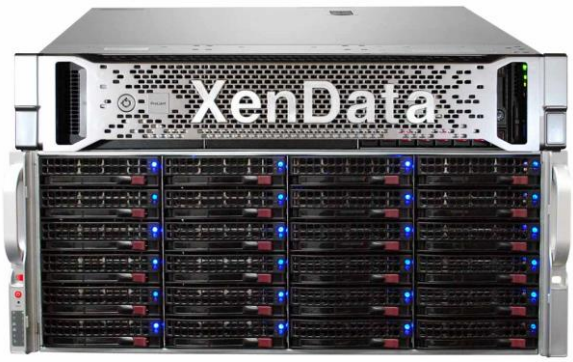
FX-Series:

One System Combining Shared Disk Storage and Archive

The high performance FX Server combines a high capacity shared disk volume and an archive volume. It provides one scalable platform that meets the storage needs of 4K workflows and beyond for both video editing and long term archive. It simplifies everything:

- **One Shared Disk Logical Volume**
- **One Archive Logical Volume**
- **One Server**
- **One Interface**

Transfers between your edit storage and the archive are local to the server, avoiding network bottlenecks.



Shared Disk Volume

Capacity: 120 TB to 240 TB

Enterprise Class 6 TB Disks

RAID 60 for Reliability and Performance

Single Windows NTFS Volume

High Bandwidth 4K+ Performance

Archive Volume

LTO, Optical or Azure Cloud

Scales to Multiple PBs

Single Archive Volume

FX-Server

Windows Server 2012 R2

10 GbE Interface Options

Overview

The FX-Series systems run a Windows Server 2012 R2 operating system and provide two independent storage volumes: a high performance shared disk volume suitable for 4K workflows with usable capacities from 120 TB to 240 TB; and an archive volume that supports either an attached LTO library, an attached Optical Disc Archive library or Microsoft Azure Cloud storage. The archive volume scales to multiple petabytes. It is ideal for storing completed projects and content that must be kept for a long time but is less frequently accessed.

The shared disk volume uses 6 TB enterprise class disks which are configured in two groups, each of which has RAID6 protection. Each RAID6 group provides a high level of redundancy allowing two disk failures. Furthermore the system may be configured with two hot swap disks that automatically replace a failed disk. In summary the system is conservatively configured to provide a high level of data protection. The two RAID6 groups are striped, creating a RAID60 volume, to deliver 4K+ bandwidths and meet the demanding levels of performance needed for creative video editing.

The archive volume will support a robotic LTO library, a Sony optical library or Azure Cloud storage. An LTO-7 library located on-premises gives an exceptionally fast archive rate, capable of writing tens of TBs of content per day. Whereas, a Sony optical library provides extraordinarily stable recording with fast access times. And for those that want the convenience of automated cloud storage, Microsoft Azure delivers a cost effective solution with very good access times.

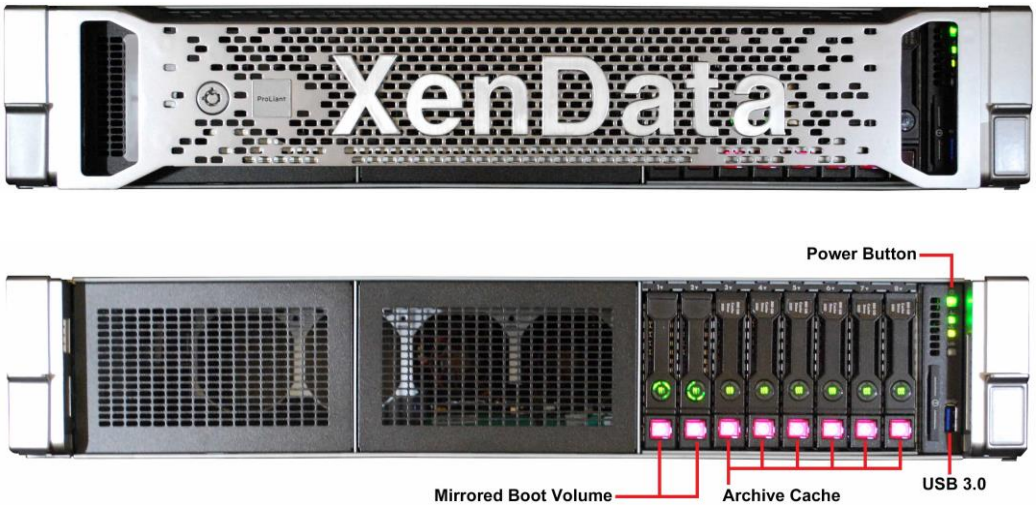
The FX-Series systems have great compatibility with a wide range of media and entertainment applications including axle Video's MAM, CatDV from Squarebox Systems, Dalet MAMs, eMAM, Metus MAM, MXFserver from FilmPartners and Parking from Marquis Broadcast.

