IBM System Storage Product Guide
Why IBM System Storage?
In this era of Smarter Computing, the amount of information most organisations deal with on a daily basis has exploded – as much as doubling every 18 to 24 months. At the same time, big data projects can quickly double or triple this amount of information. And information is becoming more valuable, with the ability to analyse it counting as a competitive advantage.
To stay ahead, organisations need faster access to more data. Another trend, cloud computing, will be adopted or deployed by up to 90 percent of organisations within the next three years, saving US businesses an estimated GBP403 billion over five years. This growth and transformation is happening at a time when IT budgets are flat. Inflexible infrastructures and increasing complexity can create significant obstacles for organisations trying to take advantage of these tremendous opportunities.

These growing demands require a new approach to storage – a more intelligent, more efficient, more automated approach that fundamentally changes the way we think about it. Introducing IBM® Smarter Storage, a new strategy for storage design and deployment. IBM Smarter Storage enables organisations to take control of their data so they can focus on gaining more valuable insights from this information and delivering more value to the business. IBM Smarter Storage solutions are:

- **Efficient by design.** Efficiency features are designed into IBM storage systems from the beginning. Advanced features are pre-installed, ready to deploy and operate consistently. Storage-efficiency technologies, like real time data compression, can significantly reduce the amount of data that has to be stored because they support all data, including active primary data
- **Self-optimising.** Self-optimising storage operates at the speed of business – much faster and more accurately than manual performance tuning. Self-optimising storage can increase throughput for critical applications while reducing the cost of storing less active data

- **Cloud agile.** Cloud-agile storage has virtualisation built in. Virtualisation increases agility by enabling online data migration and simplified storage provisioning. Cloud-agile storage enables immediate self-service and automates most manual storage administration tasks, improving the ability to manage larger, more unpredictable workloads. The storage leadership and ongoing product innovation of IBM supports organisations in significantly improving storage efficiency and information access with solutions that are easy to use and powerful enough to control massive storage growth.

**Storage at the speed of business**
In addition to delivering new levels of storage efficiency, today's organisations are under extreme pressure to increase their agility and speed to stay competitive in a changing global marketplace.

To be successful, businesses must do things faster than their competitors – find new customers faster, bring products to market faster and identify new revenue streams faster

- Similarly, chief information officers (CIOs) and IT organisations are successful only if they help the business to run faster, enabling faster access to information, bringing applications online faster and meeting user needs faster
- And in today's environment, both IT and business units have to operate faster without increasing operating costs.

As expectations of businesses and CIOs are rising, so should expectations of storage systems. Companies should expect more from both their storage systems and their storage provider – efficiency by design, self-optimisation and cloud agility. By building these three pillars into our storage systems, IBM can help organisations meet higher expectations for both speed and efficiency.

Whether your next destination is cloud, business analytics, big data, or somewhere else, you'll be more successful when your storage works with you to help your organisation adapt to change.

Learn more about IBM Smarter Storage at: ibm.com/storage

**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 Storwize V3700
- IBM Flex System V7000 Storage Node
- IBM System Storage DS8870
- IBM System Storage TS260 external standalone Linear Tape-Open® (LTO®) 6 tape drive
- IBM System Storage TS2360 external standalone LTO6 tape drive
- IBM System Storage TS1060 Tape Drive for the TS3500 Tape Library
- IBM System Storage N3150.

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

- IBM Virtualisation Engine TS7700 family
- IBM Storwize V7000 and Storwize V7000 Unified
- IBM XIV Storage System
- IBM System Storage TS2900, TS3100, TS3200, TS3310 tape libraries now optionally include the new LTO6 tape drive.
SAN routers to connect heterogeneous SAN fabrics and enable distance extension using Fibre Channel over IP (FCIP) and Converged Switches

IBM System Storage SAN06B-8 extension switch (2498-R06)

- Designed for high performance with up to 24 giga bps per second (gigabits) Fibre Channel (FC) ports and a 1 Gbps Ethernet (GbE) ports for faster data, the SAN06B-R supports either 8, 4, 2 or 4, and 2 and 1 Gbps FC link speeds.
- Infrastructure simplicities solutions for the IBM Power Systems and IBM System i families include disaster tolerance over metropolitan and global IP networks with System Storage devices designed with an intuitive Management data protection software. Support for IBM System i2 servers is provided via the optional 8 Gbps Advanced Extension, IBM PCOMM Accelerator and FICON CUP Activation features.

Cisco MDS 9221 for IBM System Storage (2054-E01)

- Designed to address the needs of medium-sized businesses and large enterprises (LEs) with a wide range of SAN capabilities, the modular 4/4 Gbps Port module multiservice SAN router enables high performance, cost-effective SAN extension over IP for continuity solutions.
- The solution includes 16 Gbps FC ports, 4 Gbps IP ports, the SAN Extension over IP Package for integrated IP ports and one modular expansion slot.
- A 4/4 Gbps FC switching module allows support for up to 66 FC ports. A 4-port 10 Gbps FC module is also available for high performance, inter-switch link (ISL) connections as well as support for data-at-rest and SAN extension.

Cisco MDS 9148 for IBM System Storage (2498-416)

- The solution provides high performance, scalable and simple-to-use fabric switching with 16, 24 or 48 ports operating at 8, 4, 2 or 1 Gbps, depending on which optical transceiver is used, for servers running Microsoft Windows®, IBM i, UNIX® and Linux® operating systems, server clustering, virtualised environments multimode and business continuity solutions.
- The SAN48B-4 includes the EZSwitchSetup wizard, which is an embedded setup tool designed to guide novice users through setup process. It is less than five minutes.

Cisco MDS 9124 Express for IBM System Storage (2498-24, 249624)

- Cisco MDS 9124 Express provides high performance, scalable and simple-to-use fabric switching with 16, 24 or 24 ports operating at 1, 2 and 4 Gbps for servers running Microsoft Windows, UNIX, Linux, Novell NetWare and IBM i.
- The solutions offer high port density and scalability for midrange enterprise SAN switches with redundant, hot-pluggable components and non-disruptive software upgrades.

Midrange SAN switches for scalable SMB and enterprise solutions

IBM System Storage SAN48B-5 (2498-F48)

- The SAN48B-E and SAN48B-F are high performance, stand-alone devices 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 from 48 to 96 Gbps encryption processing power to meet the needs of the most demanding environments with flexible, on-demand performance.
- Tightly integrated with one of the leading, enterprise-class key management systems, IBM TrueKey Lifecycle Manager (TLMLE) can scale to support key lifecycle services across distributed ecosystems.

IBM System Storage SAN32B-E4 (2498-E32)

- 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 i2050 operating systems. Many advanced functions are available to facilitate operation in medium and large networks.

IBM System Storage SAN80B-4 (2498-B40, 249640)

- The SAN80B-E 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 i2050 operating systems. Many advanced functions are available to facilitate operation in medium and large networks.

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 centre environments. RackSwitch provides virtualisation-ready switching with high bandwidth, low latency, optimised airflow and low power consumption at an attractive price.

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

As networks consolidate on to fewer devices, IBM RackSwitch can make it possible for servers and storage to share the same network. Virtual LANs (VLANs) can separate storage, data and other traffic. DCB features can prioritise and optimise storage traffic. Virtual link aggregation helps enable second-sub-second failover for HA and rapid predictable failover.
IBM System Networking Ethernet Switch modules for IBM BladeCenter

IBM BladeCenter include 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 bandwidth and also provide high performance Ethernet capabilities designed to help your business run better. The solution can provide flexible and simple management via web browser or industry-standard command line interface (CLI). It can interoperate seamlessly with other vendors’ upstream switches.

