Half-High LTO Generation 5 SAS Tape Drive
Product Guide (withdrawn product)

The fifth-generation Linear Tape-Open (LTO5) Half-High Ultrium Drive delivers twice the capacity (up to 3.0 TB) with significantly greater performance (up to 280 MBps) than the preceding generation, extending the proven reliability and low-cost of ownership LTO lineage to effectively meet the demanding backup, archival, and regulatory compliance requirements of your System x environment. This enterprise data protection offering is available in a 5.25" half-height internal form factor for integration into System x tower servers.

Figure 1 shows the internal Half-high LTO Generation 5 SAS Tape Drive,

Figure 1. Half High LTO Gen 5 Internal SAS Tape Drive

Did you know?

LTO Generation 5 tape drives feature hardware-based data encryption capabilities and support write once, read many (WORM) cartridges to help protect your data. WORM cartridges allow you to store vital data in a non-erasable, non-rewritable format, while AES256 hardware encryption can securely store data to help ensure compliancy with data security, information disclosure, and privacy regulations for data at rest.

This drive is also the first LTO generation to introduce Media Partitioning & Linear Tape File System, which allows LTO Gen 5 media to be divided into segments, improving accessibility by providing the ability to quickly locate data to retrieve or update.

Part number information

Table 1 lists the ordering part numbers and feature codes.

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
Half-High LTO Generation 5 SAS Tape Drive	49Y9898*	5345
LTO 5 Media 5 Pack	49Y9899	5346
LTO Cleaning Cartridge Option	49Y9893	5347

* Withdrawn from marketing

External tape drive offering: For a LTO5 tape drive in an external enclosure, use the IBM TS2900 Tape Autoloader for Lenovo. For information see, the product guide at
https://lenovopress.com/tips1303-ibm-ts2900-tape-library-for-lenovo

The Half-High LTO Generation 5 SAS Tape Drive part number 49Y9898 includes:

- LTO Generation 5 internal SAS tape drive assembly
- Tape mount kit (drive rails)
- Ultrium Cleaning Cartridge
- Documentation CD containing the User's Guide
- Important Notices
- Warranty flyer
- SAS cable for internal tape connectivity

Features

The features of the Half-High LTO Generation 5 SAS Tape Drive are:

- Backward compatibility with LTO 4 (read and write) and LTO 3 (read) media
- Speed matching and channel calibration for improved performance
- Media partitioning for faster access to stored data
- Support for host Application Managed Encryption (AME)
- Support for SAS adapters for improved performance and reliability
- Support for leading operating systems and popular backup software

Specifications

The specifications for the Half-High LTO Generation 5 SAS tape drive are:

- 6 Gbps SAS interface
- Half-height form factor (for internal tape drive)
- Native storage capacity of 1,500 GB (1.5 TB) per cartridge (3,000 GB at 2:1 compression)
- Maximum native data transfer rate of up to 140 MB per second
- Burst data transfer rate of 600 MB per second
- 256 MB read-and-write cache
- Support for encryption on Ultrium 5 tape cartridges
- Single-character display (SCD) operator panel
- Ready and fault status lights
- Maintenance mode functions

Key prerequisites

The Half-High LTO Generation 5 SAS Tape Drive prerequisites are:

- SAS controller
- One or more LTO Generation 4 or LTO Generation 5 data cartridges (not supplied with drive option)
- An available half-height drive bay

Physical specifications

The physical specifications of the internal Half-High LTO Generation 5 SAS Tape Drive are:

- Height: 43 mm (1.7 in.)
- Width: 148 mm (5.8 in.)
- Depth: 210 mm (8.3 in.)
- Weight: 1.6 kg (3.5 lb)

Operating environment

The Half-High LTO Generation 5 SAS Tape Drive is supported in the following environment:

- Temperature:
    - Operating: 10 to 40 °C (50 to 104 °F)
    - Storage or shipping: -40 to 60 °C (-40 to 140 °F)
- Relative humidity:
    - Operating: 20 to 80% (non-condensing)
    - Storage or shipping: 10 to 90% (non-condensing)
- Maximum altitude:
    - Operating or storage: 3048 m (10000 ft.)
    - Shipping: 12,192 m (40000 ft.)

