IBM TotalStorage UltraScalable Tape Library 3584 Extends Attachment to 16 Frames

Overview

The IBM TotalStorage UltraScalable Tape Library 3584 is a highly scalable, automated tape library combining IBM automation technology and high-performance IBM Linear Tape-Open (LTO) Ultrium Tape Drives for the midrange to enterprise open systems environment. Your investment in the UltraScalable Tape Library 3584 has been enhanced with the addition of expanded capacity, enhanced availability, and improved library management. These enhancements include:

- Expanded cartridge storage — You can have up to 6,881 cartridges in the 3584 with the attachment of up to 15 Model D32 Expansion Frames. This provides a LTO Ultrium 2 native library capacity of up to 1,376 TB (2,752 TB with 2:1 compression), giving you the flexibility to expand and grow to meet your increasing storage and application needs.

- Expanded drive capability — With 12 Ultrium 1 or 2 Tape Drives per frame, up to 192 tape drives and logical libraries are available to accommodate backup windows and meet your requirements for multiple heterogeneous hosts and additional applications.

- Dual AC Power — Two independent line cords can be connected to independent power feeds to enhance library availability.

- Multiple simultaneous Web clients — Allow up to five simultaneous users access to the library.

- Individual Web login IDs and passwords — Which can enhance your 3584 library security.

- Insert Notification — This option enables more efficient management of tape cartridge inventory and handling by notifying host applications when new cartridges are imported into the library.

- Data Path Failover and load balancing — Improves availability and manageability by providing failover and load balancing for fibre Channel host bus adapters.

These new enhancements may be added to your installed 3584 libraries.

The UltraScalable Tape Library 3584 is suitable for use in network attached storage implementations, such as backups and mass storage archives where multi-terabyte capacities are required. Storage and tape management for the 3584 is provided by software such as Tivoli Storage Manager and other industry-leading compatible software offerings.

Key Prerequisites

Appropriate levels of host software are required to attach the UltraScalable Tape Library 3584 with IBM LTO Ultrium 2 Tape Drives to selected IBM @server iSeries™, AS/400®, IBM @server pSeries™, RS/6000®, RS/6000 SP®, IBM @server xSeries®, Netfinity®, IBM @server zSeries® Linux, Sun, Microsoft® Windows NT®, Windows® 2000, Windows 2003, Linux, and other UNIX® and PC servers. Refer to the Technical Information section for details.

At a Glance

The IBM TotalStorage UltraScalable Tape Library 3584 combines IBM tape and automation reliability at open systems prices. New features to expand capacity, enable growth, enhance availability, and improve library management include:

- Extending current library from 6 to 16 frames
- Increasing the maximum number of attached IBM LTO Ultrium Tape Drives to 192
- Increasing the maximum number of cartridges from 2,481 to 6,881
- Expanding the available storage capacity up to 2,752 TB (with 2:1 compression)
- Providing a dual power cord line feed
- Enabling multiple simultaneous Web clients, individual login IDs, cartridge insert notification, and data path failover and load balancing

Planned Availability Date

August 1, 2003
Description

The UltraScalable Tape Library 3584 is a tape library storage solution designed for the large, unattended storage requirements of today's midrange systems as well as high-end network servers. Each aspect of the library is designed to optimize access to data and reliability. The 3584 can contain IBM LTO Ultrium Tape Drives, which are compact storage devices that support the highly intensive read and write operations required by today's network servers.

New Features of the 3584:

- Expanded cartridge storage capacity
- Expanded drive capability
- Dual AC Power
- Multiple simultaneous Web clients
- Individual Web login IDs and passwords
- Insert Notification
- Data Path Failover and load balancing

Expanded Cartridge Storage Capacity

The UltraScalable Tape Library 3584, which automates the retrieval, mounting and demounting, and storage of tape cartridges for host systems, provides the following increases in storage and cartridge capacity:

- Attachment of up to 15 Model D32 Expansion Frames
- Number of cartridge slots expanded from 2,881 to 6,881
- Library data storage capacity expanded to up to 1,376 TB native (2,752 TB with 2:1 compression) with the use of LTO Ultrium 200 GB Data Cartridges

The UltraScalable Tape Library 3584 Model L32 now supports the attachment of up to 15 Model D32 Expansion Frames. This provides you investment protection for your installed library, and the flexibility to expand and grow the 3584 library to meet your increasing storage and application needs. A 3584 Model L32 can contain a maximum of 281 cartridge cells and each 3584 Model D32 Frame can contain a maximum of 440 cartridges. The number of cartridge cells expands from 2,881 with a six frame 3584, to 6,881 with a 16 frame 3584 configuration. With Ultrium 200 GB Tape Cartridges and 16 frames, the data storage capacity is greatly enhanced up to 2,752 TB (with 2:1 compression). The greater capacity of the 3584 enables operators to be more productive and dramatically extends the unattended capacity.

