



IBM TS4500 Tape Library supports TS7700 attachment to deliver mainframe connectivity, high availability, capacity on-demand, and an enhanced GUI

Table of contents

1 Overview	4 Product number
2 Key prerequisites	6 Publications
2 Planned availability date	7 Technical information
2 Description	10 Terms and conditions
3 Product positioning	10 Prices

At a glance

The new IBM[®] TS4500 release delivers data continuity with redundancy, reduces time to data, and offers advanced enterprise data protection enhancements:

- Up to 60% reduction in floor space costs
- Up to two times faster access to data
- Up to 25% higher bandwidth per frame over TS3500
- z Systems™ synergy with support for 16 Gb Fibre Channel switch attached to TS7700 for up to 100 PB of z System Data storage
- Flexible growth options with new x track design
- Add top of rack for up to 10U of data center rack space savings
- Support for external TS3000 system console (TSSC) or Integrated Management Console (IMC)
- Management GUI improvements

Overview

IBM TS4500 tape libraries are the next generation in cloud storage solutions, delivering high storage density, high availability, and integrated management. TS4500 tape libraries are designed to deliver mainframe support provided through TS7700 attachment, along with the following features and enhancements:

- Increased mount performance and overall system availability with dual robotic accessors
 - Ability to grow left or right with less than one hour of downtime
 - Integrated service bays to reduce inactive service space by 40%
 - No dedicated service bay frames required
- TS7700-ready
- Flexible growth options with new x track design (now called flex track)
 - Simplified ordering for dual accessor
 - Standard on all new TS4500 tape libraries at latest release general availability
 - Field upgrade supported for pre-R3 libraries
- Support for external TSSC or IMC
- Management GUI improvements

Key prerequisites

Prerequisites for using encryption

Certain hardware and software prerequisites must be met before using encryption with TS4500 tape libraries.

Encryption is managed at the logical library level in TS4500 tape libraries. All encryption-enabled drives that are assigned to a logical library use the same method of encryption. The rules for setting up encryption differ based on whether the library is installed with 3592 or LTO™ tape drives, and whether you use library-managed encryption (LME) or application-managed encryption (AME). If the library contains 3592 tape drives, the following prerequisites apply:

- IBM Security Key Lifecycle Manager (formerly Tivoli® Key Lifecycle Manager) must be attached to the TS4500 and configured for LME
- Tape drives must be enabled for encryption from the Logical Libraries page of the TS4500 management GUI

If the library contains LTO tape drives, the following prerequisites apply:

- Tape drives must be enabled for encryption from the Logical Libraries page of the TS4500 management GUI
- Feature code 1604, Transparent LTO Encryption, is required for LTO tape drives if using LME
- IBM Security Key Lifecycle Manager is required as the key manager when using LME with LTO

Planned availability date

- June 3, 2016: All countries except Argentina, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russian Federation, and Taiwan.
- July 15, 2016: Argentina, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russian Federation, and Taiwan.

Description

TS4500 features and functions

IBM TS4500 tape libraries are the next-generation cloud storage solution that delivers high storage density and integrated management. Designed to deliver TS4500 mainframe support provided through TS7700 attachment, the following features and enhancements are also included:

- Increased mount performance and overall system availability with dual robotic accessors
 - Dual active accessors
 - Ability to grow left or right with less than one hour of downtime
 - Integrated service bays to reduce inactive service space by 40%
 - New *elastic capacity* option completely eliminates inactive service space and provides temporary relief for temporary overfill conditions (a portion of left-most and right-most frames used for service)
 - No dedicated service bay frames required
 - Two frame minimum for dual accessor configuration; TS3500 requires 4 frames minimum
 - Eighteen frame maximum configuration; same as TS3500, but with added capacity
- TS7700-ready

