



# IBM TS3100 and TS3200 tape library models with LTO Ultrium 7 drives deliver increased capacity, performance, and reliability

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## At a glance

IBM<sup>®</sup> 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™ 7 half-high 6 Gb SAS and 8 Gb Fibre Channel, and full-high 8 Gb Fibre Channel drives (feature numbers 8444, 8447, and 8448)
- LTO Generation 7 media specification native data transfer rate up to 300 MB/sec
- LTO Generation 7 media specification tape cartridge compressed capacity of up to 15 TB with 2.5 to 1 compression
- Encryption on LTO Ultrium 7 and Ultrium 6 tape drives
- Support for media partitioning and self describing tape
- 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 TS3100 Tape Library Model L2U (machine type 3573) and IBM TS3200 Tape Library Model L4U (machine type 3573) now incorporate the new LTO Ultrium 7 full-high 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 6 tape drives with a native data transfer rate of up to 300 MB/sec.

Mixed LTO Ultrium generations and attachment tape drive types are supported where drive space is available. Ultrium 7 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 7 tape drives for the TS3100 and TS3200 Tape Libraries are only available as feature numbers.

LTO Ultrium 7 tape drives support the LTO Generation 7 media specification of more than double the compressed capacity of up to 15 TB with 2.5 to 1 compression (up to 6 TB native capacity) compared to previous LTO 6 compressed capacity of up to 6.25 TB with 2.5:1 compression (up to 2.5 TB native capacity) per tape cartridge. IBM Ultrium 7 tape drives can read and write LTO Ultrium 6 and 7 data cartridges, and can read LTO Ultrium 5 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 enable continuous library operation while importing or exporting media. A remote management unit and a barcode reader are standard in the library, enabling 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. 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. A remote management unit and a barcode reader are standard in the library, enabling it to run in sequential or random access mode.

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## Key prerequisites

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Appropriate levels of host software are required to attach and support the TS3100 or TS3200 Tape Library with IBM LTO Ultrium 7 tape drives to select IBM Power Systems™, IBM System z<sup>(R)</sup>, Linux™, and Windows™ servers. Refer to the [Technical information](#) section for details.

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## Planned availability date

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October 23, 2015

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## Description

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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 7 full-high tape drive with Fibre Channel attachment or up to two IBM LTO Ultrium 7 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 drive or up to a maximum of two IBM LTO Ultrium half-high tape drives.

The TS3100 Tape Library has the following important characteristics:

- **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 standard bar code reader, the TS3100 can be operated as a random access tape library with labeled media.  
Labeled or generic Ultrium media can be ordered at the time of purchase through the 3589 LTO Ultrium media machine type or IBM Media at 888-IBM-MEDIA (426-6334).
- **I/O station:** Standard on the TS3100 is a single-cartridge I/O station on the left cartridge magazine, designed to enable 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 replaceable parts.

### TS3200 Tape Library

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

- Up to two IBM LTO Ultrium 7 full-high tape drives with Fibre Channel attachment or up to four IBM LTO Ultrium 7 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 has the following important characteristics:

- **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 standard bar code reader, the TS3200 can be operated as a random access tape library with labeled media.  
Labeled or generic Ultrium media can be ordered at time of purchase through the 3589 LTO Ultrium media machine type or IBM Media at 888-IBM-MEDIA (426-6334).
- **I/O station:** Standard on the TS3200, a three-slot I/O station on the lower-left cartridge magazine is designed to enable 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.
- **CRUs:** Drives, power supply, and cartridge magazines are customer replaceable parts.

### TS3100 and TS3200 Tape Libraries

The IBM LTO Ultrium 7 tape drive is the seventh-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products. The Ultrium 7 tape drive in the TS3100 and TS3200 offers the following significant improvements over the Ultrium 6 tape drive:

- **Increased performance:** LTO Generation 7 specification native data transfer rate is up to 300 MB/sec and data tracks are written 32 at a time. IBM Ultrium 7 tape drives can read and write LTO Ultrium 6 or 7 data cartridges, and can read LTO Ultrium 5 data cartridges.

