Product Brief

X100 Archive Systems

XenData X100 archive systems manage LTO and ODA robotic libraries that scale to 100+ PB. They support leading enterprise libraries, including from HPE, IBM, Oracle, Qualstar, Quantum, Sony and Spectra Logic.

The X100 is available as a clustered system with no single point of failure and as a single high-performance server. It is powered by XenData Archive Series software which is trusted by many of the world's largest media companies.

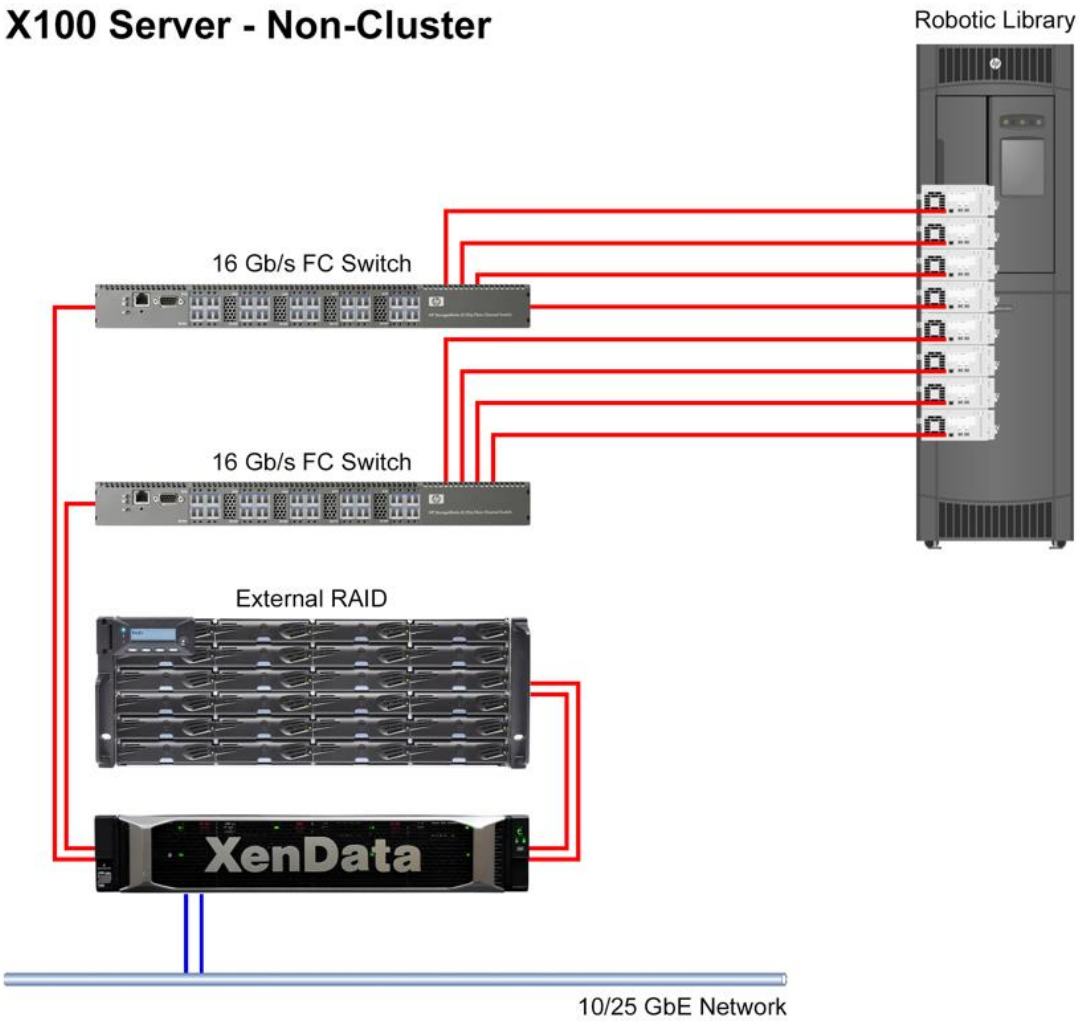
Overview

LTO data tape and Sony Optical Disc Archive cartridges in robotic libraries provide highly scalable and secure storage suitable for massive digital archives. XenData X100 systems manage one or more robotic libraries, providing high performance and rich functionality. They are powered by XenData Archive Series software which is trusted by over 1,500 organizations in more than 90 countries, including many of the world's largest media companies.

X100 systems use the power of modern servers to simplify the archive architecture. No longer are complex architectures with many servers required, even for the largest media archives. The XenData software that powers the X100 is optimized to take advantage of today's high-performance servers with dual Xeon processors and Windows Server operating systems.

