



IBM System Storage TS3100 and TS3200 Tape Library models with LTO Ultrium 6 drives and IBM 7226 Model 1U3 Multi-Media Storage Enclosure feature

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At a glance

The TS3100 and TS3200 Tape Libraries combine IBM® tape and automation reliability at open system prices. Both libraries are designed to support entry-level, unattended backup, open system attachment flexibility, and enhanced capacity and performance.

The TS3100 and TS3200 Tape Libraries include support for:

- New IBM LTO™ Ultrium™ 6 half-high 6 Gb SAS and 8 Gb Fibre Channel, and full-high 8 Gb Fibre Channel drives (feature numbers 8344, 8347, and 8348)
- LTO Generation 6 media specification native data transfer rate up to 160 MB/sec
- LTO Generation 6 media specification tape cartridge compressed capacity of up to 6.25 TB with 2:5 to 1 compression
- Encryption on LTO Ultrium 6 and Ultrium 5 tape drives
- LTO-6 media partitioning and self describing tape with IBM Linear Tape File System™ (LTFS) Library Edition and IBM LTFS Storage Manager software
- Adherence to LTO specifications

The TS3100 can accommodate up to two Ultrium half-high tape drives or one Ultrium full-high tape drive with 24 cartridge slots in two removable magazines, including a standard one-cartridge I/O station, a remote management unit, and barcode reader.

The TS3200 can accommodate up to four Ultrium half-high tape drives or two Ultrium full-high tape drives with 48 data cartridge slots in four removable magazines, including a standard three-cartridge I/O station and barcode reader.

Overview

IBM System Storage® TS3100 Tape Library Model L2U (machine type 3573) and IBM System Storage TS3200 Tape Library Model L4U (machine type 3573) now incorporate the new LTO Ultrium 6 full-high 8 Gb Fibre Channel, half-high 6 Gb SAS, and half-high 8 Gb Fibre Channel tape drives, enhancing tape performance over the previous generation of IBM LTO Ultrium 5 tape drives with a native data transfer rate of up to 160 MB/sec.

Mixed LTO Ultrium generations and attachment tape drive types are supported where drive space is available. Ultrium 6 SAS and Fibre Channel tape drives are encryption capable.

The TS3100 and TS3200 Tape Libraries incorporate IBM Multi-Path Architecture with logical libraries equal to the number of drives installed. Ultrium 6 tape drives for the TS3100 and TS3200 Tape Libraries are only available as feature numbers in AAS.

LTO Ultrium 6 tape drives support the LTO Generation 6 media specification of more than double the compressed capacity of up to 6.25 TB with 2.5 to 1 compression (up to 2.5 TB native capacity) compared to previous LTO 5 compressed capacity of up to 3.0 TB with 2:1 compression (up to 1.5 TB native capacity) per tape cartridge. IBM Ultrium 6 tape drives can read and write LTO Ultrium 5 and 6 data cartridges, and can read LTO Ultrium 4 data cartridges.

The TS3100 Tape Library can accommodate up to two LTO Ultrium half-high tape drives or one LTO Ultrium full-high tape drive, and comes standard with two removable cartridge magazines, one on the left side (12 data cartridge slots) and one on the right (12 data cartridge slots). The left magazine includes a single cartridge I/O station designed to allow for continuous library operation while importing or exporting media. A remote management unit and a barcode reader are standard in the library, allowing the library to run in sequential or random access mode. Optional features available include a rack mount kit, additional attachment cables, transparent LTO encryption, path failover, additional drives, interposers, and power cords.

The TS3200 Tape Library can accommodate up to four LTO Ultrium half-high tape drives or two LTO Ultrium full-high tape drives. The TS3200 comes standard with four removable cartridge magazines, providing 48 data cartridge slots, including a three-slot I/O station. A remote management unit and a barcode reader are standard in the library, allowing the library to run in sequential or random access mode.

Optional features available include a rack mount kit, an additional power supply, additional removable cartridge magazines, transparent LTO encryption, path failover, additional drives, attachment cables, interposers, and power cords.

The TS3100 and TS3200 Tape Libraries also support IBM System Storage LTFS Library Edition and IBM System Storage LTFS Storage Manager software for IBM Ultrium 6 and 5 tape drives.

