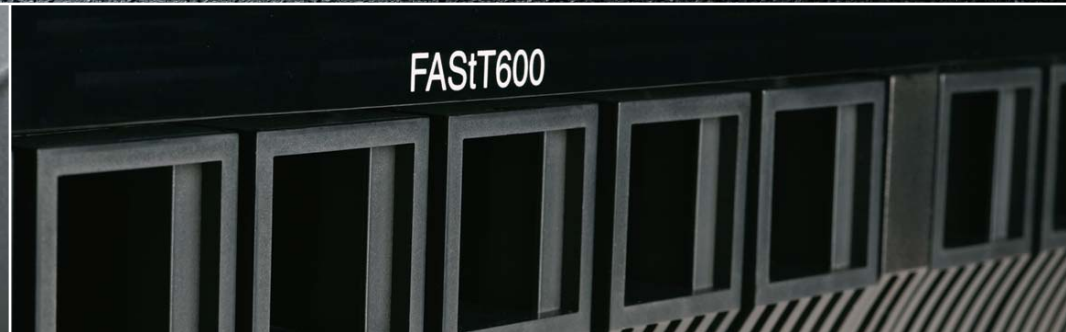


IBM® TotalStorage® Product Guide



Strategic storage imperatives

Information technology is the lifeblood of any business, especially today when organizational performance depends on information on demand. Business accountability hinges on it, laws and regulations mandate it, customers demand it and effective business processes rely on it. With information on demand, businesses can respond quickly with the flexibility to meet customer requirements, market opportunities or external threats. But as utterly valuable as information on demand has become, it also has become more costly to store, maintain and protect.

A comprehensive approach to the challenges of providing information on demand

To meet these challenges, IBM® has taken a holistic approach to the problem, looking well beyond storage products alone to help you share, manage and protect your data. To provide complete solutions for businesses using the On Demand model, IBM has addressed three areas of IT.

Infrastructure simplification

Few would question the statement that IT infrastructures have grown more complex in recent years. The dramatic growth in the use of IT, combined with distributed computing architectures, is part of the reason. But business processes have also become more complex and integrated too, driving a greater need for complex interconnections among systems.

The added complexity that accompanies growth can stand in the way of fully realizing the benefits of IT. *Infrastructure simplification* is a way to look at the entire IT operation and help eliminate the complexity that can raise costs, reduce reliability and create dependencies on specialized skills—factors making it harder to operate as an on demand business.

Three proven methods for simplifying an IT infrastructure are consolidation, virtualization and automated management. Each technique can be applied to all areas that compose an IT operation—servers, storage and networks.

Within the storage arena, consolidation can include reducing the number of data centers and sharing fewer large-capacity storage systems among a greater number of application servers. Consolidated resources can cost less and can be easier to share and protect.

Storage virtualization involves a shift in thinking from physical to logical—treating storage as a logical pool of resources, not individual devices. Not only can this help simplify the storage environment, but it also can help increase utilization and availability.

The storage arena is ripe with opportunities to lower administrative costs through automation. Once tasks are automated, administrators can deal with more strategic issues. In addition, automation can help reduce errors and contribute to higher system performance.

Business continuity

On demand businesses rely on their IT systems to conduct business. Everything must be working all the time. Nothing less is acceptable. A sound and comprehensive *business continuity* strategy encompasses high availability, near continuous operations and disaster recovery. For each of these areas, the IBM TotalStorage® Resiliency Family includes a comprehensive set of products that are compatible with multiple platforms.

Information life cycle management

The primary goal of *information life cycle management* (ILM) techniques is to optimize the storage and management of information based on its value to your business. An ILM process can help a business maximize the value of information, from the moment of its creation to the moment of its disposal. Corporate governance policies, business processes and compliance guidelines all influence ILM policies.

The primary capabilities from IBM that support ILM include optimized storage environments with tiered storage platforms; policy-based retention management software; content and records management applications; and non-erasable media. The potential benefits to your business include improved risk management, optimum storage utilization, better handling of compliance issues and lower costs.

Entry and Midrange Fibre Channel Switches

2031-232 McDATA Spheron 3232 Fabric Switch	<ul style="list-style-type: none"> • 2Gbps switching with 16 to 32 ports • High-availability design with redundant, hotswappable fans, power supplies, optics and concurrent firmware activation • FICON®, Fibre Channel (FCP) and FICON/FCP intermix • Enterprise Fabric Connectivity Manager and SANpilot management software • OpenTrunking and SANtegrity Binding
2031-212/224 McDATA Spheron 4300 and 4500 Fabric Switch	<ul style="list-style-type: none"> • 2Gbps switching with 4, 8 or 12; 8,16 or 24 ports • High-performance IBM TotalStorage Enterprise Storage Server® (ESS), FASSt, 3590 and LTO® tape device support • High-availability design with HotCAT™ concurrent firmware activation • SANpilot management software • Enterprise Fabric Connectivity Manager, OpenTrunking and SANtegrity Binding (4500 only)
2005-H08/-H16; 3534-F08 and 2109-F16/-F32 IBM TotalStorage SAN Switch H08/H16; F08 and F16/F32	<ul style="list-style-type: none"> • 2Gbps switching with 4-8/8-16; 4-8 and 8-16/16-32 ports • High-availability design with hot swappable, redundant power supplies (F16 and F32), optics and concurrent firmware activation (H08, H16 and F32) • Switched Fabric and FC-AL support • Up to 8Gbps aggregate speed with Inter-Switch Link (ISL) trunking • Advanced fabric services such as end-to-end performance monitoring • WEBTOOLS and Fabric Manager V4 management software • Secure Fabric OS
2062-D01 Cisco MDS 9216 Multilayer Fabric Switch	<ul style="list-style-type: none"> • 2Gbps switching with 16 to 48 ports and 20/40 ports • iSCSI and FCIP connectivity with four or eight Gigabit Ethernet ports • High-availability design with redundant, hotswappable fans, power supplies, optics and concurrent firmware activation • Switched Fabric and FC-AL support • Up to 32Gbps aggregate speed with PortChannel • Virtual SAN (VSAN) for SAN consolidation on a single physical fabric • Cisco Fabric Manager management software • FICON, FCP and FICON/FCP intermix (D01)
2061-020/-040 Cisco MDS 9120/9140 Multilayer Fabric Switch	<ul style="list-style-type: none"> • 2Gbps switching with 16 to 48 ports and 20/40 ports • iSCSI and FCIP connectivity with four or eight Gigabit Ethernet ports • High-availability design with redundant, hotswappable fans, power supplies, optics and concurrent firmware activation • Switched Fabric and FC-AL support • Up to 32Gbps aggregate speed with PortChannel • Virtual SAN (VSAN) for SAN consolidation on a single physical fabric • Cisco Fabric Manager management software • FICON, FCP and FICON/FCP intermix (D01)

McDATA Fabric Switch, IBM SAN Switch and Cisco Fabric Switch details, including supported servers and storage products, are available on the Web at ibm.com/totalstorage/mcdata, ibm.com/storage/fcswitch and ibm.com/storage/cisco.