FX Server

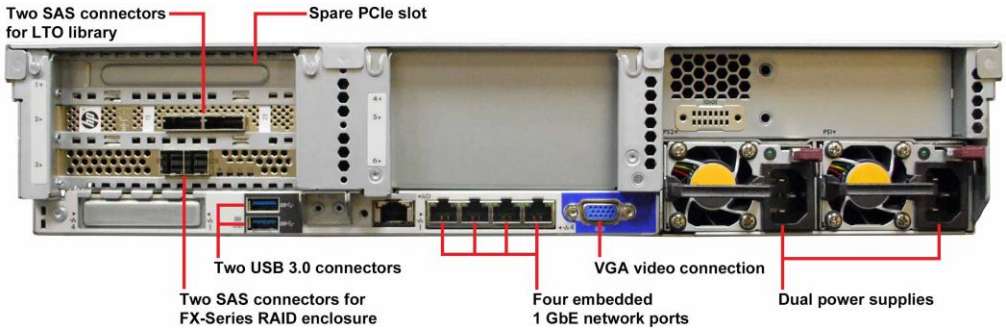
The FX-Series server is a 2RU rack mount unit. It has an 8 core Xeon processor and 64 GB of RAM. It includes two independent RAID controllers – one for the shared disk storage volume and another for the archive cache disk. The entire system is configured to deliver exceptional performance as a file server. The shared disk volume is optimized to deliver multiple video streams.

The server runs a Windows Server 2012 R2 Standard Edition operating system and fully supports the Microsoft security model. It can be installed in a Workgroup or an existing Active Directory domain.

Front View of the Server with and without Bezel



Rear View of the Server (SAS LTO Library Interface)



The archive connection depends on archive type:

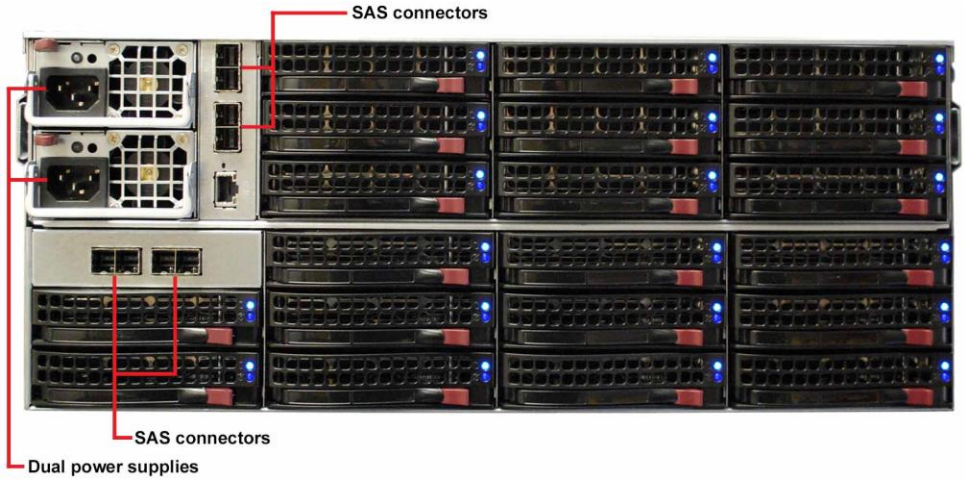
- For LTO, the server connects to an LTO library via SAS or fibre channel
- For Sony optical, the server connects to an Sony ODS-L30M library via fibre channel
- To archive to the Azure Cloud, the connection is over an Ethernet connection

The base model FX servers have four embedded 1 GbE Ethernet network ports and a dual port 10 GbE Ethernet network adapter may be added. There are two 10 GbE options available: SFP+ which supports optical connectors and a CAT6 / UTP copper connector option.