**IBM BladeCenter Virtual Fabric 10 Gb Switch Module (46C7191)**

- Ten 10 Gb uplinks have up to 200 Gbps of bidirectional uplink bandwidth
- With extremely low oversubscription—capable of supporting over 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 terabits per second (Tbps) of data per BladeCenter H chassis
- Supports DCB/Converged Enhanced Ethernet (CEE) (ideal for NAS, iSCSI or FCoE) and stacking for server-to-server connectivity
- With lower power consumption, the solution uses only 75 W per switch

**IBM BladeCenter 1/10 Gb Uplink Ethernet Switch Module (44W4404)**

- With six external 1 Gb and three external 10 Gb ports, this solution is an ideal choice for customers who require 1 Gb today and 10 Gb capability for future growth
- The WWave feature makes the BNT 1/10 Gb Uplink Ethernet Switch Module virtualization aware
- The solution can reduce power consumption to as low as 40 W

**IBM BladeCenter Layer 2-7 GbE Switch Module (32R1859P)**

- Four external 10/100/1000 100BASE-T GbE ports have RJ-45 connectors
- The Layer 2-7 GbE Switch Module integrates Layer 2/3 Ethernet connectivity with Layer 4-7 application and server load balancing in a single switch module
- The Layer 2-7 GbE Switch Module can reduce power consumption to as low as 40 W

**IBM BladeCenter Layer 2/3 Copper and Fibre GbE Switch Modules (Copper: 32R1860*, Fibre: 32R1861)**

- The solution contains six external 1 Gb copper ports or 6 external 1 Gb fibre ports
- The Layer 2/3 Copper and Fibre GbE 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

**IBM RackSwitch G8052 (1455-48E)**

- 48 × 1 GbE RJ45 ports and four standard 10 GbE small form factor pluggable (SFP+) ports are in a 1U form factor
- The RackSwitch G8052 provides up to 176 Gbps throughput with latency as low as 1.8 microseconds
- The solution offers typical power consumption of up to 130 W

**IBM RackSwitch G8124E (1455-24E)**

- 24 SFP+ ports operate at 10 Gb or 1 Gb speeds in a 1U form factor
- Low latency of 570 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)**

- 64 × 1/10 Gb SFP+ and future-ported ports with four 40 Gb QSFP+ ports in a 1U form factor
- 1280 Gbps throughput and latency of 880 nanoseconds makes the RackSwitch G8264 ideal for applications requiring high bandwidth and low latency
- The solution offers typical power consumption of up to 275 W

**IBM RackSwitch G8264T (rear to front: 7309CF9*, front-to-rear: 8036AFX*)**

- 48 10GBase-T connections plus four 40 Gb QSFP+ connections in a 1U form factor 48
- Flexible and low-cost connectivity option for 10 Gb environments supporting distances up to 100m using CAT5/6 cables
- Ideal for connecting to the IBM System Storage DS3500 with 10Gbase-T connections

**IBM RackSwitch G8361E (rear to front: 8036ARX*, front-to-rear: 8036AFX*)**

- 16 × 40 Gb QSFP+ ports and up to 64 × 10 Gb SFP, ports form a high-density, 10 Gb cluster in a 1U form factor
- With a latency of 880 nanoseconds, the RackSwitch G8361E is optimised 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 Gb RackSwitch G8264T/G8264T at the access layer

**Entry-level Tape Products**

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Machine type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS2240</td>
<td>3580</td>
<td>H4V, 3580S4V</td>
</tr>
<tr>
<td>TS2250</td>
<td>3580</td>
<td>H55, 3580S5E</td>
</tr>
<tr>
<td>TS2260</td>
<td>3580</td>
<td>H65, 3580S6E</td>
</tr>
</tbody>
</table>

**Product characteristics**

- **Multi O/S**: Encryption capable LTO4 High capacity Half-high (HH) form factor
- **Multi O/S**: Encryption & media partition capable Linear tape file system (LTFS) support LTO6 High capacity HH form factor

**Number of drives**

- 1

**Max number of cartridges**

- 1

**Write Once, Read Many (WORM) encryption**

- yes

**Native capacity**

- Gen 4: 800 gigabytes (GB)
- Gen 5: 1.5 TB
- Gen 6: 2.5 TB

**Typical capacity**

- Gen 4: 1.6 terabytes (TB)
- Gen 5: 3.0 TB
- Gen 6: 6.25 TB

**Native (uncompressed) performance**

- Gen 4: 120 megabytes per second (MBps)
- Gen 5: 160 MBps
- Gen 6: 160 MBps

**Interface**

- 6 Gbps serial attached SCSI (SAS)
- 6 Gbps SAS

**Supported tape libraries**

- N/A

**Platform support**

- System p, System x and others supporting 6 Gbps attach
- System p, System x and others supporting 6 Gbps attach

**Application support**

- A (others in plan)
- A, B, C, E, F, G, H
- A, B, C, E, F, G, H

**Media**

- Refer to Tape Media, page 8
- Refer to Tape Media, page 8
- Refer to Tape Media, page 8

**Warranty period**

- Three years
- Three years
- Three years

**Warranty type**

- Customer replaceable unit (CRU)
- CRU
- CRU

**NOTES**

- Max number of cartridges decreases as tape drives are added
- Typical compression for open system environments is 2:1 (user results may vary)
- Also includes selected IBM xSeries, IBM Netfinity, IBM System i, IBM AS/400 and IBM System p servers; System z support for Linux only
- 6 Gbps SAS 6 Gbps SAS
- HH form factor

**F/W**: Fast/Wide, **DIFF**: Differential, **N/A**: Not Applicable, **PC**: Fibre Channel, **Ext**: Extended length cable, **IOE**: IBM Onsite Exchange, **CRU**: Customer Replaceable Unit
## Entry-level/Midrange Products

<table>
<thead>
<tr>
<th>Model, HVEC#</th>
<th>CRU</th>
<th>CRU</th>
<th>CRU</th>
<th>CRU</th>
<th>CRU</th>
<th>CRU</th>
<th>On-site Repair</th>
<th>Warranty type</th>
<th>Warranty period</th>
<th>Product strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>3580 L43, 3580L4X</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, Encryption capable LTO4, High performance</td>
</tr>
<tr>
<td>3580 3580L4X</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>LTO HH</td>
<td>FH</td>
<td>FH</td>
<td>FH</td>
<td>30</td>
<td>Three years</td>
<td>Multi O/S, Encryption &amp; media partition capable LTO5, High capacity</td>
</tr>
<tr>
<td>3580 3572S3R, 3572S4R, 3572S5R, 3572S6R</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance</td>
</tr>
<tr>
<td>3573 L2U 35732UL</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance, High capacity, Data protection, Media partitioning</td>
</tr>
<tr>
<td>3573 L4U 35734UL</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance, High capacity, Data protection, Media partitioning</td>
</tr>
<tr>
<td>3578 F4A</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance, High capacity, Data protection, Media partitioning</td>
</tr>
<tr>
<td>3588 PSA</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance, High capacity, Data protection, Media partitioning</td>
</tr>
<tr>
<td>3588 PSA</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>9</td>
<td>Three years</td>
<td>Multi O/S, High performance, High capacity, Data protection, Media partitioning</td>
</tr>
</tbody>
</table>

**Notes:**
- N/A = Not Applicable
- F/W = Firmware
- X = Extended length cartridge
- LTO = Linear Tape Open
- LTO4 = LTO Generation 4
- LTO5 = LTO Generation 5
- LTO6 = LTO Generation 6
- HH = Half-High Form Factor
- FH = Full-High Form Factor
- LVD = Low Voltage Differential
- Gbps = Gigabits per second
- SCSI = Small Computer System Interface
- O/S = Operating System
- Dantz = Dantz Disk Technologies
- Symantec = Symantec Corporation
- Other = Other vendors

**Platform support:**
- 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 support:**
- A, B, C, E, F, G, H, L, M
- A, B, C, D, E, F, G, H, L, M, N
- A, B, C, D, E, F, G, H, L, M, N
- A, B, C, D, E, F, G, H, L, M, N
- A, B, C, D, E, F, G, H, L, M

**Supported tape libraries:**
- N/A
- N/A
- N/A
- N/A
- N/A
- TS3500
- TS3550
- TS3550

**Warranty period:**
- Three years
- Three years
- Three years
- One year
- Three years
- Three years
- One year
- One year

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:**
- Max number of cartridges decreases as tape drives are added.
- Typical compression for open system environments is 2:1 (user results may vary).
- Related products: IBM System i, IBM AS/400, IBM p5 servers; System z support for IBM i, z/OS, z/VMM, z/VM, and z/TPF.
- 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 = BalaBone NetVault, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = HelpSystems Robot/Save.
- Linux: Customer Replaceable Unit (CRU) for IBM i5, i5x, i6, i6x systems.
- IBM i5, i5x, i6, i6x support for System i5, i5x, i6, i6x systems.
- System z support for IBM i, z/OS, z/VMM, z/VM, and z/TPF.
- 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 = BalaBone NetVault, I = LSC, J = IBM BRMS, K = IBM OnDemand, L = HelpSystems Robot/Save.
- Linux: Customer Replaceable Unit (CRU) for IBM i5, i5x, i6, i6x systems.
- IBM i5, i5x, i6, i6x support for System i5, i5x, i6, i6x systems.
- System z support for IBM i, z/OS, z/VMM, z/VM, and z/TPF.
## Midrange/Enterprise Tape Products