Enterprise Fibre Channel Switches

2032-064 McDATA Intrepid 6064 Director	<ul style="list-style-type: none"> • 2Gbps switching: 2032-064 with 16 to 64 ports; 2032-140 with 16 to 140 ports with 4-port increments • High-availability design with redundant power supplies and cooling fans, automatic failover, call-home and concurrent firmware activation • FICON, Fibre Channel (FCP) and FICON/FCP intermix • Enterprise Fabric Connectivity Manager and SANpilot management software • OpenTrunking and SANtegrity Binding for FICON cascading
2032-140 McDATA Intrepid 6140 Director	
2032-C40 McDATA FC-512 Fabriccenter Cabinet	
2042-N16 CNT UltraNet Multi-service Director (UMD)	<ul style="list-style-type: none"> • 2Gbps switching: 2042-N16 and 2042-256 with 32 to 256 ports; 2042-128 with 24 to 128 ports; 2042-001 with 16 to 64 ports with 8-port increments • High-availability design with redundant power supplies and cooling fans, automatic failover, call-home and concurrent firmware activation • FC/9000-64 upgradable to FC/9000-128; FC/9000-128 upgradable to FC/9000-256 • Logical domains; virtual ISLs and extensibility to 512-ports (UMD) • FICON, FCP and FICON/FCP intermix • IN-VSN management software • SecureVSN for FICON cascading
2042-256 CNT FC/9000-256 Fibre Channel Director	
2042-128 CNT FC/9000-128 Fibre Channel Director	
2042-001 CNT FC/9000-64 Fibre Channel Director	
2109-M14/M12 and 2109-C36 IBM TotalStorage SAN Director M14/M12 and Cabinet C36	<ul style="list-style-type: none"> • 2Gbps switching with 32 to 128 ports (M12 with two 64-port fabrics), with 16-port increments • High-availability design with redundant power supplies and cooling fans, automatic failover, concurrent firmware activation and call-home with Fabric Manager V4 • Up to 8Gbps aggregate speed ISL trunking • Advanced fabric services such as end-to-end performance monitoring • WEBTOOLS and Fabric Manager V3, V4 management software • FICON, FCP and FICON/FCP intermix • Secure Fabric OS
2062-D07/T07 Cisco MDS 9509 Multilayer Director	<ul style="list-style-type: none"> • 2Gbps switching: 9509 with 16 to 224 ports; 9506 with 16 to 128 ports • iSCSI and FCIP connectivity: 9509 with 4 to 40 Gigabit Ethernet ports; 9506 with 4 to 24 Gigabit Ethernet ports • High-availability design with redundant, hot-swappable fans, power supplies, automatic failover, concurrent firmware activation and call-home capability • Up to 32Gbps aggregate speed with PortChannel • VSAN for SAN consolidation on a single physical fabric • FICON, FCP and FICON/FCP intermix
2062-D04/T04 Cisco MDS 9506 Multilayer Director	

McDATA Director, CNT Director, IBM SAN Director and Cisco Director details, including supported servers and storage products, are available on the Web at ibm.com/totalstorage/mcdata, ibm.com/totalstorage/cnt, ibm.com/storage/fcswitch and ibm.com/storage/cisco.

Product	Highlights	Technology	Length (m/feet)	Capacity Native	Compressed (up to)	Part Number	Related Products	Part Number
Enterprise Tape	<ul style="list-style-type: none"> Custom labeling and initialization services are available Server tracks help improve data integrity Cartridge intermix within libraries supports smooth migration, legacy systems Write Once Read Many (WORM) functionality 	Enterprise Tape Cartridge 3592	610/2001	300GB	900GB	18P7534	3590 Conductive Abrasive Cleaning Cartridge 3480/3490 Conductive Cleaner 3480/3490 Cleaning Cartridge 3592 Cleaning Cartridge	05H4435 05H3917 4780527 18P7535
			610/2001	300GB WORM	900GB WORM	18P7538		
			246/810	60GB	180GB	24R0316		
			246/810	60GB WORM	180GB WORM	24R0317		
		Enterprise Tape Cartridge 3590	320/1050	10/20/30GB	30/60/90GB	05H4434		
Enterprise Tape Cartridge 3590E	634/2070	20/40/60GB	60/120/180GB	05H3188 05H3302-J-less 08L6091-K-less	09G4494			
	3490E Enhanced Capacity Tape Cartridge (36-track)	335/1100	800MB	2.4GB	09G4494			
	3480 Tape Cartridge (18-track)	165/541	200MB		4479753			
.31" MP Tape	<ul style="list-style-type: none"> Unique midpoint load mechanism enables the system to locate data fast Durable cartridge case helps protect the tape 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	167/54	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"> Media uses industry-leading, interchangeable LTO format Cartridge is highest-capacity open standard tape cartridge available Custom labeling is available IBM-exclusive Statistical Analysis and Reporting System (SARS) statistics are stored in cartridge memory High durability helps support automation environments 	Ultrium® 2	609/1997	200GB	400GB	08L9870	Ultrium Cleaning Cartridge (all) Leader Pin Attachment Kit LTO 6-Cartridge Magazine	35L2086 08L9129 19P4529
		Ultrium 1	609/1997	100GB	200GB	08L9120		
SDLTape	<ul style="list-style-type: none"> Optical servo and backcoating technologies help support precision positioning and high-capacity recording New leader buckle helps accurate loading and new durable cartridge design 	SDLT-1 SDLT220	557/1800	110GB	220GB	35L1119	Cleaning Cartridge	19P4357
		SDLT-1 SDLT320	557/1800	160GB	320GB	35L1119		
DLTape	<ul style="list-style-type: none"> Two visible reel-lock indicators show open or damaged locks to protect drives Cartridge labeling area and labels are included DLTape IV is backward-compatible with earlier DLT 4000 and 7000 drives VS1 Data Cartridge 	DLT 4000	548/1800	20GB	40GB	59H3040	Cleaning Cartridge - DLT	59H3092
		DLT 7000	548/1800	35GB	70GB	59H3040		
		DLT 8000	548/1800	40GB	80GB	59H3040		
		VS1	563/1850	80GB	160GB	18P8923	Cleaning Cartridge - VS160	18P8924
VXA-2	<ul style="list-style-type: none"> Durable coating can resist oxidation and moisture Advanced archival and capacity properties are included Wide selection of compatible cartridge capacities support daily or full backups Media enclosure shutter locks out dirt and debris 	VXA 8mm	62/203	20GB	40GB	19P4878	Cleaning Cartridge	19P4880
			170/558	59GB	118GB	19P4877		
			230/754	80GB	160GB	19P4876		
AIT-2	<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 can store more information in less space 	AIT	230/754	50GB	100GB	18P6482	Cleaning Cartridge	18P7057
AIT-3			230/754	100GB	260GB	18P6483		

Media Guide (continued)