Expanded Drive Capability

With the expanded frame support for the UltraScalable Tape Library 3584, the number of drives and logical libraries supported in a 3584 configuration has increased considerably. Additional drives can enhance performance and improve library throughput, accommodate additional workload, or enable multiple heterogeneous host attachments. Each frame of a 3584 configuration, including the base Model L32 frame, can accommodate up to 12 Ultrium 1 or 2 Tape Drives. In a fully configured 16 frame 3584, up to 192 Ultrium 1 or 2 Tape Drives and logical libraries are supported. Any Model D32 frame may contain drives or any frame may be storage only.

Dual AC Power

A new Dual AC Power feature, supporting either 110 V ac or 220 V ac, is available for the UltraScalable Tape Library 3584. This feature provides two independent line cords that may be connected to two independent customer branch circuits. This can enhance library availability by having an alternative power source in case of planned or unplanned power grid outages. A power switch connects to one of two customer power feeds and passes all ac power to the frame from that feed. The switch monitors the ac line voltage from the feed it is using and automatically switches to the alternate ac power feed if the incoming voltage is lost.

Multiple Simultaneous Web Clients

Previously, the Web user interface only supported a single user at any given time. Now each Ethernet-capable frame on the UltraScalable Tape Library 3584 will allow five simultaneous users of the Web user interface. This will allow multiple users to simultaneously access the library Web user interface.

Individual Web Login IDs and Passwords

For the UltraScalable Tape Library 3584, the Web user interface will support a list of users that can access various areas of the Web user interface. Each user has a 30 character name, a 15 character login ID, a 15 character password, and an access level. This enhances security by providing multiple login IDs and a log of who accessed the Web pages. The access level defines the level of Web access that the user is allowed. The two levels of access are “user” for non-destructive Web access and “super user” for more advanced functionality, such as moving cartridges and configuring the library. With user and super user login IDs, you can not create, modify, or change any login IDs. Any login ID is able to change their own password. The login ID “admin” can create, modify, and destroy all login IDs except the admin ID.

Insert Notification

Insert Notification is an option that can be enabled and disabled from the operator panel of the 3584 library and the Web user interface. This can provide more efficient management of the library, including tape cartridge inventory and handling, by notifying host applications when new tape cartridges are imported into the library. The I/O station is monitored for any new media. New media refers to a cartridge that does not have any logical library assignment. This can be caused by opening the I/O station door and placing a cartridge into an empty I/O slot or by opening the I/O station door and moving a cartridge from one I/O slot to another. Library movement of cartridges never results in a loss of logical library assignment. If insert notification is enabled, the operator panel displays a message when new media is detected, that asks the operator to select a logical library. Any unassigned cartridges in the I/O station are assigned to the selected logical library (and all other logical libraries are not able to access the cartridges). There is an option to defer any assignment and there is a time-out period where the deferral will automatically take effect.

Data Path Failover and Load Balancing

Data Path Failover and load balancing is a new capability exclusively supporting native Fibre Channel Ultrium 2 Tape Drives in the Ultrium Tape Library 3582, Ultrium Scalable Tape Library 3583, and UltraScalable Tape Library 3584 using the IBM Ultrium Device Driver for AIX®. When accessing an Ultrium 2 device that has been configured with alternate pathing across multiple host ports, the IBM Ultrium Device Driver automatically selects a path through the host bus adapter (HBA) that has the fewest open tape devices. This autonomic self-optimizing capability is called load balancing. Further, Data Path Failover provides autonomic self-healing capabilities similar to Control Path Failover, with transparent failover to an alternate data path in the event of a failure in the primary host-side path.
Product Positioning

As you compare competitive tape solutions, consider:

- Library scalability: 1 to 16 frames, 1 to 192 tape drives, 2,881 to 6,881 cartridges
- Capacity and performance requirements
- Data integrity, reliability, and availability
- Storage usage and application requirements
- Affordability
- Loyalty to legacy or existing tape formats

The UltraScalable Tape Library 3584 and industry-leading software applications lead in addressing these requirements and constitute a functionally rich tape storage solution incorporating LTO Ultrium tape technology. You also gain flexibility of automated tape library management and unattended save/restore operations.

