IBM System Storage TS3100/TS3200 Tape Library Models L2U and L4U now available in driveless configurations; Path Failover option now available via HVEC and Xccelerator

At a glance

The TS3100 and TS3200 Tape Libraries combine IBM® tape and automation reliability at open systems prices. Both models are designed to support entry-level unattended backup, open systems attachment flexibility, and enhanced capacity and performance.

The TS3100 and TS3200 Tape Libraries Driveless models include:

- Support for LTO Ultrium 4 and Ultrium 3 tape drives in a variety of connectivity options and in either full-high or half-high formats
- Support for large native physical data capacities:
  - The TS3100 Tape Library with Ultrium 4 Tape Drives is designed to support native physical data capacities up to 19.2 TB (up to 38.4 TB using 2:1 compression) with 24 data cartridge slots, including a standard one-cartridge I/O station, remote management unit, and bar code reader
  - The TS3200 Tape Library with Ultrium 4 Tape Drives is designed to support native data physical capacities up to 38.4 TB (up to 76.8 TB using 2:1 compression) with 48 data cartridge slots, including a standard three-cartridge I/O station, and bar code reader
- An increased maximum data transfer rate -- up to 120 MB/sec native as compared to LTO Ultrium 3 for each Ultrium 4 drive
- Double the maximum cartridge capacity compared to Ultrium 3 -- up to 800 GB native physical capacity per cartridge (1,600 GB with 2:1 compression) with Ultrium 4 800 GB media
- Encryption support for LTO Ultrium 4 SAS and Fibre Channel tape drives
- Adherence to LTO specifications
Overview

The IBM System Storage™ TS3100 Tape Library Model L2U Driveless and the IBM System Storage TS3200 Tape Library Model L4U Driveless are designed to offer high capacity, enhanced performance, and technology for the midrange open systems environments. The products are included as part of the IBM System Storage tape library family of offerings.

These new driveless versions of the TS3100 and TS3200 Tape Library are being introduced in HVEC/Xcc to mimic the product structure available in AAS where the Tape Library is a base automation device and drives of various LTO generations and attachment types are available as features. These driveless versions of the TS3100 and TS3200 Tape Library in HVEC/Xcc will allow simplification in stocking and inventory of libraries, particularly for business partners and customers, with the flexibility of matching the drive of choice at time of need.

For full functionality, the TS3100 and TS3200 Tape Libraries Driveless models require IBM LTO Ultrium Tape Drives. Ultrium 4 drive features are offered as 4 Gbps Fibre Channel in full-high format, or LVD Ultra160 SCSI or 3 Gbps Serial Attached SCSI (SAS) in either full-high or half-high formats. IBM Ultrium 4 Fibre Channel and SAS tape drives support encryption. Ultrium 3 drive features are offered as 4 Gbps Fibre Channel in full-high format, or LVD Ultra160 SCSI or 3 Gbps Serial Attached SCSI (SAS) in either full-high or half-high formats.

The TS3100 Tape Library is an external 2U stand-alone or rack-mountable unit that can incorporate a single IBM LTO Ultrium Full High Tape Drive or two IBM LTO Ultrium Half High Tape Drives and has two removable cartridge magazines, one on the left side and one on the right side, providing 24 data cartridge slots, including a single I/O slot. The TS3100 provides a media physical capacity of up to 19.2 TB (38.4 TB with 2:1 compression) data storage per unit with Ultrium 4 media.

The TS3200 Tape Library is an external 4U stand-alone or rack-mountable unit that incorporates up to two LTO IBM Ultrium Full High Tape Drives or four IBM LTO Ultrium Half High Tape Drives and has four removable cartridge magazines, providing 48 data cartridge slots, including one three-slot I/O station. The TS3200 provides a media physical capacity of up to 38.4 TB (76.8 TB with 2:1 compression) data storage per unit with Ultrium 4 media.

The TS3100 and TS3200 Tape Libraries incorporate IBM’s Multi-Path Architecture with logical libraries equal to the number of drives installed. The TS3200 also accommodates an optional power supply (part number 23R7262).

For Xcelerator (Xcc) and HVEC ordering, the following IBM Ultrium tape drives can be ordered and are supported in the TS3100 and TS3200 Tape Library Driveless models:

- Ultrium 4 LVD SCSI Drive (SEO/part number 95P5002)
- Ultrium 4 Fibre Channel Drive (SEO/part number 95P5004)
- Ultrium 4 SAS Drive (SEO/part number 95P5006)
- Ultrium 4 Half High SAS Drive (SEO/part number 45E2243)
- Ultrium 3 LVD SCSI Drive (SEO/part number 23R7260)
- Ultrium 3 Fibre Channel Drive (SEO/part number 23R7261)
- Ultrium 3 Half High LVD SCSI Drive (SEO/part number 95P4998)
- Ultrium 3 Half High SAS Drive (SEO/part number 95P5000)

Other HVEC/Xcc options available for the TS3100 or TS3200 Tape Libraries include:

- Path Failover (part number 45E9503)
- Transparent LTO Encryption (part number 45E3081)
- Rack Mount Kit (part number 23R6998)
- Left Side 2U Magazine (part number 45E2237)
- Left Side Upper 4U Magazine (part number 45E2225)
- Left Side Lower 4U Magazine (part number 45E2231)
- Ultrium Tape Cartridges (part number 95P4278 for Ultrium 4 media and part number 95P2020 for Ultrium 3 media)
- Ultrium Cleaning Cartridge (part number 23R7008)
- L4U Additional Power Supply (part number 23R7262)
- SCSI, Fibre Channel, and SAS cables

**Key prerequisites**

Appropriate levels of host software are required to attach the TS3100 or TS3200 Tape Libraries with any of the supported tape drives to selected IBM System p®, IBM System i®, IBM System z®, IBM System x®, HP-UX, Sun, UNIX®, Linux®, and Windows® servers. Refer to the Technical information section for details.

**Planned availability date**

September 4, 2009

Availability of programs with an encryption algorithm in France is subject to French government approval.

