IBM System Storage Business Partner Guidebook

Your Roadmap to Success with IBM System Storage

Max Facts™

eBook

Edited by Jim Hoskins

Titles of Interest

More IBM Titles of Interest

- *Exploring IBM SOA Technology & Practice*
- *IBM System x Business Partner ebook*
- *Understanding IBM Workplace Strategy & Products*
- And many more…

Top e-business Titles

- *101 Ways to Promote Your Web Site*
- *3G Marketing on the Internet*
- *Podcasting for Profit*
- *Protect Your Great Ideas for Free!*
- And many more…

For more information, visit us at *www.maxpress.com*, e-mail us at info@maxpress.com, or call us in the U.S. at (850) 934-0819.

IBM System Storage Business Partner Guidebook

Sixth Edition

Your Roadmap to Success with IBM System Storage

Edited by Jim Hoskins

(version 6.1e)

Notices

Production Manager: Gina Cooke

Cover Designer: Lauren Smith

Proofreader: Jacquie Wallace

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold with the understanding that the publisher is not engaged in rendering professional services. If legal, accounting, medical, psychological, or any other expert assistance is required, the services of a competent professional person should be sought. ADAPTED FROM A DECLARATION OF PRINCIPLES OF A JOINT COMMITTEE OF THE AMERICAN BAR ASSOCIATION AND PUBLISHERS.

This report was sponsored by IBM. This report utilized information provided by IBM and other companies including publicly available data. This report represents Maximum Press's viewpoint and does not necessarily represent IBM's position on these issues.

Acknowledgments

Many people gave assistance in preparation of this ebook. Some provided information concerning their product area of expertise. Others reviewed the manuscript and provided helpful comments. To all of those who assisted…THANK YOU!!

Disclaimer

The purchase of computer software or hardware is an important and costly business decision. While the author and publisher of this ebook have made reasonable efforts to ensure the accuracy and timeliness of the information contained herein, the author and publisher assume no liability with respect to loss or damage caused or alleged to be caused by reliance on any information contained herein and disclaim any and all warranties, expressed or implied, as to the accuracy or reliability of said information.

This ebook is not intended to replace the manufacturer's product documentation or personnel in determining the specifications and capabilities of the products mentioned in this ebook. The manufacturer's product documentation should always be consulted, as the specifications and capabilities of computer hardware and software products are subject to frequent modification. The reader is solely responsible for the choice of computer hardware and software. All configurations and applications of computer hardware and software should be reviewed with the manufacturer's representatives prior to choosing or using any computer hardware and software.

Trademarks

The words contained in this text which are believed to be trademarked, service marked, or otherwise to hold proprietary rights have been designated as such by use of initial capitalization. No attempt has been made to designate as trademarked or service marked any words or terms in which proprietary rights might exist. Inclusion, exclusion, or definition of a word or term is not intended to affect, or to express judgment upon, the validity or legal status of any proprietary right which may be claimed for a specific word or term.

Dear Colleagues:

As we enter the first quarter of 2008, I would like to thank you for your business and for representing IBM so well in 2007. I welcome your partnership in the coming year.

IBM is committed to helping our clients realize business innovation through industry leading technology, open standards support, and proven best practices. We are committed to delivering measurable value to our SMB and Enterprise clients.

IBM's Information Infrastructure solutions help our clients do this through proactively and securely managing information risks associated with the explosion of information and the complexity of managing their information assets to create business insight.

Through effective collaboration with each of you, we are able to deliver industry leading and cost efficient business solutions. IBM is committed to your success and to providing you with the enablement and support ecosystem that enables you to meet your clients' current and developing needs. As part of our commitment, I am pleased to forward the sixth edition of the *IBM System Storage Business Partner Guide-*

book, a complete desk reference for IBM's Storage product offerings and announcements.

Whether you are a new or an existing partner, I hope you find this guide useful in building your business success with IBM Storage offerings. Let me know how IBM can continue to help you succeed. Best wishes for a successful 2008.

Regards,

Susan Blocher
Vice President, Worldwide Marketing System Storage
IBM Systems and Technology Group
Somers, NY

Table of Contents

Chapter 2:
General System Storage Resources   30

Chapter 3:
System Storage Quick Reference   63

Your 8-Step Quick Start

If you are a new IBM Business Partner, take these 8 steps to "hit the ground running."

1. Check for Updated Editions of This eBook

This ebook has the ability to check for more current editions which are released periodically. Simply click on the "More on the Web" link provided here (or the link on the cover) and this ebook will automatically check to see if you have the most current edition. If you don't, you will be able to download the latest edition immediately.

MORE ON THE WEB

- Check for Updates Now

2. Apply for Your IBM PartnerWorld Membership

The IBM PartnerWorld Web site is your source for information for all things related to being an IBM Business Partner (e.g., Business Partner relationships, guidelines, support, product info, etc.). You will need a user ID and a password to gain access to some areas of the site. If you have any questions, call PartnerWorld for help (follow the link in the

MORE ON THE WEB

- Get your PartnerWorld user ID
- Explore PartnerWorld
- PartnerWorld contact phone numbers by country

"More on the Web" box to get the right phone number for your country).

3. Plug in to IBM Product and Program Communications

Staying informed is one key to success. IBM has a special page on PartnerWorld that helps you do just that. Here you will find new product announcements, letters to Business Partners, customer success stories, educational opportunities, and more.

> **MORE ON THE WEB**
>
> • Get plugged in to IBM product and program communications
> • Barry Whyte (Storage Virtualization) blog
> • Tony Pearson (Inside IBM Storage) blog

4. Understand the Express Seller Program

Express Seller is designed to help IBM Business Partners accelerate sales of IBM products and services to small and medium businesses. IBM provides key offerings that meet your clients' business needs at competitive prices and provides extensive marketing support including "air cover" advertising and customizable materials to help you generate leads.

> **MORE ON THE WEB**
>
> • Express Seller Toolkit

5. Learn to Quickly Find IBM Product Information

IBM maintains a search page that allows you to quickly find detailed product information from IBM announcement letters (one of these is released for every product IBM announces),

the IBM Sales Manual (a comprehensive collection of detailed info on all IBM products), and much more. Give it a try so you will know how to find what you need when you need it.

6. Learn to Find Competitive Information

IBM consistently updates information about the competitors

you will encounter and their products. Explore this valuable tool so you will be ready when you need it. You will need your user ID and password.

7. Try Out "Know Your IBM"

IBM offers eligible Business Partners some "quick-learn training modules" under the name "Know Your IBM (KYI)," which can help you learn what you need to know about IBM offerings. You can get points by completing these modules which can be redeemed for merchandise at participating retailers.

You can earn additional points for reporting sales through KYI.

KYI is more general training that will give you a "high-level" view of IBM offerings. The road maps provided by IBM will guide you to more detailed training opportunities.

8. Make Your Training and Certification Plan

Knowledge is power. IBM offers many opportunities to learn and to demonstrate your knowledge through certification. Now is a good time to make your plans.

MORE ON THE WEB

- Explore training and certification opportunities

Introduction

About This eBook

This MaxFacts™ interactive ebook brings together—all in one place—the resources you need to be successful as an IBM System Storage Business Partner. It contains information gathered and adapted with permission from multiple IBM and non-IBM sources. There are embedded links to more detailed and fast-changing information maintained on the Web so you can have the most current information at your fingertips. We are confident you will find this a useful tool.

As we are always working to better help you succeed, please forward any suggested improvements to this ebook to info@maxpress.com.

How to Use This MaxFacts™ Interactive eBook

This ebook has been specially designed to be read on your computer screen using the free Adobe Acrobat Reader software or a supporting Web browser. Alternatively, you can print this ebook on most any printer and read the material anywhere.

Reading on a computer screen at your desk isn't as cozy as reading a printed page while lying on a towel at the beach. If you give it a fair chance, however, you may find that the instant access to expanded information and function provided

by the many embedded Web links makes reading this ebook on-screen worthwhile. And then you can bring some engaging work of fiction to the beach with you instead.

If you decide to print this out and read it in paper form, keep a pen handy and mark the Web links that interest you. When you return to your computer, you can then pull this ebook up on your screen and simply click to explore the links.

Links provided throughout this ebook (anywhere you see a "More on the Web" inset or within some figures) will lead you to additional information related to the topic at hand resident on the Web. In this way, this ebook is a "three-dimensional guide" providing you with information about the topics at the level of detail you choose. To follow a link, simply click on it and a Web browser window will appear on your screen with the requested information. If the link brings you to a password-protected area on the IBM PartnerWorld Web site, you will be prompted to enter your IBM-issued user ID and password before you are presented with information.

When you are done exploring, just close or minimize the Web browser window and you will arrive back at the ebook. You are encouraged to explore all links that interest you to get the most out of this ebook. You must have an active connection to the Internet to use the embedded links.

To navigate around within this ebook, you can:

- Step forward or backward a page at a time using the standard Acrobat Reader navigation toolbar shown along the top of your screen,

- Click on the table of contents links shown on the left side of your screen to go directly to that part of the ebook,

- Search for keywords in the document using the Acrobat Reader "Find" function (the binocular icon on the toolbar).

Distribution Rights and the Honor System

IBM has been licensed to distribute this MaxFacts interactive ebook in unaltered form exclusively to current and prospective IBM System Storage Business Partners located within the United States and to the IBM management and staff that directly support them. Distribution by anyone to any others is prohibited by U.S. and international copyright law.

To make this ebook as accessible and easy to use as possible, we have chosen not to implement digital rights functions that prevent unauthorized copying or distribution. Because of this decision, you need not be inconvenienced by passwords, user authentication schemes, copying restrictions, Adobe Reader versions, and other limitations.

In return, we ask that you abide by the above distribution restrictions. Please refer anyone else who would like a single copy or full redistribution rights to Maximum Press (850-934-0819). Thank you for your cooperation.

Get the Latest Version—Instantly

This ebook is updated periodically. You can check to see if this is the latest version of the ebook right now by following the link provided in the "More on the Web" box. If there is a more current version, you will be able to immediately download the update.

MORE ON THE WEB
• Check for an updated version now

Reader Feedback

We welcome your feedback on any aspect of this ebook, so please e-mail your comments or suggestions to moreinfo@maxpress.com.

To see our full line of IBM titles, we invite you to visit our Web site, maxpress.com. From all of us at Maximum Press, thank you for your interest in our ebooks.

MORE ON THE WEB
• Maximum Press Web site

1

You and IBM System Storage Offerings

In this chapter, we take a look at some business basics about IBM and System Storage to consider as you move forward with your own business.

Why Team with IBM?

If you are seeking to truly differentiate yourself in the marketplace by extending your market reach with more profitable end-to-end solution offerings, IBM is uniquely positioned to help you make this happen. IBM provides you with an integrated portfolio of hardware, software, services, and channel programs that can take your business wherever it wants to go. IBM is committed to helping your clients realize business innovation through industry leading technology, open standards support, and proven best practices.

IBM is a trusted vendor, committed to help you deliver measurable value to your SMB and enterprise clients. It is this dedication to the success of our channel partners that helped IBM earn a Five-Star Partner rating for 2007 from VARbusiness Magazine as well as a Channel Champion Award for Programs and Support in the SMB/Volume Server category from Computer Reseller News Magazine.

IBM collaborates across a worldwide ecosystem of business partners to deliver industry leading and cost efficient business

solutions. By providing innova-
tive technology that delivers
flexibility and high perfor-
mance, easy to administer pro-

grams, and flexible financing options, IBM has an unmatched
understanding and appreciation of channel importance that
translates into success and prosperity for our partners.

Consider these facts about IBM:

• One of the world's top 10 most valuable brands

• A market leader in the storage and server industries

• Second largest software business in the world

• In each year for over a decade, IBM has earned more patents
  than any competitor, according to the U.S. Patent Office.

It is an exciting time to be involved with information tech-
nology. The worlds of business and computer systems are
blending in ways that will result in productivity breakthroughs
greater than the sum of their parts. Teaming with IBM will al-
low you to provide the insight, solutions, and innovation that
matter to help your customers succeed.

Why IBM System Storage?

IBM is a market leader in the storage industry. Innovative
technology, open standards, excellent performance, a broad
portfolio of storage proven software, hardware, and solutions
offerings—all backed by IBM with its record of leadership—are

just a few of the reasons why you should consider IBM storage offerings.

Go Green and Save

The marketplace is changing, with open, pervasive technologies as a driving force. Rising infrastructure costs coupled with a growing emphasis on energy efficiencies lead you to seek new means to manage your budget. To maximize the return on your IT investments, you want solutions such as tiered storage offerings, storage consolidation, and advanced virtualization. IBM engineers are constantly researching new ways to help you improve the cost structure of your IT operations.

Here are a few examples of how IBM System Storage can help you manage the explosion of data—in the most cost effective way.

Virtualization

The IBM Virtualization Engine TS7700 can help reduce costs such as power, maintenance, operations, and support staff. Through the implementation of a fully integrated tiered storage hierarchy of disk and tape, the benefits of both technologies can be leveraged to help enhance performance and provide the capacity needed for today's tape processing requirements. Deploying this innovative subsystem may help reduce batch processing time, total cost of ownership, and management overhead.

Storage Area Network (SAN)

The IBM System Storage SAN32B-3 SAN fabric switch requires up to 20 percent less power than the SAN32B-2 (its predecessor), thus reducing cooling requirements. This reduction in power and cooling enables integration of power supplies and cooling fans into a single unit.

A 32 port Cisco MDS 9134 switch offers up to 25 percent reduction in power and cooling per port compared to a 24 port Cisco MDS 9124 switch. For non-oversubscribed configurations, a 64 port MDS 9134 switch fabric offers more than a 50 percent reduction in power and cooling per port compared to a 28 port Cisco MDS 9216A (16 switch ports plus an optional 12 port line card).

Disk Storage

IBM System x 15K hard disk drives (HDDs) have three field-proven generations of reliability, decrease RAID rebuild times, and have similar or lower power and cooling requirements, acoustics, and rotational vibration compared to 10K rpm HDDs.

Manage Complexity and Growth

The marketplace is changing, with open, pervasive technologies as a driving force. Computing power is everywhere, with Web-centric workloads and an explosion of structured and unstructured data. IBM researchers and developers are ever-mindful of your need to create a dynamic, scalable IT infra-structure. New storage devices are being designed to improve

systems and operational management to reduce complexity, and to address operational risk, security, and availability challenges.

Here are a few examples of IBM System Storage features that can help you manage growth, complexity, and risk.

Disk Storage

The IBM System Storage DS4000 series is well known for exceptional performance, robust functionality, and unparalleled ease of use. The disk systems in this series include IBM System Storage DS4000 Storage Manager to help centrally manage the DS4000 series, simplifying your infrastructure.

Tape Storage

The IBM System Storage TS3200 Tape Library Express Model is an excellent tape storage solution for organizations with existing digital linear tape or requiring high-performance automated tape backup. The TS3200 is also designed for organizations that have limited physical space in their IT environments. Operating in a rack environment allows organizations the advantage of placing the TS3200 in a standard 19-inch rack, which provides 76.8 TB of compressed tape storage in just a 4U space.

Storage Area Network (SAN)

IBM TotalStorage SAN256B is designed to provide director-class high availability with redundant, hot-pluggable components to avoid single points of failure, helping you manage your risk. Redundant control processors, power supplies, and

fans provide a design for concurrent hardware and firmware maintenance and upgrade without disruption to network operation.

N series

N series systems excel at application-level availability. Snapshot™, a standard feature of the Data ONTAP operating system, makes it possible to instantly revert to a previous version of data upon failure or user error, thus helping you manage risk.

Realize Innovation

The marketplace is changing, with open, pervasive technologies as a driving force. In the new marketplace, connectedness is everywhere. Open standards, virtualization and service oriented architecture are useful to enable you to manage your systems more efficiently. And IBM innovation with technology advancements can help you protect your investments in existing technology while ensuring the system performance to meet your business demands.

Here are a few of the technology advancements from IBM System Storage to help you realize innovation.

Disk Storage

IBM System Storage disk systems provide virtualized, resilient, high-performance storage for mission critical workloads. The DS6800 is designed to deliver enterprise-class storage functionality for distributed and mainframe servers in a

modular, space-saving, power-efficient, scalable package. The DS8000 helps you manage the total cost of ownership with Enterprise Choice warranties of 1-, 2-, 3- or 4-years on hardware and advanced functions.

Tape Storage

The IBM System Storage TS2230 Tape Drive Express Model has a storage capacity of up to 800 GB (with 2:1 compression) in conjunction with the IBM TotalStorage LTO Ultrium 400 GB data cartridge, which is double the capacity of the Ultrium 2 technology. Along with its higher capacity, the performance of the TS2230 Tape Drive has more than doubled over the previous generation of half-high LTO drives on the market for a native data transfer rate of up to 60 MBps. The TS2230 Tape Drive provides an excellent alternative to slower and smaller capacity ¼-inch, 4 mm and 8 mm DLT/SDLT tape drives.

Storage Area Network (SAN)

The introduction of large capacity, high-availability storage systems offers new opportunities for cost reduction through storage consolidation and infrastructure and management simplification. Fibre Channel SANs were developed to provide efficient, high-performance access to many storage devices from many servers. The Cisco MDS 9124 Express for IBM System Storage is designed to serve as a foundation for infrastructure simplification.

Data Encryption

Increasing attention is being paid to the need to protect company data against theft or accidental loss, particularly data that contain personal or sensitive information of a company's customers. The TS1120 now includes data encryption capabilities within the drive itself, helping to avoid the need for host-based encryption of data—and the concurrent drain on host performance—or the use of specialized encryption appliances. This capability is intended to provide customers with a greater ability to protect information if tape cartridges are lost or stolen by supporting the storage of the data in an encrypted form.

2

General System Storage Resources

This chapter provides you with some general information and valuable resources that will help you as you sell IBM products.

How to Sell IBM System Storage Products

In this section, we will offer some ideas that will help you identify and explore opportunities for selling IBM System Storage.

Identifying Storage Sales Opportunities

Here are some "triggers" that tell you there is a sales opportunity for IBM Storage:

- Is the customer buying servers? Server buyers tend to buy storage within three months of their server purchase.

- Is there a need to share files? Keeping a copy of the same file on multiple servers is wasteful and leads to confusion about which copy of the file is canonical (has the latest updates).

- Is the number of users of the application increasing? Adding employees or upgrading applications generally leads to additional storage needs.

- Does the customer have multiple System p or UNIX servers? Multiple System x or other Windows, Linux, or NetWare servers? System z? A mixture of these? These typically have limited internal storage capacity and customers can save a lot of money by sharing files between them on external storage.

- Are existing storage assets coming off lease or nearing the end of the depreciation cycle? The data on multiple older storage controllers can often be consolidated onto a single newer, faster system with cost savings.

- Does the customer already have IBM external storage installed but is running out of capacity? This is an opportunity to upgrade the storage.

- Does the client need to keep large amounts of infrequently accessed Linux, UNIX, or Windows data at a lower cost than typically provided by storage controllers?

- Does the open-systems customer need to keep large amounts of (infrequently accessed) data at a lower cost than typically provided by storage controllers? SATA drives behind a DS4000 controller can lower the overall costs of keeping this data, yet at sequential retrieval rates comparable to Fibre Channel storage.

- Does the customer want to leverage an Ethernet infrastructure to allow sharing of storage and data? The N3700 supports Ethernet environments, enabling economical NAS and iSCSI deployments.

- Does the customer need to protect his/her business data? Tivoli Storage Manager can help reduce the risks associated with data loss while helping to reduce complexity, manage costs and address compliance with regulatory data retention requirements.

- Does the customer want to manage his/her data more efficiently and effectively through its lifecycle? TotalStorage Productivity Center Standard Edition helps with management tasks for the customer's data, SAN fabric, and disk storage devices, including device discovery, topology mapping, monitoring, reporting, configuration management, and volume management.

- Does the customer want to be able to make informed decisions for initiatives such as server and storage consolidation, migration, data archival, or information lifecycle management? TotalStorage Productivity Center for Data includes many advanced features to help customers identify, evaluate, control, and predict their enterprise storage management needs, as well as manage and automate capacity utilization of file systems and databases.

- Does the customer have limited to no near-real time or historical performance analysis capabilities for SVC, DS6000, and DS8000 subsystems? TotalStorage Productivity Center for Disk is the only open systems management tool from IBM to monitor and manage the SVC and DS8000.

- Does the customer want to monitor and centrally manage his/her DS8000 replication services? TotalStorage Productivity Center for Replication coordinates Copy Service Functions,

including FlashCopy, Metro Mirror, and Metro Global Mirror (for DS8000, ESS 800, SVC) and provides management of planned and unplanned two-site and three-site disaster recovery for failover/failback.

How to Facilitate a Storage Consolidation Discussion

Here are some pointers on how to start conversations with your clients and discover sales opportunities.

Probing Questions

- Are your data storage needs growing?

- Do you have communities of users that need to share files?

- Can your employees and customers access data quickly enough to keep them productive and happy?

- Are you spending money on distributed storage capacity attached to your servers that is not being fully utilized?

- How do you ensure that your data is protected from loss?

- Do you have multiple midrange storage controllers coming off lease or nearing the end of their depreciation cycle?

- Who is your current storage vendor and are you happy with the TCO that your current storage vendor is providing you?

Typical Findings after Asking the Above Questions

- Multiple islands of storage are becoming hard to manage and are driving costs up.

- Performance is not always sufficient to meet users' needs.

- Reliability is not at desirable levels. Even a small outage is a big deal when it happens in a remote location.

- Storage capacity is not being used efficiently. Some users and servers need more storage while capacity on other servers sits idle.

- Data backup is becoming hard to manage.

- Storage total costs are getting out of control as storage needs rise.

Qualifying Questions

Here are questions you can use to gauge a possible sales opportunity:

- Are you under pressure to control costs and IT expenditures?

- How many servers and what operating systems do you have? What are the key applications that drive your storage demand?

- Can your storage scale easily to meet growth and new application needs?

- Are you unable to add additional storage capacity because of budget constraints?

- Are you concerned that you can't predict future growth? Do you need a storage system that can be upgradeable to higher capacity and performance without losing your initial investment?

- Do you often find that you are adding additional servers and associated storage to keep pace with your growth?

- Do you need more capacity and performance—at a better price?

- Does storage management cost you money for staffing, education, time?

- How much benefit would you see from having a single interface—fewer tools to learn and use—for server and storage management?

- Are your backup windows getting shorter?

- Do you need to run test applications against live data?

- Do you need the ability to set up a disaster recovery plan?

- Are your storage needs satisfied by the internal storage in the server?

- Do you need to lower IT costs and complexity while still providing a computing infrastructure with high levels of server and storage performance typical for database and online transaction processing?

- Are you confronted with significant complexities of storage management and looking to simplify the environment?

- Do you have a large number of server/storage platforms and/or operating environments?

- Do you understand the risks and costs associated with data access delay or data unavailability? Do you have the skills to complete an analysis? (IBM does—Storage study).

- What competitive storage or server hardware is installed and which competitor(s) are bidding for the business? (EMC, HP, Dell, Sun).

Selling Storage Solutions

Presenting a complete storage solution (as opposed to a single point product) to your clients is an excellent way to sell IBM storage offerings and bring real value to your clients. Complete storage solutions include the software that enables "Information Management," and will typically be of greater interest both inside the IT department and to "line-of-business" (LoB) managers outside of the IT department. LoB managers often control technology budgets for business applications. Your ability to align a complete storage solution to the business requirements can be important to your success. LoB managers are often more interested in the business problems technology can solve than the underlying technology itself. So be prepared to talk about storage in terms of solving business problems.

Businesses are experiencing an increased demand for information infrastructure that addresses changing business needs. Demand for information solutions is driven by four key factors:

1. Information is driving value. Seventy-five percent of enterprises use information solutions to create a holistic client view and enable client-centric business. Ten percent growth in the business analytics market is enabled by enterprises leveraging their vast stores of data.

2. Information is exploding. The amount of data created and copied is expected to grow at 57 percent CAGR through 2010, with enterprise content growing faster. Eighty percent is unstructured content generated largely by e-mail, with increasing contribution by documents, images, and video.

3. Non-IT organizations are influencing decision-making. Multiple diverse initiatives are emerging across enterprises to deal with the explosive growth of business digital information and compliance issues. Thirty-eight percent of e-mail archiving decisions receive input from a C-level executive, and 23 percent from legal/compliance professionals.

4. Risk management is needed. Compliance with 30+ new rules and regulations, in the U.S. and internationally, require increased data storage and retrieval capabilities. U.S. courts demand quick access to electronically stored information in the legal discovery process.

Now let's take a look at some examples of how you can apply IBM System Storage offerings to solve commonly encountered business problems both inside the data center and outside in the LoB elements of a business.

Line of Business Applications

Selling complete storage solutions is even more important once you are outside of the IT department where line of business (LoB) managers are more interested in solving problems than in technology. Here are some example applications for IBM System Storage commonly found outside the data center.

Content Management

The discipline of content management helps companies implement business controls for managing unstructured data (e.g. e-mail, signed documents, audio files, Web content, etc.) in much the same way database software manages more traditional structured data. Interestingly, unstructured data in use today already exceeds the amount of structured data in use, and will soon represent 85 percent of the data companies must manage. That is why the content management sector is growing faster than most other software sectors and is expected to reach $10 billion in revenue within three years. IBM content management software is number one in market share. So customers wanting an all number one content management solution can choose IBM software, servers, and storage, thereby reducing complexity and risk.

Content management owners often talk about their "ingestion rate," which is the number of documents they can scan or load per hour, and retention periods of several years. Content management business requirements drive a steady demand for storage upgrades. Larger companies

---

MORE ON THE WEB

- Content management solutions on IBM.com
- The Social Security content management project

are often interested in consolidating their content manage-
ment systems to reduce support costs. The typical large com-
pany supports several
brands of content man-
agement software,
which often isn't neces-
sary. Content manage-
ment systems often
store large amounts of
infrequently accessed
images and records.
Content management

*Did you know… IBM built one of the
world's largest Web content management
environments? The U.S. Social Security Ad-
ministration claims processing system adds
32 million documents a year and supports
over 10,000 concurrent users. IBM also has
one of the world's premier ECM imple-
mentation services teams. Dozens of IBM
hardware and software products are built
to support ECM environments.*

systems also store critical catalog information in database ta-
bles that require fast access. Content management applications
are good candidates for tiered storage.

Content management systems often maintain business
records and documents that must be recovered unaltered, in
case of legal action. Compliance is a main driver of new con-
tent management projects. Examples include e-mail, quality
test results, stock transactions, and signed documents.

Databases

Online transaction processing (OLTP) database applications
form the core of many companies. Service interruptions,
planned and unplanned, can have a measurable impact on
quarterly profits and bonuses. Storage solutions for databases
typically have high availability requirements. Storage infra-
structure for databases must provide adequate performance
during peak workloads, backups, and database maintenance.
Data availability practices can include multiple forms of repli-

cated data (hot sites, warm sites, multiple snapshots, extracts). Each data copy may have unique storage requirements.

Databases are excellent candidates for tiered storage. Heavily used table spaces are ideal for fast disk, while transaction logs and flash copies may get the best price performance from SATA disk. Database performance requirements can change over time, and tiered storage allows data to be seamlessly re-hosted. Database users are often heavy users of tape, disk mirroring, and flash copies. Typically, the replicated disk copy is backed up to tape daily, and transaction logs are backed up to tape more frequently.

> **MORE ON THE WEB**
>
> - Application and database solutions on IBM.com
> - Redbook: N Series with Database
> - IBM System Storage solutions for Oracle

Data Warehousing

Data warehouse applications can be very large but they contain no new data. Data warehouses are optimized to perform complex queries more quickly. Data warehouses maintain multiple copies of data in extract and translation tables, as well as in the data rows. Data warehouse tables are often heavily indexed, effectively creating more copies of the data. When data warehouses get too large or too busy, smaller data marts are generated that contain subsets of the data. Data warehouses can require 10 times the storage of the raw data.

Data warehouses support one or more large transactions per day, often called ETL processes (extract, translate, and load). Extracts can occur from source databases throughout

the company. Ex-
tracts are loaded
into temporary ta-
bles, reformatted,

and loaded into the data warehouse. Storage infrastructure
is designed to meet required query performance times and
minimize downtime associated with the ETL process. Older
data warehouse data is usually accessed less frequently than
newer data, which means older data warehouses are excel-
lent candidates for tiered storage. Data warehouses that ex-
tract data from remote sources may need replicated storage
to meet ETL target times.

Medical Imaging

Digital medical imaging implementations are rapidly replac-
ing film-based x-rays. Images typically need to be searched,
transferred, and annotated. Images also need to be protect-
ed from tampering and secured from public viewing. Some
medical images have long retention periods. Companies and
physicians face penalties if they lose some types of medical
images. Applications that manage large numbers of medical
images are called Picture Archive Communication Systems,
or PACS.

Medical imaging systems typically require large amounts
of storage for infrequently accessed data. New images need
to be stored quickly, so faster disks may be needed for new
workloads. Researchers often need access to images in mul-
tiple physical repositories. Medical imaging applications are
good candidates for tiered storage, especially if a SATA disk
might be able to keep up with planned ingestion rates. Medi-

cal imaging applications are also good candidates for replicated storage. Because of the cost of data loss, images are typically copied to a remote location as soon as possible.

The IBM Grid Medical Archive Solution (GMAS) is a medical industry storage infrastructure solution that provides resilient, enterprise-wide, multi-campus or single-site hospital access to digital images and research data on disparate PACS across an integrated delivery network. GMAS is built with IBM System Storage Multilevel Grid Access Manager software, described in the Storage Software section.

PeopleSoft

PeopleSoft Enterprise applications are mission critical database applications (ie databases solution). PeopleSoft applications support Human Resources (HR), Enterprise Resource Planning (ERP), and Customer Relationship Management (CRM). High availability practices and configurations are generally required for PeopleSoft. PeopleSoft is database independent, even after acquisition by Oracle. IBM DB2 and Informix, Microsoft

SQL Server, Sybase, and Oracle are supported in PeopleSoft PeopleTools.

Many PeopleSoft installations support database copies for reporting and data warehousing (see Data Warehousing so-

lution). PeopleSoft customers are good candidates for tiered storage, since they run multiple database copies. Archiving is important to many PeopleSoft customers (see Archiving solution).

SAP

SAP applications are mission critical database applications. SAP tends to be the single most important application in companies where it is installed. Some companies lose functionality in multiple departments if SAP is unavailable, so high availability practices and configurations are expected. SAP almost always runs at least three database instances: production, development, and test. SAP application code is stored in the database, so each version of SAP requires a new instance of the database.

Did you know that IBM is the world's largest SAP installation? IBM also has one of the world's premier SAP implementation services teams. Dozens of IBM hardware and software products are built to run in SAP environments.

Many SAP installations also run SAP's Business Intelligence module, SAP BI, or another type of data warehouse (see Data Warehousing section). SAP customers are good candidates for tiered storage, since they run multiple database copies. SAP archiving is also important to many SAP customers (see Archiving solution).

SAP-specific storage solutions have been developed for demanding SAP environments. Solutions are available for On Demand cloning of SAP with TPC, and implementing Hot Standby for SAP Supply Chain Management's critical liveCache data structure.

IBM System Storage N series SnapManager for SAP automates Online Cloning, Online Backup and Retention, and Designated Point-in-Time Restores.

Siebel

Siebel Customer Relationship Management applications are mission critical database applications (see Databases section). Siebel is critical to sales and customer service functions, so high availability practices and configurations are generally required. Sales people are expensive resources, so Siebel applications typically require top performance for database inserts and ad hoc queries.

Siebel is database independent, even after acquisition by Oracle. IBM DB2, Microsoft SQL Server, and Oracle are supported in Siebel 8. Siebel installations commonly use database copies and extracts for reporting. Brio, Cognos, and other data analysis tools are also common. Larger Siebel customers are candidates for tiered storage, but CRM databases are generally small compared to ECM, ERP, and other popular database applications. Siebel customers will probably get the fastest disk they can afford.

Archiving is important to many Siebel customers to maintain optimal application performance and user productivity (see Archiving section). Siebel data is very valuable and needs to be secured. Siebel customers are excellent can-

didates for secure storage. When Siebel is used for parts of business transactions, auditors may require Siebel records to be saved using protected storage.

Did you know that… IBM is the world's largest Siebel installation? IBM also has one of the world's premier Siebel implementation services teams. Dozens of IBM hardware and software products are built to run in Siebel environments.

Data Center Applications

Here we will survey storage solutions typically of interest in data center environments.

Archiving

Data archiving is an important "best practice" that is rapidly gaining popularity. Archiving is any process that copies or moves objects to another repository in such a way that they can be retrieved later. E-mail archiving is growing at 44 percent per year, according to the AIIM Global ECM Survey, March 2007. Some customers need help from Business Partners to understand the total value of implementing proper archiving practices for all their important applications and file systems.

Regardless of the type of data, the business argument for archiving is the same: It makes more sense to clear out existing space than to upgrade critical environments. Archiving makes important business applications and file systems run faster, with less maintenance and fewer infrastructure upgrades. Archiving reduces the cost of backup and improves recovery time. Archiving helps companies implement data

retention and lifecycle management policies. Most customers agree archiving makes sense, but some may need help with the proposal and implementation.

