

IBM System Storage Product Guide



Why IBM Information Infrastructure?

IBM® Information Infrastructure helps organizations manage the incredible explosion of the amount and types of digital information, even during difficult economic times. IBM Information Infrastructure can help clients lower storage acquisition costs dramatically while improving data resiliency and security. Today, IBM offers proven capabilities in core technologies such as deduplication, virtualization, encryption and solid-state storage. New solutions are available for larger organizations using mainframes, as well as for midsize organizations. New IBM Smart Business Systems simplify deployment of private cloud solutions for archiving and network file services.

IBM Information Infrastructure can do much more than help reduce costs. It is also an important enabler of information-led transformation, which is key to growth for many organizations. Information-led transformation is a process through which organizations can turn information into a strategic driver for innovation, business optimization and competitive differentiation. This process can help clients use information more pervasively across the organization, leverage analytics to take a predictive view of the business, make real-time decisions and discover new kinds of intelligence from the information at hand.

As organizations build new information-driven or information-based products and services, throughput and availability requirements can increase dramatically. The IBM solution helps enable information-led transformation with innovative technology that can break through traditional performance barriers with best practice-based services to help clients manage the transition. For example, with a smart use of solid-state storage, IBM storage arrays and virtualization controllers can deliver drastic improvements with a small amount of solid-state disk.

IBM core technologies to drive your information infrastructure

IBM solutions can help midsize organizations, large enterprises, cloud computing providers and other businesses save time and money based on their unique needs. A key benefit of selecting IBM for your next information infrastructure project is gaining access to a broad portfolio of outstanding products and services. IBM offers highly rated, patented technology that delivers unique value.

Some IBM differentiating capabilities include:

- Real-time Compression—Keep up to five times more network-attached storage (NAS) production information online
- Storage virtualization—Reduce storage area network (SAN) disk costs by helping to significantly increase utilization
- Data deduplication—Lower storage acquisition costs dramatically while reducing energy, cooling, floor space, management requirements and maintenance costs
- Solid-state storage architectures—Improve drive access response time without application tuning
- Next-generation scalable storage—Achieve Tier 1 functionality at Tier 2 costs
- Mainframe storage—Optimize mainframe applications with unrivaled support for IBM System z® performance, scalability, security and high-availability features
- Self-encrypting storage and security management—Improve security with encryption at the drive level with little or no performance impact
- Information archiving—Optimize application performance and simplify application administration while lowering total costs
- Business intelligence platform integration—Correlate disparate information faster across the value chain
- Continuous data protection—Get applications and users up and running within minutes following a data loss
- Storage infrastructure management—Improve storage utilization and simplify administration

No other major vendor can match the IBM breadth of information infrastructure capabilities. IBM offers integrated solutions for consolidation, data protection, storage management simplification, compliance support and more. IBM technology includes SAN and NAS disk systems, tape systems, SAN switches, storage management software, services, self-encrypting storage with key management, non-erasable, non-rewriteable storage for regulatory compliance and flexible financing for large and midsize organizations.

Learn more about IBM Information Infrastructure, including the full range of data storage solutions and companion software and services offerings, at:

ibm.com/information_infrastructure

What's new?

IBM System Storage® products and services have been enhanced to better meet the information infrastructure needs of businesses. This Product Guide features several new products:

- IBM Real-time Compression Appliances™ STN6500 and STN6800
- IBM Storwize® V7000 Unified Disk System
- IBM System Storage N6060 series
- IBM System Storage EXP2500 Express storage enclosure
- IBM System Storage EXP3500 Express storage enclosure
- IBM XIV® Storage System Gen3
- IBM System Storage SAN768B-2 and SAN384B-2
- IBM System Storage SAN48B-5
- IBM System Storage DCS3700 High Performance Computing System
- IBM System Networking RackSwitches: G8052, G8124E, G8264, G8316
- IBM System Networking BNT Virtual Fabric 10GB Ethernet Switch Module
- IBM System Networking BNT 1/10Gb Uplink Ethernet Switch Module
- IBM System Networking BNT Layer 2-7 Gigabit Ethernet Switch Module
- IBM System Networking BNT Layer 2/3 Copper and Fiber Gigabit Ethernet Switch Module

The following products featured in this guide have been significantly enhanced:

- IBM XIV Storage System
- IBM System Storage DS8800
- IBM System Storage DS8700
- IBM System Storage DS3000 Express
- IBM Comprehensive Data Protection Solution (IBM Tivoli® Storage Manager FastBack® bundle)
- IBM System Storage DS5100/DS5300
- IBM System Storage SAN Volume Controller
- Cisco MDS 9500 Series Multilayer Directors for IBM System Storage

SAN routers to connect heterogeneous SAN fabrics and enable distance extension using Fibre Channel over IP

IBM System Storage SAN06B-R extension switch (2498-R06)

- Designed for high performance with up to sixteen 8 Gigabits per second (Gbps) Fibre Channel ports and six 1 Gigabit Ethernet (GbE) ports, the SAN06B-R supports either 8, 4, 2 or 4, 2 and 1 Gbps FC link speeds.
- Infrastructure simplification solutions for the IBM Power Systems™ and IBM System x® families include disaster tolerance over metropolitan and global IP networks with System Storage disk arrays, tape libraries and Tivoli Storage Manager data protection software. Support for System z servers is provided via the optional 8 Gbps Advanced Extension, IBM FICON® Accelerator and FICON CUP Activation features.

Cisco MDS 9222i for IBM System Storage (2054-E01)

- Designed to address the needs of medium-sized businesses and large enterprises, the modular 18/4 (4 Gbps Fibre Channel/GbE) port multiservice SAN router enables high performance, cost-effective SAN extension over IP for continuity solutions.
- The solution includes eighteen 4 Gbps Fibre Channel ports, 4 GbE IP ports, the SAN Extension over IP Package for integrated IP ports and one modular expansion slot.
- A 4/44 8 Gbps Fibre Channel switching module allows support for up to 66 Fibre Channel ports. A 4-port 10 Gbps Fibre Channel module is also available for high-performance, inter-switch link (ISL) connections over metro optical networks.

Entry SAN switches for easy-to-use SMB solutions

IBM System Storage SAN24B-4 Express (2498-B24, 249824E)

- This solution provides high-performance, scalable and simple-to-use fabric switching with 8, 16 or 24 ports operating at 8, 4, 2 or 1 Gbps—depending on which optical transceiver is used—for servers running Microsoft Windows, IBM AIX®, UNIX and Linux operating systems, server clustering, infrastructure simplification and business continuity solutions. The SAN24B-4 Express includes the EZSwitchSetup wizard, which is an embedded setup tool designed to guide novice users through switch setup, often in less than five minutes.

Cisco MDS 9124 Express for IBM System Storage (2053-424, 241724C)

- Cisco MDS 9124 Express provides high-performance, scalable and simple-to-use fabric switching with 8, 16 or 24 ports operating at 1, 2 and 4 Gbps for servers running Microsoft Windows, UNIX, Linux, Novell NetWare and IBM Operating System/400®, server clustering, infrastructure simplification and business continuity solutions. The switch includes a replaceable power supply, Virtual SAN (VSAN), Cisco Data Center Network Manager (DNCM) and a redundant power supply feature designed to simplify setup and ongoing maintenance for Cisco MDS 9000 users.

Midrange SAN switches for scalable SMB and enterprise solutions

IBM System Storage SAN48B-5 (2498-F48)

- Designed to meet the demands of hyper-scale, private cloud storage environments, the solution can deliver 16 Gbps Fibre Channel technology and capabilities that support highly virtualized environments. To enable greater flexibility and investment protection, the SAN48B-5 is configurable in 24, 36, or 48 ports, and it supports 2, 4, 8, 10, or 16 Gbps speeds in an efficiently designed 1U package.
- The solution offers higher port density and scalability for midrange enterprise SAN switches with redundant, hot-pluggable components and nondisruptive software upgrades.

IBM System Storage SAN32B-E4 (2498-E32)

- The SAN32B-E4 is a high-performance, stand-alone device designed for protecting data-at-rest in mission-critical environments.
- Delivering fabric-based encryption services to protect data assets either selectively or on a comprehensive basis, the solution can scale nondisruptively to provide from 48 up to 96 Gbps of encryption processing power to meet the needs of the most demanding environments with flexible, on-demand performance.
- Tightly integrated with one of the industry-leading, enterprise-class key management systems, IBM Tivoli Key Lifecycle Manager can scale to support key lifecycle services across distributed environments.

IBM System Storage SAN40B-4 (2498-B40, 249840E)

- This solution provides high-performance, scalable and simple-to-use fabric switching with 24, 32 or 40 ports operating at 8, 4, 2 or 1 Gbps—depending on which optical transceiver is used—for servers running Microsoft Windows, AIX, UNIX, Linux, OS/400 and IBM z/OS® operating systems. Many advanced functions are available to facilitate operation in medium and large networks.

IBM System Storage SAN80B-4 (2498-B80)

- The SAN80B-4 provides high-performance, scalable and simple-to-use fabric switching with 48, 64 or 80 ports operating at 8, 4, 2 or 1 Gbps—depending on which optical transceiver is used—for servers running Microsoft Windows, AIX, UNIX, Linux, OS/400 and z/OS operating systems. Many advanced functions are available to facilitate operation in medium and large networks.

Cisco MDS 9148 for IBM System Storage (2417-C48)

- This solution is designed to provide an affordable, highly capable and scalable storage networking solution for small, midrange and large enterprise customers that are aiming for business continuity or remote backup capability.
- A standalone, scalable 16 to 48 port switch featuring 48 fixed auto-sensing Fibre Channel ports capable of speeds of 1, 2, 4 or 8 Gbps, the Cisco MDS 9148 can be activated by using the On-Demand Port Activation feature.
- Using NX-OS software intelligence to provide storage access for virtual machine server environments, the new Cisco DCNM for SAN (formerly Cisco Fabric Manager) provides centralization and ease of management for the growing data centers.

Enterprise SAN directors for high availability and scalability enterprise solutions

IBM System Storage SAN768B (2499-384) and SAN384B (2499-192)

- The solution is designed to be the premier fabric platforms for evolving enterprise data centers. Each machine combines breakthrough performance, scalability and energy efficiency with long-term investment protection. Supporting open systems and System z environments, the machines address data growth and server virtualization challenges; enable server, SAN and data center consolidation; minimize disruption and risk; and reduce infrastructure and administrative costs.
- Built for large enterprise networks, the SAN768B has eight vertical blade slots to provide up to 512 8 Gbps Fibre Channel ports. The SAN384B is ideal for midsize core or edge deployments, providing four horizontal blade slots and up to 256 8 Gbps Fibre Channel ports. The flexible blade architecture also supports Fibre Channel over Ethernet (FCoE), fabric-based encryption for data-at-rest and SAN extension advanced functionality for high-performance server I/O consolidation, data protection and disaster recovery solutions.

IBM System Storage SAN768B-2 (2499-816) and SAN384B-2 (2499-416)

- Designed to increase business agility while providing nonstop access to information and reducing infrastructure and administrative costs, the SAN768B-2 and SAN384B-2 fabric backbones with 16 Gbps Fibre Channel capabilities support the growing demands of highly virtualized environments and private cloud architectures, extending the life of this robust, reliable and high-performance technology.
- Built for large enterprise networks, the 14U SAN768B-2 has eight vertical blade slots to provide up to 384 16 Gbps universal (E, F, D, M, and EX) Fibre Channel ports using 48-port Fibre Channel blades or up to 512 8 Gbps universal (E, F, M, and EX) Fibre Channel ports using 64-port 8 Gbps Fibre Channel blades.
- Built for midsize networks, the 8U SAN384B-2 has four horizontal blade slots to provide up to 384 16 Gbps universal (E, F, D, M, and EX) Fibre Channel ports using 48-port Fibre Channel blades or up to 256 8 Gbps universal (E, F, M, and EX) Fibre Channel ports using 64-port 8 Gbps Fibre Channel blades.
- The solution supports 2, 4, 8, and 16 Gbps Fibre Channel, 10 Gbps ISL connections, 64 (4x16) Gbps Inter-Chassis Link (ICL) connections and 1/10 Gbps Fibre Channel over IP (FCIP), as well as advanced fabric services and management tools.

Cisco MDS 9500 Series Multilayer Directors for IBM System Storage (2054-E04, 2054-E07, 2054-E11)

- The Cisco MDS 9506, Cisco MDS 9509 and Cisco MDS 9513 are director-class storage area networking (SAN) switches designed for deployment in scalable enterprise and service provider clouds to enable flexibility, resiliency and reliability.
- The solutions offer scalability to 192, 336 and 528 maximum Fibre Channel port count at 1, 2, 4, 8 and 10 Gbps Fibre Channel speed.
- A multi-layer architecture transparently integrates Fibre Channel, FCoE, FICON, Internet Small Computer System Interface (iSCSI), and Fibre Channel over IP (FCIP) in one system.
- With the Fabric3 Switching module, the MDS 9513 increases the active backplane bandwidth to 256 Gbps per slot.
- 32- and 48-port 8 Gbps Advanced Fibre Channel switching modules are designed to allow a port to be configured as either 1, 2, 4, 8 or 10 Gbps, which consolidates all ports into the same Fibre Channel switching module. These modules can provide 256 Gbps when used in an MDS 9513 containing the Fabric3 switching capabilities.
- High-performance Inter-Switch Links (ISLs) provide additional availability at the fabric level. A PortChannel capability allows users to aggregate up to 16 physical links into one logical bundle.
- Cisco DCNM provides an easy-to-use application that simplifies management across multiple switches and converged fabrics, aiming to offer a holistic management of the data center infrastructure.

IBM System Networking Ethernet Switches

IBM System Networking RackSwitch for Top of Rack Deployments

IBM System Networking RackSwitch is specifically designed for file-based or block-based switching in IP storage and converged data center environments. RackSwitch provides virtualization-ready switching with high bandwidth, low latency, optimized airflow and low power consumption at an attractive price.

Support for Data Center Bridging (DCB) and FCoE on some models enables lossless performance across client, server and storage networks, including iSCSI and NAS. 10 GbE models that provide the performance equivalent of 8 Gb Fibre Channel with scalability up to 40 GbE.

As networks consolidate on to fewer devices, IBM RackSwitch can make it possible for servers and storage to share the same network. Virtual local area networks (VLANs) can segregate storage, data and other traffic. DCB features can prioritize and optimize storage traffic. Virtual link aggregation helps enable sub-second failover for high availability and rapid and predictable failover.

