

IBM TotalStorage™ Product Guide



IBM TotalStorage Connected. Protected. Complete.

open

solutions

STRATEGIC STORAGE IMPERATIVES

The explosion of information created by e-business is making storage a strategic investment priority for companies of all sizes. As storage becomes a priority, two major concerns have emerged: business continuity and business efficiency.

- Business continuity requires storage that supports data availability so that employees, customers and trading partners can access data 24x7 through reliable, disaster tolerant systems.
- Business efficiency, where storage is concerned, is the need for investment protection, reduced total cost of ownership and high performance and manageability.

Storage just can't be an afterthought anymore. Too much is at stake.

BUSINESS CONTINUITY

Data Protection

It could have been a power surge or just an accidental delete, but any way you look at it, lost data can cost your company in many ways. In today's nonstop business environment, developing a stable plan for protecting data through backup and recovery is critical to ongoing success.

A good backup and recovery strategy not only helps protect vital data, but can also reduce the backup window, provide more efficient storage utilization, reduce server cycles and provide faster, more effective recovery.

Disaster Tolerance

No one likes to think that a disaster could strike their business, but planning for that off chance can save your business. High data availability and quick recovery are essential to maintaining business continuity in the event of disaster, whether it be an earthquake or a system failure.

Your company's dependence on its data requires storage that helps avoid single points of failure while providing automatic failover capabilities and the ability to do remote vaulting or mirroring over long distances. Being able to endure a disaster and to recover quickly is key to business survival.

BUSINESS EFFICIENCY

Storage Consolidation

Most complex organizations function in distributed computing environments with fragmented storage resources. As a result, storage capacity is often underutilized, but reallocating storage resources often causes disruptions or network downtime.

Consolidation is often the answer. Consolidating means that stored data is centralized, rather than dispersed—with potential benefits including reduced personnel needs, optimized storage capacity and more efficient storage management.

Data Sharing

Few companies boast a totally heterogeneous, vendor-neutral computing environment. For this reason, cross-platform data sharing has become like the holy grail of distributed computing. Cross-platform data sharing allows any-to-any access across the organization, resulting in greater operational efficiency and cost-effectiveness.

Only storage products that conform to open standards permit this degree of universal access. Sharing data across your global organization can make the difference between quick action and missed opportunity.

CONNECTED

IBM TotalStorage networking solutions offer many benefits. Test drive Network Attached Storage (NAS) and Storage Area Networks (SANs) at IBM TotalStorage Solution Centers. In addition, the IBM TotalStorage Proven™ program means products from numerous vendors are tested for interoperability with IBM TotalStorage products, helping to:

- Improve data access and reduce cost
- Provide "any-to-any" device connectivity
- Offer efficient pooled storage
- Enable data sharing by multiple clients and servers

PROTECTED

- Safeguarding your information, increasing availability
- Automated backup and recovery
- Comprehensive storage management software
- RAID disk subsystems
- High-availability features

COMPLETE

- Comprehensive solutions
- Tape
- Disk
- SAN and NAS
- Storage management software
- Consulting services
- Installation and data management services
- Financing

E-BUSINESS ON DEMAND AND IBM TOTALSTORAGE

IBM offers a portfolio of open, on demand storage tools that incorporate autonomic technology to deliver on the needs of an on demand world.

These storage solutions are designed to meet your e-business needs: data availability, efficient storage utilization and total cost of ownership reduction. Additional information is available on the Web at www.ibm.com/totalstorage.

Storage Area Network (SAN) Storage Products

Entry and Midrange Fibre Channel Switches

- 2031-232/216 McDATA Spheron 3032**
- Core-to-edge fabric switching for scalable departmental SANs
 - 2Gbps switching: 2031-232 with 32 ports
 - Offers rack space saving with new LC Small Form Factor optical transceivers
 - High-availability design with redundant, hot-swappable fans, power supplies, optics and concurrent firmware activation
 - Enterprise Fabric Connectivity (EFC) Management software and SANpilot switch and fabric management

- 2031-224 McDATA Spheron 4500 Fabric Switch**
- Affordable, scalable and simple-to-manage departmental, core or edge switch
 - First McDATA Fabric Switch with high-performance IBM 3590 and LTO® tape device support
 - 2Gbps switching with 8, 16 or 24 ports
 - Offers rack saving with 1U space
 - High-availability design with concurrent firmware activation
 - Enterprise Fabric Connectivity (EFC) Management software and SANpilot switch and fabric management

- 2031-L00 McDATA ES-1000 Loop Switch**
- Enterprise-to-edge attachment of IBM tape devices to McDATA Fibre Channel Directors and Switches
 - 8 FC-AL ports and one Bridge port for attachment to Fabric Switches and Enterprise Directors
 - High-availability connectivity design with redundant, hot-swappable fans, power supplies and optics
 - Embedded Web server provides switch monitoring and configuration management
 - ES-1000 Product Manager provides for optional enterprise-to-edge SAN management

- 2109-F32/F16 and 3534-F08 IBM TotalStorage SAN Switch F32, F16 and F08**
- 2Gbps, 32/16/8-port Fibre Channel switches
 - Up to 8Gbps aggregate speed with Inter-Switch Link (ISL) Trunking
 - Rack space saving with Small Form Factor Pluggable (SFP) transceivers
 - Advanced fabric services such as end-to-end performance monitoring
 - Redundant cooling fans and optional redundant power supply (F32 and F16)
 - Switched Fabric and FC-AL support
 - Specialist and Fabric Manager (F32/F16) provides comprehensive management tools for multiple switches across the enterprise

- 2062-D01 Cisco MDS 9216 Multilayer Fabric Switch**
- 2Gbps, 16- to 48-port Fibre Channel switch
 - High-availability modular switch design with nondisruptive firmware upgrades
 - Up to 32Gbps ISL performance with PortChannel
 - Virtual SAN (VSAN) for multiprotocol SANs sharing a single physical fabric
 - Advanced intelligence for simplified SAN management and lower TCO
 - Cisco Fabric Manager provides comprehensive management tools

The Fibre Channel Switch is cascadable. Specific details including supported servers and storage products are available on the Web at www.ibm.com/storage/fcswitch. Specific details on McDATA and Cisco products including availability, server models, operating system levels, attachment capabilities and configuration options are available on the Web at www.ibm.com/totalstorage/mcdata or www.mcdata.com/ibm and www.ibm.com/storage/cisco.