### Midrange Tape Libraries

<table>
<thead>
<tr>
<th>Name</th>
<th>TS3310</th>
<th>TS3500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine type</td>
<td>3576</td>
<td>3584</td>
</tr>
<tr>
<td>Model, HVEC#</td>
<td>L5B E9U</td>
<td>L53</td>
</tr>
<tr>
<td>Product strengths</td>
<td>Multi O/S</td>
<td>Multi O/S</td>
</tr>
<tr>
<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
</tr>
<tr>
<td>High capacity</td>
<td>High capacity</td>
<td>High capacity</td>
</tr>
<tr>
<td>Modular design</td>
<td>High density (H/D)</td>
<td>Slot Technology</td>
</tr>
<tr>
<td>Media platform support</td>
<td>LTO3 support</td>
<td>LTO3 support</td>
</tr>
<tr>
<td>Supported libraries</td>
<td>Supports LTO6, LTO5 and LTO4 drives</td>
<td>Supports LTO6, LTO5 and LTO4 drives</td>
</tr>
</tbody>
</table>

### Enterprise Tape Drives (for System z, TS7740 and open systems)

<table>
<thead>
<tr>
<th>Product</th>
<th>TS3140</th>
<th>TS3130</th>
<th>TS3120</th>
<th>3592</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine type</td>
<td>3592</td>
<td>3592</td>
<td>3592</td>
<td>3592</td>
</tr>
<tr>
<td>Model</td>
<td>E07</td>
<td>E06</td>
<td>E05</td>
<td>E07</td>
</tr>
<tr>
<td>Interface</td>
<td>8 Gbps FC</td>
<td>4 Gbps FC</td>
<td>4 Gbps FC</td>
<td>8 Gbps FC</td>
</tr>
<tr>
<td>Typical capacity</td>
<td>2.52 GBps</td>
<td>1.6 TB</td>
<td>1.6 TB</td>
<td>384 GB</td>
</tr>
</tbody>
</table>

### Enterprise Tape Controller for System z

<table>
<thead>
<tr>
<th>Product</th>
<th>TS3500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine type</td>
<td>3584</td>
</tr>
<tr>
<td>Model</td>
<td>L23</td>
</tr>
<tr>
<td>Interface</td>
<td>8 Gbps FC</td>
</tr>
<tr>
<td>Typical capacity</td>
<td>2.88 GBps</td>
</tr>
</tbody>
</table>

### Enterprise Tape Libraries

<table>
<thead>
<tr>
<th>Product</th>
<th>TS3405, TS3500, 3494***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine type</td>
<td>TS3405, TS3500, 3494***</td>
</tr>
<tr>
<td>Interface</td>
<td>8 Gbps FC</td>
</tr>
<tr>
<td>Typical capacity</td>
<td>2.7 EBps</td>
</tr>
</tbody>
</table>

### Platform support

<table>
<thead>
<tr>
<th>Application support</th>
<th>A, B, C, D, E, G, H, J, L*</th>
</tr>
</thead>
</table>

### Media

<table>
<thead>
<tr>
<th>Media</th>
<th>Refer to Tape Media, page 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next Business Day</td>
<td>(09:00 to 17:00)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warranty type</th>
<th>On-site Repair (around-the-clock)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty period</td>
<td>One year</td>
</tr>
</tbody>
</table>

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 3584 cartridges decreases as tape drives are added 2: Typical compression for mainframe environments is 3:1; 2:1 for open systems (user results may vary)


4: 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 ARChive Backup
- F: HP OpenView Storage Data Protector
- G: CommVault Galaxy
- H: BakBone NetVault
- J: IBM VRMS
- K: IBM OnDemand
- L: HP/Ex-Systems RobotSave
- M: L&L Media Management

5: Performance varies by environment.
### Midrange Open Systems Tape Virtualisation

**Product**: IBM ProtecTIER Appliances and IBM ProtecTIER Gateway

<table>
<thead>
<tr>
<th>Machine type</th>
<th>Model</th>
<th>Product strengths</th>
<th>Number of drives</th>
<th>Write Once, Read Many (WORM) encryption</th>
<th>Native capacity</th>
<th>Typical capacity**</th>
<th>Interface</th>
<th>Supported tape libraries</th>
<th>Platform support**</th>
<th>Application support**</th>
<th>Media</th>
<th>Warranty period</th>
<th>Warranty type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3959 SM2</td>
<td>3958 API</td>
<td>Eliminates redundant data by up to a factor of 25:1</td>
<td>Up to 64</td>
<td>no/no</td>
<td>Up to 128,000</td>
<td>Up to 275 TB (nominal capacity based on a deduplication ratio of 25:1)</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
<tr>
<td>3959 DD4</td>
<td>3958 API</td>
<td>Eliminates redundant data by up to a factor of 25:1</td>
<td>Up to 512,000</td>
<td>yes/yes</td>
<td>Up to 4,000,000</td>
<td>Up to 900 TB (nominal capacity based on a deduplication ratio of 25:1)</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
</tbody>
</table>

**NOTES**: 1: Compressed data rates are estimates and are data-, application- and processor-dependent. User results may vary. 2: Server platforms with SAN-ready attachability, model- and feature-dependent.

### Enterprise Tape Virtualisation for System z

**Product**: IBM Virtualisation Engine

<table>
<thead>
<tr>
<th>Machine type</th>
<th>Model</th>
<th>Product strengths</th>
<th>Number of drives</th>
<th>Write Once, Read Many (WORM) encryption</th>
<th>Native capacity</th>
<th>Typical capacity**</th>
<th>Interface</th>
<th>Supported tape libraries</th>
<th>Platform support**</th>
<th>Application support**</th>
<th>Media</th>
<th>Warranty period</th>
<th>Warranty type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS7620</td>
<td>TS7650</td>
<td>Increases performance scalable</td>
<td>Up to 256**</td>
<td>yes/yes</td>
<td>Up to 1036 (6 site GRID**)</td>
<td>Up to 275 GB</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
<tr>
<td>TS7650G</td>
<td>TS7650</td>
<td>Increases performance scalable</td>
<td>Up to 1036</td>
<td>yes/yes</td>
<td>Up to 1536 (6 site GRID**)</td>
<td>Up to 256 GB</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
<tr>
<td>TS7720</td>
<td>TS7740</td>
<td>Increases performance scalable</td>
<td>Up to 1036</td>
<td>no/no</td>
<td>Up to 4,000,000</td>
<td>Up to 1872 PB</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
<tr>
<td>TS7740</td>
<td>TS7740</td>
<td>Increases performance scalable</td>
<td>Up to 1536</td>
<td>yes/yes</td>
<td>Up to 28 TB</td>
<td>Up to 1536</td>
<td>8 Gbps FC</td>
<td>N/A</td>
<td>System p, System I, System x, Microsoft Windows, HP-UX, Sun Solaris, Linux</td>
<td>A, B, C, E, F, G, H'</td>
<td>N/A</td>
<td>One year</td>
<td>On-site Repair (around-the-clock)</td>
</tr>
</tbody>
</table>

**NOTES**: 1: Compressed data rates are estimates and are data-, application- and processor-dependent. User results may vary. 2: Server platforms with SAN-ready attachability, model- and feature-dependent.
### Enterprise use
- Custom labelling and initialisation services are available
- Serve tracks help improve data integrity
- Cartridge intermix within libraries supports smooth migration, legacy systems
- Write Once Read Many (WORM) functionality
- Machine type/model: 3599

### Midpoint load 0.31-inch MP tape
- 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 operation
- Advanced media-binder process provides ultra-clean operation
- Sophisticated mirror optics support BOT and EOT recognition
- Improved media coating helps reduce head friction and provide cleaner operation
- Cleaning cartridge is highest-capacity open standard tape cartridge available

### Open systems LTO standard
- Media uses interchangeable LTO format
- Cartridge is highest-capacity open standard tape cartridge available
- Custom labelling 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: 3599

### Removable hard drive
- Reliable, durable and secure
- Affordable, high-capacity cartridges
- Easy deployment, simple management

### DAT
- 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

### SLR (QIC) cartridges
- 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-stitched base-plate design helps provide rigidity and a stable tape path
- Cartridge cover shields against static discharge and airborne debris
- Durastat an drive rollers dissipates static

For more information, please visit: [ibm.com/storage/media](http://ibm.com/storage/media) or call 1-888-IBM-MEDIA

