

# IBM TS2280 SAS Tape Drive Model H8S incorporates IBM Half-High LTO Ultrium 8 tape drive technology for increased performance and reliability

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## At a glance

IBM<sup>®</sup> TS2280 Tape Drive is designed to deliver IBM tape reliability and performance at open systems prices. Features of the Ultrium<sup>™</sup> 8 model include:

- Specification data transfer rate of up to 300 MBps native and up to 750 MBps with 2.5 to 1 compression
- Support for LTO<sup>™</sup> Generation 8 media specification tape cartridge compressed capacity of up to 30 TB with 2.5 to 1 compression
- The ability to read and write on Ultrium 8 and Ultrium 7 data cartridges
- 6 Gbps Serial Attached SCSI (SAS) attachment for Model H8S
- Encryption support in the tape drive to work with application-managed encryption
- 19-inch rack mount shelf option to accommodate two TS2280 tape drives side by side in the rack using just 2U of rack space
- Dual SAS ports per drive to improve availability
- Half-high drive form factor
- Support for media partitioning and self-describing tape through IBM Linear Tape File System<sup>™</sup> (LTFS)

## Overview

IBM TS2280 Tape Drive (machine type 3580 model H8S) is an external, stand-alone or rack mountable unit designed to offer high capacity and performance for the midrange systems environment. The TS2280 incorporates the IBM Linear Tape-Open<sup>™</sup> (LTO) Ultrium 8 Half-High SAS Tape Drive and is designed to support LTO Generation 8 media specification native data rate performance of up to 300 MBps, and up to 750 MBps with 2.5 to 1 compression. The TS2280 tape drive supports the LTO Generation 8 specifications for LTO tape drive technology, and LTO Generation 8 media to a compressed capacity of up to 30 TB with 2.5 to 1 compression (up to 12 TB native capacity) compared to previous LTO 7 compressed capacity of up to 15 TB with 2.5 to 1 compression (up to 6.0 TB native capacity) per tape cartridge. The TS2280 can read and write to Ultrium 8 and Ultrium 7 cartridges. The Ultrium 8 tape drive is encryption-capable and designed to support application-managed encryption.

The TS2280 tape drive uses a 6 Gbps dual-port SAS interface for connection to a wide spectrum of system servers, including select IBM Power Systems<sup>™</sup> models, IBM

PureFlex™ systems, and IBM BladeCenters. The TS2280 also supports Microsoft™ Windows™ and UNIX™ operating systems.

The following IBM TS2280 Half-High LTO Ultrium 8 tape drive enhancements are designed to help improve performance, capacity, and reliability:

- Native LTO Generation 8 media specification data transfer rate of up to 300 MBps and up to 750 MBps with 2.5 to 1 compression
- LTO Generation 8 media specification tape cartridge native capacity support of 12 TB and compressed capacity of up to 30 TB with 2.5 to 1 compression
- 6 Gbps SAS attachment support
- 1 GB internal buffer
- Application-managed encryption support for half-high LTO Generation 8 SAS tape drive
- 16 KB cartridge memory with Ultrium 8 media
- Half-high drive form factor
- Two SAS ports per drive for improved availability and attachability
- IBM LTFS partitioning support

The enclosure width enables two TS2280 storage units to be mounted side by side in a 19-inch IBM server rack mount shelf kit, requiring 2U of rack space.

The TS2280 tape drive provides an excellent migration path from digital linear tape (DLT or SDLT), 1/4 in (QIC), 4 mm (DAT), 8 mm, or older LTO generation tape drives.

Other media forms like disk have never really replaced tape in most data centers. Instead, tape has continued to be number one for storage archiving, and with the continued improvements in tape technology, tape is taking a more prominent role in a data center for both backup and archive. LTO tape is high in capacity and performance, very reliable, and still the lowest priced save/restore solution on the market today.

### Management software options

**IBM Spectrum Archive™:** TS2280 leverages IBM Spectrum Archive for direct, intuitive and graphical access to data stored in IBM tape drives and libraries by incorporating the IBM LTFS format standard. LTFS compatibility enables tape-stored data to be accessed as if it were on disk or flash storage.

IBM Spectrum Archive enables users of LTO Ultrium 8 tape library systems to inventory cartridges and read, write, and search data on any cartridge, enabling writing of metadata and tagging of individual files for easy and fast access to files stored on cartridges.

**IBM Spectrum Protect™:** Spectrum Protect enables users to create, manage, and optimize archives, and provides management of concurrent copies of content, plus active, inactive, and off-site content.