Archived objects can be retrieved. Required response time for retrieval typically dictates the required storage infrastructure for an archive repository. Content management and archiving software is often used to interface between the application and the archive storage repository. Examples are shown in Figure S.1.

Archived data may require protected storage or secure storage, depending on the contents. Archive data and catalogs must adhere to business continuity policies to meet recovery time targets as archive repositories grow.

File System Files	IBM Tivoli Storage Manager
Databases	IBM Optim
E-mail	IBM Content Manager
SAP	IBM FileNet, Content Manager, and Optim
Oracle E-Business	IBM Optim
PeopleSoft	IBM Optim
JD Edwards	IBM Optim
Siebel	IBM Optim
Amdocs	IBM Optim
Custom Apps.	IBM Optim

Figure S.1. Archiving software is often used to interface between the application and the archive storage repository.

E-mail: Exchange, Lotus, GroupWise

In 2007, an estimated 131 billion e-mails were sent daily; predicted to increase to 276 billion by 2009. E-mail applications are mission critical, replicated database applications (see Databases section). E-mail is critical to sales, customer service, the CEO's office, and most managers; so high availability practices and configurations are generally required. E-mail is subject to government and industry regulations (see recent U.S. Federal Rules of Civil Procedure—FRCP), and is increasingly subpoenaed in litigation. Legally binding "document hold" orders encourage e-mail to be copied onto protected storage.

E-mail systems are excellent candidates for tiered storage. E-mail is a high priority application, so e-mail servers typically need fast storage. E-mail archiving is the fastest growing segment of the enterprise content management market. E-mail archiving is commonly used to maintain performance, which creates demand for more cost effective storage (see Archiving section). E-mail systems are also excellent candidates for secure storage such as DR550 or N Series with Snaplock, since e-mail contains corporate intellectual property.

One specific example of an archiving solution is E-mail Archive. IBM offers an E-mail Archive Preload solution which can help Business Partners get started quickly. The E-mail Archive Preload solution includes

Did you know … IBM runs one of the world's largest e-mail environments, supporting over 300,000 individual mailboxes? IBM also has one of the world's premier e-mail implementation services teams. Dozens of IBM hardware and software products are built to support Microsoft Exchange, GroupWise, and Lotus e-mail environments.

hardware and software that has been tested together for managing E-mail Archive workloads.

Database Archive: DB2, Oracle, Siebel, PeopleSoft, SQL and others

Managing huge application data growth has become both costly and risky for many organizations. Accumulating current transactions and retaining historical transactions in the same database causes the volume of application data to increase exponentially, which in turn affects performance, availability, and cost. More companies are realizing the benefits of a full-lifecycle enterprise data management strategy that includes database archiving to derive more business value and provide more options for:

- Managing continued application data growth and its impact on service levels, operational costs and risks, as well as storage requirements.

- Aligning application performance and service levels to meet operational and business objectives for timely reporting and processing, and ensuring the delivery of information to decision-makers when and how they need it.

- Supporting data retention compliance requirements and effective storage strategies that keep historical transaction records accessible until legal retention periods expire.

- Improving application portfolio management to decommission redundant applications and simplify the IT infrastructure.

Database archiving is a recognized best practice for managing data growth that offers significant advantages. IBM Optim Data Growth Solution provides proven, full-lifecycle capabilities for archiving and managing application data. IBM Optim (previously known as Princeton Softech) has the industry leadership in database archiving according to Gartner. IBM Optim Data Growth offering has been tested and supported with IBM DR550 to offer a secure, protected storage and support compliance requirements while improving efficiency and total cost of ownership.

Backup and Restore

Ensuring business continuity is a critical business process. Businesses that suffer extended downtime or data loss dramatically increase the risk of total business failure, so the stakes are high. That is why every corporation performs backup and recovery.

The backup process creates a sufficient number of data copies, and stores them in a sufficient number of locations, to protect the company's data assets. Some customers need help from Business Partners documenting a Business Continuity and Recovery Plan, which drives storage infrastructure requirements. Backups can be performed to disk, tape, or both.

Disk backup typically offers faster recovery at a higher total cost. Tape backup has an added safety benefit, since data assets aren't continually spinning at 15,000 RPM.

The backup storage infrastructure consumes more storage than the files and applications being backed up so selling IBM System Storage for backup and recovery applications is a big win. Solution design and implementation can be an important consulting project. Recovery validation is a recurring consulting engagement for many IBM Storage Business Partners.

Did you know… According to abc news, personal information on about 650,000 retail customers may have been compromised in October 2007 after a computer tape went missing? The tape was properly stored at a warehouse run by Iron Mountain Inc., and was never checked out, but can't be found. Iron Mountain said, "…Because of the volume of information we handle and the fact people are involved, we have occasionally made mistakes." The Identity Theft Resource Center says there was a six-fold increase last year in the number of records reported compromised in the United States to 125 million.

Sizing is important in backup proposals because errors can be multiplied by multiple copies. Business Partners often play an important role in helping customers understand the data they have (primary and copies), the growth rate, and the infrastructure needed to maintain their business continuity policies. Solutions are sized based on the recovery requirements, the backup window, and the maintenance window for the backup server.

Customers typically implement backup and recovery policies in tiers, depending on the cost of service interruption for

each application. Recovery strategy drives the backup solution architecture. Here is an example of a simple tiered recovery policy:

- Level 1 data must be "alive" in a second location with less than one minute of latency.

- Level 2 data must be recovered within four hours with no more than 30 minutes of data temporarily missing.

- Level 3 data must be restored from tape within 24 hours, with less than 24 hours of data loss.

Data Encryption

Almost every corporation maintains some files or databases containing trade secrets, personally identifiable information (PII), and other private information. Sensitive applications are managed with enhanced security policies, which should extend to removable storage.

Customers sometimes create backup tapes that are easy to scan for secure information. Sometimes, tapes are stored in warehouses that are far less secure than the data center. Customers who find such a security gap are likely to add secure storage at the next op-

> **MORE ON THE WEB**
>
> - Data encryption solutions on IBM.com

portunity. IBM offers storage solutions featuring data encryption and other security solutions to address these needs.

IBM PartnerWorld Web Site—Quick Tips

IBM maintains a Web site called PartnerWorld, which has a great deal of information of use to all IBM Business Partners worldwide. On the site you will find the latest presentations and marketing materials (such as brochures, data sheets, and case studies) as well as competitive information, consultant reports, IBM white papers, education and events, tools, technical support, and much more.

In this ebook, we have summarized and provided direct links to much of the PartnerWorld information that is most important to IBM System Storage Business Partners. As such, this ebook is your personal "guide" to the PartnerWorld Web site. Just the same, we encourage you to spend some time just browsing the PartnerWorld site so you can get a feel for the full scope of resources available to you.

MORE ON THE WEB
• IBM PartnerWorld Web site
• IBM PartnerWorld news and newsletters
• Regional shortcut to U.S. PartnerWorld content
• Help with your IBM PartnerWorld user ID and password

Here are a couple of quick tips for getting the most out of the IBM PartnerWorld Web site:

- You will need your IBM-assigned user ID and password to access some areas of PartnerWorld. If you don't have your user ID and password, you can contact IBM PartnerWorld help. (Follow the link in the "More on the Web" box.)

- There is a great deal of information of use to System Storage Business Partners behind the "System Sales" link on

the PartnerWorld home page. Click on that link (enter your user ID and password) and then you can use the filtering function shown at the top of the page. For example, you can use the pull-down menus to set "Geography" to "Americas" and "product" to "IBM System Storage" to reduce the amount of information you need to review when looking for what you need.

- Once you are on the System Sales page, you can see all of the resources related to a specific product line by typing the product name (e.g., DS3000) in the "System Sales Search" box located on the right side of the page (NOT the general search box at the top of the page).

Storage News and Events

You can keep current with the fast paced world of IBM System Storage by frequently checking the link shown in the "More on the Web" box.

MORE ON THE WEB
•   IBM Storage news and events

System Storage Education

As with almost any endeavor, time spent educating yourself and your team on appropriate topics such as selling techniques and storage product offerings will help you succeed. In this chapter, we discuss two ways you can get the education you need to succeed in selling with IBM System Storage products.

PartnerWorld University

The IBM PartnerWorld University is a Web-based repository of information in many different formats. It provides technical and sales information to help you succeed as a storage business-

ness partner. You will need your PartnerWorld user ID and password to access these resources.

MORE ON THE WEB
• PartnerWorld University

The Campus

The Campus is another Web-based directory of educational resources for many different IBM products. When you arrive at The Campus home page (after entering your PartnerWorld user ID and password), you can select topics in the "IBM System Storage" window. By doing so, you are taken to a listing of educational opportunities (books, CDs, live classroom education, etc.) pertinent to that storage topic.

The Campus provides you with road maps and other tools that help you select the educational offering appropriate to your needs. When you find what you need, you can order or register for education online.

MORE ON THE WEB
• The Campus

IBM Professional Certification Program

The IBM Professional Certification program offers a business solution for skilled IT professionals who seek to develop and demonstrate their expertise to the world. It's designed to validate your skills and demonstrate your proficiency in the latest IBM technology and solutions. It helps to make certain that you have the capability to perform role-related tasks and

activities at a specified level
of competence. The program
is beneficial for those who
wish to validate their skills,

as well as for companies that wish to ensure certain performance levels for their employees.

IBM Professional Certifications are associated with an individual, not a company or an organization. The target audience for certification includes employees of Business Partner firms, customers, IBM employees, and independent consultants who sell, support, or service IBM products.

Here are the basic steps in the certification process:

1. Select the certification you would like to pursue.

2. Determine which tests are required by reading the certification role description.

3. Prepare for the test.

4. Register to take a test by contacting one of our worldwide testing vendors.

5. Take the test.

6. Repeat steps 3 through 5 until all required tests are successfully completed for the desired certification role.

Sources for Competitive Marketing Information

IBM maintains a Web site called "Comp," which is a worldwide portal for information that will help you win in competitive marketing situations. It includes a searchable set of reports/

presentations/quick reference cards about the marketplace, competitors, and competitive products. You will find materials developed by IBM as well as outside sources such as Gartner, IDC, DH Brown, IDEAS International, etc.

You can also sometimes find "product-to-product comparison" information by using the keyword search function provided within the System Sales pages of the PartnerWorld Web site, but this should be considered a secondary source of competitive information.

ePlaybooks for System Storage

You'll find much useful information in the ePlaybooks on System Sales on the PartnerWorld Web site. Here you will find links to download presentations, on-demand webcasts, and other resources to help you unleash the power of our unique technologies. You will find everything you need to know about the latest System Storage sales plays and initiatives—with a special focus on the SMB market.

There are chapters that cover the big plays so you can learn more about what's driving revenue growth right now. Use the decision matrices to choose the right tactic that can address your client's pain-points. Download the "reasons of

call," proposal letters, presentations, benchmarks and sales tools to help you identify, progress, and close deals. Find tips for increasing

deal size with services (new this quarter), options and storage, and relevant financing highlighted to improve your odds of winning the sale.

Web Collage (for your Web site)

IBM Business Partners that market and sell IBM servers, storage, workstations, services, and software can improve their Web presence for FREE by leveraging syndicated Web content from ibm.com to their own Web sites. IBM has teamed with WebCollage, Inc. to provide the capability for Premier, Advanced, and Member level PartnerWorld participants to receive Web content dynamically delivered into their Web sites.

> **MORE ON THE WEB**
> - Web Collage

Attach Connector Cross Selling Tool

Attach Connector is designed to super-size your sales by helping you sell more IBM hardware, software, and services with each sales opportunity. This cross-selling tool carefully walks you through a sale by providing the right questions to ask to uncover new opportunities and deliver more complete solutions. As you select an IBM point product, a list of most common attach elements is suggested. The tool also provides key play opportunities where you can pass discounts and promotions to clients, as well as the IBM Competitive Advantage—why IBM over other specific companies.

When you buy a suit, a salesman will undoubtedly

> **MORE ON THE WEB**
> - Attach Connector cross selling tool

ask if you want a shirt and tie. Likewise, when we sell servers, we want to ask if the client wants storage, software, or services because underneath every product sale there is a much larger cross-brand opportunity. Attach Connector helps sales reps mine that larger deal by showing natural product pairings to roll your own custom solution.

Tivoli Opportunity Manager (TOM) Tool

The TOM tool provides another easy way to uncover and identify new opportunities to cross-sell Tivoli products and maximize revenue from your new and existing customer base.

This tool walks you through the process of identifying complementary products based on your customer's current needs and provides a sales scenario for each recommended cross-sell opportunity.

> **MORE ON THE WEB**
>
> • Tivoli Opportunity Manager Tool

IBM System Clothing Pointers

Whenever you are proposing the sale of a server, it only makes sense to include the needed storage devices in the original proposal. Selling storage solutions with servers

> **MORE ON THE WEB**
>
> • Compatibility/interoperability info for IBM storage products
> • Storage products for system p servers
> • Storage products for System x and BladeCenter servers
> • Storage products for System i servers
> • Storage products for System z servers
> • Storage software for managing the information infrastructure

is known as "clothing." Clothing the servers with storage solutions is a proven key to selling success. Follow the links in the "More on the Web" box to see what storage devices to propose with each type of server.

IBM Global Financing

IBM Global Financing (IGF) continues to focus on meeting customer needs by concentrating on key business areas: leasing and lending, remarketing and refurbishing, and asset management. IGF conducts business in more than 40 countries, financing IBM & non-IBM hardware, software, and services, with a full range of flexible, low-rate offerings. IGF's customers find that financing their information technology solutions offers many advantages in both robust and difficult economic climates, because financing frees up their capital for other investments. Many information technology installations, including those for customer relationship management, data mining, and e-business, require a substantial investment. IGF financing enables customers to pay for their new technology in affordable, monthly payments during the life of the project. Our customers run the gamut from the smallest, family-owned business purchasing a single server and software to the largest, multinational corporation, acquiring tens of thousands of PCs for offices on several continents. In addition to working directly with customers, we work with IBM

MORE ON THE WEB
• IBM Global Financing

Business Partners to provide financing for their clients and to help them build their own businesses.

Systems Advisor Tool

Follow the links in the "More on the Web" box to explore the IBM Systems Advisor tool. This is invaluable in help-ing you define specific solutions that include servers and storage products.

> **MORE ON THE WEB**
>
> - Systems Advisor Tool
> - More sizing guides and configuration tools

IBM Business Value Analyst Tool

The IBM Business Value Analyst Tool enables IBM Business Partners to articulate the economic value of IBM solutions. The tool can be used with CIOs, IT leads, and LOB executives to make financial business cases for IBM products, both as individ-ual products and/or solutions.

> **MORE ON THE WEB**
>
> - IBM Business Value Analyst Tool

What Are "IBM Express" Offerings?

While the needs of small and mid-sized businesses (SMB) are often conceptually similar to the needs of larger enterprises, the scale is typically smaller. For this reason, IBM developed an "Express" portfolio of offerings that has been specially de-signed for the SMB business sector. The Express portfolio of offerings is composed of IBM software, servers, storage, print-ers, services, education, and financing. These offerings are developed with input from IBM's small and mid-sized custom-ers and the IBM Business Partners that help service them. Ex-press offerings retain the functions and features sought most by mid-sized businesses and drop the more complex functions

needed by larger en-
terprises. Yet, they still
provide a non-disrup-
tive way to scale up as
a growing business. . .
well. . . grows.

MORE ON THE WEB
• IBM Express info on PartnerWorld
• Express Seller Toolkit on PartnerWorld

IBM Express offerings must meet very specific require-
ments in terms of usability, scalability, size, and price. To
make them easier to install and manage, default configura-
tions suitable for most implementations are provided.

What is Storage Virtualization?

Storage virtualization is technology used to insulate the de-
tails of a storage infrastructure (hardware and software) from
the applications and users who use that storage infrastruc-
ture. By doing
so, storage vir-
tualization re-
duces cost and
complexity.

MORE ON THE WEB
• IBM Storage Virtualization offering Info on IBM.com
• Storage Virtualization concepts on Wikipedia

IBM has a broad range of storage virtualization offerings
including the SAN Volume Controller, Virtualization Engines,
Virtual File Manager software, and more. Follow the "More on
the Web" links for more specifics on storage virtualization.

Technical Support for Business Partners

Technical Sales Support from IBM provides Business Part-
ners with extensive pre-sales support through the Partner-

MORE ON THE WEB

- Contact Techline
- Technical Sales Library
- PartnerWorld technical resources & support

World program online via the Web and by voice. Voice support can be accessed via PartnerWorld Contact Services, the single point of entry to all key support organizations. PartnerWorld Contact Services provides access to Techline for hardware and software technical sales support, as well as Competeline for win strategies and competitive information. Systems Business Partners entitled through the PartnerWorld program have access to IBM System x and IBM System Storage solutions and selected major competitive platform support including:

• Remote solution design assistance/review

• Technical marketing assistance

• Product and promotion information

• Configuration assistance

• Competitive product information

• Sales strategy information

• Solution assurance assistance.

Follow the links in the "More on the Web" box to access Technical Sales Support online (region selectable).

3

System Storage Quick Reference

In this chapter, we explore the IBM System Storage hardware, software, and packaged solutions you will be selling and offer some resources that will help you succeed.

Disk Storage

The IBM System Storage family includes a variety of disk storage products ranging from direct-attached disk drives to complete enterprise storage systems. In this section, we look at the product offerings in the disk storage arena.

Disk Storage Cross Reference by Workload Size

It is often a mistake to associate an entry-level, midrange and enterprise-class storage product with small, medium and large size businesses respectively. For example, did you know that 30 percent of DS8000's are used by small and medium businesses? Did you know that 70 percent of Storage Volume Controllers are used by small and medium businesses?

Conversely, did you know that nearly every large enterprise uses entry-level and midrange storage products in addition to enterprise-class devices? For example, some large enterprises have branch offices or remote areas where

smaller storage systems are more appropriate. Measurements often used to classify business size, such as the number of employees or sales revenue, do not always correlate with the amount of information those business store. For this reason, recommendations on products based on workloads often makes more sense though still should be considered only general guidelines. In this section, you will find a list of disk storage products organized by workload size (entry, mid-sized, and enterprise) to help you find the best solution for your client.

Disk Storage for Entry-Level Workloads

Here is a list of disk storage products designed for businesses with entry-level workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

> **MORE ON THE WEB**
>
> • Disk storage for entry-level workloads

DS3200

DS3300

DS3400

EXP24

EXP3000

N3700

Disk Storage for Mid-Size Workloads

Here is a list of disk storage products designed for mid-sized workloads. Click on the links and you will jump to the section of this ebook that describes the product.

DS4200 Express

DS4700 Express

DS4800

EXP24

EXP3000

EXP420

EXP810

Storage Volume Controller

MORE ON THE WEB
• Disk storage for mid-size workloads

Disk Storage for Enterprise Workloads

Here is a list of disk storage products designed for large enterprise workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

DS6000

DS8000

MORE ON THE WEB
• Disk storage for enterprise workloads

DS3000 Series

Designed to deliver advanced functionality at a breakthrough price, the IBM System Storage DS3000 family provides an exceptional solution for workgroup storage applications such

as e-mail, file, print, and Web servers, as well as collaborative databases and remote boot for diskless servers. In this section, we take a look at the DS3000 Series. Appendix A provides a useful DS3000 part number/model/feature cross-reference.

DS3200

Small businesses can take an overburdened internal storage infrastructure to a new level by using the flexible and affordable IBM System Storage DS3200 storage system (Figure D.1). By moving storage outside the server, small businesses can increase the capacity and reliability of the data solution well beyond the initial storage investment. And with SAS and SATA drive intermix support, the DS3200 can be optimized with the right workload demand utilizing the appropriate drive technology.

Select configurations of the DS3200 are part of the IBM Express Portfolio, designed and priced to meet the needs of mid-sized businesses. The Express models combine the DS3200 storage system with the IBM SAS HBA Controllers and SAS cables to help you get started with storage quickly.

With many small business IT departments having one or a part-time administrator and limited time to spend on data management, the DS3200 can be easily installed without extensive knowledge or effort. The DS3000 Storage Manager software was designed for easy implementation for an unseasoned administrator.

Specifications

Models	1726-21X—single controller, 1726-22X—dual controller
	1726-22T, 1726-21E—single controller Express
	1726-22E—dual controller Express
RAID controller	Dual active
Cache per controller	512 MB battery-backed cache with 1 GB upgrade option
Host interface	1 or 3 host ports per controller, Serial Attached SCSI (SAS) 3 Gbps
Drive interface	Serial Attached SCSI (SAS)
Supported drives	3 Gbps: 73 GB, 146 GB and 300 GB SAS drives at 10,000 rpm and 36 GB, 73 GB, 146 GB and 300 GB SAS drives at 15,000 rpm speeds
	3 Gbps: 500 GB and 750 GB SATA drives at 7,200 rpm speed
RAID levels	RAID-0, -1, -3, -5, -10
Storage partitions	4, 16
Maximum drives supported	48 drives (using three EXP3000 Expansion Units)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS3000 Storage Manager

- DS3200 details on PartnerWorld

- DS3200 details on IBM.com

- DS3200 competitive info on COMP

Figure D.1.   IBM System Storage DS3200 at a glance (and links to more detail).

Here are some quick DS3200 facts:

- 3 Gbps Serial Attached SCSI (SAS) host interface technology

- Easy to deploy and manage with the DS3000 Storage Manager

- Combination of 12 SAS or SATA 3.5-inch drives per enclosure

- Scalable to 3.6 TB of storage capacity with 300 GB hot-swappable SAS disks or 12 TB with 1 TB hot-swappable SATA disks in the first enclosure

- Expandable by attaching up to three EXP3000s, a total of 14.4 TB of storage capacity with 300 GB SAS or up to 48 TB with 1 TB SATA

- Affordable for the small and medium business budgets

- Telco model supports -48v DC power supplies

- NEBS and ETSI compliance for AC and DC models.

DS3300

The DS3300 (Figure D.2) is designed to meet the availability and consolidation needs for a wide range of users. With SAS and SATA drive intermix support, the DS3300 can be optimized with the right workload demand utilizing the appropriate drive technology. The DS3300 is designed to provide organizations an affordable, reliable, and scalable storage solution that leverages their current IP infrastructure equipment and in-house expertise.

Select configurations of the IBM DS3300 are part of the IBM Express Portfolio and are designed and priced to address
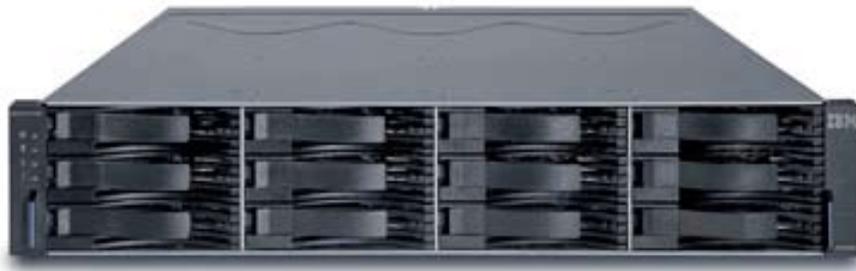
Specifications

Models	1726-31X—single controller, 1726-32X—dual controller 1726-32T—dual controller Telco, 1726-31E—single controller Express 1726-32E—dual controller Express
RAID controller	Dual active
Cache per controller	512 MB battery-backed cache with 1 GB upgrade option
Host interface	Two host ports per controller, 1-Gbps iSCSI
Drive interface	Serial Attached SCSI (SAS)
Supported drives	Supports 3 Gbps SAS: 73 GB, 146 GB and 300 GB SAS drives at 10,000 rpm and 36 GB, 73 GB, 146 GB and 300 GB SAS drives at 15,000 rpm speeds 3 Gbps SATA: 500 GB, 750 GB, and 1 TB SATA drives at 7,200 rpm speed
RAID levels	RAID -0, -1, -3, -5, -10
Storage partitions	2, 16
Maximum drives supported	48 SAS or SATA drives (using three EXP3000 expansion units)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS3000 Storage Manager

- DS3300 details on PartnerWorld

- DS3300 details on IBM.com

- DS3300 competitive info on COMP

Figure D.2. IBM System Storage DS3300 at a glance (and links to more detail).

the needs of a wide range of businesses. The Express models combine the DS3300 storage system with the IBM iSCSI offload HBAs and Ethernet cables for quick and simple set-up and administration. The IBM System Storage DS3000 Storage Manager software is designed to provide a user friendly interface from set-up to administration.

Here are some quick DS3300 facts:

- 1 Gbps iSCSI connection to a host

- Two 3 Gbps SAS interfaces for capacity expansion (one per controller)

- Combination of 12 SAS or SATA 3.5 inch drives per enclosure

- Scalable to 3.6 TB of storage capacity with 300 GB hot-swappable SAS disks or 12 TB with 1 TB hot-swappable SATA disks in the first enclosure

- Expandable by attaching up to three EXP3000s, a total of 14.4 TB of storage capacity with 300 GB SAS or up to 48 TB with 1 TB SATA

- Direct or SAN-attached configurations

- Affordable, reliable IP networked-attached storage

- Solution for IBM System x and BladeCenter and select third party servers

- Telco model supports -48v DC power supplies

- NEBS and ETSI compliance for AC and DC models.

DS3400

The IBM System Storage DS3400 (Figure D.3) leads the way for these organizations to take advantage of consolidating and sharing this data within a direct-attach or SAN solution. With SAS and SATA drive intermix support, the DS3400 can be optimized with the right workload demand utilizing the appropriate drive technology. The DS3400 offers the opportunity to meet the demands of data expansion, data availability, and flexibility in a simple, affordable disk system.

Select configurations of the DS3400 are part of the IBM Express Portfolio, designed and priced to meet the needs of mid-sized businesses. The Express models combine the DS3400 storage system with the FC cables and SFP transceivers to help you get started with storage quickly.

Here are some quick DS3400 facts:

- 4 Gbps Fibre Channel (FC) interface technology

- Easy to deploy and manage with the DS3000 Storage Manager

- Combination of 12 SAS or SATA 3.5-inch drives per enclosure

- Scalable to 3.6 TB of storage capacity with 300 GB hot-swappable SAS disks or 12 TB with 1 TB hot-swappable SATA disks in the first enclosure

- Expandable by attaching up to three EXP3000s, a total of 14.4 TB of storage capacity with 300 GB SAS or up to 48 TB with 1 TB SATA

Specifications

Models	1726-41X—single controller, 1726-42X—dual controller, 1726-42T—dual controller Telco, 1726-41E—single controller, Express, 1726-42E—dual controller Express
RAID controller	Dual active
Cache per controller	512 MB battery-backed cache with 1 GB upgrade option
Host interface	2 host ports per controller, Fibre Channel (FC) 4 Gbps auto-sensing 1 Gbps/2 Gbps
Drive interface	Serial Attached SCSI (SAS)
Supported drives	Supports 3 Gbps SAS: 73 GB, 146 GB and 300 GB SAS drives at 10,000 rpm and 36 GB, 73 GB, 146 GB and 300 GB SAS drives at 15,000 rpm speeds 3 Gbps SATA: 500 GB, 750 GB, and 1 TB SATA drives at 7,200 rpm speed
RAID levels	RAID-0, -1, -3, -5, -10
Storage partitions	2, 4, 16
Maximum drives supported	48 SAS and/or SATA drives (using three EXP3000 Expansion Units)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS3000 Storage Manager
SAN support	Supported IBM FC switches

- DS3400 details on PartnerWorld

- DS3400 details on IBM.com

- DS3400 competitive info on COMP

Figure D.3.   IBM System Storage DS3400 at a glance (and links to more detail).

- Flexible for use with IBM System x, IBM System p and BladeCenter servers

- Affordable for the small and medium business budgets

- Telco model supports -48v DC power supplies

- NEBS and ETSI compliance for AC and DC models.

EXP24

The IBM TotalStorage EXP24 is designed to give cost-conscious businesses an entry-level server that can help meet storage and near-line application storage needs without undo expense, while leaving them room to grow. The EXP24 is scalable up to 7.2 TB of Ultra 320 SCSI physical disk storage with 24 internal 300 GB disks. The EXP24 is designed to provide ample yet scalable storage without the cost of extra expansion units. This storage server also is designed to help consolidate storage into a centrally managed environment.

The EXP24 is designed to interoperate with IBM System p and eServer pSeries servers. To help make integration easy, IBM tests the EXP24 for interoperability with IBM System p and eServer pSeries.

The EXP24 also includes management tools designed to help lower administration costs. And the cost benefits that come with the EXP24 are not at the expense of reliability—the Ultra 320 SCSI based EXP24 helps support increased reliability and

MORE ON THE WEB

- EXP24 info on PartnerWorld
- EXP24 info on IBM.com

performance compared to many older, non-redundant designed products.

Here are some quick EXP24 facts:

- Well-suited for small to medium-sized enterprises that need affordable, entry-level storage

- Supports storage expansion of up to 24 Ultra 320 SCSI disk drives

- Offers high-availability features, including redundant power supplies, cooling, and hot swap DASD

- Provides up to four SCSI initiator host ports designed to economically attach up to four servers to a single EXP24 or for failover capabilities.

EXP3000

The IBM System Storage EXP3000 is a high-density 2U, 19-inch rack-mountable driven closure designed for supporting a total of 12 3.5-inch disk drives. Robust and flexible, the EXP3000 can be used as a direct-attach solution for IBM System x servers with support of MegaRAID or ServeRAID host bus adapters.

MORE ON THE WEB

- EXP3000 info on PartnerWorld
- EXP3000 info on IBM.com

Multiple EXP3000s can be connected together to expand capacity of the solution to help address your data needs today and tomorrow.

The EXP3000 also supports attachment of the DS3000 Series supporting SAS and SATA disk drives. Here are some quick EXP3000 facts:

- 3 Gbps SAS interface technology

- Support for up to 3.6 TB of SAS disk physical storage capacity

- Support for up to 9 TB of SATA disk physical storage capacity in a single enclosure when attached to select IBM System x servers using a MegaRAID or ServeRAID host bus adapter

- SAS or SATA hard disk drive intermix supported with select IBM System x servers using MegaRAID or ServeRAID host bus adapters

- Supports attachment of the DS3000 Series supporting SAS disk drives. Three EXP3000s can be attached to a DS3000 to expand up to 14.4 TB of physical storage capacity

- Powerful and comprehensive management and configuration tools included

- Telco model supports -48v DC power supplies

- NEBS and ETSI compliance for AC and DC models.

DS3000 Series Warranty, Maintenance, and Service

The standard warranty that is included with the purchase of a DS3000 Series is three years parts and labor. You can learn more details in the document "All About DS4000 Warranty, Maintenance and Service Guide." Yes... it is the same for both the DS3000 and the DS4000 families.

MORE ON THE WEB

- DS4000 warranty, maintenance, and service (same as DS3000)

DS3000 Series Competitive Marketing

Follow the "More on the Web" link to see the latest resources to help you overcome the competition when selling the DS3000 Series.

DS4000 Series

The IBM System Storage DS4000 series consists of midrange rack-mountable storage devices that can be used in multiple operating environments (Microsoft Windows, Netware, Linux, and UNIX). In this section, we take a look at the

DS4000 Series. Appendix B provides a useful DS4000 part number/model/feature cross-reference.

DS4200 Express

The IBM System Storage DS4200 Express disk storage system (Figure D.4) supports a high-performance 4 Gbps Fibre Channel interface for increased host connectivity to deliver necessary bandwidth for high throughput applications. Designed for data-intensive applications that demand increased connectivity provided by four 4 Gbps host channels designed to provide up to 1550 MBps of sustained bandwidth for high throughput applications through the four channels directly attached to the host servers or connected to a Fibre Channel storage area network (SAN).

Specifications

Model	1814-7VA
RAID controller	Dual active
Cache	2 GB battery-backed
Host interface	4 host ports, Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, Auto-sensing 1 Gbps/2 Gbps/4 Gbps
Drive interface	4 drive ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, 4 Gbps
Supported drives	Supports 4 Gbps capable SATA 7,200 rpm 500 GB/750 GB EV-DDM
RAID levels	0, 1, 3, 5, 6, 10
Storage partitions	4, 8, 16, 64 or 128 storage partitions
Maximum drives supported	112 SATA drives (using 6 DS4000 EXP420 Expansion Units)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS4000 Storage Manager version 10.10
SAN support	Supported IBM FC switches and directors (product numbers 2005, 2006, 2109, 2026, 2027, 2031, 2032, 2034, 2042, 2054, 2061 and 2062, and IBM BladeCenter)
Warranty	Three year parts and labor warranty, 9x5 next business day, upgradeable to 24x7 with four hour response

- DS4200 details on PartnerWorld

- DS4200 details on IBM.com

- DS4200 competitive info on COMP

Figure D.4. IBM System Storage DS4200 Express Model 7v at a glance (and links to more detail).