* WORM version

---

### Highlights

<table>
<thead>
<tr>
<th>Technology</th>
<th>Capacity (Compressed)</th>
<th>Part number</th>
<th>Related products</th>
</tr>
</thead>
<tbody>
<tr>
<td>3592 Tape Cartridge</td>
<td>5 TB</td>
<td>46X6454</td>
<td>3592 Cleaning Cartridge</td>
</tr>
<tr>
<td></td>
<td>10 TB</td>
<td>46X6454</td>
<td>3592 Cleaning Cartridge</td>
</tr>
<tr>
<td>3590 Tape Cartridge</td>
<td>5 GB</td>
<td>05H4434</td>
<td>3590 Cleaning Cartridge</td>
</tr>
<tr>
<td>3590E Tape Cartridge</td>
<td>60/120 GB</td>
<td>08L6091-K-less</td>
<td>3590 Cleaning Cartridge</td>
</tr>
<tr>
<td>IBM Magstar MP Fast Access Linear Tape Cartridge</td>
<td>10 GB</td>
<td>08L6187-C</td>
<td>Cleaning Cartridge</td>
</tr>
<tr>
<td>Ultrium 6</td>
<td>2.5 TB</td>
<td>00V7590</td>
<td>Ultron Cleaning Cartridge (all)</td>
</tr>
<tr>
<td>Ultrium 6</td>
<td>2.5 TB</td>
<td>00V7590</td>
<td>Leader Pin Attachment Kit</td>
</tr>
<tr>
<td>Ultrium 5</td>
<td>15 TB</td>
<td>46X1290</td>
<td>5-pack LTO Ultrium 5 tapes</td>
</tr>
<tr>
<td>Ultrium 4</td>
<td>15 TB</td>
<td>46X1290</td>
<td>5-pack LTO Ultrium 4 tapes</td>
</tr>
<tr>
<td>Ultrium 3</td>
<td>15 TB</td>
<td>95P4436</td>
<td>5-pack LTO Ultrium 3 tapes</td>
</tr>
<tr>
<td>Ultrium 2</td>
<td>9 GB</td>
<td>95P4436</td>
<td>5-pack LTO Ultrium 3 tapes</td>
</tr>
<tr>
<td>Ultrium 1</td>
<td>10 GB</td>
<td>95P4436</td>
<td>5-pack LTO Ultrium 3 tapes</td>
</tr>
<tr>
<td>IBM PEX Cartridges</td>
<td>10 GB</td>
<td>46C3355</td>
<td>Ultrium Cleaning Cartridge (all)</td>
</tr>
<tr>
<td></td>
<td>50 GB</td>
<td>46C3355</td>
<td>Leader Pin Attachment Kit</td>
</tr>
<tr>
<td>Cleaning Cartridge</td>
<td>15 GB</td>
<td>05H4435</td>
<td>5-pack LTO Ultrium 5 tapes</td>
</tr>
<tr>
<td>3592 Cleaning Cartridge</td>
<td>20 GB</td>
<td>35L2086</td>
<td>5-pack LTO Ultrium 4 tapes</td>
</tr>
<tr>
<td>3590 Cleaning Cartridge</td>
<td>30 GB</td>
<td>35L2086</td>
<td>5-pack LTO Ultrium 3 tapes</td>
</tr>
<tr>
<td>3590E Cleaning Cartridge</td>
<td>60 GB</td>
<td>35L2086</td>
<td>5-pack LTO Ultrium 3 tapes</td>
</tr>
<tr>
<td>DAT 160</td>
<td>72 GB</td>
<td>23R6638</td>
<td>DAT 160 Cleaning Cartridge - 4 mm</td>
</tr>
<tr>
<td>DAT 160</td>
<td>72 GB</td>
<td>23R6638</td>
<td>DAT 160 Cleaning Cartridge - 4 mm</td>
</tr>
<tr>
<td>DAT 160</td>
<td>72 GB</td>
<td>23R6638</td>
<td>DAT 160 Cleaning Cartridge - 4 mm</td>
</tr>
</tbody>
</table>

---

### Specifications

- **Machine type/model:** 3589
- **High durability helps support automation environments**
- **IBM-exclusive Statistical Analysis and Reporting System (SARS) statistics are stored in cartridge memory**
- **High durability helps support automation environments**
- **Machine type/model:** 3589

### Ports

- USB 3.0
- USB 2.0
- IEEE 1394

### Weight

- **Approximate weight:** 2.5 kg (5.5 lb)

---

### Part numbers

- **Part number:** 05H3302-J
- **Part number:** 08L6091-K
- **Part number:** 46C3355
- **Part number:** 46C3356

---

### Tape path operation

- **Almost instantaneous head/tape contact at load time speeds operation**
- **Durable cartridge case helps protect the tape**
- **Self-contained tape path helps improve reliability and extend tape life**
- **Proprietary hub lock helps reduce positioning errors to improve data integrity**
- **Improved media coating helps reduce head friction and provide cleaner operation**

---

### Additional features

- **IBM Magstar MP Fast Access Linear Tape Cartridge**
- **IBM-exclusive Statistical Analysis and Reporting System (SARS) statistics are stored in cartridge memory**
- **High durability helps support automation environments**
- **Machine type/model:** 3589

---

### Related products

- **IBM 3590 Tape Cartridge**
- **IBM 3590 Cleaning Cartridge**
- **IBM 3592 Tape Cartridge**
- **IBM 3592 Cleaning Cartridge**

---

### Additional notes

- **Write Once Read Many (WORM) functionality**
- **Machine type/model:** 3599

---

### For more information

- Please visit [ibm.com/storage/media](http://ibm.com/storage/media) or call 1-888-IBM-MEDIA
- * WORM version
## Disk Storage Systems

### Entry-level Disk Systems

<table>
<thead>
<tr>
<th>Storwize V3700</th>
<th>DS3500 Express</th>
<th>EXP3500 Expansion Unit</th>
<th>EXP2500 Storage Enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Storwize V3700</td>
<td>DS3500</td>
<td>EXP3500</td>
</tr>
<tr>
<td>Machines/model</td>
<td>207212C Storwize V3700 large form-factor (LFF) Dual Control Enclosure</td>
<td>207212E Storwize V3700 LFF Expansion Enclosure</td>
<td>207212C Storwize V3700 SFF Expansion Enclosure</td>
</tr>
<tr>
<td>RAID support</td>
<td>0, 1, 5, 6, 10</td>
<td>0, 1, 5, 6, 10</td>
<td>6 Gbps SAS</td>
</tr>
<tr>
<td>Cache (min, max)</td>
<td>4 GB cache per controller standard, upgradeable to 8 GB</td>
<td>1 GB, 2 GB per controller (battery-backed)</td>
<td>N/A</td>
</tr>
<tr>
<td>RAID support</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Capacity (min, max)</td>
<td>Min 3 TB, Max scales up to 120 drives with the attachment of up to four Storwize V3700 expansions</td>
<td>Min 300 GB, Max 192 drives, high performance SAS drives, SAS-NL drives and self-encrypting disk (SED) SAS drives</td>
<td>EXP35012: up to 12 disk drives (3.5 in. drives), scalable up to 192 drives (mix of expansion enclosures)</td>
</tr>
<tr>
<td>Drive interface</td>
<td>6 Gbps SAS</td>
<td>6 Gbps SAS</td>
<td>6 Gbps SAS</td>
</tr>
<tr>
<td>Drive support</td>
<td>SFF 2.5 in. disk drives: 15k revolutions per minute (rpm): 146 GB and 300 GB 10k rpm: 300 GB, 600 GB and 1000 GB 7.2k rpm SAS nearline (SAS-NL): 500 GB and 1 TB LFF 3.5 in. disk drives: 10k rpm: 300 GB, 600 GB and 900 GB 7.2k rpm NL: 2 TB and 3 TB 7.2k rpm SED: 600 GB 6 Gbps SAS 2.5 in. drives: 10k rpm: 300 GB, 600 GB and 900 GB 7.2k rpm NL: 500 GB and 1 TB 7.2k rpm SED: 300 GB Solid state drives (SSD): 200 GB and 400 GB</td>
<td>EXP35012: 6 Gbps SAS 3.5 in. drives: 15k rpm: 300 GB, 450 GB and 600 GB 10k rpm: 300 GB, 600 GB and 1000 GB 7.2k rpm NL: 2 TB and 3 TB 7.2k rpm SED: 600 GB EXP35024: 6 Gbps SAS 2.5 in. drives: 10k rpm: 146 GB 10k rpm: 300 GB, 600 GB and 900 GB 7.2k rpm: 500 GB and 1 TB 10k rpm SED: 300 GB 200 GB and 400 GB SAS SSD*</td>
<td>EXP35012: 6 Gbps SAS 3.5 in. drives: 15k rpm: 300 GB, 450 GB and 600 GB 10k rpm: 300 GB, 600 GB and 1000 GB 7.2k rpm NL: 2 TB and 3 TB 7.2k rpm SED: 600 GB EXP35024: 6 Gbps SAS 2.5 in. drives: 10k rpm: 146 GB 10k rpm: 300 GB, 600 GB and 900 GB 7.2k rpm: 500 GB and 1 TB 10k rpm SED: 300 GB 200 GB and 400 GB SAS SSD*</td>
</tr>
<tr>
<td>Clustering support</td>
<td>N/A</td>
<td>Microsoft Clustering Services</td>
<td>N/A</td>
</tr>
</tbody>
</table>

---

1. Limitations: Maximum of 24 SSDs per system (a system is defined as the DS3500 storage controller and all attached EXP3524 expansion units).

