

IBM TS3100 and TS3200 Tape Libraries

This IBM® Redbooks® Product Guide describes the IBM TS3100 and TS3200 tape libraries, which are well-suited for handling backup, restore, and archive data storage needs for small-to-medium environments. The TS3100 and TS3200 units are shown in Figure 1.



Figure 1. TS3100 (3573 L2U) tape library (left) and TS3200 (3573 L4U) tape library (right)

The TS3100 library uses of one IBM Linear Tape-Open (LTO) Ultrium 7, 6, or 5 Full-High tape drive, or up to two LTO Ultrium 7, 6, or 5 Half-High tape drives. The TS3100 has a 24-tape cartridge capacity with a library capacity of 360 TB compressed 2:5:1 (144 TB native). The TS3200 has a 48-tape cartridge capacity and contains up to two LTO Ultrium 7, 6, or 5 Full-High tape drives or up to four LTO Ultrium 7, 6, or 5 Half-High tape drives and scales to 720 TB compressed 2:5:1 (288 TB native). The LTO Ultrium 7 tape drive supports up to 300 MBps native data transfer; LTO Ultrium 6 tape drive supports up to 160 MBps native data-transfer and the LTO Ultrium 5 tape drive supports 140 MBps.

Both libraries include a bar-code reader as standard, which supports their operation in sequential or random access mode. The design of the remote library management through a standard web interface offers flexibility and greater administrative control of storage operations. Path Failover (an optional feature for the libraries) provides automatic control path failover to a preconfigured redundant control path if a host adapter or control path drive is lost without aborting the current job in process.

Did you know?

The TS3100 and TS3200 Tape Libraries are designed for storage management, capacity, performance, data protection, reliability, affordability, and application requirements. They are functionally rich, high-capacity, entry-level tape storage solutions that incorporate the latest generation of IBM LTO Ultrium 7 tape technology. The IBM TS3100 and TS3200 models are excellent solutions for large-capacity or high-performance tape backup with or without random access. They also are excellent choices for tape automation for IBM Power Systems™, IBM System x®, System x (Lenovo), and other open systems.

Highlights

The IBM TS3100 and TS3200 take advantage of LTO technology to cost-effectively handle growing storage requirements. Consider the following points:

- The TS3100 uses one LTO Full-High tape drive or up to two LTO Half-High tape drives and 24 tape cartridges capacity. The library is configured with two removable cartridge magazines, one on the left side (12 data cartridge slots) and one on the right side (12 data cartridge slots). The left magazine also includes a single mail slot to help support continuous library operation while media is imported and exported.
- The TS3200 scales with the use of up to two LTO Full-High tape drives or up to four LTO Half-High tape drives and 48 tape cartridges capacity. The library is configured with four removable cartridge magazines, two on the left side (24 data cartridge slots) and two on the right side (24 data cartridge slots). The lower left magazine also includes a three-slot I/O station to help support continuous library operation while media is imported and exported.

LTO Technology

The IBM LTO Ultrium 7 tape drive supports up to 300 MBps native data-transfer. IBM LTO standards leadership continues with the LTO Ultrium 7 tape drive, which increases the storage capacity to 15.0 TB compressed (6.0 TB native) on LTO Ultrium 7 media. The LTO Ultrium 6 more than doubled the storage capacity of the LTO Ultrium 5 tape drive with 6.25 TB compressed 2:5:1 on LTO Ultrium 6 media.

The following backward compatibility (read and write) is available:

- LTO Ultrium 7 tape drive can read and write LTO Ultrium 7 and 6 tape cartridges and read from LTO Ultrium 5 tape cartridges
- LTO Ultrium 6 tape drive can read and write LTO Ultrium 6 and 5 tape cartridges and read LTO Ultrium 4 tape cartridges
- LTO Ultrium 5 tape drive can read and write LTO Ultrium 5 and 4 tape cartridges

Security

Data is one of the most highly valued resources in a competitive business environment. Protecting that data, controlling access to it, and verifying its authenticity while maintaining its availability are priorities in our security-conscious world. Increasing regulatory requirements are also helping to direct the need for the adequate security of data. LTO Ultrium 7, 6, and 5 drive technology helps address security and compliance requirements with its continued Write Once Read Many (WORM) and Application Managed Encryption (AME) capability.

