



X1 Archive Appliance for LTO

Highlighted Functionality

- ✓ Manages one or more LTO external drives, creating an archive that can be accessed locally or via a network share
- ✓ Other file systems on your network may be mirrored to the LTO archive
- ✓ Supports creation of archive drop-boxes on your network
- ✓ Manages an unlimited number of LTO cartridges and up to 2 billion files
- ✓ Supports file transfers that span across cartridges
- ✓ Automatic cartridge replication when using two or more LTO drives
- ✓ Writes to LTO in LTFS or TAR
- ✓ Runs Windows 10 Pro
- ✓ 1.92 TB SSD cache enhances performance
- ✓ Network connection via 1 Gigabit ethernet or wireless
- ✓ End to end logical block protection provides checksum verification
- ✓ Includes a Cloud File Gateway for sharing content via cloud object storage
- ✓ Provides tape contents and file search reports
- ✓ Tightly integrated with many complementary applications.



Overview: Small yet Powerful

The X1 Archive Appliance manages one or more LTO external drives and delivers powerful functionality in a small footprint. It runs Windows 10 Pro and is powered by XenData's LTO Server Edition and FS Mirror software.

The archive appears locally as a single logical drive – the X: drive. And there are multiple ways to write to and restore files from it:

- ❖ Share the X: drive over your network and write to it and restore from it like any disk-based share.
- ❖ Use FS Mirror to synchronize one or more locally accessible file systems or file shares to the LTO archive.
- ❖ Use FS Mirror to create archive drop-boxes on your network that automatically move files to the archive.
- ❖ Use third party applications that integrate with XenData's XML API to archive and restore files.

The LTO drives connect to the X1 via Thunderbolt 3 or USB 3.1. And if your LTO drive has a SAS port, it may be connected to the Thunderbolt port via an adapter.

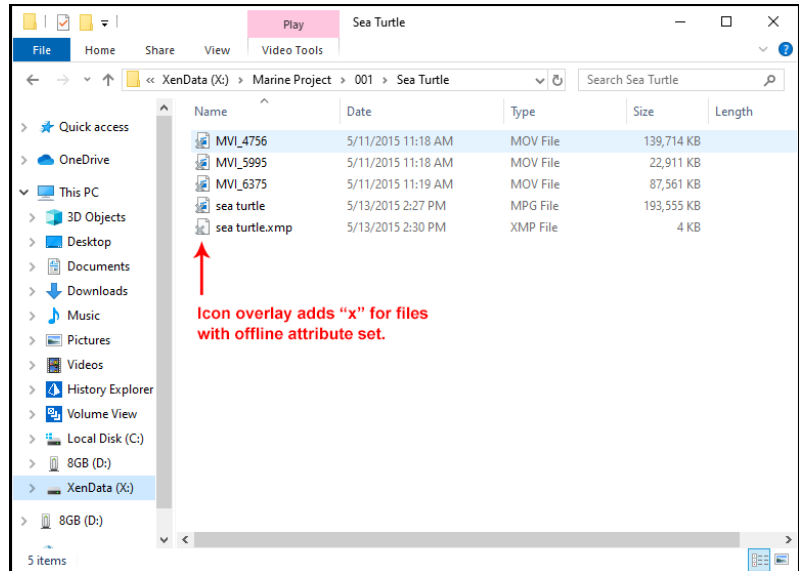
The X1 securely integrates into your existing environment. It conforms to the Microsoft security model based on Active Directory and may be easily added to an existing Domain or Workgroup.

Archiving Files: SSD Cache Enhances Performance

All files written to the archive are first stored on the high performance internal 1.92 TB SSD. This is used as a highly flexible cache. After a file is written to the SSD cache, user-defined policies then determine how that file will be treated by the system. For example, you can define policies that write temporary files ending in '.tmp' only to the SSD, never writing them to LTO. Whereas, all other files are first cached on the SSD and then written to LTO.