**Description**

The TS3100 and TS3200 are external stand-alone or rack-mountable library units that can contain a LTO Ultrium tape drive that is designed for the heavy demands of backup tape storage.

**TS3100 Tape Library**

The TS3100 capacity is 24 tape cartridges, providing an Ultrium 4 media physical capacity of up to 19.2 TB (38.4 TB with 2:1 compression) data storage per unit. It is supported for LVD SCSI, Fibre Channel, and SAS attachment for System p, System i, System z, System x, HP-UX, Sun, UNIX, Linux, and Windows servers with LTO Ultrium Tape Drives.

The TS3100 Tape Library offers the following significant improvements over the existing 3581 Tape Autoloader:

- **Increased cartridge capacity:** The TS3100 is configured to hold two removable magazines, one on the left side (11 + 1 slots) and one on the right (12 slots) for a total of 24 data cartridges.
- **Standard bar code reader:** With the addition of the standard bar code reader, you will be able to operate the TS3100 as a random access tape library with labeled media. Labeled Ultrium media can be ordered as part number 95P4278
or 95P2020, via the 3589 LTO Ultrium media machine type. Refer to the Supplies section for additional information.

- I/O station: Standard on the TS3100, a single-cartridge I/O station on the left cartridge magazine is designed to allow for continuous library operation during import or export of data cartridges.
- Removable cartridge magazines: The TS3100 has two removable magazines that house the 24 data cartridges. This allows for quick population of the tape library, as well as ease of storage for media. You may order additional right-side magazines as an optional feature number.
- Customer Replacement Units: Drives, power supply, and cartridge magazines are customer replacement parts.

**TS3200 Tape Library**

The TS3200 capacity is 48 tape data cartridges, providing an Ultrium 4 media physical capacity of up to 38.4 TB (76.8 TB with 2:1 compression) data storage per unit. It is supported for LVD SCSI, Fibre Channel, and SAS attachment for System p, System i, System z, System x, HP-UX, Sun, UNIX, Linux, and Windows servers with Ultrium Tape Drives.

The TS3200 Tape Library offers the following significant improvements over the existing 3582 Tape Library:

- Increased cartridge capacity: The TS3200 is configured to hold four removable magazines, providing 48 data cartridges, including a three-slot I/O station.
- Standard bar code reader: With the addition of the standard bar code reader, you will be able to operate the TS3200 as a random access tape library with labeled media. Labeled Ultrium media can be ordered as part number 95P4278 or 95P2020, via the 3589 LTO Ultrium media machine type. Refer to the Supplies section, for additional information.
- I/O station: Standard on the TS3200, a three-cartridge I/O station on the lower-left cartridge magazine is designed to allow for continuous library operation during import or export of data cartridges.
- Removable cartridge magazines: The TS3200 has four removable magazines that allow for quick population of the tape library, as well as ease of storage for media. You may order additional right-side magazines as an optional feature number.
- Customer Replacement Units: Drives, power supply, and cartridge magazines are customer replacement parts.

**TS3100 and TS3200 Tape Libraries**

The TS3100 and TS3200 incorporate the IBM LTO Ultrium 4 Tape Drives or IBM LTO Ultrium 3 Tape Drives. The IBM LTO Ultrium 4 Tape Drive is the fourth-generation LTO Ultrium Tape Drive in the IBM LTO Ultrium family of products. The Ultrium 4 Tape Drive offers the following significant improvements over the Ultrium 3 Tape Drive:

- Increased performance: Maximum tape drive throughput data rate performance is enhanced to up to 120 MB/sec native data transfer rate. Data tracks are written 16 at a time. IBM Ultrium 4 Tape Drives can read and write LTO Ultrium 3 Data Cartridges at Ultrium 3 capacities and rates, and read LTO Ultrium 2 Data Cartridges at Ultrium 2 capacities with improved rates.

  **Note:** Although the Ultrium 4 Tape Drive provides the capability for excellent tape performance, other components of the system may limit the actual performance achieved. Also, although the compression technology used in the tape drive can typically double the amount of data that can be stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

- Increased tape cartridge capacity: The tape cartridge physical capacity is doubled over the Ultrium 3 Data Cartridge, up to 800 GB native physical capacity (1,600 GB with 2:1 compression), with the use of the new IBM LTO Ultrium 800 GB Data Cartridge. This is achieved by increasing the linear density and the media length.
The tape itself is an advanced metal particle tape developed to help provide durability and capacity.

- **Ultrium 3 cartridge compatibility**: The Ultrium 4 Tape Drive can read and write Ultrium 3 cartridges.
- **Encryption supported on Ultrium 4 Fibre Channel and SAS tape drives**: The IBM System Storage TS3100 and TS3200 Tape Libraries will support data encryption on the base drive with Ultrium 4 media meeting LTO consortium specifications and Application Managed encryption.
- **Attachment options**: The TS3100 and TS3200 Tape Libraries come with 3 Gbps SAS, 4 Gbps Fibre Channel, or Ultra160 LVD SCSI attachment models with LTO Ultrium 4 for connection to a wide spectrum of open system servers. They are supported on System p, System i, System x, Sun Solaris, HP-UX, Microsoft® Windows, Linux, and other open systems.
- **WORM media support**: The IBM 3589 Ultrium 4 800 GB WORM Tape Cartridges are designed for applications such as archiving and data retention as well as those applications requiring an audit trail. These cartridges work with the IBM LTO Ultrium 4 Tape Drive to help prevent the alteration or deletion of user data. IBM Ultrium 800 GB WORM Tape Cartridges can be ordered as unique 3589 models with the following features:
  - Pre-labeling, with the ability to specify a starting volume serial and color-coding
  - Packaging in individual jewel cases or in bulk
  - Cartridge memory, built into every cartridge, which helps to enhance functionality and media reliability by storing access history and media performance information for use by the tape drive every time the cartridge is accessed
  - Half-inch particle tape with a 800 GB WORM native capacity in a single cartridge
- **Larger internal data buffer**: The Ultrium 4 Tape Drive has a 256 MB internal data buffer as compared to a 128 MB internal data buffer in the Ultrium 3 Tape Drive.
- **Highly integrated electronics**: Using IBM engineered copper technology: This technology is designed to reduce the total number of components in the drive, lower chip temperatures, and reduce power requirements, helping to provide for a more reliable drive. The fourth-generation drive electronics are designed to provide real-time error correction of soft errors in the memory arrays in data and control paths.