The UltraScalable Tape Library 3584 models are an excellent choice for tape automation for pSeries, RS/6000, iSeries, AS/400, zSeries Linux, and other popular open systems. The IBM 3584 utilizes the patented Multi-Path architecture allowing homogeneous or heterogeneous open systems servers to share the library robotics.

The UltraScalable Tape Library Base Frame 3584 Model L32 offers 141 to 281 slots and up to 12 IBM LTO Ultrium 1 or 2 Tape Drives. It provides excellent price/performance in the open systems environments where the tape automation requirements are satisfied by one to twelve drives or a library capacity of 112 TB (with 2:1 compression) or 56 TB native.

The UltraScalable Tape Library Expansion Frame 3584 Model D32 offers 440 slots and up to 12 tape drives. Up to 15 Model D32 Frames can be attached to a Model L32 Frame providing a total library capacity of up to 192 IBM LTO Ultrium 1 or 2 Tape Drives or up to 6,881 cartridge slots, holding up to 2,752 TB (with 2:1 compression) or 1,376 TB native.

The 3584 is the answer to growing storage requirements and shrinking backup windows, and is part of a family of IBM TotalStorage LTO Ultrium tape products.

If you have existing digital linear tape experience or require high-performance automated tape backup, the UltraScalable Tape Library 3584 constitutes an excellent tape storage solution. In addition to reading and writing on IBM LTO Ultrium-format tape cartridges, the 3584 tape drives provide an enhanced functional alternative to DLT/SDLT, 1/4-inch, 4mm, 8mm, or IBM Magstar MP 3570 tape drives.

For capacity requirements less than 28.8 TB (compressed), a wide spectrum of tape libraries are available from the family of IBM TotalStorage Ultrium Tape products, depending on your storage usage and requirements. You may choose from the following tape automation products: IBM TotalStorage Ultrium Scalable Tape Library 3583 (up to 28.8 TB compressed), IBM TotalStorage Ultrium Tape Library 3582 (up to 9.6 TB compressed), and the IBM TotalStorage Ultrium Tape Autoloader 3591 (up to 2.8 TB compressed).

For mission-critical data protection, optimized for enterprise multi-mode and host attachment, high-cycle and start/stop intensive tape applications, consider the IBM TotalStorage Enterprise Tape Drive 3590 or the IBM TotalStorage Enterprise Automated Tape Library 3494.

Reference Information

Refer to:

- The Ultrium 2 Tape Drive in the UltraScalable Tape Library 3584, in Hardware Announcement 103-004, dated January 28, 2003
- Expanded I/O and remote library access features for the UltraScalable Tape Library 3584, in Hardware Announcement 101-165, dated June 12, 2001
- Native Fibre Channel Support for the UltraScalable Tape Library 3584, in Hardware Announcement 101-041, dated February 20, 2001
- The UltraScalable Tape Library 3584, in Hardware Announcement 100-237, dated August 23, 2000

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Publications

The following publications are shipped with the product. Additional copies are available. To order, contact your IBM representative:

<table>
<thead>
<tr>
<th>Title</th>
<th>Order Number</th>
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<tr>
<td>IBM TotalStorage™ UltraScalable Tape Library 3584 Planning and Operator Guide</td>
<td>GA32-0408</td>
</tr>
<tr>
<td>IBM Ultrium Device Driver Installation and User’s Guide (English)</td>
<td>GA32-0430</td>
</tr>
<tr>
<td>Translated Safety Notices for External Storage Devices</td>
<td>SA26-7197</td>
</tr>
</tbody>
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The publications listed above and the following publications are also available at:

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

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<tr>
<td>IBM TotalStorage UltraScalable Tape Library 3584 SCSI Reference (English)</td>
<td>GA32-0454</td>
</tr>
<tr>
<td>IBM Ultrium Device Driver Programming Reference (English)</td>
<td>GC35-0483</td>
</tr>
</tbody>
</table>

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http://service5.boulder.ibm.com/pnsrege.nsf/messages/welcome

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http://www.ibm.com/shop/publications/order

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Note that PNS subscribers most often order their publications via the Publication Center.