Advanced encryption through Library Managed Encryption (LME) and System Managed Encryption (SME) are available as optional Transparent LTO Encryption feature 5900. For key management for encryption, IBM Security Key Lifecycle Manager V2 is required. Whether encryption is application- or hardware-based, vital data can securely be stored to help ensure compliancy with data security, information disclosure, and privacy regulations for data at rest.

IBM Linear Tape File System

IBM Linear Tape File System™ (LTFS) is the first file system that works with LTO generations 7, 6, and 5 tape technology to set a new standard for ease-of-use and portability for open systems tape storage. The LTO Ultrium 5 tape drive was the first generation to introduce media partitioning, which allows LTO Ultrium media to be divided into segments and improves accessibility by providing the ability to quickly locate data to retrieve or update.

With LTFS, accessing data that is stored on an IBM tape cartridge became as easy and intuitive as using a USB flash drive. With LTFS and the operating system's file manager, reading data on a tape cartridge is as easy as dragging and dropping. Users can run any application that is designed for disk files against tape data without being concerned that the data is physically stored on tape. Originally built on the LTO Ultrium 5 format standard, IBM Spectrum Archive™ Library Edition (LE) provides a direct, intuitive, graphical access to data that is stored in IBM tape drives and libraries that use LTO Ultrium 7, 6, or 5 tape cartridges.

A member of the IBM Spectrum Storage™ family, IBM Spectrum Archive enables direct, intuitive, and graphical access to data that is stored in IBM tape drives and libraries by incorporating the LTFS format standard for reading, writing, and exchanging descriptive metadata on formatted tape cartridges. Spectrum Archive eliminates the need for more tape management and software to access data. Spectrum Archive offers three software solutions for managing your digital files with the LTFS format: Single Drive Edition, Library Edition, and Enterprise Edition. The TS3100 and TS3200 tape libraries support IBM Spectrum Archive Library Edition software for IBM LTO Ultrium 7, 6, and 5 tape drives.

Spectrum Archive Library Edition features the following benefits:

- The GUI helps reduce complexity by enabling an icon-based view of an LTO Ultrium 7, 6, or 5 library, including tape cartridges and files that use the operating system's file manager.
- LE helps reduce costs because it does not require any other tape management software or utilities.
- The file system API of the operating system is used to provide a basic read/write interface to the tape library for applications without any other operating system enhancements, such as plug-ins or service packs.
- “Mount-less” cartridge inquiry for fast access is achieved after the tape library is inventoried. Tape cartridges do not have to be remounted to retrieve content index data and basic cartridge information, such as volume name and serial number.
- Spectrum Archive LE software can be ordered concurrently with hardware, or as software only for installed supported tape libraries. Spectrum Archive LE can be ordered as product identifier (PID) software base order number 5639-LT1. The feature number is 5806.

Part number information

Table 1 lists part numbers and feature codes for the TS3100 and TS3200.