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## Key prerequisites

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Appropriate levels of host software are required to attach the IBM TS2280 tape drive to select IBM Power Systems, UNIX, and PC servers.

See the [Technical information](#) section for details.

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## Planned availability date

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November 17, 2017

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## Description

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3580 Tape Drive Model H8S (TS2280) is an external, stand-alone or rack shelf mountable half-high LTO tape unit designed to offer high capacity and performance for IBM Power Systems, Lenovo (formerly IBM System x), and other OEM system environments. The LTO8 tape drive in the 3580 is available with a SAS electronic interface.

The TS2280 incorporates IBM LTO Gen 8 half-high tape drives which are designed to provide maximum tape drive throughput native data rate performance of up to 300 MBps (up to 750 MBps with 2.5 to 1 compression) and a storage capacity of up to 30 TB with the introduction of the IBM LTO Ultrium 8 data cartridge. The LTO Gen 8 Tape Drive delivers double the tape cartridge capacity of the LTO Ultrium 7 tape drives. IBM LTO Gen 8 tape drives can read and write LTO Ultrium 7 data cartridges. In addition, the Gen 8 SAS tape drive is encryption-capable and designed to support application-managed encryption.

The TS2280 attaches to IBM Power Systems and IBM PureFlex servers, and supports Microsoft Windows and UNIX operating systems.

Specifications:

- Native LTO Generation 8 media specification data transfer rate of up to 300 MBps (up to 750 MBps with 2.5 to 1 compression)
- Support for LTO Generation 8 media specification tape cartridges with 12 TB native capacity, and a compressed capacity of up to 30 TB assuming 2.5 to 1 compression
- 6 Gbps SAS attachment support
- A 1 GB buffer
- Application-managed encryption support for half-high LTO Generation 8 SAS tape drives
- 16 KB cartridge memory with Ultrium 8 media
- Half-high drive form factor
- Two SAS ports per drive to improve availability and attachability
- Support for media partitioning and self-describing tape

IBM LTO Ultrium 8 Tape Cartridges will be available by ordering machine type 3589.

The Ultrium 8 data cartridge can also be ordered directly through the [IBM Storage Media](#) website.

### Management software options

**IBM Spectrum Archive:** TS2280 leverages IBM Spectrum Archive for direct, intuitive and graphical access to data stored in IBM tape drives and libraries by incorporating the IBM LTFS format standard. LTFS compatibility enables tape-stored data to be accessed as if it were on disk or flash storage.

IBM Spectrum Archive enables users of LTO Ultrium 8 tape library systems to inventory cartridges and read, write, and search data on any cartridge, enabling writing of metadata and tagging of individual files for easy and fast access to files stored on cartridges.

**IBM Spectrum Protect:** Spectrum Protect enables users to create, manage, and optimize archives, and provides management of concurrent copies of content, plus active, inactive, and off-site content.

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## Product positioning

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As you compare competitive tape solutions, consider:

- Capacity and performance requirements
- Data integrity, reliability, and availability
- Data security and encryption
- Storage usage and application requirements
- Affordability
- Loyalty to legacy or existing tape formats
- Work environment where space is limited

IBM TS2280 tape drives and software applications are designed to address these requirements and deliver a functionally rich tape storage solution incorporating LTO Ultrium 7 tape drive technology.

TS2280 is an excellent choice if you use tape drives that require large-capacity or high-performance tape backup. The TS2280, an entry offering to the family of IBM Ultrium tape products, is the answer to growing storage requirements and shrinking backup windows.

The TS2280 tape drive is an excellent tape storage solution if you use digital linear tape drives or require high-performance tape backup. In addition to reading and writing on IBM LTO Ultrium 7 or 8 format tape cartridges, the TS2280 tape drive provides an excellent functional alternative to DLT/SDLT, 1/4 in, 4 mm, 8 mm, IBM Magstar<sup>®</sup> MP 3570, or older LTO generation tape drives.

For capacity requirements greater than 30 TB (compressed) incorporating LTO Ultrium technology, consider the IBM TS2900 Tape Autoloader or TS4300 Entry/Mid-Range tape libraries, or the larger TS4500 Enterprise Tape Library.

For mission-critical data protection needs, optimized for enterprise multimode and host attachment, high-duty cycle and start/stop intensive tape applications, consider the IBM TS1155 or TS1150 Tape Drive with the IBM TS4500 Enterprise Tape Library.