IBM System Storage 7226 Multi-Media Enclosure Model 1U3 now offers a RDX 3.0 Removable Disk Drive Docking Station (feature number EU03). This feature accommodates a 320 GB, 500 GB, or 1.0 TB removable disk drive or data cartridge.

Key prerequisites

Appropriate levels of host software are required to attach and support the TS3100 or TS3200 Tape Library with IBM LTO Ultrium 6 tape drives to selected IBM Power Systems™, IBM System p® , IBM System i® , IBM System z® , IBM System x® , HP-UX, Sun, UNIX™ , Linux™ , and Windows™ servers. Refer to the [Technical information](#) section for details.

Planned availability date

December 7, 2012

Description

The TS3100 and TS3200 Tape Libraries are external, stand-alone or rack-mountable units that contain LTO Ultrium tape drives designed for the heavy demands of backup tape storage.

TS3100 Tape Library

TS3100 has the capacity for 24 tape cartridges and supports:

- A single IBM LTO Ultrium 6 full-high tape drive with Fibre Channel attachment or up to two IBM LTO Ultrium 6 half-high tape drives with SAS or Fibre Channel attachment
- A combination of up to a maximum of one IBM LTO Ultrium full-high tape drives or up to a maximum of two IBM LTO Ultrium half-high tape drives

The TS3100 Tape Library offers the following significant improvements over existing 2U Tape Libraries:

- **Increased cartridge capacity:** The TS3100 is configured to hold two removable magazines, one on the left side (11 slots plus 1) and one on the right side (12 slots) for a total of 24 data cartridges.
- **Standard barcode reader:** With the addition of the standard bar code reader, the TS3100 can be operated as a random access tape library with labeled media.

Labeled Ultrium media can be ordered at the time of purchase via the 3589 LTO Ultrium media machine type, or through IBM Media at 888-IBM-MEDIA (426-6334).

Refer to the [Supplies](#) section for additional information.

- **I/O station:** Standard on the TS3100 is a single-cartridge I/O station on the left cartridge magazine, designed to allow for continuous library operation during import or export of data cartridges.
- **Removable cartridge magazines:** The TS3100 has two removable magazines that house 24 data cartridges. This enables quick population of the tape library, as well as ease of storage for media. Additional magazines may be ordered as an option.
- **Customer replacement units (CRUs):** Drives, power supply, and cartridge magazines are customer replacement parts.

TS3200 Tape Library

The TS3200 has the capacity for 48 tape data cartridges and supports:

- Up to two IBM LTO Ultrium 6 full-high tape drives with Fibre Channel attachment or up to four IBM LTO Ultrium 6 half-high tape drives with SAS or Fibre Channel attachment
- A combination of up to a maximum of two IBM LTO Ultrium full-high tape drives or up to a maximum of four IBM LTO Ultrium half-high tape drives

The TS3200 Tape Library offers the following significant improvements over existing 4U Tape Libraries:

- **Increased cartridge capacity:** The TS3200 is configured to hold four removable magazines, providing 48 data cartridges, including a three-slot I/O station.
- **Standard barcode reader:** With the addition of the standard bar code reader, the TS3200 can be operated as a random access tape library with labeled media.

Labeled Ultrium media can be ordered at time of purchase via the 3589 LTO Ultrium media machine type or through IBM Media at 888-IBM-MEDIA (426-6334).

Refer to the [Supplies](#) section, for additional information.

- **I/O station:** Standard on the TS3200, a three-slot I/O station on the lower-left cartridge magazine is designed to allow for continuous library operation during import or export of data cartridges.
- **Removable cartridge magazines:** The TS3200 has four removable magazines to enable quick population of the tape library, as well as ease of storage for media. Additional magazines may be ordered as an option.

- **Customer replacement units (CRUs):** Drives, power supply, and cartridge magazines are customer replacement parts.

TS3100 and TS3200 Tape Libraries

The IBM LTO Ultrium 6 tape drive is the sixth-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products. The Ultrium 6 tape drive in the TS3100 and TS3200 offers the following significant improvements over the Ultrium 5 tape drive:

- **Increased performance:** LTO Generation 6 specification native data transfer rate is up to 160 MB/sec and data tracks are written 16 at a time. IBM Ultrium 6 tape drives can read and write LTO Ultrium 5 or 6 data cartridges, and can read LTO Ultrium 4 data cartridges.