**Note:** Although the Ultrium 7 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 7 media specification tape cartridge physical capacity is up to 15 TB compressed physical capacity, more than double that of the Ultrium 6 data cartridges. This is achieved by increasing the linear density, track density, and the media length. The tape itself is a Barium Ferrite tape developed to help provide durability and increased capacity.
- **Ultrium 6 cartridge compatibility:** The Ultrium 7 tape drive can read and write Ultrium 6 cartridges.
- **Encryption supported on Ultrium 7, 6, 5, and 4 Fibre Channel and SAS tape drives:** The IBM TS3100 and TS3200 Tape Libraries support data encryption on the base drive with LTO 7, 6, 5, and 4 media meeting LTO Generation 7 media specifications and application-managed encryption. System Managed and Library Managed Encryption are supported with the Transparent LTO Encryption feature number 5900. IBM Security Key Lifecycle Manager V1 is required with this feature.
- **Attachment options:** The TS3100 and TS3200 Tape Libraries come with dual port 6 Gbps SAS or single port 8 Gbps Fibre Channel LTO-7 tape drive attachment for connection to a wide spectrum of open system servers. They are supported on IBM Power Systems, System p, System z, Microsoft<sup>®</sup> Windows, Linux, and other open systems.
- **WORM media support:** With LTO Generation 7 media specification of up to 15 TB with 2.5 to 1 compression, IBM 3589 LTO-7 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 7 tape drive to help prevent the alteration or deletion of user data. IBM LTO-7 WORM tape cartridges can be ordered as unique 3589 models with the following features:
  - Color coding and prelabeling with the ability to specify a starting volume serial
  - 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 15 TB WORM compressed capacity in a single cartridge
- **Larger internal data buffer:** There is a 1 GB internal data buffer in the Ultrium 7 full-high and half-high tape drive.
- **Digital speed matching:** Speed matching on Ultrium 7 ranges from 100 to up to 300 MB/sec versus 40 to up to 160 MB/sec on Ultrium 6.
- **Giant Magneto Resistive (GMR) head design:** Use of flat lap head technology in GMR heads from the Enterprise tape drives for Ultrium 7 helps minimize contact, edge damage, debris accumulation, and wear on the tape as it moves over the read/write heads.
- **Dual-stage 32-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 7 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.

Proven IBM LTO Ultrium features in the IBM LTO Ultrium 7 tape drive include:

- **Servo and track layout technology:** There are 3,584 data tracks in Ultrium 7 versus 2,176 data tracks in Ultrium 6. 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 7, 6, 5, and 4 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, 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:** This is designed to cause any write command of two or more filemarks to cause a separate data set to be written containing all filemarks after the first. This feature helps improve performance if a subsequent append overwrites somewhere after the first filemark.
- **LTO Data Compression (LTO-DC):** The Ultrium 7 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 7.
- **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 7 LTO-CM is 16,320 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 7 tape drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history saved in the Cartridge Memory module and the drive performance history kept in the drive flash 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 seventh-generation drive electronics are designed to provide error correction of soft errors in the memory arrays in data and control paths.

### **Ultrium 15 TB compressed data cartridge**

The LTO Generation 7 media specification tape cartridge physical compressed capacity of up to 15 TB (with 2.5 to 1 compression) more than doubles the IBM Ultrium 6 data cartridge compressed capacity of up to 6.25 TB with 2.5:1 compression. IBM LTO Ultrium 7 tape drives can read and write Ultrium 6 or 7 data cartridges, and read Ultrium 5 data cartridges. LTO 7 data cartridges should be ordered using machine type 3589, or as a feature number for restricted resellers 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 7 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 more 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.

### Product preview

IBM intends to introduce IBM Spectrum Archive™ Single Drive Edition and Spectrum Archive Library Edition support for LTO Ultrium 7 tape drives in the fourth quarter of 2015.

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.

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## Product number

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Description	Machine type	Model	Feature number
Ultrium 7 Fibre Channel Drive	3573	L2U, L4U	8444
Ultrium 7 Half-High SAS Drive	3573	L2U, L4U	8447
Ultrium 7 Half-High Fibre Channel Drive	3573	L2U, L4U	8448

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## Business Partner information

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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<sup>(R)</sup> ID and password are required (use IBM ID).

