

IBM TS2290, TS2280, TS2270 LTO Ultrium Tape Drives Product Guide

The family of IBM LTO Ultrium Tape Drives are external, stand-alone or rack-mountable tape drives that contain an LTO Ultrium 9, 8, or 7 Tape Drive. The drives are designed for the heavy demands of backup tape storage delivering IBM tape reliability and performance at a cost-effective price.

- TS2290 Model H9S incorporates the LTO Ultrium 9 Half-High SAS Tape Drive uses a dual-port 12 Gbps SAS interface for connection.
- TS2280 Model H8S incorporates the LTO Ultrium 8 Half-High SAS Tape Drive uses a dual-port 6 Gbps SAS interface for connection
- TS2270 Model H7S incorporates the LTO Ultrium 7 Half-High SAS Tape Drive uses a dual-port 6 Gbps SAS interface for connection.

The LTO Ultrium Tape Drives are excellent choices if you use tape drives that require larger-capacity or higher-performance tape backup.



Figure 1. TS2290 Tape Drive

Did you know?

The latest LTO Ultrium technology, is the TS2290 Tape Drive that provides up to 45 TB, the TS2280 Tape Drive provides up to 30 TB, and the TS2270 Tape Drive provides up to 15 TB all three tape drives feature 2.5:1 compressed backup storage capacity.

Lenovo can be your trusted partner that offers "one stop shop" and single point of contact for delivery of leading edge technologies and innovations from Lenovo and other leading IT vendors. These offerings can satisfy the wide range of your end-to-end IT infrastructure needs, including handheld devices, notebooks, personal computers, servers, storage, networking, services, management software, and financing.

Key features

The IBM LTO Ultrium Tape Drives deliver the following features:

- Entry-level tape drives for high capacity, high performance, and high reliability
- Adherence to LTO specifications
- Support for one half-high LTO Ultrium 9 (TS2290), LTO Ultrium 8 (TS2280), or LTO Ultrium 7 (TS2270) SAS Tape Drive
- Native cartridge capacity of up to 18TB (Ultrium 9), 12 TB (Ultrium 8), or 6 TB (Ultrium 7)
- Native data transfer rate of up to 300 MB/s (Ultrium 9, 8 or 7)
- Mixed media support, including IBM LTO Write Once Read Many (WORM) media
- Remote monitoring of status of the tape drive
- Encryption support in the tape drive to work with Application Managed Encryption
- Optional rack-mount with the shelf to accommodate up to two tape drives side-by-side in a 2U rack space
- A dual-port 12 Gbps SAS attachment on Ultrium 9 and 6 Gbps on Ultrium 8
- Supports connection to Lenovo servers running Microsoft Windows and Linux server operating systems
- Support from an extensive ecosystem of backup software vendors



Figure 2. TS2290 Tape Drive

The IBM LTO Ultrium Tape Drives include the following IBM LTO Ultrium features:

- Independent tape loader and threader motors and positive pin retention
These technologies help improve the reliability of loading and unloading a cartridge and retain the pin, even if tension is dropped. An independent loader motor that is coupled with the positive pin retention causes the tape to thread with a higher level of reliability.
- Graceful dynamic braking
If there is a power failure, reel motors maintain tension and gradually decelerate instead of stopping abruptly, which helps reduce tape breakage, stretching, or loose tape wraps during a sudden power outage.
- Servo and track layout technology
There are 6656 data tracks in Ultrium 9 & 8 versus 3584 data tracks in Ultrium 7 . The high-bandwidth servo system features a low mass servo to help more effectively track servo bands and improve data throughput with damaged media in less-than-optimal shock and vibration environments.
- Surface Control Guiding Mechanism
IBM patented Surface Control Guiding Mechanism guides the tape along the tape path in the Ultrium Tape Drives. This method uses the surface of the tape (rather than the edges) to control tape motion. This configuration helps reduce tape damage (especially to the edges of the tape) and tape debris, which comes from the damaged edges and can accumulate in the head area.

