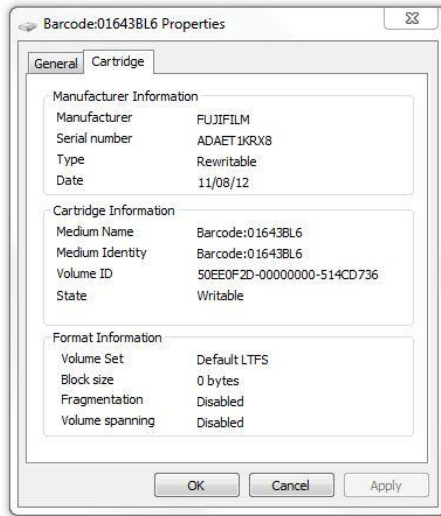
4.2 How to Obtain LTO Cartridge Properties

LTO cartridge properties may be obtained for tapes in a tape drive and for offline tapes as follows.

- Launch Windows Explorer.
- Right click on the tape under 'LTO Drives' or 'LTO Shelf' in the left hand navigation pane and select Properties.
- Select either the 'General' or 'Cartridge' Tab.

The available properties are shown below.

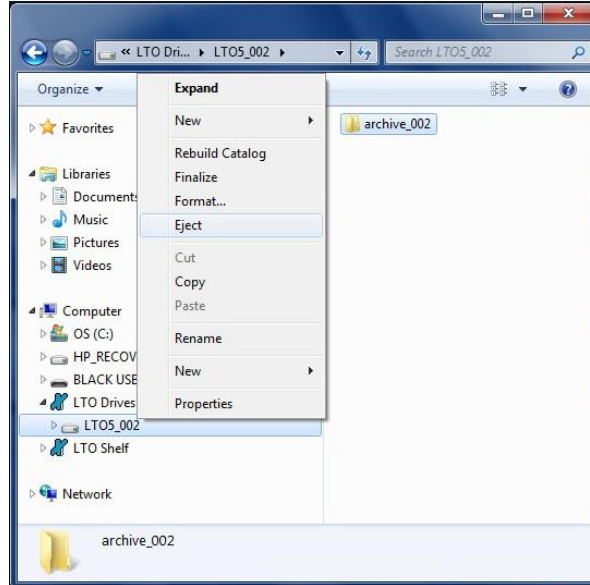




4.3 How to Eject Cartridges from an LTO Drive

When a cartridge is ejected from an LTO drive, it becomes offline. It is no longer displayed under 'LTO Drives' in Windows Explorer but continues to be displayed under 'LTO Shelf'.

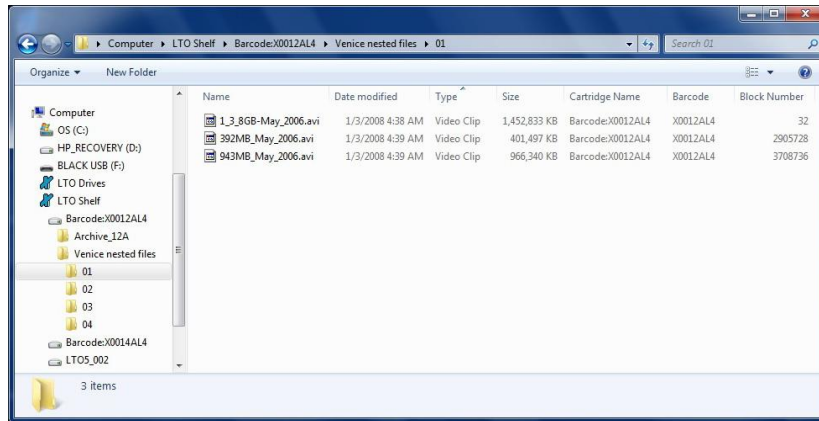
An LTO cartridge may be ejected from a tape drive by either depressing the eject button on the drive or by selecting the tape drive in the left navigation pane of Windows Explorer and clicking on 'Eject', as shown below.



4.4 About LTO Shelf

LTO Shelf appears in the left navigation pane of Windows Explorer and it contains all of the tapes that the system knows about including the tapes that are currently in a tape drive.

The folder and file structure stored on each tape may be expanded and displayed in the left and right panes of Windows Explorer as shown below.