Enterprise Fibre Channel Switches

- 2032-064 McDATA Intrepid 6064 Director**
- 2032-064 provides 2Gbps with up to 64 ports
 - High availability design with redundant power supplies and cooling fans, automatic failover, and call-home
- 2032-140 McDATA Intrepid 6140 Director**
- FICON™ and switched-fabric support
 - 2032-140 provides 2Gbps with up to 140 ports
 - Enterprise Fabric Connectivity (EFC) Management software provides centralized management for multiple, distributed Directors and Switches in an enterprise-wide Fibre Channel fabric

- 2042-256 INRANGE FC/9000-256 Fibre Channel Director**
- Provides 2Gbps with scalability from 48 to 256 ports with FC/9000-256 and 24 to 64 ports with FC/9000-64
 - Directors upgradeable from 1 to 2Gbps. FC/9000-64 upgradeable to FC/9000-128; FC/9000-128 upgradeable to FC/9000-256

- 2042-128 INRANGE FC/9000-128 Fibre Channel Director**
- Intermixed FICON/switched fabric and 1/2Gbps support

- 2042-001 INRANGE FC/9000-64 Fibre Channel Director**
- IN-VSN Management software provides centralized management for multiple Directors

- 2109-M12 and 2109-C36 IBM TotalStorage SAN Switch M12 and Cabinet C36**
- 2Gbps, one or two 64-port core fabric switches
 - Up to 8Gbps aggregate speed with ISL Trunking
 - Enterprise-level scalability and high availability design for deployment with dual core/edge fabrics
 - Rack space saving with Small Form Factor Pluggable (SFP) transceivers with up to 128 ports in 14U enclosure
 - Up to 256 ports in a single C36 Cabinet
 - Advanced fabric services such as end-to-end performance monitoring
 - Switched Fabric and FC-AL support
 - Fabric Manager V3 for management of large enterprise core/edge fabrics

- 2062-D07/T07 Cisco MDS 9509 Multilayer Director**
- 2Gbps, 32- to 224-port Fibre Channel switch
 - High-availability director design with nondisruptive firmware upgrades
 - Up to 32Gbps ISL performance with PortChannel
 - VSAN for multiprotocol SANs sharing a single physical fabric
 - Advanced intelligence for simplified SAN management and lower TCO
 - Cisco Fabric Manager provides comprehensive management tools

All directors are cascadable. Specific details on McDATA, INRANGE and Cisco products including availability, server models, operating system levels, attachment capabilities, and configuration options are available on the Web at www.ibm.com/storage/mcdata or www.mcdata.com/ibm and www.ibm.com/storage/inrange or www.inrange.com/ibm and www.ibm.com/storage/cisco.

IBM Serial Disk Controller

- 7140-160 7133 Controllers**
- TotalStorage SAN Controller 160
 - One Fibre Channel port and one SSA port

Storage Services

IBM Global Services for Storage and Storage Networking

Data Storage Services from IBM can help companies achieve their business objectives by creating cost-effective data storage solutions that address the unique requirements of key business applications. These solutions support multiple platforms and product vendors, helping to provide enhanced protection for critical business data, increased asset utilization, availability and reliability levels with reduced management costs.

IBM Global Services, as the leading data storage services provider, brings best practices from its thousands of customer engagements to work with your employees to integrate new solutions and technology with your business and IT needs. IBM offers a comprehensive portfolio of data storage services including:

- Assess**
 - Analyze enterprise information needs and environment
 - Define enterprise-wide storage strategies
 - Quantify business benefits
- Plan**
 - Backup/restore and business continuity planning
 - Performance and capacity planning
 - Enterprise security architecture
 - Storage migration and consolidation
- Design**
 - Networked storage architecture design
 - SAN configuration and integration services
 - Proof of concept, validation and certification
- Implement**
 - Implementation, testing and migration services
 - Education and training
 - Installation, relocation, cabling and site preparation
- Run**
 - Business and application recovery services
 - Systems monitoring and management
 - Managed Storage Services

IBM Global Services has a proven track record in offering services for open and mainframe storage, data migration, installation and support services for IBM and non-IBM environments. Some examples are:

- IBM Storage Strategy Assessment assists with the vision and strategy, assessment, architecture and conceptual designs to help customers optimize their storage infrastructure to new architectures.
- IBM Planning Services for 3494 Automated Tape Library and Virtual Tape Server can help improve tape storage management and gain control of an often expanding, unmanageable library of tapes.
- IBM Operational Support Services for Tivoli® Storage Manager assist customers in the planning and implementation of storage management software.
- IBM Managed Storage Services offer scalable, cost-effective storage capacity, management and backup/restore services on a usage basis—without an upfront capital expense.

More information about IBM storage services can be found at ibm.com/services/storage.

IBM Financing

IBM offers innovative, flexible financing solutions that make acquiring your new storage solution manageable and affordable. Low Rate Financing, available for all storage hardware products, and Financing for SAN Solutions for eligible SAN and NAS solutions are two of the industry's most competitive options and can help turn upfront costs into low monthly payments. Both offers can help reduce your total cost of usage and provide one-stop financing for a TOTAL Solution. Additional information on IBM Global Financing solutions is available on the Web at ibm.com/financing/total/promotions.html.