Technical Information

Specified Operating Environment

Hardware Requirements: The UltraScalable Tape Library 3584 can be attached to the Sun, Hewlett-Packard, iSeries™, pSeries™, xSeries® AS/400®, RS/6000®, Netfinity®, zSeries® Linux, and non-IBM servers, workstations, and open systems that support SCSI HVD, SCSI LVD, and Fibre Channel interfaces. The 3584 library comes with raven black covers.

One First Expansion Frame Attachment feature (#9002) or one Additional Expansion Frame Attachment feature (#9003) must be added to the 3584 Model L32 for each Model D32 Expansion Frame that is attached. This assures the proper cables are shipped and configuration records are correct. Up to 15 Model D32 Frames can now be attached to the Model L32, for a total of 16 frames, and each frame can contain up to 12 IBM LTO Ultrium 1 or 2 Tape Drives (for a total of up to 192 tape drives).

Note: If a Model D42 Frame is attached, the maximum number of Expansion Frames that can be attached is five (four of #9003).

When the total number of frames in the 3584 library coming from the plant is going to number 8 to 14 frames (7 to 13 Expansion Frames), the 7-14 Frame X-Track Cable will be shipped with the library unless the 8-16 Frame X-Track Cable feature (#9316) is specified on the Model L32. The 8-16 Frame X-Track Cable feature (#9316) must be specified on the Model L32 if there will be a total of 15 or 16 frames (14 or 15 Expansion Frames) in the 3584 library.

When frames are added to the library as a field upgrade, a new X-Track Cable may be required according to the following table of total installed frames:

<table>
<thead>
<tr>
<th>Installed Frame Qty</th>
<th>New Frame Qty</th>
<th>X-Track Cable Feature Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>3 - 6</td>
<td>#1806</td>
</tr>
<tr>
<td>1 - 6</td>
<td>7</td>
<td>#1814</td>
</tr>
<tr>
<td>1 - 6</td>
<td>8 - 14</td>
<td>#1814 or #1816</td>
</tr>
<tr>
<td>1 - 14</td>
<td>15 - 16</td>
<td>#1816 (if #9316 not installed)</td>
</tr>
</tbody>
</table>

When frames are removed from the library, a new X-Track Cable is required according to the following:

<table>
<thead>
<tr>
<th>Installed Frame Qty</th>
<th>New Frame Qty</th>
<th>X-Track Cable Feature Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 - 16</td>
<td>7</td>
<td>#1814 (if #9316/#1816 installed)</td>
</tr>
<tr>
<td>7 - 16</td>
<td>3 - 6</td>
<td>#1806</td>
</tr>
<tr>
<td>3 - 16</td>
<td>1 - 2</td>
<td>#1802</td>
</tr>
</tbody>
</table>

A Dual AC Power feature (#1901) is now available to provide a second line cord, for a total of two line cords.
for connection to two independent branch power circuits. Two line cords of the default or specified type are provided when feature number 1901 is ordered. The line cords connect to a power switch that monitors the ac line voltage on the primary power line and automatically switches to the alternate ac line feed if the incoming voltage is lost.

An Additional Power Supply feature (#1902) can be added to a Model D32 Expansion Frame for further redundancy to the N+1 redundancy of the two library power supplies provided in the Model L32 Frame.

Note: The Model L32 includes two hot-swap library power supplies for N+1 redundancy of the power supplied to the accessor for any library size (separate hot-swap drive power supplies provide N+1 redundancy for the tape drives). The Model D32 Frame Control Assembly feature (#1452) does not require or include a library power supply. However, the Model D32 Frame Control Assembly does support placement of a library power supply in the Model D32 Frame for power configuration flexibility.

The support of multiple simultaneous Web clients, individual Web login IDs and passwords, and insert notification is available through an update of the IBM Ultrium Device Driver for AIX®.

Software Requirements: There are no changes required for support of these new features and functions on the operating systems software.

The UltraScalable Tape Library 3584 is supported on the following operating systems at the minimum levels indicated:

- OS/400® V5R1, or later
- AIX V4.3.3, or later
- Sun Solaris 7, 8, or 9
- Microsoft® Windows NT®, 4.0 with Service Pack 6
- Microsoft Windows® 2000 (build 2195, or greater)
- Microsoft Windows 2003 (build 3790, or greater)
- HP-UX 11.00 and 11i (64 bit)
- Linux distributions: Red Hat Advanced Server 2.1, SuSE Linux Enterprise Server Update

For a current list of host software versions and release levels that support the 3584, refer to the following Web site:

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

Select “LTO Support”, then the “Interoperability Matrix and Software ISVs”, and view the “Supported Servers and Operating Systems” for the product.