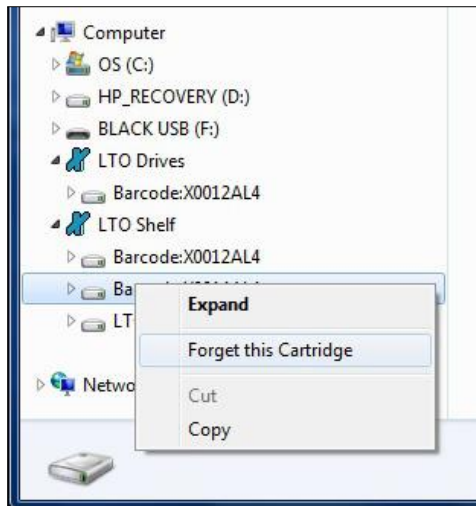
Offline tapes may be removed from LTO Shelf by using the 'Forget this Tape' operation as described in [How to Forget a Tape \(4.5\)](#).

4.5 How to Forget a Tape

LTO Shelf displays the folder and file structure for all tapes that the system knows about. To remove a tape and its folder and file structure from the LTO Shelf display, use the Forget this Tape function, as described below.

- Ensure that the tape is offline. If necessary eject it from a tape drive as described in [How to Eject a Tape \(4.3\)](#).
- Right click on the tape under LTO Shelf in the left navigation pane of Windows Explorer and select 'Forget this Tape'.

This is illustrated below.



5. Tape Catalogs and Finalization

5.1 About Tape Catalogs

A Tape Catalog contains the contents of a specific LTO tape cartridge. In XenData documentation, it is termed either a 'Tape Contents Catalog' or a 'Tape Catalog' for short.

When an LTO cartridge is formatted using either TAR or LTF5, tape catalog data is created for it and is stored in the following folder: c:\ProgramData\XenData\catalogs\.

When a tape formatted as TAR is [finalized \(5.3\)](#), a Tape Catalog is written to the end of the tape. The presence of a Tape Catalog greatly reduces the time to move a TAR formatted tape from one XenData system to another. When a TAR formatted cartridge containing a Tape Catalog is moved to a new system for the first time, the Tape Catalog is read and the catalog data is automatically stored on the new system. This means that there is no need to perform a [Build Catalog \(5.2\)](#) operation which can take several hours.

The finalize operation is not applicable to a cartridge formatted with LTF5 because the cartridge contents are retained in the index partition. When an LTF5 formatted cartridge is moved to a new system for the first time, the small index partition is read and the contents are quickly and automatically obtained.

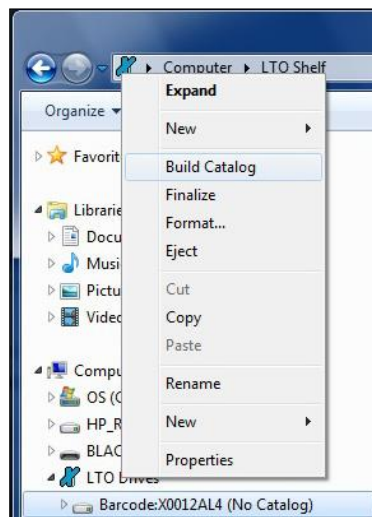
5.2 Build and Rebuild Catalog

A [Tape Catalog \(5.1\)](#) is automatically written to the end of a TAR formatted tape when it is [finalized \(5.3\)](#). If a finalized tape is moved to another XenData system for the first time, the tape catalog is automatically read by the system and the tape catalog data is automatically stored on the c: drive of the system. However, if the tape has not been finalized, the tape catalog data must be built by scanning the tape. This is performed by using the Build Catalog operation.

If a TAR formatted tape that the system already knows about has been updated by writing, deleting or renaming one or more additional files on another system, you should perform the following steps:

- use the 'Forget the tape' function before inserting it back in the system
- insert it in the tape drive and
- rebuild the catalog using the Rebuild Catalog operation.

To build or rebuild the catalog data, right click on the applicable tape under 'LTO Drives' in the left navigation pane of Windows Explorer and select Build Catalog or Rebuild Catalog, as illustrated below.



5.3 About Finalizing Tapes

Finalizing is an operation applicable to TAR formatted cartridges; it does not apply to the LTFS format.

Finalizing a TAR formatted tape results in a [Tape Contents Catalog \(5.1\)](#) being written to the end of the tape, followed by special tape marks that prevent further files being written to that tape. XenData6 Workstation automatically finalizes a tape when it becomes 98% full. Partially filled tapes may also be finalized. This is described in [How to Finalize Tapes \(5.4\)](#).