- Tunneling magnetoresistive (TMR) head technology (LTO Ultrium 9 & 8 tape drives)
IBM LTO Ultrium 9 & 8 Tape Drives use TMR head technology, which helps achieve increased storage capacity and high data integrity.
- Digital speed matching
The LTO Ultrium Tape Drives perform dynamic speed matching to adjust the drive's native data rate as closely as possible to the net host data rate (after data compressibility is factored out). This matching helps reduce the number of backhitch repositions and improve throughput performance.
- Robust drive components optimized for automation environments
To help enhance reliability and prolong the life of the drives, some of the most robust components available are used, such as an all metal clutch, steel ball bearings in the loader, robust leader block design, and a single circuit card.
- Power management
The power management function of the Ultrium 9, 8 & 7 Tape Drives controls the drive electronics to be completely turned off or in a low-power mode when the circuit functions are not needed for drive operation.
- Adaptive read equalization
This equalization automatically compensates for dynamic changes in readback signal response.
- Dynamic amplitude asymmetry compensation
This compensation dynamically optimizes readback signals for linear readback response from MR read head transducers.
- LTO Data Compression (LTO-DC)
The Ultrium LTO uses LTO-DC, which is an implementation of a Lempel-Ziv class 1 (LZ-1) data compression algorithm. LTO-DC is an extension of Adaptive Lossless Data Compression (ALDC) and an improvement over previous IBM lossless compression algorithms. IBM patented "Scheme-Swapping" compression looks ahead at incoming data and determines the most efficient storage method (ALDC or pass-through mode) to help optimize data compression and increase data throughput.
- LTO Cartridge Memory (LTO-CM)
Contained within the LTO Ultrium data cartridge is the LTO-CM, which is a passive, contactless silicon storage device that is physically a part of the cartridge. The LTO-CM holds information about that specific cartridge, the media in the cartridge, and the data on the media. The storage capacity of the Generation 9, 8 & 7 LTO-CM is 16320 bytes. Communication between the drive and the LTO-CM is via a low-level RF field transmitted by the drive to the cartridge.
- Statistical Analysis and Reporting System (SARS)
The Ultrium Tape Drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history that is saved in the CM module and the drive performance history that is kept in the flash EEPROM to help determine the likely cause of failure. SARS causes the drive to request a cleaner tape, mark the media as degraded, and indicate that the hardware is degraded.
- Highly integrated electronics that use IBM engineered copper technology
This technology reduces the number of components in the drive, helping lower chip temperatures, and reduces power requirements to deliver a more reliable drive. The sixth-generation drive electronics provide error correction of soft errors in the memory arrays in data and control paths.
- Dual-stage head actuator
The 32-channel actuator (LTO Ultrium 9, 8 & 7) provide precision head alignment to help support higher track density and improved data integrity.

- Separate writing of multiple filemarks

The Ultrium LTO9 is designed to cause any write command of two or more filemarks to cause a separate data set to be written containing all filemarks after the first. This feature helps improve performance if a subsequent append overwrites somewhere after the first filemark.

- Giant Magneto Resistive (GMR) head design (LTO Ultrium 7 tape drives)

IBM LTO Ultrium Tape Drives use GMR head technology with beveled contouring for reducing striction and friction. This head design was demonstrated in enterprise tape products to help minimize contact, edge damage, debris accumulation, and wear on the tape as it moves over the read/write heads.

Components and connectors

The following figure shows the front of the TS2290. The front view of the TS2280 and TS2270 is similar to the front view of the TS2290.