When a file has been successfully written to LTO and is no longer stored on the SSD cache, it is converted to a stub file. This is a representation of the file that takes minimal space on the SSD. The stub file appears in the archive file-folder structure with the same properties as the full file - with the same name, path, creation date, modified date, size, etc. But there is one property that changes: this is the Windows offline attribute which is set. It indicates that the file is no longer instantly available from disk and is used by other Windows machines in a networked environment to prevent time-outs when restoring files. File Explorer displays an icon overlay for files that have the offline attribute set, as shown opposite.

The user-defined policies also define cache retention times. This is the duration after the file was written or last read before it is converted to a stub file. As an example, you might want to write index files to LTO and additionally keep them permanently on the SSD cache. But all other files should be converted to stub files as soon as they are securely written to LTO. Policies such as these are easily implemented on the X1.



Intelligently Managed Storage Hierarchy

The X1 supports three tiers of storage hierarchy:

- ❖ **Online disk** with one instance of a file on the SSD cache and, in addition, there will typically be an instance on LTO. In this case, the file will be read from the SSD.
- ❖ **Near-line LTO** with an instance of the file on an LTO cartridge loaded in an attached drive and no instances on the SSD cache. When a file on near-line LTO is read, the XenData software will wind the tape to the beginning of the file from where it is restored automatically.
- ❖ **Offline LTO** with no instance on the SSD cache and one or more instances of the file on LTO cartridges, none of which are loaded in an attached LTO drive.

When an application reads a file that is on the SSD cache or on an LTO cartridge loaded in an attached drive, the file will be restored automatically, just like being read from disk. Of course, there will typically be a delay when restoring from near-line LTO as the tape is wound to the beginning of the file.

When a user attempts to read a file that is offline, a message is returned immediately that identifies that the file is not available. In addition, the X1 will issue an on-screen message or send an email alert identifying the name of the LTO cartridge that contains it. After importing the cartridge into an attached LTO drive, the read request should be repeated.

Cartridge Formats: LTFS and TAR

The X1 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. When configuring a new group of LTO cartridges, the user selects either TAR or LTFS as the cartridge file system format. In either case, the file restored from the system is identical to the original archived file. For example, if an MXF file is written to the archive, the same MXF will be restored.

The choice of cartridge file system format is important when transferring cartridges from one system to another. 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 tapes written on other systems, including non-XenData systems, are easily imported into the X1 archive file system.

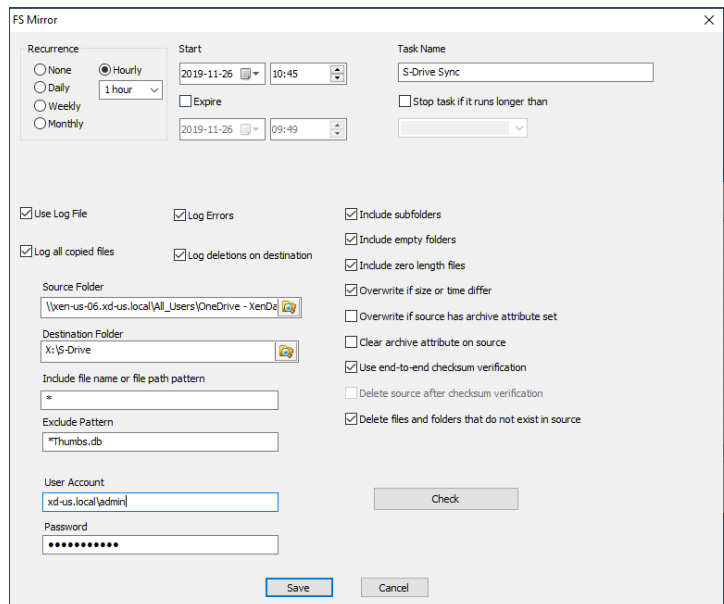
The X1 is compatible with both standard rewritable LTO cartridges and unalterable WORM cartridges. The TAR format is used with WORM cartridges as LTFS is intended for rewritable tapes and does not support WORM.