Shared Disk Volume

The front of the disk assembly has bays for 24 disks:

The rear of the disk assembly has bays for 20 disks:



The shared disk volume uses enterprise-class 3.5 inch disks in an external 4 RU enclose which has 44 bays in total and dual redundant power supplies. The enterprise class 6 TB disks come with 3 year warranties. The FX-Series system is available with either 24, 34 or 44 disks. As an option, two disks may be reserved for automatic hot swap. The disks are configured in RAID60 for both reliability and ultra-high performance. The available models are given below:

Usable Capacity	Disks	Raw Disk Capacity	XenData SKU
120 TB	24 x 6 TB	144 TB	231001
180 TB	34 x 6 TB	204 TB	231002
240 TB	44 x 6 TB	264 TB	231003

The 24 disk and 34 disk configurations can be upgraded to a 44 disk configuration after initial purchase.

Shared Disk Volume Performance

The FX shared disk volume is optimized for video streaming and has high performance suitable for 4K workflows and beyond, as illustrated below:

Format	Frame Rate (fps)	Ave. Data Rate (Mbps)	Max. Stream Count 24 disk systems	Max. Stream Count 44 disk systems
Red 6K HD 7:1	23.98	820	12	12
UHD DNxHR HQ	23.98	670	14	14
XAVC 2160p 4K	59.94	600	16	16
ProRes 4444 (1920x1080)	29.97	330	40	40

Even with the lower capacity 24 disk configurations, the FX shared disk volume provides excellent performance. These measurements are applicable up to 100% full.

Archive Volume Interfaces

Whether you select the LTO, Optical or Cloud archive option, the archive volume has two interfaces for writing and reading files:

- **File – Folder Interface** This provides a single file system that is presented as a logical drive letter on the Windows server. It may be accessed locally or shared over the network using CIFS/SMB or FTP. It supports manual archiving using Microsoft File Explorer, FTP and many other file management utilities. It also gives broad compatibility with a wide range of third party applications.

- **API Driven Data Mover** This interface obtains xml instructions from third party applications via a network socket. It may be used to pull files, or groups of files, to the archive from another local or network location. Similarly, it can push files or groups of files from the archive to another local or network location. In addition, it provides file metadata, such as the barcodes of LTO or optical cartridges that contain a specified file. This interface is used by many third-party applications to provide a tight integration with the archive.

These two interfaces may be used simultaneously. For example, a media asset management system may use the API to move files at the same time as the file-folder interface is used to archive and restore different content.

Archive Volume - LTO

The FX LTO Archive Option supports a wide range of LTO-7 libraries from leading manufacturers including Dell, HPE, IBM, Oracle, Overland, Quantum, Qualstar and Spectra Logic. LTO archive options are as follows.

- LTO Archive Option for Fibre Channel Libraries - SKU 231021. This supports fibre channel LTO libraries and includes an interface card pre-installed in the FX server with two 8 Gb/s fibre channel ports. For libraries with one or two LTO drives, the internal library drives can be direct connected to these ports. For libraries with three or more LTO drives, these may be connected via a FC switch or additional interface cards may be installed to support direct connections.

- LTO Archive Option for SAS Libraries - SKU231022. This supports SAS LTO libraries and includes an interface card pre-installed in the FX server with two 12 Gb/s SAS ports. For libraries with one or two LTO drives, the internal library drives are direct connected to these ports. For libraries with three or more LTO drives, additional interface cards may be installed to support direct connections.

In each case, the LTO Archive Option includes a 4 TB disk cache consisting of six 800 GB high endurance SSDs in a RAID5 configuration. The disk cache provides intelligent management of multi-threaded LTO archive and restore operations.