Product	Highlights	Technology	Length (m/feet)	Capacity Native	Compressed (up to)	Part Number	Related Products	Part Number
4mm Tape	<ul style="list-style-type: none"> Precision-matched tape reels and reel heights help support reliable operation Proprietary hub lock helps reduce positioning errors to improve data integrity Improved media coating helps reduce head friction and provide cleaner operation 	DDS-1	90/295	2GB	4GB	21F8754	Cleaning Cartridge—4mm	21F8763
		DDS-2	120/393	4GB	8GB	8191151		
		DDS-3	125/410	12GB	24GB	59H3465		
		DDS-4	150/492	20GB	40GB	59H4456		
		DAT72	170/557	36GB	72GB	18P7912		
8mm Tape	<ul style="list-style-type: none"> Special media formulation can help reduce drop-out to improve reliability Rigid magnetic stability specification helps increase coercivity to prolong shelf life and improve read reliability 100 percent media enclosure can help lock out dirt and debris to protect the cartridge 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	3.5GB	7GB	87G1603	Cleaning Cartridge—Metal Particle	16G8467
		AME	22/73	2.5GB	5GB	59H2671		
			170/557	20GB	40GB	59H2678		
		Mammoth-2 (w/ SmartClean)	225/738	60GB	150GB	18P6485		
			150/492	40GB	100GB	09L5323		
			75/246	20GB	50GB	35L1044		
SLR (QIC) Cartridges	<ul style="list-style-type: none"> Sophisticated mirror optics support BOT and EOT recognition Advanced media-binder process provides ultra-clean operation Stringent wheel-pin perpendicularity specification enables smoother operation and fewer re-reads Proprietary belt design provides steady tension Special stippled base-plate design helps provide rigidity and a stabletape path 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	Related Products	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	1500' Data Cartridge	
		5.25" SLR100	457/1500	50/100GB	152.4 KFCI	35L0968		
		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		
		5.25" SLR60/SLR100	47/156	5/10GB	152.4 KFCI	35L0661	155' Data Cartridge 900' Data Cartridge	
			274/900	30/60GB		19P4209		
		5.25" SLR60	366/1200	37.5GB	75GB	24R0146		
		NS20	226/740	10GB	79,800/3142	59H4364		
		1-888-IBM-MEDIA ibm.com/storage/media	Travan 40	228.7/750	20GB	96,000/3780	19P4882	Travan Cleaning Cartridge



Enterprise Tape Products

	3592	3590	3494	3494-VTS
Product	1/2" Enterprise Tape Drive	1/2" Enterprise Tape Drive	1/2" Cartridge Tape Library	Virtual Tape Server
Machine Model	3592 J1A	3590	3494 (Frames) L12, L14, L22-Library D12,D14,D22,D24-Library (Frame) S10-Storage HA1-High Availability	3494 B10, B20
Product Strengths	Multipurpose drive, capacity, performance, Write Once Read Many (WORM) support	Capacity, performance, reliability	Modular, reliable automation for high-volume storage	Virtualtape,fastacces peer-to-peercopy
Technology	Longitudinal Serpentine	Longitudinal Serpentine		Disk: Emulated 3490E Tape: 3590 1/2"
Number of Heads/Tracks	8/512	H: 16/384 E: 16/256	Drive Dependent	N/A
Number of Drives	1	1	Drive Dependent	64-256 (virtual)
Max Number of Cartridges	N/A	N/A	6,240 ²	500,000 (virtual volumes)
Cartridge Capacity Native/Compressed	300/900GB 300/900GB WORM 60/180GB 60/180GB WORM	E: 20/60GB EX: 40/120GB H: 30/90GB HX: 60/180GB	Drive Dependent	400/1200MB ⁶ 800/2400MB ⁶
Max System Capacity Compressed¹	900GB	EX: 120GB HX: 180GB	H: 561TB HX: 1122TB J1A: 5616TB	Disk: up to 5.2TB Tape: 1122TB
Max Drive Data Rate¹ Native/Compressed	40/120MB/sec	E: 14/42MB/sec H: 14/42MB/sec	Drive Dependent	VTS: up to 280MB/sec
Time to Data⁴	Cartridge Dependent	Model Dependent	Drive Dependent	VTS: 1-3 seconds if data in VTS Cache
Interface	FC, ESCON [®] , FICON, 2Gb FICON	SCSI-2 F/W, Diff PCI, Ultra SCSI, FC, ESCON, FICON, 2Gb FICON	SCSI-2 F/W, Diff PCI, Ultra SCSI, FC, ESCON, FICON, 2Gb FICON	Ultra SCSI, ESCON, FICON
SAN-Ready⁵	pSeries [®] , iSeries [™] , RS/6000 [®] , Sun, HP, Windows NT [®] , Linux, Windows [®] 2000	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
Supported Platforms⁵	iSeries, AS/400 [®] , pSeries, RS/6000, zSeries [®] , S/390 [®] , Linux [®] , Windows NT, Windows 2000, Sun, HP	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
ISV (Independent Software Vendor)⁵	Model Dependent ⁷	Model Dependent ⁷	A B D E F G H I J K L M ⁸	
Media Part number 1-888-IBM-Media	18P7534	05H4434 X: 05H3188	18P7534 (3592) 05H4434 (3590) X: 05H3188 (3590)	05H4434 X: 05H3188
Warranty	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7

F/W = Fast/Wide, Diff = Differential, N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, 10E = IBM OnSite Exchange, CRU = Customer Replaceable Unit
 NOTES: 1: Compressed data rates are estimates and are data - application- and processor-dependent. User results may vary. 2: Max number of cartridges decreases as tape drives are added.
 3: AIX 4.1.5 or later, 4: Load and search only, 5: Server platforms with SAN-ready attachability, model- and feature-dependent, 6: Depends on virtual cartridge configuration, 7: The latest ISV support can be found in the connectivity section at ibm.com, 8: The following vendors provide application support to the platforms defined above: A = Avicorp, B = BMC Storage Manager (TSM), B = IBM SysBack[™], 6000, C = CA Arcserve IT, D = Legato NetWorker, E = VERITAS NetBackup, F = CA Alexandria, G = SCH ReelLibrary, H = SCH ReelLibrary, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = HelpSystems Robot/Save, M = LXi Media Management, N = Dantz.

Products (continued)



Midmarket Tape Products

	3580	3581	3582	3583	3584
Product	LTO Ultrium Tape Drive	LTO Ultrium Tape Autoloader	LTO Ultrium Tape Library	LTO Ultrium Scalable Library	LTO Ultrium UltraScalable Tape Library
Machine Model	3580 L23 Ultrium 2 H23 Ultrium 2 L13 Ultrium 1 H13 Ultrium 1 L11 Ultrium 1 H11 Ultrium 1	3581 L23 Ultrium 2 H23 Ultrium 2 L17 Ultrium 1 H17 Ultrium 1 L13 Ultrium 1 H13 Ultrium 1	3582 L23 Ultrium 2	3583 L18-18 Carts L36-36 Carts L72-72 Carts	3584 L32-Base Frame D32-Expansion Frame: up to 15 frames may be added
Product Strengths	Open systems attach, high capacity, fast data transfer rate, desktop footprint	Open systems attach, multiplatform, high capacity, optional barcode reader	Open systems attach, multiplatform, scalable, high capacity, direct-to-SAN attach	Open systems attach, multiplatform, scalable, high capacity, direct-to-SAN attach	Open systems attach, multiplatform, ultra-scalable, high capacity
Technology	Longitudinal Serpentine	Longitudinal Serpentine	Longitudinal Serpentine	Longitudinal Serpentine	Longitudinal Serpentine
Number of Heads/Tracks	Ultrium 2: 8/512 Ultrium 1: 8/384	Ultrium 2: 8/512 Ultrium 1: 8/384	Ultrium 2: 8/512	Ultrium 2: 8/512 Ultrium 1: 8/384	Ultrium 2: 8/512 Ultrium 1: 8/384
Number of Drives	1	1	1-2	1-6	1-192
Max Number of Cartridges	1	7	24	72	6,881 ²
Cartridge Capacity Native/Compressed	Ultrium 2: 200/400GB Ultrium 1: 100/200GB	Ultrium 2: 200/400GB Ultrium 1: 100/200GB	Ultrium 2: 200/400GB	Ultrium 2: 200/400GB Ultrium 1: 100/200GB	Ultrium 2: 200/400GB Ultrium 1: 100/200GB
Max System Capacity Compressed¹	Ultrium 2: 400GB Ultrium 1: 200GB	Ultrium 2: 2.8TB Ultrium 1: 1.4TB	Ultrium 2: 9.6TB	Ultrium 2: 28.8TB Ultrium 1: 14.4TB	Ultrium 2: 2.75PB Ultrium 1: 496TB
Max Drive Data Rate¹ Native/Compressed	Ultrium 2: 35/70MB/sec Ultrium 1: 15/30MB/sec	Ultrium 2: 35/70MB/sec Ultrium 1: 15/30MB/sec	Ultrium 2: 35/70MB/sec	Ultrium 2: 35/70MB/sec Ultrium 1: 15/30MB/sec	Ultrium 2: 35/70MB/sec Ultrium 1: 15/30MB/sec
Time to Data⁴	Ultrium 2: 49 seconds Ultrium 1: 73 seconds	Ultrium 1: 73 seconds	Ultrium 2: 49 seconds	Ultrium 2: 49 seconds Ultrium 1: 73 seconds	Ultrium 2: 49 seconds Ultrium 1: 73 seconds
Interface	L23, L13, L11-LVD H23, H13, H11-HVD	L23, L17, L13-LVD H23, H17, H13-HVD	LVD, HVD, FC fabric	LVD, HVD, FC fabric	Ultrium2: FC fabric, LVD, HVD Ultrium1: FC-AL, LVD, HVD
SAN-Ready⁶	pSeries, RS/6000, Windows NT, 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 Platforms⁵	xSeries®, Netfinity®, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Windows Server 2003, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Windows Server 2003, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Windows Server 2003, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows NT, Windows 2000, Windows Server 2003, Sun, HP, Linux	xSeries, Netfinity, iSeries, AS/400, pSeries, RS/6000, Windows 2000, Windows Server 2003, Sun, HP, Linux
ISV (Independent Software Vendor)⁵	A C D E F G H I J L N ⁸	A C D E F G H I J L N ⁸	A C D E F G H I J L N ⁸	A C D E F G H I J L N ⁸	A C D E F G H I J L N ⁸
Media Part number 1-888-IBM-Media	Ultrium 2: 08L9870 Ultrium 1: 08L9120	Ultrium 2: 08L9870 Ultrium 1: 08L9120	Ultrium 2: 08L9870	Ultrium 2: 08L9870 Ultrium 1: 08L9120	Ultrium 2: 08L9870 Ultrium 1: 08L9120
Warranty	L23, H23, L13, H13: 3 years, CRU L11, H11: 1 year, IOE	L13, H13: 3 years, CRU L17, H17: 1 year, IOE	3 years, CRU	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7

