

A highly scalable, automated tape solution to address information availability, security, retention and compliance



IBM System Storage TS3500 Tape Library



Highlights

- ***Supports scalable, automated data retention utilizing high-capacity IBM System Storage™ Tape Drives***
- ***Enhances data availability and library reliability with optional dual library accessor***
- ***Provides data security and regulatory compliance via support for tape drive encryption and WORM cartridges***

The IBM System Storage TS3500 Tape Library (TS3500 tape library) is designed to provide a highly scalable, automated tape library for mainframe and open systems backup and archive in midrange to enterprise environments.

The TS3500 tape library supports System z™ via the IBM 3953 Tape System (3953 tape system). The 3953 tape system enables System z hosts to access the TS3500 tape library cartridge inventory and allows

connection to TS1130, TS1120 and IBM TotalStorage® 3592 Model J1A tape drives. The TS3500 tape library can support up to four 3953 tape systems, allowing for up to eight IBM Virtualization Engine™ TS7700 subsystems per physical library.

High availability and Capacity on Demand

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

The TS3500 tape library's entry base frame provides a more flexible upgrade path for users who want to expand their tape storage at time of need. Capacity on Demand configurations for TS3500 tape library L-frame models include the "entry level" configuration, an "intermediate" configuration, and a "full capacity" configuration.

Library frames provide high capacity

The TS3500 tape library continues to lead the industry in tape drive integration with features such as persistent World Wide Name, multipath architecture, drive/media exception reporting, remote drive/media management, and host-based path failover. The L23 and D23 frames support the TS1130, TS1120 or 3592 J1A tape drives.

The L53 and D53 frames support IBM System Storage TS1040 Tape Drives as well as previous generation IBM LTO Ultrium® tape drives. L-frame models support improved cartridge handling, hot-swap drive packaging, and the option of an additional 16-slot Input/Output (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 the TS1130, TS1120 or 3592 J1A tape drives within the TS3500 library frame-by-frame.

High Density Frames

With ever increasing regulatory pressure to comply with federal mandates for medical, legal, email, financial and government data, storage requirements are exploding. To help meet that need the



TS3500 tape library supports storage-only, library frames with patented high density slots, which 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, and S54 frames support up to 1,320 LTO cartridges in 10 square feet.

Advanced features

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

Highlights include:

- *Flexible capacity with up to 192 drives in up to 16 TS3500 tape library frames.*
- *Architecture designed to allow simultaneous attachment of servers and applications to logical library partitions.*

- *Remote management via Web interface for library control and configuration.*
- *Simple Network Management Protocol (SNMP) 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 Advanced Library Management System (ALMS) is an available feature that supports dynamic storage management, allowing the user to dynamically create and change logical libraries and configure any drive into any logical library. ALMS is required when attaching to mainframe environments and also

when integrating high-density frames into a library configuration. Based on capacity requirements, ALMS can be implemented as an “entry,” “intermediate” or “full” Capacity on Demand level in the TS3500 tape library.

Encryption support

To keep information confidential if backup tapes are lost or stolen, the TS3500 tape library supports TS1130, TS1120 and TS1040 tape drive encryption. These tape drives include data encryption capabilities within the drives, helping to avoid the need for host-based encryption of data—and the concurrent drain on host performance—or the use of specialized encryption appliances.

The IBM Encryption Key Manager component for the Java™ platform can help generate and manage encryption keys for TS1130, TS1120 and TS1040 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.

WORM cartridge support for TS1130, TS1120 and LTO Generation 4 drives

TS1130 and TS1120 tape drives include support for the IBM 3592 JW/JR WORM (Write Once Read Many) cartridges. The TS1130 tape drive supports IBM 3592 JX Extended WORM cartridges that feature 1 TB native capacity.

IBM LTO Ultrium 4 800 GB cartridges (standard and Write Once Read Many (WORM)) and TS1040 tape drives are designed to provide up to double the

tape cartridge capacity and a 50% improvement in tape drive performance over the third-generation LTO Ultrium drives. The fourth-generation LTO Ultrium is designed to support up to 120 Mbps native data-transfer rates. The TS1040 tape drive can read and write IBM LTO Ultrium 3 cartridges and read LTO Ultrium 2 cartridges at original capacities with improved performance. The TS1040 tape drive and cartridges (standard or WORM) can be resident in the same TS3500 tape library frame with LTO Ultrium 3 and 2 tape drives and cartridges.

Software support

You can increase the power of the TS3500 tape library by integrating it with industry-leading storage management solutions such as IBM Tivoli® Storage Manager and a wide array of other storage software.