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## Product number

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| Description  | Machine type | Model | Feature number |
|--|--------------|-------|----------------|
| TS2280 Tape Drive Model H8S with HHLTO8 SAS Tape Drive with enclosure and power supply | 3580         | H8S   |                |
| SEO Options Routing  | 3580         | H8S   | 0789           |
| SEO Translation Admin Code - Options   | 3580         | H8S   | 0791           |
| TAA Compliance   | 3580         | H8S   | 0983           |
| SEO SCSI Routing Code  | 3580         | H8S   | 0993           |
| Admin SEO Translation Code   | 3580         | H8S   | 0996           |
| Hungary CHW Plant 9SH  | 3580         | H8S   | 1764           |
| Guad CHW Plant 9KQ   | 3580         | H8S   | 1765           |
| ISTC CHW 9K2   | 3580         | H8S   | 1766           |
| RTP CHW 9NR  | 3580         | H8S   | 1767           |
| China Offload Routing  | 3580         | H8S   | 1770           |
| Capacity Sched Svc   | 3580         | H8S   | 1772           |
| Custom SLA Sched   | 3580         | H8S   | 1796           |

| <b>Description</b>                     | <b>Machine type</b> | <b>Model</b> | <b>Feature number</b> |
|--|---------------------|--------------|-----------------------|
| 2.0M SAS/Mini-SAS 1x Cable             | 3580                | H8S          | 5402                  |
| 1m Hi-Perf SAS External Cable          | 3580                | H8S          | 5501                  |
| 2.0M Mini-SAS/Mini-SAS 1x Cable        | 3580                | H8S          | 5502                  |
| HD SAS to Mini-SAS Cable               | 3580                | H8S          | 5507                  |
| Y SAS HD to Mini-SAS Cable             | 3580                | H8S          | 5509                  |
| Rack Mount Shelf Kit w/PDU Line Cord   | 3580                | H8S          | 7003                  |
| Ultrium Cleaning Cartridge             | 3580                | H8S          | 8002                  |
| Consolidate Shipment                   | 3580                | H8S          | 8031                  |
| Ultrium 7 Data Cartridge (Single)      | 3580                | H8S          | 8704                  |
| Ultrium 7 Data Cartridge (5-Pack)      | 3580                | H8S          | 8706                  |
| Attached to Windows System             | 3580                | H8S          | 9212                  |
| Attached to Linux™ System              | 3580                | H8S          | 9215                  |
| Attached to IBM AIX® System            | 3580                | H8S          | 9600                  |
| Power® Cord Options:                   |                     |              |                       |
| 2.8m Power Cord 125V US/Canada         | 3580                | H8S          | 9800                  |
| 2.8m Power Cord 250V France/Germany    | 3580                | H8S          | 9820                  |
| 2.8m Power Cord 250V Denmark           | 3580                | H8S          | 9821                  |
| 2.8m Power Cord 250V UK/China          | 3580                | H8S          | 9825                  |
| 2.8m Power Cord 250V Israel            | 3580                | H8S          | 9827                  |
| 2.8m Power Cord 250V Switzerland       | 3580                | H8S          | 9828                  |
| 2.8m Power Cord 250V S. Africa         | 3580                | H8S          | 9829                  |
| 2.8m Power Cord 250V Italy             | 3580                | H8S          | 9830                  |
| 2.8m Power Cord 250V Australia         | 3580                | H8S          | 9831                  |
| 2.8m Power Cord 250V US/Canada         | 3580                | H8S          | 9833                  |
| 2.8m Power Cord 250V Uruguay/Argentina | 3580                | H8S          | 9834                  |
| 2.8m Power Cord 125V Taiwan            | 3580                | H8S          | 9835                  |
| 2.8m Power Cord 250V China (PRC)       | 3580                | H8S          | 9840                  |
| 2.8m Power Cord 250V Taiwan            | 3580                | H8S          | 9841                  |
| 2.8m Power Cord 125V Japan             | 3580                | H8S          | 9842                  |

| <b>Description</b>                      | <b>Machine type</b> | <b>Model</b> | <b>Feature number</b> |
|---|---------------------|--------------|-----------------------|
| 2.8m Power Cord<br>250V Korea           | 3580                | H8S          | 9844                  |
| 2.8m Power Cord<br>250V India           | 3580                | H8S          | 9845                  |
| 2.8m Power Cord<br>250V Brazil          | 3580                | H8S          | 9847                  |
| Rack Device to<br>PDU Line Cord         | 3580                | H8S          | 9848                  |
| OEM 1 FC Order<br>Indicator             | 3580                | H8S          | ACW1                  |
| OEM 1 Order<br>Indicator                | 3580                | H8S          | ACY1                  |
| No Rules Order<br>Indicator             | 3580                | H8S          | ADNR                  |
| Shipping and<br>Handling - No<br>charge | 3580                | H8S          | AG00                  |
| Shipping and<br>Handling - Charge       | 3580                | H8S          | AGGE                  |