Product	Highlights	Technology	Length (m/feet)	Capacity		Part number	Related products	
				Native	Compressed (up to)			
1/2" Tape	<ul style="list-style-type: none"> Custom labeling and initialization services are available Longitudinal recording technique increases capacity and reliability High-capacity cartridges help reduce the number of cartridges and tape mounts required in the tape environment, thereby helping to lower operational costs Enterprise 3590 Tape Cartridges can help to protect existing investments by coexisting with 3490 cartridges 	Enterprise 3590 Tape Cartridge	320/1050 634/2070	10/20/30GB 20/40/60GB	30/60/90GB 60/120/180GB	05H4434 05H3188 05H3302-J-less 08L6091-K-less	3590 Conductive Abrasive Cleaning Cartridge 3480/3490 Conductive Cleaner 3480/3490 Cleaning Cartridge	05H4435 05H3917 4780527
		3490E Enhanced Capacity Tape Cartridge (36-track)	335/1100	800MB	2.4GB	09G4494		
		3480 Tape Cartridge (18-track)	175/575	200MB		4479753		
.31" MP Tape	<ul style="list-style-type: none"> Unique midpoint load mechanism enables the system to locate data fast A durable cartridge case helps protect the tape A self-contained tape path helps improve reliability and extend tape life Almost instantaneous head/tape contact at load time speeds processing 	Magstar® MP Fast Access Linear Tape Cartridge	167/547	5GB	15GB	05H2462—B 08L6187—C	Cleaning Cartridge	05H2463
		Magstar MP Fast Access Linear Tape Cartridge—XL	227/745	7GB	21GB	08L6663-C-XL		
LTO Tape	<ul style="list-style-type: none"> A higher number of concurrent recording channels are available Information recorded in servo bands monitors and controls head position A recording density of 100Mb/in² inch supports high storage capacity Data written onto defective areas of tape are dynamically rewritten 	Ultrium® 2	609/1997	200GB	400GB	08L9870	Ultrium 2 Cleaning Cartridge	35L2086
		Ultrium 1	609/1997	100GB	200GB	08L9120	Ultrium 1 Cleaning Cartridge Leader Pin Attachment Kit LTO 6-Cartridge Magazine	08L9124 08L9129 19P4529
SDLTape	<ul style="list-style-type: none"> Optical servo and backcoating technologies help support precision positioning and high-capacity recording New leader buckle for accurate loading and new durable cartridge design 	SDLT	557/1800	110/160GB	220/320GB	35L1119	Cleaning Cartridge	19P4357
DLTtape	<ul style="list-style-type: none"> Two visible reel-lock indicators show open or damaged locks to protect drives A cartridge labeling area and labels are included DLTtape IV is backward-compatible with earlier DLT 4000 and 7000 drives 	IV	548/1800	35GB	70GB	59H3040	Cleaning Cartridge	59H3092
VXA-2	<ul style="list-style-type: none"> Durable coating to resist oxidation and moisture Advanced archival and capacity properties Wide selection of fully compatible cartridge capacities for daily or full backups Media enclosure shutter locks out dirt and debris 	AME	62/203	20GB	40GB	19P4878	Cleaning Cartridge	19P4880
			170/558	59GB	118GB	19P4877		
			230/754	80GB	160GB	19P4876		
AIT-2 AIT-3	<ul style="list-style-type: none"> Advanced Metal Evaporated media format provides highly durable tape Built-in memory chip stores critical information and helps provide fast access to data High native recording capacity with 50GB or 100GB to store more information in less space 	AIT	230/754	50GB	100GB	18P6482		
230/754			100GB	260GB	18P6483			
4mm Tape	<ul style="list-style-type: none"> Precision-matched tape reels and reel heights help support reliable operation A proprietary hub lock reduces positioning errors, helping to improve data integrity An improved media coating helps reduce head friction and provide cleaner operation 	DDS-1 DDS-2 DDS-3 DDS-4	90/295	2GB	4GB	21F8754	Cleaning Cartridge—4mm	21F8763
			120/393	4GB	8GB	8191151		
			125/410	12GB	24GB	59H3465		
			150/492	20GB	40GB	59H4456		
8mm Tape	<ul style="list-style-type: none"> A special media formulation reduces drop-out to help improve reliability A rigid magnetic stability specification helps increase coercivity to prolong shelf life and improve read reliability 100 percent media enclosure locks out dirt and debris to protect the cartridge A built-in electrostatic discharge shield helps reduce risks to data and hardware 	Metal Particle	112/367	2.3GB	4.6GB	21F8575	Cleaning Cartridge—AME	35L1409
			160/524	7GB	14GB	87G1603	Cleaning Cartridge—Metal Particle	16G8467
		AME	22/73	2.5GB	5GB	59H2671		
			170/557	20GB	40GB	59H2678		
		Mammoth-2	225/738	60GB	150GB	18P6485		
			150/492	40GB	100GB	09L5323		
			75/246	20GB	50GB	35L1044		
QIC Cartridges	<ul style="list-style-type: none"> Sophisticated mirror optics supports BOT and EOT recognition An advanced media-binder process provides ultra-clean operation A stringent wheel-pin perpendicularity specification enables smoother operation and fewer re-reads A proprietary belt design provides steady tension A special stippled base plate design helps provide rigidity and a stable tape path A cartridge cover shields against static discharge and airborne debris Durastat on drive rollers dissipates static 	Form and type/ QIC compatibility	Length (m/feet)	Capacity Native	Recording density (FTPI/FTPMM)	Part number		
		5.25" DC9120/QIC-1000	290/950	1.2GB	45,000/1772	21F8730	QIC 5.25" Wet Process Cleaning Cartridge	16G8572
		5.25" DC9250/QIC-2GB-DC	366/1200	2.5GB	50,800/2000	16G8436	QIC 5.25" MLR/SLR Cleaning Cartridge (50 uses)	35L0844
		5.25" SLR5/QIC-4GB-DC	458/1500	4GB	62,000/2441	59H3660		
		5.25" SLR100	47/155	5/10GB	152.4 KFCI	35L0661	155" Data Cartridge	
		5.25" SLR100	457/1500	50/100GB	152.4 KFCI	35L0968	1500" Data Cartridge	
		5.25" SLR60	900ft	30/60GB	152.4 KFCI	19P4209		
		5.25" MLR1/QIC-5010-DC	458/1500	16GB	50,800/2000	59H4175		
			60/200	2GB	50,800/2000	35L0589		
		5.25" MLR3/QIC-5120-DC	462/1515	25GB	77,343/3045	59H4128		
		NS20	226/740	10GB	79,800/3142	59H4364		
		Travan 40	228.7/750	20GB	96000/3780	19P4882	Travan Cleaning Cartridge	19P4881