F/W = FastWide, **DIF** = Differential, **N/A** = Not Applicable, **FC** = Fibre Channel, **X** = Extended length cartridge, **IOE** = IBM Onsite Exchange, **CRU** = Customer Replaceable Unit
NOTES 1: Compressed data rates are estimates and are data-, application- and processor-dependent. User results may vary. 2: Max number of cartridges decreases as tape drives are added.
 3: AX 4, 1.5 or later. 4: Load and search only. 5: Server platforms with SAN-ready attachability, model- and feature-dependent. 6: Depends on virtual cartridge configuration. 7: The latest ISV support can be found in the connectivity section at ibm.com/storage/tape/contrib. 8: The following vendors provide application support to the platforms defined above: A = Attili Storage Manager (TSM), B = IBM SysBack™ 6000, C = CA ARCserve IT, D = Legato NetWorker, E = VERITAS NetBackup, F = CA Alexandria, G = SOH RealGuard, H = SOH RealGuard, I = LSC, J = IBM BRMS, K = IBM Oudemand, L = HelpSystems RobotSave, M = LVI Media Management, N = Dantz.

Products (continued)



Complementary Storage Products

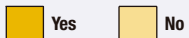
	7204	7206	7206-VX2	7332	7208	7205	7207	7212-102	7212-103
Product	External Disk Drive	4mm DDS-4 4mm Gen 5 (DAT72)	8mm VXA-2 Tape Drive	4mm DDS-3,4 Tape Autoloader	8mm Mammoth Tape Drive	DLT Drive SDLT Drive	SLR (QIC) Compatible External Tape Drive	Storage Device Enclosure	VXA-2 Autoloader
Machine Model	7204 518-18GB 536-36GB 573-73GB	7206 220-DDS4 336-DDS Gen 5	7206 VX2	7332 220-DDS4	7208 345-Mammoth-2	7205 550	7207 122 330	7212 102	7212 103
Product Strengths	External deskside 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	Backward read/write compatible with iSeries internal	Rack-mountable 2-drive enclosure utilizes only 1U (1.75") of space	Rack-mountable Only 1 EIA rack unit high
Technology	N/A	Helical Scan	Helical Scan	Helical Scan	Helical Scan	Longitudinal Serpentine	SLR (QIC format)	DDS, DVD, VXA	Helical Scan
Number of Heads/Tracks	8 heads 4 disks	Rotating Drum	Rotating Drum	Rotating Drum	Rotating Drum	8/536	1/1	DDS/VXA: Rotating Drum	Rotating Drum
Number of Drives	1	1	1	1	1	1	1	1-2	1
Max Number of Cartridges	N/A	1	1	6	1	1	1	2	10
Cartridge Capacity Native/Compressed	N/A	220: 20/40GB 336: 36/72GB	20/40GB 59/118GB 80/160GB	20/40GB	60/150GB	160/320GB	122: 4/8GB 330: 30/60GB	DDS-4: 20/40GB DAT72: 36/72GB VXA-2: 80/160GB	80 GB/160GB
Max System Capacity Compressed¹	518: 18GB 536: 36GB 573: 73GB	220: 40GB 336: 72GB	160GB	240GB	150GB	320GB	122: 4/8GB 330: 30/60GB	160GB with two VXA-2 drives 18.8GB with two DVD-RAM drives	1600 GB
Max Drive Data Rate¹ Native/Compressed	80MB/sec	220: 3/6MB/sec 336: 3/6MB/sec	6/12MB/sec	3/6MB/sec	12/30MB/sec	16/32MB/sec	122: .38/.76MB/sec 330: 4/8MB/sec	DDS/DAT72: 3/6MB/sec VXA: 6/12MB/sec	6/12MB/sec
Time to Data⁴	70ms	50 seconds	50 seconds	40 seconds	93 seconds	70 seconds	122: 85 seconds 330: 50 seconds	VXA-2: 40 seconds VXA: 40 seconds DAT72: 50 seconds	50 seconds
Interface	SCSI-3 ULTRA, LVD/SE, 160/320	SCSI-2 F/W SE, LVD/SE	SCSI-3 ULTRA, LVD/SE, 160/320	SCSI-2 F/W SE, LVD/SE	SCSI-2 Ultra2 LVD	SCSI-2 F/W, Diff PCI, Ultra2 SCSI LVD	SCSI-2 SE, ULTRA, LVD/SE, 160/320	SCSI-3 ULTRA, LVS/SE, 160/320	SCSI-3 Ultra, LVD-SE, 160/320
SAN-Ready⁶	pSeries, RS/6000	pSeries, RS/6000	pSeries, RS/6000, iSeries, AS/400, Windows NT	pSeries, RS/6000	pSeries, RS/6000, iSeries, AS/400, Windows NT	pSeries, RS/6000	iSeries, AS/400, pSeries, RS/6000		pSeries/RS6000
Supported Platforms⁵	pSeries, RS/6000	pSeries, RS/6000	pSeries, RS/6000, iSeries, AS/400	pSeries, RS/6000	pSeries, RS/6000, iSeries, AS/400	pSeries, RS/6000 ³	iSeries, AS/400, pSeries, RS/6000	pSeries, RS/6000, iSeries, AS/400	pSeries/RS6000
ISV (Independent Software Vendor)⁵	A B C E ³	A B C E ³	A B C E ³	A B C E ³	A B C E J ⁸	A B C E ³	A B C D E ³	Varies	A B C E ³
Media Part number 1-888-IBM-Media	N/A	DDS-3: 59H3465 DDS-4: 59H4456 DAT72: 18P7912	19P4876 (230M), 19P4877 (170M), 19P4878 (62M)	DDS-3: 59H3465 DDS-4: 59H4456	18P6485-60GB	35L1119	122: 59H3660 330: 19P4209	DDS-4: 59H4456 DAT72: 18P7912 VXA-2: 19P4876 SLR60: 19P4209 SLR100: 35L0968	19P4878
Warranty	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 year, 24x7	IBM Onsite Repair 1 Year, 24x7	IBM Onsite Repair 1 Year, 24x7	IBM Onsite Repair 1 Year, 24x7	CRU, IBM Onsite Repair 1 year, 24x7