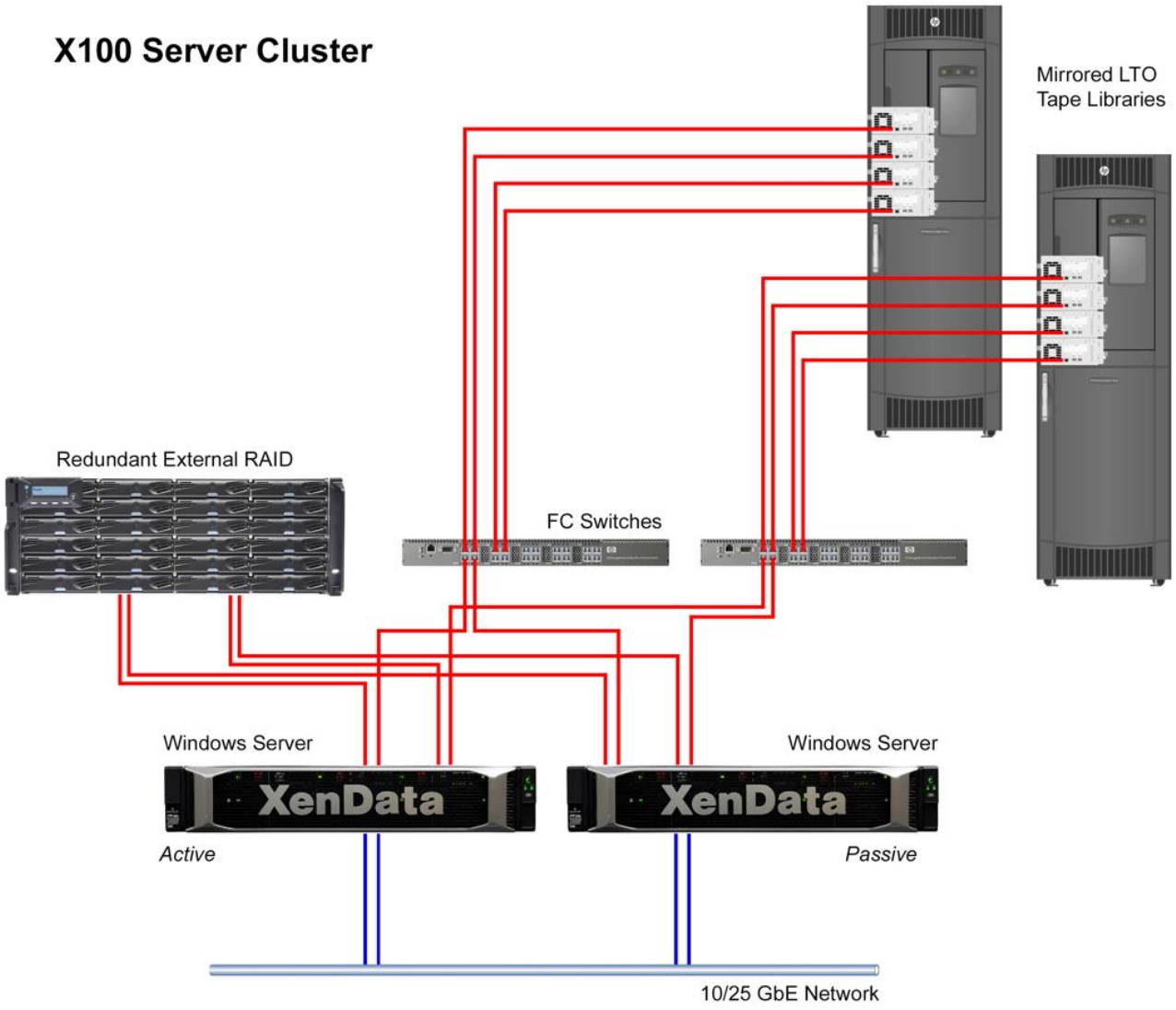
Single Server Configurations

The X100 is available in a single server configuration as illustrated below. The software and hardware are optimized to provide maximum performance. For example, the external RAID provides performance-enhancing caching of files written to the archive. Furthermore, it allows frequently accessed files to be retained online.



Clustered Configurations

The X100 is available as a clustered system with no single point of failure. An example configuration is illustrated below which shows an X100 system managing two LTO libraries and mirroring files across them. Other configurations with a single enterprise-class library are supported.



Automated Tiered Storage Policies

The administrator defines policies that automatically determine where files will be physically stored on the digital archive. These policies support tiered storage management. Three levels of storage hierarchy are supported:

- **Online disk** with one instance of a file on the external RAID and, in addition, there will typically be one or more instances on LTO or ODA. In this case, the file will be retrieved from disk when accessed over the network.

- **Near-line** with at least one instance of a file on an LTO or ODA cartridge within the library and no instances on RAID. When a file on near-line LTO or ODA is accessed over the network, the XenData software automatically transfers the file over the network directly from LTO/ODA in response to the network read request.

- **Offline** with no instances on RAID and instances of a file on one or more LTO or ODA cartridges, all of which have been exported from the robotic library. All XenData systems, including the X100, are licensed for a unlimited number of offline cartridges.