Enterprise Tape Products

Mid-market Tape Products

	3590	3494	3494-VTS	3580	3581	3583	3584
Description	1/2" Enterprise Tape Drive	1/2" Cartridge Tape Library	Virtual Tape Server	LTO Ultrium Tape Drive	LTO Ultrium Tape Autoloader	LTO Ultrium Scalable Library	LTO Ultrium Ultra-Scalable Tape Library
Machine Model	3590 B1A/E1A/H1A-Library B11/E11/H11-Rack	3494 (frames) L12, L14-Library D12, D14-Library (Frame) S10-Storage HA1-High Availability	3494 B10, B20	3580 H11 Ultrium 1 L11 Ultrium 1 H13 Ultrium 1 L13 Ultrium 1 L23 Ultrium 2 H23 Ultrium 2	3581 H17 L17 H13 L13	3583 L18-18 Carts L36-36 Carts L72-72 Carts	3584 L32-Base Frame D32-Expansion Frame
Product Strengths	Capacity, performance, reliability	Modular, reliable automation for high-volume storage	Virtual tape, fast access, peer-to-peer copy	Open systems attach, high capacity, streaming data rate	Open systems attach, high capacity, streaming data rate	Open systems attach, scalable, high capacity, streaming data rate	Open systems attach, multiplatform, ultra-scalable, high capacity
Technology	Longitudinal Serpentine		Disk: Emulated 3490E Tape: 3590 1/2"	Longitudinal Serpentine	Longitudinal Serpentine	Longitudinal Serpentine	Longitudinal Serpentine
# Heads/Tracks	B: 16/128 E: 16/256	H: 16/384 Drive Dependent	N/A	Ultrium 2: 8/512 Ultrium 1: 8/384	8/384	8/384	Ultrium 2: 8/512 Ultrium 1: 8/384
Number of Drives	1	1-32 SCSI/FC, 1-76 ESCON®/FICON or SCSI/Fiber mix	64-256 (virtual)	1	1	1-6	1-72
Max Number of Cartridges	10 per autoloader	6, 240 ³	500,000 (virtual volumes)	1	7	72	2,481 ³
Cartridge Capacity Native/Compressed	B: 10/30GB BX: 20/60GB E: 20/60GB EX: 40/120GB H: 30/90GB HX: 60/180GB	Drive Dependent	400/1200MB ¹⁰ 800/2400MB ¹⁰	Ultrium 2: 200/400GB Ultrium 1: 100/200GB	Ultrium 1: 100/200GB	Ultrium 1: 100/200GB	Ultrium 2: 200/400GB Ultrium 1: 100/200GB
Max System Capacity Compressed¹	B11: 300/600GB E11: 600/1200GB H11: 900/1800GB	H: 561TB HX: 1122TB	Disk: up to 5.2TB Tape: 748TB	Ultrium 2: 400GB Ultrium 1: 200GB	1.4TB	14.4TB	Ultrium 2: 992TB Ultrium 1: 496TB
Max Drive Data Rate/Sec¹ Native/Compressed	B: 9/27MB E: 14/42MB H: 14/42MB	Drive Dependent	VTS: up to 280MB	Ultrium 2: 35/70MB Ultrium 1: 30/15MB	15/30MB	15/30MB	Ultrium 2: 35/70MB Ultrium 1: 30/15MB
Time to Data⁵	Model Dependent	Drive Dependent	VTS: 1-3 sec. if data in VTS Cache	Ultrium 2: 46 sec. Ultrium 1: 73 sec.	Ultrium 1: 73 sec.	Ultrium 1: 73 sec.	Ultrium 2: 46 sec. Ultrium 1: 73 sec.
Interface	SCSI-2 F/W, Diff PCI, Ultra SCSI, FC, ESCON, FICON, 2Gb FICON	SCSI-2 F/W, Diff PCI, Ultra SCSI, FC, ESCON, FICON, 2 Gbit FICON	Ultra SCSI, ESCON, FICON	L23, L13, L11-LVD H23, H13, H11-HVD	L17, L13-LVD H17, H13-HVD	LVD, HVD, FC	Ultrium 2: FC fabric, LVD, HVD Ultrium 1: FC-AL, LVD, HVD
SAN-Ready⁶	pSeries™, iSeries™, RS/6000®, Sun, HP, Windows NT®, Linux, Windows® 2000, Tru64 UNIX®	pSeries, iSeries, RS/6000, Sun, HP, Windows NT, Linux, Windows 2000, Tru64 UNIX	pSeries, RS/6000, Windows NT, Windows 2000, Sun	pSeries, RS/6000, Windows NT, Sun	pSeries, RS/6000, Windows NT, Sun	pSeries, RS/6000, Windows NT, Sun	pSeries, RS/6000, Windows NT, Sun
Supported Platforms⁶	iSeries, AS/400®, pSeries, RS/6000, zSeries™, S/390®, Tru64 UNIX, Linux, Windows NT, Windows 2000, Sun, HP	iSeries, AS/400, pSeries, RS/6000, zSeries, S/390, Linux, Windows NT, Windows 2000, Sun, HP	pSeries, RS/6000, zSeries, S/390, Windows NT, Windows 2000, Sun, HP	xSeries™, Netfinity®, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows 2000, Sun, HP, Linux
ISV (Independent Software Vendor)⁶ Media	Model Dependent ¹¹	A B D E F G H I J K L M		A C D E F G H I J L N	A C D E F G H I J L N	A C D E F G H I J L N	A C D E F G H I J L N
Part number	05H4434 X: 05H3188	05H4434 X: 05H3188	05H4434 X: 05H3188	Ultrium 2: 08L9870 Ultrium 1: 08L9120	Ultrium 1: 08L9120	Ultrium 1: 08L9120	Ultrium 2: 08L9870 Ultrium 1: 08L9120
Warranty	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	L23, H23, L13, H13: 3 years, CEE L11, H11: 1 year, IOE	L17, H17: 1 year, IOE L13, H13: 3 years, CEE	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7

F/W = Fast/Wide Diff = Differential, N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, IOE = IBM On-Site Exchange, CEE = Customer Element Exchange, NOTES: 1: Compressed data rates are estimates and are data-application-processor-dependent. User results may vary. 2: Capacity/data rate calculated assuming all drives are 3590E. 3: Max number of cartridges decreases as tape/control units are added. 4: AIX 4.1.5 or later. 5: Load & search only. 6: Server platforms with SAN-ready attachability, model, and feature-dependent. 7: Prices are subject to change. 8: Standard cartridge. 9: Extended cartridge. 10: Depends on virtual cartridge configuration. 11: The latest ISV support can be found in the connectivity section at www.storage.ibm.com/hardware/tape/3590/for.html. The following vendors provide application support to the platforms defined above: A = Avicore, B = IBM Sysstack 6000, C = CA ArcServe I1, D = Legato NetWorker, E = VERITAS NetBackup, F = CA Alexandria, G = SCH ReelLibrary, H = SCH ReelLibrary, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = Help/Systems Root/Save, M = LXI Media Management, N = Dantz.

Products (continued)



Complementary Storage Products

	7204	7206	7206-VX2	7332	7208	7205	7207	7212
Description	External Disk Drive	4mm DDS-2,3,4 Tape Drive	8mm VXA-2 Tape Drive	4mm DDS-3,4 Tape Autoloader	8mm Mammoth Tape Drive	DLT Drive SDLT Drive	QIC compatibility	Storage Device Enclosure
Machine Model	7204 518-18GB 536-36GB	7206 110-DDS3 220-DDS4	7206 VX2	7332 110-DDS3 220-DDS4	7208 341-Mammoth-1 342-Mammoth-1 345-Mammoth-2	7205 440 550	7207 122	7212 102
Product Strengths	External desk-side disk storage	Cost-effective streaming tape drive	Low-cost, high-capacity VXA-2 technology	Autoload tape cartridges into DDS-4 drive	High performance 8mm technology	Cost-effective save/restore/archive solution Longitudinal Serpentine 440: 4/208 550: 8/536	Backward read/write QIC 1/1 No	Rack-mountable 2-drive enclosure utilizes only 1U (1.75) of space DDS-4, DVD-RAM, CD-ROM, VXA-2 Rotating Drum (DDS-4)
Technology	N/A	Helical Scan		Helical Scan	Helical Scan			
# Heads/Tracks	N/A	Rotating Drum No	N/A	Rotating Drum No	Rotating Drum No			
Number of Drives	1	1	1	1	1	1	1	1 - 2
Max Number of Cartridges	N/A	1	1	110: 4 220: 6	1	1	1	2
Cartridge Capacity Native/Compressed	N/A	110: 12/24GB 220: 20/40GB	80GB (non-compressed) 160GB (compressed) on 230M tape	110: 12/24GB 220: 20/40GB	341: 20/40GB 342: 20/40GB 345: 60/150GB	440: 40/80GB 550: 160/320GB	4/8GB	VXA-2: 80/160GB
Max System Capacity Compressed¹	518: 18GB 536: 36GB	110: 24GB 220: 40GB	160GB	110: 96GB 220: 240GB	341: 40GB 342: 40GB 345: 150GB	440: 80GB 550: 320GB	4/8GB	160GB with 2 VXA-2 18.8GB with 2 DVD-RAM drives
Max Drive Data Rate/Sec¹ Native/Compressed	32MB	110: 1/2MB 220: 3/6MB		110: 1/2MB 220: 3/6MB	341: 3/6MB 342: 3/6MB 345: 12/30MB	440: 6/12MB 550: 16/32MB	.38/.76MB	VXA-2: 6/12MB
Time to Data⁵	70ms	N/A	TBD	40 sec.	341: 82 sec. 342: 82 sec. 345: 93 sec.	440: 100 sec. ⁵ 550: 50 sec.	85 sec.	VXA-2: 40 sec.
Interface	SCSI-2, SCSI-3 LVD/SE	SCSI-2 F/W SE, SCSI/Ftr 6534 LVD/SE		SCSI-2 F/W SE, LVD/SE	341: SCSI-2 F/W Diff 342: SCSI FC 6534 or 2729 345: SCSI-2 Ultra2 LVD	SCSI-2 F/W Diff PCI, Ultra2 SCSI LVD	SCSI-2, SE	SE Ultra SCSI, Ultra2 SCSI, Ultra3 SCSI
SAN-Ready⁶			No				No	
Supported Platforms⁶	pSeries, RS/6000	pSeries, RS/6000, Sun, HP, DEC	pSeries, RS/6000	pSeries, RS/6000, Sun, HP	341: pSeries, RS/6000 342: iSeries, AS/400 345: pSeries, RS/6000, iSeries, AS/400	pSeries, RS/6000 ⁴	iSeries, AS/400, pSeries, RS/6000	pSeries, RS/6000
ISV (Independent Software Vendor)⁸ Media	N/A	A B C E	N/A	A B C E	A B C E J	A B C E	A B C D	Varies
Part number 1-888-IBM-Media	N/A	59H3465-DDS3 59H4458-DDS4	19P4876 (230M), 19P4877 (170M), 19P4878 (62M)	59H3465-DDS3 59H4458-DDS4	341: 59H2678 - 20GB 342: 59H2678 - 20GB 345: 09L5322 - 60GB	440: 59H3040 550: 35L1119	59H3660	DDS-4: 59H4458 DVD-RAM 4.7GB: 19P0862 DVD-RAM 9.4GB: 19P0490 VXA-2 40GB: 19P4876
Warranty	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 year, 24x7	IBM On-Site Repair 1 Year, 24x7	IBM On-Site Repair 1 Year, 24x7	IBM On-Site Repair 1 Year, 24x7