IBM RackSwitch G8052 (1455-48E)	<ul style="list-style-type: none"> 48 × 1 GbE RJ45 ports and four standard 10 GbE SFP+ ports are in a 1RU form factor. The Rackswitch G8052 provides up to 176 Gbps throughput with latency as low as 1.7 microseconds. The solution offers typical power consumption of up to 120 W.
IBM RackSwitch G8124E (1455-24E)	<ul style="list-style-type: none"> 24 SFP+ ports operate at 10 Gb or 1 GbE speeds in a 1 RU form factor. Low latency of 680 nanoseconds and 480 Gbps throughput makes it optimal for high-performance computing (HPC) and other applications that require high bandwidth and low latency. The RackSwitch G8124E is equipped with enhanced processing and memory that help improve performance.
IBM RackSwitch G8264 (1455-64C)	<ul style="list-style-type: none"> 64 × 1/10 Gb SFP+ and future-proofed ports with four 40 Gb QSFP+ ports are in a 1 RU form factor. The throughput of 1280 Gbps and latency under 1 microsecond makes the Rackswitch G8264 ideal for applications requiring high bandwidth and low latency. The solution offers typical power consumption of up to 330 W.
IBM RackSwitch G8316 (G8316R: 8036ARX*, G8316F: 8036AFX*)	<ul style="list-style-type: none"> 16 × 40 Gb QSFP+ ports and up to 64 × 10 Gb SFP+ ports form a high-density, 10 Gb cluster in a 1 RU form factor. The Rackswitch G8316 is optimized for HPC and other applications requiring high bandwidth and low latency. A powerful control plane provides a cost-efficient way to aggregate multiple racks of servers. An ideal aggregation layer switch is used with the 10/40 GbE RackSwitch G8264 at the access layer.

* MTM specific to HVEC ordering system

IBM System Networking Ethernet switch modules for IBM BladeCenter

IBM BladeCenter® Open Fabric includes industry-leading Ethernet switch modules that offer a simple way to manage high-performance Ethernet networking capabilities for BladeCenter systems. Compatible with BladeCenter Open Fabric Manager software, these switch modules support 1 Gb and 10 Gb Ethernet bandwidth, and also provide high-performance Ethernet capabilities designed to help your business run better.

BNT Virtual Fabric 10 Gigabit Switch Module for IBM BladeCenter (46C7191*)	<ul style="list-style-type: none"> Ten 10 Gb uplinks have up to 200 Gbps of bi-directional uplink bandwidth. With extremely low oversubscription—capable of supporting even the most performance-intensive environments—the module can use up to four switches and the quad port 10 Gb adapter and get up to 1.92 Tbps of data per BladeCenter H chassis. BNT Virtual Fabric 10 Gigabit Switch Module supports DCB/Converged Enhanced Ethernet and stacking for client-server-storage convergence. With lower power consumption, the solution uses only 75 W per switch.
BNT 1/10 Gigabit Uplink Ethernet Switch Module for IBM BladeCenter (44W4404*)	<ul style="list-style-type: none"> With 6 external 1Gb and 3 external 10Gb ports, this solution is an ideal choice for customers who require 1Gb today and 10Gb capability for future growth. Advanced L3 functions, such as OSPF and BGP, allow the switch to integrate seamlessly into a large routed network environment. The VMready feature makes the BNT 1/10 Gigabit Uplink Ethernet Switch Module virtualization aware. The solution can reduce power consumption to as low as 40 W.
BNT Layer 2-7 Gigabit Ethernet Switch Module for IBM BladeCenter (32R1859*)	<ul style="list-style-type: none"> Four external 10/100/1000 1000BASE-T Gigabit Ethernet ports have RJ-45 connectors. The BNT Layer 2-7 Gigabit Ethernet Switch Module integrates Layer 2/3 Ethernet connectivity with Layer 4-7 application and server load balancing in a single switch module. The solution can provide flexible and simple management via web browser or industry-standard CLI. The BNT Layer 2-7 Gigabit Ethernet Switch Module can reduce power consumption to as low as 40 W.
BNT Layer 2/3 Copper and Fiber Gigabit Ethernet Switch Module for IBM BladeCenter (Copper: 32R1860*, Fiber: 32R1861*)	<ul style="list-style-type: none"> The solution contains six external 1 Gb copper ports or 6 external 1Gb fiber ports. The BNT Layer 2/3 Copper and Fiber Gigabit Ethernet Switch Module delivers complete Layer 2 and 3 functionality with routing, filtering and traffic queuing to better serve the processing demands of bandwidth -intensive applications. It can interoperate seamlessly with other vendors' upstream switches. The solution provides flexible and simple management via web browser or industry-standard CLI.

* MTM specific to HVEC ordering system

Entry-level Tape Products



	Entry-level Tape Drives		
	TS2230	TS2240	TS2250
Product	3580	3580	3580
Machine Type	3580	3580	3580
model	H3V, PNs 3580S3V	H4V, PNs 3580S4V	H5S, PNs 3580S5E
Product strengths	Multiplatform support Half-high form factor Lower entry price	Encryption capable Multiplatform support High capacity Half-high form factor	Encryption & media partition capable LTFS support Multiplatform support High capacity Half-high form factor
Number of drives	1	1	1
Max number of cartridges	1	1	1
WORM/Encryption	yes/no	yes/yes	yes/yes
Native capacity	Gen 3: 400 GB	Gen 4: 800 GB	Gen 5: 1.5 TB
Typical capacity²	Gen 3: 800 GB	Gen 4: 1.6 TB	Gen 5: 3.0 TB
Native performance	Gen 3: 80 MBps	Gen 4: 120 MBps	Gen 5: 140 MBps
Interface	6 Gbps SAS	6 Gbps SAS	6 Gbps SAS
Supported tape libraries	N/A	N/A	N/A
Platform support⁴	System p®, System i®, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux	System p, System x and others supporting 6 Gbps attach	System p, System x and others supporting 6 Gbps attach
Application support⁵	A, B, C, D, E, F, G, H, J, L, M	A (others in plan)	A, B, C, E, F, G, H
Media	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9
Warranty period	3 years ⁶	3 years	3 years
Warranty type	CRU	CRU	CRU

F/W = Fast/Wide, Diff = Differential, N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, IOE = IBM Onsite Exchange, CRU = Customer Replaceable Unit

NOTES 1: Max number of cartridges decreases as tape drives are added. **2:** Typical compression for open system environments is 2:1 (user results may vary) **4:** Also includes selected IBM xSeries®, IBM Netfinity®, IBM System i, IBM AS/400® and IBM System p servers. System z support for Linux only **5:** Refer to http://www-03.ibm.com/systems/support/storage/config/ssic/displaysearchwithoutjs.wss?start_over=yes for current application support **6:** In most countries **7:** The following vendors provide application support to the platforms defined above: **A** = IBM Tivoli Storage Manager, **B** = Symantec Veritas NetBackup, **C** = Symantec Veritas Backup Exec, **D** = EMC Legato NetWorker, **E** = CA BrightStor ARCserve Backup, **F** = HP OpenView Storage Data Protector, **G** = CommVault Galaxy, **H** = BakBone NetVault, **I** = LSC, **J** = IBM BRMS, **K** = IBM OnDemand, **L** = Help/Systems Robot/Save, **M** = LXI Media Management, **N** = Dantz.

Entry-level/Midrange Products



	Entry-level Tape Libraries					Midrange Tape Drives		Midrange Tape Libraries	
	TS2340	TS2350	TS2900	TS3100	TS3200	TS1040	TS1050	TS3310	TS3500
Product	3580	3580	3572 featuring Ultrium Half-high drives	3573 L2U	3573 L4U	3588	3588	3576	3584
Machine Type	3580	3580	3572	3573	3573	3588	3588	3576	3584
model	L43, PNs 3580L4X	S53, PNs 3580S5X	3572S3H, 3572S4H, 3572S5H PNs, 3572S3R, 3572S4R, 3572S5R	L2U PN 35732UL Tape Library w/o Drive	L4U PN 35734UL Tape Library w/o Drive	F4A	F5A	L5B E9U	L53 D53 S54
Product strengths	Encryption capable Multiplatform support High performance High capacity	Encryption & media partition capable Multiplatform support High capacity Full-high form factor LTFS support	Multiplatform support High performance High capacity Lower entry price High capacity Supports LTO3, LTO4 and LTO5 drives	Multiplatform support High performance High capacity Supports Full High and Half High Tape Drives Supports LTO3, LTO4 and LTO5 drives LTFS support	Multiplatform support High performance High capacity Supports Full High and Half High Tape Drives Supports LTO3, LTO4 and LTO5 drives LTFS support	Multiplatform support High performance High capacity Data protection	Multiplatform support High performance High capacity Data protection Media partitioning	Multiplatform support High performance High capacity Modular design	Multiplatform support High performance High capacity High density (HD) Slot Technology LTFS support
Number of drives	1	1	1 LTO half-high	1 FH 1-2 HH	1-2 FH 1-4 HH	1	1	1-18	1-192 Up to 2700 in a complex
Max number of cartridges	1	1	9	24	48	N/A	N/A	409	20,000, 300,000 in a complex
WORM/Encryption	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes
Native capacity	Gen 4: 800 GB	Gen 5: 1.5 TB	Gen 3: 3.6 TB Gen 4: 7.2 TB Gen 5: 13.5 TB	Gen 3: 9.6 TB Gen 4: 19.2 TB Gen 5: 36 TB	Gen 3: 19.2 TB Gen 4: 38.4 TB Gen 5: 72 TB	800 GB	1.5 TB	Gen 3: 163.6 TB Gen 4: 327.2 TB Gen 5: 613.5 TB	30 PB per library. Up to 450 PB in a complex
Typical capacity²	Gen 4: 1.6 TB	Gen 5: 3.0 TB	Up to 27 TB	Up to 72 TB	Up to 144 TB	1.6 TB	3 TB	Up to 1.22 PB	60 PB per library. Up to 900 PB in a complex
Native performance	Gen 4: 120 MBps	Gen 5: 140 MBps	Up to 140 MBps	Up to 280 MBps	Up to 560 MBps	120 MBps	140 MBps	Up to 2.52 GBps	26.9 GBps
Interface	LVD SCSI	6 Gbps SAS	6 Gbps SAS 3 Gbps SAS	8 Gbps FC and 6 Gbps SAS 4 Gbps FC, 3 Gbps SAS and LVD SCSI (LTO-4 FH only)	8 Gbps FC and 6 Gbps SAS 4 Gbps FC, 3 Gbps SAS and LVD SCSI (LTO-4 FH only)	4 Gbps FC	8 Gbps FC	4 Gbps FC 3 Gbps SAS (LTO4 only) LVD SCSI (LTO3 only) 8 Gbps FC (LTO5 only)	8 Gbps FC
Supported tape libraries	N/A	N/A	N/A	N/A	N/A	TS3500	TS3500	N/A	N/A
Platform support⁴	System p, System i, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux	System p, System x and others supporting 6 Gbps attach	System p, System x and others supporting 6 and 3 Gbps attach	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, Microsoft Windows; HP-UX; Sun Solaris; Linux
Application support⁵	A (others in plan)	A, B, C, E, F, G, H	A (others in plan)	A, B, C, D, E, F, G, H, J, L, M, N ⁷	A, B, C, D, E, F, G, H, J, L, N ⁷	A (others in plan)	A, B, C, D, E, F, G, H, J, L ⁷	A, B, C, D, E, F, G, H, J, L ⁷	A, B, C, D, E, F, G, H, J, L ⁷
Media	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9
Warranty period	3 years ⁶	3 years	1 year ⁶	3 years ⁶	3 years ⁶	1 year	1 year	1 year	1 year
Warranty type	CRU	CRU	CRU	CRU	CRU	Onsite Repair (24x7)	Onsite Repair (24x7)	Next Business Day (9x5)	Onsite Repair (24x7)

Midrange/Enterprise Tape Products



	Enterprise Tape Drives			Enterprise Tape Controller		Enterprise Tape Libraries	Midrange Tape Virtualization	
	3592	3592	3592	3592	3592	3584	ProtecTIER Appliances	
Product	TS1140	TS1130	TS1120	TS1120	Tape Controller for System z	TS3500	TS7610	TS7650A
Machine Type	3592	3592	3592	3592	3592	3584	3958 API	3959 SM1
model	E07	E06 EU6	E05	C06	C07	D23 S24 SC1		
Product strengths	Multiplatform support High performance High capacity Data protection	Multiplatform support High performance High capacity Data protection	Multiplatform support High performance High capacity Data protection	System z attachment of TS1130 and TS1120 drives High performance	System z attachment of TS1140, TS1130 and TS1120 drives High performance	Multiplatform support Advanced management Scalable High Density (HD) Slot Technology	Eliminates redundant data by up to a factor of 25:1	Eliminates redundant data by up to a factor of 25:1
Number of drives	1	1	1	1-12	1-16	1-192 in a library string Up to 2700 in a library complex	Up to 64	Up to 256, up to 512 clustered
WORM/Encryption	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	no/no	no/no
Number of cartridges	N/A	N/A	N/A	N/A	N/A	15,000 per library ² 225,000 in a library complex	Up to 8,000	Up to 128,000
Native capacity	4 TB (JC/JY media), 1.6 TB (JB/JX media), 500 GB (JK media)	60/100/128 GB (JJ/JR media) 300/500/640 GB (JA/JW media) 700 GB/1 TB (JB/JX media)	60/100 GB (JJ/JR media) 300/500 GB (JA/JW media) 700 GB (JB/JX media)	N/A	N/A	Up to 60 PB per library 900 PB in a complex	Up to 5.4 TB	Up to 36 TB
Typical capacity ¹	12 TB	384 GB with JJ/JR 1920 GB with JA/JW 3 TB with JB/JX	180/300 GB with JJ/JR 900/1500 GB with JA/JW 2.1 TB with JB/JX	N/A	N/A	Up to 180 PB. Up to 2.7 EB in a complex	Up to 135TB (nominal capacity based on a deduplication ratio of 25:1)	Up to 900 TB (nominal capacity based on a deduplication ratio of 25:1)
Native performance	Up to 250 MBps	Up to 160 MBps	Up to 104 MBps	Varies ⁸	Varies ⁸	Up to 48 GBps	Up to 100 MBps	Up to 500 MBps
Interface	8 Gbps FC	4 Gbps FC	4 Gbps FC	4 Gbps FC	8 Gbps FC	8 Gbps FC	8Gbps FC	8Gbps FC
Supported tape library	TS3500	TS3400, TS3500, 3494***	TS3400, TS3500, 3494***	TS3400, TS3500, 3494***	TS3500	N/A	N/A	N/A
Platform support ⁵	System p, System i, System x, System Z, Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, System z; Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, System z; Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, System z; Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, System z; Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System i, System x, System z; Microsoft Windows; HP-UX; Sun Solaris; Linux	System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux	System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux
Application support ⁶	A, B, D, E, G, H	A, B, D, E, G, H	A B C D E F G H J L ⁷	A B C D E F G H J L ⁷	A B C D E F G H J L ⁷	See drive	A, B, C, E, F, G, H	A, B, C, E, F, G, H
Media	Refer to Tape Media, page 9	Refer to Tape Media, page 9	Refer to Tape Media, page 9	N/A	N/A	Refer to Tape Media, page 9	N/A	N/A
Warranty period	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year
Warranty type	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite repair (24x7)	Onsite repair (24x7)