- TS7700 back-end switch support (16 Gb switches)
- GUI support for TS7700 logical library
- Attach to TS7700 TSSC for centralized service
- Flexible growth options with new x track design (now called flex track)
 - Simplified ordering for dual accessor
 - Same length ranges as single accessor, such as 1-2, 3-6, 7-14, or 9-18 frames
 - Reduced costs and outages when adding frames to left or right of dual accessor library within range
 - Standard on all new TS4500 tape libraries at latest release general availability
 - Field upgrade supported for pre-R3 libraries
 - All frames in library must be upgraded
 - Prerequisites to dual accessor upgrade
- Support for external TSSC or IMC
 - IMC maintains role of local operator GUI
- Customer-requested enhancements
 - Up to four library-managed encryption (LME) key paths per logical library
 - Management GUI improvements
 - Improve warning and progress dialogs for actions
 - Additional service options

IBM maintains the latest levels of Storage tape drive and library device drivers and documentation online at the [Fix Central](#) download portal.

There are several menus to navigate to the correct download as follows:

1. On the first menu item Click **Select Product > Product Group > System Storage^(R)**
2. Expand **Select from System Storage > Tape Systems**
3. Expand **Select from Tape systems > Tape drivers and software**
4. Expand **Select from Tape drivers and software > user product**
5. Expand **Platform > user operating system**
6. Click **Continue** to view what drivers are available

The [IBM Tape Device Drivers Installation and User's Guide](#) can be found online.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the [IBM Accessibility](#) website.

Product positioning

As you compare competitive tape solutions, consider:

- Capacity and performance requirements
- Data integrity and encryption, reliability, and availability
- Data partitioning, formatting, and management, such as Linear Tape File System™
- Storage usage and application requirements
- Affordability
- Loyalty to legacy or existing tape formats

TS4500 Tape Library and IBM software applications excel in addressing these requirements and deliver a functionally rich tape storage solution incorporating LTO Ultrium™ and 3592 tape technology. You also gain the flexibility of automated tape library management and unattended save, restore, and archive operations.

TS4500 tape library models are a smart choice in tape automation for IBM System i[®], IBM System p, or IBM z Systems™ products, and other open systems. TS4500 utilizes the patented multipath architecture, designed to enable homogeneous or heterogeneous open systems applications to share the library robotics, with Advanced Library Management System (ALMS) for storage slot pooling and flexible drive assignment.

The TS4500 is part of the IBM tape product family and can be the answer to growing storage requirements and shrinking backup windows.

If you have existing digital linear tape experience or require high-performance automated tape backup, the TS4500 tape library delivers an excellent tape storage solution.

Additional TS4500 features include advanced electronics, HD frames, Capacity on Demand entry library frames, and LTO and 3592 drive technology choices and integration.

Depending on capacity requirements, a wide spectrum of tape libraries are available from the IBM Ultrium Tape family of products based on your storage usage and requirements. Lower capacity tape automation products to choose from include the IBM TS3310, TS3200, or TS3100 Tape Libraries.

For high duty-cycle and start/stop intensive tape applications, with mission-critical data protection and high-capacity requirements, consider the IBM TS1140 or TS1150 or 3592 Tape Drive with the IBM TS4500 tape library.

Reference information

For more information, refer to the following announcements:

- IBM TS1140 Tape Drive Model EH7, Hardware Announcement [114-078](#), dated May 19, 2014
- IBM TS4500 Tape Library, Hardware Announcement [114-072](#), dated May 19, 2014
- IBM TS1060 Tape Drive Model F6A, Hardware Announcement [112-162](#), dated October 3, 2012
- IBM TS1140 Tape Drive Model E07, Hardware Announcement [111-087](#), dated May 9, 2011
- IBM TS1050 Tape Drive Model F5A, Hardware Announcement [110-075](#), dated April 12, 2010
- IBM TS1150 Tape Drive models EH8 and E08, Hardware Announcement [114-165](#), dated October 6, 2014

For IBM statement on compliance with European Union Directive on Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) (RoHS), visit the [IBM and the Environment](#) website.