The IBM System Storage DS4200 Disk Storage System (Express Seller not to be confused with Express Advantage) offers customers a SAN solution to take advantage of the performance offered by 4 Gbps technology. The IBM DS4200 4 Gbps SAN product is designed to offer up to 1550 MBps throughput with up to 121,500 IOPS (input/output per second). A 4 Gbps storage array requires as few as half the number of ports compared to a 2 Gbps storage array to deliver equal throughput. This frees up ports in the SAN for each array.

On the host side, if a server requires more than two 2 Gbps host bus adapters (HBAs) to attain the required performance (a server should have at least two HBAs for availability), then that number can be halved with 4 Gbps. Fewer HBAs help lower the number of switch ports used.

Here are some quick DS4200 Express facts:

- 4 Gbps Fibre Channel interface technology

- Up to 1550 MBps bandwidth for high throughput applications

- SATA-only hard disk drives supported

- Includes IBM System Storage DS4000 Storage Manager to help centrally manage the DS4000 Series

- Four total host channels with dual controllers for increased connectivity

DS4700 Express

The DS4700 Express (Figure D.5) offers high-performance 4 Gbps capable Fibre Channel connections, up to 84 TB of

Specifications

Model	1814-70A/H/S/T, 1814-72A/H/S/T
	1814-70S/T, 1814-72S/T (DC power supplies)
RAID controller	Dual active
Cache	Model 70A/70S: 2 GB; Model 72A/72S: 4 GB
	Battery-backed
Host interface	8 host ports model 72, 4 host ports model 70—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, Auto-sensing 1 Gbps/2 Gbps/4 Gbps
Drive interface	4 drive ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, Auto-sensing 1 Gbps/2 Gbps/4 Gbps
Supported drives	Supports 2 Gbps FC: 10K – 73.4 GB, 146.8 GB, 300 GB E-DDM, 15K – 36.4 GB, 73.4 GB, 146.8 GB E-DDM
	Supports 4 Gbps FC: 15k – 300 GB, 146.8 GB, 73.4 GB, 36.4 GB E-DDM
	Supports 4 Gbps SATA: 7.2K 750 GB E-DDM
RAID levels	0, 1, 3, 5, 6, 10
Storage partitions	4, 8, 16, 64 or 128 storage partitions
Maximum drives supported	Model 72A/H/S/T: 112 FC or 112 SATA drives (using 6 DS4000 EXP810 Expansion Units) Model 70A/H/S/T: 112 FC or 112 SATA drives (using 6 DS4000 EXP810 Expansion Units)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS4000 Storage Manager version 10.10
SAN support	Supported IBM FC switches and directors (product numbers 2005, 2006, 2109, 2026, 2027, 2031, 2032, 2034, 2042, 2054, 2061 and 2062, and IBM BladeCenter)
Warranty	Three year parts and labor warranty, 9x5 next business day, upgradeable to 24x7 with four hour response

- DS4700 details on PartnerWorld

- DS4700 details on IBM.com

- DS4700 competitive info on COMP

Figure D.5.   IBM System Storage DS4700 Express at a glance (and links to more detail).

physical storage capacity with 112 750 GB SATA disk drives, and powerful system management, data management, and data protection features. The DS4700 Express is designed to expand from workgroup to enterprise-wide capability with the attachment of six DS4000 EXP810 disk enclosures. The DS4700 Express DC Models are NEBS-3 compliant storage systems designed to be powered from a -48 Volt DC Telco industry-standard power source. The DS4700 Express is available in a 3U high enclosure and mounts in a 19-inch rack-mount package.

The IBM DS4000 series has a history of flexibility that helps manage your growth. The DS4700 Express builds on that history with drive options that help manage your complexity. And the increased data protection of the DS4700 helps manage your risk.

The IBM System Storage DS4700 Express Model supports a high-performance 4 Gbps capable Fibre Channel interface designed for data-intensive applications that demand increased connectivity. The DS4700 Express supports eight 4 Gbps capable host channels that may be directly attached to host servers or connected to a Fibre Channel storage area network (SAN). Four Gbps capable drives and IT infrastructure are required to achieve 4 Gbps capable throughput speeds.

There are two ways to measure the performance of a SAN device: Megabytes per second (MBps) and input/output per second (IOPS). The DS4700 Express 4 Gbps SAN solution is designed to provide up to 1550 MBps throughput (assuming a 4 Gbps capable system) with up to 121,500 IOPS. A 2 Gbps

storage array can require up to twice as many host ports as a 4 Gbps array to deliver the throughput of four 4 Gbps ports. The DS4700 Express can help you free up or eliminate the need for additional host ports in the SAN for each array.

Here are some quick DS47000 Express facts:

- End-to-end 4 Gbps capable Fibre Channel interface technology to help optimize performance

- Up to 1550 MBps bandwidth for high throughput applications

- Support for Fibre Channel hard disk drives

- Includes IBM System Storage DS4000 Storage Manager to help centrally manage the DS4000 series

- Eight total host channels with dual controllers for increased connectivity

- Support for up to 112 disk drive modules with the attachment of six DS4000 EXP810 Expansion Units

- NEBS-3 compliant designed to be powered from a -48 V dc Telco industry-standard power source.

DS4800

The IBM System Storage DS4800 disk storage system (Figure D.6) supports a high-performance 4 Gbps Fibre Channel interface for increased host connectivity to deliver necessary bandwidth for high-throughput applications. It is designed for data-intensive applications that demand increased connectivity provided by eight 4 Gbps host channels designed

Specifications

Model	1815-80A, 1815-82A, 1815-84A, 1815-88A
RAID controller	Dual active
Cache	Model 80: 4 GB, Model 82A: 4 GB, Model 84A: 8 GB Model 88: 16 GB battery-backed
Host interface	8 host ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, auto-sensing 1 Gbps/2 Gbps/4 Gbps
Drive interface	8 drive ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, auto-sensing 2 Gbps/4 Gbps
Supported drives with expansion units	2 Gbps SATA: 7.2K rpm, 400 GB; 4 Gbps SATA: 7.2K rpm, 750 GB and 500 GB; 2 Gbps FC: 15K rpm, 146 GB/73 GB/ 36 GB (E-DDM); 2 Gbps FC: 10K rpm, 300 GB/146 GB/73 GB (E-DDM); 4 Gbps FC: 15K rpm, 300 GB/146 GB/73 GB/36 GB (E-DDM)
RAID levels	0, 1, 3, 5, 10
Storage partitions	8, 16, 32, 128, 256 or 512 storage partitions
Maximum drives supported*	Model 80A: 224 drives, Model 82A: 224 drives, Model 84A: 224 drives, Model 88A: 224 drives
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry-standard rack
Management software	IBM System Storage DS4000 Storage Manager version 10.10
SAN support	Supported IBM FC switches and directors (product numbers 2005, 2006, 2109, 2026, 2027, 2031, 2032, 2034, 2042, 2054, 2061 and 2062, and IBM BladeCenter)

Note: DS4800 supports intermixing EXP810, EXP710, and EXP100 Expansion Units.

- DS4800 details on PartnerWorld

- DS4800 details on IBM.com

- DS4800 competitive info on COMP

Figure D.6.   IBM System Storage DS4800 at a glance (and links to more detail).

to provide up to 1724 MBps of sustained bandwidth for high-throughput applications through the eight channels directly attached to the host servers or connected to a Fibre Channel storage area network (SAN).

The IBM System Storage DS4800 disk storage system offers customers a 4 Gbps SAN solution to take advantage of the performance offered by 4 Gbps technology. There are two ways to measure performance of a SAN device: Megabytes per second (MBps) and input/output per second (IOPS). The IBM DS4800 4 Gbps SAN product has very impressive performance numbers. It is designed to offer up to 1724 MBps throughput with up to 575,000 IOPS. A 2 Gbps storage array can require up to twice as many host ports as a 4 Gbps array to deliver the throughput of four 4 Gbps ports. This frees up ports in the SAN for each array.

Here are some quick DS4800 facts:

- 4 Gbps Fibre Channel interface technology

- Up to 1724 MBps bandwidth for high-throughput applications

- Intermix of Fibre Channel and SATA hard disk drives supported in the EXP810 storage expansion unit

- Includes IBM System Storage DS4000 Storage Manager to help centrally manage the DS4000 series

- Eight host channels for increased connectivity

- Supports intermix of EXP810, EXP710 and EXP100.

EXP420 Storage Expansion Unit

The IBM System Storage EXP420 Storage Expansion Unit (18128VH) is a Serial Advanced Technology Attachment (SATA) disk-only storage expansion unit for use with the DS4200 Express Model 7V.

IBM expands its DS4000 series midrange disk storage offerings of high-performance, high availability, business-critical storage solutions with the IBM System Storage DS4000 EXP420 Storage Expansion Unit, expressly designed for attachment to the DS4200 Express Model 7V. Refer to Hardware Announcement 106-xxx, dated August 8, 2006, for additional details on the System Storage DS4200 Model 7V.

The EXP420 Storage Expansion Unit (1812-8VH), is a 16-bay SATA disk-only enclosure that accommodates the DS4200 500 GB SATA EV-DDM and provides up to 8 TB physical capacity per expansion unit. The DS4200 is a SATA disk-only system that is well suited for applications requiring large amounts of storage, such as data archiving, reference data, and fixed-content applications, that do not demand the performance and access intensity typically addressed with Fibre Channel disk drives.

Here are some quick EXP420 facts:

MORE ON THE WEB
• EXP420 info on PartnerWorld
• EXP420 info on IBM.com

- Compact, 3U rack-mount disk expansion enclosure that accommodates 16 DS4200 SATA Enhanced Value Disk Drive Modules (EV-DDMs), offering up to 8 TB of physical capacity per expansion unit

- Proven DS4000 reliability and scalability—utilizes internal switching technology to attach each individual disk drive module

- Redundant, hot-swappable power supply and cooling components.

EXP810 Storage Expansion Unit

The DS4000 EXP810 is the latest disk drive enclosure in the DS4000 Series of products. This 3U enclosure has 4 Gbps Fibre Channel (FC) interfaces, and supports up to 16 disk drives.

The 4 Gbps ready IBM System Storage EXP810 Storage Expansion Unit machine type (1812-81A) offers a new 16-bay disk enclosure for attachment to selected DS4000 Midrange Disk Systems, with up to 4.8 terabytes (TB) physical capacity per expansion unit using sixteen 300 GB disk drives. The EXP810 Storage Expansion Unit is designed to accommodate 2 Gbps Fibre Channel Enhanced Disk Drive Modules (E-DDM), as well as 4 Gbps Fibre Channel Enhanced Disk Drive Modules (E-DDM), or 4 Gbps Serial ATA Enhanced Disk Drive Modules (E-DDM). Supports redundant AC or DC power and cooling modules, and ESM interfaces. The DS4000 EXP810 is available in a 19-inch rack mount package.

MORE ON THE WEB

- EXP810 info on PartnerWorld
- EXP810 info on IBM.com

DS4000 Series Warranty, Maintenance, and Service

The standard warranty that is included with the purchase of a DS4000 Series is three years parts and labor. You can learn more details in the document "All About DS4000 Warranty, Maintenance, and Service Guide."

> **MORE ON THE WEB**
>
> • DS4000 warranty, maintenance and service guide

DS4000 Competitive Marketing

Follow the "More on the Web" link to see the latest resources to help you overcome the competition when selling the DS4000 Series.

> **MORE ON THE WEB**
>
> • DS4000 competitive info on COMP

DS6000 Series

The IBM System Storage DS6000 series is an innovative storage system designed to provide high availability and high performance in a small, space-saving, power efficient modular package. This series, along with the DS8000 series, offers an enterprise-class continuum of storage systems with shared replication services and common management interfaces. The DS6000 series is well suited to help you simplify your storage infrastructure, and help you manage growth and complexity,

> **MORE ON THE WEB**
>
> • IBM System Storage DS6800 Product Page
> • IBM System Storage DS6800 Sales Kit on Partnerworld
> • IBM System Storage DS6800 Product Support Page

as well as improve the space efficiency of your storage infra-structure.

DS6800

As part of the IBM System Storage DS Family, the DS6800 (Figure D.7) is designed to provide medium and large businesses with a low-cost, enterprise-class storage solution to help simplify data management and to provide comprehensive data protection and recovery capabilities and easy scalability for both mainframe and open system storage needs.

The DS6800 is designed to provide enterprise-class reliability, availability, and serviceability by orchestrating its operations dynamically to improve performance, identify problems before they occur, and take preemptive, corrective action without administrative intervention. The DS6000 series also includes multi-pathing software designed to provide enhanced data availability through automatic path failover and improved performance through dynamic I/O load balancing across multiple paths.

The DS6800 complements the multi-pathing software by leveraging the system's four data paths with the system's dynamic data-path operations. The DS6800 uses sophisticated algorithms that monitor existing data traffic to select an optimal path to store and retrieve data from the system. The preferred path operations of the DS6800 can automatically re-route a read or write request from one path to another while the data is in-flight.

The DS6800 enterprise-class storage system has proven reliability and is designed to deliver both high data availabil-

Specifications

Model	1750-522
RAID controller	Dual active
Processor	IBM Power PC 750GX 1 GHz
Cache	2 GB cache per controller
	4 GB cache per system
Battery backup for cache	72 hours
Host ports	8
Host interface	Fibre Channel / FICON
Storage ports	8
Maximum disk drives	128 (with expansion enclosures) supported
	16 disk drives per enclosure, including controller
Disk drive sizes	73 GB (15K rpm)
	146 GB (15K rpm)
	300 GB (15K rpm)
	500 GB FATA (7.2K rpm)
Maximum physical storage capacity	38.4 TB (using all Fibre Channel disk drives)
	64 TB (using all FATA disk drives)
RAID levels	5, 10
Power supplies and fans	2 per enclosure
Rack support	19" rack mountable
Form factor	3U (5-1/4" high)
Management software	IBM DS6000 Storage Manager—no charge, included with system
Warranty	One year, 24x7, same day response, parts and labor—includes both hardware and software
	Optional service and maintenance upgrades are available

- DS6800 details on PartnerWorld

- DS6800 details on IBM.com

- DS6800 competitive info on COMP

Figure D.7. IBM System Storage DS6800 at a glance (and links to more detail).

ity and resiliency. The system's hardware architecture of four data paths to each disk drive can provide data availability and resiliency against single, double, and triple failures.

Here are some quick DS6800 facts:

- Designed to deliver enterprise-class storage functionality for distributed and mainframe servers in a modular, space-saving, power-efficient, scalable package

- Provides low total cost of ownership by offering tiered pricing on software and a 24x7 IBM on site repair warranty that covers both hardware and software

- Designed to offer a highly available, robust storage solution for medium and large enterprises

- Supports advanced copy services, which are interoperable with IBM System Storage DS8000 series and IBM TotalStorage Enterprise Storage Server

- Designed to provide over 1600 MBps performance for high throughput applications

- Includes eight host ports supporting Fibre Channel and IBM FICON connectivity

- Supports Fibre Channel and Fibre Channel ATA (FATA) disk drives for tiered storage in a single system

- Includes DS6000 Storage Manager software that supports a Web-based intuitive interface and Express Configuration Wizards for simplified system configuration and management.

DS6000 Series Warranty, Maintenance, and Service

Current models of the IBM System Storage DS6000 series, 1750-522 and 1750-EX2 include IBM installation and a one year, 24x7, IBM on-site, same-day-response warranty on both hardware and software. Additional services for maintenance, configuration, data migration, and other storage management needs are available to help organizations optimize their storage infrastructure and choose the length of service and support that is right for their needs.

MORE ON THE WEB

- Warranty information
- Warranty service upgrades and maintenance options
- Implementation services

DS6000 Competitive Marketing

Follow the "More on the Web" link to see the latest resources to help you overcome the competition when selling the DS6000 Series.

MORE ON THE WEB

- DS6000 competitive info on COMP

DS8000 Series

The IBM System Storage DS8000 series is designed to support the most demanding business environments. The DS8000 series provides exceptional performance and

---

MORE ON THE WEB

- IBM System Storage DS8000 Product Page
- IBM System Storage DS8000 Sales Kit on Partnerworld
- IBM System Storage DS8100 Product Support Page
- IBM System Storage DS8300 Product Support Page

---

should be considered for applications that require fast access to data. What's more, for those concerned with maintaining business uptime, the DS8000 provides resiliency features that support continuous availability.

DS8000 Turbo

In addition to its exceptional performance, the DS8000 Turbo's (Figure D.8) high capacity scalability, broad server support, and virtualization features position it well for simplifying the storage environment by consolidating data from multiple storage systems onto a single system. Through virtualization, organizations can allocate system resources more effectively and better control application quality of service.

The DS8000 is also ideally suited to help lower total cost of ownership and reduce the challenges of managing complex storage environments. Physical capacity can range from 1.1 TB up to 512 TB on a single system, providing scalability on which to grow or consolidate data within a single system. Additionally, the DS8000 can enable customers to construct a tiered storage environment that can replace the traditional model of maintaining separate storage systems. Within one DS8000, customers can use high performance Fibre Channel disks for mission critical applications and Fibre Channel ATA (FATA) technology for cost-effective storage of less-frequently-used information such as backup data, archiving, document imaging, retention and reference data. A consolidated system like this can help customers address their unique cost, performance, and capacity requirements, while also simplifying their storage environment. In addition, IBM RAID-5 and

Specifications

Models	DS8100 (931)	DS8300 (932, 9B2)
Shared SMP processor configuration	POWER5+ dual 2-way	POWER5+ dual 4-way
Other major processors	PowerPC, ASICs	PowerPC, ASICs
IBM Virtualization Engine (LPAR) capability	Not available	Optional
Processor memory for cache and NVS (min/max)	16 GB/128 GB	32 GB/256 GB
Host adapter interfaces	4-port 4 Gbps or 2 Gbps Fibre Channel/FICON, 2-port ESCON	4-port 4 Gbps or 2 Gbps Fibre Channel/FICON, 2-port ESCON
Host adapters (min/max)	2/16	2/32
Host ports (min/max)	4/64	4/128
Drive interface	FC-AL	FC-AL
Number of disk drives (min/max)	16/384	16/1024
Device adapters	Up to 8 4-port FC-AL	Up to 16 4-port FC-AL
Maximum physical storage capacity	192 TB	512 TB
Disk sizes	73 GB (15,000 rpm) 146 GB (15,000 rpm) 300 GB (15,000 rpm) 500 GB (7,200 rpm) FATA	73 GB (15,000 rpm) 146 GB (15,000 rpm) 300 GB (15,000 rpm) 500 GB (7,200 rpm) FATA
RAID levels	5, 10	5, 10

- DS8000 Turbo details on PartnerWorld

- DS8000 Turbo details on IBM.com

- DS8000 Turbo competitive info on COMP

Figure D.8.   IBM System Storage DS8000 Turbo Series at a glance (and links to more detail).

RAID-10 configurations can be intermixed within a single DS8000 series enclosure, which adds to the flexibility of this premier storage system.

Enhancing its ability to help simplify the storage environment, the DS8300 model includes innovative virtualization capabilities with storage system logical partitioning (LPAR). This storage system LPAR technology is designed to enable the creation of two completely separate virtual storage subsystems within a single DS8300. Each subsystem can be used as a distinct production environment, test environment, or other unique storage environment and can be tailored to support the specific performance requirements of that environment's workload. The DS8000 series system hardware-based partitioning implementation helps to isolate and protect the separate workloads in the LPARs. These storage system LPAR capabilities are designed to help improve management efficiency, cost effectiveness, and flexibility.

Here are some quick DS8000 Turbo facts:

- Support continuous operations for mission-critical workloads with cost-effective disk systems designed to be robust, flexible, and highly available

- Improve responsiveness with world class performance

- Adapt to growing and changing business needs with advanced, automated management capabilities

- Manage growth and complexity through consolidation fostered by scalability up to 512 TB, support for a wide variety of server platforms, and advanced storage system logical partitions

- Realize greater efficiencies for IBM server environments through features such as HyperPAV, z/OS Global Mirror Multiple Reader, and various other IBM System z synergies, as well as IBM System p cooperative caching and I/O priorities

- Improve the cost structure of operations and lower energy consumption through a tiered storage environment, which leverages both high performance (Fibre Channel) and high capacity (FATA) disk drive technology

- Manage the total cost of ownership with Enterprise Choice warranties of one, two, three, or four years on hardware and advanced functions.

DS8000 Series Warranty, Maintenance, and Service

The IBM System Storage DS8000 series offers leading Enterprise Choice warranties with one, two, three, or four years with IBM installation and 24x7 IBM on-site, same-day-response on both hardware and advanced function software. Additional services for maintenance, configuration, data migration, and other storage management needs are available to help organizations optimize their storage infrastructure and choose the length of service and support that is right for their needs.

MORE ON THE WEB

- DS8000 warranty information
- Warranty service upgrades and maintenance options
- Implementation services

DS8000 Competitive Marketing

Follow the "More on the Web" link to see the latest resources to help you overcome the competition when selling the DS8000 Series.

MORE ON THE WEB
• DS8000 competitive info on COMP

SAN Volume Controller

The IBM System Storage SAN Volume Controller (SVC) is a storage virtualization system that enables a single point of control for disparate, heterogeneous storage resources to help support improved business application availability and greater resource utilization (Figure V.1). The objective is to identify all storage resources in your IT infrastructure and to make sure they're used to the advantage of your business—and do it quickly, efficiently, in real time, while avoiding administrative costs.

SAN Volume Controller is designed to pool storage volumes from IBM and non-IBM storage systems into a single reservoir of capacity for centralized management. SAN Volume Controller is designed to hide the boundaries among disk systems, which helps you to focus on managing storage as a resource to meet business requirements and not as a set of boxes. SAN Volume Controller helps you to set business process goals based on all the storage resources at your disposal rather than allowing the storage resources to dictate what your business can accomplish.

SAN Volume Controller is designed to help increase the amount of storage capacity that is available to host applica-

- SAN Volume Controller on PartnerWorld
- SAN Volume Controller Sales Kit on PartnerWorl
- SAN Volume Controller on IBM.com
- SAN Volume Controller info on COMP

Figure V.1.　IBM System Storage SAN Volume Controller at a glance (and links to more detail).

tions. By pooling the capacity from multiple disk systems within the storage area network (SAN), it helps enable storage administrators to reach beyond traditional "islands" of SAN storage and deploy storage in ways that can help best meet the needs of host applications. In this way, SVC helps to increase utilization of storage systems. Improvements of as much as 30 percent have been seen by customers deploying SVC.

SAN Volume Controller can help improve administrator productivity by enabling management at the cluster level, and it is designed to provide a single point-of-control over all the storage it manages. It also provides an easy-to-use graphical interface for central management. With this single interface,

administrators can perform configuration, management, and service tasks in a consistent manner over multiple storage systems even from different vendors. SAN Volume Controller is designed to allow administrators to map disk storage volumes to virtual pooled volumes to help organizations use their existing storage more efficiently. SAN Volume Controller also incorporates the Storage Management Initiative Specification (SMI-S) application programming interface (API) and further demonstrates IBM's support of open standards. SAN Volume Controller integrates with IBM TotalStorage Productivity Center and IBM Tivoli Provisioning Manager to support automated management and provisioning of virtualized storage.

Because it hides the physical characteristics of storage from host systems, SAN Volume Controller is designed to help insulate host applications from physical changes to the storage pool. This ability can help enable applications to continue to run without disruption while you make changes to your storage infrastructure, which can help your business increase its availability to its customers.

Here are some fast SAN Volume Controller facts:

- Designed to enable a tiered storage environment in which the cost of storage can be better matched to the value of the data

- Designed to support advanced copy services from higher- to lower-cost devices and across storage systems from multiple vendors

- SVC supports more than 130 different disk systems from a wide range of IBM and non-IBM vendors

- SVC is a tremendous success with over 10,000 SVC "engines" shipped, running in more than 3,400 SVC systems world-wide

- Over 70 percent of SVC sales are made by IBM Business Partners and over 60 percent of sales are to SMB customers.

N Series

IBM network-attached storage (NAS) products provide a wide range of network attachment capabilities to a broad range of host systems.

N3000 Systems

The IBM N3000 systems (Figure N.1) are designed to provide primary and secondary storage for midsize enterprises. Consolidating all their fragmented application-based storage and unstructured data into one unified, easily managed and expandable platform can help IT generalists increase their effectiveness. N3000 systems, including the N3300 and the N3600, offer integrated block- and file-level data access, intelligent management software, and data protection capabilities—like higher-end N series systems—in a cost-effective package. IBM N3000 series innovations include internal controller support for Serial-Attached SCSI (SAS) or SATA drives, expandable I/O connectivity and onboard remote management.

The IBM N3000 is compatible with the entire family of N series unified storage systems, which feature a comprehensive line-up from top-to-bottom of hardware and software designed to address a variety of possible deployment environments.

Specifications

Machine type	**N3300**	**N3300**	**N3600**	**N3600**
Model	2859-A10	2859-A20	2862-A10	2862-A20
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed	Intel 2.2 GHz Mobile Celeron	Intel 2.2 GHz Mobile Celeron	Intel 2.2 GHz Mobile Celeron	Intel 2.2 GHz Mobile Celeron
Number of processors	1	2	2	4
Random access memory	1 GB	2 GB	2 GB	4 GB
Nonvolatile memory	128 MB	256 MB	256 MB	512 MB
Integrated I/O ports (standard/maximum)				
Fibre channel ports (speed)	2/2 (4 Gbps)	4/4 (4 Gbps)	2/4 (4 Gbps)	4/8 (4 Gbps)
Ethernet ports (speed)	2/2 (1 GbE)	4/4 (1 GbE)	2/4 (1 GbE)	4/8 (1 GbE)
Maximum number of Fibre Channel loops	1	1	2	2
Maximum raw capacity (note 3)	68 TB	68 TB	104 TB	104 TB
Maximum number of internal drives	12	12	20	20
Maximum number of expansion drives	56	56	84	84
Maximum number of disk drives	68	68	104	104
Maximum volume size	8 TB	8 TB	16 TB	16 TB
Maximum number of volumes/LUNs	1024	1024	1024	1024

- N3000 details on PartnerWorld

- N3000 details on IBM.com

- N3000 competitive info on COMP

Figure N.1. IBM System Storage N3000 Modular Disk Storage System (N3300 and N3600) at a glance (and links to more detail).

The N3300 squeezes 12 TBs of physical capacity into a 2U enclosure with optional external expansion that can increase total system raw capacity to 68 TBs. The N3600 scales up to 20 TBs of internal raw capacity and can scale up to 104 TBs by supporting up to 104 disk drives. Whether for primary or secondary storage use, the N3000 systems are intended to provide outstanding deployment versatility and connectivity to help satisfy your data protection and recovery needs.

N3700

IBM System Storage N3700 (Figure N.2) is designed to offer you fast data access with extremely low maintenance requirements for a highly capable data storage solution. The N3700 filer integrates storage and storage processing into a single unit, facilitating affordable network deployments. These advanced storage systems leverage a proven storage architecture and offer standard IBM System Storage N series elements, including integrated I/O, high availability via clustering, and Fibre Channel and/or SATA disk drives. IBM System Storage N3700 models are designed to integrate easily into existing IT environments to deliver unified storage for organizations with NAS, IP SAN via iSCSI protocols, FC SAN via FCP protocols, or combined environments, making enterprise-level storage a realistic goal for company sites regardless of size or staffing.

N3700 models use Fibre Channel and/or disk drives as their storage media to support enterprise-class reliability. All N3700 systems are configured with Data ONTAP software. Data ONTAP can facilitate greater efficiency and productivity

Specifications

	N3700 A10	N3700 A20
Maximum raw capacity	16.8 TB	16.8 TB
Maximum number of disk drives	56	56
Volumes and RAID groups (min./max. of 1 RAID group per volume)	1/7	1/7
Maximum volume size (physical capacity)	8 TB	8 TB
ECC memory	1 GB	2 GB
Nonvolatile memory	128 MB	256 MB
Ethernet 10/100/1000 copper	2	4
Copper FC ports for EXN expansion unit attachment	1	2
Optical FC ports for FC SAN and tape attachment	1	2
Clustered failover–capable	No	Yes
Rack Mount (in IBM 2101 Storage Solutions Rack Model 200 or other industry-standard 19-inch rack)	Yes	Yes

- N3700 details on PartnerWorld

- N3700 details on IBM.com

- N3700 competitive info on COMP

Figure N.2.   IBM System Storage N3700 at a glance (and links to more detail).

within your organization, which can help reduce the total cost of ownership (TCO).

Here are some quick N3700 facts:

- *High availability*—Leverages proven features including a high performing and scalable operating system, data management software, and redundancy features

- *Heterogeneous storage access*—Designed to provide networked storage capable of consolidating NAS and iSCSI storage requirements

- *FCP support*—Designed for operation in Fibre Channel SAN environments

- *Instant backup and instant recovery*—Supports disk-based backup, with file or application-level recovery in seconds with Snapshot and SnapRestore software features

- *Simple replication and disaster recovery*—Designed to provide an easy-to-deploy mirroring solution that's highly tolerant of WAN interruptions

- *Management simplicity*—Designed to enable on-the-fly provisioning; self-diagnosing systems with automated replacement parts delivery; self-service file recovery for end users

- *Cost Effectiveness*—FlexVol can double storage utilization, and both block and file storage can be consolidated into a single affordable system.

N5000 Series

The IBM System Storage N5000 series (Figures N.3 and N.4) offers additional choice to organizations facing the challenges of enterprise data management. The N5000 series includes the N5200, N5300, N5500, and N5600—all designed to deliver high-end enterprise storage and data management value with midrange affordability.

These enterprise storage systems deliver a unified storage architecture with versatility to simultaneously meet diverse needs—SAN and NAS, primary, and secondary storage—while providing high levels of availability. N5000 systems handle complex requirements in a way that actually simplifies the storage infrastructure and improves productivity.

The N5000 line of offerings is fully compatible with all IBM N series systems, which meet a range of storage needs, from small remote office and departmental applications through the largest enterprise applications and consolidations.

The N5000 products offer built-in enterprise serviceability and manageability features that help support your efforts to increase reliability, simplify and unify storage infrastructure and maintenance, and deliver exceptional economy.

Here are some quick N5000 series facts:

- *Reliable*—Designed to address the needs of business- and mission-critical applications through high data availability and system-level redundancy features

- *Versatile*—Single, integrated architecture designed to support concurrent block I/O and file serving over Ethernet and Fibre Channel SAN infrastructures

Specifications

	N5200 2864-A10	N5200 2864-A20	N5500 2865-A10	N5500 2865-A20
Machine type model				
Controller configuration	Single	Dual	Single	Dual
Processor speed and type	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon
Number of processors	1	2	2	4
Random access memory	2 GB	4 GB	4 GB	8 GB
Fibre Channel ports (speed)	4 (2 Gbps)	8 (2 Gbps)	4 (2 Gbps)	8 (2 Gbps)
Ethernet ports (speed)	4 (1 GbE)	8 (1 GbE)	4 (1 GbE)	8 (1 GbE)
Maximum raw capacity	84 TB	84 TB	168 TB	168 TB
Maximum disk drives	168	168	336	336
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	1024	1024	1024	1024
Maximum enclosures	12	12	24	24
PCI-e expansion slots	0	0	0	0
PCI-x expansion slots	3	6	3	6
Maximum number of FC ports	16	32	16	32
Maximum Ethernet ports	12	24	12	24
Maximum adapters	3	6	3	6
Disk expansion units supported	EXN4000—4 Gbps Fibre Channel Disk Storage Expansion Unit EXN1000—SATA Disk Storage Expansion EXN2000—FC Storage Expansion Unit (Legacy)			

- N5000 details on PartnerWorld
- N5000 details on IBM.com
- N5000 competitive info on COMP

Figure N.3. IBM System Storage N5000 Modular Disk Storage System (N5200 and N5500) at a glance (and links to more detail).

Specifications

	N5300 2869-A10	N5300 2869-A20	N5600 2868-A10	N5600 2868-A20
Machine type model				
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	2.4 GHz AMD Single-core 64-bit Opteron	2.4 GHz AMD Single-core 64-bit Opteron	1.8 GHz AMD Dual-core 64-bit Opteron	1.8 GHz AMD Dual-core 64-bit Opteron
Number of processors	2	4	2	4
Random access memory	4 GB	8 GB	8 GB	16 GB
Fibre Channel ports (speed)	4 (4 Gbps)	8 (4 Gbps)	4 (4 Gbps)	8 (4 Gbps)
Ethernet ports (speed)	4 (1 GbE)	8 (1 GbE)	4 (1 GbE)	8 (1 GbE)
Maximum raw capacity	336 TB	336 TB	504 TB	504 TB
Maximum disk drives	336	336	504	504
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum volumes/LUNs	2048	2048	2048	2048
Maximum number of storage enclosures	24	24	36	36
PCI-e expansion slots	3	6	3	6
PCI-x expansion slots	0	0	0	0
Maximum number of FC Ports	16	32	16	32
Maximum Ethernet ports	16	32	16	32
Maximum adapters	3	6	3	6
Disk expansion units supported	EXN4000—4 Gbps Fibre Channel Disk Storage Expansion Unit EXN1000—SATA Disk Storage Expansion EXN2000—FC Storage Expansion Unit (Legacy)			

- N5000 details on PartnerWorld

- N5000 details on IBM.com

- N5000 competitive info on COMP

Figure N.4.   IBM System Storage N5000 Modular Disk Storage System (N5300 and N5600) at a glance (and links to more detail).