Multiple Interfaces

Both the clustered and non-clustered configurations offer three interfaces which can be used simultaneously:

- **File-Folder Interface** which scales to billions of files and hundreds of petabytes. Writing to and reading from this interface is just like writing to a disk-based volume. It supports SMB, NFS, FTP network protocols as well as local file transfers.

- **Object Storage Interface** which is ideal for remote access. It presents an S3 interface, supporting HTTPS and HTTP protocols.

- **XML API** which provides frame accurate timecode based partial file restores for video archives. The XML instructions include the ability to pull assets from a source location and push them back to that location or another destination.

Overview of Additional Functionality

Standard LTO Formats: LTFS and TAR

When used with LTO, the system uses the LTFS or TAR format, as defined by the storage policy.

Standard ODA Format

Sony Optical Disc Archive cartridges use only one format, no matter what software is initializing and writing to the cartridge. This format is based on the UDF optical disc file system format and is used by all XenData systems.

Cartridge Replication

Automatically generates up to 8 replica LTO cartridges. Automatic cartridge replication is not supported with ODA libraries.

Unlimited Externalized Cartridges
The system supports an unlimited number of externalized cartridges.

Multiple Cartridge Pool Support
The software allows groups of files to be allocated to specified groups of LTO or ODA cartridges.

Auto-Expansion of Cartridge Pools
The system will dynamically expand cartridge pools to meet capacity demands, minimizing system administration.

End-to-End Verification
Provides an automated check-sum operation for all data written to LTO.

Optimized Restores
The system restores a queue of files in the shortest possible time. The restore requests are processed in an order that minimizes unnecessary tape movement or, in the case of ODA, minimizes unnecessary disc swapping.

Partial File Restore
The XenData XML API is available with partial file restore (PFR) based on timecodes.

File Version Control
The software provides comprehensive file version control. Deleted files and old file versions may be restored from LTO or ODA.

Easy Migration to Later Generations
The XenData archive software makes for easy system upgrades, going from an older to a later generation of LTO or ODA.

Cartridge Contents and Search Reports
The files contained on any cartridge, including offline cartridges, can be listed in a report. Additionally, search reports list all the files and their cartridge barcode locations that match a search term.

Archive to Cloud Option
Allows files to be stored on cloud object storage in addition to LTO or ODA.

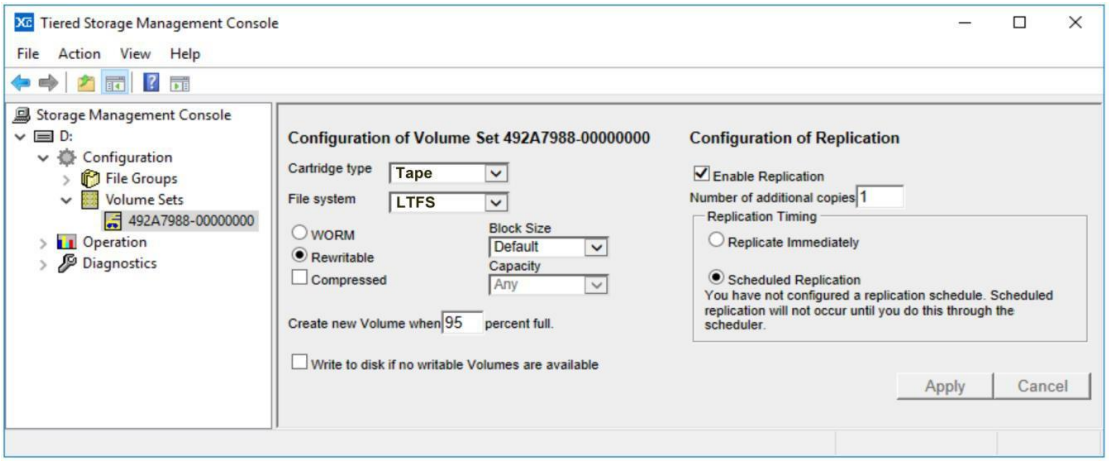
Multi-Site Sync Option
When you have LTO or ODA archives at different facilities, you can use XenData Multi-Site Sync to integrate them in a single global file system accessible from any location. The different sites communicate via secure HTTPS.

Industry Standard File Security
The appliance runs a Windows Server operating system and integrates fully with the Microsoft Windows security model based on Active Directory.