The LTO Archive Options includes a permanent license to support an LTO library with up to 50 slots and 2 drives plus an unlimited number of offline cartridges. This may be upgraded to support larger libraries.

The LTO archive volume operates automatically and has the following functionality.

Single File System Interface – The digital archive accepts all file types – from an MXF to a WORD document - and presents them in a single Windows file/folder structure.

Data Mover Interface – In addition to the file system interface, an XML API may be used to pull files from and push files to other network and local locations including the FX shared disk volume. Applications that use this interface include CatDV from Squarebox Systems, Marquis Project Parking, axle Video MAM and MXFserver from FilmPartners.

Supported LTO Cartridge Types – LTO-7 and earlier generations, back to LTO-3, are supported including rewritable and WORM cartridges.

Supported LTO Formats – LTFS and TAR. The administrator defines LTO cartridge groups and selects LTFS or TAR for each group. LTFS and TAR groups may be mixed on the same system.

LTO Cartridge Replication – The system may be configured to automatically generate replica LTO cartridges. This is useful for creating duplicate cartridges that are exported from the library and held off site for data protection.

Dynamically Expanding LTO Groups – Blank LTO cartridges are automatically initialized and added to LTO cartridge groups. When cartridges become full, the system automatically jumps to the next cartridge. This approach means that the archive volume is not constrained by cartridge boundaries.

Offline Cartridge Management – The system manages an unlimited number of offline LTO cartridges.

Standard Network Protocols – The solution is optimized for CIFS/SMB and FTP file transfers.

End to End Verification – Data written to LTO is verified using CRC check-sums.

Partial File Restore – Partial file restore from LTO is supported.

Migration to New Generations of Archival Storage – The archive management software includes a utility called Repack that will migrate from today's LTO cartridges to a future generation, while keeping the files in the same logical location.

Alert Module – A software module is included which provides e-mail and on-screen alerts. These are tailored to the needs of system operators, system administrators and IT support personnel.

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 LTO cartridge barcode locations that match a user-defined search term. The reports may be exported to Excel for further analysis.

Industry Standard File Security – Integrates fully with the Microsoft Windows security model.

The archive volume is managed by XenData6 Server software, the XenData Alert Module and the XenData Workflow API which provides the data mover interface.

Archive Volume - Optical

The FX-Series Optical Archive Option supports the expandable Sony ODS-L30M library with Optical Disc Archive (ODA) drives:

- Optical Archive Option - SKU 231023 - which includes an interface card pre-installed in the FX server with two 8 Gb/s fibre channel ports. For libraries with one or two ODA drives, the internal library drives can be direct connected to these ports. For libraries with three or more ODA drives, these may be connected via a FC switch or additional interface cards may be installed to support direct connections.

This FX Archive Option includes a 4 TB disk cache consisting of six 800 GB high endurance SSDs in a RAID5 configuration. The disk cache provides intelligent management of multi-threaded ODA archive and restore operations.

The Optical Archive Option includes a permanent license to support an ODS-L30M library with up to 30 slots and 2 drives plus an unlimited number of offline cartridges. This may be upgraded to support larger libraries.

The optical archive volume operates automatically and has the following functionality.

Single File System Interface – The digital archive accepts all file types – from an MXF to a WORD document - and presents them in a single Windows file/folder structure.

Data Mover Interface – In addition to the file system interface, an XML API may be used to pull files from and push files to other network and local locations including the FX shared disk volume. Applications that use this interface include CatDV from Squarebox Systems, Marquis Project Parking, axle Video MAM and MXFserver from FilmPartners.

Supported Optical Cartridge Types – Sony 3.3 TB ODA2 cartridges and all lower capacities are supported including rewritable and WORM cartridges.

Dynamically Expanding Cartridge Groups – Blank ODA cartridges are automatically initialized and added to ODA cartridge groups. When cartridges become full, the system automatically jumps to the next cartridge. This approach means that the archive volume is not constrained by cartridge boundaries.

Offline Cartridge Management – The system manages an unlimited number of offline optical cartridges.

Standard Network Protocols – The solution is optimized for CIFS/SMB and FTP file transfers.