  

| <b>Description</b>          | <b>Machine type</b> | <b>Model</b> | <b>Feature number</b> |
|-----------------------------|---------------------|--------------|-----------------------|
| OEM 1 FC Order<br>Indicator | 3580                | H6S, H7S     | ACW1                  |

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## Business Partner information

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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<sup>(R)</sup> ID and password are required (use IBMid).

[BP Attachment for Announcement Letter 117-076](#)

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## Publications

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The following publication is shipped with the product. Additional copies are available.

| <b>Title</b>   | <b>Order number</b> |
|--|---------------------|
| <i>IBM TS2280 Tape Drive model H8S Setup, Operator and Service Guide</i> | SC27-4649-00        |

The following publications are available. To order, contact your IBM representative.

| <b>Title</b>   | <b>Order number</b> |
|--|---------------------|
| <i>IBM TS2280 Tape Drive Model H8S Setup, Operator, and Service Guide</i>          | SC27-4649-00        |
| <i>IBM Half Height LTO Tape Drive (SAS) Installation Quick Reference (English)</i> | GC27-2276-03        |
| <i>IBM Tape Device Driver Installation and Users Guide (English)</i>               | GC27-2130           |
| <i>IBM Tape Device Driver Programming Reference (English)</i>                      | GA32-0566           |

These publications are also available at the [IBM Publications Center](#) website.

Click on country, then enter publication number.

The device driver publications are also available at the [IBM Tape Device Drivers Installation and User's guide](#) website.

All new IBM tape device drivers will only be posted to the web through the Fix Central download portal.

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

There are a few pull down menus to navigate to the correct download as follows:

1. In the first pull down menu labeled **Product Group**, select **System Storage<sup>(R)</sup>**.
2. In the next pull down menu that appears which is labeled **Product Family**, select **Tape Systems**.
3. With the next pull down menu, **Product Type**, select **Tape drivers and software**.
4. This will bring up the **Product** menu, which provides selections for **Platform drivers, Tools, or Software**.
5. In order to download your driver, select the correct operating system under **Platform drivers**.
6. Two more pull down menus will appear with information. Click **Continue**.
7. The next screen can be used to narrow the search, however, just click **Continue** to view what is available.

See the [IBM Tape Device Drivers Installation and User's Guide](#) website.

[IBM Knowledge Center](#) provides you with a single information center 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.

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.

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## Services

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### IBM Systems Lab Services

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IBM Systems Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Systems Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Systems Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the [Lab Services](#) website.

### Global Technology Services

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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 [IBM Global Technology Services<sup>\(R\)</sup>](#) 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.

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## Technical information

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### Specified operating environment

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#### **Physical specifications**

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

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

#### **Operating environment**

- Temperature: 10°C to 38°C (50°F to 100°F)
- Relative humidity: 20% - 80%
- Wet bulb (caloric value): 26.0°C (78.8°F)
- Electrical power: 0.21 kVA 1.0 amps at 100 V AC, 0.5 amps at 240 V AC

#### **Hardware requirements**

The TS2280 tape drive comes with raven black covers and uses a SAS interface. The TS2280 tape drive can be attached to IBM Power Systems and non-IBM servers that support those interface specifications. A current list of supported open system configurations is available from the [IBM SSIC](#) website.

Select the **model**, then **Product Details**, and **LTO Compatibility** to view the Independent Software Vendor Matrix (ISV) for the product.

A power cord option number, if applicable, should also be specified.

**Cables:** For TS2280 Model H8S, a SAS cable is required to attach a TS2280 tape drive to host a SAS adapter.

- SAS/Mini-SAS cables provide attachment from HBA with SFF-8470 to the TS2280 Ultrium 8 SAS drive with SFF-8088
- Mini-SAS/Mini-SAS cables provide attachment from HBA with SFF-8088 SAS/Mini-SAS external cable to the TS2280 Ultrium 8 SAS drive with SFF-8088
- Mini-SAS/HD-SAS cables provide attachment from and HD HBA with HD-SAS/Mini-SAS external cable to the TS2280 Ultrium 8 SAS drive with SFF-8088

At least one of the above cables should be specified on the initial plant order.