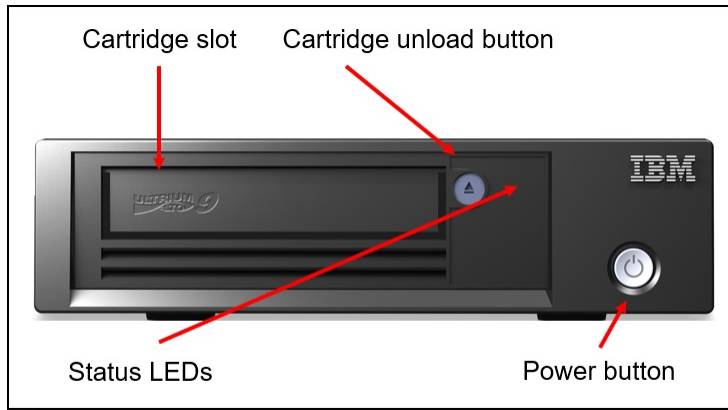


Figure 3. Front view of TS2290

The following figure shows the rear of the TS2290

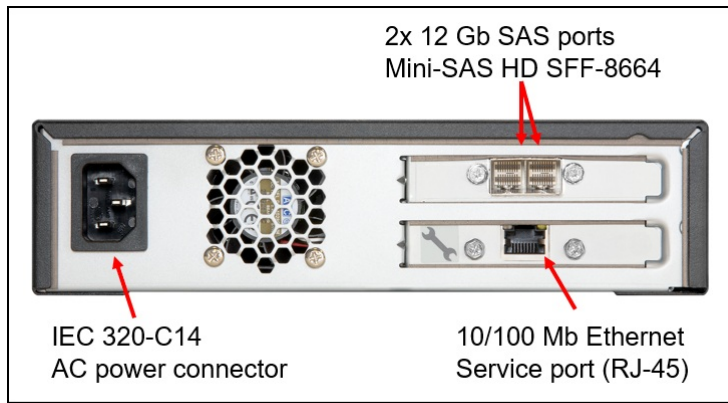


Figure 4. Rear view of TS2290

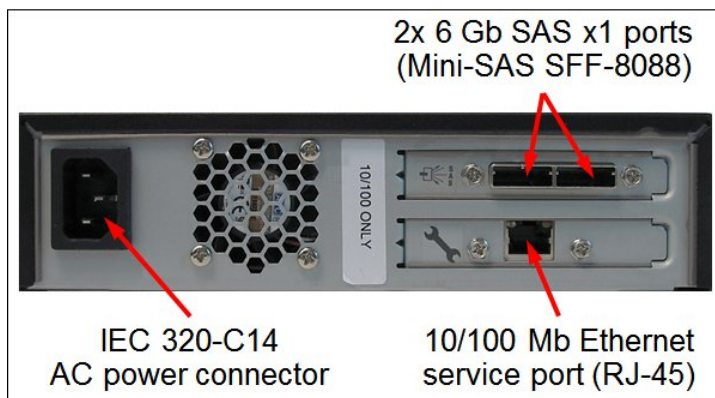


Figure 5. Rear view of TS2280 & TS2270

System specifications

The following table lists the LTO Ultrium Tape Drives system specifications.

Table 1. System specifications

Attribute	Specification
Form factor	Standalone or 2U rack mount (on a fixed shelf)
Drive technology	<ul style="list-style-type: none"> • TS2290: LTO Ultrium 9 half-high drive • TS2280: LTO Ultrium 8 half-high drive • TS2270: LTO Ultrium 7 half-high drive
Drive interface	<ul style="list-style-type: none"> • LTO9: 2x 12Gb SAS x1 ports (Mini-SAS HD SFF-8644) • All Others: 2x 6 Gb SAS x1 ports (Mini-SAS SFF-8088)
Number of drives	1
Number of cartridge slots	1
Cartridge capacity	<ul style="list-style-type: none"> • LTO 9: 18 TB native; up to 45 TB compressed (with 2.5:1 compression ratio) • LTO 8: 12 TB native; up to 30 TB compressed (with 2.5:1 compression ratio) • LTO 7: 6 TB native; up to 15 TB compressed (with 2.5:1 compression ratio)
Data transfer rate	<ul style="list-style-type: none"> • LTO 9: Up to 300 MB/s native; up to 750 MB/s compressed (with 2.5:1 compression) • LTO 8: Up to 300 MB/s native; up to 750 MB/s compressed (with 2.5:1 compression) • LTO 7: Up to 300 MB/s native; up to 750 MB/s compressed (with 2.5:1 compression)
Security features	Application Managed Encryption (AME) with optional third-party software (such as IBM Spectrum Protect)
Management interfaces	1x Ethernet port (UTP, RJ-45) for drive status and servicing only
Cooling	Fixed internal fan
Power supply	One 73 W AC fixed power supply with IEC 320-C14 power connector
Hot-swap parts	None
Dimensions	Width: 213 mm (8.4 in.) Depth: 332 mm (13.1 in.) Height: 58 mm (2.3 in.)
Weight	4.3 kg (9.4 lb.)
Warranty	3-year limited warranty, customer replaceable unit (CRU) and on-site service in most countries, next-business-day 9x5, service upgrades available
Service and support	Optional warranty service upgrades are available through Lenovo Services: 24x7 coverage, 2-hour or 4-hour response time, committed repair (select countries), up to 5 years of warranty extension, installation services.
Host operating systems	Microsoft Windows Server, Red Hat Enterprise Linux (RHEL), SUSE Linux Enterprise Server (SLES). For a full list of supported operating systems, refer to the IBM System Storage Interoperation Center .