Tivoli® Storage Manager and other industry-leading compatible software offerings provide storage and tape management software for the 3584. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or independent software vendors (ISV). A list of compatible software is available from your IBM representative or at:

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

Select “LTO Support”, then the “Interoperability Matrix and Software ISVs”, and view the “Supported Storage Management Software” for the product.

IBM continues to work together with ISVs to support the UltraScalable Tape Library 3584. Individual application vendors should be contacted for specific information and availability dates. Consult with ISV providers for their support of mixed drive types and media types in the same logical library.

Limitations: If a Model D42 Frame is attached, the maximum number of Expansion Frames that can be attached is five (four of #9003).

OS/400 supports a maximum of:

- 90 tape drives per logical library
- 32 tape drives per AS/400 host system
- 16 devices (tape drives or control paths) per adapter

Planning Information

Customer Responsibilities: Physical planning is a customer responsibility. Detailed planning information is in the IBM TotalStorage UltraScalable Tape Library 3584 Planning and Operator Guide (GA32-0408).

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

Cable Orders: Any required cables are included with the announced features.

Supplies

For End Users

The IBM TotalStorage LTO Ultrium 200 GB Data Cartridges and the IBM TotalStorage LTO Cleaning Cartridge, for use with IBM LTO Ultrium 1 and 2 Tape Drives, can be purchased from IBM using feature numbers with the initial order of the UltraScalable Tape Library 3584, or from your media supplier. Labeled or unlabeled IBM media can also be ordered directly through AAS using machine type 3589. Refer to the 3589 Sales Manual for further information.

For information about IBM branded media, such as additional IBM LTO Ultrium data or cleaning cartridges, call 888-IBM-MEDIA (426-6334) in the U.S. or Canada, or refer to the following Web site:

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

Security, Auditability, and Control

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

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

Terms and Conditions

This product is available for purchase under the terms of the IBM Customer Agreement.

IBM hardware products are manufactured from new parts and used parts. In some cases, the hardware product may have been previously installed. Regardless, IBM’s warranty terms apply.

MES Discount Applicable: No

Field Installable Feature: Yes
Warranty Period
UltraScalable Tape Library 3584, including IBM LTO Ultrium Tape Drives: One year
IBM LTO Ultrium media: Warranted separately
Customer Setup: No
Licensed Internal Code: Same license terms and conditions as designated machine

### Prices

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine Type</th>
<th>Model</th>
<th>Feature Number</th>
<th>Purchase Price</th>
<th>MMNC</th>
<th>Field Install Only</th>
<th>Plant Install Only</th>
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<tr>
<td>Tape Library</td>
<td>3584</td>
<td>L32</td>
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<td></td>
<td></td>
<td>$ 528</td>
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<td>N</td>
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<td>7-14 Frame X-Track Cable</td>
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<td></td>
<td></td>
<td>$ 783</td>
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<td>N</td>
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<td>8-16 Frame X-Track Cable</td>
<td>1816</td>
<td></td>
<td></td>
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<td>N</td>
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<td>9316</td>
<td></td>
<td></td>
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<td>Watertight Power Cord, 250 V</td>
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<td></td>
<td>$ 0</td>
<td>NC</td>
<td>N</td>
<td>Y</td>
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<tr>
<td>Tape Library</td>
<td>3584</td>
<td>D32</td>
<td></td>
<td></td>
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<tr>
<td>Expansion Frame</td>
<td></td>
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<tr>
<td>Dual AC Power</td>
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<td></td>
<td>$ 597</td>
<td>NC</td>
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<td>$ 623</td>
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<td>N</td>
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<td>9951(^1)</td>
<td></td>
<td></td>
<td>$ 0</td>
<td>NC</td>
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<td>N</td>
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<td>Watertight Power Cord, 250 V</td>
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<td>$ 0</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>110 V Power Cord</td>
<td>9951(^1)</td>
<td></td>
<td></td>
<td>$ 0</td>
<td>NC</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

NC = No Charge
Y = Yes
N = No

Note: No cables are required with these features.

\(^1\) Feature number 9951 is not a new feature but has been changed to both plant and field MES availability.

For ServiceElect (ESA) Maintenance Service Charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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Fax: 800-2IBM-FAX (242-6329)
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