2. Please check the SSIC site for the most up to date platform support.
### Disk Storage Systems (continued)

#### Midrange Disk Systems

<table>
<thead>
<tr>
<th>Product/ Machine/model</th>
<th>Storwize V7000 and Storwize V7000 Unified</th>
<th>Flex System V7000 Storage Node</th>
<th>EXP5060</th>
<th>DS5020 Express</th>
<th>DS3950 Express*</th>
<th>EXP395/EXP520</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host connectivity</td>
<td>SAN/NAS SAN-attached 8 Gbps FC, 1 Gbps iSCSI and optional 10 Gbps iSCSI and FCoE; NAS-attached 10 Gbps Ethernet</td>
<td>SAN-attached 8 Gbps FC, 10 Gbps iSCSI/FCoE</td>
<td>N/A</td>
<td>Host/SAN connectivity Up to eight 8 Gbps FC, or four 8 Gbps FC and four 1 Gbps iSCSI</td>
<td>Model 94H: four 8 Gbps FC Model 98H: four 8 Gbps FC and four 1 Gbps iSCSI</td>
<td>N/A</td>
</tr>
<tr>
<td>SAN support</td>
<td>Switched fabric</td>
<td>Switched fabric</td>
<td>N/A</td>
<td>Direct, FC Arbitrated Loop (FC-AL), Switched Fabric</td>
<td>Direct, FC-AL, Switched Fabric</td>
<td>N/A</td>
</tr>
<tr>
<td>Copy services</td>
<td>FlashCopy, Metro Mirror, Global Mirror, file snapshot IBM enhanced mirroring</td>
<td>FlashCopy, Metro Mirror, Global Mirror, IBM enhanced mirroring</td>
<td>N/A</td>
<td>Enhanced Remote Mirroring, FlashCopy, VolumeCopy</td>
<td>Enhanced Remote Mirroring, FlashCopy, VolumeCopy</td>
<td>N/A</td>
</tr>
<tr>
<td>Availability features</td>
<td>Fault-tolerant RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver</td>
<td>Fault-tolerant RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver</td>
<td>N/A</td>
<td>Fault-tolerant RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver</td>
<td>Fault-tolerant RAID, redundant power/cooling, hot-swap drives, dual controllers, concurrent microcode update capability, dual-pathing driver</td>
<td>N/A</td>
</tr>
<tr>
<td>Controller</td>
<td>Dual active controllers with 8 Gbps FC 1 Gbps iSCSI and 10 Gbps FC SVC (Models 3xx only) Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI</td>
<td>Dual active controllers with 8 Gbps FC and 10 Gbps iSCSI/FCoE</td>
<td>N/A</td>
<td>Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI Dual active 8 Gbps RAID controllers and/or 1 Gbps iSCSI</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Cache (min, max)</td>
<td>8/16/32 GB cache per controller/control enclosure/clustered system</td>
<td>8/16/32 GB cache per controller/control enclosure/clustered system</td>
<td>2/4 GB</td>
<td>2/4 GB</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>RAID support</td>
<td>0.1, 0.5, 6.10</td>
<td>0.1, 0.5, 6.10</td>
<td>0.1, 0.5, 6.10</td>
<td>0.1, 0.5, 6.10</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Capacity (min, max)</td>
<td>300 GB min, up to 160 TB per controller enclosure on nine disk expansion units; up to 1.44 PB per clustered system</td>
<td>Up to 240 drives per control enclosure; 960 per clustered system</td>
<td>Max drive support: 60.3.5 in. SATA 8 disk drives Up to 180 TB using 3.5 in. SATA drives per 4U 60-drive enclosure</td>
<td>Up to 236 TB of SANS-NL physical storage capacity, or up to 224 TB of SATA physical storage capacity, or up to 180 TB of SAS physical storage capacity, or up to 8 TB of SSD physical storage capacity</td>
<td>Up to 224 TB of raw physical capacity using 112 SATA 3.5 in. (2 TB) disk drives Up to 16 TB using 16 Fibre Channel or SATA disk drives</td>
<td>N/A</td>
</tr>
<tr>
<td>Drive interface</td>
<td>6 Gbps SAs</td>
<td>6 Gbps SAs</td>
<td>4 Gbps FC</td>
<td>4 Gbps Switched</td>
<td>4 Gbps Fibre Channel for high-speed connectivity</td>
<td>4 Gbps Fibre Channel for high-speed connectivity</td>
</tr>
<tr>
<td>Drive support</td>
<td>3.5 in. disk drives: 73k SAS-NL: 2 TB; 3 TB 2.5 in. hard drives: 15k SAS: 146 GB, 300 GB 10k SAS: 300 GB, 450 GB, 600 GB 7.2k SAS-NL: 1 TB Enterprise-grade multilevel cell (E-MLC) SSD: 200 GB, 300 GB, 400 GB</td>
<td>2.5 in. disk drives only: 73k SAS-NL: 500 GB, 1 TB 15k SAS: 146 and 300 GB 10k SAS: 300, 600 and 900 GB 6 Gbps SAs: 200 GB, 400 GB</td>
<td>1 TB SATA 2 TB SATA 3 TB SATA</td>
<td>4 Gbps FC:SAS: 15k rpm: 300 GB, 450 GB, 600 GB 4 Gbps SAs: 7.2k rpm: 1 TB and 2 TB 6 Gbps SAS: 10k SAS: 300 GB, 600 GB, 900 GB SSD*</td>
<td>200 GB and 400 GB 6 Gbps SAS (3.5 in.): 7.2k rpm: 3 TB</td>
<td>See DS3950/DS5020 options</td>
</tr>
<tr>
<td>Certifications</td>
<td>See website</td>
<td>See website</td>
<td>N/A</td>
<td>Microsoft Clustering Services, IBM SAN Volume Controller (SVC), HACMP</td>
<td>Microsoft Clustering Services, IBM SVC, HACMP</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Product not available in the U.S. and Canada
** Limitation - a maximum of 20 SSDs are supported in a DS5020 system (which includes all of the attached expansion enclosures)