The following cable options are available for SAS attachment:

- Feature #5402 - 2.0M SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)
- Feature #5501 - 1.0M Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)

- Feature #5502 - 2.0M Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)
- Feature #5507 - 2.0M HD- SAS/Mini-SAS Cable
- Feature #5509 - 2.0M HD-SAS/Mini-SAS Y Cable (from HBA with SFF-8088 to drive with SFF-8088)

Refer to the **Special Features** section of the TS2280 (3580) tape drive sales manual for detailed descriptions of these features.

For a current list of HBAs that support the TS2280, go to the [IBM SSIC](#) website.

### **Software requirements**

For a current list of host software versions and release levels that support the TS2280, see the [IBM SSIC](#) website.

Spectrum Protect, BRMS, and other compatible software offerings provide storage and tape management software for the 3580 or TS2280 family of products. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or independent software vendors (ISVs). A list of compatible software is available from your IBM representative or at the [IBM SSIC](#) website.

Select the **model**, then **Product Details**, then **LTO Compatibility**, and view **Independent Software Vendor (ISV) matrix for LTO** for the product.

IBM continues to work together with the ISVs to support the IBM LTO Ultrium tape drives or TS2280 family of products. Individual application vendors should be contacted for specific information and availability dates.

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

There are a few pull down menus to navigate to the correct download as follows:

1. In the first pull down menu labeled **Product Group**, select **System Storage**.
2. In the next pull down menu that appears which is labeled **Product Family**, select **Tape Systems**.
3. With the next pull down menu, **Product Type**, select **Tape drivers and software**.
4. This will bring up the **Product** menu, which provides selections for **Platform drivers, Tools, or Software**.
5. In order to download your driver, select the correct operating system. under **Platform drivers**.
6. Two more pull down menus will appear with information. Click **Continue**.
7. The next screen can be used to narrow the search, however just click **Continue** to view what is available.

See the [IBM Tape Device Drivers Installation and User's Guide](#) website.

### **Compatibility**

IBM LTO Ultrium 8 tape drives can read and write IBM LTO 7 and 8 data cartridges. The LTO Generation 8 media specification of 30 TB compressed data cartridges can only be used on the new IBM LTO Ultrium 8 tape drives.

### **Limitations**

SAS cable lengths are limited to 5.5 m (18 ft).

Installing more than one TS2280 tape drive on a SAS bus may impact tape drive or system performance. Intermixing of other SAS devices on the same bus as the TS2280 may also impact performance of those devices.

Although multiple systems may be attached to a tape drive, the systems cannot use the drive simultaneously.

While compression technology can increase the amount of data stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

## Planning information

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### **Customer responsibilities**

Physical planning is a customer responsibility. Detailed planning information is in the *IBM TS2280 Tape Drive Model H8S Setup, Operator, and Service Guide* (SC27-4649). The TS2280 tape drive is designated as a customer setup unit (CSU). It is the customers' responsibility to install the unit. Customers are responsible for obtaining the appropriate SAS adapters, cables, and interposers (if required) for system attachment. Customers are also responsible for ordering media. For optimum performance, the customer must obtain the latest level of firmware prior to installing the unit. Customers can download the latest level of firmware from the [LTO](#) website.

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**

For TS2280 Model H8S, a SAS cable is required to attach a TS2280 tape drive to a host SAS adapter. SAS/Mini-SAS cables provide attachment from HBA with SFF-8470 to the drive with SFF-8088. Mini-SAS/Mini-SAS cables provide attachment from HBA SFF-8088 to the drive with SFF-8088. SAS high-density (HD) cables are also available. At least one SAS cable should be specified on the initial plant order.

The following cable options are available for SAS attachment:

- Feature #5402 - 2 m SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)
- Feature #5501 - 1 m Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)
- Feature #5502 - 2 m Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)
- Feature #5507 - 4 m HD SAS/Mini-SAS Cable
- Feature #5509 - 3 m HD-SAS/Mini-SAS Y Cable (from HBA with SFF-8088 to drive with SFF-8088)

See the **Specify or Special Features** section of the 3580 Sales Manual for a detailed description of the cables available.

### **Installability**

Installation time for the TS2280 tape drive is approximately 0.5 to 0.7 hours.