F/W = Fast/Wide, Diff = Differential, N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, IOE = IBM Onsite Exchange, CRU = Customer Replaceable Unit
 NOTES 1: Typical compression for mainframe environments is 3:1; 2:1 for open systems (user results may vary) 2: Max number of 3592 cartridges decreases as tape drives are added 3: IBM AIX 4.1.5 or later. 4: Load and search only 5: Server platforms with SAN-ready attachability, model- and feature-dependent. 6: The latest ISV support can be found in the connectivity section at <http://www-03.ibm.com/systems/storage/tape/library.html#compatibility>. 7: The following vendors provide application support to the platforms defined above: A = IBM Tivoli Storage Manager, B = Symantec Veritas NetBackup, C = Symantec Veritas Backup Exec, D = EMC Legato NetWorker, E = CA BrightStor ARCserve Backup, F = HP OpenView Storage Data Protector, G = CommVault Galaxy, H = BakBone NetVault, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = Help/Systems Robot/Save, M = LXI Media Management. 8: Performance varies by environment 10: Applies to Linux on System z using FCP 11: Requires RFPQ 12: EE = Enterprise Edition LE = Limited Edition

Enterprise Tape Products/Other Backup Tape Products



Enterprise Tape Virtualization

	Virtualization Engine		ProtectTIER Gateway	
Product	TS7720	TS7740	TS7650G	TS7680
Machine Type model	3957 VEB (requires additional machine types and models)	3957 V07 (requires additional machine types and models)	3598DD4	3598DE2
Product strengths	Increases performance Scalable Large cache for fast recall	Increases performance Scalable Helps reduce cost	Eliminates redundant data by up to a factor of 25:1	Eliminates redundant data by up to a factor of 25:1
Number of drives	Up to 256* Up to 1024* (4 site GRID)	Up to 256* Up to 1024* (4 site GRID)	Up to 256*, up to 512* clustered	Up to 256*
WORM/Encryption	yes/yes	yes/yes	no/no	no/no
Number of cartridges	Up to 2,000,000*	Up to 2,000,000*	Up to 512,000*	Up to 1,000,000*
Native capacity	Up to 443 TB Up to 1.7 PB (4 site GRID****)	Up to 28 TB Up to 115 TB (4 site GRID****)	Up to 1 PB	Up to 1 PB
Typical capacity ¹	Up to 1.3 PB	Up to 84 TB	Up to 25 PB (nominal capacity based on a deduplication ratio of 25:1)	Up to 25 PB (nominal capacity based on a deduplication ratio of 25:1)
Native performance	Up to 900 MBps	Up to 900 MBps	Up to 1400 MBps, up to 2000 MBps clustered	Up to 500 MBps
Interface	8 Gbps FC	8 Gbps FC	8 Gbps FC	8 Gbps FC
Supported tape library	TS3500, when in a grid with TS7740	TS3500, 3494***	N/A	N/A
Platform support ⁶	System z	System z	System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux	System z
Application support ⁶	A	A	A, B, C, E, F, G, H	A, B
Media	N/A	N/A	N/A	N/A
Warranty period	1 year	1 year	1 year	1 year
Warranty type	Onsite Repair (24x7)	Onsite Repair (24x7)	Onsite repair (24x7)	Onsite repair (24x7)

* Virtual resource specification

** for data replication only

*** Product withdrawn from marketing

**** Total capacity for 4 similar models, mix of models is supported

N/A = Not Applicable, FC = Fibre Channel, X = Extended length cartridge, IOE = IBM Onsite Exchange, CRU = Customer Replaceable Unit, SCSI = Small Commercial Systems Interface, SAS = Serial Attach SCSI

NOTES 1: Compressed data rates are estimates and are data-, application- and processor-dependent. User results may vary.
 3: Server platforms with SAN-ready attachability, model- and feature-dependent. 6: The following vendors provide application support to the platforms defined above: A = IBM Tivoli Storage Manager, B = Symantec Veritas NetBackup, C = Symantec Veritas Backup Exec, D = EMC Legato NetWorker, E = CA BrightStor ARCserve Backup, F = HP OpenView Storage Data Protector, G = CommVault Galaxy, H = BakBone NetVault, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = Help/Systems Robot/Save, M = LXI Media Management, N = Dantz.



External Device Enclosure

	7214
Product	Device Enclosure*
Machine Type model	7214 1U2
Product strengths	Rack-mountable 2-drive enclosure utilizes only 1U (1.75 in.) of space
Number of drives	1 - 2
Max number of cartridges	2
Cartridge capacity native/compressed	DVDRAM: Variable (FC1420) DVDROM: Variable (FC1421) DAT160 80/160 GB (FC1401) HH LTO-4 800 GB/1.6 TB (FC1404)
Max drive data rate ¹ native/compressed	DAT160 6.9/13.8 Mbps HH LTO-4 120/240 Mbps
Interface	3 Gbps SAS
Platform support ³	IBM Power Systems™
Media	Refer to Tape Media, page 8
Warranty period	1 year
Warranty type	Onsite Repair (24x7)



External Device Enclosure

	7216
Product	Device Enclosure
Machine Type model	7216 1U2
Product strengths	Rack-mountable multimedia enclosure utilizes only 1U (1.75 in.) of space System attach options: <ul style="list-style-type: none"> • Single drive on each Host Bus Adapter • Quad cable allows attach of up to four SAS drives to a single Host Bus Adapter
Number of drives	1 - 4 Maximum of 2 tape drives Maximum of 4 DVD-RAM drives
Cartridge capacity native/compressed	DVD-RAM: 2.6 GB - 9.4 GB/Up to 28 GB (FC) RDX: 160 or 500 GB/320 GB or 1.0 TB DAT160 80/160 GB (FC) HH LTO-5 1.5 TB/3.0 TB (FC)
Max drive data rate ¹ native/compressed	DAT160 6.9/13.8 Mbps HH LTO-5 140/280 MBps
Interface	HH LTO-5 available with 6 Gbps SAS DAT160 DVD-RAM, RDX available with 3 Gbps (SAS)
Platform support ³	IBM POWER 6 and POWER7® Systems
Media	Refer to Tape Media, page 8
Warranty period	1 year
Warranty type	Onsite Repair (24x7) Customer Replaceable Unit (CRU)

Selecting a solution

	Solution	Native Performance	Capacity*	System z	POWER Systems	System x	Open Systems***
Entry tape products	TS2230 tape drive	80 MBps	800 GB				
	TS2240 tape drive	120 MBps	1600 GB				
	TS2340 tape drive	120 MBps	1600 GB				
	TS2250 tape drive	140 MBps	3.0 TB				
	TS2350 tape drive	140 MBps	3.0 TB				
	TS2900 tape autoloader	140 MBps	Up to 27 TB				
	TS3100 tape library	140 MBps	Up to 72 TB				
	TS3100 tape library with HH drives	280 MBps	Up to 72 TB				
	TS3200 tape library	280 MBps	Up to 144 TB				
	TS3200 tape library with HH drives	560 MBps	Up to 144 TB				
Midrange tape products	TS1050 tape drive	140 MBps	3 TB				
	TS3310 tape library	Up to 2.52 GBps	Up to 1.227 PB				
	TS3500 tape library	Up to 26.9 GBps	Up to 900 PB				
Enterprise tape products	TS1140 tape drive	Up to 250 MBps	12 TB				
	TS1130 tape drive	Up to 160 MBps	3 TB				
	TS1120 tape drive	Up to 104 MBps	2.1 TB				
	TS3500 tape library	Up to 48 GBps	Up to 2.7 EB				
Tape Virtualization	TS7610	Up to 100 MBps	Up to 36 TB				
	TS7650	Up to 2000 MBps	Up to 1 PB				
	TS7680	Up to 500 MBps	Up to 1 PB				
	TS7720	Up to 900 MBps	Up to 1.7 PB				
	TS7740	Up to 900 MBps	Up to 115 TB				

* Compressed; see ibm.com/storage for specific capacities.

*** See ibm.com/storage for specific open systems connectivity.

Yes No

Media tape	Highlights	Technology	Length (m/feet)	Capacity native	Capacity Compressed (typical)	Part number	Related products	Part number
Enterprise tape	<ul style="list-style-type: none"> Custom labeling and initialization services are available Servo tracks help improve data integrity Cartridge intermix within libraries supports smooth migration, legacy systems Write Once Read Many (WORM) functionality Machine type/model: 3599 	3592 Tape Cartridge	880/2887 880/2887 146/479 825/2706 825/2706 610/2001 610/2001 246/810 246/810	4 TB 4 TB 500 GB 700 GB/1 TB/1.6 TB 700 GB/1 TB 300/500/640 GB 300/500/640 GB 60/100/128 GB 60/100/128 GB	12 TB 12 TB 1.5 TB 2.1/3/4.8 TB 2.1/3/4.8 TB 900 GB, 1.5/1.9 TB 900 GB, 1.5/1.9 TB 180/300/384 GB 180/300/384 GB	46X7452 46X7454* 46X7453 23R9830 23R9831* 18P7534 18P7538* 24R0316 24R0317*	3592 Cleaning Cartridge	18P7535
		3590 Tape Cartridge	320/1050	10/20/30 GB	30/60/90 GB	05H4434 05H3302-J-less	3590 Cleaning Cartridge	05H4435
		3590E Tape Cartridge	634/2070	20/40/60 GB	60/120/180 GB	05H3188 08L6091-K-less		
.31-inch 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 	IBM Magstar® MP Fast Access Linear Tape Cartridge	167/54	5 GB	15 GB	05H2462—B 08L6187—C	Cleaning Cartridge	05H2463
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 Machine type/model: 3589 	Ultrium 5 Ultrium 5 Ultrium 4 Ultrium 4 Ultrium 3 Ultrium 3 Ultrium 2 Ultrium 1	846/2775 846/2775 820/2690 820/2690 680/2231 680/2231 609/1998 609/1998	1.5 TB 1.5 TB 800 GB 800 GB 400 GB 400 GB 200 GB 100 GB	3.0 TB 3.0 TB 1600 GB 1600 GB 800 GB 800 GB 400 GB 200 GB	46X1290 46X1292* 95P4436 95P4450* 24R1922 96P1203* 08L9870 08L9120	Ultrium Cleaning Cartridge (all) Leader Pin Attachment Kit 5-pack LTO Ultrium 5 tapes 5-pack LTO Ultrium 4 tapes 5-pack LTO Ultrium 3 tapes	35L2086 08L9129 23R7008 95P4278 95P2020
Removable hard drive	<ul style="list-style-type: none"> Reliable, durable and secure Affordable, high capacity cartridges Easy deployment, simple management 	IBM RDX Cartridges	N/A	500 GB 320 GB 160 GB	1.0 TB 640 GB 320 GB	46C5379 46C5377 46C5375		
Optical cartridge	<ul style="list-style-type: none"> Suitable for storing data that can be overwritten and has a finite life span WORM media helps safeguard against data being erased or changed 	3996 Ultra Density Optical (UDO)	N/A	30 GB 30 GB 60 GB 60 GB		23R2568 23R2567* 59H5629 59H5628*		
DLTtape	<ul style="list-style-type: none"> Cartridge labeling area and labels are included VS1 Data Cartridge 	VS1	563/1850	80 GB	160 GB	18P8923	Cleaning Cartridge - VS160	18P8924
VXA-2/3	<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 8 mm—X6 VXA 8 mm—X10 VXA 8 mm—X23	62/203 124/406 230/754	40 GB 80 GB 160 GB	80 GB 160 GB 320 GB	24R2134 24R2136 24R2137	Cleaning Cartridge—X-MEDIA	24R2138
DAT 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 	DAT320 DAT160 DAT72 DDS-4 DDS-3	153/502 190/623 170/557 150/492 125/410	160 GB 80 GB 36 GB 20 GB 12 GB	320 GB 160 GB 72 GB 40 GB 24 GB	46C1936 23R5635 18P7912 59H4456 59H3465	DAT320 Cleaning Cartridge only DAT160 Cleaning Cartridge only Cleaning Cartridge - 4 mm	46C1937 23R5638 21F8763
8 mm 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 		170/557	20 GB	40 GB	59H2678	Mammoth 1 Cleaning Cartridge	35L1409
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 stable tape path Cartridge cover shields against static discharge and airborne debris Durastat on drive rollers dissipates static <p>1-888-IBM-MEDIA ibm.com/storage/media</p>	5.25 in. SLR5/QIC-4GB-DC	458/1500	4 GB	8 GB	59H3660	QIC 5.25-inch MLR/SLR Cleaning Cartridge (50 uses)	35L0844
		5.25 in. MLR1/QIC-5010-DC	458/1500	16 GB	32 GB	59H4175		
		5.25 in. MLR3/QIC-5120-DC	462/1515	25 GB	50 GB	59H4128		
		5.25 in. SLR60	274/900	30 GB	60 GB	19P4209		
		5.25 in. SLR	47/156	5 GB	10 GB	35L0661		
		5.25 in. SLR100	457/1500	50 GB	100 GB	35L0968		