F/W = Fast/Wide; Diff = Differential; N/A = Not Applicable; FC = Fibre Channel; X = Extended length cartridge; IOE = IBM On-Site Exchange; CEE = Customer Element Exchange; NOTES: 1: Compressed data rates are estimates and are data-application-processor-dependent. User results may vary. 2: Capacity/data rate calculated assuming all drives are 3590E. 3: Max number of cartridges decreases as tape/control units are added. 4: AIX 4.1.5 or later. 5: Load & search only. 6: Server platforms with SAN-ready attachability, model- and feature-dependent. 7: Prices are subject to change. 8: Standard cartridge. 9: Extended cartridge. 10: Depends on virtual cartridge configuration. 11: The latest ISV support can be found in the connectivity section at www.storage.ibm.com/handsoft/tape/3590/for.html. The following vendors provide application support to the platforms defined above: A = Tivoli Storage Manager (TSM); B = IBM's Sysback 6000; C = CA Arcserve IT; D = Legato NetWorker; E = VERITAS NetBackup; F = CA Alexandria; G = SCH Reelibrarian; H = SCH HeekBackup; I = LSC; J = IBM BRMS; K = IBM OnDemand; L = Help/Systems Robot; Saw, M = LXI Media Management; N = Dantz.

Selecting a Solution

	Model	Technology	Maximum system capacity (GB)*	zSeries S/390	iSeries AS/400	pSeries RS/6000	xSeries Netfinity	Open Systems**
Enterprise Tape Products	3590-B1A, E1A, H1A, B11, E11, H11	1/2" Enterprise	1800					
	3494, L12, L14, D12, D14, S10, HA1	1/2" Enterprise	1166000					
	3494-B10, B20 Virtual Tape Server	Virtual Tape 1/2" Enterprise	1166000					
Mid-market Tape Products	3580-L23, H23	LTO	400					
	3580-L13, H13, L11, H11	LTO	200					
	3581-H17, L17, H13, L13	LTO	1400					
	3583-L18, L36, L72	LTO	14400					
	3584-L32, D32	LTO	992000					
Complementary Storage Products	7204-518	HDD	18					
	7204-536	HDD	36					
	7206-110	4mm DDS-3	24					
	7206-220	4mm DDS-4	40					
	7332-110	4mm DDS-3	96					
	7332-220	4mm DDS-4	240					
	7208-341	8mm Mammoth-1	40					
	7208-342	8mm Mammoth-1	40					
	7208-345	8mm Mammoth-2	150					
	7205-440	DLT	80					
	7207-122	QIC	8					

* Compressed; see ibm.com/totalstorage for specific capacities
 ** See ibm.com/totalstorage for specific open systems connectivity

Yes No

IBM @server systems:
pSeries, xSeries, iSeries, zSeries

Customer demand for lightning-fast communication and transactions has driven the need for universal commitment to e-business. No matter what industry, or what size company, success today hinges on building a high-performance, responsive infrastructure that embraces open standards—exactly what you'll find in the IBM @server product portfolio. What's more, the hardware attaches to IBM TotalStorage products that help support today's demanding storage requirements: high data availability, efficient storage utilization and reduction in total cost of ownership.

IBM TotalStorage Proven Program
Helps Simplify Interoperability

IBM has introduced the TotalStorage Proven program to help customers identify storage solutions and configurations that have been pre-tested for interoperability. IBM TotalStorage Proven means that the applications and hardware you choose from leading companies, combined with IBM state-of-the-art storage technology, are capable of providing you with flexible, ready-to-run and more easily installed solutions that can help address your software and infrastructure needs.

Storage Proven means integrated solutions are more than just hardware and software—they are tested together for specific applications and configurations. IBM helps take the guesswork out of putting a total solution together, which can help simplify your purchase decision, freeing you to focus on running your business.

Please visit the Storage Proven Website to view over one hundred available products and solutions to meet your storage needs: www.ibm.com/totalstorage/proven

Links: Independent Software Vendors

Computer Associates	http://www.cai.com
Help/Systems	http://www.helpsystems.com
Legato	http://www.legato.com
LSC	http://www.lsci.com
VERITAS	http://www.veritas.com
XuiS	http://www.xuis.co.uk

IBM makes no guarantee about the functionality, compatibility, performance or availability of non-IBM applications. Contact the respective company for additional product information and to verify compatibility and hardware and software configurations supported by the respective software vendor.