Table 1. TS3100 and TS3200 ordering information

TS3100	TS3200	Description	MTM
Yes	No	Tape Library Model L2U Driveless	3573 L2U
No	Yes	Tape Library Model L4U Driveless	3573 L4U
Drive options			Feature code
Yes	Yes	Ultrium 7 Full-High	8 Gbps Fibre Channel 8444
Yes	Yes	Ultrium 7 Half-High	6 Gbps SAS 8447
Yes	Yes		8 Gbps Fibre Channel 8448
Yes	Yes	Ultrium 6 Full-High	8 Gbps Fibre Channel 8344
Yes	Yes	Ultrium 6 Half-High	6 Gbps SAS 8347
Yes	Yes		8 Gbps Fibre Channel 8348
Yes	Yes	Ultrium 5 Full-High	6 Gbps SAS 8245
Yes	Yes		8 Gbps Fibre Channel 8244
Yes	Yes	Ultrium 5 Half-High	6 Gbps SAS 8247
Yes	Yes		8 Gbps Fibre Channel 8248
Optional feature codes			
Yes	Yes	Path Failover (at least 2 drives required)	1682
Yes	Yes	Transparent LTO Encryption	5900
Yes	Yes	Rack mount	7002
Yes	Yes	Right-side magazine set	8106
Yes	No	Left-side magazine	8109
No	Yes	Left-side magazine, upper	8107
No	Yes	Left-side magazine, lower	8108
Yes	Yes	Ultrium tape cartridges WORM media*	Ultrium 7 media 5-packs 8706
Yes	Yes		Ultrium 6 media 5-packs 8605
Yes	Yes		Ultrium 5 media 5-packs 8505
Yes	Yes	Ultrium Cleaning Cartridge	8002
No	Yes	Additional Power Supply	1901

* Ultrium 7, 6, and 5 WORM media and tape cartridge options can be ordered at this website:
<http://www.ibm.com/systems/storage/media>

The IBM Ultrium WORM cartridges (Machine Type 3589) were designed for applications, such as archiving and data retention, and for applications that require an audit trail. IBM Ultrium 7, 6, and 5 tape drive WORM support allows vital data to be stored in a non-erasable, non-rewritable format that are provided for these types of applications. The IBM Ultrium WORM cartridges work with the IBM LTO Ultrium tape drives to help prevent the alteration or deletion of user data. In addition, IBM took the following steps to reduce the possibility of tampering with the information:

- The bottom of the cartridge is molded in a different color than rewritable cartridges.
- The special cartridge memory helps protect the WORM nature of the media.
- A unique format is factory written on each WORM cartridge.

Table 2 lists the cabling ordering information for the TS3100 and TS3200.

Table 2. TS3100 and TS3200 cabling ordering information

Cables	Feature
13.0 m LC/LC Fibre Cable	6013
25.0 m LC/LC Fibre Cable	6025
2M SAS/Mini-SAS 1x Cable	5402
2M Mini-SAS/Mini-SAS 1x Cable	5502
SAS/Mini-SAS 4x Interposer	5400
Mini-SAS/Mini-SAS 4x Interposer	5500

Table 3 lists the common specifications for the TS3100 and TS3200.

Table 3. TS3100 and TS3200 specifications

Specifications	
Tape drive type	<ul style="list-style-type: none"> ● IBM LTO Ultrium 7 Full-High and Half-High ● IBM LTO Ultrium 6 Full-High and Half-High ● IBM LTO Ultrium 5 Full-High and Half-High
Tape drive physical capacity	<ul style="list-style-type: none"> ● Up to 15.0 TB per cartridge compressed 2:5:1; 6.0 TB native with LTO-7 media ● Up to 6.25 TB per cartridge compressed 2:5:1; 2.5 TB native with LTO-6 media ● Up to 3.0 TB per cartridge compressed 2:1; 1.5 TB native with LTO-5 media
Data transfer rate (per drive)	<ul style="list-style-type: none"> ● Up to 300 Mbps native with LTO-7 tape drive ● Up to 160 Mbps native with LTO-6 tape drive ● Up to 140 MBps native with LTO-5 tape drive
Attachment support	<ul style="list-style-type: none"> ● 8 Gbps fibre channel and 6 Gbps SAS interfaces
Warranty	Three-year, customer-replaceable unit (CRU) service in most countries
Operating environment	
Temperature	50 to 113 degrees F (10 to 45 degrees C)
Relative humidity	10% RH to 80% RH (non-condensing)
Electrical power	4.0 amps at 100 V ac; 2.0 amps at 240 V ac 0.1 KVA

Table 4 lists the unique specifications of the TS3100.