Product number

Description	Machine type	Model	Feature number
HA Kit w/Second Accessor	3584	D25, D55, S25, S55	1442
1-2 Frame Flex-Track A cable	3584	L25, L55	2002

Description	Machine type	Model	Feature number
3-6 Frame Flex-Track A cable	3584	L25, L55	2006
7-14 Frame FlexTrack A Cable	3584	L25, L55	2014
9-18 Frame FlexTrack A Cable	3584	L25, L55	2018
Flex Track Guide Base	3584	L25, L55	2071
Flex Track Guide Expansion	3584	D25, D55, S24, S54, S25, S55	2072
TS4500 Accessor Refresh	3584	L25, L55, D25, D55, S25, S55	2309
2 Frame Flex Track B Cable	3584	L25, L55	2402
3-6 Frame Flex Track B Cable	3584	L25, L55	2406
7-14 Frame FlexTrack B Cable	3584	L25, L55	2414
9-18 Frame FlexTrack B Cable	3584	L25, L55	2418
Console Expansion 26Port Enet Switch/Rackmount	3584	L25, L55	2704*
Console Attachment	3584	L25, L55	2715*
TS7700 BE Sw Mounting Hdw	3584	L25, D25	4879**
TS7700 BE 16 Gb Switch	3584	L25, D25	4880**
3 Meter OM3 Quad Cables (LC)	3584	L25, D25	AGKQ**
High Availability Library	3584	L25, L55	9040*
Flex Track Guide Base	3584	L25, L55	9071
Flex Track Guide Expansion	3584	D25, D55, S25, S55	9072
Attached to TS7700	3584	L25, L55	9217*

* This feature was previously announced on other model.

**Features are also announced in Hardware Announcement [116-026](#), dated May 10, 2016.

Business Partner information

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 ID and password are required (use IBM ID).

[BP Attachment for Announcement Letter 116-051](#)

Education support

Call IBM IT Education Services at 800-IBM-TEACH (426-8322) for catalogs, schedules, and enrollments.

Publications

Information about new features are contained in the following TS4500 Tape Library publications. Additional copies are available. To order, contact your IBM representative.

Title	Order number
IBM TS4500 Lx5 Base Frame Installation Roadmap	SC27-5987
<i>IBM TS4500 Product Information CD</i>	

Additional information is available at the [IBM Publications Center](#).

Title	Order number
<i>IBM TS4500 Introduction and Planning Guide</i>	SC27-5990-03

Additional planning information is available at [Fix Central](#) or [TS4500 Knowledge Center](#).

IBM Knowledge Center provides you with a single point of reference 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 by going to [IBM Knowledge Center](#) for all your product information needs.

To access the IBM Publications Center Portal, go to the [IBM Publications Center](#) website.

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.

Services

Global Technology Services

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 go to the <http://www.ibm.com/services/> website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the [Resiliency Services](#) website.

Details on education offerings related to specific products can be found on the [IBM authorized training](#) website.

Technical information

Specified operating environment

Hardware requirements

A current list of supported open system configurations for TS4500 and its tape drives is available from the [IBM System Storage[®] Interoperation Center](#).

Select the **model**, then **Interoperability Matrix**, and view the *Supported Servers and Operating Systems* for the product.

Cables

Cables are required to attach tape drives in the TS4500 tape library to each server connection, up to the number of tape drive attachments installed. A Fibre Channel cable should be specified on the TS4500 frame.

Fibre Channel cables

A Fibre Channel cable is required to attach a tape drive in the TS4500 Tape Library Models L25 or L55 to host Fibre Channel adapters, the IBM 2109 SAN Fibre Switch, or other Fibre Channel components. The cable can be customer supplied or ordered with the TS4500 tape library in the lengths shown. The attaching Fibre Channel cable must be a 50.0/125 micrometer, short wavelength fiber-optic cable for distances up to 500 meters. These tape drives come with LC Duplex connectors. Eight LC-LC Fibre Channel drive-to-patch panel cables are included with each Quad Drive Mounting Kit (#152x).