- *Fast*—Supports high throughput and fast response times for database, e-mail, and technical applications

- *Flexible*—Fibre Channel and SATA disk drive capabilities allow for deployment in multiple solution environments including data compliant retention, near-line storage, disk-to-disk backup scenarios and high-performance, mission-critical I/O intensive operations.

N7000 Series

The IBM System Storage N7000 Series (Figures N.5 and N.6) offers additional choice to organizations facing the challenges of enterprise data management. The N7000 series, including the N7600, N7700, N7800, and N7900, is designed to deliver high-end enterprise storage and data management value with midrange affordability. Built-in enterprise serviceability and manageability features help support your efforts to increase reliability, simplify and unify storage infrastructure and maintenance, and deliver exceptional economy.

N7000 systems are easy to configure, manage, expand and upgrade. Add these general characteristics to the performance, capacity, and remarkable versatility of the N7000 series, and you have an ideal platform for large-scale applications and storage consolidation.

Here are some quick N7000 series facts:

- *Reliable*—Designed to address the needs of business- and mission-critical applications through high data availability and system-level redundancy features

Specifications

	N7600 2866-A10	N7600 2866-A20	N7800 2867-A10	N7800 2867-A20
Machine type model				
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	2.6 GHz AMD Opteron	2.6 GHz AMD Opteron	2.6 GHz AMD Opteron	2.6 GHz AMD Opteron
Number of processors	2	4	4	8
Random access memory	16 GB	32 GB	32 GB	64 GB
Fibre Channel ports/speed	8 (2 Gbps)	16 (2 Gbps)	8 (2 Gbps)	16 (2 Gbps)
Ethernet ports/speed	6 (1 GbE)	12 (1 GbE)	6 (1 GbE)	12 (1 GbE)
Storage scalability				
Maximum raw capacity	840 TB	840 TB	1008 TB	1008 TB
Maximum number of disk drives	840	840	1008	1008
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	2048	2048	2048	2048
Maximum number of storage enclosures	60	60	72	72
Disk expansion units supported	EXN4000—4 Gbps Fibre Channel Disk Storage Expansion Unit EXN1000—SATA Disk Storage Expansion EXN2000—FC Storage Expansion Unit (Legacy)			
PCI-Express (PCI-e) Expansion slots	5	10	5	10
PCI-x expansion slots	3	6	3	6
Maximum number of FC ports	28	56	28	56
Maximum number of Ethernet ports	26	52	26	52

- N7000 details on PartnerWorld

- N7000 details on IBM.com

- N7000 competitive info on COMP

Figure N.5.   IBM System Storage N7000 Modular Disk Storage System (N7600 and N7800) at a glance (and links to more detail).

Specifications

Machine type model	N7700 **2866-A11**	N7700 **2866-A21**	N7900 **2867-A11**	N7900 **2867-A21**
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	2.6 GHz AMD Opteron	2.6 GHz AMD Opteron	2.6 GHz AMD dual core Opteron	2.6 GHz AMD dual core Opteron
Number of processors	2	4	4	8
Random access memory	16 GB	32 GB	32 GB	64 GB
Fibre Channel ports/speed	8 (4 Gbps)	16 (4 Gbps)	8 (4 Gbps)	16 (4 Gbps)
Ethernet ports/speed	6 (1 GbE)	12 (1 GbE)	6 (1 GbE)	12 (1 GbE)
Maximum raw capacity	840 GB	840 GB	1176 GB	1176 GB
Maximum number of disk drives	840	840	1176	1176
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	2048	2048	2048	2048
Maximum number of storage enclosures	60	60	84	84
Disk expansion units supported	EXN4000—4 Gbps Fibre Channel Disk Storage Expansion Unit EXN1000—SATA Disk Storage Expansion EXN2000—FC Storage Expansion Unit (Legacy)			
PCI-Express (PCI-e) expansion slots	5	10	5	10
PCI-x expansion slots	3	6	3	6
Maximum number of FC ports	28	56	28	56
Maximum number of Ethernet ports	26	52	26	52

- N7000 details on PartnerWorld

- N7000 details on IBM.com

- N7000 competitive info on COMP

Figure N.6. IBM System Storage N7000 Modular Disk Storage System (N7700 and N7900) at a glance (and links to more detail).

- *Application Availability*—N7000 systems with Data ONTAP enable application-level recovery in minutes, not hours, upon failure or user error

- *Versatile*—Single, integrated architecture designed to support concurrent block I/O and file serving over Ethernet and Fibre Channel SAN infrastructures

- *Performance*—Delivers high, consistent performance for mission critical applications

- *Flexible*—Fibre Channel and SATA disk-drive capabilities allow for deployment in multiple solution environments, including data retention, near-line storage, disk-to-disk backup scenarios and high-performance, mission-critical I/O intensive operations.

N5000 Series Gateways

The IBM System Storage N5000 Gateways (Figures N.7 and N.8) are network-based solutions designed to provide heterogeneous access to Fibre Channel attached storage arrays. The N5000 Gateways, including the N5200, N5300, N5500, and N5600, can help you leverage the dynamic provisioning capabilities of Data ONTAP software across your existing Fibre Channel SAN infrastructure to support an expanded set of business applications. The IBM N5000 Gateways are based on the Data ONTAP microkernel operating system, which is designed to unify block and file storage networking paradigms under a common architecture. The N5000 Gateways feature a comprehensive suite of advanced data management capa-

Specifications

Machine type model	N5200 2864-G10	N5200 2864-G20	N5500 2865-G10	N5500 2865-G20
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon
Number of processors	1	2	2	4
Random access memory	2 GB	4 GB	4 GB	8 GB
Fibre Channel ports (speed)	4 (2 Gbps)	8 (2 Gbps)	4 (2 Gbps)	8 (2 Gbps)
Ethernet ports (speed)	4 (1 GbE)	8 (1 GbE)	4 (1 GbE)	8 (1 GbE)
Maximum raw capacity	84 TB	84 TB	168 TB	168 TB
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	168	168	336	336
PCI-Express (PCI-e) expansion slots	0	0	0	0
PCI-x expansion slots	3	6	3	6
Maximum number of FC ports	16	32	16	32
Maximum number of Ethernet ports	12	24	12	24
Maximum number of optional adapters	3	6	3	6

- N5000 Gateway details on PartnerWorld

- N5000 Gateway details on IBM.com

- N5000 Gateway competitive info on COMP

Figure N.7. IBM System Storage N5000 Series Gateways (N5200 and N5500) at a glance (and links to more detail).

Specifications

Machine type model	N5300 **2869-G10**	N5300 **2869-G20**	N5600 **2868-G10**	N5600 **2868-G20**
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	2.4 GHz AMD Single-core 64-bit Opteron	2.4 GHz AMD Single-core 64-bit Opteron	1.8 GHz AMD Dual-core 64-bit Opteron	1.8 GHz AMD Dual-core 64-bit Opteron
Number of processors	2	4	2	4
Random access memory	4 GB	8 GB	8 GB	16 GB
Fibre Channel ports (speed)	4 (4 Gbps)	8 (4 Gbps)	4 (4 Gbps)	8 (4 Gbps)
Ethernet ports (speed)	4 (1 GbE)	8 (1 GbE)	4 (1 GbE)	8 (1 GbE)
Maximum raw capacity	336 TB	336 TB	504 TB	504 TB
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	336	336	504	504
PCI-Express (PCI-e) expansion slots	3	6	3	6
PCI-x expansion slots	0	0	0	0
Maximum number of FC ports	16	32	16	32
Maximum number of Ethernet ports	16	32	16	32
Maximum number of optional adapters	3	6	3	6

- N5000 Gateway details on PartnerWorld

- N5000 Gateway details on IBM.com

- N5000 Gateway competitive info on COMP

Figure N.8.   IBM System Storage N5000 Series Gateways (N5300 and N5600) at a glance (and links to more detail).

bilities to help you consolidate, protect, and recover mission-critical data for enterprise applications and users.

N5000 Gateways are designed to deliver terabytes of managed capacity to help address access requirements for enterprises of all sizes. N5000 Gateway systems can be configured for simultaneous active/active access with secure failover across two independent systems in a cluster. SAN and NAS consolidation is now a possibility, using multiple N5000 Gateway systems and SAN storage systems configured in a scalable SAN infrastructure.

Here are some quick N5000 series Gateway facts:

- *Heterogeneous unified storage environment*—Designed to provide unified storage access for multiprotocol, multivendor storage environments

- *Storage consolidation*—Designed to enable organizations to consolidate UNIX, Linux, Windows, and Web workloads with existing SAN storage, thereby helping to increase storage utilization

- *Utilizing existing SAN infrastructure*—Designed to integrate into existing SAN storage environments, helping to optimize investment protection and ROI

- *Data management*—Designed to provide advanced data management solutions that maximize availability and help to significantly reduce operational cost

- *Comprehensive software suite*—Designed to provide robust system management, copy services, virtualization technolo-

gies, and disaster recovery and backup capabilities across all SAN resources.

N7000 Gateway Series

The IBM System Storage N7000 Gateways (Figure N.9) are network-based unified storage solutions designed to provide Internet Protocol (IP) and Fibre Channel (FC) protocol access to storage area network (SAN) attached heterogeneous storage arrays. The N7000 Gateway, including the N7700 and the N7900) can help you leverage the dynamic provisioning capabilities of Data ONTAP software across your existing Fibre Channel SAN infrastructure to support an expanded set of business applications. The IBM N7000 Gateway is based on the Data ONTAP microkernel operating system, which is designed to unify block and file storage networking paradigms under a common architecture. The N7000 Gateway is designed to provide a comprehensive suite of advanced data management capabilities to help you consolidate, protect, and recover mission-critical data for enterprise applications and users.

The IBM N Series Gateway is designed to deliver the performance and capacity to meet access requirements for enterprises of all sizes. N Series Gateway systems are intended to deliver industry-leading performance, offer terabytes of managed capacity, and can be configured for simultaneous active/active access with secure failover across two independent systems in a cluster. N7000 Gateways that can offer massive SAN and NAS consolidation are now a reality using

Specifications

	N7700 2866-G11	N7700 2866-G21	N7900 2867-G11	N7900 2867-G21
Machine type model				
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processor speed and type	2.6 GHz AMD dual-core	2.6 GHz AMD dual-core	2.6 GHz AMD dual-core	2.6 GHz AMD dual-core
Number of processors	2	4	4	8
Random access memory	16 GB	32 GB	32 GB	64 GB
Fibre Channel ports/speed	8 (4 Gbps)	16 (4 Gbps)	8 (4 Gbps)	16 (4 Gbps)
Ethernet ports/speed	6 (GbE)	12 (GbE)	6 (GbE)	12 (GbE)
Maximum raw capacity	840 TB	840 TB	1176 TB	1176 TB
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	840	840	1176	1176
PCI-Express (PCI-e) expansion slots	5	10	5	10
PCI-x expansion slots	3	6	3	6
Maximum number of FC ports	28	56	28	56
Maximum number of Ethernet ports	26	52	26	52

- N7000 Gateway details on PartnerWorld

- N7000 Gateway details on IBM.com

- N7000 Gateway competitive info on COMP

Figure N.9. IBM System Storage N7000 Series Gateways (N7700 and N7900) at a glance (and links to more detail).

multiple N7000 Gateway systems and SAN storage systems configured in a scalable SAN infrastructure.

Here are some quick N7000 Series Gateway facts:

- *Heterogeneous unified storage environment*—Designed to provide unified storage access for multiprotocol, multivendor storage environments

- *Versatile*—Single, integrated architecture designed to support concurrent block I/O and file serving over Ethernet and Fibre Channel SAN infrastructures

- *Storage consolidation*—Designed to enable organizations to consolidate UNIX, Linux, Windows and Web workloads with existing SAN storage, thereby helping to increase storage utilization

- *Utilizing existing SAN infrastructure*—Designed to integrate into existing SAN storage environments, helping to optimize investment protection and ROI

- *Data management*—Designed to provide advanced data management solutions that maximize availability and help to significantly reduce operational cost

- *Comprehensive software suite*—Designed to provide robust system management, copy services, virtualization technologies, and disaster recovery and backup capabilities across all SAN resources.

N Series Software

The IBM System Storage N series also provides a selection of features and functions delivered through software which are designed to provide a comprehensive set of robust management and operational tools as well as high availability features, disaster recover, and data copy services that help the system administration provide a high level of support for environments requiring IP attached storage solutions.

Here are a few examples of the many different N Series software offerings:

- Advanced Single Instance Storage

  – Performs block level data de-duplication on NearStore data volumes

  – Volume data is automatically scanned and deduplicated, resulting in immediate space savings with minimal impact on operations

- Data ONTAP

  – N series storage operating system providing full-featured and unified data management for both block and file serving environments

  – Single architecture and user interface simplify data management and reduce costs for SAN and NAS deployment

- Disk Sanitization

  – The process of physically obliterating data by overwriting disks with specified byte patterns or random data

– Helps prevents recovery of current data by any known recovery methods

- FlexClone

  – Instantaneously creates LUN and volume clones without requiring additional storage

  – Accelerated test and development and storage capacity savings

- FlexShare

  – Prioritizes storage resource allocation to highest value workloads on a heavily loaded system

  – Ensures that best performance is provided to designated high-priority applications

- FlexVol

  – Creates flexibly sized LUNs and volumes across a large pool of disks and one or more RAID groups

  – Fast, simple, and flexible storage provisioning and high-capacity utilization

- LockVault

  – Creates WORM-protected archives for unstructured files by combining SnapLock and SnapVault

  – Regulatory compliance solution for spreadsheets, presentations, and other unstructured application data

- MetroCluster

  – An integrated high-availability/disaster recovery solution for campus and metro-area deployments

  – Ensures high data availability when a site failure occurs

- MultiStore

  – Securely partitions a storage system into multiple virtual storage appliances

  – Enables secure consolidation of multiple domains and file servers

- NearStore (near-line)

  – Increases the maximum number of concurrent data streams (per storage controller)

  – Enhances backup, data protection and disaster prepared-ness by increasing the number of concurrent data streams between two N series systems

- Operations Manager

  – Manages multiple N series systems from a single adminis-trative console

  – Faster deployment and consolidated management of mul-tiple N series systems

- Protection Manager

  – Backup and replication management software for N series disk-to-disk environment

– Improves productivity through automation of data pro-
tection tasks; delivers higher assurance of data protection
than with manual execution of tasks by reducing human
errors

- RAID-DP

  – Double parity bit, RAID protection (N series RAID 6 imple-
  mentation)

  – Protects against data loss due to double disk failures and
  media bit errors occurring during drive rebuild processes

- SecureAdmin

  – Authenticates both the administrative user and the N series
  system, creating a secure, direct communication link to the
  N series system

  – Helps protect administrative logins, passwords, and session
  commands from "cleartext" snooping by replacing rsh and
  telnet with the strongly encrypted SSH protocol

- Single Mailbox Recovery for Exchange (SMBR)

  – Enables the recovery of a single mailbox from a Microsoft
  Exchange Information Store

  – SMBR can extract a single mailbox or email directly in min-
  utes compared to hours with traditional methods. Helps elimi-
  nate the need for IT staff intensive, complex and time-
  consuming exchange server and mailbox recovery for time-
  consuming

- SnapDrive

  – Provides host-based data management of N series storage from Windows, UNIX, and Linux servers

  – Simplifies host-consistent Snapshot copy creation and automates error-free restores

- SnapLock

  – Write-protects structured application data files within a volume to provide WORM disk storage

  – Provides storage enabling compliance with government records retention regulations

- SnapManager

  – Provides host-based data management of N series storage for databases and business applications

  – Simplifies application-consistent Snapshot copies, automates error-free data restores, and enables application-aware disaster recovery

- SnapMirror

  – Enables automatic, incremental data replication between systems: synchronous or asynchronous

  – Provides flexible, space- and network-efficient site-to-site mirroring for disaster recovery and data distribution

- SnapMover

  – Enables rapid reassignment of disks between controllers within a system without disruption

– Enables fast, non-disruptive load balancing within an active-active controller system

- SnapRestore

  – Rapidly restores single files, directories, or entire LUNs and volumes from any Snapshot backup

  – Enables near-instantaneous recovery of files, databases, and complete volumes

- Snapshot

  – Makes incremental, data-in-place, point-in-time copies of a LUN or volume with minimal performance impact

  – Enables frequent, non-disruptive, space-efficient, and quickly restorable backups

- SnapValidator

  – Maximizes data integrity for Oracle databases

  – Enhances Oracle database resiliency in compliance with Oracle HARD initiative

- SnapVault

  – Exports Snapshot copies to another N series system, providing an incremental block-level backup solution

  – Enables cost-effective, long-term retention of rapidly restorable disk-based backups

- SyncMirror

– Maintains two online copies of data with RAID-DP protection on each side of the mirror

– Protects against all types of hardware outages, including triple disk failure

• Virtual File Manager (VFM)

– Virtualizes multiple Windows, UNIX, and Linux file servers into a single logical pool of storage (Global Namespace)

– Provides automated, nondisruptive capacity expansion, data replication and data management across heterogeneous file server environments.

MORE ON THE WEB
• All N Series software

Follow the "More on the Web" links to learn more about all of the N Series software offerings.

Tape Storage

Server systems are woven deeply into today's business processes and are at the core of day-to-day operations. This information is thus a valuable corporate asset that must be protected. Tape storage provides a cost-effective and efficient means of backing up and archiving the information held on disk storage. Tape storage plays a vital role in reducing storage costs, maintaining data availability in the event of hardware failures, restoring data files accidentally or maliciously erased, restoring operations after a disaster, and so forth. In this section, we examine IBM's tape storage offerings.

MORE ON THE WEB
• All tape offerings on IBM.com

Tape Storage Cross Reference by Workload Size

It is often a mistake to associate an entry-level, midrange and enterprise-class storage product with small, medium and large size businesses respectively. The amount of data stored often does not correlate with the number of employees or revenue metrics often sited in determining size.

For this reason, recommendations on products based on actual workloads often makes more sense though still should be considered only a general guideline. In this section, you will find a list of tape storage products organized by workload size (entry, mid-size, and enterprise) to help you find the best solution for your client.

Tape Storage for Entry-Level Workloads

Here is a list of tape storage products designed for entry-level workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

MORE ON THE WEB
• Tape for entry-level workloads

TS2230

TS2240

TS2340

TS3100

TS3100 Express

TS3200

TS3200 Express

TS3310

3580

3580 Express

7206 Model 336

7206 Model VX3

7207

Tape Storage for Mid-Size Workloads

Here is a list of tape storage products designed for mid-size workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

MORE ON THE WEB

• Tape for mid-size business workloads

TS2340

TS3100

TS3100 Express

TS3200

TS3200 Express

TS3310

TS3400

TS3500

TS7510

TS7520

3580

3580 Express

Tape Storage for Enterprise Workloads

Here is a list of tape storage products designed for large enterprise workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

TS1120

TS3400

TS3500

TS7510

TS7520

TS7700

TS1120 Tape Drive

The IBM System Storage TS1120 Tape Drive (Figure T.1) offers a solution to address applications that need high capacity, fast access to data, or long-term data retention. It is supported in IBM tape libraries, IBM frames that support stand-alone installation, and in an IBM 3592 Tape Frame Model C20 (3592 C20 frame) attached to a Sun StorageTek 9310 library.

The tape drive uses IBM 3592 Cartridges, which are available in limited capacity (100 GB) for fast access to data, and standard capacity (500 GB) or extended capacity (700 GB) that help to reduce resources to lower total cost. All three

Specifications

Recording technique	Linear Serpentine
Number of tracks	896
Native capacity	700 GB (using JB/JX media), 3003/500 GB (using JA/JW media) or 60/100 GB (using JJ/JR media)
Native data rate	104 MBps
Adaptive data rates	104, 85, 70, 55, 41 and 35 MBps for 3592 cartridges initialized in Gen 2 format 54, 41, 36, 31, and 27 MBps for 3592 cartridges initialized in Gen 1 format
Burst data rate	400 MBps
High-speed search	10 mps
Warranty	One year
Physical characteristics	
Dimensions	95 mm H x 198 mm W x 467 mm D (3.8 in. x 7.8 in. x 18.4 in.)
Weight	5.7 kg (12 lbs 7 oz)
Operating environment	
Temperature with media	16° to 32° C (60° to 90° F)
Relative humidity	20% to 80% non-condensing (limited by media)
Wet bulb maximum	26° C (78.8° F)
Heat output	307 BTU/hr
Power requirements	0.1 kVA

- TS1120 details on PartnerWorld

- TS1120 details on IBM.com

- TS1120 competitive info on COMP

Figure T.1. IBM System Storage TS1120 at a glance (and links to more detail).

cartridges are available in re-writable or Write Once Read Many (WORM) format.

TS1120 tape drives can be shared among supported open system hosts on a storage area network (SAN) or between IBM FICON and ESCON mainframe hosts when attached to an IBM System Storage TS1120 Tape Controller (TS1120 tape controller). Sharing drives optimizes drive utilization and helps reduce infrastructure requirements.

Here are some quick TS1120 facts:

- Supports IBM systems and selected open system platform capacity cartridges

- Supports 3592 fast access, standard capacity, and extended capacity cartridges

- Supported on existing IBM and Sun StorageTek automation

- Offers native data transfer rate of up to 104 MBps

- Supports data encryption and key management.

TS2230 Tape Drive Express

The IBM System Storage TS2230 Tape Drive Express LTO3 HH Model (Figure T.2)—the entry-level IBM System Storage tape product family offering—is the answer to growing storage requirements and shrinking backup windows. By leveraging advanced Linear Tape-Open technology and the half-high format, the TS2230 Tape Drive is suited for handling the backup, save and restore, and archival data storage needs of a wide range of small systems.

Specifications

Model number	3580S3E (SAS version); 3580L3E (LVD SCSI version)
Rack-mount option	96P1565
Tape drive type	IBM LTO Ultrium 3 Half High
Capacity per cartridge	Up to 800 GB compressed; 400 GB native
Sustained data transfer rate	Up to 60 MBps native
Media type	IBM Ultrium 3
Data cartridge	IBM TotalStorage LTO Ultrium 400 GB Data Cartridge (P/N 24R1922)
Cleaning cartridge	IBM TotalStorage LTO Cleaning Cartridge (P/N 35L2086)
Dimensions	25 cm W x 6 cm H x 27.5 cm D (9.85 in. x 2.36 in. x 10.8 in.)
Weight	4.08 kg (9.03 lb)
Warranty	Three-year, Customer Replaceable Unit (CRU) service in most countries
Temperature	10° to 38° C (50° to 100° F)
Relative humidity	20% to 80% (non-condensing)
Electrical power	1–0.5 A at 100–240 V AC, 50/60 Hz
Attachment and systems support	The TS2230 features an LVD Ultra160 SCSI and a 3 Gbps SAS interface attaching to IBM p5, System p, i5, System i, System x, RS/6000, RS/6000 SP, AS/400 and Netfinity systems as well as to non-IBM servers and workstations. The TS2230 connects to Fibre Channel server adapters through selected IBM Storage Area Network Data Gateway products.
Operating systems support	Native device driver support is available for IBM AIX, OS/400 and i5/OS; Microsoft Windows 2000 (build 2195 or greater) and Windows Server 2003 (build 3790 or greater); Sun Solaris 8 and 9; HP-UX 11.0 and 11i; and Red Hat Enterprise Linux 3; SUSE Linux Enterprise Server 8.

- TS2230 Express details on PartnerWorld

- TS2230 Express details on IBM.com

- TS2230 Express competitive info on COMP

Figure T.2.   IBM System Storage TS2230 Tape Drive Express at a glance (and links to more detail).

The System Storage TS2230 Tape Drive Express LTO3 HH Model is an excellent tape storage solution for businesses requiring backup or low-cost, real-time archival of their data within a small window of time. The TS2230 has a storage capacity of up to 800 GB (with 2:1 compression) in conjunction with the IBM TotalStorage LTO Ultrium 400 GB data cartridge, which is double the capacity of the Ultrium 2 technology. Along with its higher capacity, the performance of the TS2230 Tape Drive has more than doubled over the previous generation of half-high LTO drives in the market for a native data transfer rate of up to 60 MBps. The TS2230 Tape Drive provides an excellent alternative to slower and smaller capacity 1/4-inch, 4 mm, and 8 mm DLT/SDLT tape drives.

Here are some quick TS2230 facts:

- An entry-level Ultrium tape solution for the midrange and network tape storage environments

- Designed to provide cost-effective backup, save and restore, and archival storage external to the server

- Double the storage capacity of existing HH LTO2 drives on the market

- Adheres to widely supported Linear Tape-Open (LTO) standards.

TS2240 Tape Drive Express

The IBM System Storage TS2240 Tape Drive Express (Figure T.3)—the entry-level IBM TotalStorage tape product family offering—is the answer to growing storage requirements and

Specifications

Available configurations	Model "3580 H4S"—One IBM Ultrium 4 Tape Drive, 3 Gbps SAS attach
	PN 3580S4E
	PN 3580E4S – Express Seller bundle with rack mount kit
Common features	
Tape drive type	IBM LTO Ultrium 4
Physical capacity	Up to 1.6 TB per cartridge with 2:1 compression; 800 GB native
Number of tape drives	1
Number of tape cartridges	1
Data transfer rate	Up to 120 MB/sec native
Media type	IBM LTO Ultrium 4, IBM TotalStorage LTO Ultrium 800 GB Data Cartridge, IBM TotalStorage LTO Cleaning Cartridge
	Call 1-888-IBM-Media
Weight	4.08 kg (9.03 lb)
Power requirements	1.0–0.5 A at 100–240 V AC, 50/60 Hz
Dimensions	25 cm W x 6 cm H x 27.5 cm D (9.85 in. x 2.36 in. x 10.8 in.)
Warranty	Three-year, Customer Replaceable Unit (CRU) in most countries

- TS2240 Express details on PartnerWorld

- TS2240 Express details on IBM.com

- TS2240 Express competitive info on COMP

Figure T.3. IBM System Storage TS2240 at a glance (and links to more detail).

shrinking backup windows. Incorporating the latest generation of advanced Linear Tape-Open (LTO) technology, the TS2240 Tape Drive is suited for handling the backup, save and restore, and archival data storage needs of a wide range of small systems. In addition, the TS2240 provides added security features by supporting encryption of data with 3 Gbps SAS connectivity.

The System Storage TS2240 Tape Drive is an excellent tape storage solution for businesses requiring backup or low-cost, real-time archival storage of their data. The TS2240, with a half-high form factor, offers the same high capacity of full-high LTO 4 tape drives. The TS2240 has a physical storage capacity of up to 1.6 TB (with 2:1 compression) in conjunction with the new IBM System Storage LTO Ultrium 800 GB data cartridge, which provides up to double the capacity of Ultrium 3 cartridges. The native data transfer performance of the TS2240 Tape Drive has increased over the previous LTO half-high generation to up to 120 MB/sec. The TS2240 Tape Drive continues to provide an excellent alternative to slower and smaller capacity 1/4-inch, 4 mm, and 8 mm DLT/SDLT tape drives.

Here are some quick TS2240 facts:

- Designed to provide high-capacity tape storage in a small half-high form factor to address backup and archiving requirements

- Available hardware encryption designed to offer highly secure data storage

- Native data transfer rate of up to 120 MB/sec.

TS2340 Tape Drive Express

The IBM System Storage TS2340 Tape Drive (Figure T.4)—the entry-level IBM System Storage tape product family offering—is the answer to growing storage requirements and shrinking backup windows. Incorporating the latest generation of advanced Linear Tape-Open (LTO) technology, the TS2340 Tape Drive is suited for handling the backup, save and restore, and archival data storage needs of a wide range of small systems. In addition, the TS2340 provides added security features by supporting encryption of data with 3 Gbps SAS connectivity.

The IBM System Storage TS2340 Tape Drive is an excellent tape storage solution for businesses requiring backup or low-cost, real-time archival storage of their data within a small window of time—it offers high-capacity and performance to help address the most demanding requirements. The TS2340 has a physical storage capacity of up to 1.6 TB (with 2:1 compression) in conjunction with the new IBM Ultrium 800 GB data cartridge, which provides up to double the capacity of previous Ultrium 3 technology. Along with its higher capacity, the data transfer performance of the TS2340 Tape Drive has increased over the previous generation for a native data transfer rate of up to 120 MBps. The TS2340 Tape Drive continues to provide an excellent alternative to slower and smaller capacity 1/4-inch, 4 mm, and 8 mm DLT/SDLT tape drives.

Here are some quick TS2340 facts:

- Designed to provide high-capacity and performance to address the most demanding backup and archiving requirements

Specifications

Available configurations	Model L43—One IBM Ultrium 4 Tape Drive, LVD Ultra160 SCSI attach
	Model S43—One IBM Ultrium 4 Tape Drive, 3 Gbps SAS attach
Common features	
Tape drive type	IBM LTO Ultrium 4
Physical capacity	Up to 1.6 TB per cartridge with 2:1 compression; 800 GB native
Number of tape drives	1
Number of tape cartridges	1
Data transfer rate	Up to 120 MB/sec native
Media type	IBM LTO Ultrium 4
	IBM TotalStorage LTO Ultrium 800 GB Data Cartridge
	IBM TotalStorage LTO Cleaning Cartridge
	Call 1-888-IBM-Media
Warranty	Three year, Customer Replaceable Unit (CRU), in most countries
Weight	14.2 lb (6.45 kg)
Power requirements	1.0–0.5 A at 100–240 V AC, 50/60 Hz
Dimensions	12 cm x 25 cm x 29.2 cm (4.75 in. H x 9.85 in. W x 11.50 in. D)

- TS2340 Express details on PartnerWorld
- TS2340 Express details on IBM.com
- TS2340 Express competitive info on COMP

Figure T.4. IBM System Storage TS2340 at a glance (and links to more detail).

- Double the cartridge capacity of previous generation LTO drives

- Available hardware encryption designed to offer highly secure data storage along with high performance

- Native data transfer rate of up to 120 MBps

- Choice of SCSI or SAS interfaces.

TS3100 Tape Library Express

The IBM System Storage TS3100 Tape Library Express Model (Figure T.5) and its storage management applications are designed to address capacity, performance, data protection, reliability, availability, affordability, and application requirements. It is designed as a functionally rich, entry tape-storage solution incorporating LTO Ultrium tape technology. The IBM TS3100 Express model is an excellent solution for large-capacity or high-performance tape backup with or without random access. The TS3100 is also an excellent choice for tape automation for IBM System p, IBM RS/6000, IBM System i, IBM AS/400, IBM System x, and other open systems.

The IBM TS3100 Tape Library Express is well-suited for handling backup, save and restore, and archival data-storage needs for small to medium-size environments. With its single Ultrium 4 or Ultrium 3 Tape Drive and 24 tape cartridge capacity, the IBM TS3100 model is designed to leverage LTO technology to cost effectively handle growing storage requirements. The TS3100 Tape Library is configured with two removable cartridge magazines, one on the left side and one on the right. Additionally, the left magazine includes a single

Specifications

Drive options	Ultrium 4: LVD SCSI—FC (8143); 4 Gbps Fibre Channel—FC (8144); 3 Gbps SAS—FC (8145) Ultrium 3: LVD SCSI—FC (8043); 4 Gbps Fibre Channel—FC (8044)
Tape drive type	IBM LTO Ultrium 4 or IBM LTO Ultrium 3
Number of drives	1
Number of tape cartridges	24
Number of mail slots	1
Physical capacity	Up to 1.6 TB per cartridge compressed; 800 GB native with LTO4 Up to 800 GB per cartridge compressed; 400 GB native with LTO3 Up to 38.4 TB per tape library compressed; 19.6 TB native Up to 19.2 TB per tape library compressed; 9.6 TB native
Data transfer rate	Up to 120 MBps native with LTO Ultrium 4 Up to 80 MBps native with LTO Ultrium 3
Attachment and systems support	The TS3100 features LVD Ultra160, 4 Gbps Fibre Channel and 3 Gbps SAS (LTO4 only) interfaces, attaching to IBM System p, IBM System i, IBM System x, RS/6000 SP, AS/400, and IBM Netfinity systems, and non-IBM servers, workstations and personal computers
Operating systems	Native device-driver support is available for IBM AIX, IBM OS/400, IBM i5/OS, Windows 2000, Windows Server 2003, Sun Solaris, HP-UX, Red Hat and United Linux

- TS3100 Express details on PartnerWorld

- TS3100 Express details on IBM.com

- TS3100 Express competitive info on COMP

Figure T.5.   IBM System Storage TS3100 Tape Library Express at a glance (and links to more detail).

mail slot to help support continuous library operation while importing/exporting media. A bar-code reader is standard in the library, supporting the library's operation in sequential or random access mode. The TS3100 also comes standard with remote management capabilities to allow for remote adminis- tration of the tape library through a Web interface.