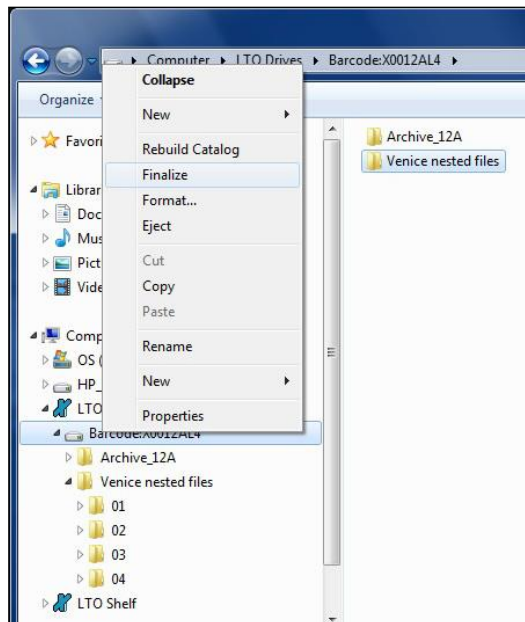
The presence of a Tape Content Catalog on a TAR formatted LTO cartridge greatly reduces the time to move a tape from one XenData system to another. When moving a TAR formatted tape that has not been finalized (and hence does not have a catalog on the tape) to another XenData system for the first time, the catalog data must be built on that system by using the [Build Catalog \(5.2\)](#) operation. This can take several hours. Whereas for a finalized tape, the operation is automatic and takes only a few minutes.

5.4 How to Finalize a Tape

The finalize operation is described in [About Finalizing Tapes \(5.3\)](#). When a TAR formatted tape becomes 98% full, it is automatically finalized by the system. A partially filled TAR formatted tape may be finalized as described below.

- Ensure that the tape to be finalized is present in a tape drive and is shown under 'LTO Drives' in the left navigation pane of Windows Explorer.
- Right click on the tape under 'LTO Drives' and select Finalize.

This is illustrated below.



6. Report Generator

6.1 About the Report Generator

The XenData6 Workstation Report Generator may be used to create the following report types.

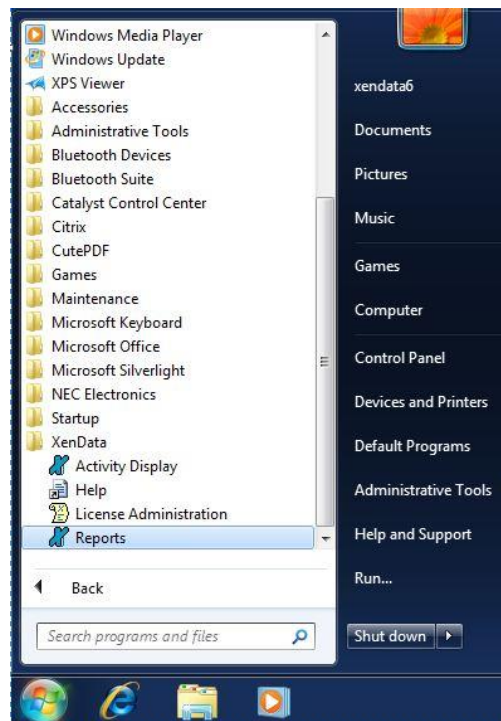
- **Archive Status** This may be used to obtain capacity and free space for all tape cartridges that the system knows about.
- **File Search** This identifies all files that match user-defined search criteria and identifies the tapes on which these files are located.
- **Tape Cartridge Contents** This is used to list the files contained on any tape cartridge that the system knows about. The list may be filtered to match user-specified search criteria.

Reports can be saved in a number of different formats, including as a text file that may be imported into Microsoft Excel.

6.2 Starting the Report Generator

The Report Generator is launched as follows.

- Windows 7:
 - Click 'Start', then 'All Programs', then 'XenData'.
 - Click 'Reports' as shown below.
- Windows 8.1 and Windows 10:
 - Open the 'Start' screen, then open the Apps view by clicking on the down-arrow near the lower-left corner of the Start screen
 - Click 'Reports' located under the XenData section.