Note: Although the Ultrium 6 tape drive provides the capability for excellent tape performance, other components of the system may limit the actual performance achieved. Also, the compression technology used in the tape drive can typically double the amount of data that can be stored on the media, but the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

- **Increased tape cartridge capacity:** LTO Generation 6 media specification tape cartridge physical capacity is up to 6.25 TB compressed physical capacity, more than doubling that of the Ultrium 5 data cartridges. This is achieved by increasing the linear density and the media length. The tape itself is a Barium Ferrite tape developed to help provide durability and increased capacity.
- **Ultrium 5 cartridge compatibility:** The Ultrium 6 tape drive can read and write Ultrium 5 cartridges.
- **Encryption supported on Ultrium 6, 5, and 4 Fibre Channel and SAS tape drives:** The IBM System Storage TS3100 and TS3200 Tape Libraries support data encryption on the base drive with LTO-6, 5, and 4 media meeting LTO Generation 6 media specifications and Application Managed encryption. System Managed and Library Managed Encryption are supported with the Transparent LTO Encryption feature number 5900. IBM Tivoli® Key Lifecycle Manager v1 is required with this feature.
- **Attachment options:** The TS3100 and TS3200 Tape Libraries come with 6 Gbps SAS or 8 Gbps Fibre Channel LTO-6 tape drive attachment for connection to a wide spectrum of open system servers. They are supported on IBM Power Systems , System p , System i , System x , System z , Sun Solaris, HP-UX, Microsoft™ Windows , Linux , and other open systems.
- **WORM media support:** With LTO Generation 6 media specification of up to 6.25 TB with 2.5 to 1 compression, IBM 3589 LTO-6 WORM tape cartridges are designed for archiving and data retention applications, as well as those applications requiring an audit trail. These cartridges work with the IBM LTO Ultrium 6 tape drive to help prevent the alteration or deletion of user data. IBM LTO-6 WORM tape cartridges can be ordered as unique 3589 models with the following features:
 - Prelabeling with the ability to specify a starting volume serial and color-coding
 - Packaging in individual jewel cases or in bulk
 - Cartridge memory is built into every cartridge to enhance functionality and media reliability by storing access history and media performance information for use by the tape drive every time the cartridge is accessed
 - Half-inch Barium Ferrite tape with up to 6.25 TB WORM compressed capacity in a single cartridge
- **Larger internal data buffer:** There is a 1 GB internal data buffer in the Ultrium 6 full-high tape drive and a 512 MB internal data buffer in the Ultrium 6 half-high tape drive.
- **Digital speed matching:** Speed matching on Ultrium 6 ranges from 40 to up to 160 MB/sec versus 40 to up to 140 MB/sec on Ultrium 5.
- **Giant Magneto Resistive (GMR) head design:** Use of flat lap head technology in GMR heads from the Enterprise tape drives for Ultrium 6 helps minimize contact, edge damage, debris accumulation, and wear on the tape as it moves over the read/write heads.

- **Dual-stage 16-channel head skew actuator:** The actuator is designed to provide precision head alignment to help support higher track density and improved data integrity. The track following skew actuator supports flangeless tape guide rollers and dynamic skew to enable the head to follow skew tape motion and improve linear actuation.
- **Power management:** The Ultrium 6 tape drive power management function is designed to control the drive electronics to be either completely turned off or in a low-power mode when the circuit functions are not needed for drive operation. Improvements specifically in idle mode are improved over Ultrium 5.

Proven IBM LTO Ultrium features in the IBM LTO Ultrium 6 tape drive include:

- **Servo and track layout technology:** There are 2,176 data tracks in Ultrium 6 versus 1,280 data tracks in Ultrium 5. The high-bandwidth servo system features a low-mass servo to help more effectively track servo bands and improve data throughput with damaged media in less-than-optimal shock and vibration environments.
- **Surface Control Guiding Mechanism:** The patented Surface Control Guiding Mechanism from IBM is designed to guide the tape along the tape path in the Ultrium 6 and 5 tape drive. This method is designed to use the surface of the tape, rather than the edges, to control tape motion to reduce tape damage (especially to the edges of the tape) and tape debris, which comes from the damaged edges and accumulation in the head area.
- **Robust drive components optimized for automation environments:** With the most robust components available, such as all-metal clutch, steel ball bearings in loader, robust leader block design, and single circuit card, the drives offer enhanced reliability and prolonged life.
- **Separate writing of multiple filemarks:** Separate writing of multiple filemarks is designed to evoke any write command of two or more filemarks to cause a separate data set to be written containing all filemarks after the first. This helps improve performance if a subsequent append overwrites somewhere after the first filemark, and helps prevent having to rewrite data sets containing customer data and the first filemark if such an append occurs.
- **LTO Data Compression (LTO-DC):** The Ultrium 6 uses LTO-DC, which is an implementation of a Lempel-Ziv class 1 (LZ-1) data compression algorithm. LTO-DC is an extension of Adaptive Lossless Data Compression (ALDC) and an improvement over previous IBM lossless compression algorithms. Patented "Scheme-Swapping" compression from IBM is designed to look ahead at incoming data and determine the most efficient storage method (either ALDC or pass-through mode) to help optimize data compression and increase data throughput. The compressed ratio is up to 2.5 to 1 for LTO Ultrium 6.
- **LTO Cartridge Memory (LTO-CM):** Contained within the LTO Ultrium data cartridge is the LTO-CM, which is a passive, contactless silicon storage device that is physically a part of the cartridge. The LTO-CM is designed to hold information about that specific cartridge, the media in the cartridge, and the data on the media. The storage capacity of the Generation 6 LTO-CM is 16,320 bytes, double the capacity of Generation 5 and 4 LTO-CM of 8,160 bytes. Communication between the drive and the LTO-CM is via a low-level RF field transmitted by the drive to the cartridge.
- **Statistical Analysis and Reporting System (SARS):** The Ultrium 6 tape drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history saved in the CM module and the drive performance history kept in the drive flash EEPROM to help determine the likely cause of failure. SARS is designed to cause the drive to request a cleaner tape, to mark the media as degraded, and to indicate that the hardware has degraded.
- **Highly integrated electronics using IBM-engineered copper technology:** This technology is designed to reduce the total number of components in the drive, help lower chip temperatures, and reduce power requirements, resulting in a more reliable drive. The fourth-generation drive electronics are designed to provide error correction of soft errors in the memory arrays in data and control paths.

Ultrium 6.25 TB compressed data cartridge

The LTO Generation 6 media specification tape cartridge physical compressed capacity of up to 6.25 TB (with 2.5 to 1 compression) more than doubles the IBM Ultrium 5 data cartridge compressed capacity of up to 3.0 TB with 2:1 compression. IBM LTO Ultrium 6 tape drives can read and write Ultrium 5 or 6 data cartridges, and read Ultrium 4 data cartridges. LTO data cartridges can be ordered using machine type 3589, LTO Ultrium tape cartridges, or as a feature number at the time of purchase.

These cartridges have been designed to provide several enhancements over previous tape technologies. They are designed to work with tape drives that have increased tape speeds and high-density data recording. The case is specially designed for use in automated libraries and is designed for repeated, unattended handling. The tape itself is a Barium Ferrite tape developed for durability and capacity.

Path failover option

With the introduction of IBM LTO Ultrium 6 tape drive support, the TS3100 and TS3200 Tape Libraries will support Control Path Failover and Data Path Failover for all generations of IBM LTO Ultrium half-high tape drives.

Multi-Path support

The Multi-Path feature of the libraries supports sharing of the library robotics. The library can be partitioned into one or two logical libraries, and can provide each logical library its own separate and distinct drives, storage slots, and control paths. You can partition the library into as many logical libraries as there are drives in the library. Each logical library must contain at least one drive.

Note: This type of partitioning is designed to allow heterogeneous applications to share the library robotics independent of each other. Cartridges under library control are not shared between logical libraries, nor allowed to be moved between logical libraries. An example of heterogeneous sharing is a Microsoft Windows application using the drive and storage slots of one logical library while a UNIX application uses the drive and slots of another logical library.

The IBM System Storage 7226 Multi-Media Enclosure Model 1U3 now offers a RDX 3.0 Removable Disk Drive Docking Station (feature number EU03).