Sync Network Volumes and Create Archive Drop-Boxes

The X1 includes FS Mirror, a XenData utility that provides file-folder synchronization and mirroring functionality. You can schedule tasks to sync any accessible file-folder structures to LTO.

Furthermore, you can turn any accessible folder on your network into an archive drop-box, whereby files written to these folders will be automatically moved to the X1 archive.

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 US19603 Nov04-19 - PO 2Checkout-PAID.pdf
\\xen-us-06.xd-us.local\\All_Users\\OneDrive - XenData\\Shared with Everyone\\Sales\\Companies\\N-Z\\Foundation\\Invoices\\Inv US19603 Nov04-19 - PO 2Checkout.pdf
\\xen-us-06.xd-us.local\\All_Users\\OneDrive - XenData\\Shared with Everyone\\Sales\\Full_Access\\LatinAmerica\\Companies\\Quotes\\LEE191126-1.pdf
\\xen-us-06.xd-us.local\\All_Users\\OneDrive - XenData\\Shared with Everyone\\Sales\\Full_Access\\LatinAmerica\\Companies\\Quotes\\LEE191126-2.pdf

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 here.

Spanning File Transfers Across Tapes

The X1 supports file transfers that span multiple LTO cartridges. It does this using the internal 1.92 TB SSD: after an LTO cartridge becomes full, the SSD temporarily stores new files written to the system and these are then written to the next tape after the full tape is swapped for a blank tape.

End-to-End Logical Block Protection

End to end logical block protection is a technology that allows XenData software to cooperate with a tape drive to ensure data integrity. The software calculates a checksum for each block of data as it reads a file and sends the checksums to the tape drive alongside the data. The tape drive performs a read-after-write verification operation and calculates its own checksum from the data stored on the tape, then compares the two checksums to ensure that the data written to the tape matches the original data. The checksum is also used by the LTO drive to verify the integrity of every block of restored data.

In summary, end-to-end logical block protection provides an effective method to ensure the integrity of all archived and restored files.

Cloud File Gateway

The X1 allows files to be stored on cloud object storage in addition to LTO. Supported public clouds include AWS S3, Azure Blob Storage and Wasabi S3. This complements the on-premises LTO storage and may be used for the following:

Share Files Anywhere

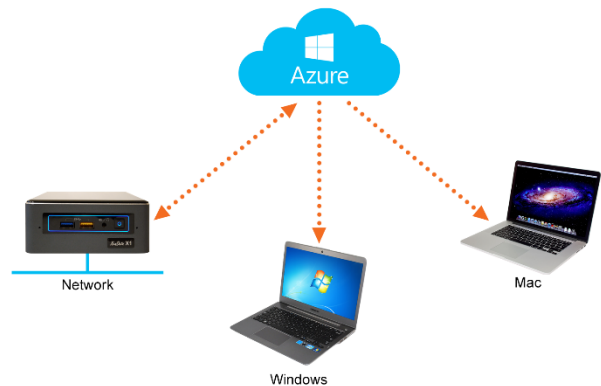
Copy selected files and folders to the cloud and then use utilities provided by the cloud provider to restore them to any location worldwide. With Azure, Microsoft provides free client software that is especially easy to use.

When using Azure blob storage, you can configure Azure Secure Access Signatures (SAS) to provide read-only access to the files that have been written to the cloud via the X1. Other users can install the free Azure Storage Explorer on a Mac, a PC or a Linux machine and use the SAS credentials to be able to easily browse and download files and folders from the cloud storage.

Copy to the Cloud for Data Protection

Use the X1's built-in FS Mirror utility to create a mirror in the cloud. Schedule the synchronization to occur hourly, daily, weekly or monthly. This creates a disaster recovery copy of your data which can be accessed from anywhere.