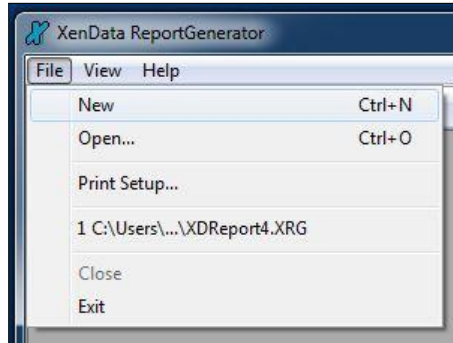


This launches the XenData Report Generator. Then click 'File' and select either 'New' to create a new report or 'Open' to open an existing report.

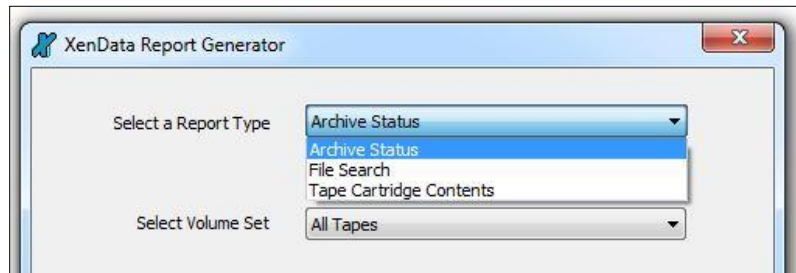
6.3 Creating, Saving and Restoring Reports

6.3.1 Creating Reports

Start the Report Generator program and from the initial page, select 'File' and then 'New' as shown below.



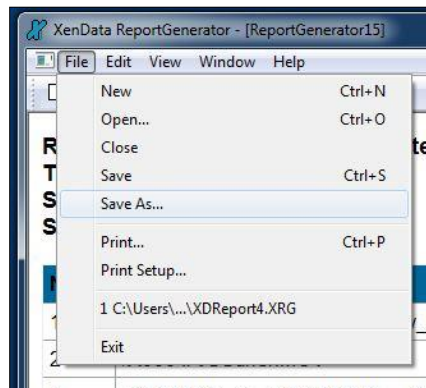
Then select the required report type from the drop down menu as shown below.



6.3.2 Saving Reports

A report can be saved in three different formats: Report Generator format (.XRG), tab delimited plain text (.txt) or XML. The XRG format is the only format which can be displayed by the Report Generator. The text format is useful for exporting the results to Microsoft Excel.

To save a report, select 'File' and then 'Save As' as shown below.

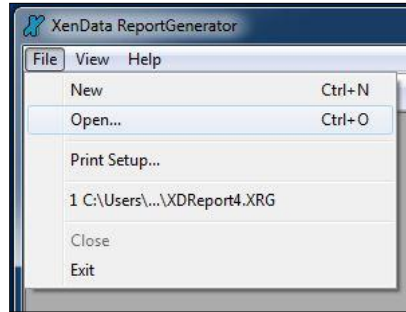


Then browse to the required location, select the file name and format and then click 'Save'.

6.3.3 Restoring Reports

The Report Generator will display reports saved in the XRG format only.

Start the Report Generator program and from the initial page, select 'File' and then 'Open' as shown below.



Then browse to the location of the saved report; select the required XRG file and open it.

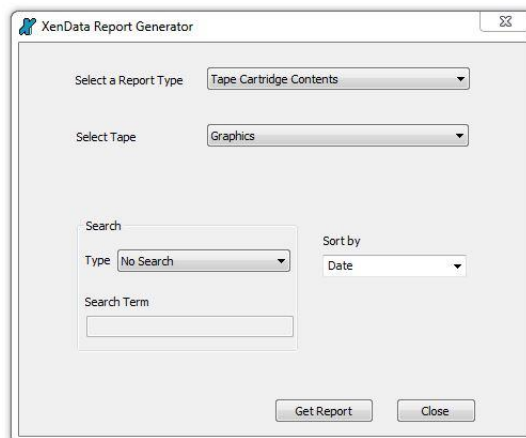
6.4 Tape Contents Report

6.4.1 How to Run a Tape Contents Report

Start the Report Generator, select 'File' and 'New'. Then, select the following:

- 'Tape Cartridge Contents' as the report type
- The tape by its Volume Label
- Search criteria - Select 'No Search' to list all files on the selected tape; alternatively select 'File Name Text Search' to filter the listed files using a text Search Term.
- The 'sort by' type which sorts the report results by either the date that the file was written to tape or the file name

This is illustrated below.



Then click 'Get Report'.

The Search Term is case insensitive and the path folder divider may be entered as '\ ' or '/'. If you enter a Search Term such as 'abc', all files written on the selected tape that contain 'abc' in the file name or path will be listed in the report.