RDX 3.0 Removable Disk Drive Docking Station

The RDX 3.0 removable disk drive docking station accommodates a 320 GB, 500 GB, or 1.0 TB removable disk drive or data cartridge. The disks are in a protective rugged enclosure that plugs into the docking station. The docking station holds one removable disk cartridge at a time. The removable disk cartridge and docking station backs up information similar to tape drives. The IBM RDX docking station interface is USB level 3.0. Any industry standard RDX removable disk drive formatted for the attaching operating system may be installed in the RDX docking station. The RDX removable disk docking station feature includes a half-high drive latch, a USB interface assembly, and an external USB cable. A docking station with an RDX removable disk drive or data cartridge can be an excellent alternative to DAT160 and LTO5 tape drives and tape cartridges. RDX cartridges are built to withstand a fall from nearly one meter and are durable, small, and like tape cartridges, can be stored off-site for disaster recovery protection. RDX also provides the same easy expandability as tape. When you reach capacity with one removable disk cartridge, just insert in a new one. There is no need to buy additional hardware.

RDX removable drive cartridges can also be an alternative to DVD disks. Archiving capacities greater than 10 GB require multiple DVD disks which means more handling and shelf space are needed. A single 500 GB RDX drive cartridge can store more data than 50 standard DVDs.

At least one of the RDX removable drive cartridges (feature numbers 1107, 1708, or EU01) must be specified with each docking station feature order.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Section 508 of the US Rehabilitation Act

The IBM System Storage TS3100 and TS3200 Tape Library Models are capable, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via

http://www.ibm.com/able/product_accessibility/index.html

Statement of general direction

IBM intends to introduce tape cartridge media meeting the LTO Generation 6 media specifications.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Product number

Description	Machine		Feature number
	type	Model	
Ultrium 6 Fibre Channel Drive	3573	L2U,L4U	8344
Ultrium 6 Half-High SAS Drive	3573	L2U,L4U	8347
Ultrium 6 Half-High Fibre Channel Drive	3573	L2U,L4U	8348
2.0M SAS/Mini-SAS 1x Cable	3573	L2U,L4U	5402*
2.0M Mini-SAS/Mini-SAS 1x Cable	3573	L2U,L4U	5502*
13M LC-LC Fibre Channel Cable	3573	L2U,L4U	6013*
25M LC-LC Fibre Channel Cable	3573	L2U,L4U	6025*

Description	Machine		Feature
	type	Model	
RDX 3.0 Removable Disk Docking Station	7226	1U3	EU03

* Previously announced feature

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM , you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=112-196>

Publications

The following publications are available.

Title	Order number
IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide	GA32-0545
IBM System Storage TS3100/TS3200 Tape Library Getting Started Guide	GA32-0548

The publication listed above and the following publications are also available at

<http://www.ibm.com/storage/tape/lto>

The device driver publications are also available at

<ftp.software.ibm.com>

Look under the directory storage/devdvr.

Title	Order number
IBM System Storage TS3100 Tape Library and TS3200 Tape Library SCSI Reference	GA32-0547
IBM Tape Device Driver Programming Reference	GC32-0566
IBM Tape Device Driver Installation and User's Guide	GC27-2130

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

IBM Publications Center Portal

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge.

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an

array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

Technical information

Specified operating environment

Hardware requirements

The TS3100 and TS3200 Tape Libraries come with raven black covers.

The TS3100 Model L2U and TS3200 Model L4U support the new Ultrium 6 half-high SAS and Fibre Channel and full-high Fibre Channel tape drives and can be attached to IBM Power Systems , System p , AIX® , Linux , and Windows servers, and non-IBM servers, workstations, and personal computers that support those interface specifications.

A current list of supported open system configurations is available at

<http://www.ibm.com/storage/tape/lto>

Select the model, "Product Details," then "Independent Software Vendor (ISV) matrix for LTO " for the product.

A power cord feature number, if applicable, should also be specified.

The TS3200 comes with one power supply and an additional power supply can be added with the following feature:

- Additional Power Supply (feature #1901)

If ordered as an option, the additional power supply will come with a power cord based on the original order. If the Additional Power Supply feature is ordered, then two power cords will be supplied based on the power cord feature ordered.

Cables

Cables are required to attach tape drives in the TS3100 or TS3200 Tape Library to each server connection (up to the number of tape drives installed).

An interposer may also be required for attachment to various server adapters. One or more of the following Fibre Channel or SAS cables should be specified on the TS3100 or TS3200.