Here are some quick TS3100 facts:

- Designed to support the new IBM LTO Ultrium 4 and the LTO Ultrium 3 Tape Drives for increased capacity and performance including 4 Gbps fibre channel, Low Voltage Differential (LVD) SCSI and 3 Gbps SAS attachment

- Designed to support cost-effective backup, save and restore, and archival storage in sequential or random access mode with a standard bar-code reader

- Designed to offer outstanding capacity, performance, and reliability for midrange and network tape-storage environ- ments in a 2U form factor with the 24 data-cartridge slots and a dedicated mail slot

- Remote library management through a standard Web inter- face supports flexibility and greater administrative control of storage operations

- Ultrium 4 native data capacities up to 19.2 TB (38.4 with 2:1 compression) with 24 data cartridge slots and the use of LTO Ultrium 4 Tape Drive with a native data rate of 120 MBps

- Ultrium 3 native physical data capacities up to 9.6 TB (up to 19.2 TB using 2:1 compression) with the 24 data-cartridge

slots, and the use of LTO Ultrium 3 Tape Drive with a native data rate of up to 80 MBps.

TS3100 Tape Library Express LTO3 HH Model

The IBM System Storage TS3100 Tape Library Express Model featuring half-high Ultrium 3 technology (Figure T.6) and its storage management applications are designed to address capacity, performance, data protection, reliability, availability, affordability, and application requirements. It is designed as a functionally rich, entry tape storage solution incorporating LTO Ultrium tape technology. The IBM TS3100 Express model featuring half-high Ultrium 3 technology is an excellent solution for large-capacity or high-performance tape backup with or without random access. The TS3100 featuring half-high Ultrium 3 technology is also an excellent choice for tape automation for IBM System p, IBM System i, IBM System x and other open systems.

Here are some quick TS3100 HH facts:

• Designed to support the new IBM LTO Ultrium 3 Half High (HH) Tape Drive, to help increase capacity and performance with Low Voltage Differential (LVD) SCSI and 3 Gbps Serial Attached SCSI (SAS) attachments

• Designed to support cost-effective backup, save and restore, and archival storage in sequential or random access mode with a standard barcode reader

• Designed to offer outstanding capacity, performance, and reliability for midrange and network tape-storage environments in a 2U form factor with 24 data cartridge slots and a mail slot

Specifications

Drive options	Ultrium 3 Half High: LVD SCSI (8046); 3 Gbps SAS (8047)
Available models	P/N 3573L32: TS3100 with LTO-3 HH SCSI tape drive
	P/N 3573S32: TS3100 with LTO-3 HH 3 Gbps SAS tape drive
	Additional drive
	P/N 95P4998: LTO-3 HH SCSI drive
	P/N 95P5000: LTO-3 HH SAS drive
Optional feature codes	
Rack mount	P/N 23R6998
Right-side magazine set	P/N 23R6999
Tape drive type	IBM LTO Ultrium 3 Half High
Number of drives	1-2
Number of tape cartridges	24
Number of mail slots	1
Physical capacity	Up to 800 GB per cartridge compressed; 400 GB native
	Up to 19.2 TB per tape library compressed; 9.6 TB native
Data transfer rate	Up to 60 MBps native with LTO Ultrium 3 Half High
Attachment and systems support	IBM System p, IBM System i, IBM System x, HP-UX, Sun Solaris, UNIX, Linux, and Windows servers, and non-IBM servers, workstations, and personal computers that support the interface specifications

- TS3100 Express half-high details on PartnerWorld

- TS3100 Express half-high details on IBM.com

- TS3100 Express half-high competitive info on COMP

Figure T.6. IBM System Storage TS3100 Tape Library Express model featuring half-high Ultrium 3 technology at a glance (and links to more detail).

- Remote library management through a standard Web interface supports flexibility and greater administrative control of storage operations

- Ultrium 3 native physical data capacities up to 9.6 TB (up to 19.2 TB using 2:1 compression) with the 24 data cartridge slots, and the use of 1-2 LTO Ultrium 3 Half High Tape Drive(s) with a native data rate of up to 60 MBps.

TS3200 Tape Library Express

The IBM System Storage TS3200 Tape Library Express Model (Figure T.7) is designed to offer high capacity and performance technology for the midrange open systems environments. The TS3200 Tape Library is an external 4U standalone or rack-mountable unit that incorporates up to two Linear Tape-Open (LTO) IBM TotalStorage Ultrium 4 or 3 tape drives. The new LTO Ultrium 4 tape drive has a native data rate of up to 120 Mbps, per drive.

The IBM System Storage TS3200 Tape Library Express Model is an excellent tape storage solution for organizations with existing digital linear tape or requiring high-performance automated tape backup. The TS3200 is also designed for organizations that have limited physical space in their IT environments. Operating in a rack environment allows organizations the advantage of placing the TS3200 in a standard 19-inch rack, which provides 76.8 TB of compressed tape storage in just a 4U space.

Here are some quick TS3200 facts:

Specifications

Number of mail slots	3
Capacity	Up to 1.6 TB per cartridge compressed; 800 GB native
	Up to 800 GB per cartridge compressed; 400 GB native
	Up to 76.8 TB per tape library compressed; 38.4 TB native
	Up to 38.4 TB per tape library compressed; 19.2 TB native
Data transfer rate	Up to 120 Mbps native with LTO Ultrium 4
	Up to 80 Mbps native with LTO Ultrium 3
Dimensions (W x H x D)	
Stand alone	17.6 in. (447.5 mm) x 7.29 in. (185.2 mm) x 31.9 in. (810 mm)
Rack-mount	17.6 in. (447.5 mm) x 6.89 in. (175.2 mm) x 29.13 in. (740 mm)
Weight	33 lb (15 kg) without rack mount
Operating environment	
Temperature	50 to 95° F, 10 to 35° C
Relative humidity	15% to 85% RH (non-condensing)
Electrical power	1.3 amps at 100 V ac, 0.7 amps at 240 V ac
Attachment and systems support	The TS3200 features LVD Ultra160 and 3 Gbps SAS (LTO4 only) interfaces, attaching to IBM System p and System p5, pSeries, IBM System i and System i5, iSeries, IBM System x, IBM RS/6000 SP, IBM AS/400, IBM BladeCenter, and IBM Netfinity systems, and non-IBM servers, workstations, and personal computers
Operating systems support	Native device driver support is available for IBM AIX, IBM OS/400, IBM i5/OS, Windows 2000, Windows Server 2003, Sun Solaris, HP-UX, Red Hat and United Linux

- TS3200 Express details on PartnerWorld

- TS3200 Express details on IBM.com

- TS3200 Express competitive info on COMP

Figure T.7. IBM System Storage TS3200 Tape Library Express at a glance (and links to more detail).

- Available with one or two Ultrium 4 or Ultrium 3 Tape Drives with either Low Voltage Differential (LVD) SCSI, 4 Gbps Fibre Channel or 3 Gbps SAS (LTO4 only) attachment

- Configured to hold four removable magazines, providing 48 data cartridges, including a three-slot I/O station

- Standard bar code reader and remote management unit to give the user greater flexibility in deployment and operation

- Removable cartridge magazines support quick bulk load of the tape library as well as ease of storage for media

- Ultrium WORM cartridges are supported with the IBM Ultrium Tape Drives

- Standalone or rack-mountable.

TS3200 Tape Library Express LTO3 HH Model

The new IBM System Storage TS3200 Tape Library Express Model featuring half high Ultrium 3 technology (Figure T.8) is designed to offer high capacity and performance technology for the midrange open systems environments. The TS3200 Tape Library featuring half high Ultrium 3 technology is an external 4U standalone or rack-mountable unit that incorporates up to four Linear Tape-Open (LTO) IBM TotalStorage Ultrium 3 Half High Tape Drives, with improved drive performance over the previous generation IBM LTO Ultrium 2 Tape Drives. It has a native data rate of up to 60 Mbps per drive.

The IBM System Storage TS3200 Tape Library Express Model featuring half high Ultrium 3 technology is an excellent tape storage solution for organizations with existing digital

Specifications

Drive options	Ultrium 3 Half High: LVD SCSI—FC (8046); Ultrium 3 Half High 3 Gb SAS—FC (8047)
Available models	3573L34 includes IBM LTO Ultrium 3 Half High LVD Ultra 160 SCSI tape drive
	3573S34 includes IBM LTO Ultrium 3 Half High 3 Gb SAS interface, half high SAS tape drive
Rack mount	7002
Right-side magazine set	8106
Additional power supply	1901
Tape drive type	IBM LTO Ultrium 3 Half High
Number of drives	1-4
Number of tape cartridges	48
Number of mail slots	3
Capacity	Up to 800 GB per cartridge compressed; 400 GB native
	Up to 38.4 TB per tape Library compressed; 19.2 TB native
Data transfer rate	Up to 60 Mbps native with LTO Ultrium 3 Half High
Dimensions (W x H x D)	
Stand alone	17.6 in. (447.5 mm) x 7.29 in. (185.2 mm) x 31.9 in. (810 mm)
Rack-mount	17.6 in. (447.5 mm) x 6.89 in. (175.2 mm) x 29.13 in. (740 mm)
Weight	33 lb (15 kg) without rack mount

- TS3200 Express half-high details on PartnerWorld

- TS3200 Express half-high details on IBM.com

- TS3200 Express half-high competitive info on COMP

Figure T.8. IBM System Storage TS3200 Tape Library Express model featuring half-high Ultrium 3 technology at a glance (and links to more detail)

linear tape experience or requiring high-performance auto-
mated tape backup.

Here are some quick TS3200 HH facts:

- Available with up to 4 Ultrium 3 Half High (HH) Tape Drives
  with either LVD SCSI or 3 Gb Serial Attached SCSI (SAS)
  attachment

- Configured to hold four removable magazines, providing 48
  data cartridge slots, a three-slot I/O station, and one dedi-
  cated cleaning cartridge slot

- Standard bar code reader and remote management unit to
  give the user greater flexibility in deployment and operation

- Removable cartridge magazines support quick bulk load of
  the tape library as well as ease of storage for media

- Ultrium 3 cartridges with Write Once, Read Many (WORM)
  capability are supported with the IBM Ultrium 3 Half High
  Tape Drives

- Standalone or rack-mountable.

TS3310 Tape Library

The IBM System Storage TS3310 Tape Library (Figure T.9)
is a modular, scalable tape library designed to address the
tape storage needs of rapidly growing companies who find
themselves space and resource constrained with tape backup
and other tape applications. Designed around a 5 EIA high
modular base library unit, the TS3310 is designed to scale

Specifications

	3576 Model L5B	**3576 Model L5B and four E9U models**
Configuration	Base library	Base library and 4 expansion units
LTO storage slots (max)	30	396
LTO Input/Output slots (max)	6	54
Maximum tape drives	2	18
Total physical capacity (2:1 compression)	24 TB	up to 633.6 TB
Capacity on demand increments	n/a	46 cartridges
Maximum logical libraries	2	18

- TS3310 details on PartnerWorld

- TS3310 details on IBM.com

- TS3310 competitive info on COMP

Figure T.9. IBM System Storage TS3310 Tape Library at a glance (and links to more detail).

vertically with expansion for LTO tape cartridges, drives, and redundant power supplies.

The base library module, model L5B, is the entry point for the product family. It contains all of the necessary robotics and intelligence to manage the 5U high library system, which houses up to 36 cartridges (30 storage slots and 6 Input/Output slots) and two LTO generation 4 and/or generation 3 tape drives.

Here are some quick TS3310 facts:

• Modular, scalable tape library designed to grow as your needs grow

• Available in desktop, deskside, and rack mounted configurations

• Designed for optimal data storage efficiency with high cartridge density using standard or WORM LTO data cartridges

• Hot-swap tape drives and power supplies

• Redundant power and host path connectivity failover options

• Remote Web-based management and SMI-S interface capable.

TS3400 Tape Library

The IBM System Storage TS3400 Tape Library (Figure T.10) is designed to offer the high capacity and performance advantage of the IBM System Storage TS1120 Tape Drive in a smaller automation footprint for System i, System p, System x, System z, and other open systems environments. The TS3400 tape library is an external 5U standalone or rack-

Specifications

Tape drive	TS1120 tape drive
Number of drives	Up to 2
Number of tape cartridges	Up to 18
Number of Input/Output slots	Up to 3
Number of logical libraries	Up to 2
Capacity	12.6 TB native capacity (37.8 TB with 3:1 compression)
Data transfer rate	Up to 104 MBps
Media type	IBM 3592 JA/JB/JJ and JW/JR/JX Write Once Read Many (WORM) cartridges
Dimensions	17.5 in. (445 mm) x 8.71 in. (221.45 mm) x 35.23 in. (895 mm)
Maximum weight	67 lb (30.39 kg) without drives, 92 lb (41.73 kg) with 2 drives
Warranty	One year on site repair
Operating system	IBM OS/400, IBM i5/OS, AIX and Linux
	See open systems support IBM z/OS, IBM z/VM, IBM VSE/ESA and Linux, HP-UX, Solaris

- TS3400 details on PartnerWorld

- TS3400 details on IBM.com

- TS3400 competitive info on COMP

Figure T.10. IBM System Storage TS3400 Tape Library at a glance (and links to more detail).

mountable unit supporting up to two TS1120 tape drives with a data transfer rate of up to 104 MBps per drive. The TS3400 tape library is an excellent tape storage solution for organizations already using TS1120 tape drives in their data centers who want to use the same technology in remote locations. The TS3400 is also designed for organizations that have limited physical space in their IT environments. The TS3400 can be installed in a standard 19-inch rack, providing up to 37.8 TB of compressed tape storage in a 5U space.

Here are some quick TS3400 facts:

- Designed to provide the high capacity and attractive performance of TS1120 tape drives in a smaller automation footprint

- Available with one or two TS1120 tape drives with 4 Gb Fibre Channel attachment

- Standalone or rack-mountable

- Supports 3592 media including non-erasable, non-rewritable cartridges.

TS3500 Tape Library

The IBM System Storage TS3500 Tape Library (Figure T.11) is designed to provide a highly scalable, automated tape library for mainframe and open systems backup and archive in midrange to enterprise environments. The TS3500 tape library supports System z via the IBM 3953 Tape System. The 3953 tape system enables System z hosts to access the TS3500 tape library cartridge inventory and allows connection

Specifications

Tape drive types	TS1120 or 3592 tape drives or IBM LTO Ultrium 4, 3, or 2 Tape Drives
Number of frames	One base frame, and up to 15 expansion frames The TS3500 Model HA1 installation provides two additional Dxx frames, required as service bays
Number of drives	Up to 12 per frame (up to 192 per library)
Number of Input/Output slots	Up to 224 (16 I/O slots standard)
Number of logical libraries	Maximum of 192 (up to number of drives installed)
Number of 3953 Systems	Maximum of four per TS3500 subsystem
Number of TS7700 Virtual- ization Engine Capacity	Maximum of eight per TS3500 subsystem IBM Ultrium 4 Cartridges: 52 TB to 5.5 PB (102 TB to 11 PB with 2:1 compression); 3592 cartridges: 29 TB to 3.13 PB (87 TB to 9.39 PB with 3:1 compression); 3592 extended capacity cartridges: 40.6 TB to 4.38 PB (121.8 TB to 13.14 PB with 3:1 compression)
Media type	L23/D23: IBM 3592 JA/JJ/JB and JW/JR/JX Write Once Read Many (WORM) cartridges L53/D53: IBM LTO Ultrium 4, 3, 2 Cartridges
Warranty	One Year; IBM On-site Repair (IOR)
Operating systems support	Device driver support is available for IBM AIX, IBM OS/400, IBM i5/OS, Windows 2000, Windows Server 2003, Linux, Sun Solaris, and HP-UX

- TS3500 details on PartnerWorld

- TS3500 details on IBM.com

- TS3500 competitive info on COMP

Figure T.11.   IBM System Storage TS3500 Tape Library at a glance (and links to more detail).

to TS1120 and 3592 J1A tape drives. The TS3500 tape library can support up to four 3953 tape systems, allowing for up to eight IBM Virtualization Engine TS7700 subsystems per physical library.

The TS3500 tape library can also be ordered with a dual accessor model option to help increase the mount performance and overall system reliability and availability. The TS3500 Model HA1 allows two robotic accessors to operate simultaneously in two to 16 frame configurations.

The TS3500 tape library's entry base frame provides a more flexible upgrade path for users who want to expand their tape storage at the time of need. Capacity on Demand configurations for the TS3500 tape library L-frame models include the "entry" level configuration, an "intermediate" configuration and a "full" capacity configuration.

Here are some quick TS3500 facts:

- Designed for IBM System z, IBM Virtualization Engine TS7700, and open systems environments

- Utilizes the IBM System Storage TS1120 Tape Drive and IBM TotalStorage 3592 Tape Drive Model J1A for System z, TS7700 Virtualization Engine and open systems environments

- Utilizes the IBM System Storage TS1040 Tape Drive, using LTO Ultrium 4 technology for increased capacity, through-put, fast access performance and WORM (Write Once Read Many) data cartridges in open systems environments

- Optional dual library accessor, with the IBM System Storage TS3500 Model HA1, designed to increase library performance, availability, and reliability

- Supports TS1120 and TS1040 tape drive encryption for data protection.

Virtualization Engine TS7510

The IBM Virtualization Engine TS7510 (Figure T.12) is the first member of the IBM Virtualization Engine TS7000 Series of virtual tape libraries. The TS7510 Virtualization Engine combines hardware and software into an integrated solution designed to provide tape virtualization for open systems servers connecting over Fibre Channel physical connections.

The TS7510 Virtualization Engine combines IBM server and disk technology and is designed to virtualize or emulate tape libraries, tape drives, and tape media. Real tape resources can then be attached to the TS7510 Virtualization Engine to help address information lifecycle management and business continuance.

The TS7510 virtualization Engine consists of three hardware machine types and a Virtualization Engine for tape software product. The IBM System Storage 3952 Frame Model F05 is an independent frame used to contain the components of the TS7510 Virtualization Engine.

Here are some quick TS7510 facts:

- Virtual tape backup functionality with disk-based access speeds and rapid access to the most frequently used data

- Part of a complete Information Lifecycle Management (ILM) solution to help efficiently manage critical data.

Specifications

Form factor/height	Frame dimensions are: 43.4 in. x 25.4 in. x 71 in. (WxDxH)
	One or two frames per system
Processor (max)	2 server nodes
Native cache (max)	46 TB
Connectivity	4 FC ports per node
	8 FC ports per system (two nodes)
Network interface	3 Ethernet ports, 1 for service, 2 for IP replication
Hot-swap components	Server nodes, disk drives, HBA, power supplies
RAID support	RAID 5
Systems management	SNMP traps for integration into ISV software for error reporting
Operating systems	AIX 5L V5.1, or later
supported	Sun Solaris 7, 8, or 9
	Microsoft Windows 2000
	Microsoft Windows 2003
	HP-UX 11.00, 11i (64 bit), and HP-UX 23pi
	Linux distributions: Red Hat Enterprise Linux 3.0 and 4.0
	(RHEL 3.0 and 4.0) and SUSE LINUX Enterprise Server 8 and 9
	(SLES 8 and 9)
Limited warranty	One year

- TS7510 details on PartnerWorld
- TS7510 details on IBM.com
- TS7510 competitive info on COMP

Figure T.12.   IBM Virtualization Engine TS7510 at a glance (and links to more detail).

Virtualization Engine TS7520

The IBM Virtualization Engine TS7520 (Figure T.13) combines hardware and software into an integrated tiered solution designed to provide tape virtualization for open systems servers connecting over Fibre Channel and iSCSI physical connections. When combined with physical tape resources for longer term data storage, the TS7520 Virtualization Engine is designed to provide an increased level of operational simplicity and energy efficiency, support a low cost of ownership, and increase reliability to provide significant operational efficiencies.

The TS7520 consists of three hardware machine types and a software program (5697-N65) Enterprise Edition, or (5697-N66) Limited Edition. The 3952 Tape Frame Model F05 is an independent frame used to contain the other components of the TS7520.

Here are some quick TS7520 facts:

- Designed to simplify the backup/restore process by incorporating IBM servers, disk, and tape into an integrated appliance

- Integrate IBM LTO 4 drives and libraries

- Designed to manage growth to 1.3 PB

- Investment protection with innovation that matters

- Manage data growth and risk with highly scalable solutions.

Virtualization Engine TS7700

The IBM Virtualization Engine TS7700 (Figure T.14) is a mainframe virtual-tape solution that is designed to optimize tape

Specifications

Max number of virtual libraries	128 virtual libraries per server; 512 virtual libraries per system
Max number of virtual drives	1,024 per server; 4,096 per system
Max number of virtual cartridges	64,000 per server; up to 256,000 per system
System performance	Maximum configuration
Read	Up to 4,760 MBps
Write	Up to 4,400 MBps
Max. system capacity (2:1 compression)	2.6 PB cache capacity at 2:1 compression

IBM Tivoli Storage Manager and other compatible software offerings provide storage and tape management software for the TS7520. 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 visit: ibm.com/servers/storage/tape.

- TS7520 details on PartnerWorld

- TS7520 details on IBM.com

- TS7520 competitive info on COMP

Figure T.13.   IBM Virtualization Engine TS7520 at a glance (and links to more detail).

processing. Through the implementation of a fully integrated tiered storage hierarchy of disk and tape, the benefits of both technologies can be leveraged to help enhance performance and provide the capacity needed for today's tape processing requirements. Deploying this innovative subsystem may help reduce batch processing time, total cost of ownership, and management overhead.

The TS7700 Virtualization Engine has been designed to reduce or eliminate a number of bottlenecks that may be present in any given tape environment. Any reduction in bottlenecks will vary depending on the characteristics of installed equipment and workload, but reducing bottlenecks can help reduce batch processing time.

Here are some quick TS7700 facts:

- Can help accelerate backups and recalls by leveraging a tiered hierarchy of disk and tape to more efficiently use tape drives

- Can help automate and simplify IT operations using advanced policy management

- Can help reduce costs such as power, maintenance, operations, and support staff

- Supports business continuity by supporting GRID connectivity and automated replication

- Supports data encryption and key management.

Specifications

	Single Node	**2 Cluster GRID**	**3 Cluster GRID**
Native tape volume cache (TB)	Up to 6	Up to 12	Up to 18
Virtual drives	256	512	768
TS1100 or 3592 tape drives	4 to 16	8 to 32	12 to 48
Virtual volumes	1,000,000	1,000,000	1,000,000
FICON channels	4	8	12
Warranty	One year on site repair		
Physical specifications			
	W: 644 mm (25.4 in.)		
	D: 1102 mm (43.4 in.)		
	H: 1804 mm (71.0 in.)		
Weight	565.6 kg (1247 lb)		
Supported environments	IBM z/OS v1.6 or higher, IBM z/VM v5.1 or higher, IBM z/VSE V3.1.2 or higher, IBM z/TPF 1.1 or higher, IBM TPF 4.1 or higher		

- TS7700 details on PartnerWorld

- TS7700 details on IBM.com

- TS7700 competitive info on COMP

Figure T.14.   IBM Virtualization Engine TS7700 at a glance (and links to more detail).

3580 Tape Drive Express

The IBM TotalStorage 3580 Tape Drive Express—the entry-level IBM TotalStorage tape product family offering—is the answer to growing storage requirements and shrinking back-up windows. By leveraging advanced Linear Tape-Open (LTO) technology, the IBM 3580 Express (Figure E.1) is suited for handling the backup, save and restore, and archival data storage needs of a wide range of small systems.

The IBM 3580 Express is an excellent tape storage solution for businesses requiring backup or low-cost, real-time archival of their data within a small window of time—high-capacity and performance can meet the most demanding require-ments. The new 3580 Express has a storage capacity of up to 800 GB (with 2:1 compression) in conjunction with the new IBM TotalStorage LTO Ultrium 400 GB data cartridge, which is double the capacity of the Ultrium 2 technology. Along with its higher capacity, the performance of the TotalStorage 3580 Tape Drive Express has more than doubled over the previous generation for a native data transfer rate of up to 80 MBps. The IBM 3580 Express provides an excellent alternative to slower and smaller capacity 1/4-inch, 4 mm, and 8 mm DLT/SDLT tape drives.

Here are some quick 3580 Express facts:

- An entry-level Ultrium tape solution for the midrange and network tape storage environments

- Designed to provide cost-effective backup, save and restore, and archival storage external to the server

- Double the storage capacity of the L23 and H23 models

Specifications

Model number	3580L3H
Tape drive type	IBM LTO Ultrium 3 LVD Ultra160 SCSI attach
Capacity per cartridge	Up to 800 GB compressed; 400 GB native
Sustained data transfer rate	80 MBps native
Media type	IBM Ultrium 3
Data cartridge	IBM TotalStorage LTO Ultrium 400 GB Data Cartridge (PN 24R1922) IBM TotalStorage LTO Ultrium 400 GB Data Cartridge 5-Pack (PN 95P2020)
Attachment and systems support	The IBM TotalStorage 3580 Tape Drive Express features an LVD Ultra160 SCSI interface attaching to IBM p5, pSeries, @server i5, iSeries, xSeries, RS/6000, RS/6000 SP, AS/400, and Netfinity systems as well as to non-IBM servers and workstations. As a SCSI-attached tape solution, the TotalStorage 3580 Tape Drive Express connects to Fibre Channel server adapters through selected IBM Storage Area Network Data Gateway products.
Operating systems support	Native device driver support is available for IBM AIX, OS/400 and i5/OS; Microsoft Windows 2000 (build 2195 or greater) and Windows Server 2003 (build 3790 or greater); Sun Solaris 8 and 9; HP-UX 11.0 and 11i; and Red Hat Enterprise Linux 3; SUSE LINUX Enterprise Server 8.

- 3580 Express details on PartnerWorld

- 3580 Express details on IBM.com

- 3580 Express competitive info on COMP

Figure E.1.   IBM TotalStorage 3580 Tape Drive Express at a glance (and links to more detail).

- Adheres to widely supported Linear Tape-Open (LTO) standards

- Includes an industry standard rack mount kit.

3580 L33 Tape Drive

The IBM TotalStorage 3580 L33 Tape Drive (Figure E.2)—the entry-level IBM TotalStorage tape product family offering—is the answer to growing storage requirements and shrinking backup windows. By leveraging advanced Linear Tape-Open (LTO) technology, the TotalStorage 3580 Tape Drive is suited for handling the backup, save and restore, and archival data storage needs of a wide range of small systems.

The TotalStorage 3580 Tape Drive Model L33 is an excellent tape storage solution for businesses requiring backup or low-cost, real-time archival of their data within a small window of time—high-capacity and performance can meet the most demanding requirements. The new Model L33 has a storage capacity of up to 800 GB (with 2:1 compression) in conjunction with the new IBM TotalStorage LTO Ultrium 400 GB data cartridge, which is double the capacity of the Ultrium 2 technology. Along with its higher capacity, the performance of the TotalStorage 3580 Tape Drive has more than doubled over the previous generation for a native data transfer rate of up to 80 MBps. The TotalStorage 3580 Tape Drive provides an excellent alternative to slower and smaller capacity 1/4-inch, 4 mm, and 8 mm DLT/SDLT tape drives.

Here are some quick 3580 L33 facts:

- An entry-level Ultrium tape solution for the midrange and network tape storage environments

Specifications

Model number	L33—LVD attach
Rack-mount option	Feature code 7003
Tape drive type	IBM LTO Ultrium 3
Capacity per cartridge	Up to 800 GB compressed; 400 GB native
Sustained data transfer rate	80 MBps native
Media type	IBM Ultrium 3
Data cartridge	IBM TotalStorage LTO Ultrium 400 GB Data Cartridge (PN 24R1922)
Cleaning cartridge	IBM TotalStorage LTO Cleaning Cartridge (PN 35L2086)
Dimensions	12 cm H x 25 cm W x 29.2 cm D (4.75 in. x 9.85 in. x 11.50 in.)
Weight	6.45 kg (14.2 lb)
Warranty	Three-year, Customer Replaceable Unit (CRU) service in most countries
Attachment and systems support	The IBM TotalStorage 3580 Tape Drive features an LVD Ultra160 SCSI interface attaching to IBM @server p5, pSeries, @server i5, iSeries, xSeries, RS/6000, RS/6000 SP, AS/400, and Netfinity systems as well as to non-IBM servers and workstations
Operating systems support	Native device driver support is available for IBM AIX, OS/400, and i5/OS, Microsoft Windows, Sun Solaris, HP-UX, and LINUX

- 3580 L33 details on PartnerWorld

- 3580 L33 details on IBM.com

- 3580 L33 competitive info on COMP

Figure E.2.   IBM TotalStorage 3580 L33 Tape Drive at a glance (and links to more detail).

- Designed to provide cost-effective backup save and restore and archival storage external to the server

- Double the storage capacity of the L23 and H23 models

- Adheres to widely supported Linear Tape-Open (LTO) standards.

7206 Model 336 Tape Drive

The IBM 7206 Model 336 External DAT72 (Figure E.3) Tape Drive is designed to be a cost-effective tape drive featuring the popular DAT72 (DDS) tape technology. It is designed to offer improved data quality and performance and increased capacity compared to the IBM 7206 Model 220. The 7206 Model 336 supports a migration path to greater tape storage capacity at a price point similar to IBM 7206-220 DDS4 tape drives.

The 7206 Model 336 tape drive is designed to achieve a media capacity up to 72 GB with 2:1 data compression, nearly twice the capacity of the previous IBM 7206-220 DDS4 tape drive. The 7206 Model 336 is also designed to offer a sustained data transfer rate of up to 6 MB per second or 21 GB per hour.

Here are some quick 7206 Model 336 facts:

- DAT72 physical capacity of up to 36 GB is nearly twice the capacity of DDS-4 tape drives

- Designed for improved data rate compared to IBM 7206 Model 220

- Designed for read and write compatibility with previous generation 4 mm tape media

Specifications

Warranty	24x7, one year, IBM on-site repair
Media	DAT72 (DDS Gen 5)
Native capacity	36 GB per cartridge
Compressed capacity	72 GB per cartridge
Data transfer rate	3 MBps (6 MBps with compression)
Interface	Ultra2 SCSI LVD (68-pin), Ultra3 SCSI LVD (68-pin), Ultra320 SCSI LVD (68-pin)
Dimensions	
	H: 55 mm (2.2 in.)
	W: 250 mm (9.8 in.)
	D: 275 mm (10.8 in.)
Weight	3.4 kg (7.5 lbs)
Operating environment	
Humidity	20% to 80%
Temperature	16° to 32° C (60° to 90° F)
Power	0.03 kVA at 120V ac typical

- 7206 Model 336 details on PartnerWorld

- 7206 Model 336 details on IBM.com

- 7206 Model 336 competitive info on COMP

Figure E.3. IBM 7206 Model 336 External DDS Gen 5 Tape Drive at a glance (and links to more detail).

- Designed for compatibility with tape storage devices used internally on IBM System p and IBM System i servers.

7206 Model VX3 Tape Drive

The IBM 7206 Models VX2 and VX3 External VXA-2 or VXA-320 Tape Drives (Figure E.4) are a higher capacity, cost-effective alternative to DDS/DAT tape technology, offering excellent data quality and performance. The never-ending growth in stored data is causing the size of backup jobs to increase as well. The new VXA tape technology standard pro-vides a migration path to greater tape storage capacity at a price point similar to DDS/DAT drives.

First introduced in 1999, award-winning VXA tape prod-ucts offer a unique combination of reliability, performance, and value. The 7206 Model VX2 and VX3 Tape Drives support three lengths of cartridges with up to 320 GB of compressed storage capacity in the new VXA-320 tape drive.

Here are some quick 7206 Model VX3 facts:

- Double the capacity of the VXA-2 tape drive

- Up to 160 GB capacity per cartridge (320 GB with 2:1 compression)

- Cost-effective migration path from 4 mm tape drives

- Twice the data rate of the VXA-2 tape drives such as the IBM 7206-VX2

- 12 MBps sustained data rate (24 MBps with 2:1 compression)

- Unique data packet formatting for variable speed operation

Specifications

Color	Black
Media	VXA-2 (VX2); VXA-320 (VX3)
Native capacity	80 GB (VX2); 160 GB (VX3)
Compressed capacity	160 GB per cartridge (VX2); 320 GB per cartridge (VX3)
Data transfer rate	6 MBps (VX2); 12 MBps (VX3)
Interface	Ultra2 SCSI LVD (68-pin)
Dimensions	H: 55 mm (2.2 in.)
	W: 250 mm (9.8 in.)
	D: 275 mm (10.8 in.)
Weight	3.2 kg (7.1 lbs)—VX2, 3.4 kg (7.5 lbs) – VX3
Operating environment	
Humidity	20% to 80%
Temperature	16° to 32° C (60° to 90° F)
Power	.03 kVA @ 120v
Warranty	24x7, one year, IBM on-site repair

- 7206 Model VX3 details on PartnerWorld

- 7206 Model VX3 details on IBM.com

- 7206 Model VX3 competitive info on COMP

Figure E.4.   IBM 7206 Model VX3 Tape Drive at a glance (and links to more detail).

- Compatible with storage devices currently used on IBM System p and IBM System i.