An asterisk may be used as a wildcard character; for example, '\venice2*avi' will search for all files that contain a folder named 'venice2' in the path followed by 'avi'.

6.4.2 How to Interpret a Tape Contents Report

An example of a Tape Cartridge Contents report is shown below.

Report Type: Tape Cartridge Contents				
Tape: Graphics				
Search Type: None				
Sorted by: Date				
No	File Name	Generation	Version	File Size (bytes)
1	/graphics/Photos/2007/Black Eye/DSCN0965.JPG	0	1	652,947
2	/graphics/Photos/2007/Black Eye/DSCN0966.JPG	0	1	774,546
3	/graphics/Photos/2007/Black Eye/DSCN0968.JPG	0	1	767,713
4	/graphics/Photos/2007/Black Eye/Thumbs.db	0	1	16,384
5	/graphics/Photos/2007/Cardiff 2007/DSCN0930.JPG	0	1	713,328
6	/graphics/Photos/2007/Cardiff 2007/DSCN0932.JPG	0	1	713,537
7	/graphics/Photos/2007/Cardiff 2007/DSCN0933.JPG	0	1	783,029
8	/graphics/Photos/2007/Cardiff 2007/DSCN0934.JPG	0	1	754,990
9	/graphics/Photos/2007/Cardiff 2007/DSCN0940.JPG	0	1	331,910
10	/graphics/Photos/2007/Cardiff 2007/DSCN0941.JPG	0	1	557,096
11	/graphics/Photos/2007/Cardiff 2007/DSCN0942.JPG	0	1	787,706

The display columns are explained below.

No. This is the number of the file in the display sorted by either tape order or file name, as defined by the 'Sort by' selection.

File Name This is the file name including the full path.

Generation When a file of a given name and path is first created, it is termed generation 0. Every time the file is deleted and then a new file of the same name containing data is created, the system increments the generation number. Note that each time the generation number is incremented, the version starts again with version 1 of the new file.

Version If a file is updated with a newer version by overwriting or appending, the XenData software assigns a new version number. A file's version number increases by one every time it has data written to it. Note that the version number does not increase for every individual write operation, just for every file open that is followed by a write. Version 0 of a file never contains any data; the first time an application writes to the file, the version number is incremented to 1.

File Size in bytes

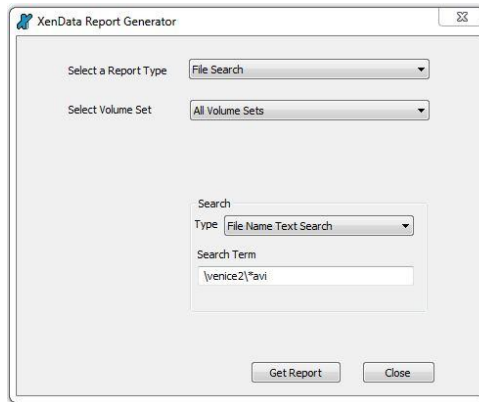
6.5 File Search Report

6.5.1 How to Run a File Search Report

Start the Report Generator, select 'File' and 'New'. Then, select the following:

- 'File Search' as the report type
- 'All Volume Sets' or a specific Volume Set
- Search - Select 'File Name Text Search' and enter a Search Term to search file name and path.

This is illustrated below.



Then click 'Get Report'.

The Search Term is case insensitive and the path folder divider may be entered as '\ ' or '/'. If you enter a Search Term such as 'abc', all archived files that contain 'abc' in the file name or path will be listed in the search report. An asterisk may be used as a wildcard character; for example, '\\venice2*avi' will search for all files that contain a folder named 'venice2' in the path followed by 'avi'.

6.5.2 How to Interpret a File Search Report

A File Search Report lists all the files that meet the search criteria. An example of a File Search Report is shown below.

No	File Name	Generation	Version	File Size (bytes)	Volume Label
1	/X0004A/Venice2/1_3_8GB-May_2006.avi	0	1	1,487,700,480	Barcode:X0004AL4
2	/X0004A/Venice2/392MB_May_2006.avi	0	1	411,132,928	Barcode:X0004AL4
3	/X0004A/Venice2/943MB_May_2006.avi	0	1	989,532,160	Barcode:X0004AL4
4	/Venice2/1_3_8GB-May_2006.avi	0	1	1,487,700,480	Barcode:X0003AL4
5	/Venice2/392MB_May_2006.avi	0	1	411,132,928	Barcode:X0003AL4
6	/Venice2/943MB_May_2006.avi	0	1	989,532,160	Barcode:X0003AL4

The display columns are explained below.