* WORM version

Entry-level Disk Systems



System x and IBM BladeCenter® Direct Attach or SAN Solutions

	DS3500 Express	EXP3500 Expansion Unit	EXP2500 Storage enclosure	DS3400 FC Storage Controller	EXP3000 Expansion Unit
Product	DS3500	EXP3500	EXP2500	DS3400	EXP3000
Machine/model	1746A2S DS3512 Express Single Controller Storage System 1746A2D DS3512 Express Dual Controller Storage System 1746A4S DS3524 Express Single Controller Storage System 1746A4D DS3524 Express Dual Controller Storage System 1746T4D DS3524 Express DC Dual Controller Storage System	EXP3512 - 1746 E2A EXP3524 -1746 E4A	1747-HC1 (PN 174712X) – IBM System Storage EXP2512 Express Storage Enclosure 1747-HC2 (PN 174724X) – IBM System Storage EXP2524 Express Storage Enclosure	1726-42T Telco DC Power Model	1727-01X, 1727-02T Telco DC Power Model
Platform support¹	Microsoft Windows, UNIX, Linux and VMware. For a current list of platforms supported, please visit the IBM System Storage Interoperation Center (SSIC): ibm.com/systems/support/storage/config/ssic/	Microsoft Windows, UNIX, Linux and VMware. For a current list of platforms supported, please visit the IBM System Storage Interoperation Center (SSIC): ibm.com/systems/support/storage/config/ssic/	Microsoft Windows, UNIX, Linux. For a current list of platforms supported, please visit the IBM System Storage Interoperation Center (SSIC): ibm.com/systems/support/storage/config/ssic/	Windows 2003, Windows 2008, Red Hat 4, Red Hat 5, SUSE 9, SUSE 10, NetWare, VMware 2.5.4, VMware 3.0.1, VMware 3.0.2, VMware 3.5/3i, AIX 5.2, AIX 5.3, AIX 6.1	Windows 2003, Red Hat 3, Red Hat 4, SUSE 9
Host connectivity	Four options: • Four or eight 6 Gbps SAS ports • Eight 8 Gbps Fibre Channel ports and four 6 Gbps SAS ports • Eight 1 Gbps iSCSI ports and four 6 Gbps SAS ports • Four 10 Gbps iSCSI ports and four 6 Gbps SAS ports	N/A	6 Gbps SAS	Two host ports per controller, Fibre Channel (FC) 4Gbps auto-sensing 1Gbps/2Gbps	SAS
SAN support	-SAS SAN with BladeCenter -Switched, IP SAN -Direct, Switched Fabric	N/A	Direct Attached	Direct, Switched Fabric	N/A
Copy services	IBM FlashCopy, IBM VolumeCopy, Remote Mirroring	N/A	N/A	IBM FlashCopy, IBM VolumeCopy	N/A
Availability features	Fault-tolerant RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver	-Redundant power supplies, cooling fans and ESMs. -All primary components are hot-swappable CRUs and can be easily accessed and removed or replaced	RAID, Redundant Hot-swap power, dual port, hot-swappable drives	Fault-tolerant, RAID, Redundant Hot-swap power, Hot-swap drives, Dual controller, dual pathing drivers	Fault-tolerant RAID, Redundant Hot-swap drives, Dual pathing drives
Controller	Dual active, hot-swappable controllers	N/A	Direct attachment to selected System x servers using the IBM ServeRAID M5025 SAS/SATA Controller (part number 46M0830) Direct attachment to selected BladeCenter servers using the IBM BladeCenter SAS Connectivity Module (part number 39Y9195) and IBM ServeRAID MR10ie (CI/Ov) Controller (part number 46C7167)	Dual Active 4 Gbps FC RAID Controllers	MegaRAID 8480
Cache (min, max)	1 GB, 2 GB per controller (battery-backed)	N/A	N/A	Per controller 512 MB with 1 GB upgrade option	256 MB battery backup
RAID support	0, 1, 3, 5, 6, 10	N/A	Supports RAID levels supported by ServeRAID Controllers: Standard 0, 1, 10, 5, 50 Optional 6, 60	0, 1, 3, 5, 6, 10	0, 1, 3, 5, 6,10
Capacity (min, max)	Min 300 GB, Max 192 drives—high performance SAS drives, nearline SAS drives, and SED SAS drives -EXP3512 (2U 12 3.5-inch drives) and EXP3524 (2U 24 2.5-inch drive) enclosures, which can be intermixed behind a DS3500 enclosure	EXP3512 Up to 12 disk drives(3.5-inch drives), Scalable up to 192 drives(mix of expansion enclosures) EXP3524 Up to 24 disk drives(2.5-inch drives), Scalable up to 192 drives(mix of expansion enclosures)	12 in the EXP2512 enclosure 24 in the EXP2524 enclosure	Min 300GB, Max 48 SAS or SATA drives (using three EXP3000 Expansion Units) for a total of up to 96.0 TB with 2.0 TB SATA	Min 300 GB, Max 24 TB in a single EXP3000 Expansion Units
Drive interface	Two 6 Gb SAS drive ports	6 Gbps SAS	6 Gbps SAS	3 Gbps SAS	3 Gbps SAS 3 Gbps SATA II
Drive support	6 Gbps SAS 3.5-inch drives: • 15K rpm: 300 GB, 450 GB and 600 GB • 7.2K rpm Nearline:1 TB , 2 TB and 3 TB • 600 GB 15K rpm SED 6 Gbps SAS 2.5-inch drives: • 15K rpm: 146 GB, 300 GB, 600 GB and 900 GB • 7.2K rpm: 500 GB and 1 TB • 300 GB 10K rpm SED • 200 GB and 400 GB SAS SSD*	EXP3412 6 Gbps SAS 3.5-inch drives: • 15K rpm: 300 GB, 450 GB and 600 GB • 7.2K rpm: 1 TB, 2 TB and 3 TB • 600 GB 15K rpm SED EXP3524 6 Gbps SAS 2.5-inch drives: • 146 GB 15K rpm • 10K rpm: 300 GB, 600 GB and 900 GB • 7.2K rpm: 500 GB and 1 TB • 300 GB 10K rpm SED • 200 GB and 400 GB SAS SSD*	EXP2512: (6 Gb SAS 3.5-inch HDD) • 15K rpm: 300 GB, 450 GB and 600 GB • 7.2K rpm: 1 TB, 2 TB and 3 TB (not supported with BladeCenter configuration) EXP2524 (6 Gb SAS 2.5-inch HDD) • 15K rpm: 146 GB and 300 GB • 10K rpm: 300 GB, 600 GB and 900 GB • 7.2K rpm: 500 GB and 1 TB • 200 GB and 400 GB SAS SSD	3 Gbps SAS: 146 GB, 300 GB, and 450 GB SAS drives at 15,000 rpm speeds 6 Gbps SAS: 300 GB, 450 GB, 600 GB SAS drives at 15,000 rpm speeds 3 Gbps SATA: 500 GB, 750 GB, 1.0 TB, 2.0 TB SATA drives at 7,200 rpm speed	6 Gbps SAS: 300 GB, 450 GB, 600 GB SAS drives at 15,000 rpm SATA: 1 TB, 2 TB SATA 7,200 rpm
Clustering Support	Microsoft Clustering Services	N/A	N/A	Microsoft Windows MSCS	N/A

* Limitations: Maximum of 20 solid state drives per system (a system is defined as the DS3500 storage controller and all attached EXP3524 expansion units)

¹ Please check the SSIC site for the most up to date platform support.

Midrange Disk Systems



	Storwize V7000 Unified	DS5000 series	EXP5060	DS5020 Express	DS3950 Express*	EXP395/EXP520
Product	Storwize V7000 Unified	DS5100 and DS5300	EXP5060	DS5020 Express	DS3950 Express*	EXP395* and EXP520
Machine/model	2076 Models 112, 124,, 212, 224, 312, 324 2073 Model 700	1818-51A,1818-53A	1818G1A	1814-20A	Models 94/98 Part Numbers 68Y7530/68Y7533	1814-92H
Platform support¹	System x, System i, System p, System z, i5/OS®, AIX, Solaris, HP-UX, Windows 2000, Windows Server 2003, Windows Server 2008, z/VSE®, Red Hat and SUSE Linux, OpenVMS, Tru64, NetWare, Hyper-V, Citrix Zen, VMware, Apple Macintosh OS X, IRIX	System p, System x, Windows 2003, Windows 2008 w/Hyper-V, AIX 5.2,5.3 and 6.1, VMware 3.5, SLES 9 and 10, RHEL 4 and 5, HP-UX	Expansion Enclosure for DS5300 and DS5100	System p, System x, Windows 2003, Windows 2008 w/Hyper-V, AIX 5.3 and 6.1, VMware 3.5, 4, SLES 9 and 10, RHEL 4 and 5, HP-UX IBM i w/VIOS RHEL, SLES	System p, System x, Windows 2003, Windows 2008 w/Hyper-V, AIX 5.3 and 6.1, VMware 3.5, 4, SLES 9 and 10, RHEL 4 and 5, HP-UX IBM i w/VIOS RHEL, SLES	N/A
Host connectivity	SAN/NAS SAN-attached 8 Gbps Fiber Channel (FC), 1 Gbps iSCSI and optional 10 Gbps iSCSI NAS-attached 10 Gbps ethernet	Host/SAN connectivity • (16) 4/8 Gb FC • (8) 1/10 Gb iSCSI • (8) FC and (4) iSCSI	N/A	Host/SAN connectivity • (8) 8 Gb FC • (8) FC and (4) 1Gb iSCSI	Fibre Channel/iSCSI	N/A
SAN support	Switched fabric	Direct, FC-AL, Switched Fabric	N/A	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric	N/A
Copy services	FlashCopy, Metro Mirror, Global Mirror, file snapshot IBM enhanced rsync	Enhanced Remote Mirroring, FlashCopy, VolumeCopy	N/A	Enhanced Remote Mirroring, FlashCopy, VolumeCopy	Enhanced Remote Mirroring, FlashCopy, VolumeCopy	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	Supports individual drive replacement while others remain active, Dual redundant fans and power supplies	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	ESM-embedded "loop switch", Redundant 4 Gbps FC drive loops ensure complete accessibility to all drives in the event of a loop or cable failure, Redundant power supplies, cooling fans and ESMs, All primary components are hot-swappable
Controller	Dual active controllers with 8 Gbps FC 1 Gbps iSCSI and 10Gbps iSCSi (Models 3xx only) Dual active file Modules for NAS support	Dual active 4 Gbps RAID controllers		Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI	Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI	N/A
Cache (min, max)	8 GB/16 GB/32 GB Cache per controller/ control enclosure/ clustered system	Up to a total of 64 GB cache • 8/16/32/64 GB		2/4 GB	2/4 GB	N/A
RAID support	0, 1, 5, 6, 10	0, 1, 3, 5, 6, 10		0, 1, 3, 5, 6, 10	0, 1, 3, 5, 6, 10	N/A
Capacity (min, max)	300 GB min, up to 360 TB per control enclosure with nine disk expansion units; up to 720 TB per clustered system system	Legacy support for EXP810 587 GB min, Max: 268.8 TB (using all Fibre Channel or FC-SAS disk drives), 960 TB using all SATA disk drives 448 Intermixed/480 SATA	Max drive support: 60 3.5-inch SATA II disk drives Up to 120 TB per 4U 60-drive enclosure	Legacy support for EXP810 587 GB min, up to 67.2 TB's with 6 EXP520's w/FC drives or 224 TB's with SATA Up to 112 drives	Legacy support for EXP810 587 GB min, up to 67.2 TB's with 6 EXP395's w/FC drives or 224 TB's with SATA Up to 112 drives	Up to 16 FC or SATA disk drives.
Drive interface	6 Gbps SAS	4 Gbps Switched	4 Gbps FC	4 Gbps Switched	4 Gbps Switched	4 Gbps FC for high-speed connectivity
Drive support	3.5-inch disk drives: • 2 TB, 3 TB 3.5-inch 7.2k Near-Line SAS disk 2.5-inch disk drives: • 146 GB, 300 GB 2.5-inch 15k SAS disk • 300 GB, 450 GB, 600 GB 2.5-inch 10k SAS disk • 1 TB 2.5-inch 7.2k Near-Line SAS disk • 200 GB, 300 GB, 400 GB 2.5-inch E-MLC (enterprise-grade multilevel cell) solid state drive (SSD)	4 Gbps FC - 15k rpm: 300 GB, 450 GB, 600 GB 4 Gbps FC SED - 15k rpm: 300 GB, 450 GB, 600 GB 4 Gbps SATA - 7.2k rpm: 1 TB, 2 TB, Solid State Drives: 73 GB, 300 GB 600 GB 10,000 rpm FC-SAS disk drive	1 TB SATA 2 TB SATA	4 Gbps FC - 15k rpm: 300 GB, 450 GB, 600 GB 4 Gbps SATA - 7.2k rpm: 1 TB, 2 TB, Solid State Drives: 73 GB, 300 GB 600 GB 10,000 rpm FC-SAS disk drive	4 Gbps FC - 15k rpm: 300 GB, 450 GB, 600 GB 4 Gbps SATA - 7.2k rpm: 1 TB, 2 TB, 600 GB 10,000 rpm FC-SAS disk drive	See DS3950/DS5020 options
Certifications	See website	Microsoft Clustering Services, IBM SAN Volume Controller 4.3, HACMP	N/A	Microsoft Clustering Services, IBM SAN Volume Controller, HACMP	Microsoft Clustering Services, IBM SAN Volume Controller, HACMP	N/A

* Product not available in the U.S. and Canada

High-end and Enterprise Disk Systems



	XIV	XIV Gen3	DS8700	DS8800
Product	IBM XIV Storage System	IBM XIV Storage System Gen3	IBM System Storage DS8000	IBM System Storage DS8000
Machine/model	2810/A14, 2812/A14	2810/114, 2812/114	2421-941/94E, 2422-941/94E, 2423-941/94E, 2424-941/94E	2421-951/95E, 2422-951/95E, 2423-951/95E, 2424-951/95E
Platform support¹	System x, System p, AIX, Solaris, HP-UX, Windows 2000, Windows Server 2003, Linux for Intel systems, Linux for System p, Linux for System z, VMware, Apple Macintosh OSX	System x, System p, AIX, Solaris, HP-UX, Windows 2000, Windows Server 2003, Linux for Intel systems, Linux for System p, Linux for System z, VMware, Apple Macintosh OSX	System x, System i, System p, System z, i5/OS, OS/400, AIX, Solaris, HP-UX, Windows 2000, Windows Server 2003, Linux for System z, z/OS, z/VM, VSE/ESA, TPF, Linux for System i, Linux for System p, Linux for Intel systems, OpenVMS, TRU64, NetWare, VMware, Apple Macintosh OS X, Fujitsu PRIMEPOWER, SGI IRIX	System x, System i, System p, System z, i5/OS, OS/400, AIX, Solaris, HP-UX, Windows 2000, Windows Server 2003, Linux for System z, z/OS, z/VM, VSE/ESA, TPF, Linux for System i, Linux for System p, Linux for Intel systems, OpenVMS, TRU64, NetWare, VMware, Apple Macintosh OS X, Fujitsu PRIMEPOWER, SGI IRIX For a current list of platforms supported, please visit: ibm.com/systems/support/storage/config/ssic/
Host connectivity	4 Gbps Fibre Channel, iSCSI	8 Gbps Fibre Channel, iSCSI	4 Gbps Fibre Channel/ FICON	4- and 8-port 8 Gbps Fibre Channel/FICON
SAN support	FC-AL, Switched Fabric, Ethernet	FC-AL, Switched Fabric, Ethernet	Direct, FC-AL, Switched Fabric	Direct, FC-AL, Switched Fabric
Copy services	synchronous mirror, asynchronous mirror, snapshot, thin provisioning	synchronous mirror, asynchronous mirror, snapshot, thin provisioning	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, z/OS Global Mirror, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, z/OS Global Mirror, Metro/Global Mirror
Availability features	Fault tolerant, N+1 redundancy, hot-swappable parts, 3 Universal Power Supplies, nondisruptive hardware changes, nondisruptive code load multipathing device drivers as supported through OSs	Fault tolerant, N+1 redundancy, hot-swappable parts, 3 Universal Power Supplies, nondisruptive hardware changes, nondisruptive code load multipathing device drivers as supported through OSs	Fault tolerant, N+1 redundancy, hot-swappable components throughout, nondisruptive hardware changes, nondisruptive code load multipathing device drivers	Fault tolerant, N+1 redundancy, hot-swappable components throughout, nondisruptive hardware changes, nondisruptive code load multipathing device drivers
Controller	Multiple active-active	Multiple active-active	Dual active/active	Dual active/active
Cache (min, max)	48/240 GB	72/360 GB	32 GB/384 GB	16 GB/384 GB
RAID support	Data mirroring	Data mirroring	5, 6, 10	5, 6, 10
Capacity—raw (min, max)	72 TB 360 TB	144 TB 360 TB	4.8 TB, 2048 TB	2.3 TB 2.3 PB
Drive interface	SATA	SAS	Fibre Channel	SAS-2
Drive support	1000 GB, 2000 GB	2000 GB	600 GB SSD, 300 GB 15K, 450 GB 15K, 600 GB 15K, 2 TB 7.2K SATA	300 GB SSD, 146 GB 15K, 300 GB 15K, 450 GB 10K, 600 GB 10K, 900 GB 10K, 3 TB 7.2K
Certifications	For ISV clustering and multiplatform support, please visit the IBM System Storage Interoperability Center (SSIC) at: ibm.com/systems/support/storage/config/ssic/ For ISV solutions, please visit the ISV Solutions resource library at: http://www-03.ibm.com/systems/storage/solutions/iv/index.html	For ISV clustering and multiplatform support, please visit the IBM System Storage Interoperability Center (SSIC) at: ibm.com/systems/support/storage/config/ssic/ For ISV solutions, please visit the ISV Solutions resource library at: http://www-03.ibm.com/systems/storage/solutions/iv/index.html	For ISV clustering and multiplatform support , please visit the IBM System Storage Interoperability Center (SSIC) at: ibm.com/systems/support/storage/config/ssic/ For ISV solutions, please visit the ISV Solutions resource library at: http://www-03.ibm.com/systems/storage/solutions/iv/index.html	For ISV clustering and multiplatform support , please visit the IBM System Storage Interoperability Center (SSIC) at: ibm.com/systems/support/storage/config/ssic/ For ISV solutions, please visit the ISV Solutions resource library at: http://www-03.ibm.com/systems/storage/solutions/iv/index.html