Please check the SSIC site for the most up to date platform support.
<table>
<thead>
<tr>
<th>Product</th>
<th>XIV DS8800</th>
<th>DS8870</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>IBM XIV Storage System</td>
<td>IBM System Storage DS8800</td>
</tr>
<tr>
<td><strong>Machine/model</strong></td>
<td>2810/114, 2812/114</td>
<td>2421-951/95E, 2422-951/95E, 2423-951/95E, 2424-951/95E</td>
</tr>
<tr>
<td><strong>Platform support</strong>¹</td>
<td>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 OS X</td>
<td>System x, System i, System p, 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</td>
</tr>
<tr>
<td><strong>Host connectivity</strong></td>
<td>8 Gbps FC, iSCSI</td>
<td>4- and 8-port 8 Gbps FC/FICON</td>
</tr>
<tr>
<td><strong>SAN support</strong></td>
<td>FC-AL, Switched Fabric, Ethernet</td>
<td>Direct, FC-AL, Switched Fabric</td>
</tr>
<tr>
<td><strong>Copy services</strong></td>
<td>Synchronous mirror, asynchronous mirror, snapshot, thin provisioning</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, z/OS Global Mirror, Metro/Global Mirror</td>
</tr>
<tr>
<td><strong>Availability features</strong></td>
<td>Fault tolerant, N+1 redundancy, hot-swappable parts, three universal power supplies, non-disruptive hardware changes, non-disruptive code load multipathing device drivers as supported through operating systems</td>
<td>Fault tolerant, N+1 redundancy, hot-swappable components throughout, non-disruptive hardware changes, non-disruptive code load multipathing device drivers</td>
</tr>
<tr>
<td><strong>Controller</strong></td>
<td>Multiple active-active</td>
<td>Dual active-active</td>
</tr>
<tr>
<td><strong>Cache</strong></td>
<td>144/360 GB, up to 6.0 TB SSD caching (optional)</td>
<td>16 GB/384 GB</td>
</tr>
<tr>
<td><strong>RAID support</strong></td>
<td>Data mirroring</td>
<td>Direct, FC-AL, Switched Fabric</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>28 TB (usable capacity)</td>
<td>2.3 TB (raw capacity)</td>
</tr>
<tr>
<td><strong>Drive interface</strong></td>
<td>SAS</td>
<td>5, 6, 10</td>
</tr>
<tr>
<td><strong>Drive support</strong></td>
<td>2 TB, 3 TB</td>
<td>2304 TB</td>
</tr>
<tr>
<td><strong>Drive support</strong></td>
<td>1 TB, 2 TB, 3 TB</td>
<td>146 GB (15k rpm)*</td>
</tr>
<tr>
<td></td>
<td>300 GB SSDs*</td>
<td>300 GB (15k rpm)*</td>
</tr>
<tr>
<td></td>
<td>400 GB SSDs*</td>
<td>450 GB (10k rpm)*</td>
</tr>
<tr>
<td></td>
<td>146 GB (15k rpm)*</td>
<td>600 GB (10k rpm)*</td>
</tr>
<tr>
<td></td>
<td>300 GB (15k rpm)*</td>
<td>900 GB (10k rpm)*</td>
</tr>
<tr>
<td></td>
<td>450 GB (10k rpm)*</td>
<td>3 TB (7.2k rpm and 3.5 in. form factor)*</td>
</tr>
</tbody>
</table>

- **Certifications**
  - For independent software vendor (ISV) clustering and multiplatform support, please visit the IBM SSIC at: [ibm.com/systems/support/storage/config/ssic/](http://www-03.ibm.com/systems/storage/solutions/isv/index.html)
  - For ISV solutions, please visit the ISV Solutions resource library at: [http://www-03.ibm.com/systems/storage/solutions/isv/index.html](http://www-03.ibm.com/systems/storage/solutions/isv/index.html)

¹ For a current list of platforms supported, please visit: [ibm.com/systems/support/storage/config/ssic/](http://www-03.ibm.com/systems/support/storage/config/ssic/)

* Full Disk Encryption option available

For ISV clustering and multiplatform support, please visit the IBM SSIC at: [ibm.com/systems/support/storage/config/ssic/](http://www-03.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/isv/index.html](http://www-03.ibm.com/systems/storage/solutions/isv/index.html)
### Disk Storage Systems (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>Highlights</th>
</tr>
</thead>
</table>
| **DS8000**<br> EXP2500, EXP3500, DS3500 Express, EXP395/EXP520, DS5020 Express | - The new DS8870 delivers up to three times performance improvement by leveraging IBM POWER7 technology and a larger, 1 TB cache  
- The IBM Easy Tier feature automates data placement across the appropriate drive tiers within the system, which can increase performance up to three times with as little as three percent of data on solid-state storage  
- Scaleable to more than 2.3 PB  
- Thin provisioning and Dynamic Volume Expansion capabilities, along with the updated graphical user interface (GUI), help minimize the time administrators spend provisioning storage and help increase storage efficiency  
- I/O Priority Manager automatically and dynamically aligns quality of service (QoS) levels to current application workloads. Special integration with Workload Manager for z/OS provides a single, application-based QoS policy  
- Storage Pool Stripping avoids disk ‘hot spots’ by automatically spreading data across multiple RAID groups  
- Protects and secures critical enterprise information from external and internal threats with innovative DS8000 SED options  
- Provides extensive support for a variety of server operating systems  
- Special integration between DS8000 and System z and Power Systems platforms offers clients unique benefits when these high-end systems are deployed together  
- Provides extraordinary system availability with full hardware redundancy built on the market-proven Power Systems architecture  
- Advanced local and long distance data replication features enable extraordinary business continuity  
- Together, DS8000 and IBM Geographically Dispersed Parallel Sysplex (GDPS) provides HyperSwap that is designed to deliver over six-nine’s availability. |
| **XIV**<br> Storwize V7000 Unified, XIV | - A revolutionary, proven high-end disk storage system designed for data growth and extreme ease of use  
- Consistent high performance without hotspots, enabled through massive parallelism and self-tuning  
- Extra performance boost option through management-free SED caching  
- High reliability and availability via full redundancy, self-healing and impressive rebuild speed  
- Low total cost of ownership (TCO) enabled by high-density storage, simplified planning, cost-free features and low-touch management  
- Virtualised storage, easy provisioning and flexibility for optimised virtual environments and cloud services  
- Provides rich, enterprise-class function and performance in a system packaged and priced to suit midsize businesses  
- Integrates IBM Real-time Compression supports storing up to five times more active data in the same disk space using IBM Real-time Compression  
- Experience rapid, flexible provisioning and simple configuration changes with internal virtualisation and thin provisioning  
- Have continuous access to data with integrated non-disruptive migration  
- Protect data with sophisticated remote mirroring and integrated FlashCopy technology  
- Benefit from advanced functionality and reliability usually only found in more expensive systems  
- Mixed host interfaces support (FC/iSCSI) to enable SAN tiering  
- Balanced performance is well-suited for virtualisation/consolidation  
- SEDs secure data throughout your drive's lifecycle  
- Support for intermixing FC/FDE/SATA drives enables tiered storage  
- Feature-rich management software maximises utilisation and minimises storage TCO |
| **Flex System V7000**<br> Storage Node | - Automate and speed deployment with integrated storage for the IBM PureFlex System or IBM Flex System  
- Simplify management with an integrated, intuitive user interface for faster system accessibility  
- Reduce network complexity with FCU and ISCSI connectivity  
- Store up to five times more active data in the same disk space using IBM Real-time Compression  
- Virtualise third-party storage for investment protection of the current storage infrastructure  
- Optimise costs for mixed workloads with IBM Easy Tier, which automatically moves most active data to SSD |
| **Storwize V7000 and Storwize V7000 Unified**<br> Storwize V3700 | - Provides rich, enterprise-class function and performance in a system packaged and priced to suit midsize businesses  
- Control enclosure supports attachment of up to nine expansion enclosures with configurations up to 360 TB physical storage capacities (144 PB in clustered block systems; Storwize V7000 Unified does not support clustered systems)  
- Integrated IBM Real-time Compression supports storing up to five times’ as much active primary data in the same physical disk space, helping to reduce costs and improve utilisation  
- IBM Easy Tier function automatically moves most active data to SSD, helping to optimise both cost and performance  
- Supports IBM Systems Director, VMware VAAI and vCenter, Microsoft System Center Operations Manager  
- Virtualises existing disk systems for data migration with minimal application disruption, or to extend the life of existing storage assets  
- Attached to a wide range of Windows, UNIX and Linux systems using FC and ISCSI  
- Easily managed and deployed system with embedded GUI based on the IBM Storwize interface design  
- Experience rapid, flexible provisioning and simple configuration changes with internal virtualisation and thin provisioning  
- Have continuous access to data with integrated non-disruptive migration  
- Protect data with sophisticated remote mirroring and integrated FlashCopy technology  
- Benefit from advanced functionality and reliability usually only found in more expensive systems  
- Mixed host interfaces support (FC/iSCSI) enables SAN tiering  
- Balanced performance is well-suited for virtualisation/consolidation  
- SEDs secure data throughout your drive’s lifecycle  
- Support for intermixing FC/FDE/SATA drives enables tiered storage  
- Feature-rich management software maximises utilisation and minimises storage TCO  
- Mixed host interfaces support (FC/iSCSI) to enable SAN tiering  
- Balanced performance is well-suited for virtualisation/consolidation  
- Support for intermixing FC/SATA drives enables tiered storage  
- Feature-rich management software that maximises utilisation and minimises storage TCO  
- 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  
- 3 Gbps SAS systems deliver midrange performance and scalability at entry-level prices  
- Mirroring over IP provides inexpensive link to replicate data for DR  
- Mixed host interface support enables direct attach storage (DAS) and SAN tiering, reducing overall operation and acquisition costs  
- FDE with local key management provides relentless data security  
- Offers network equipment building system (NEBS) and European Telecommunication Standards Institute (ETSI) compliance  
- 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 TB of SAS physical disk storage (3 TB capacity-optimised SAS) in a single enclosure and up to 576 TB when fully expanded up to 192 drives  
- High performance SAS, capacity-optimised SAS HDDs and SEDs interim support  
- EXP3502 and EXP3524 expansion units can be intermixed behind a single DS8870 for optimal data utilisation and efficiency  
- Easy installation and management with storage expansion technology designed for System x direct attach via ServerRAID M5025 adapter  
- Next generation 6 Gbps SAS host and drive interfaces enable infrastructure simplification  
- Support for flexible high performance and NL disk drive options  
- High capacity, with support for multiple enclosures per configuration |