No. This is the number of the file in the display.

File Name This is the file name including the full path.

Generation When a file of a given name and path is first created, it is termed generation 0. Every time the file is deleted and then a new file of the same name containing data is created, the system increments the generation number. Note that each time the generation number is incremented, the version starts again with version 1 of the new file.

Version If a file is updated with a newer version by overwriting or appending, the XenData software assigns a new version number. A file's version number increases by one every time it has data written to it. Note that the version number does not increase for every individual write operation, just for every file open that is followed by a write. Version 0 of a file never contains any data; the first time an application writes to the file, the version number is incremented to 1.

File Size in bytes

Volume Label This is the volume label of the tape cartridge which contains the file.

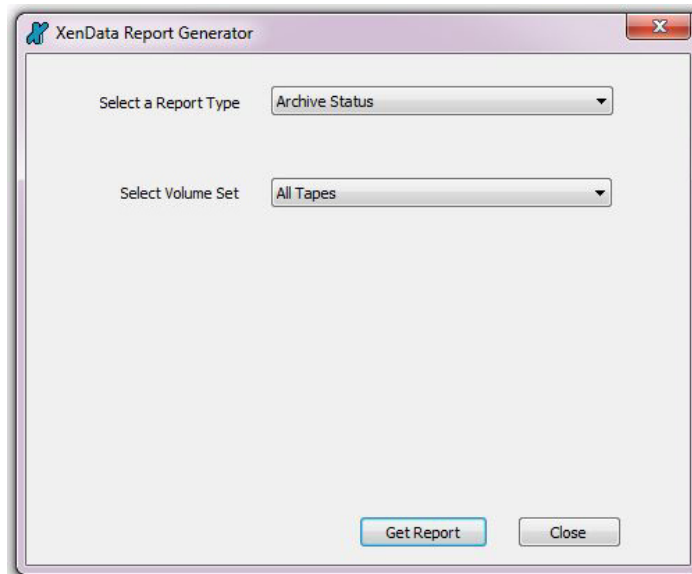
6.6 Archive Status Report

6.6.1 How to Run an Archive Status Report

Start the Report Generator, select 'File' and 'New'. Then, select the following:

- 'Archive Status' as the report type
- 'All Tapes' or a specific Volume Set

This is illustrated below.



Then click 'Get Report'.

6.6.2 How to Interpret an Archive Status Report

An example of an Archive Status Report is shown below.

Report Type: Archive Status					
Tape: All Tapes					
No	Volume Label	Capacity (in GB)	Used Space (in GB)	Free Space (in GB)	Status
1	Barcode:X0014B	780.5	8.07	772.5	Writable
2	Barcode:X0015A	780.6	2.69	777.9	Writable
3	Jan_20	781.5	8.07	773.5	Writable

The display columns are explained below.

No. This is the line number for the tape in the display.

Volume Label This is the Volume Label for the tape cartridge.

Capacity (in GB) This is the capacity of the tape cartridge.

Used Space (in GB) This is the used space for the tape cartridge.

Free Space (in GB) This is the available free space for the tape cartridge.

Status This gives status for the tape cartridge such as Writable or Finalized.