1: For a current list of platforms supported, please visit: ibm.com/systems/support/storage/config/ssic/

Disk Storage Systems (continued)

Product	Highlights
DS8800	<ul style="list-style-type: none"> Performance: DS8800 model offers superior performance with new IBM POWER6+™ controllers, faster 8 gigabits per second (Gbps) host and device adapters, and 6 gigabits per second (Gbps) SAS (serial-attached SCSI) drives Availability and resiliency: Greater than five-nines availability¹ and over 10-year lineage of incremental hardware and microcode improvements built on the IBM POWER® server architecture Optimized storage tiering: IBM System Storage Easy Tier™ feature automatically helps optimize application performance by automating placement of data across the appropriate drive tiers Flexibility: Support for an extensive variety of server platforms, drive tiers, and application workloads, can help enable cost-effective storage consolidation Scalability: Models can scale up from the smallest configuration to the largest configuration—over three petabytes—non-disruptively by upgrading drive capacity, host adapters, drive adapters and memory
DS8700	<ul style="list-style-type: none"> Availability and Resiliency: Greater than five-nines availability¹ and a 10-year lineage of incremental hardware and microcode improvements built on the IBM POWER server architecture Performance: Designed for the highest levels of performance for your mission-critical applications Flexibility and Scalability: Systems can scale up from the smallest configuration to the largest configuration—over two petabytes—non-disruptively by upgrading drive capacity, host adapters, drive adapters, memory, and even the system's processor complexes Optimized Storage Tiering: IBM System Storage Easy Tier feature helps optimize application performance by automating placement of data across the appropriate drive tiers
XIV and XIV Gen3	<ul style="list-style-type: none"> A revolutionary high-end disk system for UNIX and Intel processor-based environments designed to eliminate the complexity of storage management Provides even and consistent performance for a broad array of applications—no tuning required. XIV Gen3 is suitable for very demanding workloads Scales up to 360 TB of physical capacity, 161 TB of usable capacity Thousands of instantaneous and highly space-efficient snapshots enable point-in-time copies of data Built-in thin provisioning that can help reduce direct and indirect costs Synchronous and Asynchronous remote mirroring provides protection against primary site outages, disasters and site failures Offers FC and iSCSI attach for flexibility in server connectivity
Storwize V7000	<ul style="list-style-type: none"> Provides rich enterprise-class function and performance in a system packaged and priced to suit midsized businesses RAID controller supports attachment of up to nine storage expansion units with configurations up to 240 TB physical storage capacities (480 TB in clustered systems) IBM Easy Tier function automatically moves most active data to SSD, helping to optimize both cost and performance Supports IBM Systems Director, VMware VAAI and vCenter, Microsoft System Center Operations Manager Virtualizes existing disk systems for data migration with minimal application disruption, or to extend the life of existing storage assets Attaches to a wide range of Windows, UNIX, and Linux systems using FC and iSCSI
DS5000 (DS5100/DS5300)	<ul style="list-style-type: none"> Provides SAN-ready flexible, efficient, scalable disk storage system for UNIX and Intel processor-based environments Field-replaceable host interface cards (HIC)—two per controller <ul style="list-style-type: none"> Current release supports 4, 8 Gbps Fibre Channel HICs or 1, 10 Gbps iSCSI—dual ported (sixteen total host ports) Scalable up to 448 drives using the EXP5000 enclosure and up to 960 TB of high-density storage with the EXP5060 enclosure Support for intermixing drive types—FC, FC-SAS, SED, SATA and SSD—and host interfaces—Fibre Channel and iSCSI—for investment protection and cost-effective tiered storage Supports business continuance with its optional high-availability software and advanced Enhanced Remote Mirroring function Helps protect customer data with its multi-RAID capability, including RAID 6, and hot-swappable redundant components
DS5020 Express	<ul style="list-style-type: none"> Mixed host interfaces support (FC/iSCSI) enables SAN tiering Balanced performance well-suited for virtualization/consolidation Self-encrypting drives secure data throughout your drive's lifecycle Support for intermixing FC/FDE/SATA drives enables tiered storage Feature-rich management software that maximizes utilization and minimizes storage TCO
DS3950 Express	<ul style="list-style-type: none"> Mixed host interfaces support (FC/iSCSI) enables SAN tiering Balanced performance well-suited for virtualization/consolidation Support for intermixing FC/SATA drives enables tiered storage Feature-rich management software that maximizes utilization and minimizes storage TCO
EXP395/EXP520	<ul style="list-style-type: none"> 4 Gbps FC interfaces for high-speed connectivity Up to 16 FC or SATA disk drives ESM-embedded "loop switch" Redundant 4 Gbps FC drive loops ensure complete accessibility to all drives in the event of a loop or cable failure. Redundant power supplies, cooling fans and ESMs.
DS3400 (DC Model)	<ul style="list-style-type: none"> Scalable to 24 terabytes (TB) of storage capacity with 2 TB hot-swappable Serial ATA (SATA) disks Expandable by attaching up to three EXP3000s, a total of 96 TB of storage capacity Flexible for use with IBM System x and BladeCenter servers
DS3500 Express	<ul style="list-style-type: none"> Six Gbps SAS systems deliver midrange performance and scalability at entry-level prices Mixed host interface support enables DAS and SAN tiering, reducing overall operation and acquisition costs Full disk encryption with local key management provides relentless data security Offers NEBS and ETSI
EXP3500	<ul style="list-style-type: none"> Next-generation SAS expansion enclosures Supports high bandwidth and random I/O applications with 6 Gbps x4-wide SAS ports Support for up to 36.0 TB of SAS physical disk storage (3 TB capacity-optimized SAS) in a single enclosure and up to 576 TB when fully expanded up to 192 drives High-performance SAS, capacity-optimized SAS hard disk drives and self-encrypting drives (SEDs) intermix support EXP3512 and EXP3524 expansion units can be intermixed behind a single DS3500 for optimal data utilization and efficiency
EXP3000	<ul style="list-style-type: none"> 3 Gbps SAS interface technology Support for up to 24 TB of storage in a single enclosure Support for up to 96 TB in a cascaded configuration with MegaRAID 8480 adapter Powerful and comprehensive management and configuration tools included
EXP2500	<ul style="list-style-type: none"> Easy installation and management with storage expansion technology designed for IBM System x direct attachment via ServeRAID M5025 adapter Next-generation 6 Gbps Serial Attached SCSI (SAS) host and drive interfaces enable infrastructure simplification Support for flexible high-performance and nearline disk drive options High capacity, with support for multiple enclosures per configuration

¹ Five-nines is a term used to denote that a piece of equipment is functioning with 99.999 percent reliability.

Operating Systems and Copy Services Platform Coverage

	DS3950/DS5020/DS5100/DS5300	DS8700	DS8800	XIV	Storwize V7000
Windows NT	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror				FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Windows 2000	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Windows Server 2003	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
NetWare	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror		FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Linux¹	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
AIX	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
VMware	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Dynix					
HP-UX	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Solaris	FlashCopy, VolumeCopy, Metro Mirror, Global Copy and Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
IRIX	-				FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Tru64 UNIX	-	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror		FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
OpenVMS		FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, z/OS Global Mirror, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, z/OS Global Mirror, Metro/Global Mirror		FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
z/OS, OS/390, TPF		FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Copy	FlashCopy, FlashCopy SE, Metro Mirror, z/OS Global Mirror, z/OS Metro/Global Mirror, Global Copy, Metro/Global Copy, Metro/Global Mirror		
i5/OS		FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror		FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration
Apple Macintosh OSX		FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror	snapshot, asynchronous and synchronous mirroring, thin provisioning, data migration	FlashCopy (all variants), Metro and Global Mirror, thin provisioning, Easy Tier, data migration

* 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.

Operating Systems and Copy Services Platform Coverage

	EXP3000/MegaRAID	DS3400
Windows NT		
Windows 2000		
Windows Server 2003		FlashCopy, VolumeCopy
NetWare		FlashCopy, VolumeCopy
Linux ¹		FlashCopy, VolumeCopy
AIX		FlashCopy, VolumeCopy
VMware		
Dynix		
HP-UX		
Solaris		
IRIX		
Tru64 UNIX		
OpenVMS		
z/OS, OS/390		
i5/OS		
DG/UX		

* Request via RPQ process

Yes No

- 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: 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.
- 3: VolumeCopy, Metro Mirror, Global Copy and Global Mirror require turbo option.

IBM System Storage DCS3700



Highlights

- 6 Gbps SAS high density storage system delivering scalable capacity at an affordable price point
- Ideally suited for high performance streaming applications, such as rich media, financial markets, telecommunications, weather modeling and others needing rigorous bandwidth requirements
- Combined with IBM's best-in-class General Parallel File System (GPFS), the new DCS3700 can help organizations optimize the flow and management of large file-based data, while retaining ease of data access
- Built on over 30 years of IBM's best-of-breed technology, the DCS3700 meets the most demanding data growth requirements with dense capacity packaging (up to 45 TB per U)
- Management expertise built into an intuitive and powerful storage management software
- Combined with the best-in-class IBM General Parallel File System (GPFS™), the new DCS3700 can help organizations optimize the flow and management of large file-based data, while retaining ease of data access.
- Superior serviceability and easy installation with front load 12-drive drawers which can be extended while drives remain active allowing for individual drive replacement without affecting the operation of other drives.
- Multilevel data protection with IBM FlashCopy®, Volume Copy and Remote Mirroring across Fiber Channel
- Energy saving implementations for cost savings today and tomorrow with a high density enclosure, power supplies designed with multiple efficiency standards, and variable speed fans.
- Mixed host interfaces support DAS and SAN tiering to reduce overall operation and acquisition costs.
- Investment protection and cost backup and recovery with remote mirror across Fibre Channel host ports and compatibility with DS3500, DS5000 and DS4000

Feature	Benefits
Up to 60 nearline SAS drives in 4U	<ul style="list-style-type: none"> • Highly dense storage to maximize rack space efficiency and reduce cost: 60 nearline SAS drives in 4U, expandable to 180 drives • Lower overall annual energy expenditures: 45 TB per U provides highly efficient enclosures
Redundant, hot-swappable components	<ul style="list-style-type: none"> • Fully redundant components, automated I/O path failover and online administration create "always-on" availability to ensure your data is always accessible • Front load 12-drive drawers can be extended while drives remain active
6 Gbps SAS host interface	<ul style="list-style-type: none"> • Improve bandwidth utilization, management and network robustness • Second-generation, 6 Gbps SAS builds upon the solid foundation of 3 Gbps SAS with performance improvements and reliability enhancements • With direct attachment support and the capability to be shared by multiple host servers, the DCS3700 with SAS provides ease-of-use and simplicity at an affordable price
8 Gbps FC host interface	<ul style="list-style-type: none"> • Fibre Channel, a mature and proven technology now available at 8 Gbps is the host interface of choice for high performance environments • The DCS3700 with Fibre Channel allows you to exploit the benefits offered by a SAN environment
Backup and Replication capabilities	<ul style="list-style-type: none"> • Multilevel data protection with FlashCopy and Volume Copy to create logical or physical copies of data for file restoration and backup • Remote Mirroring to provide storage system-based data replication from one DCS3700 system to another DCS3700 system using either synchronous or asynchronous data transfers over Fibre Channel communication links
RAID levels and storage partitions	<ul style="list-style-type: none"> • RAID levels 0, 1, 3, 5, 6, and 10 to give you the flexibility to choose the level of protection required • Storage partitions that logically divide a single DCS3700 into multiple systems to manage volume-to-host access
Intuitive IBM DS Storage Manager	<ul style="list-style-type: none"> • Designed to ensure optimal storage utilization, the IBM DS Storage Manager provides a powerful, yet easy-to-use and intuitive graphical user interface (GUI) for DCS3700 administrative activities. This includes configuration, reconfiguration, expansion, and routine maintenance, as well as performance tuning and management of advanced functions.
Energy saving features	<ul style="list-style-type: none"> • The DCS3700 was developed with energy savings features, such as power supplies designed to meet multiple efficiency standards and variable speed fans, to help reduce power consumption and provide a lower overall total cost of ownership. And with 60 drives housed within just a 4U enclosure, the DCS3700 is optimized for maximum storage density.

Real-time Compression Appliances



IBM Real-time Compression Appliance Highlights

- Shrink primary production online data in real time without performance degradation
- Keep up to five times more information online for analytics, reduce storage space requirements or a combination of both
- Deliver improved user response times and overall throughput, with applications that spend less time waiting for disk requests
- Deploy and administer quickly and easily

Building efficiencies by optimizing storage

IBM Real-time Compression can help slow the growth of storage acquisition, reducing storage costs while simplifying both operations and management. It also enables organizations to keep more data available for use rather than storing it offsite, supporting improved analytics and decision making.

IBM Real-time Compression solutions enable four key benefits:

- Real-time operation: Supports the performance and accessibility requirements of business-critical applications because data is compressed in real time, without performance degradation
- Transparency: Provides compatibility with downstream storage processes such as snapshots, clones, mirroring, archives and backups, including deduplicated backups
- Simplicity: Requires no software drivers and no configuration changes to applications, servers, networks or storage systems
- High availability: Seamlessly integrates with existing high-availability storage system configurations and supports enhanced monitoring for high-availability environments, helping the organization maintain service levels.