Defining Storage Policies

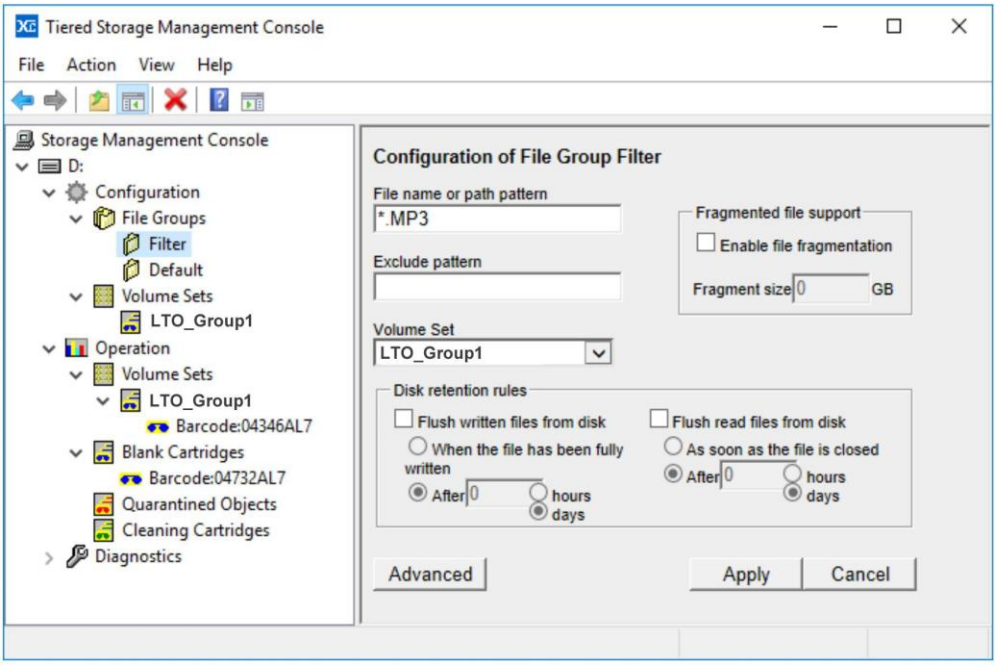
The XenData software provides a Tiered Storage Management Console which is used to define storage policies. The console supports configuration of many different policies, tailored to the needs of the different file types and folders within the archive file system.

The administrator first defines one or more groups of LTO or ODA cartridges, as illustrated below.



In this case, the LTO format, LTFS or TAR, is defined for the group of LTO cartridges, together with replication. When replication is enabled, the system can be configured to replicate LTO cartridges immediately or at a scheduled time. Scheduled replication delays updating of the replica cartridges until a quiet time, perhaps overnight. This part of the user interface is also used to configure dynamic expansion of LTO cartridge groups: it defines when blank cartridges will be pre-initialized and added to the group of LTO cartridges.

After configuring at least one group of cartridges, the administrator defines which groups of files will be allocated to which groups of cartridges and how long specific groups of files will be retained on the external RAID. The user interface is illustrated below.