1. Six-nines is a term used to denote that a piece of equipment is functioning with 99.999 percent reliability.  
2. Compression data based on IBM measurements. Compression rates vary by data type and content.
<table>
<thead>
<tr>
<th>Operating Systems and Copy Services Platform Coverage</th>
<th>DS3950/DS5020</th>
<th>DS8700</th>
<th>DS8800</th>
<th>XIV</th>
<th>Storwize V7000, Storwize V7000 Unified and Flex System V7000</th>
<th>Storwize V3700</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Windows NT</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Windows 2000</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Windows Server 2003</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Windows Server 2008</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>NetWare</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Linux</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>AIX</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>VMware</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Dynix</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>HP-UX</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Solaris</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>IRIX</strong></td>
<td>FlashCopy, VolumeCopy, Metro Mirror, Global Copy, and Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Tru64 UNIX</strong></td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>OpenVMS</strong></td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>z/OS, OS/390, TPF</strong></td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>i5/OS</strong></td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
<tr>
<td><strong>Apple Macintosh OSX</strong></td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy, FlashCopy SE, Metro Mirror, Global Mirror, Global Copy, Metro/Global Mirror</td>
<td>FlashCopy (all variants), Metro and Global Mirror, thin provisioning, data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
<td>FlashCopy, thin provisioning and data migration</td>
</tr>
</tbody>
</table>

* 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

<table>
<thead>
<tr>
<th></th>
<th>EXP3000/MegaRAID</th>
<th>DS3400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows NT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows Server 2003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NetWare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linux**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VMware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP-UX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solaris</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRIX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tru64 UNIX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OpenVMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>z/OS, OS/390</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5/OS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DG/UX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Request via RPQ process

** 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.

*** 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.

**** VolumeCopy, Metro Mirror, Global Copy and Global Mirror require turbo option.
IBM System Storage DCS3700

Highlights

- Provides fast, highly available, dense storage capabilities at an affordable price point
- Ideally suited for high performance streaming applications, such as rich media, financial markets, telecommunications, weather modelling and others needing rigorous bandwidth requirements
- Delivers automated recovery with consistent performance during disk drive failures with DOP
- Enhanced IBM FlashCopy features deliver greater, faster copy services support
- Combines solid uptime, massive scalability and green efficiencies
- Helps optimise the flow and management of large, file-based data while retaining ease of data access
- Offers multi-level data protection using a mix of replication features
- Available DCS3700 Performance Module option for improved performance and scalability
- Management expertise built into intuitive and powerful storage management software
- When combined with the best in-class IBM General Parallel File System (GPFS), the DCS3700 storage system can help organisations optimise the flow and management of large file-based data while retaining ease of data access
- Superb 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 is provided through IBM Enhanced FlashCopy, Volume Copy and Remote Mirroring across FC connections with DCS3700 base system and FC or IP host ports with the DCS3700 Performance Module Storage System
- 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 that support DAS and SAN tiering to reduce overall operation and acquisition costs
- Investment protection and cost backup and recovery with Remote Mirror across IP and/or FC host ports and compatibility with IBM DS3500, IBM DS5000 and IBM DS4000
- Support for low-power, high-reliability and high performance SSDs

Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 60 SAS-NL drives in 4U</td>
<td>- Highly dense storage to maximise rack space efficiency and reduce cost: 60 SAS-NL drives in 4U, expandable to 180 drives or 360 drives with IBM DCS3700 with Performance Modules option</td>
</tr>
<tr>
<td>Redundant, hot-swappable components</td>
<td>- Lower overall annual energy expenditures with 45 TB per U provide highly efficient enclosures</td>
</tr>
<tr>
<td>6 Gbps SAS host interface</td>
<td>- Fully redundant components, automated I/O path failover and online administration creates “always-on” availability to ensure your data is always accessible</td>
</tr>
<tr>
<td>6 Gbps FC host interface</td>
<td>- Front-load 12-drive drawers can be extended while drives remain active</td>
</tr>
<tr>
<td>Backup and replication capabilities</td>
<td>- Improves bandwidth utilisation, management and network robustness</td>
</tr>
<tr>
<td>Data Protection</td>
<td>- Second generation, 6 Gbps SAS builds upon the solid foundation of 3 Gbps SAS with performance improvements and reliability enhancements</td>
</tr>
<tr>
<td>Storage Partitions</td>
<td>- 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</td>
</tr>
<tr>
<td>Intuitive IBM DS Storage Manager</td>
<td>- DCS3700 with FC allows you to exploit the benefits offered by a SAN environment</td>
</tr>
<tr>
<td>Thin provisioning with DDP</td>
<td>- The DCS3700 with FC and SAS provides ease of use and simplicity at an affordable price</td>
</tr>
<tr>
<td>Performance</td>
<td>- The DC3700 with FC allows you to exploit the benefits offered by a SAN environment</td>
</tr>
<tr>
<td>Energy-saving features</td>
<td>- The DCS3700 with FC and SAS provides ease of use and simplicity at an affordable price</td>
</tr>
</tbody>
</table>

Intuitive IBM DS Storage Manager

- Designed to ensure optimal storage utilisation, the IBM DS Storage Manager provides a powerful, yet easy to use and intuitive GUI for DCS3700 administrative activities, including configuration, reconfiguration, expansion and routine maintenance, as well as performance tuning and management of advanced functions

Thin provisioning with DDP

- Thin provisioning is designed to manage storage space and avoid unused resources
- No more unnecessary storage expenses: thin provisioning can help to save storage capacity, helping to remove the need to purchase all storage up front for each request

Performance

- Performance Read Cache Option utilises SSDs as a level one data cache, significantly improving read performance off of spinning media; Performance Read Cache is extremely easy to set up and, once implemented, automatically identifies the data that is read most frequently and copies it into cache for fast access

Energy-saving features

- Power supplies are designed to meet multiple efficiency standards and variable-speed fans help reduce power consumption and provide a lower overall TCO
- Optimised for maximum storage density, with 60 drives housed within just a 4U enclosure
# IBM 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 optimising 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 organisations to keep more data available for use rather than storing it off-site, 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
- **HA:** Seamlessly integrates with existing HA storage system configurations and supports enhanced monitoring for HA environments, helping the organisation maintain service levels

---

## IBM Real-time Compression Appliances

<table>
<thead>
<tr>
<th>Models</th>
<th>STN6500 (2452-650) and STN6800 (2452-680)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td>IBM STN6800 has 2×6 Core Intel Xeon® 2.8 GHz processors</td>
</tr>
<tr>
<td></td>
<td>IBM STN6500 has 2×Quad Core Intel Xeon 2.4 GHz processors</td>
</tr>
<tr>
<td>Cache per controller</td>
<td>72 GB</td>
</tr>
<tr>
<td>Host interface</td>
<td>Transmission control protocol/internet protocol (TCP/IP) or user datagram protocol (UDP)</td>
</tr>
<tr>
<td>Storage interface</td>
<td>NAS: Microsoft Common Internet File System (CIFS) and Network File System (NFS) version 3, SMB1</td>
</tr>
<tr>
<td>Connectivity</td>
<td>IBM STN6800 supports up to 8×10 GbE ports, or mixed configurations with up to 4×10 GbE and up to 8×1 GbE ports</td>
</tr>
<tr>
<td></td>
<td>IBM STN6500 has 16×1 GbE ports</td>
</tr>
<tr>
<td>Fans and power supplies</td>
<td>Hot-swappable N+1 fans and power supply units</td>
</tr>
<tr>
<td>Rack support</td>
<td>2U form factor per appliance (85.3 mm or 3.36 in.)</td>
</tr>
</tbody>
</table>