The following features are available for Fibre Channel cables in the TS4500 frame:

- Feature number AGK1 - 10 m OM3 fiber Cable (LC)
- Feature number AGK2 - 25 m OM3 fiber Cable (LC)
- Feature number AGK3 - 80 m OM3 fiber Cable (LC)
- Feature number AGKQ - 3 m OM3 Quad Cable (LC) - For attachment to TS7700 BE switch

Refer to the **Special Features** section of the TS4500 or 3584 tape library Sales Manual for detailed descriptions of these features.

Host bus adapter (HBA) support

For a current list of HBAs that support the TS4500 and its tape drives, go to the [IBM System Storage Interoperation Center](#).

Software requirements

LTO Ultrium or Enterprise Tape Drives in the TS4500 Tape Library

For the latest supported hardware interoperability configurations, go to the [IBM System Storage Interoperation Center](#).

The installation of a TS4500 Tape Library and/or its tape drives require code updates for supported open systems device drivers or storage management software. According to the *Solutions Assurance Product Review (SAPR) Guide*, the account team or Business Partner should ensure that the customer checks the support levels required for their particular software environment prior to the installation of the TS4500 Tape Library and/or its tape drives. A Solutions Assurance call is required at a minimum for the installation of the first TS4500 in an account.

IBM Security Key Lifecycle Manager and other industry-leading compatible software offerings provide storage and tape management software for the TS4500 (machine type 3584). Supporting software and applications must be obtained separately from

IBM, IBM Business Partners, or ISVs. A list of compatible software is available from your IBM representative or at the [IBM Tape Storage](#) website.

The [IBM Tape Device Drivers Installation and User's Guide](#) can be found at the [IBM Support Portal](#).

Application software

For a list of compatible software for TS4500, go to the [IBM Tape Storage](#) website.

1. Click **IBM TS4500 Tape Library** > *Product details*
2. Click **Learn more** > *Interoperability matrix* or *ISV matrix for LTO*

For complete IBM storage interoperability information, including operating systems, servers, switches, and adapters supported by the TS4500 tape library in a SAN configuration, go to the [IBM System Storage Interoperation Center](#).

Compatibility

Compatible servers and software

The TS4500 tape library is supported by a wide variety of servers, operating systems, and adapters. There are many ways to determine the servers and software that support the TS4500 tape library.

These attachments can change throughout the lifecycle of the product. To determine the latest attachments, or to get a comprehensive list of compatible software, perform one of the following actions:

For a list of compatible software, operating systems, and servers for LTO and 3592 tape drives, go to the [IBM Tape Drives](#) website.

For complete IBM storage interoperability information, including operating systems, servers, switches, and adapters supported by the TS4500 tape library in a SAN configuration, go to the [IBM Storage Interoperation Center \(SSIC\)](#). Contact your IBM sales representative.

Notes:

1. IBM does not provide application software with the TS4500 tape library. To order software, contact your IBM sales representative, IBM Business Partner, or an Independent Software Provider.
2. If you attach your library to a non-IBM platform with non-IBM software, it is recommended that you contact your software vendor to obtain a matrix of compatible hardware, software, firmware revisions, and adapter cards.

Limitations

- A model Sx4 frame cannot be positioned left of the Lx5 frame in any TS4500 tape library and cannot be the rightmost frame in a dual accessor TS4500 tape library.
- Flex track cable field upgrade supported for pre-R3 libraries
 - All frames in library must be upgraded
 - Prerequisite to dual accessor upgrade
- The library does not support I/O Stations within integrated service bay A; for dual accessor configuration, model Lx5 cannot be the leftmost frame and a model Dx5 with feature #1652 cannot be the leftmost frame

Planning information

Customer responsibilities

Physical planning is a customer responsibility. Detailed planning information is in the *IBM TS4500 Introduction and Planning Guide*, (SC27-5990-03). Current levels of

the open systems device drivers should be obtained to ensure that the TS1070 LTO Ultrium Tape Drives are supported.