Products



	2105	7133	1742	1742	3552	3542	2104
Description	Enterprise Storage Server	Serial Disk System	FAST900 Storage Server	FAST700 Storage Server	FAST500 Storage Server	FAST200 Storage Server	EXP Plus
Model	800	D40, T40	90U	1RU	1RU	1RU, 2RU	DU3, TU3
Platform Support³	xSeries, iSeries, AS/400®, pSeries, RS/6000, zSeries™, S/390, OS/400®, AIX®, Solaris™, HP-UX, Dynix, DG/UX, OpenVMS, Tru64, Windows NT, Windows 2000, NetWare, Linux for S/390, z/OS™, zVM™, OS/390®, VM/ESA®, VSE/ESA™, MVS/ESA™, TPF, Linux commercial distributions ² , SGI Origin IRIX	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, AIX, Windows NT, Windows 2000, Solaris, HP-UX and many others ¹	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, select Sun and HP UNIX servers and other Intel processor-based servers, Windows NT, Windows 2000, Netware, VMWare, Linux, AIX, Solaris, HP-UX	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, Windows NT, Windows 2000, NetWare, Linux, AIX, HP-UX, Solaris	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, AIX, Windows NT, Windows 2000, NetWare, Linux, HP-UX, Solaris	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, AIX, Windows NT, Windows 2000, Dynix, HP-UX, Linux, NetWare, Solaris	pSeries, select RS/6000 servers, AIX
Host Connectivity	ESCON, FICON, Fibre Channel, 2Gb Fibre Channel/FICON, SCSI	SSA, Fibre Channel ¹ , SCSI ¹	Fibre Channel	Fibre Channel	Fibre Channel	Fibre Channel	Ultra3 SCSI
SAN Support	Direct, FC-AL, Switched Fabric	FC-AL ¹ , Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	N/A
Copy Services	Remote Copy (XRC & PPRC), FlashCopy®, Concurrent Copy	Remote Copy (up to 10km), 3-way copy, Instant Copy ¹	Remote Copy, FlashCopy	Remote Copy, FlashCopy	Remote Copy, FlashCopy	FlashCopy	N/A
Availability Features	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update, dual-pathing driver	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual adapters, enclosure services, dual-pathing driver	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver	Fault-tolerant, RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver	RAID with server adapters, redundant power/cooling, hot-swap drives, enclosure services
Controller	SMB dual active	Single/multiple active adapters	Dual active 2Gb RAID controllers	Dual active 2Gb RAID controllers	Dual active	Single/dual active	Adapters in server
Cache (min, max)	8GB, 64GB	0, 32MB write and 64MB read	2GB, 2GB	2GB, 2GB	512MB, 1GB	128MB, 256MB	N/A
RAID Support	5, 10	0, 1, 5, 10 (using adapters), 1, 10	0, 1, 3, 5, 10	0, 1, 3, 5, 10	0, 1, 3, 5, 10	0, 1, 3, 5, 10	0, 1, 5 (using server-based adapters)
Capacity (min, max)	582GB, 55.9TB (physical capacity)	72.8GB, 14.0TB	32GB, 32TB	32GB, 32TB	32GB, 32TB	18.2GB, 9.6TB via EXP500 or EXP700	18.2GB, 2.0TB
Drive Interface	SSA	SSA	2Gb FC-AL	2Gb FC-AL	FC-AL	FC-AL	Ultra3 SCSI
Drive Support	18.2GB, 36.4GB, 72.8GB and 145.6GB 10,000 rpm disk drives 18.2GB, 36.4GB and 72.8GB 15,000 rpm disk drives	18.2GB, 36.4GB, 72.8GB and 145.6GB 10,000 rpm disk drives	36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 18.2GB, 36.4GB and 73.4GB 15,000 rpm disk drives	36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 18.2GB, 36.4GB and 73.4GB 15,000 rpm disk drives	36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 18.2GB, 36.4GB and 73.4GB 15,000 rpm disk drives	36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 18.2GB, 36.4GB and 73.4GB 15,000 rpm disk drives	18.2GB, 36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 36.4GB and 73.4GB 15,000 rpm disk drives
Certifications	Microsoft® RAID, Cluster and Data Center, HACMP, Novell NetWare, Linux	Microsoft RAID, Cluster, HACMP	Microsoft RAID, Cluster, Netware Cluster support ⁴	Microsoft RAID, Cluster and Data Center, HACMP, NetWare Cluster support	Microsoft RAID, Cluster and Data Center, HACMP, NetWare Cluster support	Microsoft RAID, Cluster, HACMP, NetWare Cluster support	HACMP

¹: Via IBM TotalStorage SAN Controller 160, no cluster or HACMP support ²: RedHat, SuSE, TurboLinux. Please verify specific product information for details ³: Consult product information for details ⁴: Also, verification will be completed for VERITAS Clustering and HP Service Guard

Selecting a Solution

	ESS	7133	FASi700	FASi500	FASi200	EXP Plus
Local copy within controller		requires 7140 or 2108-S20				
Remote Copy (>10km)			*	*		
Centralized management						
AIX N-Way performance						
Low entry point (\$)						
Storage Area Network		requires 7140				
Concurrent Heterogeneous Servers (UNIX and Intel)						
Concurrent microcode install						
Intermix disk capacities						
Multiple RAID options						requires adapter
Controller-based call-home						
Rack mount						

Yes
 No

* Remote Copy (>10km) is via TotalStorage proven vendors (Legato, CNT, NSI)

Operating Systems and Copy Services Platform Coverage

	ESS	7133	FASi700	FASi500	FASi200
Windows NT	FlashCopy PPRC	Instant copy (7140)	FlashCopy Remote Mirroring	FlashCopy Remote Mirroring	*
Windows 2000	FlashCopy PPRC	Instant copy (7140)	FlashCopy Remote Mirroring	FlashCopy Remote Mirroring	*
NetWare	FlashCopy PPRC		FlashCopy Remote Mirroring	FlashCopy Remote Mirroring	FlashCopy
Linux ¹	FlashCopy, PPRC, PPRC Extended Distance		FlashCopy Remote Mirroring	FlashCopy Remote Mirroring	FlashCopy
AIX	FlashCopy PPRC	3-way copy (SSA Adapter, 7140)	**	**	** (FlashCopy only)
Dynix	FlashCopy PPRC				
HP-UX	FlashCopy PPRC	Instant copy (7140)	FlashCopy (Remote Mirroring 1003)	FlashCopy (Remote Mirroring 1003)	FlashCopy
Solaris	FlashCopy PPRC	Instant copy (7140)	FlashCopy (Remote Mirroring 1003)	FlashCopy (Remote Mirroring 1003)	FlashCopy
IRIX					
Tru64 UNIX	FlashCopy PPRC				
OpenVMS	FlashCopy PPRC				
z/OS, OS/390	FlashCopy, PPRC, XRC, Concurrent Copy				
OS/400	FlashCopy PPRC				
DG/UX	FlashCopy PPRC				

Yes
 No

* Remote Mirroring via Legato Mirroring Extensions
 ** Support available in 1Q 2003; check the support Web site for the latest availability
¹: Linux distribution support varies per product. Refer to product-specific information for current support.
 This chart reflects IBM's current intentions. Changes may occur without notice.
 Consult the appropriate Web pages for support details.