7207 External Tape Drive

The IBM 7207 Model 330 30 GB External SLR60 Tape Drive (Figure E.5) can be an excellent low-cost solution if you use quarter-inch-cartridge tape format for save and restore of your data. The IBM TotalStorage 7207 Model 330 External SLR60 Tape Drive is designed to offer improved capacity, performance, and data reliability for IBM eServer iSeries/AS400 and pSeries RS6000 servers. Its LED and messaging features are similar to other external tape drive products on these servers.

To help protect the data availability of tapes written by older generation QIC drives, the 7207 Model 330 is designed to be capable of reading and writing tapes written on other systems that use SLR100, MLR3, and MLR1 tape formats; it is read-only compatible with SLR5 and DC9250 media. All this adds up to a flexible and cost-effective backup, restore, and archiving solution that can help provide an easy migration path to greater tape storage capacity. And since many iSeries and AS/400 customers use QIC technology as their internal tape drive, the 7207 Model 330 offers additional compatibility across that entire platform. The 7207 Model 330 can be used as a small, desktop save and restore tape drive, or in an IS facility up to 15 meters from the server. The Model 330 can also be located in a rack using the IBM Rack Mount feature (FC 8723).

Here are some quick 7207 facts:

Specifications

Capacity per cartridge (2 options)	Up to 30 GB native; Up to 60 GB compressed (Part Number: 14P4209) Up to 5 GB native: Up to 10 GB compressed (Part Number: 35L0661)
Data transfer rate	Up to 4 MB/sec native; Up to 8 MB/sec compressed
Media	SLR (QIC)
Interface	SCSI Ultra2 LVD (68-pin)
Warranty	24x7, one year, IBM on-site repair
Operating environment	
Temperature	16° to 40° C (41° to 105° F)
Relative humidity	20% to 80%
Power	.03 kVA at 120 V
Software requirements	
pSeries/RS6000	IBM AIX 4.3.3, AIX 5L Version 5.1, AIX 5L Version 5.2 or later
iSeries/AS400	V5R1 or later
User-ready configuration	The 7207 Model 330 includes one SLR60 drive in a black enclosure that contains power and cooling, and the following components: SCSI cable and power cord (specify), and SCSI terminator SLR60 data cartridge (may be used for initial drive testing or data storage) SLR (QIC) cleaning cartridge Safety, installation and service guides

- 7207 Model VX3 details on PartnerWorld

- 7207 Model VX3 details on IBM.com

- 7207 Model VX3 Express competitive info on COMP

Figure E.5.   IBM 7207 External Tape Drive at a glance (and links to more detail).

- Designed to offer increased capacity of 30 GB (60 GB when compressed) per cartridge, a 7x capacity over predecessor IBM TotalStorage 7207 Model 122 Tape Drive at a similar price point

- Sustained data rate of 4 MB/sec native and 8 MB/sec compressed

- Compatibility with 7207 Model 122 Tape Drives used on IBM eServer iSeries/AS400, IBM eServer pSeries/RS/6000 servers, and most iSeries/AS400 internal QIC drives.

7212 Storage Device Enclosure Express

The IBM System Storage 7212 Storage Device Enclosure Express Model features the latest technology options in tape drives and a DVD-RAM optical drive. The 7212 Express Model packaging is a low-profile, modular design that is an excellent choice for rack-mount or limited space desktop applications. The 7212 Express Model offers customers a variety of choices for storage drives in either rack-mountable 1U or desktop configurations.

Here are some quick 7212 Enclosure facts:

> **MORE ON THE WEB**
>
> - 7212 Enclosure Express details on PartnerWorld
> - 7212 Enclosure Express details on IBM.com
> - 7212 Enclosure Express details on COMP

- Features a compact design that can be configured with up to two storage devices

- Can be configured for one EIA unit (1U) of a standard 19-inch server rack or as a low-profile desktop solution

- Offers several storage device options for both tape drives and optical drives

- Low-profile storage solution for environments in which cabling space and server storage bays are limited

- Connects to IBM System i and System p workstations and servers.

7214 Storage Device Enclosure

The IBM System Storage 7214 Storage Device Enclosure features the latest technology options in tape drives and DVD optical drives. The 7214 Storage Enclosure is a low-profile design that is an excellent choice for mounting in your System p 19-inch rack.

The 7214 storage enclosure is a one EIA (1U) design that features two drive bays that can hold one tape drive, a slim design DVD-RAM drive and a DVD-ROM optical drive for a total of up to three drives. The 7214 storage device enclosure may also feature two tape drives. No more than two DVD drives may be featured in a single enclosure. Connection of the 7214 enclosure to System p requires the PCI-X DDR Dualx4 SAS Adapter (Feature # 5900). Up to two

MORE ON THE WEB

- 7214 Enclosure details on PartnerWorld
- 7214 Enclosure Express details on IBM.com
- 7214 Enclosure Express details on COMP

7214 enclosures may be attached to this adapter. The new Serial SCSI electronic bus featured in the 7214 helps potentially provide higher through-put of drive data exchange on your System p server.

Here are some quick 7214 Enclosure facts:

- Features a 1U rack mountable easy-to-install design that can be configured with up to three storage devices

- Offers storage device options for both tape and DVD optical drives

- Provides performance enhancements with the new Serial SCSI interface and a control card sensor to track hardware function

- Connects to high performance IBM System p servers.

Archive and Retention Products

In this section, we explore IBM System Storage products that employ a combination of disk and tape store to address business needs.

DR550

The IBM System Storage DR550 (Figure A.1) is an award-winning, industry-proven information retention solution. It is designed to help businesses meet the growing challenge of managing and protecting business information for the long term while providing operational efficiency and information security.

Specifications

Model DR1	IBM 25U high rack
	— Rack security feature
	— Power control assembly (PCA)
	Single IBM System p5 POWER5+ server running AIX, Version 5.3
	Starting capacity: 880 GB (730 GB usable), with 6 TB increments
	Maximum capacity supported: 36.88 TB raw (30 TB usable) capacity
	RAID Level 5
	IBM System Storage Archive Manager, Version 5.5.0
	IBM System Storage DR550 File System Gateway (optional)
Model DR2	IBM 36U high rack
	— Rack security feature
	— Power control assemblies (PCAs)
	Single or Dual IBM System p5 POWER5+ server running AIX, Version 5.3
	— IBM HACMP 5.3 (Dual-server configuration)
	IBM System Storage Archive Manager, Version 5.5.0
	IBM System Storage SAN 16B-2 Fibre Channel switch
	Starting capacity: 6 TB (4.5 TB usable), with 6 TB increments
	Maximum capacity supported: 168 TB raw (136.5 TB usable)
	RAID Level 5
	IBM System Storage DR550 File System Gateway (optional)
Optional systems	Tape Systems: LTO Gen 3 or Gen 4, TS1120, many others
	Optical systems: IBM 3996, others

- DR550 Sales Kit on PartnerWorld

- DR550 details on IBM.com

- DR550 competitive info on COMP

Figure A.1.   IBM System Storage DR550 at a glance (and links to more detail).

Well suited for archiving e-mail, digital images, databases, applications, instant messages, business transactions, contracts, insurance claims, and other types of storage records, the DR550 is the optimum information retention solution for mid to large size businesses. IBM DR550 is a secure, protected storage that is suitable for highly-regulated industries and industries with long retention needs. DR550 supports all major content management and archiving applications out in the market—over 40—and can scale up to 168 TB of physical disk storage capacity per system. It also supports external storage devices such as tape or optical systems for expansion to hundreds of TB in storage capacity. Because tape is much lower cost than disk storage, it is well suited for long-term retention of large quantities of archive information.

Here are some DR550 facts:

- *True storage tiering*. One of the main features of DR550 is its capability to support tiers of storage (disk, tape, and optical) within an archive providing operational efficiency for the long-term.

- *Migration*. DR550 is designed to support data migration capabilities to move data from disk to tape and from generation to generation while maintaining data immutability. Migrations can be automated or scheduled for off hours and can be performed by the customer or as a service.

- *Chronological and event-based data retention*. DR550 uses policies to manage information and retention and is designed to prevent data deletion before the retention criteria is satisfied.

- *Non-erasable, non-rewriteable archival storage*. DR550 offers non-rewritable, non-erasable storage controls to prevent deletion or alteration of data stored on the system until deletion is permitted by retention policy. DR550 also has "Deletion Hold" to retain content for legal or audit reasons.

- *High performing*. DR550 supports archive and retrieve enabling data rates of up to 60 MB/sec and more than 2000 objects/second. Scalable performance through multi-object transaction is enabled by TSM API.

- *Security and protection through data encryption and data shredding options*. DR550 provides data encryption options (128 bit AES or 56 bit DES technology). Data is encrypted prior to transmission and remains encrypted in the DR550, including backup copies. The DR550 also supports the tape encryption capabilities offered with the IBM System Storage TS1120 and LTO-4 tape drives. The encryption on the TS1120 or LTO-4 tape drive is designed to allow for encryption within the drive and encryption key management independent of the application.

- *Integrated backup and high availability*. System Storage Archive Manager in DR550 provides an integrated backup facility for DR550 to an external tape system. DR550 Model DR2 provides high availability and remote mirroring option for continuity and disaster recovery.

The DR550 comes in a new packaging designed to offer improved ordering, service, and support. DR550 hardware, ordered as a single machine type of 2233, comes in two mod-

els: DR1 and DR2. DR1 is a compact model targeted mainly for midmarket and can scale up to 30 TB of usable capacity. DR2, packaged in a bigger rack, offers single or dual node configuration options and offers greater scalability (up to 168 TB) to address large customers' needs. Both models support File System Gateway as an optional feature for providing NFS/CIFS interface to applications and external tape or optical systems. DR550 is fully integrated—all hardware has been installed, cabled, tested and the System Storage Archive Manager (SSAM) software is installed and pre-configured with RAID 5. (Note that SSAM is a separate PID).

The DR550 can help businesses:

- Address regulatory compliance and reduce business risk. SEC Rule 17a-4(f) and a similar regulation set forth by the Commodity Futures Trading Commission specifically require a non-rewriteable, non-erasable recording process. However, most regulations related to electronic records require that the integrity of the records be preserved for the required retention period. The information archived to the DR550 is protected against being overwritten, erased, or altered for the required retention period.

- Operate with efficiency. It is costly to keep all archived data in a near-line storage throughout its retention period. The DR550 is designed to support transparent migration of data from disk to tape. It helps ease the administrative burden of managing the archived data while keeping the operational costs down for the long-term.

- Achieve lower TCO. The DR550 leverages true storage mix—disk, tape, optical—within its archive. Tape is still a lower cost option than disk and offers a longer media life. For long-term retention, data needs to be migrated to newer media and associated technologies, a significant cost factor in TCO. The DR550 helps provide a built-in media and technology migration capability that mitigates those cost issues.

- Secure and protect business information. Information written to DR550 is protected from alterations and deletions until the end of the retention period. Optionally, it can be encrypted.

SAN Fabric

The growing importance of storage is fueling a model for storage infrastructures in which storage devices are not attached to a specific server but rather make up an independent storage area network, or SAN. The storage devices (disk drives, tape drives, etc.) residing in a SAN typically are shared among a group of servers that reside on a separate network.

In addition to storage and tape servers, which often are used to build SANs, IBM sells switches used to build SAN fabric. In this section, we look at these SAN fabric products. IBM SAN products and solutions provide integrated SMB and enterprise SAN solutions with multiprotocol local, campus, metropolitan, and global storage networking.

MORE ON THE WEB

- SAN Fabric info on IBM.com

SAN Fabric Cross Reference by Business Size

In this section, you will find a list of SAN products organized by workload size (entry, mid-sized, and enterprise) to help you find the best solution for your client.

SAN Fabric for Entry-Level Workloads

Here is a list of SAN fabric products designed for entry-level workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

> **MORE ON THE WEB**
>
> • SAN Fabric for the entry-level workloads

SAN10Q-2

SAN16B-2 Express

SAN16B-2

Cisco MDS 9124 Express

SAN Fabric for Mid-Size Workloads

Here is a list of SAN fabric products designed for mid-size workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

> **MORE ON THE WEB**
>
> • SAN Fabric for the mid-size workloads

SAN32B-3

SAN64B-2

Cisco MDS 9134

Cisco MDS 9216A

SAN Fabric for Enterprise Workloads

Here is a list of SAN fabric products designed for large enterprise workloads. Click on the links and you will jump to the section of this ebook that describes the product (you can click on the back arrow to jump back to this page).

SAN256B

SAN140M

SAN256M

SANC40M

Cisco MDS 9513

Cisco MDS 9506

Cisco MDS 9509

SAN10Q-2

Affordable, capable, and extremely easy to use, the entry-level IBM System Storage SAN10Q allows even the smallest business to enjoy the benefits of networked storage without having to hire a SAN expert. With a small form factor of only 0.9 kg (2 lbs) and 1U deep, the IBM System Storage SAN10Q is a true spacesaver—requiring only one-half of a rack slot. This means two Fibre Channel switches can be racked in a single slot for a total of 20 ports. All ports are auto-discovering and self-configuring, which helps allow maximum port density and power with a minimum investment.

Simple software wizards lead you through the installation and configuration of a SAN. SANsurfer Express management application software is included and provides convenient access to your IBM switches and HBAs. It is designed to allow you to manage and provision your storage from one tool.

Here are some quick SAN10Q-2 facts:

• Small and capable—1U, 4 Gbps, 10-port, half-width rack

• Flexible—rack-able or standalone form factor

• Designed to improve manageability—no-wait routing helps maximize performance independent of data traffic

• Simple to use—auto-sensing, self-configuring ports

• Logical choice—intuitive and affordable migration from direct attached storage to SAN

• Complete package—SANsurfer Express software helps simplify switch installation, managing, and fabric scaling.

SAN b-type Switches

The IBM System Storage and TotalStorage SAN b-type family provides entry and midrange switches and enterprise directors.

SAN16B-2 Express

The IBM TotalStorage SAN16B-2 Express Model fabric switch is designed specifically to address the needs of small to medium-size SAN environments. It can be used to create a wide range of high performance SAN solutions, from simple single-switch configurations to larger multi-switch configurations which support fabric connectivity and advanced business continuity capabilities. Infrastructure simplification solutions for IBM System x, System i and System p servers include storage consolidation and high-availability server clustering with IBM TotalStorage disk storage arrays. Business continuity solutions include data protection with IBM TotalStorage tape libraries and devices and IBM Tivoli Storage Manager data protection software.

> **MORE ON THE WEB**
>
> • SAN16B-2 Express Model info on PartnerWorld
> • SAN16B-2 Express Model info on IBM.com

A single SAN16B-2 Express Model switch can serve as the cornerstone of a storage area network for those who want to obtain the benefits of storage consolidation and are just beginning to implement Fibre Channel storage systems.

Here are some quick SAN16B-2 Express Model facts:

- Simple-to-use SAN switch with ease-of-installation and ease-of-use features designed specifically for the needs of small to medium-size environments

- Foundation for new infrastructure simplification and business continuity solutions for servers running Microsoft Windows, UNIX, Linux, and NetWare operating systems

- High-performance 4 Gigabit per second links (requires storage hardware that supports 4 Gbps throughput) with pay-as-you-grow "Ports on Demand" scalability enable growth from 8 to 12 to 16 ports.

SAN16B-2

The IBM TotalStorage SAN16B-2 fabric switch is designed specifically to address the needs of small to midsize SAN environments. It can be used to create a wide range of high-performance SAN solutions, from simple single-switch configurations to larger multi-switch configurations which support fabric connectivity and advanced business continuity capabilities. Infrastructure simplification solutions for IBM System x, System p, and System i servers include storage consolidation and high-availability server clustering with IBM TotalStorage disk storage arrays.

Here are some quick SAN16B-2 facts:

- Simple-to-use SAN switch with ease-of-installation and ease-of-use features designed specifically for the needs of small to medium-size environments

- Foundation for new infrastructure simplification and business continuity solutions for servers running Microsoft Windows, UNIX, Linux, NetWare, and OS/400 operating systems

- High-performance, 4 Gigabit per second links (requires storage hardware that supports 4 Gbps throughput) with pay-as-you-grow "Ports on Demand" scalability enable growth from 8 to 12 to 16 ports.

SAN32B-3

The IBM System Storage SAN32B-3 SAN fabric switch provides 16, 24, or 32 active ports and is designed for high performance with 4, 2, and 1 Gbps link speeds. High availability features make it suitable for use as a core switch in midrange environments or as an edge-switch in enterprise environments where a wide range of SAN infrastructure simplification and business continuity configurations are possible. Many IBM and non-IBM disk and tape devices are supported in many common operating system environments. Optional features provide specialized distance extension, link trunking, performance monitoring, and advanced security capabilities.

MORE ON THE WEB
• SAN32B-3 info on PartnerWorld
• SAN32B-3 info on IBM.com

Here are some quick SAN32B-3 facts:

- High port density design with 32 ports in an efficient, compact 1U height helps save rack space

- Simple-to-use midrange and enterprise SAN fabric switch for IBM system i, System p, System x, and other server environments

- Pay-as-you-grow scalability supports non-disruptive capacity activation.

SAN64B-2

A wide range of IBM System Storage medium-size and enterprise storage area network (SAN) infrastructure simplification and business continuity solutions can be created with the IBM System Storage SAN64B-2 fabric switch. Infrastructure simplification solutions for the IBM System i, System p, System x, and System z families of servers include storage consolidation and high-availability server clustering with IBM Total-Storage disk storage arrays. Business continuity solutions include data protection with IBM System Storage tape libraries and devices and IBM Tivoli Storage Manager data protection software.

MORE ON THE WEB

- SAN64B-2 info on PartnerWorld
- SAN64B-2 info on IBM.com

Here are some quick SAN64B-2 facts:

- Simple-to-use medium-size and enterprise infrastructure simplification and business continuity solution for IBM System i, System p, System x, and System z servers plus other selected IBM, Intel-based, UNIX, Sun, and HP servers

- Designed for high-performance with 4 Gbps ports and enhanced Inter-Switch Link (ISL) trunking with up to 32 Gbps per data path

- Pay-as-you-grow scalability with "Ports on Demand" features

- Designed to support high availability with redundant, hot-swappable fans and power supplies and non-disruptive software upgrades

- Provides a broad range of open server Fibre Channel switching

- Multiple management options for medium-size and complex enterprise SAN consolidation solutions

- Interoperability with the IBM System Storage SAN b-type switch family helps protect switch investment.

SAN256B

The IBM TotalStorage SAN256B is designed to provide outstanding performance, enhanced scalability, and a design ready for high-performance 4 Gbps and 10 Gbps capable hardware and expanded capability features. The SAN256B is well suited to address enterprise SAN customer requirements for infrastructure simplification and improved business continuity. The SAN256B director interoperates with other members of the IBM TotalStorage SAN b-type family. It can be configured with a wide range of highly scalable solutions that address demands for integrated IBM System z and open system server enterprise SANs.

MORE ON THE WEB
- SAN256B info on PartnerWorld
- SAN256B info on IBM.com

Here are some quick SAN256B facts:

- High availability with built-in redundancy designed to avoid single points of failure

- Highly scalable director with 16, 32, or 48 ports per port switch blade and from 16 to 384 ports in a single domain

- Multiprotocol router blade with 16 Fibre Channel (FC) ports and two Internet Protocol (IP) ports for SAN routing and distance extension over IP

- iSCSI blade enables servers to access storage over IP (Ethernet) in a highly integrated, cost-effective manner for storage consolidation

- 10 Gbps Fibre Channel blade provides extended distance ISL connectivity between directors over dark fibre or DWDM

- Sixteen and 32 port switch blades support IBM FICON Director switching with Fibre Channel/FICON intermix, FICON CUP (Control Unit Port) and FICON cascading.

SAN m-type Switches

The IBM TotalStorage SAN m-type family provides McDATA switch and director technology with worldwide IBM warranty, maintenance service and support for entry, midrange, and enterprise infrastructure simplification, and business continuity solutions.

SAN140M

A wide range of IBM System Storage and TotalStorage enterprise storage area network (SAN) infrastructure simplification and business continuity solutions can be created with the IBM TotalStorage SAN140M director. Infrastructure simplification solutions for IBM System i, System p, and System x Fibre

---

MORE ON THE WEB

- SAN140M info on PartnerWorld
- SAN140M info on IBM.com

Channel servers and IBM System z mainframe FICON servers include storage consolidation and highest-availability server clustering with IBM TotalStorage DS4000 series and disk storage arrays. Business continuity solutions include data protection with IBM TotalStorage Ultrium 2 Linear Tape-Open (LTO) or IBM TotalStorage 3590 and 3592 Tape Drives and IBM Tivoli Storage Manager data protection software.

Here are some fast SAN140M facts:

- Easy-to-manage enterprise infrastructure simplification and business continuity solutions for IBM System i, System p, System x, and System z

- Highly scalable, 16- to 140-port switching backbone for advanced enterprise infrastructure simplification and business continuity solutions, including mainframe IBM FICON disk and tape storage

- Designed to provide high availability of all IBM SAN switches through redundancy of active components, including hot-swappable processors, fans, and power supplies; HotCAT online code activation; and call-home capability with Enterprise Fabric Connectivity Manager (EFCM) software

- Includes Enterprise Fabric Connectivity Manager, FICON Management Server (CUP), and Open Systems Management Server software designed to help simplify management of complex SAN infrastructures.

SAN256M

A wide range of IBM TotalStorage enterprise storage area network (SAN) infrastructure simplification and business continuity solutions can be created with the IBM TotalStorage SAN256M enterprise director. Infrastructure simplification solutions for IBM System i, System p, and System x Fibre Channel servers and IBM System z mainframe FICON servers include storage consolidation, high availability server clustering, and SAN island consolidation with IBM System Storage DS4000, DS6000, and DS8000 series disk storage.

MORE ON THE WEB
• SAN256M info on PartnerWorld
• SAN256M info on IBM.com

Here are some fast SAN256M facts:

- Easy-to-manage tiered enterprise infrastructure simplification and business continuity solutions for IBM System i, System p, System x and System z servers

- Highly-scalable 64 to 256-port switching backbone for tiered global enterprise storage area networks (SANs)

- Designed to provide high availability with concurrent hardware and firmware upgrades and call-home with McDATA Enterprise Fabric Connectivity Manager, EFCM

- Director LPAR and Open VSAN, designed to provide dynamic application network provisioning, can help simplify Fibre Channel and mainframe IBM FICON SAN consolidation

- Helps to provide global business continuity solutions with 10 Gigabit per second (Gbps) links up to 190 km

- EFCM and FICON Management Server (CUP) software can help simplify management of complex SAN infrastructures.

SANC40M

The IBM TotalStorage SANC40M cabinet provides vertical space for a 1U rack mount management server and 39U for IBM TotalStorage m-type (McDATA) directors and switches, while occupying only seven square feet (0.7 square meter) of valuable floor space. The cabinet supports internal cable management for up to 512 fiber cables and includes a 24-port Ethernet.

Its design provides required airflow and power for high-availability operation. The cabinet comes complete with 28 in-dividual power connections or 14 power connections with dual independent power distri-bution and dual line cords. The cabinet supports up to two IBM TotalStorage SAN256M directors; three IBM TotalStorage SAN140M directors; or a combination of up to 14 high-availability, dual power-connected IBM TotalStorage SAN m-type switches and directors.

> **MORE ON THE WEB**
>
> - SANC40M info on PartnerWorld
> - SANC40M info on IBM.com

Here are some fast SANC40M facts:

- Space-saving cabinet for IBM TotalStorage SAN m-type (McDATA) directors and switches

- Dual power distribution system designed for high availability

- Space for 1U rack mount management server and 39U for directors and switches

- Future-ready design

- Flexible configuration options.

Cisco MDS

The Cisco MDS 9000 family provides midrange switches and enterprise directors.

Cisco MDS 9124

The Cisco MDS 9124 Express for IBM System Storage is designed to address the needs of small- and medium-size businesses with a wide range of SAN capabilities. It can be used as part of SAN solutions from simple single-switch configurations to larger multi-switch configurations in support of fabric connectivity and advanced business continuity capabilities. Fabric connectivity capabilities can be the basis for infrastructure simplification solutions for IBM System i, System p, and System x servers and storage consolidation and high-availability server clustering with IBM System Storage disk storage arrays. Business continuity capabilities can help businesses protect valuable data with IBM System Storage tape libraries and devices and IBM Tivoli Storage Manager data protection software.

Here are some fast MDS 9124 facts:

MORE ON THE WEB
• MDS 9124 info on PartnerWorld
• MDS 9124 info on IBM.com

- Foundation for new infrastructure simplification and business continuity solutions for servers running Microsoft Windows, UNIX, Linux, NetWare, and IBM OS/400 operating systems

- High-performance 1, 2, and 4 Gigabit per second links with pay-as-you-grow scalability enable growth from 8 to 16 to 24 ports

- Designed for high availability with hot-swappable, dual power supplies and non-disruptive firmware upgrades

- Cisco MDS 9000 family compatibility supports scalability and consistent service as the SAN grows

- Enterprise Package and Fabric Manager Server Package provide added intelligence and value.

MDS 9134

The Cisco MDS 9134 for IBM System Storage is designed to address the needs of medium-size businesses and large enterprises with a wide range of storage area network (SAN) capabilities. It can be used as part of a high performance simple SAN with single-switch or stacked switch configurations for business-class customers in support of IT simplification and business continuity solutions. It can also be used as an edge switch for device aggregation with 10 Gbps core director configurations for large enterprise customers.

Fabric connectivity capabilities can be the basis for IT simplification solutions for IBM System i, System p, System x and System z servers and storage consolidation and high availability server clustering with IBM System Storage disk storage arrays. Business continuity capabilities can help businesses protect

MORE ON THE WEB

- MDS 9134 info on PartnerWorld
- MDS 9134 info on IBM.com

valuable data with IBM System Storage tape libraries and IBM Tivoli Storage Manager data protection software. Advanced connectivity capabilities can help businesses protect against major disasters with IBM System Storage disk metro and global mirroring disaster recovery solutions.

Here are some fast MDS 9134 facts:

- Simple-to-use 4 and 10 Gigabit per second performance for simplification and business continuity solutions with Windows, UNIX, Linux, NetWare, IBM OS/400, and IBM z/OS servers

- Cost-effective "green" switch requires up to 50 percent less power per port

- Stackable design provides pay-as-you-grow scalability and flexibility with On-Demand port activation features

- Designed to support high availability with redundant, hot swappable power supplies and fans and non-disruptive firmware upgrades

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, Mainframe and Fabric Manager Server Packages provide added intelligence and value.

MDS 9216A

The Cisco MDS 9216A for IBM System Storage provides 1, 2, and 4 Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance, and manageability required to consolidate geographically

dispersed storage devices into a large enterprise SAN. Administrators can use the Cisco MDS 9216A to help address the needs

> **MORE ON THE WEB**
>
> • MDS 9216A info on PartnerWorld
>
> • MDS 9216A info on IBM.com

for high performance and reliability in SAN environments ranging from small workgroups to very large, integrated global enterprise SANs.

Here are some fast MDS 9216A facts:

- Supports Fibre Channel throughput of up to 4 gigabits per second (Gbps) per port and up to 64 Gbps with each port channel Inter-Switch Link (ISL) connection

- Offers scalability from 16 to 64 Fibre Channel ports

- Offers 10 Gbps ISL ports for inter-data center links over metro optical networks

- Features modular design with excellent availability capabilities

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, SAN Extension over IP, Mainframe, Storage Services Enabler, and Fabric Manager Server packages provide added intelligence and value.

MDS 9216i

The Cisco MDS 9216i for IBM System Storage provides 1, 2, and 4 Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance,

and manageability required to consolidate geographically dispersed storage devices into a large enterprise SAN. Administrators can use the Cisco MDS 9216i to help address the needs for high performance and reliability in SAN environments ranging from small workgroups to very large, integrated global enterprise SANs.

Here are some fast MDS 9216i facts:

- Supports Fibre Channel throughput of up to 4 Gbps per port and up to 64 Gbps with each port channel inter-switch for IBM System Storage Link (ISL) connection

- Offers integrated 14 Fibre Channel ports and two Gigabit Ethernet (GbE) IP ports for iSCSI or FCIP connectivity over global networks

- Offers 10 Gbps ISL ports for inter-data center links over metro optical networks

- Features modular design with excellent availability capabilities

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, SAN Extension over IP, Mainframe Storage Services Enabler, and Fabric Manager Server packages provide added intelligence and value.

MDS 9222i

The Cisco MDS 9222i for IBM System Storage is designed to address the needs of medium-size businesses and large enterprises with a wide range of storage area network (SAN) capabilities. It can be used as a cost-effective high performance SAN extension over IP router switch for midrange SMB customers in support of IT simplification and business continuity solutions. It can also be used for remote site device aggregation and SAN extension connectivity to large customer data center directors. A wide range of IBM System Storage mid-range and enterprise storage area network (SAN) IT simplification and business continuity solutions can be created with the Cisco MDS 9222i for IBM System Storage multiservice modular switch. IT simplification solutions for IBM System i, System p, System x, and System z servers include storage consolidation and high-availability server clustering with IBM System Storage disk storage arrays.

MORE ON THE WEB

- MDS 9222i info on PartnerWorld
- MDS 9222i info on IBM.com

Here are some fast MDS 9222i facts:

- Multiservice design for high performance business continuity solutions with Windows, UNIX, Linux, NetWare, IBM OS/400, and IBM z/OS servers

- Cost-effective "green" switch design requires up to 27 percent less power per port

- Modular design provides scalability and configuration flexibility

- Excellent availability with redundant, hot swappable components and non-disruptive firmware upgrades

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, Mainframe, and Fabric Manager Server Packages provide added intelligence and value.

MDS 9506

The Cisco MDS 9506 for IBM System Storage supports 1, 2, and 4 Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance, and manageability required to consolidate geographically dispersed storage devices into a large-enterprise SAN. The Cisco MDS 9506 for IBM System Storage utilizes two Supervisor-2 Modules designed for high availability and performance. The Supervisor-2 Module combines an intelligent control module and a high-performance cross-bar switch fabric in a single unit. It uses Fabric Shortest Path First (FSPF) multi-path routing, which provides intelligence to load balance across a maximum of 16 equal-cost paths and to dynamically reroute traffic if a switch fails.

> **MORE ON THE WEB**
> - MDS 9506 info on PartnerWorld
> - MDS 9506 info on IBM.com

Here are some fast MDS 9506 facts:

- Provides Fibre Channel throughput of up to 4 Gbps per port and up to 64 Gbps with each port channel inter-switch link connection

- Offers scalability from 12 to 192 Fibre Channel ports

- Offers 10 Gbps ISL ports for inter-data center links over metro optical networks

- Offers Gigabit Ethernet IP, GbE ports for iSCSI, or FCIP connectivity over global networks

- High-availability design with support for non-disruptive firmware upgrades

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, SAN Extension over IP, Mainframe, and Storage Services Enabler and Fabric Manager Server Packages provide added intelligence and value.

MDS 9509

The Cisco MDS 9509 for IBM System Storage provides 1, 2, and 4 Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance, and manageability required to consolidate geographically dispersed storage devices into a large enterprise SAN. The Cisco MDS 9509 for IBM System Storage utilizes two Supervisor-2 Modules designed to support high availability and performance. The Supervisor-2 Module combines an intelligent control module and a high-performance crossbar switch fabric in a single unit. It uses Fabric Shortest Path First (FSPF)

MORE ON THE WEB

- MDS 9509 info on PartnerWorld
- MDS 9509 info on IBM.com

multipath routing, which supports load balancing across a maximum of 16 equal-cost paths designed to dynamically re-route traffic if a switch fails.

Here are some fast MDS 9509 facts:

- Provides Fibre Channel throughput of up to 4 Gbps per port and up to 64 Gbps with each port channel inter-switch link connection

- Offers scalability from 12 to 336 4 Gbps Fibre Channel ports

- Offers 10 Gbps ISL ports for inter-data center links over metro optical networks

- Offers Gigabit Ethernet IP (GbE) ports for iSCSI or FCIP connectivity over global networks

- High-availability design with support for non-disruptive firmware upgrades

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric

- Enterprise, SAN Extension over IP, Mainframe and Storage Services Enabler and Fabric Manager Server Packages provide added intelligence and value.

MDS 9513

The Cisco MDS 9513 for IBM System Storage supports 1, 2, and 4 Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance, and manageability required to consolidate dispersed SAN

islands into a large enterprise SAN. The Cisco MDS 9513 for IBM System Storage utilizes two Supervisor-2 Modules de-

signed to support high availability. The Supervisor-2 Module is designed to provide industry leading scalability, intelligent SAN services, non-disruptive software upgrades, stateful process restart, failover, and redundant operation. Dual crossbar switching fabric modules provide a total internal switching bandwidth of 2.4 Tbps for interconnection of up to 11 Fibre Channel switching modules.

Here are some fast MDS 9513 facts:

- Provides Fibre Channel throughput of up to 4 Gbps per port and up to 64 Gbps with each port channel inter-switch link connection

- Offers scalability from 12 to 528 4 Gbps Fibre Channel ports

- Offers 10 Gbps ISL ports for inter-data center links over metro optical networks

- Offers Gigabit Ethernet (GbE) IP ports for iSCSI or FCIP connectivity over global networks

- High-availability design with support for non-disruptive firmware upgrades

- Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN "islands" on a single physical fabric

- Enterprise, SAN Extension over IP, Mainframe, Storage Services Enabler, and Fabric Manager Server Packages provide added intelligence and value.