Models

The following table lists the ordering information for the LTO Ultrium Tape Drive models.

Table 2. LTO Ultrium Tape Drive models

Description	Part number	Machine Type-Model	Feature code
IBM TS2290 Tape Drive Model H9S	6160S9E	6160-H9S	BLW2
IBM TS2280 Tape Drive Model H8S	6160S8E	6160-H8S	B1EV
IBM TS2270 Tape Drive Model H7S	6160S7E	6160-H7S	ATP3

The tape drives models include the following items:

- One SAS Tape Drive
- One universal cleaning cartridge
- Documentation package

Notes:

- The Rack mount kit is not included; it should be ordered with the tape drive, if needed (for ordering information, see the following table). The rack mount kit includes a fixed shelf on which the drive is placed.
- A power cable is not included with the tape drive. A 10A/100-250V, C13 to IEC 320-C14 rack power cable, or a line cord must be ordered with the tape drive (for ordering information, see [Power cables](#)).
- The Rack mount kit includes one 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable, and a line cord also can be ordered, if needed (for ordering information, see [Power cables](#)).

Table 3. Rack mount kit

Description	Part number	Feature code	Maximum quantity
6160 Rack Mount Shelf Kit w/PDU Line Cord	00NV426	AS1C	1

A SAS cable is required to attach an LTO Ultrium SAS Tape Drive to a SAS host adapter.

The following table lists the supported cable options for the TS2290.

Table 4. SAS cables for LTO9

Description	Part number	Feature code	Maximum quantity
SAS connectivity cables: Mini-SAS HD (HBA SFF-8644 host) to Mini-SAS HD (HBA SFF-8644 tape drive)			
3 m Mini-SAS HD/Mini-SAS HD 1x Cable (from HBA with SFF-8644 to tape drive (LTO-9) with SFF-8644)	02JH830	BLW3	1
1.5 m Mini-SAS HD/Mini-SAS HD 1x Cable (from HBA with SFF-8644 to tape drive (LTO-9) with SFF-8644)	02JH831	BLW4	1

The following table lists the supported cable options for the TS2280 and earlier drives.

Table 5. SAS cables for LTO8 and LTO7

Description	Part number	Feature code	Maximum quantity
SAS connectivity cables: SAS (SFF-8470 host) to Mini-SAS (SFF-8088 tape)			
2 m SAS/Mini-SAS 1x Cable (host SFF-8470 to target SFF-8088)	00NA007	5402	1*
SAS connectivity cables: Mini-SAS (SFF-8088 host) to Mini-SAS (SFF-8088 tape)			
2 m Mini-SAS/Mini-SAS 1x Cable (host SFF-8088 to target SFF-8088)	00NA009	AS0Z	1
SAS connectivity cables: Mini-SAS HD (SFF-8644 host) to Mini-SAS (SFF-8088 tape)			
HD-SAS Cable to Mini-SAS (4 m)	00NV419	AS10	1
Y SAS HD to Mini-SAS Cable (3 m)	00NV420	AS12	1**

* Not supported with the TS2270 LTO 7 tape drive.

** The Y SAS HD cable is used to connect up to two SAS tape drives to a single Mini-SAS HD x4 port on a supported SAS HBA.

Tape media

LTO Ultrium Tape Drives support the following backward compatibility for the previous generations of tape media:

- LTO 9 Tape Drives can read and write LTO 9 and LTO 8 data cartridges.
- LTO 8 Tape Drives can read and write LTO 8 and LTO 7 data cartridges.
- LTO 7 Tape Drives can read and write LTO 7 and LTO 6 data cartridges, and can read LTO 5 data cartridges.

A 5-Pack of the Ultrium 7, 8 or 9 Data Cartridges includes five unattached loose labels.

The following table lists tape media options that can be ordered for the tape drives.

