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## Highlights

- Support highly-scalable, automated data retention on tape using Linear Tape-Open (LTO) Ultrium and IBM® 3592 tape drive families
  - Deliver extreme scalability and capacity, growing from one to 16 frames per library and from one to 15 libraries per library complex
  - Provide up to 2.25 exabytes (EB) of automated, low-cost storage under a single library image, improving floor space utilization and reducing storage cost per TB with IBM 3592 JD enterprise advanced data cartridges
  - Enable data security and regulatory compliance via support for tape drive encryption and write-once-read-many (WORM) cartridges
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# IBM TS3500 tape library

*A highly scalable, automated tape solution addresses data protection and long-term retention*

The IBM TS3500 tape library is designed to provide a highly-scalable, automated tape library for mainframe and open-systems backup and archive that can scale from midsized to large enterprise environments.

## Automates solutions for open and mainframe environments

TS3500 continues to lead the industry in tape drive integration with features such as persistent worldwide name, multipath architecture, drive/media exception reporting, remote drive/media management and host-based path failover. The L23 and D23 frames support IBM TS1150,<sup>1</sup> IBM TS1140, IBM TS1130, IBM TS1120 or IBM 3592 J1A tape drives. The L53 and D53 frames support LTO Ultrium 6 tape drives as well as previous-generation LTO Ultrium tape drives. L-frame models support improved cartridge handling, hot-swappable drive packaging and the option of an additional 16-slot I/O station. The TS3500 model D23 and D53 frames can be attached to existing model L22 or D52 frames. Mixed media is supported by combining LTO Ultrium tape drives and TS1150, TS1140, TS1130, TS1120 or 3592 J1A tape drives within the TS3500 library, frame by frame.

TS3500 supports IBM System z® when used with the IBM 3953 tape system, the IBM TS7700 family of virtual tape servers or the IBM Tape Controller for System z with its embedded library manager.



These systems enable System z hosts to access the TS3500 cartridge inventory and allow connection to TS1140, TS1130, TS1120 and IBM 3592 Model J1A tape drives. TS3500 can support up to four 3953 tape systems, up to eight TS7700 subsystems per physical library and up to 16 tape controllers for System z per logical library.

Tape Controller for System z offers IBM FICON® attachments of TS1140 tape drives in a TS3500 or rack, and reduces hardware and infrastructure requirements by sharing tape drives with FICON hosts. It can also add tape drives nondisruptively, which helps enhance configuration flexibility and availability.



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### Offers high-capacity, high-density, low-cost storage

Storage requirements are exploding in organizations due to the growing use of cloud, mobile and social media technologies. Data retention and protection policies further increase these demands, while at the same time, available floor space in data centers is diminishing. To help manage these conflicting issues, TS3500 supports storage-only library frames with patented, high-density slots that can significantly increase a library's total capacity. These frames contain multiple tiers of cartridge slots, yet have the same physical footprint as L and D frames. S24 frames can store up to 1,000 3592 cartridges with 30 PB of compressed data, and S54 frames support up to 1,320 LTO cartridges with 8.25 PB of compressed data, all in just 10 square feet. When configured with high-density frames, TS3500 can store up to 125 PB of compressed data with LTO cartridges, or up to 450 PB of compressed data with 3592 cartridges.

TS3500 supports the IBM Tape Library Connector (shuttle connector), which allows single or multiple interconnection of library strings to form a library complex of up to 15 libraries with a total capacity of 2.25 EB of data and up to 2,880 tape drives for storing and managing vast amounts of information in an automated fashion.

### Ensures high availability and capacity on demand

The TS3500 tape library can be ordered with a dual-accessor model option to help increase mount performance and overall system reliability and availability. The TS3500 Model HA1 enables two robotic accessors to operate simultaneously in configurations from two to 16 frames.

The TS3500 entry-base frame provides a more flexible upgrade path for users who want to expand their tape storage as their needs grow. Capacity-on-demand (CoD) configurations for TS3500 L-frame models include an “entry-level” configuration, an “intermediate” configuration and a “full-capacity” configuration. S-frame models also allow two CoD configurations.

### Includes advanced features

The TS3500 tape library is designed with a number of advanced features to deliver cutting-edge performance and long-term value. Highlights include:

- Flexible library capacity with up to 192 drives in up to 16 TS3500 frames, and up to 15 libraries interconnected in a library complex
- Architecture designed to allow simultaneous attachment of servers and applications to logical library partitions
- Remote management with a web-based interface for library control and configuration
- Simple Network Management Protocol query and trap functionality

- Automatic control path and data path failover to support improved continuity and disaster recovery
- Redundant control paths, grippers, power supplies and AC feeds for enhanced availability

The available Advanced Library Management System feature supports dynamic storage management, enabling users to dynamically create and change logical libraries and configure any drive into any logical library. Based on capacity requirements, the Advanced Library Management System can be implemented as an entry, intermediate or full CoD level in the TS3500 tape library.