Storage Software

Bringing together the best in infrastructure management, virtualization, and productivity software, IBM storage software utilizes the best in storage technology to answer your information on demand

> **MORE ON THE WEB**
>
> - Browse all IBM Storage software on IBM.com

needs. In this section, we will examine some of the key storage software offerings.

Tivoli Storage Manager

IBM Tivoli Storage Manager is part of a robust family of products that delivers a single point of control and administration for your storage management needs, helping to increase the efficiency of your IT operations and control costs related to storage management. This advanced, scalable product helps take the complexity out of storage management, performing a variety of tasks through policy-based automation.

Tivoli Storage Manager delivers centralized, Web-based administration and intelligent data move-and-store techniques to ease storage management. The product scales from small to very large installations, works with devices from

> **MORE ON THE WEB**
>
> - Tivoli Storage Manager info on PartnerWorld
> - Tivoli Storage Manager info on IBM.com

PCs to UNIX servers to mainframes, and supports more than 50 operating system versions and hundreds of devices. It also facilitates a multitude of connections, including Internet, wide area networks (WANs), local area networks (LANs) and storage area networks (SANs).

Here are some fast Tivoli Storage Manager facts:

- Increases business continuity by shortening backup and recovery times and maximizing application availability with advanced data restoration technology

- Employs a hierarchy of storage to increase efficiencies and conserve resources

- Enhances data security with innovative security features

- Helps manage change within the IT infrastructure to minimize service disruptions and speed restorations and backups

- Helps control storage management costs with ease-of-use features and integration with IBM NAS products.

TotalStorage Productivity Center

IBM TotalStorage Productivity Center can help you manage the capacity utilization of storage systems, file systems, and databases and automate file-system capacity provisioning, perform device configuration and management of multiple devices from a single user interface, tune and proactively manage the performance of storage devices on the storage area network (SAN) and manage, monitor, and control your SAN fabric.

IBM TotalStorage Productivity Center is an integrated suite that includes a single user interface to manage capacity, storage networks, storage systems, and replication services. Productivity Center provides both role-based administration and single-sign-on capabilities. Additionally, the suite is designed to provide the foundation for storage service level management by offering storage system and SAN performance and availability management. This includes connectivity reporting between file systems and physical disk as well as SAN and disk subsystem failure and audit logging. IBM TotalStorage Productivity Center suite of products includes: Productivity Center for Fabric, Productivity Center for Data, Productivity Center for Disk, Productivity Center for Replication, and Productivity Center Basic Edition.

Here are some fast Productivity Center facts:

- Helps centralize the management of your storage infrastructure from a single interface using role-based administration and single sign-on

- Provides a single management application with modular integrated components that are easy to install and provides common services for simple/consistent configuration and consistent operations across host, fabric, and storage systems

- Allows you to manage performance and connectivity from the host file system to the physical disk, including in-depth performance monitoring and analysis on SAN fabric performance.

Grid Access Manager

IBM System Storage Multilevel Grid Access Manager Software enables customers with single or multiple sites and with fixed content/reference data storage requirements to improve storage utilization and investment across sites via an enterprise-wide, fault-tolerant storage grid with real time failover capabilities.

Grid Access Manager Software can help protect enterprise data via the use of automated replication, lifecycle management, and digital signature functionality. The need to retain massive volumes of business critical fixed-content data for long periods of time is presenting new data and storage management challenges for IT. Users continue to demand fast performance as well as higher and broader availability of enterprise data. Massive data volumes combined with long retention periods require storage administrators to deliver a cost effective storage strategy that meets the user's needs, protects valuable data, scales on demand, simplifies data migration, and automates recovery from both planned and unplanned downtime.

> **MORE ON THE WEB**
>
> • Grid Access Manager info on PartnerWorld
> • Grid Access Manager info on IBM.com

Here are some fast Grid Access Manager facts:

- Simplified management and improved storage utilization, with excellent performance

- Data protection and improved business continuity

- Support for global access, multi-site operation

General Parallel File System

The IBM General Parallel File System (GPFS) is a high-performance shared-disk file management solution that provides fast, reliable access to a common set of file data from two computers to hundreds of systems. GPFS integrates into your environment by bringing together mixed server and storage components to provide a common view to enterprise file data.

GPFS provides online storage management, scalable access, and integrated information lifecycle tools capable of managing petabytes of data and billions of files. The proven GPFS file management infrastructure provides the foundation for optimizing the use of your computing resources.

Here are some fast Parallel File System facts:

- Scalable high-performance shared disk file system for AIX and Linux systems

- Capable of supporting multi-petabytes of storage and thousands of disks within a single file system

- High reliability/availability through redundant paths and automatic recovery from node and disk failures

- Information lifecycle management (ILM) tools simplify data management and enhance administrative control

- Powers many of the world's largest supercomputers.

Storage Services

IBM System Storage also offers a portfolio of services as part of a complete solution portfolio. We will cover some such services in this section.

Data Mobility Services (Softek TDMF, LDMF, DCM, Replicator)

To support the IT needs of your dynamic business, you need the ability to move data with ease—whether for storage consolidation or optimization, performing non-disruptive backups, replicating data for disaster recovery, or creating remote archives for data protection. You need to perform all of these activities with minimal disruption. With IBM's Data Mobility Solutions—integrated products and services that combine Softek technology and IBM's 30 years of experience in data migration—you can simplify data movement across heterogeneous environments, centralize management in multi-vendor environments, and achieve greater visibility and control with integrated tools and services.

> **MORE ON THE WEB**
>
> - Data Mobility info on PartnerWorld
> - Data Mobility info on IBM.com

Storage and Data Transformation Services

In 2007, IBM acquired NovusCG, a privately held storage solutions company. The combined capabilities of IBM Storage and Data Services and Novus provide clients improved access to business information, enable stronger regulatory and cor-

porate compliance, and boost their overall information technology performance.

With Novus IBM offers the methodologies and software to enable organizations to better understand their storage environments while helping clients achieve operational efficiency. Novus is able to determine customer storage environment complexity and provides a roadmap for reduction with standardized processes and procedures for generating and implementing a corporate wide storage architecture. With best in class IP and best practices, GTS helps clients with enterprise wide reporting on utilization, cost, chargeback data by line of business, along with storage assessment and reporting linked to key business applications, and assessment of legal and IT compliance.

MORE ON THE WEB

- Press Release: IBM Acquires NovusCG
- Storage optimization and integration services: literature

About the Editor

Jim Hoskins is the founder of Maximum Press, a premier publisher of books, ebooks, and rich media that help businesses apply technology profitably. Jim has been involved with computer technology design, implementation, and education for over 25 years. He is the author of many articles and books covering a wide range of technology and Internet business topics. Jim spent a decade with IBM designing computer systems and directly helping businesses of all sizes design and implement real-world solutions. He is the author/editor of the popular *Exploring IBM* series which has sold over 350,000 copies in 12 languages. Jim has a degree in electrical engineering from the University of Florida and resides in Gulf Breeze, Florida, with his wife and five children. You can reach Jim via e-mail at jimh@maxpress.com.

Appendix A: DS3000 Machine Type/ Part Number Cross Reference

MORE ON THE WEB

- DS3000 Interoperability Matrix

DS3000 Storage Controllers and Expansion Units

Description	PN/SEO ID	MTM	FC
DS3200 SAS Storage Controllers			
IBM System Storage DS3200 (Single controller)	172621X	1726-HC2	2603
IBM System Storage DS3200 (Dual controller)	172622X	1726-HC2	2604
IBM System Storage DS3200 DC Power Model (Dual controller)[1]	172622T	1726-HC6	2627
IBM System Storage DS3200 Express Model (Single controller)[2]	172621E	N/A	N/A
IBM System Storage DS3200 Express Model (Dual controller)[3]	172622E	N/A	N/A
DS3300 iSCSI Storage Controllers			
IBM System Storage DS3300 (Single controller)	172631X	1726-HC3	2618
IBM System Storage DS3300 (Dual controller)	172632X	1726-HC3	2619
IBM System Storage DS3300 Express Model (Single controller)[4]	172631E	N/A	N/A
IBM System Storage DS3300 Express Model (Dual controller)[4]	172632E	N/A	N/A
DS3400 FC Storage Controllers			
IBM System Storage DS3400 (Single controller)	172641X	1726-HC4	2605
IBM System Storage DS3400 (Dual controller)	172642X	1726-HC4	2606
IBM System Storage DS3400 DC Power Model (Dual controller)	172642T	1726-HC8	2626
IBM System Storage DS3400 Express Model	172641E	N/A	N/A

(Single controller)[5]			
IBM System Storage DS3400 Express Model (Dual controller)[6]	172642E	N/A	N/A
IBM System Storage DS3400 (Single controller) Simple SAN Express Kit	172641U	N/A	N/A
IBM System Storage DS3400 (Dual controller) Simple SAN Express Kit	172642U	N/A	N/A
EXP3000 Expansion Units			
IBM System Storage EXP3000 (Single Environmental	172701X	1727-HC1	2676

Footnotes

1 Two SAS 2 port daughter cards (39R6509) included with DS3200 DC Power Model

2 DS3200 Single Controller Express Model (1726-21E) contains one DS3200 SAS Single Controller Model (1726-21X), one SAS HBA Controller (25R8060), and one 3m SAS Cable (39R6531)

3 DS3200 Dual Controller Express Model (1726-22E) contains one DS3200 SAS Dual Controller Model (1726-22X), two SAS HBA Controllers (25R8060), and two 3m SAS Cables (39R6531)

4 Includes one IBM Qlogic iSCSI Single Port PCI-e HBA (39Y6146)

5 DS3400 Single Controller Express Model (1726-41E) contains one DS3400 FC Single Controller Model (1726-41X), two 5M Fiber Optic Cables LC-LC (39M5697), and two 4-Gbps SW SFP Transceivers (39R6475)

6 DS3400 Dual Controller Express Model (1726-42E) contains one DS3400 FC Dual Controller Model (1726-42X), four 5M Fiber Optic Cables LC-LC (39M5697), and four 4-Gbps SW SFP Transceivers (39R6475)

7 Expand a single controller DS3200 or DS3400 using an EXP3000 with a single Environmental Services Module (ESM) EXP3000 and a dual controller DS3200 or DS3400 using an EXP3000 with two ESMs

Appendix B: DS4000 Machine Type/ Part Number Cross Reference

DS4100 1SC

Model Type/ Feature	Part Number	Description
	17241SC	DS4100 STORAGE SERVER SINGLE CONTROLLER
	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
	19K1271	SHORT WAVE SFP GBBIC
	19K1272	LONG WAVE SFP GBIC
	39M4570	SATA 400 GB/7200 RPM DRIVE MODULE
	39M5950	DS4100 SCU TO DCU UPGRADE
	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
	19K1250	LC/SC 50U FIBER CABLE ADAPTER
	24P8997	DS4100 FLASHCOPY
	25R0051	DS4100 INTEL PACK
	25R0060	DS4100 LINUX/INTEL HOST KIT
	25R0061	DS4100 NOVELL NETWARE HOST KIT
	25R0062	DS4100 VMWARE HOST KIT
	25R0066	DS4100 SUN HOST KIT
	25R0069	DS4100 HP HOST KIT
	25R0137	DS4100 LINUX FOR POWER HOST KIT
	25R0072	DS4100 4-STORAGE PARTITION ACTIVATION
	25R0074	DS4100 8-STORAGE PARTITION ACTIVATION
	25R0077	DS4100 16-STORAGE PARTITION ACTIVATION
	25R0080	DS4100 4 TO 8 STORAGE PARTITION UPGRADE
	25R0081	DS4100 8 TO 16 STORAGE PARTITION UPGRADE

DS4100

Model Type/ Feature	Part Number	Description
1724-100	1724100	DS4100 STORAGE SERVER
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBBIC
2220	19K1272	LONG WAVE SFP GBIC
4603	39M4570	SATA 400 GB/7200 RPM DRIVE MODULE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
5702	19K1250	LC/SC 50U FIBER CABLE ADAPTER
7351	24P8997	DS4100 FLASHCOPY
7353	39M5720	DS4100 VOLUMECOPY
7354	39M5719	DS4100 FLASHCOPY/VOLUMECOPY
7355	39M5602	DS4100 ENH. REMOTE MIRROR
7369	25R0213	DS4100 4TH-7TH EXP100 ATTACH
7600	25R0051	DS4100 INTEL PACK
7701	25R0060	DS4100 LINUX/INTEL HOST KIT
7702	25R0061	DS4100 NOVELL NETWARE HOST KIT
7703	25R0062	DS4100 VMWARE HOST KIT
7711	25R0063	DS4100 AIX HOST KIT
7712	25R0066	DS4100 SUN HOST KIT
7713	25R0069	DS4100 HP HOST KIT
7714	25R0137	DS4100 LINUX FOR POWER HOST KIT
8804	25R0072	DS4100 4-STORAGE PARTITION ACTIVATION
8808	25R0074	DS4100 8-STORAGE PARTITION ACTIVATION
8816	25R0077	DS4100 16-STORAGE PARTITION ACTIVATION
8848	25R0080	DS4100 4 TO 8 STORAGE PARTITION UPGRADE
8849	25R0081	DS4100 8 TO 16 STORAGE PARTITION UPGRADE
9201	N/A	PLANT INTEGRATE INTO 2101-200 RACK SYSTEM
9202	N/A	FIELD INTEGRATE

DS4300 6LU

Model Type/Feature	Part Number	Description
1722-6LU	17226LU	DS4300 STORAGE SERVER SINGLE CONTROLLER
2011	24P8963	DS4300 MODEL 6LU UPGRADE
2012	24P8964	DS4300 MODEL 6LU TURBO UPGRADE
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBBIC
2220	19K1272	LONG WAVE SFP GBIC
5206	06P5762	2 GBPS FC, 73.4 GB/10K DRIVE
5207	32P0765	2 GBPS FC, 146.8 GB/10K DRIVE
5208	73P8005	2 GBPS FC, 300 GB/10K DRIVE
5212	06P5772	2 GBPS FC, 36.4 GB/15K DRIVE
5213	32P0768	2 GBPS FC, 73.4 GB/15K DRIVE
5214	73P8022	2 GBPS FC, 146.8 GB/15K DRIVE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
5702	19K1250	LC/SC 50U FIBER CABLE ADAPTER
7351	24P8217	DS4300 FLASHCOPY
7600	24P8067	DS4300 INTEL PACK
7701	24P8068	DS4300 LINUX/INTEL HOST
7702	24P8069	DS4300 NOVELL NETWARE HOST
7703	24P8070	DS4300 VMWARE HOST KIT
7712	24P8073	DS4300 SUN HOST KIT
7713	24P8074	DS4300 HP-UX HOST KIT
7714	25R0091	DS4300 LINUX FOR POWER HOST
7719	24P8072	DS4300 AIX HOST KIT (only with upgrade to 1722-60U)
8102	39M5711	DS4300 IBD FOR EXCHANGE
8804	24P8075	DS4300 4-STORAGE PARTITION AC
8808	24P8157	DS4300 8-STORAGE PARTITION AC
8816	24P8221	DS4300 16-STORAGE PARTITION AC
8848	24P8154	DS4300 4 TO 8 STORAGE PARTITION
8851	24P8223	DS4300 UPGRADE FROM 8 TO 16
8850	24P8224	DS4300 W/TURBO 16 TO 64 ST
8863	24P8222	DS4300 W/TURBO 8 TO 64 ST

DS4300

Model Type/ Feature	Part Number	Description
1722-60U	172260U	DS4300 STORAGE SERVER DUAL CONTROLLER
2000	n/a	DS4300 TURBO FEAT-IPO (see DS4300 Turbo tab)
2010	24P8216	DS4300 TURBO FEATURE-MES
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBBIC
2220	19K1272	LONG WAVE SFP GBIC
5206	06P5762	2 GBPS FC, 73.4 GB/10K DRIVE
5207	32P0765	2 GBPS FC, 146.8 GB/10K DRIVE
5208	73P8005	2 GBPS FC, 300 GB/10K DRIVE
5212	06P5772	2 GBPS FC, 36.4 GB/15K DRIVE
5213	32P0768	2 GBPS FC, 73.4 GB/15K DRIVE
5214	73P8022	2 GBPS FC, 146.8 GB/15K DRIVE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
5702	19K1250	LC/SC 50U FIBER CABLE ADAPTER
7351	24P8217	DS4300 FLASHCOPY
7353	24P8218	DS4300 VOLUMECOPY
7354	24P8219	DS4300 FLASH/VOLUME COPY
7356	25R0169	DS4300 ENCLOSURE INTERMIX
7360	24P8066	DS4300 TWO EXP700 ATTACH
7361	24P8149	DS4300 1ST EXP700 ATTACH
7362	24P8151	DS4300 2ND EXP 700 ATTACH
7363	24P8183	DS4300 3RD EXP700 ATTACH
7368	24P8180	DS4000 THREE EXP700 ATTACH
7600	24P8067	DS4300 INTEL PACK
7701	24P8068	DS4300 LINUX/INTEL HOST
7702	24P8069	DS4300 NOVELL NETWARE HOST
7703	24P8070	DS4300 VMWARE HOST KIT
7711	24P8072	DS4300 AIX HOST KIT
7712	24P8073	DS4300 SUN HOST KIT
7713	24P8074	DS4300 HP-UX HOST KIT
7714	25R0091	DS4300 LINUX FOR POWER HOST
8102	39M5711	DS4300 IBD FOR EXCHANGE
8804	24P8075	DS4300 4-STORAGE PARTITION AC
8808	24P8157	DS4300 8-STORAGE PARTITION AC
8816	24P8221	DS4300 16 STORAGE PARTITION AC
8848	24P8154	DS4300 4 TO 8 STORAGE PARTITION AC
8849	24P8223	DS4300 UPGRADE FROM 8 TO 16
9201	N/A	PLANT INTEGRATE INTO 2101-200 RACK SYSTEM
9202	N/A	FIELD INTEGRATE

DS4300 Turbo

Model Type/ Feature	Part Number	Description
1722-60U		
w/FC#2000	24P8215	DS4300 TURBO FEAT—FACTORY INSTALL
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBBIC
2220	19K1272	LONG WAVE SFP GBIC
5206	06P5762	2 GBPS FC, 73.4 GB/10K DRIVE
5207	32P0765	2 GBPS FC, 146.8 GB/10K DRIVE
5208	73P8005	2 GBPS FC, 300 GB/10K DRIVE
5212	06P5772	2 GBPS FC, 36.4 GB/15K DRIVE
5213	32P0768	2 GBPS FC, 73.4 GB/15K DRIVE
5214	73P8022	2 GBPS FC, 146.8 GB/15K DRIVE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
5702	19K1250	LC/SC 50U FIBER CABLE ADAPTER
7351	24P8217	DS4300 W/TURBO FLASHCOPY
7353	24P8218	DS4300 W/TURBO VOLUMECOPY
7354	24P8219	DS4300 W/TURBO FLASH/VOLUME COPY
7355	25R0168	DS4300 W/TURBO ENHANCED MIRROR
7356	25R0169	DS4300 ENCLOSURE INTERMIX
7360	24P8066	DS4300 TWO EXP700 ATTACH
7361	24P8149	DS4300 1ST EXP700 ATTACH
7362	24P8151	DS4300 2ND EXP 700 ATTACH
7363	24P8183	DS4300 3RD EXP700 ATTACH
7368	24P8180	DS4000 THREE EXP700 ATTACH
7600	24P8067	DS4300 INTEL PACK
7701	24P8068	DS4300 LINUX/INTEL HOST
7702	24P8069	DS4300 NOVELL NETWARE HOST
7703	24P8070	DS4300 VMWARE HOST KIT
7711	24P8072	DS4300 AIX HOST KIT
7712	24P8073	DS4300 SUN HOST KIT
7713	24P8074	DS4300 HP-UX HOST KIT
7714	25R0091	DS4300 LINUX FOR POWER HOST
8102	39M5711	DS4300 IBD FOR EXCHANGE
8849	24P8223	DS4300 UPGRADE FROM 8 TO 16
8850	24P8224	DS4300 W/TURBO 16 TO 64 ST
8864	24P8222	DS4300 W/TURBO 8 TO 64 ST
9201	N/A	PLANT INTEGRATE INTO 2101-200 RACK SYSTEM
9202	N/A	FIELD INTEGRATE

DS4400

Model Type/ Feature	Part Number	Description
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBBIC
2220	19K1272	LONG WAVE SFP GBIC
3507	19K1269	DS4400 MINI-HUB
5601	19K1247	1M LC-LC FIBRE OPTIC CABLE
5605	19K1248	5M LC-LC FIBRE OPTIC CABLE
5625	19K1249	25M LC-LC FIBRE OPTIC CABLE
5702	19K1250	LC-SC FIBRE CHANNEL ADAPTER
7201	19K1294	DS4000 FLASHCOPY ACTIVATION
7203	24P8230	DS4400 VOLUMECOPY ACT
7204	24P8231	DS4400 FLASH/VOLUMECOPY ACT
7205	25R0165	DS4400 ENHANCED REMOTE MIRROR
7206	25R0170	DS4400 FC/SATA ENCLOSURE INTERMIX
8102	39M5713	DS4300 IBD FOR EXCHANGE
9201	N/A	PLANT INTEGRATE INTO 2101-200 RACK SYSTEM
9202	N/A	FIELD INTEGRATE

DS4500

Model Type/ Feature	Part Number	Description
1742-90U	174290U	DS4500 STORAGE SERVER
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2210	19K1271	SHORT WAVE SFP GBIC
2220	19K1272	LONG WAVE SFP GBIC
3507	19K1269	DS4000 2 GBPS MINI HUB
5601	19K1247	1M LC-LC FIBRE OPTIC CABLE
5605	19K1248	5M LC-LC FIBRE OPTIC CABLE
5625	19K1249	25M LC-LC FIBRE OPTIC CABLE
5702	19K1250	LC-SC FIBRE CHANNEL ADAPTER
7111	24P7981	DS4500 AIX HOST KIT
7112	24P7982	DS4500 SUN HOST KIT
7113	24P7983	DS4500 HP-UX HOST KIT
7714	25R0103	DS4500 LINUX FOR POWER HOST
7301	24P7985	DS4000 FLASHCOPY ACTIVATION
7303	24P8227	DS4500 VOLUMECOPY ACT
7304	24P8228	DS4500 FLASH/VOLUMECOPY ACT
7305	25R0167	DS4500 ENHANCED REMOTE MIRROR
7306	25R0247	DS4500 FC/SATA ENCLOSURE INTERMIX
7664	24P7984	UPGRADE FROM 16 TO 64 PARTITION
8102	39M5713	DS4300 IBD FOR EXCHANGE

DS4700

Model Type/ Feature	Part Number	Description
1814-70A	na	IBM DS4700 Express Model 70 (2 GB cache, 1 GB per Cntrler.)
1814-72A	na	IBM DS4700 Express Model 72 (4 GB cache, 2 GB per Cntrler.)
na	181470H	IBM DS4700 Express Model 70 (2 GB cache, 1 GB per Cntrler.)+Windows Host Kit and 2 Storage Partitions
na	181472H	IBM DS4700 Express Model 72 (4 GB cache, 2 GB per Cntrler.)+Windows Host Kit and 8 Storage Partitions
1814-70S	na	IBM DS4700 Express Model 70-DC Power (2 GB cache, 1 GB per Cntrler.)
1814-72S	na	IBM DS4700 Express Model 72-DC Power (4 GB cache, 2 GB per Cntrler.)
na	181470T	IBM DS4700 Express Model 70-DC Power (2 GB cache, 1 GB per Cntrler.)+Windows Host Kit and 2 Storage Partitions
na	181472T	IBM DS4700 Express Model 72-DC Power (4 GB cache, 2 GB per Cntrler.)+Windows Host Kit and 8 Storage Partitions
2010	42D3306	DS4700 Telco Bezel option
2012	42D3329	DS4700/EXP810 DC Power Cords
2105	39M5894	DS4000 1-pt PCI-X 4 Gbps HBA
2106	39M5895	DS4000 2-pt PCI-X 4 Gbps HBA
2410	26K7941	SW 4 Gbps SFP transcvr pair
4610	39M4554	500 GB/7.2K SATA E-DDM
4615	43W9714	750 GB/7.2K SATA II E-DDM
5221	39M4586	2 Gbps FC, 73.4 GB/10K E-DDM
5222	39M4590	2 Gbps FC, 146.8 GB/10K E-DDM
5223	39M4594	2 Gbps FC, 300 GB/10K E-DDM
5231	40K6800	2 Gbps FC, 36.4 GB/15K E-DDM
5232	40K6804	2 Gbps FC, 73.4 GB/15K E-DDM
5233	40K6808	2 Gbps FC, 146.8 GB/15K E-DDM
5412	40K6812	4 Gbps FC, 36.4 GB/15K E-DDM
5413	40K6816	4 Gbps FC, 73.4 GB/15K E-DDM
5414	40K6820	4 Gbps FC, 146.8 GB/15K E-DDM
5415	42D0410	4 GBPS FC, 300 GB/15K E-DDM
5601	39M5696	1M FIBER OPTIC CABLE LC-LC
5605	39M5697	5M FIBER OPTIC CABLE LC-LC
5625	39M5698	25m Fiber Optic Cable LC-LC
7301	41Y5203	DS4700 FlashCopy
7303	41Y5208	DS4700 VolumeCopy
7304	41Y5212	DS4700 Flash/VolumeCopy
7305	41Y5214	DS4700 Enhanced Remote Mirror
7306	41Y5217	DS4700 FC/SATA Encluding Intemix
7382	41Y5222	DS4700 Model 70 EXPs. Att 1-3
7383	41Y5225	DS4700 Model 70 EXPs. Att 4-6

DS4700

Model Type/Feature	Part Number	Description
7384	41Y0704	DS4700 Model 72 EXPs. Att 4-6
7700	na	DS4700 Windows Host Kit
7701	41Y5178	DS4700 Linux/Intel Host Kit
7702	41Y5180	DS4700 Novell Netware Host
7703	41Y5182	DS4700 VMware ESX Host Kit
7711	41Y5184	DS4700 AIX Host Kit
7712	41Y5186	DS4700 SUN Solaris Host Kit
7713	41Y5188	DS4700 HPUX Host Kit
7714	41Y5190	DS4700 Linux for Power Host
8850	na	DS4700 Model 70 2-Storage IPO
8851	na	DS4700 Model 70 4-Storage IPO
8852	na	DS4700 Model 70 8-Storage IPO
8853	na	DS4700 Model 70 16-Storage IPO
8854	na	DS4700 Model 70 64-Storage IPO
8856	na	DS4700 Model 72 8-Storage IPO
8857	na	DS4700 Model 72 16-Storage IPO
8858	na	DS4700 Model 72 64-Storage IPO
8860	41Y5228	DS4700 2-4 Storage Partition MES
8861	41Y0652	DS4700 2-8 Storage Partition MES
8862	41Y0656	DS4700 4-8 Storage Partition MES
8863	41Y0660	DS4700 4-16 Storage Partition MES
8864	41Y0664	DS4700 8-16 Storage Partition MES
8865	41Y0668	DS4700 8-64 Storage Partition MES
8866	41Y0672	DS4700 16-64 Storage Partition MES

DS4800

Model Type/Feature	Part Number	Description
1815-80A	na	IBM DS4800 Model 80 Disk System (4 GB cache, 2 GB per controller)
na	181580H	IBM DS4800 Model 80 Disk System (4 GB cache, 2 GB per controller) + Windows Host Kit and 8 Storage Partitions
1815-82A	n/a	DS4800 Model 82 3 Yr warranty
n/a	181582H	DS4800 Model 82 3 Yr warranty (8 Prtns, Windows Host Kit)
1815-84A	n/a	DS4800 Model 84 3 Yr warranty
n/a	181584H	DS4800 Model 84 3 Yr warranty (8 Prtns, Windows Host Kit)
1815-88A	n/a	DS4800 Model 88 3 Yr warranty
n/a	181588H	DS4800 Model 88 3 Yr warr. (8 Prtns,Windows Host Kit)
2024	22R4239	Model 82 Cache Upgrade to 8 GB
2025	39M5884	Model 82 Cache Upgrade to 16 GB
2028	39M5885	Model 84 Cache Upgrade to 16 GB
2104	24P0960	DS4000 FC2-133 HOST BUS ADAPTER (for xSeries)
2105	39M5894	DS4000 1-pt PCI-X 4 Gbps HBA
2106	39M5895	DS4000 2-pt PCI-X 4 Gbps HBA
2410	22R4242	4 GB SW SFP pairs
5601	19K1247	1M LC-LC FIBRE OPTIC CABLE
5605	19K1248	5M LC-LC FIBRE OPTIC CABLE
5625	19K1249	25M LC-LC FIBRE OPTIC CABL
7301	22R4244	DS4800 FlashCopy Activation
7303	22R4245	DS4800 VolumeCopy Activation
7304	22R4246	DS4800 FlashCopy/VolumeCopy Activation
7305	22R4247	DS4800 Enhanced Remote Mirror Activation
7306	22R4248	DS4800 FC/SATA Enclosure Intermix Activation
7307	22R6621	DS4800 Model 80 Enhanced Remote Mirror
7386	23R1987	DS4800 Model 80 EXPs Att 8-14
7700	n/a	DS4800 - Windows Host Kit
7701	22R4252	DS4800 - Linux/Intel Host Kit (RedHat ES, SUSE ELS)
7702	22R4253	DS4800 - Novell Netware Host Kit
7703	22R4254	DS4800 - VMware ESX Host Kit
7711	22R4255	DS4800 - AIX Host Kit
7712	22R4256	DS4800 - SUN Solaris Host Kit
7713	22R4257	DS4800 - HPUX Host Kit
7714	22R4258	DS4800 - Linux on Power Host Kit
8102	39M5715	DS4300 IBD FOR EXCHANGE
8870	n/a	8 Storage Partitions
8871	n/a	16 Storage Partitions
8872	n/a	64 Storage Partitions
8880	22R4670	UPGRADE 8-16 Storage Partitions
8881	22R4671	UPGRADE 8-64 Storage Partitions
8882	22R4259	UPGRADE FROM 16-64 Storage Partitions

DSExp

Model Type/ Feature	Part Number	Description
c	181281H	DS4000 EXP810
1812-81S	181281T	IBM System Storage EXP810 Expansion Unit
2010	42D3305	EXP810 Telco Bezel option
2012	42D3329	DS4700/EXP810 DC Power Cords
2410	26K7941	SHORT WAVE 4 GBPS SFP PAIR (2-PACK) LONG WAVE SFP GBIC
4610	39M4554	500 GB/7.2K SATA E-DDM
4615	43W9714	750 GB/7.2K SATA II E-DDM
5221	39M4586	2 GBPS FC, 73.4 GB/10K E-DDM
5222	39M4590	2 GBPS 146.8 GB/10K E-DDM
5223	39M4594	2 GBPS FC, 300 GB/10K E-DDM
5226	N/A	16-Pak 2 Gbps 300 GB/10K FC E-DDM
5231	40K6800	2 GBPS FC, 36.4 GB/15K E-DDM
5232	40K6804	2 GBPS 73.4 GB/15K E-DDM
5233	40K6808	2 GBPS FC, 146.8 GB/15K E-DDM
5412	40K6812	4 Gbps FC, 36.4 GB/15K E-DDM
5413	40K6816	4 Gbps FC, 73.4 GB/15K E-DDM
5414	40K6820	4 Gbps FC, 146.8 GB/15K E-DDM
5415	42D0410	4 GBPS FC, 300 GB/15K E-DDM
5433	N/A	16-Pak 4 Gbps 73.4 GB/15K FC E-DDM
5434	N/A	16-Pak 4 Gbps 146.8 GB/15K FC E-DDM
5435	N/A	16PK 4 GBPS 300 GB/15K E-DDM
5601	39M5696	1M LC/LC 50U FIBER OPTIC CABLE
5605	39M5697	5M LC/LC 50U FIBER OPTIC CABLE
5625	39M5698	25M LC/LC 50U FIBER OPTIC CABLE
1740-710	1740710	DS4000 EXP710
2210	19K1271	SHORT WAVE SFP GBIC
2220	19K1272	LONG WAVE SFP GBIC
3501	25R0166	EXP700 SWITCH ESMS
5206	06P5762	2 GBPS FC, 73.4 GB/10K DRIVE
5207	32P0765	146.8 GB/10K DISK MODULE
5208	73P8005	2 GBPS FC, 300 GB/10K DRIVE
5212	06P5772	2 GBPS FC, 36.4 GB/15K DRIVE
5213	32P0768	73.4 GB/15K DISK MODULE
5214	73P8022	2 GBPS FC, 146.8 GB/15K DRIVE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
5702	19K1250	LC/SC 50U FIBER CABLE ADAPTER

