A highly scalable, tape solution for System z, IBM Virtual Tape Server and Open Systems

IBM System Storage TS3500 Tape Library

Highlights

- ***Designed for IBM System z™, IBM Virtual Tape Server and open systems environments***
- ***Utilizes the IBM TotalStorage® 3592 Tape Drive Model J1A and IBM System Storage™ TS1120 Tape Drive for System z, Virtual Tape Server and open systems environments***
- ***Utilizes the IBM System Storage TS1030 Tape Drive, using LTO™ Ultrium® 3 technology for increased capacity, throughput, fast access performance and WORM (Write Once Read Many) data cartridges in open systems environments***
- ***Optional dual library accessor, with the IBM System Storage TS3500 Model HA1, designed to increase library performance, availability and reliability***
- ***Supports TS1120 tape drive encryption for data protection***

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 3592 J1A and TS1120 tape drives. The TS3500 tape library can support up to four 3953 tape systems, allowing for up to eight VTS 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 the mount performance and overall system reliability and availability. The TS3500 Model HA1 allows two robotic accessors to operate simultaneously in two to 16 frame configurations.

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 the TS3500 tape library L-frame models include the "entry" level configuration, an "intermediate" configuration, and a "full" capacity configuration.

Advanced features

The L23 and D23 frames support the 3592 J1A and TS1120 tape drives. The L53 and D53 frames support TS1030. TS3500 tape library models continue 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. Both L-Frame models support improved cartridge handling, hot-swap drive packaging, and a second optional 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 3592 J1A and TS1120 tape drives within the TS3500 library frame by frame. The TS1030 tape drive is a native switched fabric 4 Gbps Fibre Channel tape drive. It is installed in the TS3500 models L53 and D53 and supports and offers investment protection with LTO Ultrium technology.

The TS3500 tape library is designed to provide the flexibility required to help address the system capacity and performance requirements of the most demanding applications by accommodating up to 192 drives in up to sixteen TS3500 tape library frames. The TS3500 tape library is designed with a variety of advanced features. The TS3500 tape library architecture is designed to allow simultaneous attachment of servers and applications to logical library partitions. Remote management using a Web browser provides library control and configuration. Simple Network Management Protocol (SNMP) query and trap functionality is also included. Redundant control paths, gripper, power supplies, and AC feeds offer enhanced availability. Control path and data path automatic failover capabilities further enhance the autonomic capabilities of the TS3500 tape library.

The Advanced Library Management System (ALMS) is available as a feature. ALMS 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. Based on capacity requirements, ALMS can be implemented as an "entry," "intermediate," or "full" Capacity on Demand level in the TS3500 tape library.

The 3592 J1A and TS1120 tape drives used in the L23 and D23 frames are designed for automation and use a tape cartridge with a form factor similar to the IBM 3590 tape cartridge. The 3592 J1A has a dual-ported 2 Gbps fibre channel interface and has a native data rate of up to 40 Mbps and 300GB native cartridge physical capacity or a short-length 60GB capacity cartridge.

The TS1120 tape drive has a dual-ported 4 Gbps Fibre Channel interface and has a native data rate of 100 Mbps. With the use of the existing IBM 3592 JA/JJ Cartridges for the 3592 J1A, the TS1120 tape drive has a native cartridge capacity of up to 500GB (1.5TB with 3:1 compression).

Encryption support

To keep information confidential if backup tapes are lost or stolen, the TS3500 tape library supports TS1120 tape drive encryption. The TS1120 tape drive includes data encryption capabilities within the drive itself, 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. This capability is intended to provide customers with greater ability to protect information if tape cartridges are lost or stolen by supporting the storage of the data in an encrypted form.

The IBM Encryption Key Manager component for the Java™ platform can help generate and manage encryption keys for TS1120 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 3592, TS1120 and LTO Generation 3 drives

The 3592 J1A and TS1120 tape drives also include support for the IBM 3592 JW/JR WORM (Write Once Read Many) cartridges.

The IBM LTO Ultrium 3 400GB cartridges (standard and Write Once Read Many (WORM)) and native 4 Gbps Fibre Channel TS1030 tape drive provide up to double the tape cartridge capacity and tape drive performance over the second generation LTO Ultrium drives. The third generation LTO Ultrium is designed to support up to 80 Mbps native data-transfer rates. The TS1030 tape drive can read and write IBM LTO Ultrium 2 cartridges and read LTO Ultrium 1 cartridges at original capacities with improved performance. The TS1030 tape drive and cartridges (standard or WORM) can be resident in the same TS3500 tape library frame with LTO Ultrium 1 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 3592 or TS1120, D23 - expansion frame for 3592 or TS1120 L53 - base frame for LTO, D53 - expansion frame for LTO HA1 - High Availability service bay frame for use with the dual accessor feature
Tape drive types	3592 J1A or TS1120 tape drives or IBM LTO Ultrium 3,or 2, Tape Drives
Number of frames	One base frame, and up to 15 expansion frames The TS3500 Model HA1 installation, provides two additional Dxx frames, required as service bays
Number of drives	Up to 12 per frame (up to 192 per library)
Number of tape cartridges	L23 “Entry” -58; L23 “Intermediate” - 117; L23 “Full” - 199 to 260; D23 - 360 to 400; Total: Up to 6,260 L53 “Entry” - 64; L53 “Intermediate” - 129; L53 “Full” - 219 to 287; D53 - 396 to 440; Total: Up to 6,887
Number of Input/Output slots	Up to 32 (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 VTS	Maximum of eight per TS3500 subsystem
Capacity[1]	IBM Ultrium 3 Cartridges: 26TB to 2,755TB (51TB to 5,510TB with 2:1 compression) 3592 cartridges: 29TB to 3,130TB (87TB to 9,390TB with 3:1 compression)
Data transfer rate[2]	Up to 160 MBps (with 2:1 compression) with LTO Ultrium 3
Media type	L23/D23: IBM 3592 JA/JJ and JW/JR Write Once Read Many (WORM) cartridges L53/D53: IBM LTO Ultrium 3, 2, 1 Cartridges
Dimensions (all frames)	70.9"H x 30.8"W x 47.7"D (1800 mm x 782 mm x 1212 mm)
Max. weight	L23 - 1079 lb (490 kg); D23 - 994 lb (451 kg) L53 - 1061 lb (481kg); D53 - 970 lb (440 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; 1.6 kVA
Attachment and systems support	The TS3500 tape library can attach to IBM 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 i5/OS®; 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 3 TS1120 tape controllers
Library Manager	3953 Model L05 – single library manager. Maximum of 2 (redundancy only) per 3953 tape system
Number of frames	Six total: One base frame, and up to 5 expansion frames
TSSC	One per 3953 tape system
VTS support	VTS Models B10 or B20. Maximum of 2 VTSs per 3953 tape system, maximum of 8 per TS3500 tape library
TS1120 Tape Controller support	Maximum of 14 with 2 VTSs up to 16 with 0 VTSs
TSSC capability	yes, required
Dimensions (all frames)	71"H x 43.4"W x 25.4"D (1804 mm x 1102 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 support	The 3953 tape system enables the 3592 J1A and TS1120 tape drives within the TS3500 tape library to attach to System z hosts or VTS Models B10 or B20
Operating systems support	IBM z/OS®

For more information

Contact your IBM representative or IBM Business Partner or visit

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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] Data rate reflects maximum compression with IBM LTO Ultrium 3 Tape Drives.

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