### **Packaging**

| Product  | Shipment group                          | Number of boxes |
|----------|---|-----------------|
| 3580-H8S | TS2280 with Tape Drive (3580 Model H8S) | 1               |
|          | Power cord option                       |                 |
|          | One cleaning cartridge                  |                 |
|          | Documentation CD that includes:         |                 |

| Product | Shipment group  | Number of boxes |
|---------|---|-----------------|
|         | <ul style="list-style-type: none"> <li>• <i>IBM TS2280 Model H8S Tape Drive Setup, Operator, and Service Guide</i></li> <li>• <i>IBM TS2280 Statement of Limited Warranty</i></li> <li>• <i>IBM Translated Safety Notices</i></li> </ul>  |                 |
|         | <p>Documentation kit that includes:</p> <ul style="list-style-type: none"> <li>• <i>License Agreement</i></li> <li>• <i>IBM TS2280 Statement of Limited Warranty</i></li> <li>• <i>IBM TS2280 Model H8S Quick Reference</i></li> <li>• <i>CD pointer document</i></li> <li>• <i>Device Driver pointer document</i></li> <li>• <i>Compliance document</i></li> </ul> |                 |

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### **Security, auditability, and control**

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

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### **IBM Systems Lab Services**

For details on available services, contact your IBM representative or go to the [Lab Services](#) website.

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## **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.

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## Terms and conditions

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### **Volume orders**

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Contact your IBM representative.

### **IBM Global Financing**

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Yes

### **Products - terms and conditions**

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#### ***Warranty period***

Three years.

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. 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. 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.

#### ***Warranty Service***

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. Certain Machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country and location-specific information.

#### ***CRU Service***

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

#### ***Tier 1 (mandatory) CRU***

Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

## **Tier 2 (optional) CRU**

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next business day (NBD) delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU. You may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:

- 3580 enclosure with power supply and fan
- I/O adapters
- Processor power regulator
- Service processor

## **CRU and On-site Service**

At IBM's discretion, you will receive specified CRU service, or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

Service level is:

- 9 hours per day, Monday through Friday, excluding holidays, next business day response. Calls must be received by 6:00 pm local time in order to qualify for next business day response.

## **International Warranty Service**

International Warranty Service allows you to relocate any machine that is eligible for International Warranty Service and receive continued warranty service in any country where the IBM machine is serviced. If you move your machine to a different country, you are required to report the machine information to your Business Partner or IBM representative.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased. Warranty service will be provided with the prevailing warranty service type and service level available for the eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

The following types of information can be found on the [International Warranty Service](#) website

- Machine warranty entitlement and eligibility
- Directory of contacts by country with technical support contact information
- Announcement Letters

## **Warranty service upgrades**

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities

for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

### ***Maintenance service options***

#### ***CRU and On-site Service***

At IBM's discretion you will receive CRU service or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose. The following on-site response-time objectives are available as warranty service upgrades for your machine. Available offerings are:

- 9 hours per day, Monday through Friday, excluding holidays, 4 hour average, same business day response
- 24 hours per day, 7 days a week, 4 hour average response
- 24 hours per day, 7 days a week, 2 hour average response

Customer Replaceable Units (CRUs) may be provided as part of the machine's standard warranty CRU Service except that you may install a CRU yourself or request IBM installation, at no additional charge, under the CRU and On-site Service level specified above. For additional information on the CRU Service, see the warranty information.

#### ***Maintenance services***

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information. The following service selections are available as maintenance options for your machine type.

#### ***On-site Service***

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

Service levels are:

- 9 hours per day, Monday through Friday, excluding holidays, next business day response

#### ***Customer Replaceable Unit (CRU) Service***

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a

container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

CRUs may be provided as part of the machine's standard maintenance service except that you may install a CRU yourself or request IBM installation, at no additional charge, under any of the On-site Service levels specified above.

***Usage plan machine***

No

***IBM hourly service rate classification***

Two

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

**General terms and conditions**

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***Field-installable features***

No

***Model conversions***

No

***Machine installation***

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

***Graduated program license charges apply***

No

***Licensed Machine Code***

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement from the [License Agreement for Machine Code and Licensed Internal Code](#) website.

Access to Machine Code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM in its discretion.

You may also obtain updated code by contacting your IBM representative.

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

***Educational allowance***

A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

The educational allowance is 15% for the products in this announcement.