Proven IBM LTO Ultrium features enhanced in the IBM LTO Ultrium 4 Tape Drive include:

- **Dual-stage 16-channel head actuator**: The actuator is designed to provide precision head alignment to help support higher track density and improved data integrity.
- **Independent tape loader and threader motors and positive pin retention**: These are designed to help improve the reliability of loading and unloading a cartridge, and to retain the pin, even if tension is dropped. An independent loader motor coupled with the positive pin retention is designed to cause the tape to thread with a higher level of reliability.
- **Graceful dynamic braking**: In the event of power failure, reel motors are designed to maintain tension and gradually decelerate instead of stopping abruptly, helping reduce tape breakage, stretching, or loose tape wraps during a sudden power outage.
- **Servo and track layout technology**: There are 704 data tracks in Ultrium 4 and 3 versus 512 data tracks in Ultrium 2. 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's patented Surface Control Guiding Mechanism is designed to guide the tape along the tape path in the Ultrium 4 Tape Drive. This method uses the surface of the tape, rather than the edges, to control tape motion. This 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.
- Magneto Resistive (MR) head design: Use of flat lap head technology in MR heads for Ultrium 4 helps minimize contact, debris accumulation, and wear on the tape as it moves over the read/write heads.
- Digital speed matching: The Ultrium 4 Tape Drive is designed to perform dynamic speed matching (at one of six speeds: 30, 48, 66, 84, 103, or 120 MB/sec) to adjust the drive's native data rate as closely as possible to the net host data rate (after data compressibility has been factored out). This helps reduce the number of backhitch repositions and improve throughput performance. Speed matching on Ultrium 4 ranges from 30 to 120 MB/sec versus 30 to 80 MB/sec on Ultrium 3.
- Robust drive components optimized for automation environments: Using some of the most robust components available, such as all-metal clutch, steel ball bearings in loader, robust leader block design, single circuit card, to help enhance reliability and prolong the life of the drives.
- Power management: The Ultrium 4 Tape Drive power management function is designed to control the drive electronics to be either completely turned off or in a low-power mode when the circuit functions are not needed for drive operation.
- Adaptive read equalization: Designed to automatically compensate for dynamic changes in readback signal response.
- Dynamic amplitude asymmetry compensation: This is designed to optimize readback signals for linear readback response from MR read head transducers.
- Separate writing of multiple filemarks: Separate writing of multiple filemarks 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 has two advantages: first, it helps improve performance if a subsequent append overwrites somewhere after the first filemark; second, writing of multiple filemarks typically indicates a point where an append operation might occur after the first of these filemarks. This change helps prevent having to rewrite datasets containing customer data and the first filemark if such an append occurs.
- LTO Data Compression (LTO-DC): The Ultrium 4 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's patented "Scheme-Swapping" compression is designed to look ahead at incoming data and determine the most efficient storage method (either ALDC or pass-thru 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 is designed to hold information about that specific cartridge, the media in the cartridge, and the data on the media. The storage capacity of the LTO-CM is 8 KB. 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 4 Tape Drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history saved in the CM module and the drive performance history kept in the drive flash EEPROM to help determine the most likely cause of failure. SARS is designed to cause the drive to request a cleaner tape, to mark the media as degraded, and to indicate that the hardware has degraded.

**Ultrium 800 GB Data Cartridge**

The tape cartridge physical capacity of the IBM Ultrium 800 GB Data Cartridge has doubled over the IBM Ultrium 400® GB Data Cartridge to 800 GB native physical capacity (1,600 GB with 2:1 compression). IBM LTO Ultrium 4 Tape Drives can read and write Ultrium 3 data cartridges, and read only Ultrium 2 data cartridges. LTO Ultrium 800 GB data cartridges can be ordered using Machine Type 3589, part number 95P4278 at the time of purchase.

These cartridges have been designed to provide several enhancements over previous tape technologies. They are designed to work with tape drives that have increased tape speeds and high-density data recording. The case is specially designed for use in automated libraries and is designed for repeated, unattended
handling. The tape itself is an advanced metal particle tape developed for durability and capacity.

With support for IBM LTO Ultrium-format tape data cartridges, the TS3100 and TS3200 Tape Libraries provides an excellent migration path from digital linear tape (DLT or SDLT), 1/4-inch, 4mm, or 8mm Tape Drives. These libraries can be a cost-effective solution for backup, save-and-restore, and archiving functions as the entry point for the family of IBM Ultrium tape products.

In addition to LTO Ultrium 4 drive features, the TS3100 and TS3200 are designed to provide:

- Support for Ultrium 4 media and Ultrium 4 WORM media
- Encryption support for Ultrium 4 SAS and Fibre Channel tape drives
- IBM's Multi-Path Architecture for single or multiserver attachment of homogeneous or heterogeneous systems or applications on the TS3200
- Standard bar code reader and remote management unit
- Free-standing library or with optional rack mounting in an industry-standard 19-inch rack

The TS3100 and TS3200 Tape Libraries are suitable for use in network-attached storage implementations such as backups and mass storage archives where multiterabyte capacities are required. Storage and tape management is provided by software such as Tivoli® Storage Manager and other compatible software offerings.

The TS3100 or TS3200 is designed for stand-alone operation, but an optional rack-mounting kit allows installation into an ANSI/EIA standard 19-inch rack. If you require extra redundancy in your storage operations, an additional dc power supply option is available.