Partial File Restore – Partial file restore from ODA is supported.

Migration to New Generations of Archival Storage – The archive management software includes a utility called Repack that will migrate from today's ODA cartridges to a future generation, while keeping the files in the same logical location.

Alert Module – A software module is included which provides e-mail and on-screen alerts. These are tailored to the needs of system operators, system administrators and IT support personnel.

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 optical cartridge barcode locations that match a user-defined search term. The reports may be exported to Excel for further analysis.

Industry Standard File Security – Integrates fully with the Microsoft Windows security model.

The archive volume is managed by XenData6 Server software, the XenData Alert Module and the XenData Workflow API which provides the data mover interface.

Archive Volume - Cloud

The FX Cloud Archive Option (SKU 231024) manages Microsoft Azure Blob storage and includes a dedicated 4.8 TB internal disk. It provides a hybrid cloud storage solution that is optimized for video files.

The FX Cloud Archive Option uses either Hot or Cool Azure storage tiers:

- The Hot access tier is suitable when files are very frequently restored.
- The Cool access tier is preferred for most creative video archive applications. It provides fast restores and a lower data storage cost for most users.

Files are first written to the internal disk and queued for upload to Azure. After a file has been successfully uploaded, an instance of the file is held on the internal disk for a time determined by administrator policy. It is then converted to a sparse file (often termed a 'stub file'). When a sparse file is read, it is restored directly from Azure. Restored files may be retained on the internal disk for a time determined by administrator policy.

The Cloud Archive Option delivers the following functionality.

Single File System Interface – The digital archive accepts all file types – from an MXF to a WORD document - and presents them in a single Windows file/folder structure.

Data Mover Interface – In addition to the file system interface, an XML API may be used to pull files from and push files to other network and local locations including the FX shared disk volume. Applications that use this interface include CatDV from Squarebox Systems, Marquis Project Parking, axle Video MAM and MXFserver from FilmPartners.

Standard Network Protocols – The solution is optimized for CIFS/SMB and FTP file transfers.

Checksums – The integrity of files uploaded to Azure is automatically verified using checksums.

Partial File Restore – Partial file restore from the cloud is supported.

Support for Multiple Azure Regions – Any regions that provides block blob storage is supported.

Scheduling Writing to Azure – You can schedule time windows when you can write to local disk but the copy to Azure is postponed. This is useful when Internet bandwidth is limited and there are busy times when it is in heavy demand.

Alert Module – A software module is included which provides e-mail and on-screen alerts. These are tailored to the needs of system operators, system administrators and IT support personnel.

Industry Standard File Security – The server integrates fully with the Microsoft Windows security model.

Encryption for Transfers to and from Azure – All data transferred is encrypted using SSL. In addition Azure Storage Service Encryption (SSE) for Data at Rest encrypts your data prior to persisting to storage and decrypts prior to retrieval. The encryption, decryption, and key management are totally transparent to users.

A Cloud Archive Volume requires an Internet connection, an Azure Blob storage account and a XenData Cloud File Gateway subscription.

Specifications and Options

FX-Series Server – Base Configuration

Operating system:	Microsoft Windows Server 2012 R2 Standard Edition
Processor:	Intel® Xeon® 8-core processor
RAM:	64 GB
System disk:	2 x 480 GB SSDs mirrored
Network connections:	4 x RJ45 connectors; 1000BASE-T, 100-BASE-TX, 10BASE-T
USB connections:	2 x USB 3.0 (rear mounted); 1 x USB 2.0 (front mounted)
Number of power supplies:	2 redundant power supplies
Power:	100-240V; 50-60 Hz; 6.2-4.1 Amp max
Operation temperature and humidity:	50-95°F (10-35°C); 8-90% non-condensing
Form factor:	2U, 26.75” deep
Dimensions (HxWxD):	3.44” x 17.54” x 26.75” (87.3mm x 445.5mm x 680 mm)
Weight:	55 lbs (24.95 Kg)
Rack Rails:	Included

FX-Series Server – Connectivity Upgrade Options

XenData SKU	**Description**
101048	Dual port 10 GbE network adapter HP 560SFP+ pre-installed in FX-Series server. This adds two 10 GbE ports to the DX-Series server and uses one PCIe slot. Transceivers not included.
101057	SFP+ 10 Gb/s LC Short Range Transceiver for insertion in SKU 101048. HPE part number J9150A. Quantity 2 required to use both 10 GbE ports in the adapter.
107130	Dual port 10 GbE network adapter for use with standard CAT6 or UTP cabling pre-installed in FX-Series server. It is an HPE model 561T adapter and uses one PCIe slot.