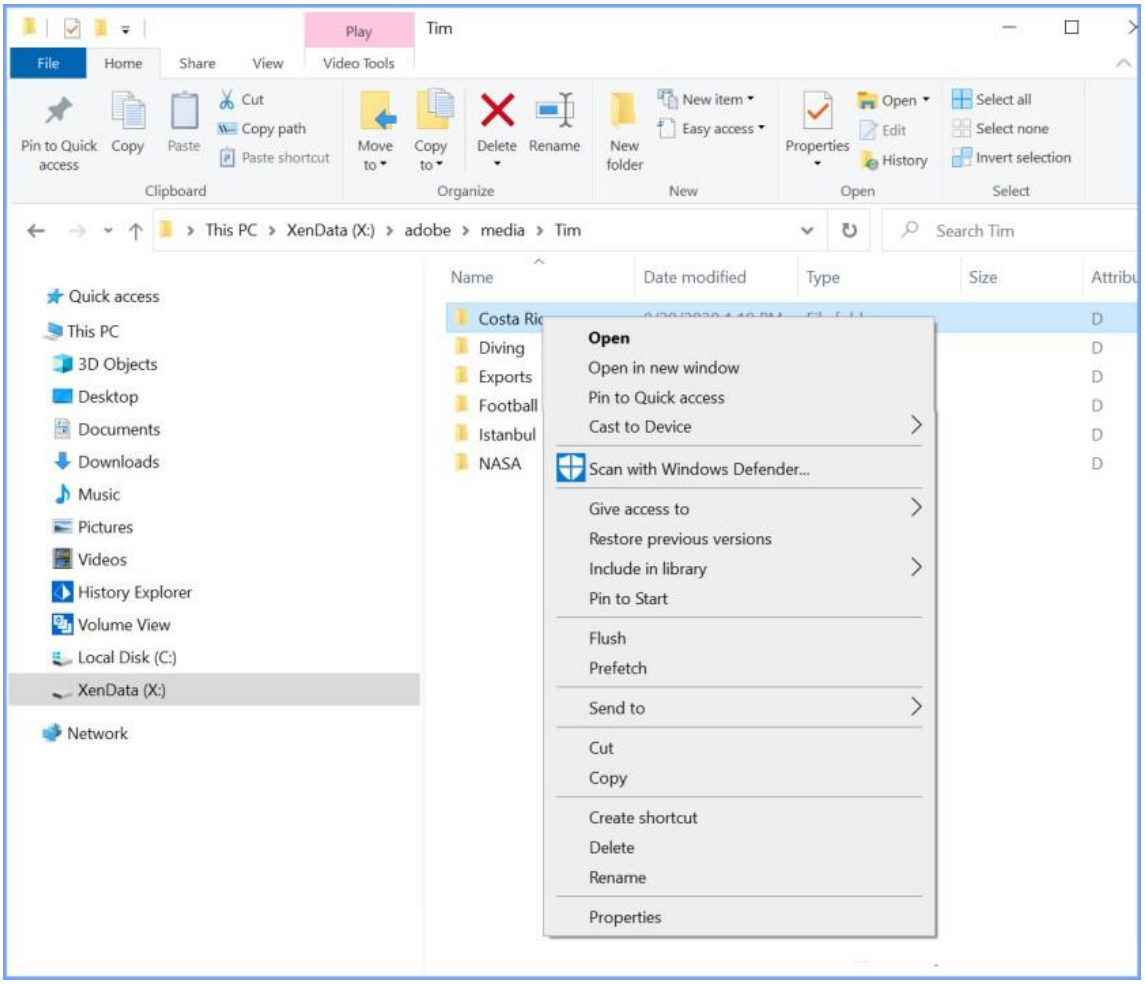


The Tiered Storage Management Console is also used to perform many cartridge management functions, including:

- Exporting cartridges from the library
- Write protecting cartridges
- Status and cartridge properties
- Management of LTO cleaning cartridges
- Repacking cartridge contents

Manual Over-Ride of Automatic Policies

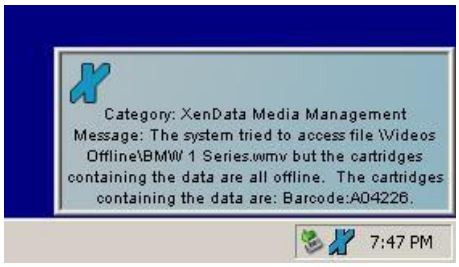
The storage policies defined using the Tiered Storage Management Console determine the RAID retention policy for archived files. They run automatically without need for manual intervention. But sometimes they need to be overridden. For example, when a big project is postponed, there might be a need to temporarily transition the associated files and folders from the external RAID to near-line LTO to free up space on the RAID. And when the project becomes active again, those files should be prefetched to the RAID. The disk retention policies may be overwritten using Windows File Explorer. The XenData software extends the capabilities of Windows File Explorer and allows manual over-ride of the automatic policies, as illustrated below.



Externalized LTO Management

The X100 manages an unlimited number of cartridges that have been externalized by being exported from a library. And the XenData software is always licensed to support an unlimited number of externalized cartridges.

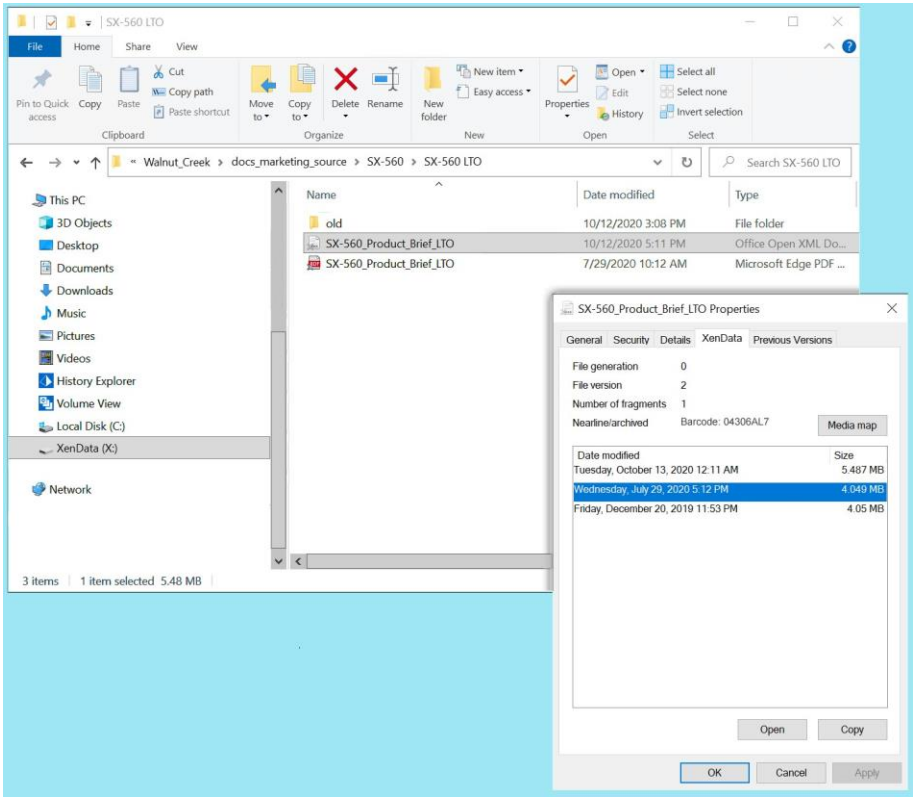
When a file moves from near-line LTO or ODA to being offline because the cartridge on which it is stored is exported from the library, the file remains unchanged in the archive file system. However, this is not the complete file; it is a file representation which has the same attributes as the complete file, such as reported size, modification date, etc. When an offline file is accessed by a program, a message is returned immediately that identifies that the file is not available. Also, the XenData software puts a message in the Windows Event Log and optionally sends an e-mail and/or on-screen message that identifies which cartridges contain the requested file. This notification allows the correct cartridge to be easily identified and then imported back into the library.