**Multi-Path support**

The Multi-Path feature of the TS3200 Tape Library supports sharing of the library robotics. The library can be partitioned into logical libraries and can provide each logical library its own separate and distinct drive, storage slots, and control path. You can partition the library into as many logical libraries as there are drives in the library. Each logical library must contain at least one drive.

**Note:** This type of partitioning is designed to allow heterogeneous applications to share the library robotics independent of each other. Cartridges under library control are not shared between logical libraries, nor allowed to be moved between logical libraries. An example of heterogeneous sharing is a Microsoft Windows application using the drive and storage slots of one logical library while a UNIX application uses the drive and slots of another logical library.

**Path Failover option**

The TS3200 Tape Library may use path failover (part number 45E9503) to help enhance availability. This optional feature is designed to provide automatic control path failover to a preconfigured redundant control path in the event that a host adapter or control path drive is lost without aborting the current job in progress. Support is provided under various operating systems such as System p, Linux, Solaris, HP-UX, and Windows for Fibre Channel attachments when the IBM tape device driver is used.

Data path failover and load balancing supports native Fibre Channel Ultrium 4 Tape Drives in the Tape Library using the IBM tape device driver for System p, Linux, Solaris, and Windows. Data path failover is designed to provide a failover mechanism in the IBM device driver, which is designed to enable you to configure multiple redundant paths in a SAN environment. In the event of a path or component failure, the failover mechanism is designed to automatically provide error recovery to retry the current operation using an alternate, preconfigured path without aborting the current job in progress. This helps allow flexibility in SAN configuration, availability, and management.
When accessing a tape drive device that has been configured with alternate pathing across multiple host ports, the IBM device driver is designed to automatically select a path through the host bus adapter (HBA) that has the fewest open tape devices, and assign that path to the application. This autonomic self-optimizing capability is called load balancing. The dynamic load balancing support is designed to optimize resources for devices that have physical connections to multiple HBAs in the same machine. The device driver is designed to dynamically track the usage on each HBA as applications open and close devices, and balance the number of applications using each HBA in the machine. This may help optimize HBA resources and improve overall performance. Further, data path failover is designed to provide autonomic self-healing capabilities similar to control path failover, and is designed to failover to an alternate data path in the event of a failure in the primary host-side path. Data path failover and load balancing for Ultrium 4 Tape Drives requires the optional path failover feature.

### Product positioning

As you compare competitive tape solutions, consider:

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

The TS3100 and TS3200 and storage management applications help address these requirements and constitute a functionally rich tape storage solution incorporating LTO Ultrium tape technology. This solution is designed to give you flexibility of tape library management and unattended save and restore operations. The TS3100 or TS3200 are excellent solutions if you use tape or require a larger-capacity or higher-performance tape backup with or without random access. They are excellent choices for tape automation for System p, System i, System z, System x, HP-UX, Sun, UNIX, Linux, and Windows servers.

The TS3100 supports IBM LTO Ultrium Tape Drives and 24 cartridge slots (including one configurable I/O slot) with a physical capacity of 38.4 TB (with 2:1 compression) or 19.2 TB native with Ultrium 4 media. The TS3200 supports IBM LTO Ultrium Tape Drives and 48 cartridge slots (including three configurable I/O slots) with a library physical capacity of 76.8 TB (with 2:1 compression) or 38.4 TB native with Ultrium 4 media.

The TS3100 and TS3200 can be the answers to growing storage requirements and shrinking backup windows and are a part of a family of IBM System Storage LTO Ultrium tape products. These products constitute excellent tape storage solutions if you have an existing digital linear tape experience or require high-performance automated tape backup.

For capacity requirements less than 19.2 TB (native), the IBM System Storage TS3100 Tape Library and the IBM System Storage 3580 Tape Drive should be considered.

For capacity requirements in the 38.4 TB to 76.8 TB (with 2:1 compression) range with an entry-level automation need, the IBM System Storage TS3200 Tape Library should be considered with its one or two IBM LTO Ultrium 4 Tape Drives and 48-cartridge capacity.

For larger capacity requirements, with drives and cartridge capacity scalability, the IBM System Storage TS3310 Tape Library (machine type 3576) should be considered.
Customers can now tailor the TS3310 Tape Library to match system capacity and performance needs with up to 18 IBM LTO Ultrium tape drives total in an L5B plus four E9U systems.

For larger capacity requirements, the IBM System Storage TS3500 Tape Library (machine type 3584) should be considered. The TS3500 Tape Library can help address system capacity from 102.4 TB to 10.8 PB, 204.8 TB to 21.6 PB (with 2:1 compression), using up to 192 IBM Ultrium Tape Drives in up to sixteen 3584 library frames.

For protection of mission-critical data and hardware needs, optimized for enterprise multimode and host attachment, high-duty cycle, and start/stop-intensive tape applications, consider the IBM System Storage TS1120 with the IBM System Storage TS3400 or TS3500 Tape Library.

**Product number**

**Note:** The power cord options are used in the country listed and other countries. Refer to the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide* (GA32-0545) for specific country availability or contact your IBM representative.

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<td>Ultrim Cleaning Cartridge L1 UCC</td>
<td>3573</td>
<td>2UL, 4UL</td>
<td>23R7008(1)</td>
</tr>
<tr>
<td>3573 Additional Power Supply</td>
<td>3573</td>
<td>4UL</td>
<td>23R7262(1)</td>
</tr>
</tbody>
</table>
4.5M VHDCI/HD68 SCSI Cable 3573 2UL,4UL 23R7134(1)
10M VHDCI/HD68 SCSI Cable 3573 2UL,4UL 23R7135(1)
13M LC/LC Fibre Cable 3573 2UL,4UL 23R7137(1)
25M LC/LC Fibre Cable 3573 2UL,4UL 23R7138(1)