FX- Shared Disk Volume

Disk bays:	44 hot-swap (24 front and 20 rear)		
Disk capacity, type:	6 TB SAS 7,200 rpm		
RAID configuration:	RAID 60		
Capacity options:	120 TB	180 TB	240 TB
Number of disks:	24	34	44
Connections to server:	External SFF-8644 Mini-SAS HD connectors		
Option for hot spare disks:	Yes - SKU 231007. Converts two disks to hot spares – Note 1.		
Cooling:	7 hot-swap redundant cooling fans		
Number of power supplies:	2 redundant power supplies		
Power:	100-240V; 50-60 Hz; 6 – 12 Amp max		
Operation temperature and humidity:	41-95°F (5-35°C); 8-90% non-condensing		
Form factor:	4U, 27.5” deep		
Dimensions (HxWxD):	7” x 17.2” x 27.5” (178mm x 437mm x 699mm)		
Weight – 44 disk configuration	75 lbs (11.5 Kg)		
Rack Rails:	Included		

LTO Archive Options

Archive Management Software:	XenData6 Server, XenData Alert Manager, XenData Workflow API
Library software license:	Includes a license for an LTO library with up to two internal drives and 50 slots; unlimited externalized LTO cartridges are supported – Note 2
Disk Cache:	6 x 800 GB high endurance SSDs in RAID5 providing 4 TB cache
Supported network protocols:	CIFS/SMB, FTP
Number of spare PCIe slots:	1
Library Connectivity Options and SKUs	**SKU 231022 for an LTO SAS Library:** includes 2 x external SFF-8644 Mini-SAS HD connectors **SKU 231021 for an LTO Fibre Channel Library:** includes 2 x 8 Gb/s FC connectors

Note 1 The hot spare configuration option reduces the usable capacity of the shared disk volume by the capacity of two disks. Hot spare disks automatically replace a failed disk, improving the overall data integrity of the system.

Note 2 The LTO Archive Options support a wide range of LTO libraries. Please refer to the XenData web site for a list of supported devices. The LTO library must be purchased separately. For LTO libraries with more than two internal drives and 50 slots, an upgrade license is required.

Optical Archive Option

Archive Management Software:	XenData6 Server, XenData Alert Manager, XenData Workflow API
Library software license:	Includes a license for a Sony ODS-L30M library with up to two internal drives and 30 slots; unlimited externalized cartridges are supported. Note 3.
Disk Cache:	6 x 800 GB high endurance SSDs in RAID5 providing 4 TB cache
Supported network protocols:	CIFS/SMB, FTP
Spare PCIe slots:	1
Connections to library:	2 x 8 Gb/s FC connectors
Option SKU:	231023

Note 3 The library must be purchased separately. For ODA libraries with more than two internal drives and 30 slots, an upgrade license is required.

Cloud Archive Option

Archive management software:	XenData File Gateway, XenData Alert Manager, XenData Workflow API
Supported Cloud Storage	Includes a 12-month subscription to support up to 300 TB of Azure Blob Storage. The subscription may be upgraded to support higher capacities and extended for longer periods. The Azure Blob Storage Option does not include the cost of the Azure cloud storage or the Internet connection which must be purchased separately.
On-premise disk:	6 x 1.2TB 10K rpm in RAID50 providing 4.8 TB cache
Supported network protocols:	CIFS/SMB, FTP
Spare PCIe slots:	2
Connection to cloud:	Via network – see FX-Server base configuration and upgrade options. Requires an Internet connection.
Option SKU:	231025

Contact Us

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