TS3500 Tape Library at a glance

Characteristics

| | |
|--|---|
| Frame definition | L23 – base frame for TS1130, TS1120 or 3592, D23 – drive capable expansion frame for TS1130, TS1120 or 3592, S24 – storage only expansion frame for 3592 cartridges L53 – base frame for LTO, D53 – drive capable expansion frame for LTO, S54 – storage only expansion frame for LTO cartridges HA1 – High Availability service bay frame for use with the dual accessor feature |
| Tape drive types | TS1130, TS1120 or 3592 tape drives or IBM LTO Ultrium 4, 3, or 2 Tape Drives |
| Number of frames | One base frame, up to 15 expansion frames The TS3500 Model HA1 installation provides one of the two additional frames required as service bays in a dual accessor library |
| Number of drives | Up to 12 per frame (up to 192 per library) |
| Number of tape cartridges | L23 – up to 260; D23 – up to 400; S23 – up to 1,000; Total supported: Up to 6,260 L53 – up to 287; D53 – up to 440; S53 – up to 1,320; Total supported: Up to 6,887 |
| Number of Input/Output slots | Up to 224 (16 I/O slots standard) |
| Number of logical libraries | Maximum of 192 (up to number of drives installed) |
| Number of 3953 Systems | Maximum of four per TS3500 subsystem |
| Number of TS7700 Virtualization Engine | Maximum of eight per TS3500 subsystem |
| Capacity ¹ | IBM Ultrium 4 Cartridges: up to 5.5 PB (up to 11 PB with 2:1 compression) 3592 extended capacity cartridges: up to 6.2 PB (18.6 PB with 3:1 compression) |
| Media type | L23/D23/S23: IBM 3592 JA/JJ/JB and JW/JR/JX Write Once Read Many (WORM) cartridges L53/D53/S53: IBM LTO Ultrium 4, 3, 2 Cartridges |
| Dimensions (all frames) | 70.9"H x 30.8"W x 47.7"D (1,800 mm x 782 mm x 1,212 mm) |
| Max. weight | L23 – 1,079 lb (490 kg); D23 – 994 lb (451 kg), S23 L53 – 1,061 lb (481kg); D53 – 970 lb (440 kg), S53 |
| Warranty | One Year; IBM On-site Repair (IOR) |

Operating environment

| | |
|-------------------|------------------------------------|
| Temperature | 16° to 32° C (61° to 90° F) |
| Relative humidity | 20% to 80% (non-condensing) |
| Wet bulb maximum | 23.0° C (73.4° F) |
| Electrical power | 8.0 amps at 200 – 240 VAC; 1.6 kVA |

Attachment and systems support

The TS3500 tape library can attach to IBM Power™ Systems, System p™, System i™, and System x™ servers and non-IBM servers, workstations

Operating systems support

Device driver support is available for IBM AIX®; IBM OS/400®; IBM i; Windows® 2000; Windows Server™ 2003; Linux®; Sun Solaris; and HP-UX

3953 Tape System at a glance

Characteristics

| | |
|--------------------------------------|---|
| Frame | 3953 Model F05 + feature code 5505—base frame for the 3953 tape system, consisting of the mechanical frame, power and cabling infrastructure to support the library manager(s) and a single TS1120 tape controller Up to 5 additional F05s can be configured as expansion frames, each capable of supporting up to three TS1120 tape controllers |
| Library Manager | 3953 Model L05 – single library manager. Maximum of two (redundancy only) per 3953 tape system |
| Number of frames | Six total: One base frame, and up to five expansion frames |
| TSSC | One per 3953 tape system |
| TS7700 Virtualization Engine support | Maximum of two TS7700s per 3953 tape system, maximum of eight per TS3500 tape library |
| TS1120 Tape Controller support | Maximum of 14 with two TS7700s, up to 16 with 0 TS7700s |
| TSSC capability | Yes, required |
| Dimensions (all frames) | 71"H x 43.4"W x 25.4"D (1,804 mm x 1,102 mm x 644 mm) |
| Weight | 3953 Model F05 – 620.4 lb (282 kg) |
| Warranty | One Year; IBM On-site Repair (IOR) |

Operating environment

| | |
|-------------------|------------------------------------|
| Temperature | 16° to 32° C (61° to 90° F) |
| Relative humidity | 20% to 80% (non-condensing) |
| Wet bulb maximum | 23.0° C (73.4° F) |
| Electrical power | 8.0 amps at 200 – 240 VAC; 1.5 kVA |

Attachment and systems support²

The 3953 tape system enables the TS1130², TS1120 and 3592 J1A tape drives within the TS3500 tape library to attach to System z hosts or the TS7700 Virtualization Engine

Operating systems support

IBM z/OS®



For more information

Contact your IBM representative or
IBM Business Partner or visit

ibm.com/systems/storage/tape

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MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.

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¹ Capacity depends on drives installed, number and type of cartridges used, and compression ratio achieved. Listed capacity is physical. Usable capacity may be less.

² TS1130 tape drives are not supported in the TS7700 Virtualization Engine at this time.

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