Customers are responsible for obtaining the appropriate adapters, cables, and interposers (if required) for system attachment. Customers are also responsible for ordering media.

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

Cables are required to attach tape drives in the TS4500 Tape Library to each server connection, up to the number of tape drive attachments installed.

Installability

Installation time for each field-installed tape drive in the TS4500 tape libraries is approximately 0.5 to 0.7 hours.

Packaging

Product	Shipment group	Number of boxes
3588 Model F7C	3588 Tape Drive Model F7C	1

Security, auditability, and control

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

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent

for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, go to the [IBM Electronic Support](#) website.

Terms and conditions

MES discount applicable

Equal to the volume commitment discount

Field installable feature

Yes

Warranty period

One year

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. 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 effective on its date of installation. 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

No

Machine code

No license terms apply

Prices

Description	Machine type	Model	Feature number	Installation type**
HA Kit w/ Second Accessor	3584	D25, D55, S25, S55	1442	Plant
1-2 Frame Flex-Track A cable	3584	L25, L55	2002	Both
3-6 Frame Flex-Track A cable	3584	L25, L55	2006	Both
7-14 Frame FlexTrack A Cable	3584	L25, L55	2014	Both
9-18 Frame FlexTrack A Cable	3584	L25, L55	2018	Both
Flex Track Guide Base	3584	L25, L55	2071	Field
Flex Track Guide Expansion	3584	D25, D55, S24, S54, S25, S55	2072	Field
TS4500 Accessor Refresh	3584	L25, L55, D25, D55, S25, S55	2309	Field

Description	Machine type	Model	Feature number	Installation type**
2 Frame Flex Track B Cable	3584	L25, L55	2402	Both
3-6 Frame Flex Track B Cable	3584	L25, L55	2406	Both
7-14 Frame FlexTrack B Cable	3584	L25, L55	2414	Both
9-18 Frame FlexTrack B cable	3584	L25, L55	2418	Both
Console Expansion 26Port Enet Switch/ Rackmount	3584	L25, L55	2704*	Both
Console Attachment	3584	L25, L55	2715*	Both
TS7700 BE Sw Mounting Hdw	3584	L25, D25	4879	Both
TS7700 BE 16 Gb Switch	3584	L25, D25	4880	Both
3 Meter OM3 Quad Cables (LC)	3584	L25, D25	AGKQ	Both
High Availability Library	3584	L25, L55	9040*	Both
Flex Track Guide Base	3584	L25, L55	9071	Plant
Flex Track Guide Expansion	3584	D25, D55, S25, S55	9072	Plant
Attached to TS7700	3584	L25, L55	9217*	Both

* This feature was previously announced on other model.

** Install type:

- "Plant" denotes plant installation only.
- "Field" denotes field installation only.
- "Both" denotes both plant and field installation.

Alternative service

Machine type-model-feature	IOR IBM same day on-site repair (IOR, 24 x 7)
3584-D25-1442	
3584-D55-1442	
3584-S25-1442	
3584-S55-1442	
3584-L25-4880	
3584-D25-4880	

Pricing terms

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.

Trademarks

z Systems, Linear Tape File System, IBM z Systems and Electronic Service Agent are trademarks of IBM Corporation in the United States, other countries, or both. IBM, Tivoli, Global Technology Services, System Storage and System i are registered trademarks of IBM Corporation in the United States, other countries, or both. LTO and Ultrium are trademarks of HP IBM Corp. and Quantum in the U.S. and other countries. Other company, product, and service names may be trademarks or service marks of others.

Terms of use

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Additional terms of use are located at:

[Terms of use](#)

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

<http://www.ibm.com/planetwide/us/>