F/W = FastWrite, Diff = Differential, N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, IOE = IBM Onsite Exchange, CRU = Customer Replaceable Unit
 NOTES 1: Compressed data rates are estimates and are data - application- and processor-dependent. User results may vary. 2: Max number of cartridges decreases as tape drives are added.
 3: AX 4, 1.5 or later. 4: Load and search only. 5: Server platforms with SAN-ready attachability, model- and feature-dependent. 6: Depends on virtual cartridge configuration. 7: The latest ISV support can be found in the connectivity section at ibm.com/storage/tape/compress. 8: The following vendors provide application support to the platforms defined above: A = Thwili Storage Manager (TSM), B = IBM SysBack™ 6000, C = CA Arcserve IT, D = Legato NetWorker, E = VERITAS NetBackup, F = CA Alexandria, G = SOH ReelIt, H = SOH ReelIt, I = LSC, J = IBM BRMS, K = IBM Ordermand, L = HelpSystems RobotSave, M = LVI 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	3592-J1A	1/2" Enterprise	900	Yes	Yes	Yes	Yes	Yes
	3590, E1A, H1A, E11, H11	1/2" Enterprise	1800	Yes	Yes	Yes	Yes	Yes
	3494, L12, L14, L22, D12, D14, D22, D24, S10, HA1	1/2" Enterprise	Up to 5616000	Yes	Yes	Yes	Yes	Yes
	3494-B10, B20 Virtual Tape Server	Virtual Tape 1/2" Enterprise	1166000	Yes	Yes	Yes	Yes	Yes
Midmarket Tape Products	3580-L23, H23 3580-L13, H13, L11, H11	LTO LTO	400 200	Yes	Yes	Yes	Yes	Yes
	3581-L13, H13, L17, H17	LTO	1400	Yes	Yes	Yes	Yes	Yes
	3581-L23, H23	LTO	2800	Yes	Yes	Yes	Yes	Yes
	3582-L23, H23, F23	LTO	9600	Yes	Yes	Yes	Yes	Yes
	3583-L18, L36, L72	LTO	28800	Yes	Yes	Yes	Yes	Yes
	3584-L32, D32	LTO	2752400 (2.75PB)	Yes	Yes	Yes	Yes	Yes
Complementary Storage Products	7204-536	HDD	36	Yes	Yes	Yes	Yes	Yes
	7204-573	HDD	73	Yes	Yes	Yes	Yes	Yes
	7205-550	SDLT	320	Yes	Yes	Yes	Yes	Yes
	7206-220	4mm DDS-4	40	Yes	Yes	Yes	Yes	Yes
	7206-336	DAT72	72	Yes	Yes	Yes	Yes	Yes
	7206-VX2	8mm VXA-2	160	Yes	Yes	Yes	Yes	Yes
	7207-122	QIC	8	Yes	Yes	Yes	Yes	Yes
	7207-330	SLR	60	Yes	Yes	Yes	Yes	Yes
	7208-345	8mm Mammoth-2	150	Yes	Yes	Yes	Yes	Yes
	7212-102	DVD, 4mm, SLR, VXA-2	320	Yes	Yes	Yes	Yes	Yes
	7212-102	DVD, SLR, VXA-2	160	Yes	Yes	Yes	Yes	Yes
	7212-103	VXA-2	1600	Yes	Yes	Yes	Yes	Yes
	7332-220	4mm DDS-4	240	Yes	Yes	Yes	Yes	Yes

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



IBM @server Systems and IBM TotalStorage

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 will find in the IBM @server® product portfolio. Investments in servers often result in demands on disk and tape storage systems. IBM has a family of storage offerings that complements the @server product portfolio. There is no better storage offering for IBM @server systems than an IBM TotalStorage product. These offerings are tested and supported by IBM and are backed by outstanding IBM service and support.

IBM TotalStorage Proven Program Helps Simplify Interoperability

The IBM TotalStorage Proven™ Program is designed to help customers identify storage solutions and configurations that have been pretested for interoperability. IBM TotalStorage Proven means that the applications and hardware you choose from leading companies, combined with state-of-the-art IBM storage technology, can provide 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 Web site at ibm.com/totalstorage/proven to view more than one hundred available products and solutions to meet your storage needs.

IBM TotalStorage Solution Centers

More than 140 worldwide IBM TotalStorage Solution Centers can deliver one-stop shopping for storage hardware, software and consulting services. The Solution Centers offer you both a local venue for hands-on testing of IBM storage solutions and a platform for proof-of-concept and benchmarking activities. These centers also work with the leading storage software providers to support a wide variety of choices for interoperability. IBM Business Partners will help you select and implement a solution to help your business succeed in today's dynamic marketplace. Visit: ibm.com/storage/tscc

Host-Attached Storage Products



	ESS 750	ESS 800	7133	FAST900	FAST700	FAST600
Product	Enterprise Storage Server®	Enterprise Storage Server	Serial Disk System	FAST900 Storage Server	FAST700 Storage Server	FAST600 Storage Server
Machine/Model	2105/800	2105/800	7133/D40, T40	1742/90U	1742/1RU	1722/60U
Platform Support¹	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®, z/VM®, OS/390®, VM/ESA®, VSE/ESA™, MVS/ESA™, TPF, Linux commercial distributions, ² SGI Origin IRIX	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, z/VM, 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	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, VMWare	pSeries, xSeries, Windows 2000; optional support for AIX, Solaris, HP-UX, NetWare, Linux, VMWare
Host Connectivity	1Gb and 2Gb Fibre Channel/FICON, ESCON	1Gb and 2Gb Fibre Channel/FICON, ESCON, SCSI	SSA, Fibre Channel ³ , SCSI ³	Fibre Channel	Fibre Channel	Fibre Channel
SAN Support	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	FC-AL ³ , Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric
Copy Services	FlashCopy® V1 and V2, Metro/Global Mirror ⁴ V1 and V2	FlashCopy V1 and V2, Metro/Global Mirror ⁴ V1 and V2, and XRC	Remote Copy (up to 10 km), 3-way copy, Instant Copy ³	Remote Copy, FlashCopy, VolumeCopy	Remote Copy, FlashCopy, VolumeCopy	VolumeCopy (turbo option only), FlashCopy
Availability Features	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 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
Controller	SMB dual active	SMB dual active; optional turbo feature	Single/multiple active adapters	Dual active 2Gb RAID controllers	Dual active 2Gb RAID controllers	Dual active 2Gb RAID controllers; optional turbo feature
Cache (min, max)	8GB, 16GB	8GB, 64GB	0, 32MB write and 64MB read	2GB, 2GB	2GB, 2GB	512MB, 512MB (base) 2GB, 2GB (turbo option)
RAID Support	5, 10	5, 10	0,1,5,10 (using adapters)	0, 1, 3, 5, 10	0, 1, 3, 5, 10	0, 1, 3, 5, 10
Capacity (min, max)	1.1TB, 4.6TB	582GB, 55.9TB (physical capacity)	72.8GB, 14TB	32GB, 32TB via EXP700 (FC) 250GB, 56TB via EXP100 (Serial ATA)	32GB, 32TB	Base: 32GB, 8.2TB via EXP700 (FC), 250GB, 28TB via EXP100 (Serial ATA) Turbo option: 32GB, 16.4TB via EXP700 (FC), 250GB, 28TB via EXP100 (Serial ATA)
Drive Interface	SSA	SSA	SSA	2Gb FC-AL	2Gb FC-AL	2Gb FC-AL
Drive Support	72.8GB, 145.6GB (10,000rpm)	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 and 72.8GB 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
Certifications	Microsoft® RAID, Cluster and Data Center, GDPS, HACMP™, NetWare, Linux	Microsoft RAID, Cluster and Data Center, GDPS, HACMP, NetWare, Linux	Microsoft RAID, Cluster, HACMP	Microsoft RAID, Cluster, NetWare Cluster, HACMP, VERITAS Clustering ⁴	Microsoft RAID, Cluster and Data Center, HACMP, NetWare Cluster, VERITAS Clustering	Microsoft RAID, Cluster and Data Center, HACMP, VERITAS Clustering