Third party applications that use a XenData XML API may also access information about offline cartridges and display barcode information within the application user interface.

File Version Management

When an archived file is overwritten, the file system interface presents the latest version of the file and when a file is deleted, it is hidden from the file system interface. Unlike standard disk-based file systems, old versions of files and deleted files continue to be retained on LTO or ODA. The XenData software allows access to these deleted files and old file versions using its extension to Windows File Explorer.



Migrate to Later LTO Generations

The repack operation may be performed using the Tiered Storage Management Console. This allows the contents of cartridges and groups of cartridges to be moved from one generation of LTO or ODA to another, for example from LTO-6 to LTO-9. It is an operation that has zero downtime for the system. All the files stay in the same place in the file system but are moved from one generation of cartridges to another in background.

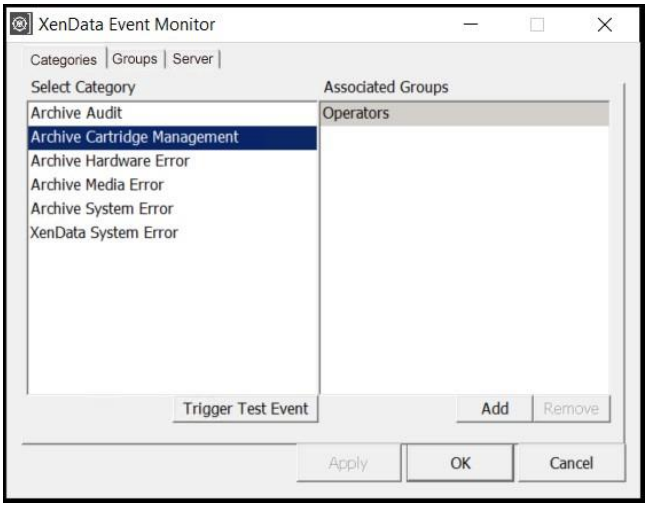
Other archive solutions make the job of migrating to a later generation of LTO or ODA very difficult. But with XenData software, it is a seamless background task.

System Monitoring

The XenData software monitors error messages issued by the LTO or ODA drives and libraries, creating alerts and notifications which are logged in the Windows Event Log. The XenData software includes an Alert Module which characterizes these alerts and notifications into five categories:

- Archive Audit: This category of event messages describes the successful completion of routine operations.
- Archive Media Management: This category of event messages may require routine action from the archive operators
- Archive Media Error: This event category consists of error messages associated with LTO or ODA cartridges.
- Archive Hardware Error. This event category consists of error messages associated with the LTO or ODA library and drives.
- Archive System Error: This event category consists of error messages associated with a system problem.

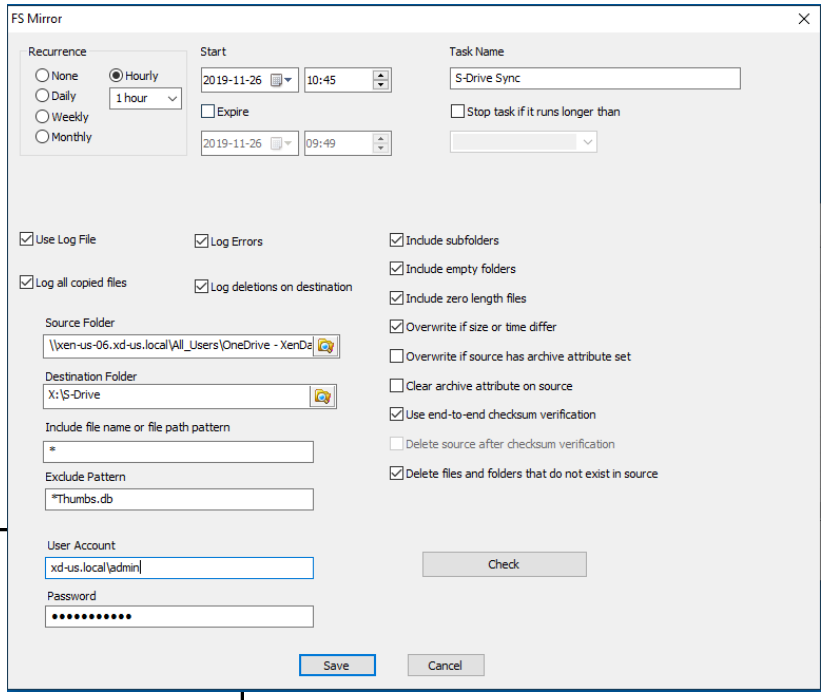
The XenData Alert Module provides email alerts to designated groups of recipients. The messages received by the different groups may be tailored to their specific needs. For example, operators may receive messages related to Archive Media Management, such as notifications related to management of externalized cartridges. Whereas another group of support engineers may receive media, hardware and system error messages. In addition to sending email alerts, the system may be configured to provide on-screen notifications.