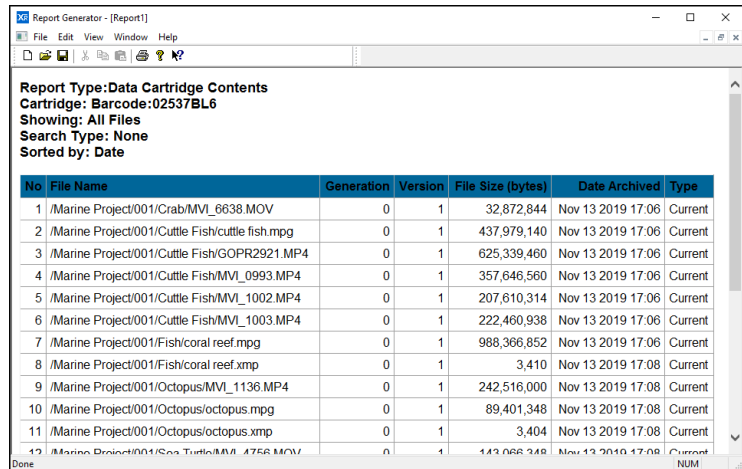
The Cloud File Gateway is licensed to manage up to 1 TB of cloud object storage. The Gateway license may be upgraded to support larger volumes of cloud storage.



Reports – Simplifying Archive Management

The X1 provides reports that simplify management of your LTO archive:

Report	Description
LTO Cartridge Contents	Including deleted and overwritten files on a selected cartridge
Unarchived Files	Lists files on SSD cache that are not written to LTO but should have been
File Search	Lists LTO cartridges for files that meet search terms



Metadata Backup

A scheduled metadata backup and restore utility is provided. This allows rapid system restore in case of a hardware failure.

LTO Drive Compatibility

The X1 is compatible with LTO drives from many different manufacturers including drives with Thunderbolt-3 interfaces from mLogic and Magstor. It supports Unitex USB connected drives and LTO drives with a SAS interface may be connected using an ATTO Thunderbolt to SAS converter. For a full list of supported LTO drives, please refer to the XenData web site.

Mounting Options

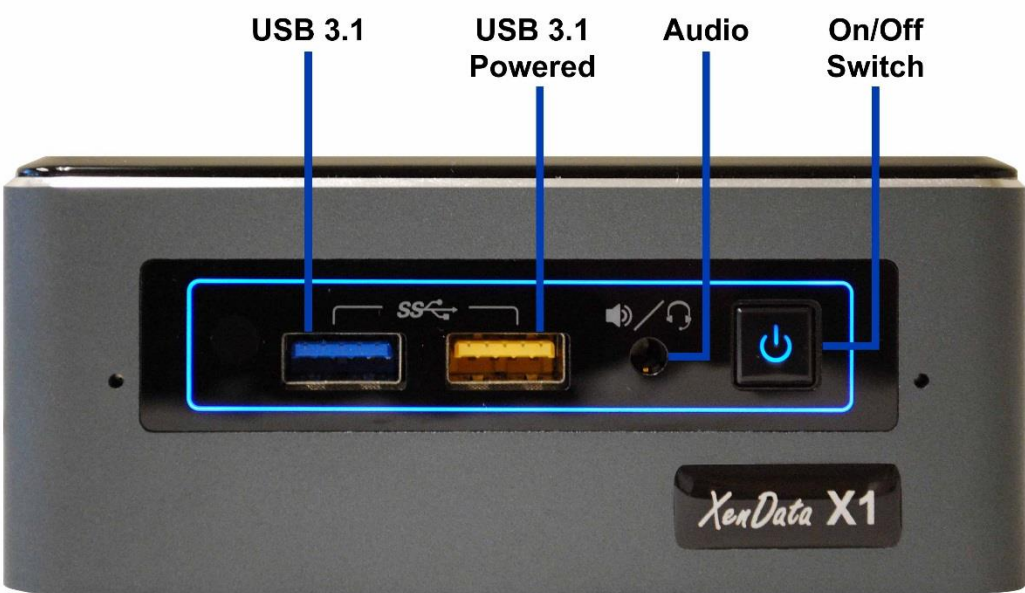
The X1 comes with a Versa 75 or 100 mounting adapter for attaching to the rear of a computer monitor, as illustrated opposite.