1: Consult product information for details. 2: RedHat, SUSE and TurboLinux. Please verify specific product information for details. 3: Via IBM TotalStorage SAN Controller 160; no cluster or HACMP support. 4: Also, verification will be completed for HP Service Guard. 5: Metro Mirror is synchronous replication; Global Mirror is asynchronous replication; Global Copy is extended distance copying.

Host-Attached Storage Products (continued)



	FAST200	FAST100	FAST EXP100	EXP Plus 320
Product	FAST200 Storage Server	FAST100 Storage Server	EXP100	EXP Plus 320
Machine/Model	3542/1RU, 2RU	1724/100	1710-10U	2104/DS4, TS4
Platform Support¹	pSeries, select RS/6000 servers, xSeries, select Netfinity servers, AIX, Windows NT, Windows 2000, Dynix, HP-UX, Linux, NetWare, Solaris, VMWare	Windows Server 2003, Windows 2000 Server & Adv.Server, Novell NetWare 5.1 w/SP6, Red Hat Enterprise Linux 3.0, SUSE LINUX Enterprise Server 8 3, VMware ESX 2.1, AIX 5.1/5.2, HP UX 11/11i, Solaris 8/9	AIX, Windows, Linux	pSeries, select RS/6000 servers, AIX
Host Connectivity	Fibre Channel	Fibre Channel	Fibre Channel attachment to FAST600 and FAST900	Ultra 320 SCSI
SAN Support	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric attachment to FAST600 and FAST900	N/A
Copy Services	FlashCopy	FlashCopy option	N/A	N/A
Availability Features	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, dual redundant, hot-swap fans and power supplies for high availability, hot-swap drives, dual Environmental Service Modules (ESMs)	RAID with server adapters, redundant power/cooling, hot-swap drives, enclosure services
Controller	Single/dual active	Dual 2Gp RAID controller	Supported by FAST600 and FAST900	Adapters in server
Cache (min, max)	128MB, 256MB	512MB, 512MB	N/A	N/A
RAID Support	0, 1, 3, 5, 10	0, 1, 3, 5, 10	0, 1, 5, 10, 50	0, 1, 5 (using server-based adapters)
Capacity (min, max)	32GB, 9.6TB	250GB, 14Tb with three Expansion Units	28TB attached to FAST600 56TB attached to FAST900	32GB, 2TB
Drive Interface	FC-AL	2Gb FC-AL	Serial ATA	Ultra 320 SCSI
Drive Support	36.4GB, 73.4GB and 146.8GB 10,000 rpm disk drives; 18.2GB, 36.4GB and 73.4GB 15,000 rpm disk drives	250GB 7,200 rpm SATA disk drives	Up to 14 250GB 7,200 rpm disk drives (2Gbps)	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, HACMP, NetWare Cluster, VERITAS Clustering	Microsoft Clustering Services, IBM SAN Volume Controller 1.1.1	N/A	HACMP

Selecting a Solution

	ESS	7133	FAST900	FAST700	FAST600	FAST200	EXP Plus 320
Local copy within controller		requires 7140 or 2108-S20					
Remote Copy (>10 km)			*	*			
Centralized management							
AIX N-way performance							
Storage area network							
Concurrent heterogeneous servers (UNIX and Intel)							
Concurrent microcode install							
Intermix disk capacities							
Multiple RAID options							requires adapter
Controller-based call-home							
Rack mount							
Virtualization							

* Remote Copy (>10 km) is via TotalStorage Proven vendors (Legato, CNT, NSI) Yes No

Product	Highlights
Enterprise Storage Server 800	<ul style="list-style-type: none"> Provides 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
Enterprise Storage Server 750	<ul style="list-style-type: none"> Enterprise-strength reliability and function. Includes ESS comprehensive server support and support for PPRC and FlashCopy Attractive enterprise storage price point, entry capacity Design supports non-disruptive upgrade to the ESS 800
FAST900 Storage Server	<ul style="list-style-type: none"> Provides SAN-ready flexible disk storage system for UNIX and Intel processor-based environments Offers 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
FAST700 Storage Server	<ul style="list-style-type: none"> Provides SAN-ready flexible disk storage system for UNIX and Intel processor-based environments Offers 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
FAST600 Storage Server	<ul style="list-style-type: none"> Provides four 2Gb Fibre Channel host ports to support multipath failover for directly attached UNIX and Intel processor-based clustered servers Designed to deliver high performance of up to 768MB/sec throughput with turbo option Can help facilitate storage consolidation in SAN, NAS and direct-attach environments Supports up to 112 disk drives and scales up to 16.4TB of capacity with turbo option Includes FAST Storage Manager to help centrally manage all FAST storage subsystems Supports multiple operating systems, including Microsoft Windows, AIX, Sun Solaris, HP-UX, Novell NetWare and Linux Can help improve service response time with automated alerts from the optional FAST Service Alert feature
FAST200 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 320	<ul style="list-style-type: none"> Provides flexible, scalable and cost-effective disk storage for RS/6000 and pSeries servers Supports Internet-centric service providers
7133 Serial Disk System	<ul style="list-style-type: none"> Provides high-throughput, high-density, scalable serial disk storage for UNIX servers Incorporates 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 Includes high-function 7133 controller

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

Operating Systems and Copy Services Platform Coverage



	ESS 750/800	7133	FASiT900	FASiT700	FASiT600 ²	FASiT200
Windows NT	FlashCopy, Metro/Global Mirror ³	Instant copy (7140)	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
Windows 2000	FlashCopy, Metro/Global Mirror ³	Instant copy (7140)	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
Windows Server 2003			FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
NetWare	FlashCopy, Metro/Global Mirror ³		FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
Linux ¹	FlashCopy, Metro/Global Mirror ³ ; Global Copy ²		FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
AIX	FlashCopy, Metro/Global Mirror ³	3-way copy (SSA Adapter, 7140)	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
VMWare						
Dynix	FlashCopy, Metro/Global Mirror ³					
HP-UX	FlashCopy, Metro/Global Mirror ³	Instant copy (7140)	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
Solaris	FlashCopy, Metro/Global Mirror ³	Instant copy (7140)	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy, Remote Mirroring	FlashCopy, VolumeCopy	FlashCopy
IRIX			*	*	*	*
Tru64 UNIX	FlashCopy, Metro/Global Mirror ³		*	*	*	*
OpenVMS	FlashCopy, Metro/Global Mirror ³					
z/OS, OS/390	FlashCopy, Metro/Global Mirror ³ ; XRC, Concurrent Copy					
OS/400	FlashCopy, Metro/Global Mirror ³					
DG/UX	FlashCopy, Metro/Global Mirror ³					

* Request via RPQ process

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.