Power Cord Options
2.8M Power Cord 125V US/CAN 3573 2UL,4UL 23R7141(1)
1.8M Power Cord 125V, Chicago 3573 2UL,4UL 23R7143(1)
2.8M Power Cord 250V US/CAN 3573 2UL,4UL 23R7145(1)
2.8M Power Cord 250V France 3573 2UL,4UL 23R7146(1)
2.8M Power Cord 250V Denmark 3573 2UL,4UL 23R7147(1)
2.8M Power Cord 250V UK 3573 2UL,4UL 23R7148(1)
2.8M Power Cord 250V Israel 3573 2UL,4UL 23R7149(1)
2.8M Power Cord 250V Switzerland 3573 2UL,4UL 23R7150(1)
2.8M Power Cord 250V S. Africa 3573 2UL,4UL 23R7151(1)
2.8M Power Cord 250V Italy 3573 2UL,4UL 23R7152(1)
2.8M Power Cord 250V Australia 3573 2UL,4UL 23R7153(1)
2.8M Power Cord 250V Uruguay/Argentina 3573 2UL,4UL 23R7154(1)
2.8M Power Cord 250V China 3573 2UL,4UL 23R7155(1)
2.8M Power Cord 125V Taiwan 3573 2UL,4UL 23R7158(1)
2.8M Power Cord 250V Taiwan 3573 2UL,4UL 23R6981(1)
2.8M Power Cord 125V Japan 3573 2UL,4UL 23R6982(1)
2.8M Power Cord 250V Japan 3573 2UL,4UL 23R6983(1)
2.8M Power Cord 250V Korea 3573 2UL,4UL 23R6984(1)
2.8M Power Cord 250V India 3573 2UL,4UL 23R6985(1)
2.8M Power Cord 125V Brazil 3573 2UL,4UL 23R6986(1)
2.8M Power Cord 250V Brazil 3573 2UL,4UL 23R6987(1)

Previously announced part number

**Note:** The power cord options are used in the country listed and other countries. Refer to the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide* (GA32-0545) for specific country availability or contact your IBM representative.

The TS3100 and TS3200 Tape Libraries Express Models are available in all European, Middle Eastern, and African countries.
The following publications are shipped with the products, as appropriate. Additional copies are available. To order, contact your IBM representative.

<table>
<thead>
<tr>
<th>Title</th>
<th>Order number</th>
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<tbody>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide</td>
<td>GA32-0545</td>
</tr>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library Getting Started Guide</td>
<td>GA32-0548</td>
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</tbody>
</table>

The preceding publication and the following publications are also available at

http://www.ibm.com/storage/tape/lto

The device driver publications are also available at


<table>
<thead>
<tr>
<th>Title</th>
<th>Language</th>
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<tbody>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library Installation Quick Reference</td>
<td>English, Japanese, German, Traditional Chinese, Brazilian Portuguese, Simplified Chinese, Spanish</td>
</tr>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library SCSI Reference</td>
<td></td>
</tr>
<tr>
<td>IBM Tape Device Driver Programming Reference</td>
<td></td>
</tr>
<tr>
<td>IBM Tape Device Driver Installation and User's Guide</td>
<td></td>
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<tr>
<td>(GC27-2130)</td>
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The following translated publications will be included on CD-ROMs with the product. They will also be available at

http://www.ibm.com/storage/tape/lto

<table>
<thead>
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<tbody>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide</td>
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</tr>
<tr>
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<td>English, Brazilian Portuguese, German, Japanese, Korean, Spanish, Simplified Chinese</td>
</tr>
<tr>
<td>IBM System Storage TS3100/TS3200 Tape Library Getting Started Guide</td>
<td>English</td>
</tr>
</tbody>
</table>
Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

http://www.ibm.com/services/

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit


Select your country, and then select the product as the category.

Technical information

Specified operating environment

Operating environment

3573 Model L2U

- Temperature: 10 to 35° C (50 to 95° F)
- Relative humidity: 15% RH to 80% RH (noncondensing)
- Wet bulb (caloric value): 26° C (79.0° F) maximum
- Voltage: 100 to 240 V ac, 50 to 60 Hz auto-ranging
- Electrical power:
  - 4.0 amps at 100 V ac
  - 2.0 amps at 240 V ac 0.1 KVA
- Maximum acoustical noise sound power levels LwAd in bels: 6.6/6.8 Heat output: 100 watts (86 KCal/hr)

3573 Model L4U

- Temperature: 10 to 45° C (50 to 113° F)
- Relative humidity: 10% RH to 80% RH (noncondensing)
- Wet bulb (caloric value): 26° C (79.0° F) maximum
- Voltage: 100 to 240 V ac, 50 to 60 Hz auto-ranging
- Electrical power:
  - 4.0 amps at 100 V ac
  - 2.0 amps at 240 V ac 0.1 KVA
- Maximum acoustical noise sound power levels LwAd in bels: 6.6/6.8
- Heat output: 100 watts (86 KCal/hr)
Hardware requirements

The TS3100 and TS3200 come with raven black covers.

The TS3100 and TS3200 Models support:

- Ultra160 SCSI Low Voltage Differential (LVD) interface
- Fibre Channel interface
- SAS interface

The TS3100 and TS3200 can be attached to System p, System i, System z, System x, HP-UX, Sun Solaris, UNIX, Linux, and Windows servers, and non-IBM servers, workstations, and personal computers that support those interface specifications.

A current list of supported open system configurations is available at

http://www-1.ibm.com/storage/tape/lto

Select the model, then "Product Details," to view "Independent Software Vendor (ISV) matrix for LTO" for the product.

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

The TS3200 comes with one power supply and an additional power supply can be added with the following option: Additional Power Supply (23R7262).

If ordered as an MES, an Additional Power Supply will come with a power cord based on the original order. If the Additional Power Supply, (23R7262) is ordered, then two power cords will be supplied based on the power cord feature ordered.

Path Failover (for TS3200)

This optional feature is designed to provide automatic control path failover and data path failover for tape drives in the tape library. The data path failover is designed to provide a failover mechanism for configuring multiple redundant paths in a SAN environment. This capability is ordered with the following feature: Path Failover (45E9503).