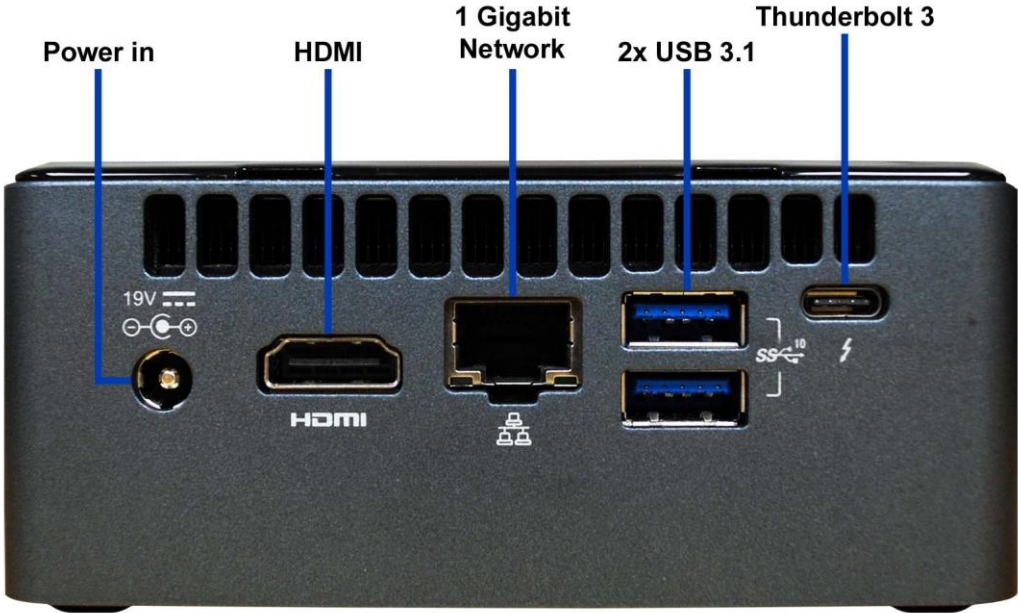
Alternatively, it can be used free standing, as shown opposite where it is connected via Thunderbolt to an LTO-8 drive from mLogic.

Connections

Front



Rear



X1 Specification – Base Configuration

XenData SKU 237001

Management software:	XenData Archive Series, LTO Server Edition XenData Cloud File Gateway Extension XenData FS Mirror XenData Alert Module
Licensed number of LTO drives:	1
Licensed number of external LTO cartridges:	Unlimited
Licensed Cloud File Gateway Capacity:	1 TB
Operating system:	Microsoft Windows 10, Professional Edition
Processor:	Intel® Quad-Core 8 th Generation i5-8259U processor
Graphics:	Iris® Plus Graphics 655
RAM:	16 GB
System disk:	256 GB M.2
Cache disk:	1.92 TB SSD
Network ethernet connection:	1 x RJ45 connector; 1 Gigabit
Network wireless connection:	Intel® Dual Band Wireless-AC 9560
Bluetooth:	Intel Bluetooth 5.0
USB connections:	2 x USB 3.1 including one charging (front mounted) 2 x USB 3.1 (rear mounted)
Thunderbolt connection	1 x Thunderbolt™ 3 USB Type-C port with data transfer up to 40 Gb/s
Display connection:	HDMI 2.0a display port supporting 8 channel audio (7.1 surround sound)
Audio out:	Front panel headphone/microphone jack
Microphone:	Dual-array front microphones
Power:	19V, 90W
Included power brick voltage range:	100 – 240 V
Operation temperature:	32-104°F (0°C -40°C)
Dimensions (HxWxD):	2.01" x 4.60" x 4.40" (51 mm x 117 mm x 112 mm)
Weight:	1.5 lbs. (0.68 Kg)

Upgrade Option

XenData SKU 237002: XenData license upgrade to support an additional LTO drive

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