Fibre Channel cables: A Fibre Channel cable is required to attach a TS3100 or TS3200 Tape Library with Fibre Channel Ultrium tape drives to host Fibre Channel adapters, Fibre Channel switches, or other Fibre Channel components. At least one Fibre Channel cable should be specified on the initial Fibre Channel drive plant order. The IBM Ultrium 5 or 6 (8 Gbps) Fibre drive comes with an LC duplex connector.

Features for specifying Fibre Channel cables and their respective lengths are as follows:

- Feature #6013 - 13M LC-LC Fibre Channel Cable
- Feature #6025 - 25M LC-LC Fibre Channel Cable

SAS cables: A SAS cable is required to attach a TS3100 or TS3200 to the server host bus SAS adapter. SAS/Mini-SAS cables provide attachment from HBA with SFF-8470 to drives with SFF-8088. Mini-SAS/Mini-SAS cables provide attachment from HBA SFF-8088 to drives with SFF-8088. At least one SAS cable should be specified on the initial plant order.

The following cable options are available for SAS attachment:

- 2.0 m SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088) (feature #5402)
- 2.0 m Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088) (feature #5502)

SAS Interposers

A 1x4 interposer with either SAS/Mini-SAS or Mini-SAS/Mini-SAS connectors is available for connecting up to four Mini-SAS/Mini-SAS 1x cables and their respective SAS drives to a single host bus adapter port. Mini-SAS/Mini-SAS 1x cable (feature #5502) connect the interposer to the drive, and needs to be ordered separately.

The following interposers are available:

- SAS/Mini-SAS 4x Interposer (from HBA with SFF-8470 to maximum four cables with SFF-8088) (feature #5400)
- Mini-SAS/Mini-SAS 4x Interposer (from HBA with SFF-8088 to maximum four cables with SFF-8088) (feature #5500)

Refer to the **Specify or Special features** section of the Sales Manual for a detailed description of the above features.

Software requirements

For a current list of host software versions and release levels that support the TS3100 or TS3200, visit

<http://www-1.ibm.com/storage/tape/lto>

Select the model, then "Product Details," "Independent Software Vendor (ISV) matrix for LTO " for the product.

Tivoli Storage Manager and other compatible software offerings can provide storage and tape management software for the TS3100 or TS3200. Supporting software and applications must be obtained separately from IBM , IBM Business Partners, or independent software vendors (ISVs). A list of compatible software is available from your IBM representative or at

<http://www-1.ibm.com/storage/tape/lto>

Select the model, "Product Details," then "Independent Software Vendor (ISV) matrix for LTO " for the product.

IBM continues to work together with the ISVs to support the TS3100 and TS3200. Individual application vendors should be contacted for specific information and availability dates.

Note: All new IBM tape device drivers will only be posted to the web through the Fix Central download portal and not through the ftpsite. IBM maintains the latest levels of System Storage tape drive and library device drivers and documentation on the Internet. Utilize the Fix Central download portal by accessing the following website

<http://www.ibm.com/support/fixcentral>

There are a few pull down menus to navigate to the correct download as follows:

1. In the first pull down menu labeled "Product Group" select "Storage Systems".
2. In the next pull down menu that appears which is labeled "Product Family" select "Tape Systems".
3. With the next pull down menu, "Product Type", select "Tape Device Drivers and Software".
4. This will bring up the "Product" menu, which provides selections for "Platform drivers, Tools, or Software".
5. Under "Platform drivers", in order to download your driver, select the correct operating system.
6. Two more pull down menus will appear with information. Click "Continue".
7. The next screen can be used to narrow the search, however just click "Continue" to view what is available.

The IBM Tape Device Drivers Installation and User's Guide can be found at the following website

<http://www-01.ibm.com/support/docview.wss?rs=577&uid=ssg1S7002972>

LTO Ultrium 6 Encryption

Encryption for the TS3100/TS3200 Tape Library, with SAS and Fibre Channel versions of the IBM LTO Ultrium 6, Ultrium 5, or Ultrium 4 tape drives, is provided in AIX , HP-UX, Linux , Sun Solaris, and Microsoft Windows 2003 operating system environments.

The installation of a Ultrium 6 tape drive with encryption may require code updates for System p and supported open systems device drivers or storage management software. An update of the open systems device drivers can be obtained via anonymous FTP from

`ftp.software.ibm.com`

Look under the directory `storage/devdvr`.