DSExp

Model Type/ Feature	Part Number	Description
1710-10U	171010U	DS4000 EXP100 (Warranty 3 yr 9x5)
N/A	17241XP	DS4000 EXP100 (Warranty 1 yr 24x7)
2210	19K1271	SHORT WAVE SFP GBIC
4603	39M4570	SATA 400 GB/7200 RPM DRIVE MODULE
5601	19K1247	1M LC/LC 50U FIBER OPTIC CABLE
5605	19K1248	5M LC/LC 50U FIBER OPTIC CABLE
5625	19K1249	25M LC/LC 50U FIBER OPTIC CABLE
9006	N/A	ATTACH TO DS4300 (1722-60U)
9009	N/A	ATTACH TO DS4500 (1742-90U)
9201	N/A	PLANT INTEGRATE INTO 2101-200 RACK SYSTEM
9202	N/A	FIELD INTEGRATE EXP100

DSExpress

Model Type/ Feature	Part Number	Description
N/A	17226LJ	DS4300 SINGLE CONTROLLER BUNDLE (NO HDDS)
N/A	172260J	DS4300 DUAL CONTROLLER BUNDLE (10 HDDS)
N/A	172260K	DS4300 DUAL CONTROLLER BUNDLE (NO HDDS)
N/A	172260L	DS4300 TURBO BUNDLE (NO HDDS)
N/A	174071J	DS4000 EXP710 BUNDLE (NO HDDS)
N/A	17241XJ	DS4000 EXP100 BUNDLE 1 yr WARRANTY (NO HDDS)
N/A	171010J	DS4000 EXP100 BUNDLE 3 yr WARRANTY (NO HDDS)
N/A	22R5030	DS4000 73 GB/10K HDD-4 Pack
N/A	22R5031	DS4000 73 GB/15K HDD-4 Pack
N/A	22R5032	DS4000 146 GB/10K HDD-4 Pack
N/A	22R5033	DS4000 146 GB/15K HDD-4 Pack
N/A	22R5034	DS4000 300 GB/10K HDD-4 Pack
N/A	22R5036	DS4000 xSeries HBAs-2 Pack
N/A	23R0285	DS4000 SATA 400 GB/7200 HDD-4 Pack
N/A	18147VH	DS4200 Express Model 7V (2 GB Cache, 1 GB per controller)
N/A	42D0389	DS4200 500 GB SATA EV-DDM
N/A	41Y0743	DS4200 FlashCopy
N/A	41Y0746	DS4200 VolumeCopy
N/A	41Y0738	DS4200 Flash/VolumeCopy
N/A	41Y0739	DS4200 Enhanced Remote Mirror
N/A	39M5954	DS4200 EXP420 Attach 1-3
N/A	39M5957	DS4200 EXP420 Attach 4-6
N/A	39M6009	DS4200 Linux/Intel Host Kit
N/A	39M6041	DS4200 Novell Netware Host
N/A	39M6046	DS4200 VMware ESX Host Kit
N/A	39M6048	DS4200 AIX Host Kit
N/A	41Y5163	DS4200 SUN Host Kit
N/A	41Y0686	DS4200 HPUX Host Kit
N/A	42D3252	DS4200 Linux on Power Host
N/A	42D3254	DS4200 2-4 Storage Partition - Fld
N/A	42D3257	DS4200 2-8 Storage Partition - Fld
N/A	42D3260	DS4200 4-8 Storage Partition - Fld
N/A	42D3263	DS4200 4-16 Storage Partition - Fld
N/A	42D3266	DS4200 8-16 Storage Partition - Fld
N/A	42D3269	DS4200 8-64 Storage Partition - Fld
N/A	42D3272	DS4200 16-64 Storage Partition - Fld
N/A	18128VH	IBM System Storage DS4000 EXP420 Storage Expansion Unit

Appendix C: Tape Machine/Part Number Cross Reference

System Storage—3580 Tape

Machine Type	Machine Model	F/C	SEO ID/ HVEC Part #	Description
IBM TS2240 Tape Drive Model H4S/S4E				
3580	H4S/E4S		3580E4S	IBM TS2240 LTO4 HH SAS Express Seller Tape Drive
3580	H4S/S4E		3580S4E	IBM TS2240 LTO4 HH SAS Tape Drive
3580	H4S/S4E/E4S	5402	95P4711	2 m SAS/Mini-SAS 1x Cable
3580	H4S/S4E/E4S	5406	95P4712	5.5 m SAS/Mini-SAS 1x Cable
3580	H4S/S4E/E4S	5502	95P4713	2 m Mini-SAS/Mini-SAS 1x Cable
3580	H4S/S4E/E4S	5506	95P4714	5.5 m Mini-SAS/Mini-SAS 1x Cable
3580	H4S/S4E/E4S	7003	96P1565	Rack Mount Option including PDU line cord
3580	H4S/S4E/E4S	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3580	H4S/S4E/E4S	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3580	H4S/S4E/E4S	8405	95P4278	Ultrium 4 Data Cartridges 5-pack
3580	H4S/S4E/E4S	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3580	H4S/S4E/E4S	9820	23R7146	2.8m Power Cord 250v France/Germany
3580	H4S/S4E/E4S	9821	23R7147	2.8m Power Cord 250v Denmark
3580	H4S/S4E/E4S	9825	23R7148	2.8m Power Cord 250v UK
3580	H4S/S4E/E4S	9827	23R7149	2.8m Power Cord 250v Israel
3580	H4S/S4E/E4S	9828	23R7150	2.8m Power Cord 250v Switzerland
3580	H4S/S4E/E4S	9829	23R7151	2.8m Power Cord 250v S. Africa
3580	H4S/S4E/E4S	9830	23R7152	2.8m Power Cord 250v Italy
3580	H4S/S4E/E4S	9831	23R7153	2.8m Power Cord 250v Australia
3580	H4S/S4E/E4S	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3580	H4S/S4E/E4S	9834	23R7154	2.8m Power Cord 250v Uruguay/ Argentina
3580	H4S/S4E/E4S	9835	23R7158	2.8 m Power Cord 125v Taiwan
3580	H4S/S4E/E4S	9840	23R7155	2.8m Power Cord 250v China (PRC)
3580	H4S/S4E/E4S	9841	23R6981	2.8m Power Cord 250v Taiwan

3580	H4S/S4E/E4S	9842	23R6982	2.8m Power Cord 125v Japan
3580	H4S/S4E/E4S	9843	23R6983	2.8m Power Cord 250v Japan
3580	H4S/S4E/E4S	9844	23R6984	2.8m Power Cord 250v Korea
3580	H4S/S4E/E4S	9845	23R6985	2.8m Power Cord 250v India
3580	H4S/S4E/E4S	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3580	H4S/S4E/E4S	9847	23R6987	2.8m Power Cord 250v Brazil
3580	H4S/S4E/E4S	9986	23R7143	1.8m Power Cord 125v Chicago

IBM TS2230 Tape Drive Model H3S/S3E

3580	H3S/S3E	3580S3E	IBM TS2230 LTO3 HH SAS Tape Drive
3580	H3S/S3E	5402	95P4711	2m SAS/Mini-SAS 1x Cable
3580	H3S/S3E	5406	95P4712	5.5m SAS/Mini-SAS 1x Cable
3580	H3S/S3E	5502	95P4713	2m Mini-SAS/Mini-SAS 1x Cable
3580	H3S/S3E	5506	95P4714	5.5m Mini-SAS/Mini-SAS 1x Cable
3580	H3S/S3E	7003	96P1565	Rack Mount Option including PDU line cord
3580	H3S/S3E	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3580	H3S/S3E	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3580	H3S/S3E	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3580	H3S/S3E	9820	23R7146	2.8m Power Cord 250v France/Germany
3580	H3S/S3E	9821	23R7147	2.8m Power Cord 250v Denmark
3580	H3S/S3E	9825	23R7148	2.8m Power Cord 250v UK
3580	H3S/S3E	9827	23R7149	2.8m Power Cord 250v Israel
3580	H3S/S3E	9828	23R7150	2.8m Power Cord 250v Switzerland
3580	H3S/S3E	9829	23R7151	2.8m Power Cord 250v S. Africa
3580	H3S/S3E	9830	23R7152	2.8m Power Cord 250v Italy
3580	H3S/S3E	9831	23R7153	2.8m Power Cord 250v Australia
3580	H3S/S3E	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3580	H3S/S3E	9834	23R7154	2.8m Power Cord 250v Uruguay/ Argentina
3580	H3S/S3E	9835	23R7158	2.8m Power Cord 125v Taiwan
3580	H3S/S3E	9840	23R7155	2.8m Power Cord 250v China (PRC)
3580	H3S/S3E	9841	23R6981	2.8m Power Cord 250v Taiwan
3580	H3S/S3E	9842	23R6982	2.8m Power Cord 125v Japan
3580	H3S/S3E	9843	23R6983	2.8m Power Cord 250v Japan
3580	H3S/S3E	9844	23R6984	2.8m Power Cord 250v Korea
3580	H3S/S3E	9845	23R6985	2.8m Power Cord 250v India
3580	H3S/S3E	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3580	H3S/S3E	9847	23R6987	2.8m Power Cord 250v Brazil
3580	H3S/S3E	9986	23R7143	1.8m Power Cord 125v Chicago

IBM TS2340 Tape Drive Model L43/L4X or S43/S4X

3580	L43/L4X	3580L4X	IBM TS2340 LTO4 LVD SCSI Tape Drive	
3580	S43/S4X	3580S4X	IBM TS2340 LTO4 SAS Tape Drive	
3580	S43/S4X	5402	95P4711	2m SAS/Mini-SAS 1x Cable
3580	S43/S4X	5406	95P4712	5.5m SAS/Mini-SAS 1x Cable
3580	S43/S4X	5502	95P4713	2m Mini-SAS/Mini-SAS 1x Cable
3580	S43/S4X	5506	95P4714	5.5m Mini-SAS/Mini-SAS 1x Cable
3580	L43/L4X	5602	23R7133	2.5m VHDCI/HD68 SCSI Cable
3580	L43/L4X	5604	23R7134	4.5m VHDCI/HD68 SCSI Cable
3580	L43/L4X	5610	23R7135	10m VHDCI/HD68 SCSI Cable
3580	L43/L4X, S43/S4X	7003	96P1565	Rack Mount Option including PDU line cord
3580	L43/L4X, S43/S4X	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3580	L43/L4X, S43/S4X	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3580	L43/L4X, S43/S4X	8405	95P4278	Ultrium 4 Data Cartridges 5-pack
3580	L43/L4X, S43/S4X	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3580	L43/L4X, S43/S4X	9820	23R7146	2.8m Power Cord 250v France/Germany
3580	L43/L4X, S43/S4X	9821	23R7147	2.8m Power Cord 250v Denmark
3580	L43/L4X, S43/S4X	9825	23R7148	2.8m Power Cord 250v UK
3580	L43/L4X, S43/S4X	9827	23R7149	2.8m Power Cord 250v Israel
3580	L43/L4X, S43/S4X	9828	23R7150	2.8m Power Cord 250v Switzerland
3580	L43/L4X, S43/S4X	9829	23R7151	2.8m Power Cord 250v S. Africa
3580	L43/L4X, S43/S4X	9830	23R7152	2.8m Power Cord 250v Italy
3580	L43/L4X, S43/S4X	9831	23R7153	2.8m Power Cord 250v Australia
3580	L43/L4X, S43/S4X	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3580	L43/L4X, S43/S4X	9834	23R7154	2.8m Power Cord 250v Uruguay/Argentina
3580	L43/L4X, S43/S4X	9835	23R7158	2.8m Power Cord 125v Taiwan
3580	L43/L4X, S43/S4X	9840	23R7155	2.8m Power Cord 250v China (PRC)
3580	L43/L4X, S43/S4X	9841	23R6981	2.8m Power Cord 250v Taiwan
3580	L43/L4X, S43/S4X	9842	23R6982	2.8m Power Cord 125v Japan
3580	L43/L4X, S43/S4X	9843	23R6983	2.8m Power Cord 250v Japan
3580	L43/L4X, S43/S4X	9844	23R6984	2.8m Power Cord 250v Korea
3580	L43/L4X, S43/S4X	9845	23R6985	2.8m Power Cord 250v India
3580	L43/L4X, S43/S4X	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3580	L43/L4X, S43/S4X	9847	23R6987	2.8m Power Cord 250v Brazil
3580	L43/L4X, S43/S4X	9848	23R7000	Rack to PDU Line Cord
3580	L43/L4X, S43/S4X	9986	23R7143	1.8m Power Cord 125v Chicago

IBM TS2230 Tape Drive Model H3L/L3E

3580	H3L/L3E	3580L3E	IBM TS2230	LTO3 HH LVD SCSI Tape Drive
3580	H3L/L3E	5602	23R7133	2.5m VHDCI/HD68 SCSI Cable
3580	H3L/L3E	5604	23R7134	4.5m VHDCI/HD68 SCSI Cable
3580	H3L/L3E	5610	23R7135	10m VHDCI/HD68 SCSI Cable
3580	H3L/L3E	7003	96P1565	Rack Mount Option including PDU line cord
3580	H3L/L3E	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3580	H3L/L3E	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3580	H3L/L3E	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3580	H3L/L3E	9820	23R7146	2.8m Power Cord 250v France/Germany
3580	H3L/L3E	9821	23R7147	2.8m Power Cord 250v Denmark
3580	H3L/L3E	9825	23R7148	2.8m Power Cord 250v UK
3580	H3L/L3E	9827	23R7149	2.8m Power Cord 250v Israel
3580	H3L/L3E	9828	23R7150	2.8m Power Cord 250v Switzerland
3580	H3L/L3E	9829	23R7151	2.8m Power Cord 250v S. Africa
3580	H3L/L3E	9830	23R7152	2.8m Power Cord 250v Italy
3580	H3L/L3E	9831	23R7153	2.8m Power Cord 250v Australia
3580	H3L/L3E	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3580	H3L/L3E	9834	23R7154	2.8m Power Cord 250v Uruguay/Argentina
3580	H3L/L3E	9835	23R7158	2.8m Power Cord 125v Taiwan
3580	H3L/L3E	9840	23R7155	2.8m Power Cord 250v China (PRC)
3580	H3L/L3E	9841	23R6981	2.8m Power Cord 250v Taiwan
3580	H3L/L3E	9842	23R6982	2.8m Power Cord 125v Japan
3580	H3L/L3E	9843	23R6983	2.8m Power Cord 250v Japan
3580	H3L/L3E	9844	23R6984	2.8m Power Cord 250v Korea
3580	H3L/L3E	9845	23R6985	2.8m Power Cord 250v India
3580	H3L/L3E	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3580	H3L/L3E	9847	23R6987	2.8m Power Cord 250v Brazil
3580	H3L/L3E	9848	23R7000	Rack to PDU Line Cord
3580	H3L/L3E	9986	23R7143	1.8m Power Cord 125v Chicago

IBM 3580 Tape Drive Model L33/L3H

3580	L3H, L33	3580L3H	IBM 3580	LTO3 LVD SCSI Tape Drive
3580	L43/L4X	5602	23R7133	2.5m VHDCI/HD68 SCSI Cable
3580	L43/L4X	5604	23R7134	4.5m VHDCI/HD68 SCSI Cable
3580	L43/L4X	5610	23R7135	10m VHDCI/HD68 SCSI Cable
3580	L43/L4X, S43/S4X	7003	96P1565	Rack Mount Option including PDU line cord
3580	L43/L4X, S43/S4X	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3580	L43/L4X, S43/S4X	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3580	L43/L4X, S43/S4X	9800	23R7141	2.8m Power Cord 125v U.S./Canada

3580	L43/L4X, S43/S4X	9820	23R7146	2.8m Power Cord 250v France/Germany
3580	L43/L4X, S43/S4X	9821	23R7147	2.8m Power Cord 250v Denmark
3580	L43/L4X, S43/S4X	9825	23R7148	2.8m Power Cord 250v UK
3580	L43/L4X, S43/S4X	9827	23R7149	2.8m Power Cord 250v Israel
3580	L43/L4X, S43/S4X	9828	23R7150	2.8m Power Cord 250v Switzerland
3580	L43/L4X, S43/S4X	9829	23R7151	2.8m Power Cord 250v S. Africa
3580	L43/L4X, S43/S4X	9830	23R7152	2.8m Power Cord 250v Italy
3580	L43/L4X, S43/S4X	9831	23R7153	2.8m Power Cord 250v Australia
3580	L43/L4X, S43/S4X	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3580	L43/L4X, S43/S4X	9834	23R7154	2.8m Power Cord 250v Uruguay/Argentina
3580	L43/L4X, S43/S4X	9835	23R7158	2.8m Power Cord 125v Taiwan
3580	L43/L4X, S43/S4X	9840	23R7155	2.8m Power Cord 250v China (PRC)
3580	L43/L4X, S43/S4X	9841	23R6981	2.8m Power Cord 250v Taiwan
3580	L43/L4X, S43/S4X	9842	23R6982	2.8m Power Cord 125v Japan
3580	L43/L4X, S43/S4X	9843	23R6983	2.8m Power Cord 250v Japan
3580	L43/L4X, S43/S4X	9844	23R6984	2.8m Power Cord 250v Korea
3580	L43/L4X, S43/S4X	9845	23R6985	2.8m Power Cord 250v India
3580	L43/L4X, S43/S4X	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3580	L43/L4X, S43/S4X	9847	23R6987	2.8m Power Cord 250v Brazil
3580	L43/L4X, S43/S4X	9848	23R7000	Rack to PDU Line Cord
3580	L43/L4X, S43/S4X	9986	23R7143	1.8m Power Cord 125v Chicago

System Storage - 3573 Tape

Machine Type	Machine Model	F/C	SEO ID/ HVEC Part #	Description
IBM TS3100/TS3200 Tape Libraries				
3573	L2U			TS3100 Tape Library
3573	L4U			TS3200 Tape Library
3573	S42, L2U		3573S42	IBM TS3100 Tape Library w LTO4 HH SAS Tape Drive
3573	S44, L4U		3573S44	IBM TS3200 Tape Library w LTO4 HH SAS Tape Drive
3573	E42, L2U		3573E42	IBM TS3100 Express Seller Tape Library w LTO4 HH SAS Tape Drive
3573	E44, L4U		3573E44	IBM TS3200 Express Seller Tape Library w LTO4 HH SAS Tape Drive
		8147	45E2243	Ultrium 4 Half High SAS Tape Drive
3573	L4U, S44, E44, L4H, S4H, F4H, L34, S34, F3H, L3H	8107	45E2225	3573 Left Upper 4U Magazine

3573	L4U, S44, E44, L4H, S4H, F4H, L34, S34, F3H, L3H	8108	45E2231	3573 Left Lower 4U Magazine
3573	L2U, S42, E42, S4S, S32, F4S, L4S, L3S, F3S. L32	8109	45E2237	3573 Left Side 2U Magazine
3573	L4S, S4S, F4S, L3S, F3S, L32, S32, S42, E42, L4H, S4H, F4H, L3H, F3H, L34, S34, S44, E44, L2U, L4U	5900	45E0381	Transparent LTO Encryption
3573	L4S, S4S, F4S, L3S, F3S, L32, S32, S42, E42, L4H, S4H, F4H, L3H, F3H, L34, S34, S44, E44, L2U, L4U	9900	95P5008	Encryption Configuration
3573	L4H, S4H, F4H, L34, S34, S44, L4U	1901	23R7262	3573 Additional Power Supply
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5400	95P4994	SAS/Mini-SAS 4x Interposer
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5402	95P4711	2m SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5406	95P4712	5.5m SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5500	95P4996	Mini-SAS/Mini-SAS 4x Interposer
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5502	95P4713	2m Mini-SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, S42, S44, L2U, L4U	5506	95P4714	5.5m Mini-SAS/Mini-SAS 1x Cable
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2U, L4U	7002	23R6998	Rack Mount Option including PDU line cord
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2U, L4U	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2U, L4U	8106	23R6999	Additional Right Side Magazine

3573	L4S, S4S, F4S, L4H, S4H, F4H, S42, S44, L2U, L4U	8405	95P4278	Ultrium 4 Data Cartridges 5-pack
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9820	23R7146	2.8m Power Cord 250v France/Germany
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9821	23R7147	2.8m Power Cord 250v Denmark
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9825	23R7148	2.8m Power Cord 250v UK+F206
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9827	23R7149	2.8m Power Cord 250v Israel
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9828	23R7150	2.8m Power Cord 250v Switzerland
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9829	23R7151	2.8m Power Cord 250v S. Africa
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9830	23R7152	2.8m Power Cord 250v Italy
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9831	23R7153	2.8m Power Cord 250v Australia
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9833	23R7145	2.8m Power Cord 250v U.S./Canada

3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9834	23R7154	2.8m Power Cord 250v Uruguay/Argentina
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9835	23R7158	2.8m Power Cord 125v Taiwan
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9840	23R7155	2.8m Power Cord 250v China (PRC)
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9841	23R6981	2.8m Power Cord 250v Taiwan
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9842	23R6982	2.8m Power Cord 125v Japan
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9843	23R6983	2.8m Power Cord 250v Japan
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9844	23R6984	2.8m Power Cord 250v Korea
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9845	23R6985	2.8m Power Cord 250v India
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9847	23R6987	2.8m Power Cord 250v Brazil
3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9848	23R7000	Rack to PDU Line Cord

3573	L4S, S4S, F4S, L32, S32, S42, L4H, S4H, F4H, L34, S34, S44, L2u, L4U	9986	23R7143	1.8m Power Cord 125v Chicago

IBM TS3100/TS3200 Tape Libraries

3573	L2U			TS3100 Tape Library
3573	L4U			TS3200 Tape Library
3573	F4S, L2U	3573F4S		IBM TS3100 Tape Library w LTO4 Fibre Tape Drive
3573	L4S, L2U	3573L4S		IBM TS3100 Tape Library w LTO4 SCSI Tape Drive
3573	S4S, L2U	3573S4S		IBM TS3100 Tape Library w LTO4 SAS Tape Drive
3573	F4H, L4U	3573F4H		IBM TS3200 Tape Library w LTO4 Fibre Tape Drive
3573	L4H, L4U	3573L4H		IBM TS3200 Tape Library w LTO4 SCSI Tape Drive
3573	S4H, L4U	3573S4H		IBM TS3200 Tape Library w LTO4 SAS Tape Drive
3573	L32, L2U	3573L32		IBM TS3100 Tape Library w LTO3 HH SCSI Tape Drive
3573	S32, L2U	3573S32		IBM TS3100 Tape Library w LTO3 HH SAS Tape Drive
3573	L34, L4U	3573L34		IBM TS3200 Tape Library w LTO3 HH SCSI Tape Drive
3573	S34, L4U	3573S34		IBM TS3200 Tape Library w LTO3 HH SAS Tape Drive
3573	L4H, S4H, F4H, L34, S34, L4U	1901	23R7262	3573 Additional Power Supply
3573	F4S, F4H, L2U, L4U	5096	23R7140	LC-SC Fibre Cable Interposer
3573	S4S, S32, S4H, S34, L2U, L4U	5400	95P4994	SAS/Mini-SAS 4x Interposer
3573	S4S, S32, S4H, S34, L2U, L4U	5402	95P4711	2m SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, L2U, L4U	5406	95P4712	5.5m SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, L2U, L4U	5500	95P4996	Mini-SAS/Mini-SAS 4x Interposer
3573	S4S, S32, S4H, S34, L2U, L4U	5502	95P4713	2m Mini-SAS/Mini-SAS 1x Cable
3573	S4S, S32, S4H, S34, L2U, L4U	5506	95P4714	5.5m Mini-SAS/Mini-SAS 1x Cable

3573	L4S, L4H, L2U, L4U, L32, L34	5602	23R7133	2.5m VHDCI/HD68 SCSI Cable
3573	L4S, L4H, L2U, L4U, L32, L34	5604	23R7134	4.5m VHDCI/HD68 SCSI Cable
3573	L4S, L4H, L2U, L4U, L32, L34	5610	23R7135	10m VHDCI/HD68 SCSI Cable
3573	F4S, F4H, L2U, L4U	6005	23R7136	5m LC/LC Fibre Channel Cable
3573	F4S, F4H, L2U, L4U	6013	23R7137	13m LC/LC Fibre Channel Cable
3573	F4S, F4H, L2U, L4U	6025	23R7138	25m LC/LC Fibre Channel Cable
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	7002	23R6998	Rack Mount Option including PDU line cord
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8043	23R7260	Ultrium 3 LVD SCSI Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8044	23R7261	Ultrium 3 Fibre Channel Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8046	95P4998	Ultrium 3 HH LVD SCSI Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8047	95P5000	Ultrium 3 HH SAS Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	8106	23R6999	Additional Right Side Magazine
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8143	95P5002	Ultrium 4 LVD SCSI Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8144	95P5004	Ultrium 4 Fibre Channel Drive
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2U, L4U	8145	95P5006	Ultrium 4 SAS Drive
3573	L32, S32, L34, S34, L2U, L4U	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3573	L4S, S4S, F4S, L4H, S4H, F4H, L2U, L4U	8405	95P4278	Ultrium 4 Data Cartridges 5-pack

3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9820	23R7146	2.8m Power Cord 250v France/Germany
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9821	23R7147	2.8m Power Cord 250v Denmark
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9825	23R7148	2.8m Power Cord 250v UK
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9827	23R7149	2.8m Power Cord 250v Israel
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9828	23R7150	2.8m Power Cord 250v Switzerland
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9829	23R7151	2.8m Power Cord 250v S. Africa
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9830	23R7152	2.8m Power Cord 250v Italy
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9831	23R7153	2.8m Power Cord 250v Australia
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U			
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9834	23R7154	2.8m Power Cord 250v Uruguay/ Argentina
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9835	23R7158	2.8m Power Cord 125v Taiwan
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9840	23R7155	2.8m Power Cord 250v China (PRC)
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9841	23R6981	2.8m Power Cord 250v Taiwan

3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9842	23R6982	2.8m Power Cord 125v Japan
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9843	23R6983	2.8m Power Cord 250v Japan
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9844	23R6984	2.8m Power Cord 250v Korea
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9845	23R6985	2.8m Power Cord 250v India
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9847	23R6987	2.8m Power Cord 250v Brazil
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9848	23R7000	Rack to PDU Line Cord
3573	L4S, S4S, F4S, L4H, S4H, F4H, L2U, L4U	9900	95P5008	Encryption Configuration
3573	L4S, S4S, F4S, L32, S32, L4H, S4H, F4H, L34, S34, L2u, L4U	9986	23R7143	1.8m Power Cord 125v Chicago

IBM TS3100/TS3200 Tape Libraries

3573	L2U			TS3100 Tape Library
3573	L4U			TS3200 Tape Library
3573	F3S, L2U	3573F3S		IBM TS3100 Tape Library w LTO3 Fibre Tape Drive
3573	L3S, L2U	3573L3S		IBM TS3100 Tape Library w LTO3 SCSI Tape Drive
3573	F3H, L4U	3573F3H		IBM TS3200 Tape Library w LTO3 Fibre Tape Drive
3573	L3H, L4U	3573L3H		IBM TS3200 Tape Library w LTO3 SCSI Tape Drive
3573	L3H, F3H, L4U	1901	23R7262	3573 Additional Power Supply
3573	F3S, F3H, L2U, L4U	5096	23R7140	LC-SC Fibre Cable Interposer
3573	L3S, L3H, L2U, L4U	5602	23R7133	2.5m VHDCI/HD68 SCSI Cable
3573	L3S, L3H, L2U, L4U	5604	23R7134	4.5m VHDCI/HD68 SCSI Cable
3573	L3S, L3H, L2U, L4U	5610	23R7135	10m VHDCI/HD68 SCSI Cable

3573	F3S, F3H, L2U, L4U	6005	23R7136	5m LC/LC Fibre Channel Cable
3573	F3S, F3H, L2U, L4U	6013	23R7137	13m LC/LC Fibre Channel Cable
3573	F3S, F3H, L2U, L4U L2U, L4U	6025	23R7138	25m LC/LC Fibre Channel Cable
3573	L3S, F3S, L3H, F3H	7002	23R6998	Rack Mount Option including PDU line cord
3573	L3S, F3S, L3H, F3H, L2U, L4U	8002	23R7008	Ultrium Cleaning Cartridge L1 UCC
3573	L3S, L3H, L2U, L4U	8043	23R7260	Ultrium 3 LVD SCSI Drive
3573	F3S, F3H, L2U, L4U	8044	23R7261	Ultrium 3 Fibre Channel Drive
3573	L3S, F3S, L3H, F3H, L2U, L4U	8106	23R6999	Additional Right Side Magazine
3573	L3S, F3S, L3H, F3H, L2U, L4U	8305	95P2020	Ultrium 3 Data Cartridges 5-pack
3573	L3S, F3S, L3H, F3H, L2U, L4U	9800	23R7141	2.8m Power Cord 125v U.S./Canada
3573	L3S, F3S, L3H, F3H, L2U, L4U	9820	23R7146	2.8m Power Cord 250v France/Germany
3573	L3S, F3S, L3H, F3H, L2U, L4U	9821	23R7147	2.8m Power Cord 250v Denmark
3573	L3S, F3S, L3H, F3H, L2U, L4U	9825	23R7148	2.8m Power Cord 250v UK
3573	L3S, F3S, L3H, F3H, L2U, L4U	9827	23R7149	2.8m Power Cord 250v Israel
3573	L3S, F3S, L3H, F3H, L2U, L4U	9828	23R7150	2.8m Power Cord 250v Switzerland
3573	L3S, F3S, L3H, F3H, L2U, L4U	9829	23R7151	2.8m Power Cord 250v S. Africa
3573	L3S, F3S, L3H, F3H, L2U, L4U	9830	23R7152	2.8m Power Cord 250v Italy
3573	L3S, F3S, L3H, F3H, L2U, L4U	9831	23R7153	2.8m Power Cord 250v Australia
3573	L3S, F3S, L3H, F3H, L2U, L4U	9833	23R7145	2.8m Power Cord 250v U.S./Canada
3573	L3S, F3S, L3H, F3H, L2U, L4U	9834	23R7154	2.8m Power Cord 250v Uruguay/ Argentina
3573	L3S, F3S, L3H, F3H, L2U, L4U	9835	23R7158	2.8m Power Cord 125v Taiwan
3573	L3S, F3S, L3H, F3H, L2U, L4U	9840	23R7155	2.8m Power Cord 250v China (PRC)
3573	L3S, F3S, L3H, F3H, L2U, L4U	9841	23R6981	2.8m Power Cord 250v Taiwan
3573	L3S, F3S, L3H, F3H, L2U, L4U	9842	23R6982	2.8m Power Cord 125v Japan

3573	L3S, F3S, L3H, F3H, L2U, L4U	9843	23R6983	2.8m Power Cord 250v Japan
3573	L3S, F3S, L3H, F3H, L2U, L4U	9844	23R6984	2.8m Power Cord 250v Korea
3573	L3S, F3S, L3H, F3H, L2U, L4U	9845	23R6985	2.8m Power Cord 250v India
3573	L3S, F3S, L3H, F3H, L2U, L4U	9846	23R6986	2.8m Power Cord 125v Brazil/Japan
3573	L3S, F3S, L3H, F3H, L2U, L4U	9847	23R6987	2.8m Power Cord 250v Brazil
3573	L3S, F3S, L3H, F3H, L2U, L4U	9848	23R7000	Rack to PDU Line Cord
3573	L3S, F3S, L3H, F3H, L2U, L4U	9986	23R7143	1.8m Power Cord 125v Chicago

Appendix D: Fibre Channel Switch and Director Offerings

IBM System Storage SAN b-type (Brocade) Switches and SAN routers

Machine Type	Model	HVEC Part Number	Description
2005	B16	200516B	IBM TotalStorage SAN16B-2 fabric switch
2005	B5K	20055KB	IBM System Storage SAN16B-3 fabric switch
2005	B64		IBM TotalStorage SAN64B-2 fabric switch
2005	R18		IBM System Storage SAN18B-R router switch

Cisco MDS 9000 for IBM System Storage Switches and routers

Machine Type	Model	HVEC Part Number	Description
2053	424		Cisco MDS 9124 Express for IBM System Storage fabric switch
2053	434		Cisco MDS 9134 for IBM System Storage fabric switch
2053	S34		Cisco MDS 9134 for IBM System Storage stacked switch
2054	E01		Cisco MDS 9222i for IBM System Storage modular router switch

IBM System Storage SAN b-type (Brocade) and m-type (McDATA) Directors

Machine Type	Model	HVEC Part Number	Description
2027	140		IBM TotalStorage SAN140M director
2027	256		IBM TotalStorage SAN256M director
2027	C40		IBM TotalStorage SANC40M cabinet
2109	M48		IBM TotalStorage SAN256B director
2109	C36		IBM TotalStorage SAN Cabinet C36
2499	384		IBM System Storage SAN768 fabric backbone

Cisco MDS 9500 for IBM System Storage Directors

Machine Type	Model	HVEC Part Number	Description
2054	E04		Cisco MDS 9506 for IBM System Storage director
2054	E07		Cisco MDS 9509 for IBM System Storage director
2054	E11		Cisco MDS 9513 for IBM System Storage director