2: VolumeCopy on FASiT600 requires turbo option.

3: Metro Mirror is synchronous replication; Global Mirror is asynchronous replication; Metro/Global Mirror is two- or three-site cascading asynchronous replication; Global Copy is extended distance copying.

 Yes  No

IP Attached Storage Products



IBM TotalStorage NAS Gateway 500

IBM TotalStorage Data Retention 450*

Model	5198-001	
Highlights	<ul style="list-style-type: none"> Installation—Offers installation wizard designed to help simplify installation and setup Increased access—Is designed to allow IP clients and servers to access SAN devices without each server or client being directly connected by Fibre Channel Flexibility—Enables cross-platform file sharing (CIFS [Microsoft Windows], NFS [UNIX]) that can help reduce network complexity and expense, and allow data to be shared across the organization Interoperability—Supports attachment to non-IBM storage via the IBM TotalStorage SAN Volume Controller† Scalability—Supports nondisruptive capacity increases up to 224TB of direct attached or SAN-attached physical storage Manageability—Includes integrated system diagnostics and management tools, which are designed to help minimize downtime High performance—Is optimized for network file serving and storage requirements Redundancy—Offers redundant fans, power supplies, disk drive, adapters, processors and clustered nodes Copy services—Provides extensive on-board and out-board disaster recovery data protection features 	<ul style="list-style-type: none"> Designed as a preconfigured, integrated solution to help store, retrieve, manage, share and secure regulated and nonregulated data in non-erasable and non-rewritable format Designed to offer automatic provisioning, migration, expiration and archiving capabilities Supports nondisruptive enterprise scalability of up to 56TB physical capacity Offers a comprehensive suite of software tools for policy- and event-based data management Designed to avoid single points of failure
Scalability	Up to 224TB of SAN-attached physical storage	3.5, 7, 14, 24.5 and 56TB
Nodes	Single- or dual-node configurations Dual-node configuration offers active/active clustering	Dual node configuration offers active/passive clustering
Processors	1.45GHz POWER4+™ processor (orderable as 2-way or 4-way per node)	Two 1.45GHz POWER4+ processors (one per node)
Network Protocol Support	NFS v2 and v3 (UNIX and Linux), CIFS (Windows), HTTP, FTP, NTP, SNMP, SMTP	IBM Tivoli Storage Manager for Data Retention application programming interface (API)
Operating System	AIX 5L™ 5.2B	AIX 5.2 ML2
Performance**	276MB/sec CIFS 68,444 I/Os per sec NFS v3	Performance testing not completed at time of publication
PCI Slots Available	6/node	2 port Gigabit Ethernet (upgrades available)
Network Connectivity	Eight (10/100/1000) Ethernet ports (copper and fiber) for file serving or service management on PCI adapters Eight (2Gbps) Fibre Channel ports for external tape and storage attachment	Two available Ethernet ports
ECC SDRAM Memory (max)	16GB with 2-way processor and 32GB with 4-way processor per node	1GB per server
Data Protection	On-board data protection using snapshots to create copies and snap rollback to restore backup copies of snapped data. Out-board remote mirroring over IP networks or SAN networks to provide copies of data at remote disaster recovery sites	Mirrored OS, RAID-5 for user data
Redundancy/High Availability	Redundant, hot swappable disk bays, power supplies, fans and PCI adapters	HACMP, redundant FASiT controllers, RDAC driver to provide path failover, RAID
Backup	External tape (SCSI or FC)	External tape
RAID Levels	SAN disk dependent	RAID-5
Systems Management	NAS WebSM, SMIT, SNMP v3, NAS CLI	SMIT, FASiT Storage Manager GUI, SNMP
Storage Management	IBM Tivoli® Storage Resource Manager (ITSRM) agent, IBM Tivoli Storage Manager client and storage agent, IBM Tivoli SAN Manager (ITSANM) agent; additional third-party products are supported†	IBM Tivoli Storage Manager client and storage agent

* Each IBM customer is responsible for ensuring its own compliance with legal requirements. It is the customer's sole responsibility to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.

** Please visit ibm.com/totalstorage/nas for additional performance information.

† For more information on third-party product support, please refer to "IBM NAS Interoperability" at ibm.com/totalstorage/nas.

SAN Virtualization

Create a tiered storage environment and increase the flexibility within your storage infrastructure by introducing solutions based on IBM TotalStorage virtualization software. Offerings include the IBM TotalStorage SAN Volume Controller and the IBM TotalStorage SAN Volume Controller for Cisco MDS 9000.

Product	Function and Value	Highlights
IBM TotalStorage SAN File System (SFS)	The IBM TotalStorage SAN File System is designed to help reduce the complexity of managing files within SANs. It combines software, hardware and optional services into an integrated solution—one that is designed to provide a network-based heterogeneous file system for data sharing and policy-based storage management in an open environment.	<ul style="list-style-type: none"> • Enhanced data management: The SFS provides policy-based data management that can help improve file and data-base management as well as administrator productivity • Improved data access: The SFS is designed to enable data sharing and improve the ease and efficiency of accessing data • On demand operating environment: The SFS is designed to provide an on demand operating environment for storage—which can play a key role in virtualization, contribute to automation and integration and support open standards • Avoidance of downtime for planned and unplanned outages, maintenance and backups: Improved application and data availability can help enable nondisruptive administrative tasks and backups and reduce or eliminate downtime
IBM TotalStorage SAN Volume Controller (SVC)	Based on Virtualization technology, the IBM TotalStorage SAN Volume Controller is designed to manage all disk storage as a single resource from a single point to simplify the operation of the environment. It is designed to allow a tiered storage environment to be deployed better than relying on physical disk arrays alone.	<ul style="list-style-type: none"> • Manage storage volumes from a central point: The SVC is designed to enhance the flexibility of your storage environment. It can combine the storage capacity from multiple disk arrays from different suppliers into a single pool of storage which can be managed from a central point. • Create a tiered storage environment: Utilizing virtualization technology, the SVC enables customers to match the cost of the storage to the value of their data. Mission-critical data can be stored on high-performance highly-available fibre-channel disks while non-mission-critical data can be stored on serial-ATA disks. • Virtually eliminate downtime related to storage: The SVC enables data migrations, storage software upgrades and changes to the physical storage without impacting host applications. • Improve storage resource utilization: By combining the storage capacity from multiple disk arrays into a single pool, SVC uses existing storage capacity more efficiently, which can defer additional storage purchases to save costs. • A single, cost-effective set of advanced copy services: The SVC can apply copy services across all the managed storage, regardless of the disk array supplier. This capability helps simplify the environment, reduce the costs of implementing disaster recovery solutions and increases the productivity of the personnel.
IBM TotalStorage SAN Volume Controller for Cisco MDS 9000 Solution	IBM and Cisco combine the SAN Volume Controller storage software with the Caching Services Module from the Cisco MDS 9000 Family of switches and directors to deliver the benefits of the SAN Volume Controller in a switch-based implementation, aiding with both data integration and consolidation of the storage network.	<ul style="list-style-type: none"> • Manage storage volumes from a central point: The SVC storage software can combine the storage capacity from multiple disk arrays from different suppliers into a single pool of storage which can be managed from a central point in the Cisco switched-fabric environment. • Create a tiered storage environment: Utilizing virtualization technology, the SVC for Cisco MDS 9000 solution enables customers to match the cost of the storage to the value of their data. Mission-critical data can be stored on high-performance highly-available fibre-channel disks while non mission-critical data can be stored on serial-ATA disks. • Virtually eliminate downtime related to storage: The SVC storage software enables data migrations, storage software upgrades and changes to the physical storage without impacting host applications. • Improve storage resource utilization: By combining the storage capacity from multiple disk arrays into a single pool, the SVC storage software uses existing storage capacity more efficiently, which can defer additional storage purchases to save costs. And integrating the software into a Cisco switched fabric saves costs even more by reducing the space requirements within the data center. • A single, cost-effective set of advanced copy services: The SVC storage software can apply copy services across all the managed storage, regardless of the disk array supplier. This helps simplify the environment, reduce the costs of implementing disaster recovery solutions and increases the productivity of the personnel.