For details on supported software versions and release levels for the LTO Ultrium 6 tape drive, as well as hardware support information, refer to the following website

<http://www.ibm.com/storage/tape>

Three modes of encryption management are supported:

- System Managed (available for AIX , Linux , Solaris, Windows)
- Library Managed (available for OS/400® , i5/OS™ , AIX , Linux , HP-UX, Solaris, and Windows)
- Application Managed (IBM Tivoli Storage Manager)

Compatibility

The IBM LTO Ultrium 6 tape drives can read and write IBM LTO Ultrium 5 or 6 data cartridges, and read IBM LTO Ultrium 4 data cartridges.

The LTO Ultrium 6 tape drives support the LTO Generation 6 media specification.

Limitations

SAS cable lengths are limited to a maximum of 6 meters (20 ft).

Fibre Channel cable lengths are limited to 500 meters (1650 ft).

IBM Ultrium 5 tape cartridges can be used with the IBM Ultrium 6 tape drives.

For LTO Ultrium 6 and 5, IBM Tivoli Key Lifecycle Manager V1.0 or V2.0 is required for enabling System Managed and Library Managed Encryption.

Some Control Path Failover environments are not supported at this time.

Planning information

Customer responsibilities

Physical installation and service planning is a customer responsibility. Detailed planning information is in the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide* (GA32-0545). The TS3100 and TS3200 Tape Libraries are designated as a customer setup unit (CSU). It is the customer's responsibility to install and service, if required, the unit. Customers are responsible for obtaining the appropriate adapters, cables, and interposers (if required) for system attachment. Customers are also responsible for ordering media. For optimum performance, the customer must obtain the latest level of firmware prior to installing the unit and must update the unit as new firmware release become available.

Customers can download the latest level of drive and library firmware from the LTO website

<http://www.ibm.com/storage/tape/lto>

Note: IBM offers IBM Installation and Maintenance support at an additional cost if the customer does not wish to install or maintain the TS3100 or TS3200 Tape Library.

You are responsible for downloading or obtaining from IBM, and installing designated Machine Code (microcode, basic input/output system code (called "BIOS"), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet website or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

Cable orders

A SAS cable for IBM Ultrium SAS tape drives is required to attach the TS3100 or TS3200 to the server. At least one cable should be specified on the initial plant order with the SAS drive feature. An interposer or interposers may be required for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium tape drive interface and the server interface.

A Fibre Channel cable is required to attach a TS3100 or TS3200 Tape Library with Fibre Channel Ultrium tape drives to host Fibre Channel adapters, Fibre Channel switches, or other Fibre Channel components. At least one Fibre Channel cable should be specified on the initial Fibre Channel drive plant order. The IBM Ultrium 6 (8 Gbps) Fibre drive comes with an LC duplex connector.

Refer to the **Cables** section at the end of [Hardware requirements](#) for a list of available cables and interposers.

Refer to the **Specify or Special Features** section of the TS3100 or TS3200 Sales Manual for a detailed description of the cables and interposers available.

Supplies

For users and remarketers:

The LTO Ultrium 6 2.5 TB data cartridges and the IBM LTO cleaning cartridge (feature #8002) can be purchased from IBM with the initial order. IBM media can also be ordered directly through AAS using Machine Type 3589. Refer to the 3589

Sales Manual for further information. For information about Priority Fulfillment Services distribution channels, call 1-888-IBM Media in the US and Canada, or visit

<http://www.ibm.com/storage/media>

Security, auditability, and control

This product uses the security and auditability features of host hardware, host software, and/or application software to which it is attached.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and conditions

MES discount applicable

Yes

Equal to the volume commitment discount

Field installable feature

Yes

Warranty period

Three years. IBM Ultrium media is warranted separately.

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

Customer setup

Yes

Machine code

Same license terms and conditions as base machine

Pricing

Description	Machine type	Model	Feature number
Ultrium 6 Fibre Channel Drive	3573	L2U,L4U	8344
Ultrium 6 Half-High SAS Drive	3573	L2U,L4U	8347
Ultrium 6 Half-High Fibre Channel Drive	3573	L2U,L4U	8348

Description	Machine type	Model	Feature number
RDX 3.0 Removable Disc Docking Station	7226	1U3	EU03

Feature number	Field install only	Plant install only	MES removal	Cables required
8344	N	N	Y	Y
8347	N	N	Y	Y
8348	N	N	Y	Y
EU03	N	Y	Y	N

Pricing terms

Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

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