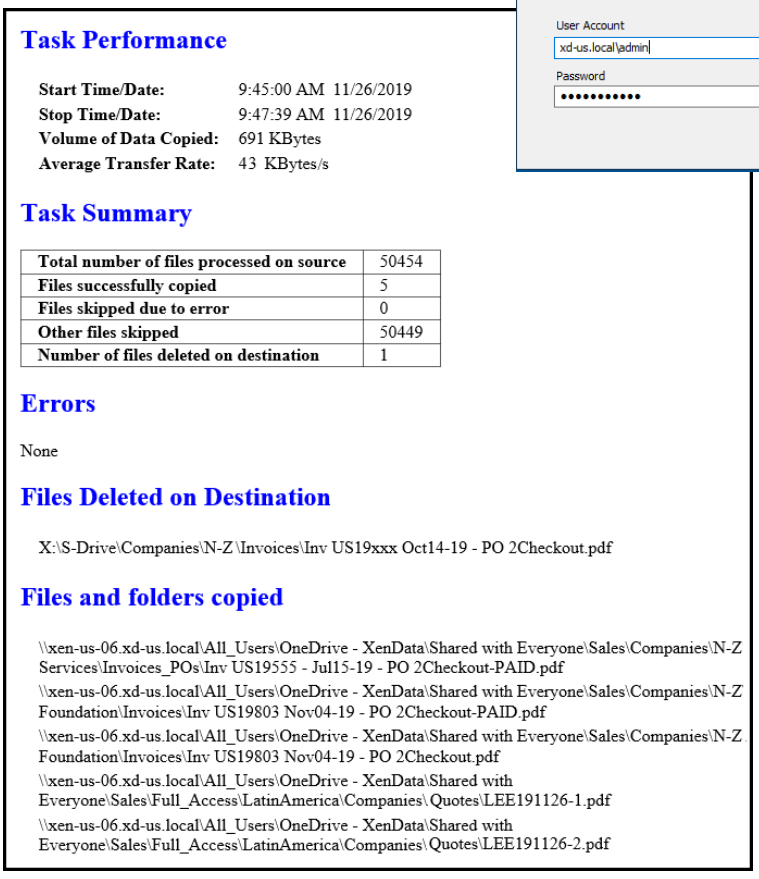


FS Mirror Option: Sync Local & Network Storage

FS Mirror, a XenData utility that provides file-folder synchronization and mirroring of any local or network storage, is an optional upgrade. You can schedule tasks to sync any accessible file-folder structure to LTO or ODA.

FS Mirror tasks are easily configured using the User Interface illustrated opposite.





Task Performance

Start Time/Date:	9:45:00 AM 11/26/2019
Stop Time/Date:	9:47:39 AM 11/26/2019
Volume of Data Copied:	691 KBytes
Average Transfer Rate:	43 KBytes/s

Task Summary

Total number of files processed on source	50454
Files successfully copied	5
Files skipped due to error	0
Other files skipped	50449
Number of files deleted on destination	1

Errors

None

Files Deleted on Destination

X:\S-Drive\Companies\N-Z \Invoices\Inv US19xxx Oct14-19 - PO 2Checkout.pdf

Files and folders copied

\\xen-us-06.xd-us.local\All_Users\OneDrive - XenData\Shared with Everyone\Sales\Companies\N-Z Services\Invoices_POs\Inv US19555 - Jul15-19 - PO 2Checkout-PAID.pdf

\\xen-us-06.xd-us.local\All_Users\OneDrive - XenData\Shared with Everyone\Sales\Companies\N-Z Foundation\Invoices\Inv US19803 Nov04-19 - PO 2Checkout-PAID.pdf