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 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 real-time, 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
DFSMSStvs	Enables batch jobs and CICS® (Customer Information Control Systems) online transactions to update shared VSAM data sets concurrently

IBM TotalStorage Productivity Center

Product	Function and Value	Highlights
IBM TotalStorage Multiple Device Manager	In a pooled or virtualized SAN environment, multiple devices work together to create a storage solution. IBM TotalStorage Multiple Device Manager is designed to provide integrated administration, optimization and replication features for these virtualization solutions.	<ul style="list-style-type: none"> • Designed to help reduce the complexity and cost of storage management while improving data availability • Offers centralized, open standards-based management of storage devices • Designed to help enhance storage administrator productivity • Offers proactive management of storage devices • Designed to monitor and automate replication operations across storage devices
IBM Tivoli Resource Manager Family	IBM Tivoli® Storage Resource Manager is an intelligent console for storage environments that provide a set of policy-driven automated tools for managing storage capacity, availability, events, performance and assets, including DAS, NAS and SAN technologies.	<ul style="list-style-type: none"> • Designed to help leverage and optimize existing storage resources and perform storage management with a high level of control • Designed to help maximize storage utilization • Designed to be able to manage more storage with the same staff
IBM Tivoli SAN Manager	IBM Tivoli SAN Manager is designed to help automate the management of heterogeneous storage networks and works with a broad range of devices, so businesses can leverage and better use existing technology investments. It is designed to provide comprehensive management of physical and logical configurations for multivendor SANs with automatic resource discovery, event monitoring and alerting, zone control and SAN error-prediction capabilities.	<ul style="list-style-type: none"> • Designed to help predict storage network failures before they happen, enabling preventative maintenance • Designed to help accelerate problem isolation when failures occur • Designed to report on storage network performance • Designed to create a single point of control, administration and security for the management of heterogeneous storage networks

IBM Tivoli Storage Manager

Function and Value	Highlights
IBM Tivoli Storage Manager is designed to provide protection of your 24x7 applications and key data in the event of hardware, software or network failures. It offers move-and-store techniques and policy-based automation, which are designed to work together to help increase data and application protection, decrease disaster recovery time and lower storage administration costs. It manages inactive data helping you match the value of the data to the most cost-effective storage management practices. Tivoli Storage Manager is designed to scale easily to protect hundreds of computers running a dozen operating systems ranging from laptops to mainframes and connected together via the internet, WANs, LANs or SANs. Tivoli Storage Manager also offers open, easy-to-use APIs designed to enable ISVs to more easily adapt their solutions to IBM software, helping to allow joint customers to customize, better secure and extend the functionality of their storage environment.	<ul style="list-style-type: none"> • Designed to protect valuable data in the most cost effective manner • Designed to archive inactive data to help reduce costs • Designed to help ensure continuity and recovery

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 requirements of key business applications. These solutions can 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

- Analysis of enterprise information needs and environment
- Defined enterprise-wide storage strategies
- Quantified 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 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 library of tapes.
- IBM Operational Support Services for Tivoli® Storage Manager assists 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.

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

IBM Global Financing

IBM Global Financing offers competitive financing to credit-qualified customers and IBM Business Partners to assist them in acquiring IT solutions. Our offerings include financing for IT acquisition—including hardware, software and services, both from IBM and other manufacturers or vendors—as well as commercial financing (revolving lines of credit, term loans, acquisition facilities and inventory-financing credit lines) for IBM Business Partners. Offerings (for all customer segments: small, medium and large enterprise), rates, terms and availability may vary by country. Contact your local IBM Global Financing organization or visit the Web at ibm.com/financing.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY, EITHER EXPRESSED OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided.

References in this document to IBM products, programs or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM program or product in this document is not intended to state or imply that only that program may be used. Any functionally equivalent program or product, that does not infringe IBM's intellectual property rights, may be used instead. It is the user's responsibility to evaluate and verify the operation of any non-IBM product, program or service.



ibm.com/totalstorage

© Copyright IBM Corporation 2004

IBM Systems and Technology Group
Route 100
Somers, NY 10589
U.S.A

Produced in the United States
July 2004
All Rights Reserved

IBM, the IBM logo, the e-business logo, AIX, AIX 5L, AS/400, CICS, DB2, DB2 Universal Database, DFSMSdcp, DFSMSdss, DFSMShsm, DFSMSmm, DFSORT, Enterprise Storage Server, ESCON, @server, FICON, FlashCopy, HACMP, iSeries, Lotus, Magstar, MVS/ESA, Netfinity, OS/390, OS/400, POWER4+, pSeries, RS/6000, S/390, SysBack, Tivoli, TotalStorage, TotalStorage Proven, VM/ESA, VSE/ESA, xSeries, z/OS, z/VM and zSeries are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries or both.

LTO and Ultrium are registered trademarks of International Business Machines Corporation, Hewlett-Packard and Certance.

Microsoft, Windows and Windows NT are trademarks of Microsoft Corporation in the United States, other countries or both. Intel is a registered trademark of Intel Corporation in the United States, other countries or both. Linux is a trademark of Linus Torvalds in the United States, other countries, or both. UNIX is a registered trademark of The Open Group in the United States and other countries. HotCAT is a trademark of McDATA Corporation. Other company, product and service names may be trademarks or service marks of others.

IBM Global Financing offerings are provided through IBM Credit Corporation in the United States and IBM Canada Ltd. in Canada to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type, equipment type and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension or withdrawal without notice.

IBM hardware products are manufactured from new parts, or new and used parts. In some cases, the hardware product may not be new and may have been previously installed. Regardless, IBM warranty terms apply.

This document could include technical inaccuracies or typographical errors. IBM may make changes, improvements, or alterations to the products, programs and services described in this document, including termination of such products, programs and services, at any time and without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. The information contained in this document is current as of the initial date of publication only and is subject to change without notice. IBM shall have no responsibility to update such information.

IBM is not responsible for the performance or interoperability of any non-IBM products discussed herein. Performance data for IBM and non-IBM products and services contained in this document was derived under specific operating and environmental conditions. The actual results obtained by any party implementing such products or services will depend on a large number of factors specific to such party's operating environment and may vary significantly. IBM makes no representation that these results can be expected or obtained in any implementation of any such products or services.

MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.