Table 6. Tape media

Description	Part number	Feature code	Supported tape drive models
Cleaning cartridge			
Ultrium Cleaning Cartridge (universal)	00NA017	AS1E	All drives
Data cartridges			
Ultrium 9 Data Cartridge 1-Pack	02JH834	BLW2	TS2290
Ultrium 9 Data Cartridge 5-Pack	02JH833	BLW1	TS2290
Ultrium 8 Data Cartridge 1-Pack	01KP956	B1EX	TS2290, TS2280
Ultrium 8 Data Cartridges 5-Pack	01KP955	B1EW	TS2290, TS2280
Ultrium 7 Data Cartridge 1-Pack	01KP957	B1EY	TS2280, TS2270
Ultrium 7 Data Cartridges 5-Pack	00WF771	ATNZ	TS2280, TS2270
Ultrium 6 Data Cartridge 1-Pack	01KP958	B1EZ	TS2270, TS2260
Ultrium 6 Data Cartridges 5-Pack	00NA025	AS24	TS2270, TS2260
Ultrium 5 Data Cartridges 5-Pack	00NA023	AS23	TS2270 (read-only), TS2260

Power cables

If the tape drive is ordered with the rack mount kit, it includes one 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable. A line cord also can be ordered, if needed.

If the tape drive is ordered without a rack-mount kit, it does not include a power cable. A line cord or a rack power cable must be ordered with the tape drive.

The part numbers and feature codes to order the power cables (one power cable per tape drive) are listed in the following table.

Table 7. Power cables

Description	Part number	Feature code
Line cords		
2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	00NA027	AS29
2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord	00NA029	AS2A
2.8m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord	00NA031	AS2B
2.8m, 10A/230V, C13 to BS 1363/A (UK) Line Cord	00NA033	AS2C
2.8m, 10A/230V, C13 to SI 32 (Israel) Line Cord	00NA035	AS2D
2.8m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord	00NA037	AS2E
2.8m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord	00NA039	AS2F
2.8m, 10A/230V, C13 to CEI 23-16 (Italy) Line Cord	00NA041	AS2G
2.8m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord	00NA043	AS2H
2.8m, 10A/208V, C13 to NEMA 6-15P (US) Line Cord	00NA045	AS2J
2.8m, 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord	00NA047	AS2K
2.8m, 10A/220V, C13 to CNS 10917-3 (Taiwan) Line Cord	00NA049	AS2L
2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	00NA051	AS2M
2.8m, 10A/110V, C13 to CNS 10917-3 (Taiwan) Line Cord	00NA053	AS2N
2.8m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	00NA055	AS2P
2.8m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord	00NA057	AS2Q
2.8m, 10A/240V, C13 to IS 6538 (India) Line Cord	00NA059	AS2R
2.8m, 10A/220V, C13 to NBR 6147 (Brazil) Line Cord	00NA061	AS2T
Rack power cord		
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	00NA063	AS2U

Physical specifications

The LTO Ultrium Tape Drives have the following dimensions and weight (approximate):

- Height: 58 mm (2.3 in.)
- Width: 213 mm (8.4 in.)
- Depth: 332 mm (13.1 in.)
- Weight: 4.3 kg (9.4 lb.)

Operating environment

The LTO Ultrium Tape Drives are supported in the following environment:

- Air temperature:
 - Operating: 10 °C - 38 °C (50 °F - 100 °F)
 - Non-operating: -40 °C - 60 °C (-40 °F - 140 °F)
 - Maximum altitude: 3,048 m (10,000 ft)
- Humidity:
 - Operating: 20% - 80%
 - Non-operating: 10% - 90%
- Electrical power:
 - 100 V AC - 240 V AC; 0.48 A - 0.2 A
 - Frequency: 50 Hz / 60 Hz
 - Power consumption: 48 watts

Warranty upgrades and post-warranty support

The LTO Ultrium Tape Drives (machine type 6160) have a three-year CRU and onsite limited warranty.

Our global network of regional support centers offers consistent, local-language support enabling you to vary response times and level of service to match the criticality of your support needs:

- **Standard Next Business Day** – Best choice for non-essential systems requiring simple maintenance.
- **Premier Next Business Day** – Best choice for essential systems requiring technical expertise from senior-level Lenovo engineers.
- **Premier 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.
- **Premier Enhanced Storage Support 24x7 4-Hour Response** – Best choice for storage systems where maximum uptime is critical.

For more information, consult the brochure [Lenovo Operational Support Services for Data Centers Services](#).

Tape media warranty

When purchased with a supported tape drive or tape library, the tape media assumes the base warranty and any warranty upgrade. For standalone media purchases, the following warranty applies.