Cables

SCSI, Fibre, or SAS cables are required to attach the TS3100 or TS3200 to the server host bus adapter. For the initial plant order:

- A SCSI cable should be ordered with each SCSI drive
- A Fibre Channel cable should be ordered with each Fibre Channel drive
- A SAS cable should be ordered with each SAS drive

An interposer or interposers may be used for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium SCSI interface and the server SCSI interface.

SCSI cables: The following cables are available for SCSI LVD attachment to the TS3100 or TS3200. (These cables include a VHDCI connector on one end and an HD68 connector on the other end).

- 4.5M VHDCI/HD68 SCSI Cable (23R7134)
- 10M VHDCI/HD68 SCSI Cable (23R7135)

Fibre Channel cables: A Fibre Channel cable is required to attach a TS3100 or TS3200 to host Fibre Channel adapters, Fibre Channel Switches, or other Fibre Channel components. The IBM LTO Ultrium 4 Fibre Tape Drive comes with an LC Duplex connector.
The following cable options are available for Fibre Channel attachment:

- 13M LC/LC Fibre Channel Cable (23R7137)
- 25M LC/LC Fibre Channel Cable (23R7138)

**SAS cables:** A SAS cable is required to attach a TS3100 or TS3200 Tape Library with an LTO Ultrium SAS Tape Drive to a host SAS adapter. At least one SAS cable must be specified on the initial plant order. The IBM Ultrium 4 dual-port SAS Tape Drive comes with two Mini-SAS (SFF-8088) connectors.

The following cable options are available for SAS attachment:

- 2M SAS/Mini-SAS 1x Cable (95P4711)
- 2M Mini-SAS/Mini-SAS 1x Cable (95P4713)

**SAS interposers:** A 1x4 interposer with either SAS/Mini-SAS or Mini-SAS/Mini-SAS connectors is available for connecting up to four Mini-SAS/Mini-SAS 1x cables and their respective SAS drives to a single HBA port. Mini-SAS/Mini-SAS 1x cables (95P4713 or 95P4714), to connect the interposer to the drive, need to be ordered separately. The following interposers are available:

- SAS/Mini-SAS 4x Interposer (from HBA with SFF-8470 to maximum of four cables with SFF-8088 drive attachment) (95P4994)
- Mini-SAS/Mini-SAS 4x Interposer (from HBA with SFF-8088 to maximum of four cables with SFF-8088 drive attachment) (95P4996)

Refer to the **Special Features** section of the TS3100 or TS3200 Sales Manual for detailed descriptions of these features.

**Host bus adapters support**

For a current list of HBAs that support the TS3100 or TS3200, visit

- http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp

**Software requirements**

For a current list of host software versions and release levels that support the TS3100 or TS3200, visit

- http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp

Tivoli Storage Manager and other compatible software offerings can provide storage and tape management software for the TS3100 or TS3200. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or ISVs. A list of compatible software is available from your IBM representative or at


Select the model, "Product Details," then "Independent Software Vendor (ISV) matrix for LTO" for the product.

IBM continues to work together with the ISVs to support the TS3100 and TS3200. Individual application vendors should be contacted for specific information and availability dates.
LTO Ultrium 4 Encryption

Encryption for the TS3100/TS3200 Tape Library, with SAS and Fibre Channel versions of the IBM LTO Ultrium 4 Tape Drive is provided in AIX®, IBM i, HP-UX, Linux, Sun Solaris, and Microsoft Windows 2003 operating system environments.

The installation of a Ultrium 4 Tape Drive with encryption may require code updates for System p and supported open systems device drivers or storage management software. An update of the open systems device drivers can be obtained via anonymous FTP from


Look under the directory storage/devdrvr.

For details on supported software versions and release levels for the Ultrium 4 Tape Drive, as well as hardware support information, visit

http://www.ibm.com/storage/tape

Three modes of encryption management are supported:

• System Managed (available for AIX, Linux, Solaris, and Windows)
• Library Managed (available for IBM i, AIX, Linux, HP-UX, Solaris, and Windows)
• Application Managed (IBM Tivoli Storage Manager)

The IBM Encryption Key Manager component for the Java™ platform is required for enabling System Managed and Library Managed Encryption. To receive the Encryption Key Manager to run on AIX, Red Hat Enterprise Linux (RHEL) 4, SUSE Linux Enterprise Server (SLES) Version 9, Sun Solaris 10, and Microsoft Windows 2003, IBM Tivoli Key Lifecycle Manager V1.0 (TKLM V1.0 replaces TPC Basic Edition), licensed program product 5608-A91 or 5724-T60 is required. IBM TotalStorage® Productivity Center (TPC) Basic Edition, licensed program product 5608-B01 is available for a limited time only. Tivoli Key Lifecycle Manager V1.0 electronic availability via Passport Advantage® and media availability via Passport Advantage and AAS will include the IBM Encryption Key Manager component for the Java platform. Note that Tivoli Key Lifecycle Manager and TPC Basic Edition are chargeable program products. Several maintenance options are also available for ordering with the Tivoli Key Lifecycle Manager.

For more information on ordering and pricing for IBM Tivoli Key Lifecycle Manager V1.0 TPC Basic Edition, licensed program product 5608-A91 or 5724-T60, refer to Software Announcement ZP08-0486, dated November 04, 2008.

For more information on ordering and pricing for TPC Basic Edition, licensed program product 5608-B01, refer to Software Announcement ZP07-0448, dated October 23, 2007. Additional information is also available at

http://www-03.ibm.com/systems/storage/software/center/index.html

System p

System p supports System Managed and Library Managed Encryption with IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library, and Application Managed Encryption with a supported software application.

AIX V5.2, or later, is required for System Managed, Library Managed, and Application Managed Encryption.