IBM Real-time Compression Appliances

Models	<ul style="list-style-type: none"> • STN6500 (2452-650) and STN6800 (2452-680)
Systems	<ul style="list-style-type: none"> • IBM STN6800 has 2x6 Core Intel Xeon 2.8 GHz processors • IBM STN6500 has 2xQuad Core Intel Xeon 2.4 GHz processors
Cache per controller	<ul style="list-style-type: none"> • 72 GB
Host interface	<ul style="list-style-type: none"> • TCP/IP or UDP
Storage interface	<ul style="list-style-type: none"> • NAS: Microsoft Common Internet File System (CIFS) and Network File System (NFS) version 3, SMB1
Connectivity	<ul style="list-style-type: none"> • IBM STN6800 supports up to 8x10 Gigabit Ethernet (GbE) ports, or mixed configurations with up to 4x10 GbE and up to 8x1 GbE ports • IBM STN6500 has 16x1 GbE ports
Fans and power supplies	<ul style="list-style-type: none"> • Hot-swappable N+1 fans and power supply units
Rack support	<ul style="list-style-type: none"> • 2 rack unit form factor per appliance (3.36 in. or 85.3 mm)
Management software	<ul style="list-style-type: none"> • Intuitive web graphical user interface (GUI) • Command line interface (CLI) for management tasks • Comprehensive Simple Network Management Protocol (SNMP) MIB providing statistics information and alerts • Active Directory integration supports external Syslog server for sending notifications and audit information
High availability	<ul style="list-style-type: none"> • Transparent path failover when deployed in pairs • Predictive Failure Analysis for hardware components • Link aggregation (IEEE 802.3ad) • Ethernet trunking (Cisco EtherChannel)
Dimensions	<ul style="list-style-type: none"> • Width: 444.5 mm (17.5 in.) • Depth: 698.5 mm (27.5 in.) • Height: (3.36 in.); 2U
Warranty	<ul style="list-style-type: none"> • One year

IBM Information Archive/IBM System Storage N series



IBM Information Archive Highlights

- A storage repository for all types of content: business, legal, regulatory, structured and unstructured
- Enables customers to index and search archived information
- Offers flexibility in retaining information through its unique “collections” architecture and choice of protection options
- Offers up to 608 TB of raw disk capacity and petabytes with external tape*
- Helps optimize storage capacity with data deduplication and compression features
- Offers low total cost of ownership (TCO) by allowing use of mixed media (disk, tape and virtual tape)
- Maintains information integrity and authenticity and increases its security through a patent-pending enhanced tamper protection feature
- Stores information using multiple industry-standard access methods

A flexible and simple archiving solution.

The explosive growth of information and the increased focus on regulatory compliance are compounding the need to retain and protect business-critical information. Clients need an archiving and retention solution that is secure, scalable and cost-effective. IBM Information Archive is a simple and flexible archiving solution to help organizations of all sizes address their complete information retention needs—business, legal or regulatory.

Three key areas are addressed with the IBM Information Archive:

Cost reduction

- Offers lower total cost of ownership by using two storage tiers
- Reduces disk capacity requirements with built-in data deduplication, compression and hierarchical storage management features
- Helps reduce the time and resources needed to locate files with a new index and search function
- Eliminates the need to maintain two separate platforms for structured and unstructured information
- Utilizes a single management point to help reduce the labor required to manage archived information

Improve operational efficiency

- Provides the flexibility to configure up to three separate information collections (virtual archives) within one Information Archive, reducing the need for additional storage to archive information with different retention needs
- Enables users and administrators to locate archived data quickly, saving labor time and costs
- Supports industry-standard interfaces and protocols for easy installation and configuration, providing quick time to value
- Simplifies management of archived information with a single web-based user interface

Manage risk

- Designed to help your business meet the most stringent information retention requirements
- Helps provide a compliant storage repository that offers protection against inadvertent or malicious deletion or alteration
- Increases protection through its patent-pending enhanced tamper protection feature

IBM Information Archive for Email, Files and eDiscovery

As part of its Smart Archive strategy, IBM delivers Information Archive for Email, Files and eDiscovery. A specific solution that helps to simplify and accelerate the implementation of an end-to-end archiving and eDiscovery solution from weeks to days. With Information Archive for Email, Files and eDiscovery, IBM is delivering a specific Smart Archive strategy solution that will ensure the success of information archiving projects.

Components of Information Archive for Email, Files and eDiscovery

- Content Collector Discovery Analytics Starter Pack, which includes Content Collector for Email, Content Collector for File Systems, eDiscovery Manager, eDiscovery Analyzer
- IBM Information Archive
- Content Manager Enterprise Edition
- System x servers already sized and configured to run the software
- Implementation Services on site
- Business Partner Maintenance Packages (optional)

* Tape is not part of IBM Information Archive.

IBM Information Archive for Email, Files and eDiscovery

The solution consists of pre-configured software, hardware and implementation services from a single vendor. The total solution configuration leverages IBM experience in customer archiving deployments, simplifying implementation and providing quick time to value. Additionally, proven services packages are available to manage ongoing administration and maintenance. This solution is ideal for organizations - with up to 1,400 employees - that have:

- A requirement to capture and retain email and file system content,
- To demonstrate compliance with retention mandates
- Experienced soaring storage costs and need to bring those costs under control, and/or have
- Requirements to quickly and efficiently respond to ediscovery requests.

N series Highlights

- **Integrated storage architecture**—provides a single storage platform to support heterogeneous, multiprotocol storage requirements with the capability of simultaneously handling both Block I/O (with FCP or iSCSI protocol) and File I/O (with CIFS, NFS, HTTP, FTP, FCoE) application needs
- **Application-aware software**—SnapManager software provides host-based data management of N series storage for databases and business applications. Simplifies application-consistent policy-based automation for data protection and disaster recovery. Snapshot copies and automates error-free data restores and enables application-aware disaster recovery
- **Thin Provisioning**—allows applications and users to get more space dynamically and nondisruptively without IT staff intervention
- **Ease of installation**—offers installation tools designed to help simplify installation and setup
- **Increased access**—allows heterogeneous access to IP attached storage and Fibre Channel attached storage subsystems
- **Operating system**—optimized and finely tuned for storing and sharing data assets, designing to enable greater efficiency within your organization and help lower TCO through improved efficiency and productivity
- **Flexibility**—enables cross-platform data access for Microsoft Windows, UNIX and Linux environments that can help reduce network complexity and expense, and allow data to be shared across the organization
- **Network Attached Storage (NAS)**—supports Network File System (NFS), Common Internet File System (CIFS) protocols for attachment to Microsoft Windows, UNIX and Linux systems
- **IP SAN**—supports Internet Small Computer System Interface (iSCSI) protocols for IP SAN attached to a multitude of host servers including Microsoft Windows, Linux, and UNIX systems
- **FC SAN**—supports Fibre Channel protocols (FCP) for accommodating attachment and participation in fibre channel SAN environments
- **FCoE**—supports Fibre Channel flow over Ethernet networks
- **Expandability**—supports nondisruptive capacity increases as well as thin-provisioning (dynamically allow the increase and decrease of user capacity assignments). Allows you to increase your storage infrastructure to keep pace with company growth
- **Designed to maintain availability** and productivity during upgrades
- **Manageability**—includes integrated system diagnostics and management tools, which are designed to help minimize downtime
- **Redundancy**—several redundancy and hot-swappable features provide the highest system availability characteristics
- **Copy Services**—provides extensive outboard services that help recover data in disaster recovery environments. SnapMirror provides one-to-one, one-to-many and many-to-one mirroring over Fibre Channel or IP infrastructures
- **NearStore (near-line) feature**—SATA drive technology enables online and quick access to archived and nonintensive transactional data
- **Deduplication**—provides block-level deduplication of data stored in NearStore volumes
- **Compliance and data retention**—software and hardware features that offer nonerasable and nonrewritable data protection to meet the industry’s highest regulatory requirements for retaining company data assets

NOTES:

A single controller can be easily upgraded to a dual controller system as your computing needs increase. The dual controller is a fully redundant system and is designed to provide failover and failback capabilities.

The N series Interoperability Matrix can be found at the following website: ibm.com/storage/network/interophome.html

The following are trademarks or registered trademarks of NetApp Inc.: Data ONTAP, FlexCache, FlexScale, FlexVol, FilerView, Protection Manager, SecureAdmin, RAID-DP, SecureAdmin, FlexClone, MultiStore, SnapLock, Snapshot, SnapDrive, SnapMirror, SnapMover, SnapRestore, SnapVault, SnapManager, SnapValidator, SyncMirror, FlexShare, NearStore, Virtual File Manager

IBM System Storage N series

All N series systems provide the following features:	
Storage controllers/filers	Active/Active with automatic failover to secondary system
Fibre channel (FC) external disk drive support	4-Gbps Fibre Channel: 300 GB, 450 GB, 600 GB, 15,000 rpm 2-Gbps Fibre Channel: 300 GB, 450 GB, 600 GB, 15,000 rpm
SATA external disk drive support	SATA: 500 GB, 1 TB, 2 TB, 7,200 rpm, SAS external drive support for N3400, N6000 and N7000; SAS: 300 GB, 450 GB, 600 GB, 15,000 rpm SAS: 450 GB, 600 GB, 10,000 rpm
SAS disk drive support (N3300, N3400)	300 GB 15K, 450 GB 15K, 600 GB
Host connectivity and platform support	The N series systems support a multitude of host attachment capabilities via FCP, CIFS, NFS and iSCSI, FCoE protocols. See product "N series Interoperability Matrix" for more information
Network protocol support	NFS V2/V3/V4 over UDP or TCP, PCNFSD V1/V2 for (PC) NFS client authentication, Microsoft CIFS, iSCSI, FCP, VLD, HTTP 1.0, HTTP 1.1 Virtual Host
Other protocol support	SNMP, NDMP, LDAP, NIS, DNS
Operating system	Data ONTAP
Data protection	Double Parity RAID, Snapshot, SnapRestore, SnapMirror, SyncMirror, SnapVault, Open System Snap Vault, MetroCluster, Protection Manager

All N series systems provide the following features:	
Redundancy/high availability	Dual redundant hot-plug integrated cooling fans, hot-swappable auto-ranging power supplies, clustered filers, hot-swappable disk bays
Backup	External tape (SCSI or Fibre Channel)
RAID levels	RAID 4, RAID-DP (double parity)
System management/Storage management	FileView, SecureAdmin, SNMP, Operations Manager, Protection Manager, Industry-standard NDMP protocols
Standard software features	Snapshot, FlexVol, FlexShare, Integrated Automatic RAID Manager, Fast Boot, NIS, DNS, SNMP, FileView, NDMP, LDAP, iSCSI, AutoSupport, SyncMirror, SnapMover, FTP protocol feature, SecureAdmin, Disk Sanitization, System Manager
Optional software features	CIFS protocol, Clustered Failover, Data ONTAP, Disk Sanitization, FCP protocol, FlexCache, FlexClone, FlexShare, FlexScale, FlexVol, FTP protocol, HTTP protocol, iSCSI protocol, MetroCluster, MultiStore, NDMP protocol, NearStore (near-line), NFS protocol, Open Systems SnapVault (OSSV), Operations Manager Core and SRM License, Protection Manager, Provisioning Manager, System Manager, RAID 4, RAID-DP, SecureAdmin, Single Mailbox Recovery for Exchange (SMBR), SnapDrive, SnapLock Enterprise, SnapManager for Exchange, SnapManager for Oracle, SnapManager for SAP SnapManager for SQL Server, SnapManager for Microsoft Office SharePoint Server, SnapManager for Hyper-V, SnapMirror, SnapMover, SnapRestore, Snapshot, SnapValidator, SnapVault, SyncMirror, Performance Acceleration Module, N3000 Software Packs, N3400 Application and Server Pack, N3000 and N6000 Software Bundles, and N7000 High Performance Bundle*

* The maximum capacity through the 3 TB SATA Drives is only available if running Data ONTAP 8.1
N3300 models do not support Data ONTAP 8.x



	N3000 Express series			N6000 series*		
	N3300	N3400	N6210	N6240	N6270	N7000 series*
						N7950T**
Machine Type Model	2859-A10/2859-A20	2859-A11/2859-A21	2858-C10/2658-C20	2858-C21/2858-E11/2858-E21	2858-C22/2858-E12/2858-E22	2867-E22
Controller Configuration	Single/Dual (active/active)	Single/Dual (active/active)	Single (C)/Dual (active/active) (CC)	Dual (active/active) (CC)/Single + IO Exp (CI)/Dual + IO Exp (active/active) (CI-HA)	Dual (active/active) (CC)/Single (CI)/Dual (active/active) (CI-HA)	Dual (active/active)
Maximum Raw Capacity	136 TB/136 TB	272 TB/272 TB	720 TB/720 TB	1800 TB/1800 TB/1800 TB	2880 TB/2880 TB/2880 TB	4320 TB
Random Access Memory	1 GB/1 GB	4 GB/8 GB	4 GB/8 GB	16 GB/8 GB/16 GB	32 GB/16 GB/32 GB	192 GB
NVRAM	128 MB/256 MB	256 MB/512 MB	512 MB/1 GB	2 G/1 GB/2 GB	4 GB/2 GB/4 GB	8 GB
Integrated I/O Ports						
Fibre Channel Ports (Speed)	2 (4 Gbps)/4 (4 Gbps)	2 (4 Gbps)/4 (4 Gbps)	2 (4-Gbps)/4 (4-Gbps)	4 (4-Gbps)/2 (4-Gbps)/4 (4-Gbps)	4 (4-Gbps)/2 (4-Gbps)/4 (4-Gbps)	8 (8-Gbps)
Ethernet Ports (Speed)	2 (1 Gbps)/4 (1 Gbps)	4 (1 Gbps)/8 (1 Gbps)	2 (1-Gbps)/4 (1-Gbps)	4 (1-Gbps)/2 (1-Gbps)/4 (1-Gbps)	4 (1-Gbps)/2 (1-Gbps)/4 (1-Gbps)	8 (10-Gbps) 4 (1-Gbps)
SAS Ports (Speed)	0/0	1 (3-Gbps)/2 (3-Gbps)	2 (6-Gbps) 4 (6-Gbps)	4 (6-Gbps)/2 (6-Gbps)/4 (6-Gbps)	4 (6-Gbps)/2 (6-Gbps)/4 (6-Gbps)	8 (6-Gbps)
I/O Scalability						
PCI-e Expansion Slots	0/0	0/0	2/4	4/6/12	4/6/12	24
Maximum number FC Ports	2/4	2/4	10/20	20/26/52	20/26/52	128
Maximum number of Ethernet Ports	2/4	4/8	10/20	20/22/44	20/22/44	100
Maximum Number of Optional Adapters	0/0	0/0	2/4	4/6/12	4/6/12	30

* N6000 and N7000 series Gateways are available ordered through a gateway feature code (9551).

**Systems based on dual clustered storage controllers. Divide all numbers by one-half if a single storage controller system is ordered.

IBM Scale Out Network Attached Storage (SONAS)



IBM Scale Out Network Attached Storage (SONAS) Highlights

- Provides extreme scalability to accommodate capacity growth for up to 21 petabytes
- Manages multiple petabytes of storage and up to a billion files in a single file system
- Enables ubiquitous access to files from across the globe quickly and cost effectively with IBM Active Cloud Engine
- Achieves operational efficiency with automated, policy-driven tiered storage
- Lowers TCO by up to 40 percent with automated lifecycle management and migration to tape
- Satisfies bandwidth hungry applications with scale-out performance
- Enables disaster recovery and business continuity
- Supports both random access and streaming workloads

IBM Scale Out Network Attached Storage (SONAS) is a scale-out NAS solution designed to manage vast repositories of information in enterprise environments requiring very large capacities, high levels of performance, and high availability. SONAS is built on a highly scalable, clustered parallel file system called IBM General Parallel File System (GPFS™), a mature and innovative technology from IBM.