## Prices

For additional information and current prices, contact your local IBM representative.

| <b>Description</b>   | <b>Machine type</b> | <b>Model</b> | <b>Feature number</b> |
|--|---------------------|--------------|-----------------------|
| TS2280 Tape Drive Model H8S with HHLT08 SAS Tape Drive with enclosure and power supply | 3580                | H8S          |                       |
| SEO Options Routing  | 3580                | H8S          | 0789                  |
| SEO Translation Admin Code - Options   | 3580                | H8S          | 0791                  |
| TAA Compliance   | 3580                | H8S          | 0983                  |
| SEO SCSI Routing Code  | 3580                | H8S          | 0993                  |
| Admin SEO Translation Code   | 3580                | H8S          | 0996                  |
| Hungary CHW Plant 9SH  | 3580                | H8S          | 1764                  |
| Guad CHW Plant 9KQ   | 3580                | H8S          | 1765                  |
| ISTC CHW 9K2   | 3580                | H8S          | 1766                  |
| RTP CHW 9NR  | 3580                | H8S          | 1767                  |
| China Offload Routing  | 3580                | H8S          | 1770                  |
| Capacity Sched Svc   | 3580                | H8S          | 1772                  |
| Custom SLA Sched   | 3580                | H8S          | 1796                  |
| 2.0M SAS/Mini-SAS 1x Cable   | 3580                | H8S          | 5402                  |
| 1m Hi-Perf SAS External Cable  | 3580                | H8S          | 5501                  |
| 2.0M Mini-SAS/Mini-SAS 1x Cable  | 3580                | H8S          | 5502                  |
| HD SAS to Mini-SAS Cable   | 3580                | H8S          | 5507                  |
| Y SAS HD to Mini-SAS Cable   | 3580                | H8S          | 5509                  |
| Rack Mount Shelf Kit w/PDU Line Cord   | 3580                | H8S          | 7003                  |
| Ultrium Cleaning Cartridge   | 3580                | H8S          | 8002                  |
| Consolidate Shipment   | 3580                | H8S          | 8031                  |
| Ultrium 7 Data Cartridge (Single)  | 3580                | H8S          | 8704                  |
| Ultrium 7 Data Cartridge (5-Pack)  | 3580                | H8S          | 8706                  |
| Attached to Windows System   | 3580                | H8S          | 9212                  |
| Attached to Linux System   | 3580                | H8S          | 9215                  |
| Attached to IBM AIX System   | 3580                | H8S          | 9600                  |

| <b>Description</b>                            | <b>Machine type</b> | <b>Model</b> | <b>Feature number</b> |
|---|---------------------|--------------|-----------------------|
| 2.8m Power Cord<br>125V US/Canada             | 3580                | H8S          | 9800                  |
| 2.8m Power Cord<br>250V France/<br>Germany    | 3580                | H8S          | 9820                  |
| 2.8m Power Cord<br>250V Denmark               | 3580                | H8S          | 9821                  |
| 2.8m Power Cord<br>250V UK/China              | 3580                | H8S          | 9825                  |
| 2.8m Power Cord<br>250V Israel                | 3580                | H8S          | 9827                  |
| 2.8m Power Cord<br>250V Switzerland           | 3580                | H8S          | 9828                  |
| 2.8m Power Cord<br>250V S. Africa             | 3580                | H8S          | 9829                  |
| 2.8m Power Cord<br>250V Italy                 | 3580                | H8S          | 9830                  |
| 2.8m Power Cord<br>250V Australia             | 3580                | H8S          | 9831                  |
| 2.8m Power Cord<br>250V US/Canada             | 3580                | H8S          | 9833                  |
| 2.8m Power Cord<br>250V Uruguay/<br>Argentina | 3580                | H8S          | 9834                  |
| 2.8m Power Cord<br>125V Taiwan                | 3580                | H8S          | 9835                  |
| 2.8m Power Cord<br>250V China (PRC)           | 3580                | H8S          | 9840                  |
| 2.8m Power Cord<br>250V Taiwan                | 3580                | H8S          | 9841                  |
| 2.8m Power Cord<br>125V Japan                 | 3580                | H8S          | 9842                  |
| 2.8m Power Cord<br>250V Korea                 | 3580                | H8S          | 9844                  |
| 2.8m Power Cord<br>250V India                 | 3580                | H8S          | 9845                  |
| 2.8m Power Cord<br>250V Brazil                | 3580                | H8S          | 9847                  |
| Rack Device to<br>PDU Line Cord               | 3580                | H8S          | 9848                  |
| OEM 1 FC Order<br>Indicator                   | 3580                | H8S          | ACW1                  |
| OEM 1 Order<br>Indicator                      | 3580                | H8S          | ACY1                  |
| No Rules Order<br>Indicator                   | 3580                | H8S          | ADNR                  |
| Shipping and<br>Handling - No<br>charge       | 3580                | H8S          | AG00                  |
| Shipping and<br>Handling - Charge             | 3580                | H8S          | AGGE                  |