Disk Storage Systems

Product	Highlights
Enterprise Storage Server	<ul style="list-style-type: none"> Enterprise-class, SAN-ready disk system Designed to provide high availability, performance, manageability and scalability Enables attachment of multiple heterogeneous servers Helps address unpredictable growth requirements Provides scalability while maintaining performance Features state-of-the-art copy services for rapid backup and disaster recovery
7133 Serial Disk System	<ul style="list-style-type: none"> High-throughput, high-density, scalable serial disk storage for UNIX and Intel-based servers An architecture that avoids single points of failure Provides concurrent maintenance with redundant power and cooling components Provides flexibility and availability with its multi-RAID data protection options High-function 7133 controller
FASi900 Storage Server	<ul style="list-style-type: none"> SAN-ready flexible disk storage system for UNIX and Intel processor-based environments High-performance, full fiber solution Provides 2Gb Fibre Channel connectivity Supports business continuance with its optional high-availability software and advanced Remote Copy function Helps protect customer data with its multi-RAID capability and hot-swappable redundant components
FASi700 Storage Server	<ul style="list-style-type: none"> SAN-ready flexible disk storage system for UNIX and Intel processor-based environments High-performance, full fiber solution Provides 2Gb Fibre Channel connectivity Supports business continuance with its high-availability software and advanced Remote Copy function Helps protect customer data with its multi-RAID capability and hot-swappable redundant components
FASi500 Storage Server	<ul style="list-style-type: none"> Offers complete fiber solution for large and growing data storage requirements of business-critical applications Built-in failover protection that overrides single points of failure
FASi200 Storage Server	<ul style="list-style-type: none"> Provides flexible and affordable external RAID storage solution for workgroup and departmental servers Features Fibre Channel host attachment with Fibre Channel drives
EXP Plus	<ul style="list-style-type: none"> Provides flexible, scalable and cost-effective disk storage for IBM RS/6000 and @server pSeries servers Supports Internet-centric service providers

Additional information on these IBM Disk Storage products is available on the Web at www.ibm.com/totalstorage/disk

IBM NAS Product Comparison

Product	Highlights
NAS 100 Model R12	<ul style="list-style-type: none"> Reliable—480GB of network attached storage in a 1U tabletop configuration with a rack-mounting chassis option and hot-swappable hard drives help protect against downtime Secure—Software RAID 0,1, 5 designed to help guard against the loss of data in the event of a hard disk failure and to support business continuance Flexible—Cross-platform file sharing (Windows [CIFS], UNIX [NFS], HTTP, FTP, Apple File Protocol and Novell NetWare) can help reduce network complexity and maintenance expense and allows data to be used across the organization Systems management—Advanced systems diagnostic and management tools can help minimize downtime Performance—Innovative design incorporates an Intel Pentium III processor to help keep performance high, even during peak usage periods Data consolidation—Centralized data management can help increase operational efficiency and can contribute to a lower total cost of ownership Simple and flexible backup solutions—Quick and efficient backup and restore through interoperable solutions with popular backup and restore software programs
NAS 200 Model 25T	<ul style="list-style-type: none"> Scalable—Storage capacity from 220.2GB up to 7.0TB to help affordably meet current and future storage requirements Flexible—Multiple file protocol support (Windows [CIFS], UNIX [NFS], HTTP, FTP, AppleTalk and NetWare) means clients and servers can share information from different platforms Reliable—Hot-swap disk drives, redundant components and IBM Advanced Systems Management designed to keep these systems up and running Data protection—250 Persistent True Image data views, instant volume restoration and data mirroring to help recover corrupted/deleted data TCP/IP Offload Engine (TOE) technology—Integrated TCP/IP Offload Engines offload network cycles from main processors, helping boost CIFS performance by 38 percent
NAS 300G Model G27	<ul style="list-style-type: none"> Accessible—Allows IP clients and servers access on SAN devices without each server or client being individually connected by Fibre Channel Fault-tolerant—Dual engines and redundant power supplies help support high availability Data acceleration—Designed to provide ease of use and Fibre Channel speed when configured with Tivoli SANergy software OS mirroring—Improves system redundancy by mirroring the OS hard disk drive Data protection—250 Persistent True Image data views, instant volume restoration and data mirroring to help recover corrupted/deleted data TOE technology—Integrated TCP/IP Offload Engines offload network cycles from main processors, helping boost CIFS performance by 61 percent



	IBM NAS 100	IBM NAS 200-25T	IBM NAS Gateway 300
Model	5190-R12 (1U)	5194-25T	5196-G27
Scalability	480GB	7TB	11TB/22TB
Engines	1 nonclustered	1 nonclustered	2 clustered
Processors	One 1.26GHz Intel Pentium III with 133MHz frontside bus	One 2.4GHz Intel Xeon with 400MHz frontside bus (second processor optional)	Two 2.4GHz Intel Xeon per engine with 400MHz frontside bus
I/O¹	File I/O	File I/O	File I/O
Platform Support	Windows (CIFS), UNIX (NFS), HTTP, FTP, Apple File Protocol and NetWare; IBM @server xSeries, pSeries, iSeries and zSeries and other vendors' servers	Windows (CIFS), UNIX (NFS), HTTP, FTP, Apple File Protocol and NetWare; IBM @server xSeries, pSeries, iSeries and zSeries and other vendors' servers	Windows (CIFS), UNIX (NFS), HTTP, FTP, Apple File Protocol and NetWare; IBM @server xSeries, pSeries, iSeries and zSeries and other vendors' servers
Operating System	Windows OS	Windows OS	Windows OS
Performance (as of 8-10-02)	48MB/sec CIFS 2552 ops/sec NFS	**	**
PCI Slots Available	1	6	6/engine
Network Connectivity	2 (std)	1 (std), 4 (opt)	1/engine (std) 4/ engine (max)
ECC SDRAM Memory (max)	512MB	Up to 4.5GB	Up to 4.5GB/engine
Protocol Attachment to HDD	ATA	SCSI	Fibre Channel
Data Protection	250 Persistent True Image Data Views, instant volume restoration. Data mirroring via optional OEM software.	250 Persistent True Image Data Views, instant volume restoration. Data mirroring via optional OEM software.	250 Persistent True Image Data Views, instant volume restoration. Data mirroring via optional OEM software.
Redundancy/High Availability	Hot swap, redundant disk drives, two failover Gigabit Ethernet ports, OS failover/OS mirroring	Hot swap, redundant power supplies and disk drives, Advanced Systems Management (Lightpath diagnostics, predictive failure analysis, remote connect automated paging)	Dual engines, hot swap, redundant power supplies and disk drives, Advanced Systems Management (Lightpath diagnostics, predictive failure analysis, remote connect automated paging), dual OS with RAID level 1
Backup	Optional through Ultra2 SCSI PCI Adapter	External Tape (SCSI or FC)	External Tape (SCSI or FC)
RAID Levels	0, 1, 5	0, 1, 1E, 5, 5E, 00, 10, 1E0, 50	SAN disk dependent
Systems Management	IBM Director Agent, TSM client, UMS, SNMP, CIM, ASF, Microsoft Terminal Services	IBM Director Agent, TSM client, UMS, SNMP, CIM, Microsoft Terminal Services	IBM Director Agent, TSM client, UMS, SNMP, CIM, Microsoft Terminal Services