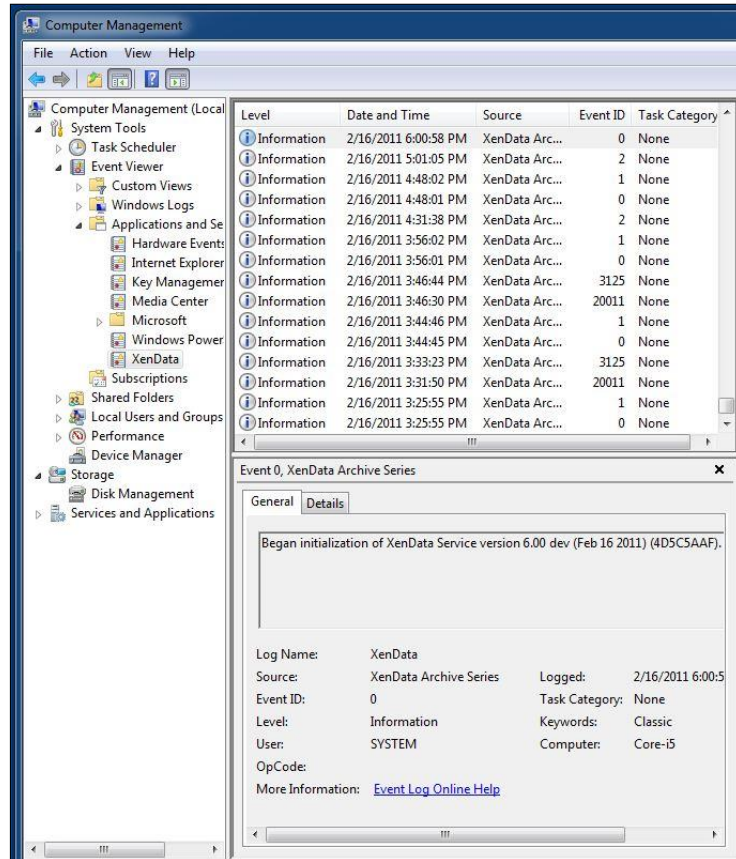
7. Problem Diagnosis

7.1 About Problem Diagnosis

The main tool for diagnosing a problem is the Windows Event Viewer. This is launched as follows.

- Windows 7:
 - Click 'Start'
 - Right click 'Computer', and then 'Manage'.
 - Expand 'Event Viewer' in the left pane, and then expand 'Applications and Services Logs'
 - Click on 'XenData'
- Windows 8.1 and Windows 10:
 - Right-click on 'Start'
 - Select 'Event Viewer', then expand 'Applications and Services Logs'
 - Click on 'XenData'

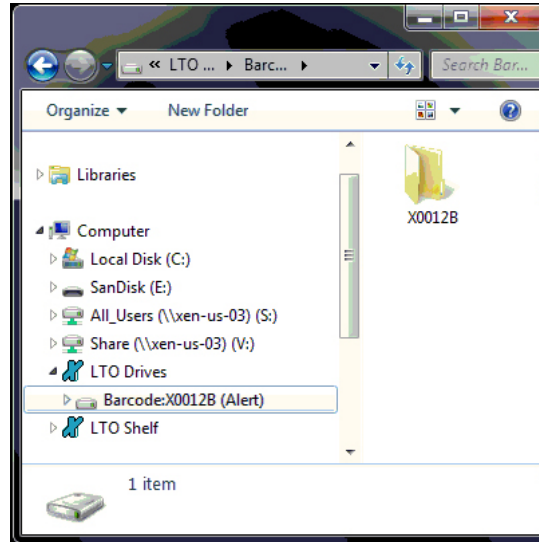
The XenData Event Log is illustrated below.



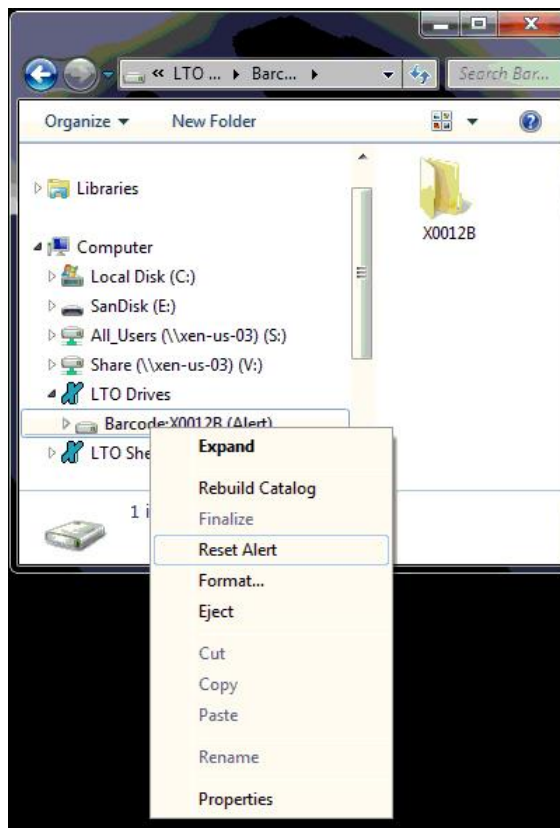
In addition, the [XenData Activity Display \(7.3\)](#) can provide diagnostic information in case of a problem.

7.2 Tape Status: XenData Alert

The system will put a tape into an 'Alert' state if there is a problem associated with a tape cartridge that must be corrected before additional data is written to that cartridge. The cartridge is identified with 'Alert' in the left navigation pane of Windows Explorer, as illustrated below.