System Managed Encryption with AIX requires:

• An Encryption Key Manager component be available to the AIX system.
• The IBM Tape Device Driver be installed, updated, and utilized. It may be downloaded from
Library Managed Encryption with AIX requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Ultrium 4 tape drives and media

If the Encryption Key Manager is run on a System p server with AIX:

- AIX V5.2, or later, is required
- One of the following IBM Java Software Development Kits (SDKs) should be updated to include the latest version of the Encryption Key Manager:
  - Java SDK 5 (31 bit and 64 bit)
  - Java SDK 1.4.2 (31 bit and 64 bit)

Updates to the AIX Java SDK may be obtained at


System i

System i supports Library Managed Encryption with Fibre Channel or SAS IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library.

IBM i 6.1, or later, is required

System i support of Library Managed Encryption on the TS3100/TS3200 requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Fibre Channel or SAS Ultrium 4 tape drives and media

The Encryption Key Manager is supported on IBM i 6.1, or later. If the Encryption Key Manager component is run on IBM i, then the following program product is required:

- IBM Developer Kit for Java - Java Developer Kit 5.0 (5722-JV1)

Linux

System x and other Intel-based or AMD Opteron-based Linux servers and System p servers support System Managed and Library Managed with IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library, and Application Managed Encryption with a supported software application.

Use of System Managed, Library Managed, and Application Managed Encryption on Linux requires one of the following:

- RHEL 4
- RHEL 5
- SLES 9
- SLES 10

System Managed Encryption with Linux requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library.
- The IBM Tape Device Driver be installed, updated, and utilized. It may be downloaded at
Library Managed Encryption with Linux requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Ultrium 4 tape drives and media

If the Encryption Key Manager is run on a server with Linux:

- One of the following is required:
  - RHEL 4
  - RHEL 5
  - SLES 9
  - SLES 10
- One of the following IBM Java SDKs should be updated to include the latest version of the Encryption Key Manager:
  - Java SDK 5 (31 bit and 64 bit)
  - Java SDK 1.4.2 (31 bit and 64 bit)

Updates to the Linux Java SDK may be obtained at


Microsoft Windows

System x and other Intel-based or AMD Opteron-based Windows servers support System Managed and Library Managed Encryption with IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library, and Application Managed Encryption with a supported software application.

Windows 2003 is required for System Managed, Library Managed, and Application Managed Encryption.

System Managed Encryption with Windows requires:

- An Encryption Key Manager component be available to the Windows system.
- The IBM Tape Device Driver be installed, updated, and utilized. It may be downloaded at

Library Managed Encryption with Windows requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Ultrium 4 drives and media

If the Encryption Key Manager is run on a server with Windows:

- Windows 2003 is required.
- An Encryption Key Manager CD is required and available through the IBM TPC Basic Edition, licensed program product 5608-B01. For information, visit
  http://www-03.ibm.com/systems/storage/software/center/index.html

HP-UX

HP-UX supports Library Managed Encryption with IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library, and Application Managed Encryption with a supported software application.

HP-UX 11iv1, 11iv2, or 11iv3 is required for Library Managed and Application Managed Encryption.
Library Managed Encryption with HP-UX requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Ultrium 4 tape drives and media

If the Encryption Key Manager is run on a server with HP-UX:

- HP-UX 11iv1 or 11iv2 is required.
- An Encryption Key Manager CD is required and available through the IBM TPC Basic Edition, licensed program product 5608-B01. For information, visit http://www-03.ibm.com/systems/storage/software/center/index.html

**Sun Solaris**

Sun Solaris supports Library Managed Encryption with IBM Ultrium 4 tape drives and the TS3100/TS3200 Tape Library, and Application Managed Encryption with a supported software application.

Use of System Managed, Library Managed, and Application Managed Encryption on Solaris requires one of the following:

- Sun Solaris 8
- Sun Solaris 9
- Sun Solaris 10

System Managed Encryption with Solaris requires:

- An Encryption Key Manager component be available to the Solaris system.
- The IBM Tape Device Driver be installed, updated, and utilized. The drivers may be downloaded at ftp://ftp.software.ibm.com/storage/devdrvr/Solaris/

Library Managed Encryption with Solaris requires:

- An Encryption Key Manager component be available to the TS3100/TS3200 Tape Library
- A TS3100/TS3200 Tape Library with Ultrium 4 drives and media

If the Encryption Key Manager is run on a server with Solaris:

- One of the following is required:
  - Sun Solaris 8
  - Sun Solaris 9
  - Sun Solaris 10
- An Encryption Key Manager CD is required and available through the IBM TPC Basic Edition, licensed program product 5608-B01. For information, visit http://www-03.ibm.com/systems/storage/software/center/index.html

**Application software**

Tivoli Storage Manager supports Application Managed Encryption.

**Compatibility**

The IBM LTO Ultrium 4 Tape Drives can read and write IBM LTO Ultrium 3 and 4 Data Cartridges and read IBM LTO Ultrium 2 Data Cartridges. The LTO Ultrium 800 GB Data Cartridges can only be used on the IBM LTO Ultrium 4 Tape Drives.
**Limitations**

SAS cable lengths are limited to a maximum of 6 meters (20 ft).

Feature number 5506 (5.5 m Mini-SAS/Mini-SAS 1x Cable) is not supported with feature numbers 5400 (SAS/Mini-SAS 4x Interposer) or 5500 (Mini-SAS/Mini-SAS 4x Interposer).

The TS3100 or TS3200 Tape Library operating environment must not conflict with media operating and storage requirements. If media is stored in the TS3100 or TS3200 Tape Library for more than 10 hours, the media storage temperature requirements must be met.

**Planning information**

**Customer responsibilities**

Physical planning is a customer responsibility. Detailed planning information is in the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide* (GA32-0545). The TS3100 and TS3200 are designated as customer setup units (CSUs). It is the customer's responsibility to install the unit. Customers are responsible for obtaining the appropriate SCSI, Fibre, or 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 Web site

http://www.ibm.com/storage/tape/lto

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 Web site 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**

SCSI, Fibre Channel, or SAS cables are required to attach the TS3100 or TS3200 to the server. At least one cable should be specified on the initial plant order. An interposer or interposers may be used for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium Tape Drive interface and the server interface.