[BP Attachment for Announcement Letter 115-132](#)

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## Publications

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The following publications are available.

Title	Order number
<i>IBM TS3100/TS3200 Tape Library Setup, Operator, and Service Guide</i>	GA32-0545
<i>IBM TS3100/TS3200 Tape Library Getting Started Guide</i>	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

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

Title	Order number
IBM TS3100 Tape Library and TS3200 Tape Library SCSI Reference	GA32-0547
IBM Tape Device Driver Programming Reference	GC32-0566

IBM Knowledge 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. IBM Knowledge Center is located at

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

The IBM Publications Center Portal is located at

<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. A large number of publications are available online in various file formats, which can currently be downloaded.

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## Services

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### **Global Technology Services**

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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/ites.wss/zz/en?pageType=tp\\_search\\_new](http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp_search_new)

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## Technical information

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### **Specified operating environment**

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#### **Hardware requirements**

The TS3100 and TS3200 tape libraries come with raven black covers.

TS3100 Model L2U and TS3200 Model L4U support the new Ultrium 7 half-high SAS and Fibre Channel and full-high Fibre Channel tape drives and can be attached to IBM Power Systems, System p, AIX<sup>®</sup>, 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 feature number 1901, Additional Power Supply. 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 6 or 7 (8 Gbps) Fibre drive comes with an LC duplex connector.

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

- Feature number 6013 - 13 m LC-LC Fibre Channel Cable
- Feature number 6025 - 25 m LC-LC Fibre Channel Cable
- Feature number AGK1 - 10 m OM3 fiber Cable (LC)
- Feature number AGK2 - 25 m OM3 fiber Cable (LC)

*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 number 5502) connects 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**, and **Independent Software Vendor (ISV) matrix for LTO** for the product.

Spectrum Protect 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**, then **Product Details**, and **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<sup>®</sup> 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. In order to download your driver, select the correct operating system under **Platform drivers**.
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 7 Encryption**

Encryption for the TS3100/TS3200 Tape Library, with SAS and Fibre Channel versions of the IBM LTO Ultrium 7, 6, 5 or 4 tape drives, is provided in AIX, Linux, and Microsoft Windows operating system environments.

The installation of an Ultrium 7 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

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

Look under the directory ***storage/devdrv***.

For details on supported software versions and release levels for the LTO Ultrium 7 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, Windows)
- Library Managed (available for OS/400<sup>(R)</sup>, i5/OS<sup>TM</sup>, AIX, Linux, and Windows)
- Application Managed (IBM Spectrum Protect<sup>TM</sup>)

### ***Compatibility***

The IBM LTO Ultrium 7 tape drives can read and write IBM LTO Ultrium 6 or 7 data cartridges, and read IBM LTO Ultrium 5 data cartridges.

The LTO Ultrium 7 tape drives support the LTO Generation 7 media specification.

### ***Limitations***

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

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

IBM Ultrium 6 tape cartridges can be used with the IBM Ultrium 7 tape drives.

For LTO Ultrium 7, 6, and 5, IBM Security Key Lifecycle Manager V1.0 or V2.0 is required for enabling System Managed and Library Managed Encryption.

Path Failover is not supported on AIX attachment to SAS device.

### ***Planning information***

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#### ***Customer responsibilities***

Physical installation and service planning is a customer responsibility. Detailed planning information is in the *IBM STS3100/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 7 (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.

### **Security, auditability, and control**

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This product uses the security and auditability features of host hardware, host software, 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.

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## **Terms and conditions**

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### **MES discount applicable**

Equal to the volume commitment discount

### **Field installable feature**

Yes

### **Warranty period**

Three years

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. 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. 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

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## Prices

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Description	Machine type	Model	Feature number
Ultrium 7 Fibre Channel Drive	3573	L2U, L4U	8444
Ultrium 7 Half-High SAS Drive	3573	L2U, L4U	8447
Ultrium 7 Half-High Fibre Channel Drive	3573	L2U, L4U	8448

Feature number	Field install only	Plant install only	MES removal	Cables required
8444	N	N	Y	Y
8447	N	N	Y	Y
8448	N	N	Y	Y

## Pricing terms

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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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