IBM SONAS is designed to scan billions of files in a matter of minutes (not days or weeks.) This is especially important for efficient storage use and backup. At the core, SONAS leverages the IBM Active Cloud Engine™, a policy-driven engine tightly coupled with file system that enables you manage file data with ease, efficiency and with the ability to scale.

Overview

IBM SONAS offers the following features to meet the demands of large enterprises:

- Scalability up to 21 petabytes of disk storage
- Clustered file system with a global namespace, facilitating a more consistent view and easier administration
- True scale-out performance
- IBM Active Cloud Engine, which enables efficient and automated file management globally
- Information Lifecycle Management (ILM) with automated placement and movement of files
- Support for Tivoli Hierarchical Storage Manager (HSM) for automatically migrating data to storage media managed by an external TSM server such as tape
- Filesystem and fileset level snapshots, file level cloning
- High performing asynchronous replication
- Offers flexible and easy access to your data in a single global namespace allowing all users a single, logical view of files through a single drive letter such as a Z drive
- Provides automated tiered storage (disk and tape) for administrative and infrastructure cost savings
- File data access through industry-standard protocols: CIFS, NFS, FTP and HTTPS
- High availability, with redundant hot-swappable components and failover capabilities
- NDMP protocol to provide full and incremental backup of files as well as restoring of these files
- Internal and external storage pools and automated storage tiering for infrastructure efficiency and cost savings
- Integration with McAfee and Symantec Antivirus allowing customers to secure their data from malware and leverage the most commonly deployed ISV antivirus applications
- Simple, highly intuitive GUI
- Can be leveraged as a Gateway for IBM XIV Storage System

The IBM Active Cloud Engine at the core of SONAS, is designed to scan very large file systems at a high rate of speed. It can scan ten million files per minute, per node and can expand up to 30 nodes. Some or all nodes (both storage and interface) can scan in parallel to help offer tremendous time and cost savings in administering petabytes of data. The Active Cloud Engine is offered at no charge. It is a suite of capabilities specifically designed to manage files in an automated, scalable manner and creates the appearance of a single system despite geographic, physical, media, or other discrepancies that may exist in the physical world. It is designed to put the right file in the right place at the right time to give the user the fastest possible access along with the same view of their data no matter where they are. This is one of the critical principles of cloud storage. It enables ubiquitous access to files from across the globe quickly and efficiently. It eliminates unnecessary replication of files to remote sites thereby lowering network costs significantly.

In addition SONAS supports tiers of storage (disk and tape) for optimized use of storage resources, and reduced TCO. It can store and retrieve any files in/out of any pool transparently and quickly without any administrator involvement, offering reduced administrative tasks, costs, and faster response time to end users.

The high-density, high-performance SONAS can help you consolidate and manage data affordably, reduce crowded floor space and reduce management expenses associated with administering an excessive number of disparate storage systems.

Key Features	Benefits
Massive scalability	Supports billions of files (up to 21 petabytes of storage) in a single file system. Supports up to 256 file systems.
Flexibility	<ul style="list-style-type: none"> • Allows access to your data in a single global namespace allowing all users a single, logical view of files through a single drive letter such as a Z drive • Provides efficient distribution of files, images and application updates and fixes to multiple locations quickly, cost-effectively • Offers internal (SAS, Nearline SAS) and external (Tape) storage pools. Automated file placement and file migration based on policies. It can store and retrieve any file data in/out of any pool transparently and quickly without any administrator involvement • Provides multiple storage tiers for flexible, efficient management of petabytes of files • Supports industry standard protocols: CIFS, NFS, FTP, HTTP • Includes up to two dual port 10 GbE cards per interface node, which provides each interface node with more flexibility, connectivity and performance enablement. It offers additional connectivity to manage multiple data streams and functions (NDMP, TSM, antivirus or asynchronous replication or both)
Operational savings and TCO	<ul style="list-style-type: none"> • Your organization can consolidate multiple individual files and its management, thereby avoiding problems associated with administering an array of disparate NAS storage systems • Localizes files to improve file access performance and reduced network costs • Automates file placement by transparently moving files to another internal or external storage pool, optimizes your storage resources and offers tremendous time and cost savings in administering petabytes of files • Enables automated file migration to external storage devices (that is Tape) managed by TSM to help lower TCO by for up to 40 percent over the long term • Helps conserve floor space (up to a PB of data in less than a square meter), is highly scalable and can help to reduce your capital expenditure and enhance your operational efficiency. Its advanced architecture virtualizes and consolidates your file space into a single, enterprise-wide file system, which can translate into reduced total cost of ownership
Performance	<ul style="list-style-type: none"> • Scans billions of files in minutes with the robust SONAS Policy Engine, and take action (that is migrate, backup, delete, replicate etc) • Leverages two dual port (all ports active) 10 GbE interface cards offering high bandwidth and additional connectivity in each SONAS interface node to manage multiple data streams and functions (that is backup, replication, antivirus) • Offers scale-out performance by adding more interface nodes (front end) and storage pods (back end) • Provides fast asynchronous replication performance with the ability to define up to 10 replication processes per node
Cloud storage	<ul style="list-style-type: none"> • IBM Active Cloud Engine enables ubiquitous access to files from across the globe quickly and cost effectively • Self-managing, autonomic system enables capacity, provisioning and other IT service management decisions to be made dynamically, without human intervention or increased administrative costs • Seamless elasticity allows you to scale computing resources up or down, as required, to meet changing organizational needs without service interruption • Highly resilient and secure applications and an underlying infrastructure help meet expected levels of availability, reliability and integrity • Highly standardized environment facilitates simultaneous service deployment and upgrades for all users, no matter where they reside • Economies of scale lower the cost of service access • Capital preservation • Clouds can provide rapid access to computing capacity at a lower cost of ownership enabling companies to perform operations that may have previously been unaffordable or impractical

Disk Storage Virtualization

Reduce storage complexity and lower costs through virtualization. IBM System Storage SAN Volume Controller keeps it simple.

Product	Function and Value	Highlights
IBM System Storage SAN Volume Controller (SVC)	SAN Volume Controller is a disk storage virtualization system that is designed to help businesses improve storage utilization and reduce the costs associated with disk storage. SAN Volume Controller is designed to pool storage volumes from IBM and non-IBM storage systems into a reservoir of capacity for centralized management. SAN Volume Controller is also designed to hide the boundaries among disk systems, which helps simplify management and enables customers to focus on managing storage as a resource to meet business requirements and not as a set of boxes.	<ul style="list-style-type: none"> • IBM System Storage SAN Volume Controller: SVC Innovative Solid-State Device (SSD) support: The SVC scalable architecture is designed to deliver outstanding performance with SSDs for critical applications, up to 800,000 read I/Os per second. SVC helps move critical data to and from SSDs as needed without application disruption. The Easy Tier function automatically migrates only active portions of volumes to SSD, helping to optimize both performance and cost. And now announcing Easy Tier support for internal SVC SSDs. • Innovative Solid-State Device (SSD) support: The SVC scalable architecture is designed to deliver outstanding performance with SSDs for critical applications, up to 800,000 read I/Os per second. SVC helps move critical data to and from SSDs as needed without application disruption. The new Easy Tier function automatically migrates only active portions of volumes to SSD, helping to optimize both performance and cost. • iSCSI server attachment support: iSCSI attachment avoids the cost of fibre channel host bus adapters (HBAs) in servers and reduces the need for fibre channel switches. This capability may be particularly attractive for IBM BladeCenter server configurations. • Improved storage utilization: By pooling capacity, storage administrators can make better use of the storage capacity. Improvements of up to 30 percent in storage utilization have been seen in SVC customers. SVC's Space-Efficient Virtual Disks function helps to improve storage utilization even more because it is designed to use physical storage capacity only when data is written to virtual disks instead of dedicating physical capacity to the entire defined virtual capacity. This capability is also referred to as "thin provisioning." • Reduced storage growth: SVC helps reduce storage growth; customers have seen reductions in growth of up to 20 percent. • Simplified management: SVC provides a single interface for managing all types of supported storage. As a result, storage administration is made simpler and storage administrators can become more productive. Productivity improvements of up to two times have been seen in SVC customers. SVC presents a fresh new user interface based on the popular XIV user interface making it even easier to use than ever. • Storage virtualization support: Storage virtualization with SVC enables customers to obtain maximum benefit from virtualized infrastructures. SVC supports VMware vStorage API for Array Integration (VAAI) and vCenter management, up to 95 percent reduction in server and SAN usage for functions such as Storage vMotion and VMware View¹ • Tiered storage: SVC makes it much easier to implement tiered storage, which enables a mix of different types of storage to be used, including lower cost storage helping to reduce overall costs. Because SVC also has cache, it can improve the performance of data stored on lower cost storage, enabling such storage to be used more widely in a data center, further reducing costs. • Replication functions: SVC implements a common set of replication functions (IBM FlashCopy, Metro Mirror and Global Mirror) that can be applied to all supported storage. This ability can help enhance the value of lower cost storage that may have more basic functionality and helps improve choice when selecting storage, which can be limited by proprietary replication functions. The Space-Efficient FlashCopy function helps to dramatically reduce the amount of storage needed for FlashCopy replicas. Savings of 75 percent or more can be expected. • Improved availability: SVC makes it possible to move data among supported disk systems without disrupting applications. As a result, common data center events such as moving data at lease expiration or rebalancing loads across disk systems no longer require costly outages. The Virtual Disk Mirroring function helps to protect against failure of disk systems or disruptive maintenance activities to disk systems. • Enhanced Stretched Cluster: SVC can also be installed in a stretched configuration where a single SVC cluster supports storage and servers in two data centers. In this configuration, SVC enables a highly-available stretched volume to be concurrently accessed by servers at both data centers. When combined with server data mobility functions such as VMware vMotion or PowerVM Live Partition Mobility, SVC stretched cluster enables nondisruptive storage and virtual machine mobility between the two data centers. Depending on application performance requirements, SVC stretched clusters may be deployed between data centers up to 300km apart. SVC stretched clusters may be combined with SVC Metro Mirror or Global Mirror to support a third data center for applications that require both high availability and disaster recovery in a single solution.

IBM TotalStorage Expert Family

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

Product	Function and Value
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 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 IBM CICS® (Customer Information Control Systems) online transactions to update shared VSAM data sets concurrently

IBM FastBack for Storwize V7000

IBM FastBack for Storwize V7000 provides an advanced data protection and near-instant recovery solution for mission-critical applications, including IP-based replication for cost-efficient disaster recovery. It is licensed per Storwize V7000 storage enclosure, and performs block-level, incremental backup of Windows and Linux servers as often as needed to reduce the amount of data at risk, and reduces the time to recover from almost any data loss to just a few minutes.

IBM Tivoli Storage FlashCopy Manager

IBM Tivoli Storage FlashCopy Manager software enables organizations to perform and manage frequent, near-instant, nondisruptive, application-aware backups and restores, leveraging advanced FlashCopy snapshot technologies in IBM storage systems. IBM Tivoli Storage FlashCopy Manager helps deliver the highest levels of protection for mission-critical IBM DB2® UDB, SAP, Oracle, Microsoft Exchange and Microsoft SQL Server applications. IBM Tivoli Storage FlashCopy Manager is an easy-to-install package that seamlessly integrates with: IBM Storwize V7000, System Storage DS8000, SAN Volume Controller and XIV on AIX, Linux, Solaris and Windows; and DS5000, DS4000® and DS3000, as well as other VSS-capable storage systems on Windows. IBM Tivoli Storage FlashCopy Manager also integrates with IBM Tivoli Storage Manager to provide the full range of long-term data management and availability capabilities.

¹ VMware: <http://www.vmware.com/resources/techresources/10117>

IBM Tivoli Storage Manager 6

Function and Value

IBM Tivoli Storage Manager 6 is a family of products that helps businesses manage and control the “information tidal wave” by delivering a single point of control and administration for storage management needs. This advanced, highly scalable product helps increase the efficiency of your IT operations and helps cut costs related to storage management by providing a wide range of data protection, recovery management, movement, reporting and monitoring capabilities using policy-based automation. 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, allowing customers to customize, better secure and extend the functionality of their storage environment.

Highlights

- 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
- Designed to consolidate the servers and storage needed to protect and retain data; reduce administration time; perform backup and restore tasks faster and more often; and improve application availability and disaster recovery planning
- Designed to help reduce storage capacity and bandwidth requirements using built-in source and target-side data deduplication

IBM Tivoli Storage Manager Extended Edition

IBM Tivoli Storage Manager Extended Edition expands on Tivoli Storage Manager backup, restore and archive abilities. It helps expedite disaster recovery with detailed planning and automated scripts. Disaster recovery reporting functionality can track where offsite copies of data are stored.

IBM Tivoli Storage Manager FastBack

IBM Tivoli Storage Manager FastBack is an advanced continuous data protection and near-instant recovery software solution for business-critical Windows and Linux servers, remote offices and small- to midsized enterprises. Tivoli Storage Manager FastBack helps clients reduce the amount of data at risk between backups to almost zero, and reduces the time to recover from almost any data loss to just seconds. The base Tivoli Storage Manager FastBack product includes nondisruptive block-level local backup and near-instant recovery; built-in data deduplication to help reduce storage and bandwidth costs; plus highly efficient replication for off-site disaster recovery and business resilience.

IBM Tivoli Storage Manager FastBack for Microsoft Exchange

Fast and easy recovery of individual email objects from a Microsoft Exchange Database (EDB), including messages, attachments, contacts, calendar entries, tasks, notes and journal entries. Works with either Tivoli Storage Manager FastBack or Tivoli Storage Manager for Mail.

IBM Tivoli Storage Manager FastBack for Bare Machine Recovery

Restores the operating system volume of Microsoft Windows servers, within an hour, to similar, dissimilar or Virtual server platforms. Used in conjunction with the near-instant data volume restore capabilities of Tivoli Storage Manager FastBack, an entire server workload can be moved and operational, anywhere in the organization, to recover from almost any type of disaster, in about an hour.

IBM Tivoli Storage Manager FastBack Center

IBM Tivoli Storage Manager FastBack Center is a convenient, cost-effective, easy-to-order and deploy combination of Tivoli Storage Manager FastBack, Tivoli Storage Manager FastBack for Microsoft Exchange and Tivoli Storage Manager FastBack for Bare Machine Recovery.

IBM Tivoli Storage Manager FastBack for Workstations

IBM Tivoli Storage Manager FastBack for Workstations is an automated, continuous data protection and recovery software solution for desktop and laptop computers, with central management for thousands of systems, and integration with other Tivoli Storage Management offerings.