Refer to the Cables topic at the end of Hardware requirements section for a list of available cables and interposers.

Refer to the Specify or Special Features section of the TS3100 or TS3200 Sales Manual for a detailed description of the cables and interposers available.

**Installability**

Installation time for the IBM System Storage TS3100 Tape Library, when rack-mounted, is approximately 3.5 to 4 hours, and when stand-alone, installation is approximately 1.5 hours.

Installation time for the TS3200 Tape Library is approximately four hours. Installation time for an additional tape drive installed in the TS3200 Tape Library is approximately one hour.

### Packaging

<table>
<thead>
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<th>Product</th>
<th>Shipment group</th>
<th>Number of boxes</th>
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### Supplies

**For end users:**

The IBM LTO Ultrium 800 GB Data Cartridges and the IBM LTO Cleaning Cartridge can be ordered as SEO part number 95P4278 or 23R7008.

For information about IBM branded media, such as additional IBM LTO Ultrium data or cleaning cartridges, visit http://www.storage.ibm.com/media

### 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.

### Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, or integration of this product.

### General product/system description

The IBM System Storage TS3100 Tape Library Express Model L2U (Machine Type 3573, Model L2U) and the IBM System Storage TS3200 Tape Library Express Model L4U (Machine Type 3573, Model L4U) are designed to offer high capacity, enhanced
performance, and technology for the midrange open system environments. The products are included as part of the IBM System Storage tape library family of offerings.

The TS3100 Tape Library is an external 2U stand-alone or rack-mountable unit that incorporates a single IBM LTO Ultrium 4 Tape Drive. The TS3100 Tape Library has two removable cartridge magazines, one on the left side and one on the right side, providing 24 data cartridge slots, including a single I/O slot, providing a media physical capacity of up to 19.2 TB (38.4 TB with 2:1 compression) data storage per unit.

The TS3200 Tape Library is an external 4U stand-alone or rack-mountable unit that incorporates up to two LTO IBM Ultrium 4 Tape Drives. The TS3200 Tape Library has four removable cartridge magazines, providing 48 data cartridge slots, including one 3-slot I/O station, providing a media physical capacity of up to 38.4 TB (76.8 TB with 2:1 compression) data storage per unit.

For Xccelerator and HVEC, the TS3100 Tape Library Express models come with a Ultrium 4 LVD SCSI Drive (SEO/part number 3573L4S), a Ultrium 4 Fibre Channel Drive (SEO/part number 3573F4S) or a Ultrium 4 SAS Drive (SEO/part number 3573S4S).

For Xccelerator and HVEC, the TS3200 Tape Library Express models come with a Ultrium 4 LVD SCSI Drive (SEO/part number 3573L4H), a Ultrium 4 Fibre Channel Drive (SEO/part number 3573F4H), or a Ultrium 4 SAS Drive (SEO/part number 3573S4H). A second drive is available as an optional SEO/part number allowing up two Ultrium tape drives. Mixed Ultrium drive and media types are supported, and TS3200 Tape Library incorporates IBM's Multi-Path Architecture with logical libraries equal to the number of drives installed. The TS3200 also accommodates an optional power supply.

Europe considerations

See "Product Functional Specifications."

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.
Terms and conditions

**Volume orders:** Contact your IBM representative.

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

**Warranty period**

Three years. IBM Ultrium media is warranted separately.

IBM options or features initially installed in an IBM system carry the same warranty period as the system. If installed after the initial system installation, they carry the balance of the system warranty.

Optional IBM features initially installed in an IBM system carry the same warranty period as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

**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 Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. 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. This product is covered by the following types of service:

Customer Replaceable Unit Service and On-site for other selected parts.

Customer Replaceable Unit 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 or a Tier 2 CRU.

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

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 is shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRU parts:

- L2U/L4U library without drives
- Drive sled with drive (SCSI, Fibre, SAS)
- Library Controller Card
- Blank Out Cover for Optional Power Supply
• Blank Out Cover for the Drive Bay
• Adhesive attached feet for desktop application
• 250 watt power supply
• Right Side magazine
• Left Side 2U magazine
• Left Side Upper 4U magazine
• Left Side Lower 4U magazine

Machine Exchange, Next Business Day

• 9 hours per day, Monday through Friday, excluding public or national holidays

Non-IBM parts support

Warranty service

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

ServicePac Offerings

Warranty and Maintenance Options

The announced products may be eligible for ServicePacs for Warranty and Maintenance Options, convenient prepackaged offerings for warranty service upgrades and maintenance services.

Installation Services

The announced products may be eligible for ServicePacs for Installation Services, convenient prepackaged offerings for installation services. Refer to the Prices section for information on the availability of ServicePac® offerings.

For additional ServicePac information, visit


IBM offers a range of ServicePacs for the System Storage products described in this announcement, delivering the most popular variety of enhancements to the IBM base warranty service post-warranty maintenance offerings.

ServicePacs are identified by IBM part number and may be purchased from your registered IBM Business Partner. ServicePacs are activated via a simple online registration process.

1 Refer to PLET ZA05-0230 for a complete list of IBM Post-Warranty ServicePacs for Storage Products.
2 Refer to PLET ZS97-0252 for a complete list of IBM Maintenance Services ServicePacs.

The products described in this announcement are eligible under the Terms and Conditions of the IBM ServiceSuite™, the IBM Enterprise Service Agreement (ESA), or under the IBM Maintenance Agreement. Consult your IBM representative for details.

IBM hourly service rate classification

One
Field-installable features
Yes

Model conversions
No

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

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 at


This license machine code pertains to a machine using LMC Type Model 3573-L2U or 3573-L4U.

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM System Storage technical support Web site


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.

Prices

For all local charges, contact your IBM representative.

Announcement countries

All European, Middle Eastern, and African countries except Iran, Sudan, and Syria.

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**Corrections**

(Corrected on December 22, 2009)

Product number section includes revised description of Path Failover option.