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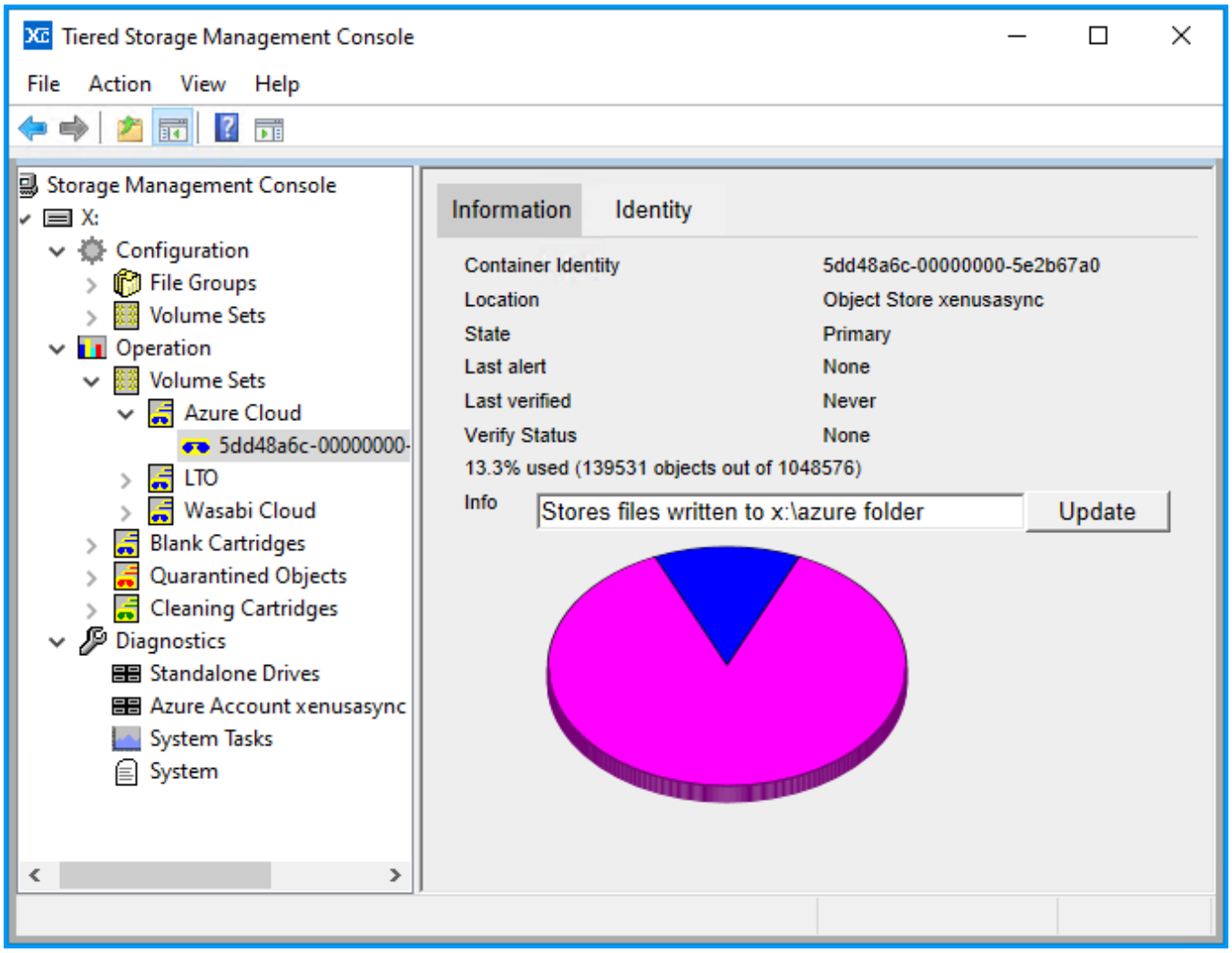
By enabling logging for an FS Mirror task, a log report is created each time the task is run. This can list all files copied, all deleted files and any files that were skipped due to being open. An example log report is shown above.

Sync to Cloud Option

The XenData software that runs on the X100 may be extended to manage cloud object storage in addition to LTO and ODA libraries. The cloud connection is secure, using HTTPS, and fast, using multipart uploads and downloads. It is optimized for video files, supporting partial file restores and video streaming.

After installing and licensing the Cloud File Gateway Extension software, the tiered storage management policies support archiving to object storage, LTO or ODA.



Supported cloud storage includes AWS S3, Azure blob storage and Wasabi S3. The system is multi-cloud, simultaneously supporting multiple cloud object storage accounts from different providers. And by adding FS Mirror, selected files and folders may be replicated across local LTO or ODA and one or more cloud object storage accounts. This creates a cloud copy of the content stored on-premises. The content copied to the cloud may be part of a disaster recovery strategy or simply a way to share content with remote users.

Multi-Site Sync

Multi-Site Sync for LTO or ODA is a synchronization service that links multiple archives in different locations, creating a single global file system accessible anywhere worldwide. As soon as a file is archived to LTO or ODA at one location, it becomes available as a stub file within the global file system. When a user makes a change by writing, overwriting or deleting a file, that change is propagated to all locations. This provides a consistent up-to-date set of files across the entire distributed organization.

When files are restored from another location, they are transferred directly using peer to peer multi-threaded HTTPS which delivers secure fast file transfers. The Multi-Site Sync service uses a cloud database, but the files themselves are never stored in public cloud object storage, avoiding cloud storage and egress fees. Furthermore, because the new service only synchronizes file system metadata, it requires minimal Internet bandwidth.

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