### Supports encryption and WORM media

To keep information confidential if backup tapes are lost or stolen, TS3500 supports TS1150, TS1140, TS1130 and TS1120 tape drive encryption. It also supports LTO Ultrium 6 and 5 tape drive encryption. These tape drives include data encryption capabilities within the drives, helping to avoid the need for host-based data encryption—and the resulting drain on host performance—or the use of specialized encryption appliances.

The IBM Security Key Lifecycle Manager component for Java platforms can help generate and manage encryption keys for TS1150, TS1140, TS1130, TS1120, and LTO Ultrium 6 and 5 tape drives across the enterprise. This feature uses standard key repositories and supports three different encryption key-management methods: application-managed, system-managed or library-managed. The LTO Ultrium generation 6, 5 and 4 tape drives can also support WORM LTO media.

### Uses next-generation tape drives

TS1150 tape drives support IBM 3592 JD and JZ advanced, standard and WORM cartridges that feature two-and-a-half times more capacity than the previous generation—up to 10 TB

native or 30 TB compressed—with more than 40 percent faster data transfer rates at 360 MB per second (MBps) native. TS1150 tape drives also support the IBM 3592 JL economy cartridge with a capacity of up to 2 terabytes (TB). TS1150 tape drives can read and write IBM 3592 JC and JY cartridges with improved capacity and performance.

LTO Ultrium 6 2.5 TB cartridges (standard and WORM) and LTO Ultrium 6 tape drives are supported and designed to provide 67 percent more tape cartridge capacity and greater than 12.5 percent improvement in tape drive performance over the fifth-generation LTO Ultrium drives. They can also support media partitioning and the IBM Linear Tape File System™ technology in IBM Spectrum Archive™ to help improve data management on tape media. The sixth-generation LTO Ultrium is designed to support up to 160 Mbps native data transfer rates. LTO Ultrium 6 tape drives can read and write LTO Ultrium 5 cartridges and read LTO Ultrium 4 cartridges at original capacities with improved performance.

TS1150 and LTO Ultrium 6 tape drives and cartridges (standard or WORM) can reside in the same TS3500 tape library string with previous generations of 3592 or LTO Ultrium tape drives and cartridges to help protect existing investments.

### Integrates with powerful software

Further enhance the power of TS3500 by integrating it with industry-leading storage management solutions, such as IBM Spectrum Protect™ and a wide array of other storage software.

### Centralizes tape management

IBM offers a wide range of management software options for TS3500. The following table lists a subset of the software options, some available as downloadable files at [ibm.com](http://ibm.com).

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#### IBM TS3500 tape library at a glance

<b>Management software</b>	IBM TS3500 command-line interface (CLI) IBM Tape System Reporter IBM Security Key Lifecycle Manager IBM Tape System Library Manager
<b>Frame definition</b>	<b>L23</b> —Base frame for TS1150, TS1140, TS1130, TS1120 or 3592 <b>D23</b> —Drive-capable and storage expansion frame for TS1150, TS1140, TS1130, TS1120 or 3592 <b>S24</b> —Storage-only expansion frame for 3592 cartridges <b>L53</b> —Base frame for LTO <b>D53</b> —Drive-capable and storage expansion frame for LTO <b>S54</b> —Storage-only expansion frame for LTO cartridges <b>HA1</b> —High-availability service bay frame for use with the dual-accessor feature <b>SC1</b> —Library strings shuttle connector
<b>Tape drive types</b>	TS1150, TS1140, TS1130, TS1120 or 3592 tape drives or LTO Ultrium 6, 5, 4, 3, 2 or 1 tape drives

## Why IBM?

The performance and availability of your storage environment can either enhance or hamper your business processes. That's where IBM comes in. As a market leader in the storage industry, IBM can help you handle the challenges, whether you are a small to mid-sized company or a large enterprise.

Innovative technology, open standards, excellent performance, and a broad portfolio of proven storage software, hardware and solutions offerings are just a few of the reasons you should consider storage solutions from IBM, including the IBM TS3500 tape library.



**Take the next step.** [Click here.](#)  
See the full list of specifications.

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## For more information

To learn more about the IBM TS3500 tape library, please contact your IBM representative or IBM Business Partner, or visit: [ibm.com/systems/storage/tape/ts3500](http://ibm.com/systems/storage/tape/ts3500)

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Route 100  
Somers, NY 10589

Produced in the United States of America  
March 2015

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Actual available storage capacity may be reported for both uncompressed and compressed data and will vary and may be less than stated.

<sup>1</sup> TS1150 supports open systems only



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