IBM BRAND STORAGE MEDIA STATEMENT OF WARRANTY

LIMITED LIFETIME WARRANTY AND LIMITATION OF REMEDIES:

Product is warranted against manufacturing and material defects for the useful life of the product, or until end of support of the product, whichever comes first. IBM warrants that IBM product is free from defects in material and manufacture at the time of purchase. If any defect in material or manufacture appears after the date of purchase, IBM's entire liability, and your exclusive remedy is, at IBM's option, either (a) repair, or (b) replacement of the product.

This warranty does NOT apply to failure of the IBM product resulting from misuse, abuse, accident, neglect or mishandling, improperly adjusted or maintained drives, incorrect environments, or wear from ordinary use.

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- The growth-driving combination of hardware, software, infrastructure, and solutions – all from one single provider with one point of accountability.

For information about Lenovo TruScale offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Regulatory compliance

The LTO Ultrium Tape Drives conform to the following regulations:

- FCC: Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, Class A
- European Union Council Directive 2004/108/EC
- EN 55022, Class A
- Australia and New Zealand Class A Statement
- Japan VCCI Class A statement
- People's Republic of China Class A Electronic Emission statement
- Taiwan Class A compliance statement
- Korea KCC Class A statement
- Russia Electromagnetic Interference (EMI) Class A Statement

Interoperability

Lenovo provides end-to-end storage compatibility testing to deliver interoperability throughout the network. The LTO Ultrium Tape Drives support attachment to Lenovo servers by using SAS storage connectivity.

Note: End-to-end storage configuration support (including adapters and operating systems) *must* be verified through the [System Storage Interoperation Center \(SSIC\)](#)

Operating systems

For the list of supported operating systems, refer to the [IBM System Storage Interoperation Center \(SSIC\)](#)

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

ISV backup software compatibility

The Independent Software Vendors (ISVs) indicate support for the LTO Ultrium Tape Drives for the following ISV backup software:

- Acronis Backup Advanced
- Arcserve Backup
- ASG Time Navigator
- CommVault Simpana

- Dell/EMC NetWorker
- Echleaf Systems Virtual Drive
- Gemalto SafeNet
- HPE/Micro Focus Data Protector
- IBM High Performance Storage System
- IBM RMS
- IBM Security Key Lifecycle Manager
- IBM Spectrum Archive Drive Edition
- IBM Spectrum Archive Library Edition
- IBM Spectrum Archive Enterprise Edition
- IBM Spectrum Protect
- Microsoft System Center Data Protection Manager
- NetApp Data Storage
- Oracle DIVA
- Oracle OSB
- Oracle SAM-QFS-HSM
- Point Archival Gateway
- Quest NetVault
- Qstar
- Veritas Backup Exec
- Veritas NetBackup
- Veeam Backup and Retention
- Versity Storage Manager

For more information, see the ISV matrix for IBM LTO that is available at this website:
<http://www.ibm.com/downloads/cas/ORLZ7EMG>

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Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. Family Portfolio: Storage

2025-04-30 | 50 minutes | Employees and Partners

This course covers the Lenovo storage portfolio, from tape drives used for backups and archiving all the way through high-performance storage systems. After completing this course about the Storage family, the learner will be able to identify products and features within the family, describe the features of this Product Family, and recognize when a specific product should be selected.

Tags: Storage, ThinkSystem

Published: 2025-04-30

Length: 50 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo Partner Learning](#)

Course code: SXSXW1201r17

2. Lenovo Data Center Product Portfolio

2024-05-29 | 20 minutes | Employees and Partners

This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

Tags: Advanced DataCenter, DataCenter Products, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2024-05-29

Length: 20 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1110r7

Related publications and links

For more information, see the following resources:

- Storage Options for ThinkSystem Servers
<https://lenovopress.com/lp0761-storage-options-for-thinksystem-servers>
- Lenovo Data Center Solution Configurator (DCSC)
<http://dcsc.lenovo.com/>
- IBM System Storage Interoperation Center (SSIC)
<http://ibm.com/systems/support/storage/ssic>
- IBM Redbooks publication, IBM Tape Library Guide for Open Systems
<http://www.redbooks.ibm.com/abstracts/sg245946.html?Open>

Related product families

Product families related to this document are the following:

- [Backup Units](#)
- [Tape Drives](#)

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