IBM Tivoli Storage Manager for Enterprise Resource Planning

IBM Tivoli Storage Manager for Enterprise Resource Planning protects your vital SAP system data. Now you can improve the availability of your SAP database servers and reduce your administration workload with automated data protection designed for mySAP environments.

IBM Tivoli Storage Manager for Mail

IBM Tivoli Storage Manager for Mail protects data on email servers running Lotus® Domino® or Microsoft Exchange. This software module for Tivoli Storage Manager automates data protection, enables “hot” backups without shutting down the server and improves data restore performance. New in version 6 is the ability to restore individual email objects and mailboxes in Microsoft Exchange environments.

IBM Tivoli Storage Manager for Microsoft SharePoint

Tivoli Storage Manager 6 for Microsoft SharePoint can offer you the peace of mind that your SharePoint content can be protected and quickly restored, with granularity. Tivoli Storage Manager for Microsoft SharePoint V6.1 extends that level of protection with new features that can help you automatically classify and prioritize your SharePoint content based on its business importance.

IBM Tivoli Storage Manager for Space Management

IBM Tivoli Storage Manager for Space Management moves inactive data to reclaim online disk space for important active data. It frees administrators and users from manual file system pruning tasks, and can allow you to defer the need to purchase additional disk storage.

IBM Tivoli Storage Manager for Storage Area Networks

IBM Tivoli Storage Manager for Storage Area Networks works with servers and client computers to make data transfers over SAN. It allows SAN-connected Storage Manager servers and Storage Manager client computers to make maximum use of their direct network connection to storage.

Tivoli Storage Manager for System Backup and Recovery

IBM Tivoli Storage Manager for System Backup and Recovery delivers a flexible backup method for your AIX systems. It offers a comprehensive system backup, restore and reinstallation tool including Bare Machine Recovery, and can be executed from either the AIX command line or by using the SMIT menu interface.

Tivoli Storage Manager for Virtual Environments

IBM Tivoli Storage Manager for Virtual Environments eliminates the burden of running backups on a virtual machine by offloading backup workloads from VMware guests to a centralized vStorage backup server. It also provides flexible recovery options—restore single files, instantly restore disk volumes, or restore an entire virtual machine—from a single pass, non-disruptive backup.

Tivoli Storage Manager HSM for Windows

Tivoli Storage Manager HSM for Windows helps you get control of, and efficiently manage, data growth and its associated storage costs by providing space management for Microsoft Windows NTFS file systems. Tivoli Storage Manager HSM for Windows has the capability to automatically migrate selected files, based on established policy, to less expensive storage devices. It accomplishes this while still preserving file accessibility to the end user.

Tivoli Storage Manager Suite for Unified Recovery

Tivoli Storage Manager Suite for Unified Recovery is a bundle of ten Tivoli Storage Manager and Tivoli Storage Manager FastBack products, with an easy to order, deploy and manage capacity-based pricing model. Customers can use any number of components, in any location, without worrying about individual product licensing. You pay only for the amount of data being managed by the TSM and FastBack servers on a tiered Terabyte scale.

IBM Tivoli Continuous Data Protection for Files

IBM Tivoli Continuous Data Protection for Files backs up your most important files the moment they are saved. It provides a real-time, continuous data protection solution for desktop and laptop computers, effortlessly and transparently, without administrative intervention.

Cristie Bare Machine Restore

Cristie Bare Machine Recovery (CBMR) integrates with IBM Tivoli Storage Manager to provide a Bare Machine Recovery (BMR) solution for Windows, Linux, SUN Solaris and HP-UX. CBMR combined with Tivoli Storage Manager functionality allows customers to recover a Windows 2000, XP or 2003 operating system to a new disk drive, RAID array or a completely new machine using only a CD and a disaster recovery backup stored in the Tivoli Storage Manager server. This functionality is also supported for Linux, SUN Solaris and HP-UX operating systems. Cristie also offers TBMR, which enables the bare machine recovery of protected systems directly from the Tivoli Storage Manager data repository, without the need for a separate backup solution.

IBM Tivoli Storage Productivity Center 4

Product	Function and Value	Highlights
IBM Tivoli Storage Productivity Center Basic Edition	IBM Tivoli Storage Productivity Center Basic Edition is designed to provide basic storage resource management through a centralized console. It extends existing management of a single storage system and provides capabilities such as storage reporting, monitoring, policy-based management and storage provisioning.	<ul style="list-style-type: none"> • Inexpensive entry point for IT managers requiring basic asset and capacity reporting. • Designed to provide storage management via the SNIA Storage Management Interface Specification (SMI-S), which includes the IBM System Storage DS® family, IBM System Storage SAN Volume Controller (SVC) and other vendor storage devices that have implemented support for the SMI-S standards.
IBM Tivoli Storage Productivity Center for Disk	In a pooled or virtualized SAN environment, multiple devices work together to create a storage solution. IBM Tivoli Storage Productivity Center for Disk is designed to provide integrated administration, performance analytics, capacity utilization, storage optimization, green tools and replication features for these environments.	<ul style="list-style-type: none"> • Designed to enable proactive performance management with a single, integrated console. • Monitors metrics, such as I/O rates and cache utilization, and support optimization of storage through the identification of the best LUNs across multiple storage subsystems. • Measures and tracks service levels by storing historical performance statistics for analysis. • Provides a performance optimization engine that can help reduce service times of resource-constrained applications by an average of 48 percent and up to a maximum of 90 percent.
IBM Tivoli Storage Productivity Center for Disk Select	IBM Tivoli Storage Productivity Center for Disk Select offers equivalent functionality to IBM Tivoli Storage Productivity Center for Disk, but designed to license by the number of storage devices managed. It allows administrators to configure, manage and monitor performance of their entire storage from a single console.	<ul style="list-style-type: none"> • Designed to support DS3000, DS4000, DS5000, Storwize V7000 and XIV as stand-alone devices or when attached to an IBM SAN Volume Controller. • Also supports any storage devices that are attached to Storwize V7000. • Licensed per storage device, such as disk controllers and their respective expansion units.

IBM Tivoli Storage Productivity Center 4

Product	Function and Value	Highlights
IBM Tivoli Storage Productivity Center for Data	IBM Tivoli Storage Productivity Center for Data provides over 400 enterprise-wide reports, monitoring and alerts, policy-based action and file-system capacity automation in a heterogeneous environment.	<ul style="list-style-type: none"> • Designed to help improve capacity utilization of file systems and databases and add intelligence to data protection and retention practices. • Designed to monitor, report on and manage growing NAS resources with a universal view of direct-attached storage and NAS—from a file system or application perspective • Offers 'chargeback' for storage capacity usage based on multiple metrics to help customers move to an On Demand storage environment. • Direct IBM Tivoli Storage Manager integration allows administrators to initiate a TSM archive or backup via a constraint or directly from a file report, simplifying policy based actions.
IBM Tivoli Storage Productivity Center for Replication	IBM Tivoli Storage Productivity Center for Replication is designed to simplify and automate the configuration of your replication environment allowing for more effective Metro Mirror, Global Mirror and IBM FlashCopy management. It is also designed to monitor and automate copy operations across devices to support a replication environment.	<ul style="list-style-type: none"> • Designed to support hundreds of replication sessions across thousands of volumes, supporting both open and IBM z/OS attached volumes. • Automates the configuration of advanced copy services features in IBM DS8000, DS6000, XIV, ESS Model 800 and IBM SAN Volume Controller. • Monitors and manages the replication operations to ensure successful completion from source volumes to disaster recovery volumes. • Designed to provide automated failover to keep the critical data online and available to users even if the primary site fails. When the primary site comes back on, the software manages failback to the default configuration as well.

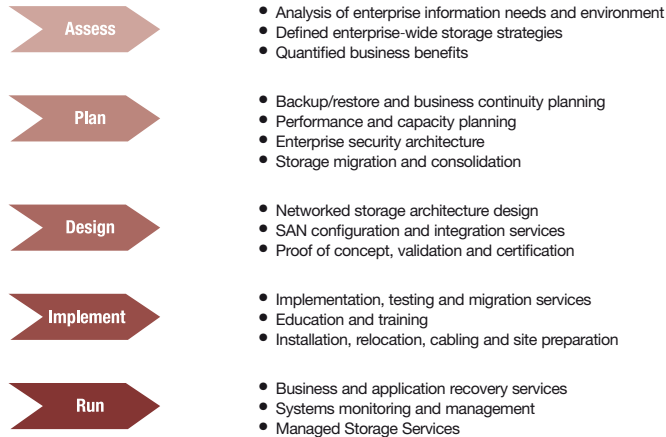
IBM Tivoli Storage Productivity Center 4

Product	Function and Value	Highlights
IBM Tivoli Storage Productivity Center Standard Edition	Combines the capabilities of Basic Edition, Disk and Data products together as one orderable product. Includes additional management, control and performance reporting for the fibre channel SAN infrastructure.	<ul style="list-style-type: none"> • Designed to provide automated device discovery, topology rendering, error detection and fault isolation, zone control, monitoring and alerts, and event management. • View and analyze multiple aspects of the storage environment, including capacity, utilization, assets and availability. • Provides storage tiering reporting that offers the capability to proactively make volume placement decisions in a virtualized environment. • Offers SAN availability features, including SAN error protector that can predict SAN network problems before they become severe and impact data and application availability. • Provides diagnostic capabilities to identify which resources are impacted by an availability or performance issue.
IBM Tivoli Storage Productivity Center Select	IBM Tivoli Storage Productivity Center Select offers equivalent functionality to IBM Tivoli Storage Productivity Center Standard Edition, but designed to license by the number of storage devices managed.	<ul style="list-style-type: none"> • Designed to support DS3000, DS4000, DS5000, Storwize V7000 and XIV as stand-alone devices or when attached to an IBM SAN Volume Controller. • Also supports any storage devices that are attached to Storwize V7000. • Licensed per storage device, such as disk controllers and their respective expansion units.
IBM System Storage Productivity Center	An integrated offering that provides a consolidated focal point for managing IBM storage products as well as managing mixed-vendor storage environments. SSPC provides enhancements to daily storage administration by making available a broader set of configuration functions.	<ul style="list-style-type: none"> • Combines the power of a customized IBM System x server with preinstalled Tivoli Storage Productivity Center software that represents a significant point of centralized management. SSPC enhances several rudimentary device utilities for easier, more intuitive, context-based administration and, on the whole, lowers resource overhead.

IBM Global Services for System Storage and Storage Networking

Data Storage Services from IBM can help you achieve 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 while reducing management costs.

IBM Global Services, as the leading data storage services provider, brings best practices from its thousands of customer engagements to work for your organization, implementing and integrating new solutions and technologies that meet your business and IT needs. IBM offers a comprehensive portfolio of data storage services including:



IBM Global Services has a track record of offering successful services for open and mainframe storage, data migration, installation and support services for IBM and non-IBM environments, including these examples:

- IBM Storage Strategy Assessment assists with the vision and strategy, assessment, architecture and conceptual designs to help customers optimize their storage infrastructure.
- 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

Financing that supports the entire technology lifecycle

IBM Global Financing can help you accelerate your acquisitions of the latest technology and services, and help make your IT and information infrastructure projects more affordable by providing competitive, customized financing of your storage, server, PC, software and services investments. In addition, IBM Global Financing can enable you to reduce the risk of technology obsolescence risk and handle planning for disposal and replacement of your IT hardware assets. With single-source, customized, competitive financing of the entire lifecycle of your IT equipment, IBM Global Financing makes it easier to manage both the up-front investment and the ongoing operating costs.

From acquisition through daily use, buyback and disposal, our end-to-end offerings form the foundation of a cohesive technology management strategy, improving asset management and increasing your flexibility for both small and large IT projects.

Offerings, rates, terms and availability may vary by country. Contact your local IBM representative or visit the web at ibm.com/financing

IBM Systems

Demand for lightning-fast communication and transactions has driven the need for a high-performance, responsive infrastructure that embraces open standards—exactly what you will find in the IBM Systems 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 IBM Systems product portfolio. There is no better storage offering for IBM Systems than an IBM System Storage product. These offerings are tested and supported by IBM and are backed by outstanding IBM service and support.

IBM Business Partner Innovation Centers (BPIC)

More than 140 worldwide IBM 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/tssc

IBM Maintenance and Technical Support Services for Storage

IBM Maintenance and Technical Support solutions can help you get the most out of your IT investment by reducing support costs, increasing availability and simplifying management with integrated support for your storage environment. To fully leverage the capabilities of today's storage devices your staff needs deep knowledge on "how to" configure these devices and proactive support to maintain hardware and software levels to maximize availability and mitigate performance issues. IBM offers a broad set of storage support services to meet these challenges ranging from foundational hardware and operating system break-fix support to priority pro-active technical support from assigned resources who understand your specific storage environment and business requirements.

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

IBM STG Lab Services

IBM STG Lab Services offers three updated Information Infrastructure services:

Storage Energy Analysis

Information Infrastructure Storage Optimization Workshop

Information Infrastructure Storage Optimization Study

Storage Energy Analysis

The Storage Energy Analysis review provides a financial business case for moving forward with IBM products that address the typical issues facing the CIO including controlling storage growth and reducing infrastructure costs.

The review requires that the client gather and return data to an IBM STG Lab Services staff member. Once the data is submitted, it will be analyzed and used as input into a business model that will predict future storage, power, cooling and facility space requirements. IBM consultants work remotely, and the engagement takes about a week.

<http://stgls01.rchland.ibm.com:81/toasted.nsf/services/AGSYS019>

Information Infrastructure Storage Optimization Workshop

This offering from STG Lab Services assesses the current state of a client's IT storage infrastructure and identifies alternative approaches for optimizing the storage environment using best practices and "green" principles for reducing the storage footprint.

The workshop begins with the client gathering data and continues with a one or two day onsite workshop (depending on scope) with client participants who are integral to storage use and management. The workshop team discusses storage-related issues and concerns and develops recommendations to address them. The IBM team then creates a report that captures the issues and concerns, offers recommendations, and provides a high-level business case that compares business as usual storage growth and management against an optimized storage infrastructure using the recommendations developed in the workshop. This engagement takes 2 to 4 weeks.

<http://stgls01.rchland.ibm.com:81/toasted.nsf/services/AGSYS018>

Information Infrastructure Storage Optimization Study

The Storage Optimization Study is more detailed than the Workshop. Like the Workshop, the Optimization Study assesses the current state of a client's IT storage infrastructure and identifies alternative approaches for optimizing the storage environment using best practices and "green" principles for reducing the storage footprint.

The assessment begins with onsite client interviews to develop a deeper understanding of the issues and concerns regarding storage. Initial findings are reviewed with the client executive sponsor and then the team goes offsite to analyze data, develop recommendations and create a report that contains the following elements: a review of the current storage infrastructure, current storage environment issues and concerns, recommendations to address the issues, and a business case that compares business-as-usual with an optimized storage infrastructure. This engagement takes 6 to 8 weeks.

<http://stgls01.rchland.ibm.com:81/toasted.nsf/services/AGSYS017>



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Route 100
Somers, NY 10589
Produced in the United States
November 2011
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