| <b>Feature number</b> | <b>Install type*</b> | <b>MES removal</b> | <b>CSU</b> |
|-----------------------|----------------------|--------------------|------------|
| 0789                  | Plant                | N                  | N          |
| 0791                  | Plant                | N                  | N          |
| 0983                  | Plant                | N                  | N          |
| 0993                  | Plant                | N                  | N          |
| 0996                  | Plant                | N                  | N          |
| 1764                  | Plant                | N                  | N          |
| 1765                  | Plant                | N                  | N          |
| 1766                  | Plant                | N                  | N          |

| <b>Feature number</b>    | <b>Install type*</b> | <b>MES removal</b> | <b>CSU</b>            |
|--------------------------|----------------------|--------------------|-----------------------|
| 1767                     | Plant                | N                  | N                     |
| 1770                     | Plant                | N                  | N                     |
| 1772                     | Plant                | N                  | N                     |
| 1796                     | Plant                | N                  | N                     |
| 5402                     | Both                 | N                  | Y                     |
| 5501                     | Both                 | N                  | Y                     |
| 5502                     | Both                 | N                  | Y                     |
| 5507                     | Both                 | N                  | Y                     |
| 5509                     | Both                 | N                  | Y                     |
| 7003                     | Both                 | N                  | Y                     |
| 8002                     | Both                 | N                  | Y                     |
| 8031                     | Plant                | N                  | N                     |
| 8704                     | Both                 | N                  | Y                     |
| 8706                     | Both                 | N                  | Y                     |
| 9212                     | Plant                | N                  | N                     |
| 9215                     | Plant                | N                  | N                     |
| 9600                     | Plant                | N                  | N                     |
| 9800                     | Both                 | N                  | Y                     |
| 9820                     | Both                 | N                  | Y                     |
| 9821                     | Both                 | N                  | Y                     |
| 9825                     | Both                 | N                  | Y                     |
| 9827                     | Both                 | N                  | Y                     |
| 9828                     | Both                 | N                  | Y                     |
| 9829                     | Both                 | N                  | Y                     |
| 9830                     | Both                 | N                  | Y                     |
| 9831                     | Both                 | N                  | Y                     |
| 9833                     | Both                 | N                  | Y                     |
| 9834                     | Both                 | N                  | Y                     |
| 9835                     | Both                 | N                  | Y                     |
| 9840                     | Both                 | N                  | Y                     |
| 9841                     | Both                 | N                  | Y                     |
| 9842                     | Both                 | N                  | Y                     |
| 9844                     | Both                 | N                  | Y                     |
| 9845                     | Both                 | N                  | Y                     |
| 9847                     | Both                 | N                  | Y                     |
| 9848                     | Both                 | N                  | Y                     |
| ACW1                     | Field                | N                  | N                     |
| ACY1                     | Plant                | N                  | N                     |
| ADNR                     | Both                 | N                  | N                     |
| AG00                     | Plant                | N                  | N                     |
| AGGE                     | Plant                | N                  | N                     |
| <b>Description</b>       | <b>Machine type</b>  | <b>Model</b>       | <b>Feature number</b> |
| OEM 1 FC Order Indicator | 3580                 | H6S, H7S           | ACW1                  |
| <b>Feature number</b>    | <b>Install type*</b> | <b>MES removal</b> | <b>CSU</b>            |
| ACW1                     | Field                | N                  | N                     |

CSU = Customer setup

\*Install type:

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

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**Alternative service**

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| Machine type-model | IE8 IBM On-site Exchange (IO8, 9 x 5) | IOE IBM On-site Exchange (IOE, 24 x 7) |
|--------------------|---------------------------------------|--|
| 3580-H8S           |                                       |  |

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**Warranty option charges**

| Machine type-model | IE8 IBM Next-day On-site Exchange (IO8, 9 x 5) | IOE IBM Same day On-site Exchange (IOE, 24 x 7) |
|--------------------|--|---|
| 3580-H8S           |  |   |

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**ServiceElect (ESA) charges**

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For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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**Billable exchange price**

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For all local charges contact your IBM representative

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