Table 4. TS3100 unique specifications

TS3100 specifications	
Number of drives	1 Full-High or up to 2 Half-Highs
Number of tape cartridges	24
Number of mail slots	1
Library physical capacity	<ul style="list-style-type: none"> ● Up to 360 TB per tape library compressed 2:5:1; 144 TB native with LTO Ultrium 7 media ● Up to 150 TB per tape library compressed 2:5:1; 60 TB native with LTO Ultrium 6 media ● Up to 72 TB per tape library compressed 2:1; 36 TB native with LTO Ultrium 5 media
Dimensions (width x height x depth)	
Stand-alone	17.6 in. (447.5 mm) x 3.84 in. (97.6 mm) x 31.9 in. (810 mm)
Rack-mount	17.6 in. (447.5 mm) x 3.44 in. (87.6 mm) x 29.13 in. (740 mm)
Weight	33 lb (15 kg) without rack mount

What is in the TS3100 shipping box?

The box contains the following items:

- Tape Library Model L2U Driveless
- 12 data cartridge left magazine
- 12 data cartridge right magazine
- IBM Ultrium Drives (ordered separately)
- Power cord (must be selected)
- One IBM Ultrium Cleaning Cartridge (universal)
- *IBM System Storage® TS3100/TS3200 Tape Setup, Operator and Service Guide*
- *IBM System Storage TS3100/TS3200 Tape Library Installation Quick Reference*
- Quality hotline card
- Device driver readme sheet
- Safety pointer multi-language readme sheet
- License Agreement for Machine Code
- NLS Translated Safety CD
- Misc documents CD

Table 5 lists the unique specifications for the TS3200.

Table 5. TS3200 unique specifications

TS3200 specifications	
Number of drives	Up to 2 Full-Highs or up to 4 Half-Highs
Number of tape cartridges	48
Number of mail slots	3
Library physical capacity	<ul style="list-style-type: none"> ● Up to 720 TB per tape library compressed 2:5:1; 288 TB native with LTO Ultrium 7 media ● Up to 300 TB per tape library compressed 2:5:1; 120 TB native with LTO Ultrium 6 media ● Up to 144 TB per tape library compressed 2:1; 72 TB native with LTO Ultrium 5 media
Dimensions (W x H x D)	
Stand-alone	17.6 in (447.5 mm) x 7.29 in (185.2 mm) x 31.9 in (810 mm)
Rack-mount	17.6 in (447.5 mm) x 6.89 in (175.2 mm) x 29.13 in (740 mm)
Weight	47 lb. (21.3 kg) without rack mount

What is in the TS3200 shipping box?

The box contains the following items:

- Tape Library Model L4U Driveless
- 12 data cartridge left upper magazine
- 12 data cartridge left lower magazine
- Two 12 data cartridge right magazines
- IBM Ultrium drives (ordered separately)
- Power cord (must be selected)
- One IBM Ultrium Cleaning Cartridge (universal)
- *IBM System Storage TS3100/TS3200 Tape Setup, Operator and Service Guide*
- *IBM System Storage TS3100/TS3200 Tape Library Installation Quick Reference*
- Quality hotline card
- Device driver readme sheet
- Safety pointer multi-language readme sheet
- License Agreement for Machine Code
- NLS Translated Safety CD
- Misc documents CD

Supported hardware platforms

The TS3100 and TS3200 are supported on the following hardware platforms:

- IBM BladeCenter®
- IBM Flex System®
- IBM Power Systems (p6 or later)
- IBM System p® (p5 or older)
- IBM System i®
- IBM System x
- System x (Lenovo)
- Advanced Micro Devices (AMD)
- Intel (x86 and x86_64)
- Oracle Sun

Supported operating systems

The TS3100 and TS3200 are supported on the following software products:

- IBM AIX® 6.1 or later
- IBM i 7.1 or later
- IBM VIOS 2.2.0 or later with client IBM i
- Microsoft Windows Server 2012 or 2012 R2 or later
- Novell SUSE Linux Enterprise 11 SP2 or later
- Oracle Solaris 10 and 11.2
- Red Hat Linux Enterprise 6.7 or 7.1

Check the latest support levels and configuration information for LTO drives, platforms, operating systems, and attachments at the Systems Storage Interoperation Center (SSIC):

<http://www.ibm.com/systems/support/storage/config/ssic>

Supported software products

Supported software products for TS3100 and TS3200 are as follows:

- IBM Backup Recovery and Media Services (BRMS)
- IBM High Performance Storage System (HPSS)
- IBM Spectrum Archive Library Edition
- IBM Spectrum Protect
- IBM Security Key Lifecycle Manager
- Atempo Time Navigator
- Barracuda Yosemite Server Backup
- CA ARCserve Backup
- CommVault Systems Galaxy/Simpana
- Dell NetVault
- EMC NetWorker
- Microsoft System Center Data Protection Manager
- Thales e-Security keyAuthority
- Veritas Backup Exec
- Veritas NetBackup

For more information about current IBM software products and independent software vendor products that support TS3100 and TS320, see the Independent Software Vendor (ISV) matrix for 3592 and LTO tape drives at this website:

http://www.ibm.com/systems/resources/ltc_isv_matrix.pdf

Also check the ISV website for product-specific version support, any limitations, and other usage information.

Warranties and Maintenance

Every TS3100 and TS3200 is covered by a system three-year, customer-replaceable unit (CRU) service warranty in most countries.

Optional IBM features that are initially installed in an IBM system carry the same warranty and warranty service support category as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

CRU service

IBM provides CRUs for you to install. CRU information and replacement instructions are included with your machine and are available from IBM upon your request.

Note: Each ServicePac is country-specific and is valid only when purchased and registered in the country in which IBM service will be provided. For a complete list of the ServicePac part numbers that are specific to your country, see the IBM ServicePac Worldwide Product Matrix at this website:

<https://www-304.ibm.com/sales/gss/download/spst/servicepac/extProductSelectorWWW.do>

Related publications

For more information, see the following resources:

- *IBM System Storage interactive product guide* :
<http://public.dhe.ibm.com/common/ssi/ecm/ts/en/tso00364usen/TSO00364USEN.PDF>
- *IBM System Storage TS3100 Tape Library and TS3200 Tape Library Setup, Operator, and Service Guide*, GA32-0545:
<http://publibfp.dhe.ibm.com/epubs/pdf/a32054d.pdf>
- *IBM Linear Tape-Open: LTO Ultrium tape drives, libraries, and autoloaders* :
<http://www.ibm.com/systems/storage/tape/index.html>
- *IBM Tape Library Guide for Open Systems*, SG24-5946:
<http://www.redbooks.ibm.com/abstracts/sg245946.html>
- *IBM Linear Tape File System Installation and Configuration*, SG24-8090:
<http://www.redbooks.ibm.com/abstracts/sg248090.html>
- *IBM TS3100 Tape Library* :
<http://www.ibm.com/systems/storage/tape/ts3100>
- *IBM TS3200 Tape Library* :
<http://www.ibm.com/systems/storage/tape/ts3200>
- *IBM LTO Ultrium 7 Data Cartridge* :
http://www.ibm.com/systems/storage/media/lto_7
- *IBM LTO Ultrium 6 Data Cartridge*
http://www.ibm.com/systems/storage/media/lto_6
- *IBM LTO Ultrium 5 Data Cartridge* :
http://www.ibm.com/systems/storage/media/lto_5
- *IBM Spectrum Archive and Linear Tape File System*
<http://www.ibm.com/systems/storage/tape/lufs>
- *IBM Security Key Lifecycle Manager* :
<http://www.ibm.com/software/products/en/key-lifecycle-manager>

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