Warranty

The Half-High LTO Generation 5 SAS tape drive has a one-year limited warranty. When installed in a System x server, this tape drive inherits the server's base warranty and any warranty upgrade.

Supported servers

The Half-High LTO Generation 5 SAS Tape Drive is supported with the servers listed in in the following tables.

The following tables list the System x servers that are compatible.

Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Table 2. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Part number	Description	x3250 M6 (3943)	x3250 M6 (3633)	x3550 M5 (8869)	x3650 M5 (8871)	x3850 X6/x3950 X6 (6241, E7 v4)	nx360 M5 (5465, E5-2600 v4)	sd350 (5493)
49Y9898	Half High LTO Gen 5 Internal SAS Tape Drive	N	N	N	N	N	N	N

Support for System x and dense servers with Intel Xeon v3 processors

Table 3. Support for servers with Intel Xeon v3 processors

Part number	Description	x3100 M5 (5457)	x3250 M5 (5458)	x3500 M5 (5464)	x3550 M5 (5463)	x3650 M5 (5462)	x3850 X6/x3950 X6 (6241, E7 v3)	nx360 M5 (5465)
49Y9898	Half High LTO Gen 5 Internal SAS Tape Drive	Y	N	Y	N	N	N	N

Support for servers with Intel Xeon v2 processors

Table 4. Support for servers with Intel Xeon v2 processors

Part number	Description	x3300 M4 (7382)	x3500 M4 (7383, E5-2600 v2)	x3550 M4 (7914, E5-2600 v2)	x3630 M4 (7158, E5-2400 v2)	x3650 M4 (7915, E5-2600 v2)	x3650 M4 BD (5466)	x3750 M4 (8753)	x3850 X6/x3950 X6 (6241, E7 v2)
49Y9898	Half High LTO Gen 5 Internal SAS Tape Drive	Y	Y	N	N	N	N	N	N

Supported software products

The Half-High LTO Generation 5 SAS Tape Drive supports the following software products:

- CA BrightStor ARCServe Backup
- Legato Networker
- Tivoli® Storage Manager
- Symantec Backup Exec
- Built-in backup functionality of supported operating system (native backup)

Supported operating systems

The Half-High LTO Generation 5 SAS Tape Drive supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Windows Small Business Server 2008 Premium Edition
- Windows Small Business Server 2008 Standard Edition
- Microsoft Windows Server 2003, Web Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter x64 Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise x64 Edition
- Microsoft Windows Server 2003/2003 R2, Standard Edition
- Microsoft Windows Server 2003/2003 R2, Standard x64 Edition
- Red Hat Enterprise Linux 6 Server x86, x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server Edition with Xen
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 4 AS for AMD64/EM64T
- Red Hat Enterprise Linux 4 ES for AMD64/EM64T
- Red Hat Enterprise Linux 4 AS for x86
- Red Hat Enterprise Linux 4 ES for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Real Time 11 AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 with Xen for x86

Not supported in guest OSes : The LTO tape drives are supported when attached and run from these host operating system, however, in virtualization environments (for example, Hyper-V, Xen), the tape drives are not supported in the guest operating systems.

For the latest information about the specific versions and service packs that are supported, see the ServerProven website at: http://www.lenovo.com/us/en/serverproven/. Select the System x or blade server and then select the expansion card to see the supported operating systems.

Related publications

For more information, see the following resources:

- *Installation Guide for 1U Rackmount Tape Enclosure*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-64787

- *Installation Guide for Half High Tabletop Tape Enclosure*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-64792

Related product families

Product families related to this document are the following:

- Backup Units

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, TIPS0826, was created or updated on January 15, 2017.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/TIPS0826
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/TIPS0826.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
ServerProven®
System x®

The following terms are trademarks of other companies:

Intel® and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Hyper-V®, Microsoft®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.