¹Standard port can accept either a quad 10/100 or a Gigabit adapter
 ** At the time of publication, NetBench and SPECsfs performance determination was in progress.
 Please check www.ibm.com/totalstorage/nas for the current status
 1: Linux supported via NFS

IBM TotalStorage Expert Family

Adds value to the storage subsystem solution by providing information for better management

Product	Function and Value
IBM TotalStorage ESS Expert	Provides storage administrators with the capability to manage the performance of the IBM Enterprise Storage Server™, this innovative tool furnishes storage asset and capacity management capabilities to centrally manage Enterprise Storage Servers located across the enterprise
IBM TotalStorage ETL Expert	Provides a high-performance monitoring tool to help simplify the management of IBM tape subsystems that include the IBM TotalStorage Enterprise Tape Library, Virtual Tape Server, and Peer-to-Peer Virtual Tape Server
IBM TotalStorage Management Toolkit	Offers a collection of products designed to provide a comprehensive menu of solutions in order to meet the storage management requirements of z/OS customers
IBM TotalStorage XRC Performance Monitor	Provides the ability to monitor and evaluate the performance of a running XRC configuration; the monitor function provides information at the realtime, historic and summary levels

DFSMS Family

Provides automated and central storage management in the z/OS environment

Product	Function and Value
DFSMSdfp™	Provides data access, program and device management functions that furnish effective management of active data
DFSMSdss™	Provides data movement, copy, backup and space management functions
DFSMShsm™	Provides backup, recovery, migration and space management functions that furnish effective management of inactive data
DFSMSrmm™	Provides a policy-driven solution for the management of removable media, such as tape cartridges and reels
DFSORT™	Provides a solution for faster and easier data sorting, reporting and analysis

Tivoli Family

Product	Function and Value
Tivoli Storage Manager	Automates data backup and restore functions, supports a broad range of platforms and storage devices, and centralizes storage management operations
IBM Tivoli Storage Manager Extended Edition	Delivers an integrated data-protection solution for large enterprises, including large library support and disaster recovery functions
IBM Tivoli Storage Manager for Application Servers	Helps safeguard WebSphere environments—administration database, configuration data and deployed applications—without affecting application availability
IBM Tivoli Storage Manager for Databases	Helps secure Informix®, Oracle and Microsoft SQL data
IBM Tivoli Storage Manager for Enterprise Resource Planning	Helps protect vital SAP R/3 system data
IBM Tivoli Storage Manager for Hardware	Helps eliminate backup-related performance impact on mission-critical databases that require 24x7 availability
IBM Tivoli Storage Manager for Mail	Helps secure Lotus® Domino™ and Microsoft Exchange data
IBM Tivoli Storage Management for Space Management	Automatically moves inactive data to less-expensive, near-line storage to free-up online disk space for more important active data using the hierarchical storage management capabilities of IBM Tivoli Storage Manager for Space Management
IBM Tivoli Storage Manager for Storage Area Networks	Helps SAN-connected Storage Manager servers and Storage Manager client computers to make maximum use of their direct network connection to storage. This software allows for LAN-free disk-to-tape and disk-to-disk data backup and restores and archive/retrieve. Allows SAN-connected tape library sharing and server-free data backup/restore and archive/retrieve
Tivoli SANergy™	Fuses the easy administration and heterogeneous, cross-platform sharing of NAS with the high bandwidth, scalability and CPU efficiency of SAN
Tivoli Storage Resource Manager	Delivers enterprise monitoring, reporting and policy-based automation to help improve storage utilization, reduce storage administration costs and prevent storage-related problems. Web-based interface provides a single view of your complex, heterogeneous storage environment. Supports direct attach storage (DAS), NAS, and SAN
Tivoli Storage Resource Manager for Databases	Delivers enterprise monitoring, reporting and policy-based automation to prevent storage-related application downtime. Supports IBM UDB, Microsoft SQL Server, Sybase and Oracle
Tivoli Storage Resource Manager for Chargeback	Makes data owners accountable by charging back for storage usage. Generates invoices or works with enterprise chargeback products

Optical and Diskette Products

	Highlights	Technology	Bytes/sector	Capacity	Part numbers
5.25" optical products	<ul style="list-style-type: none"> The lack of physical contact helps improve data integrity High performance provides fast access to information Permanent WORM is designed to meet requirements for unalterable retention of data 	Rewritable	512 bytes/sector 4X	2.3 GB	99F8494
			1024 bytes/sector 4X	2.6 GB	99F8495
			1024 bytes/sector 8X	4.8 GB	59H4785
		CCW WORM	2048 bytes/sector 8X	5.2 GB	59H4786
			1024 bytes/sector 4X	2.6 GB	99F8497
		Permanent WORM	2048 bytes/sector 8X	5.2 GB	59H4789
DVD-RAM	<ul style="list-style-type: none"> 100,000 read/write cycles Multimedia storage Massive archival storage Single-sided, can be removed from cartridge; used in later generation RAM-readable DVD-ROM 	DVD-RAM	Single-sided	4.7 GB	19P0484
			Double-sided	9.4 GB	19P0490
3.5" diskettes DS/HD	<ul style="list-style-type: none"> Ultra-thin, double-layer coating technology Soft-action head-loading mechanism and new shutter design for superior reliability 			1.44 MB	DS/HD 10-pack 34L2611

1-888-IBM-MEDIA, www.storage.ibm.com/media

Optical Storage Solutions

The family of 3995 C-Series Optical Libraries offers multifunction optical drives with support for Permanent WORM, Magneto-Optical rewritable and CCW cartridge technologies. The 7210 CD-ROM is a desktop drive that provides a low-cost, high-performance solution for accessing information stored on industry-standard CD-ROM media.

Machine Model	3995 Optical Libraries					7210 DVD-RAM
	C×0	C×2	C×4	C×6	C×8	025
Description	5 1/4" Optical Library				External	DVD-RAM Drive
Technology	Permanent WORM, CCW, Rewritable					DVD-RAM
Number of Drives	1-2	2	2-4	4-6	4-6	1
Max Number of Cartridges/Disks	20	52	104	156	258	1
Capacity Unformatted	104GB	270GB	540GB	810GB	1341GB	2.6 - 9.4GB
Network Attachment	SCSI-2 F/W Diff					SCSI-2, SE
Platform Support	pSeries, RS/6000, iSeries, AS/400, zSeries, S/390					F/N, F/W
Warranty	IBM On-Site Repair One Year, 24x7					iSeries, AS/400, pSeries, RS/6000
						IBM On-Site Repair, One Year, 24x7



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San Jose, CA 95136

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Product data is accurate as of initial publication and is subject to change without notice.

GB equals one billion bytes when referring to hard drive capacity; accessible capacity may be less.