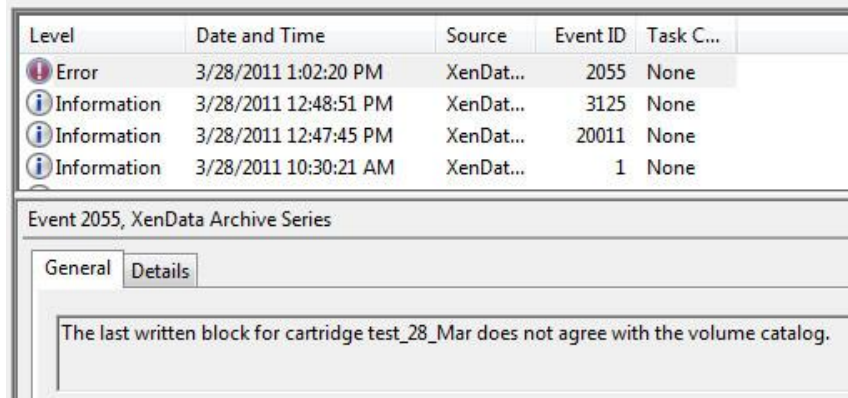


The problem may be corrected by selecting 'Reset Alert' for the tape cartridge, as illustrated below.



If this does not correct the problem, please obtain more information by viewing the Windows Event Log as described in [About Problem Diagnosis \(7.1\)](#).

If the contents catalog gets out of synchronization with the actual tape cartridge, the system will put the cartridge into an 'Alert' state. In this case, the following message will be displayed in the event log.

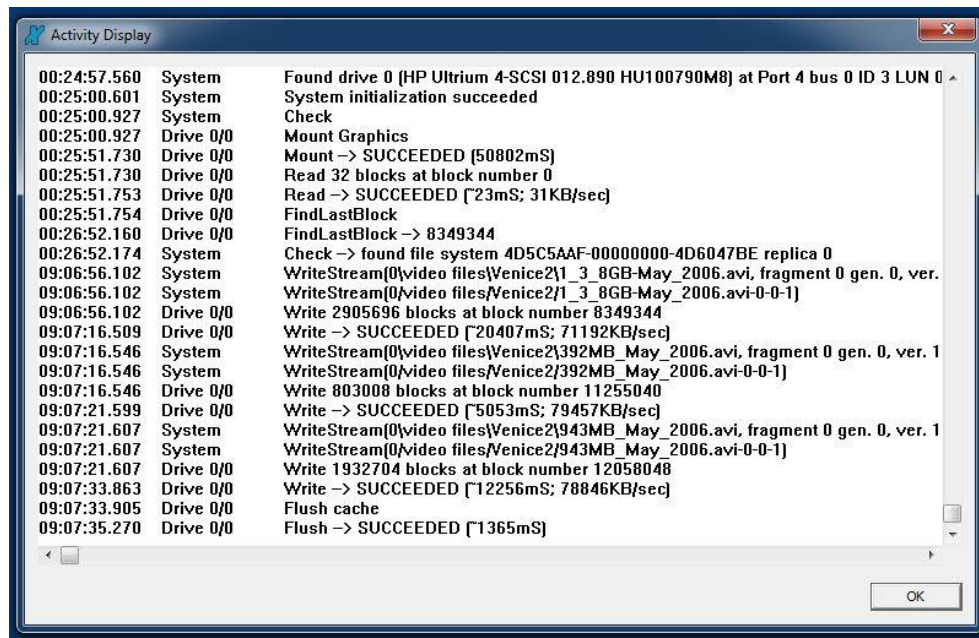


This will occur, for example, if additional data has been written to the cartridge using another system.

To correct this problem, [rebuild the catalog \(5.2\)](#) and then select 'Reset Alert'.

7.3 The XenData Activity Display

The Activity Display is a useful diagnostic for XenData support staff in case of problems and is illustrated below.



It shows interaction of the archive system with the LTO tape drives and is launched as follows.

- Windows 7:
 - Click 'Start', then 'All Programs', then 'XenData'.
 - Click 'Activity Display'.
- Windows 8.1 and Windows10:
 - Open the 'Start' screen, then open the Apps view by clicking on the down-arrow near the lower-left corner of the Start screen
 - Click 'Activity Display' located under the XenData section.