### Management software

- Intuitive web GUI
- 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

### HA

- Transparent path failover when deployed in pairs
- Predictive Failure Analysis for hardware components
- Link aggregation (IEEE 802.3ad)
- Ethernet trunking (Cisco EtherChannel)

### Dimensions

- Width: 444.5 mm (17.5 in.)
- Depth: 698.5 mm (27.5 in.)
- Height: (3.36 in.); 2U

### Warranty

- One year
## IBM System Storage N series

### 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 FC protocol (FCP), FCoE or iSCSI protocol) and file I/O (with CIFS, NFS, hypertext transfer protocol (HTTP), file transfer protocol (FTP)) application needs
- **Application-aware software**—SnapManager software provides host-based data management of N series storage for databases and business applications and simplifies application-consistent, policy-based automation for data protection and DR; Snapshot copies and restores and enables application-aware DR
- **Thin provisioning**—allows applications and users to get more space dynamically and non-disruptively 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 FC-attached storage subsystems
- **Operating system**—optimised and finely tuned for storing and sharing data assets, designed to enable greater efficiency within your organisation 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 as well as enable data to be shared across the organisation
- **NAS**—supports NFS and CIFS protocols for attachment to Microsoft Windows, UNIX and Linux systems
- **IP SAN**—supports iSCSI protocols for IP SAN-attached to a multitude of host servers including Microsoft Windows, Linux and UNIX systems
- **FC SAN**—supports FCPs for accommodating attachment and participation in FC SAN environments
- **FCoE**—supports FC flow over Ethernet networks
- **Expandability**—supports non-disruptive 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 minimise downtime
- **Redundancy**—multi-redundant and hot-swappable features provide the highest system availability characteristics
- **Copy Services**—provides extensive outbound services that help recover data in DR environments; SnapMirror provides one-to-one, one-to-many and many-to-one mirroring over FC or IP infrastructures
- **NearStore (nearline) feature**—SATA drive technology enables online and quick access to archived and non-intensive 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
- **Data compression**—helps to store more data in less space, reducing the amount of storage needed to purchase and maintain; reduces the time and bandwidth required to replicate data during volume SnapMirror transfers
- **Storage encryption**—Provides support for SED drives in N series disk shelf storage and integration with licence key managers including Tivoli Licence Key Manager

### All N series systems provide the following features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage controllers/filers</td>
<td>Active/Active with automatic failover to secondary system</td>
</tr>
<tr>
<td>FC external disk drive support (except for N3150 family)</td>
<td>FC: 300 GB, 450 GB, 600 GB (10k rpm)</td>
</tr>
<tr>
<td>SATA external disk drive support (except for N3220)</td>
<td>SATA: 1 TB, 2 TB, 3 TB (7.2k rpm)</td>
</tr>
<tr>
<td></td>
<td>SAS: 300 GB, 450 GB, 600 GB, 600 GB SED (7.2k rpm)</td>
</tr>
<tr>
<td></td>
<td>SAS: 450 GB, 600 GB, 600 GB SED, 900 GB (10k rpm)</td>
</tr>
<tr>
<td>Host connectivity and platform support</td>
<td>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</td>
</tr>
<tr>
<td>Network protocol support</td>
<td>NFS V2/V3/V4 over UDP or TCP, PC NFS V1/V2 for (FC) NFS client authentication, Microsoft CIFS, iSCSI, FCP, VLD, HTTP 1.0, HTTP 1.1 Virtual Host</td>
</tr>
<tr>
<td>Other protocol support</td>
<td>SNMP, network data management protocol (NDMP), lightweight directory access protocol (LDAP), NIS, domain name system (DNS)</td>
</tr>
<tr>
<td>Operating system</td>
<td>Data ONTAP</td>
</tr>
<tr>
<td>Data protection</td>
<td>Double Parity RAID (RAID-DP), Snapshot, SnapRestore, SnapMirror, SyncMirror, SnapVault, Open System Snap Vault, MetroCluster, Protection Manager</td>
</tr>
<tr>
<td>Redundancy/HA</td>
<td>Dual redundant hot-plug integrated cooling fans, hot-swappable auto-ranging power supplies, clustered filers, hot-swappable disk bays</td>
</tr>
<tr>
<td>Backup</td>
<td>External tape (iSCSI, SAS or FC)</td>
</tr>
<tr>
<td>RAID levels</td>
<td>RAIDX4, RAID-DP</td>
</tr>
<tr>
<td>System management/storage management</td>
<td>SecureAdmin, SNMP, OnCommand (System Manager, Unified Manager), Industry-standard NDMP protocols</td>
</tr>
<tr>
<td>Standard software features**</td>
<td>CIFS protocol, Clustered Failover, Data Compression, Data ONTAP DNS, Fast Boot, FCP, Flash Cache, FlexCache, FlexClone, FlexShare, FlexVol, FTP, HTTP, Integrated Automatic RAID Manager, iSCSI, Multistore, NDMP, Nearline, NFS, SnapVault, RAID-DP, SecureAdmin, Single Mailbox Recovery for Exchange, SnapDrive, SnapLock Enterprise, SnapManager for Exchange, SnapMirror for Hyper-V, SnapManager for Microsoft Office SharePoint Server, SnapManager for Oracle, SnapManager for SAP, SnapManager for SQL Server, SnapMirror, SnapMover, SnapRestore, Snapshot, SnapValidator, SnapVault, SNAP Storage Encryption, SyncMirror, System Manager, SystemSnap Vault, MetroCluster, Protection Manager, N3000 and N6000 Software Bundles, and N7000 High Performance Bundle*</td>
</tr>
</tbody>
</table>

* The maximum capacity through the 3 TB SATA drives is only available if running Data ONTAP 8.1
** Visit ibm.com/storage/nas for more information related to standard and optional software

### 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 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

---

**Storage encryption**—Provides support for SED drives in N series disk shelf storage and integration with licence key managers including Tivoli Licence Key Manager

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 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
<table>
<thead>
<tr>
<th>Machine type model</th>
<th>N3150</th>
<th>N3220</th>
<th>N3240</th>
<th>N6210</th>
<th>N6240</th>
<th>N6270</th>
<th>N7000 series*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller configuration</td>
<td>Single/Dual (active/active)</td>
<td>Single/Dual (active/active)</td>
<td>Single/Dual (active/active)</td>
<td>Single (CC)/Dual (active/active)</td>
<td>Dual (active/active) (CC)/Single + IO Exp (CC)/Dual + IO Exp (active/active) (CC-HA)</td>
<td>Dual (active/active) (CC)/Single (CC)/Dual (active/active)</td>
<td>Dual (active/active)</td>
</tr>
<tr>
<td>Random access memory</td>
<td>6 GB/12 GB</td>
<td>6 GB/12 GB</td>
<td>6 GB/12 GB</td>
<td>4 GB/8 GB</td>
<td>16 GB/16 GB/16 GB</td>
<td>32 GB/16 GB/32 GB</td>
<td>192 GB</td>
</tr>
<tr>
<td>Maximum number of Fibre Channel ports</td>
<td>N/A</td>
<td>2/4***</td>
<td>2/4***</td>
<td>10/20</td>
<td>4/6/12</td>
<td>4/6/12</td>
<td>20/26/52</td>
</tr>
<tr>
<td>Maximum number of Ethernet ports</td>
<td>N/A</td>
<td>2/4***</td>
<td>2/4***</td>
<td>10/20</td>
<td>20/22/44</td>
<td>20/22/44</td>
<td>100</td>
</tr>
</tbody>
</table>

* 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.
*** Optional ports available via add-on mezzanine cards.
**** Systems based on dual clustered storage controllers. Divide all numbers by one-half if a single storage controller system is ordered.
***** Optional ports available via add-on mezzanine cards.
IBM Scale Out Network Attached Storage (SONAS)

Overview
- SONAS offers the following features to meet the demands of LEs:
  - Clusters, SONAS system with a distributed, global namespace that provides a single, aggregated view of all files residing in multiple, physically distributed systems across the globe, including disk and tape
  - Linear scale-out performance and capacity
  - IBM Active Cloud Engine, an exceptional capability, enables efficient and automated file management locally, globally and in the cloud
  - Simple, highly intuitive GUI
  - HA, with redundant hot-swappable components and failover capabilities, filesystem- and filer-level snapshots, file-level cloning and high performing asynchronous replication
  - Policy-driven automated tiering (including to tape pool), lifecycle management and collaboration
  - Offered as single appliance or as a gateway; SONAS gateway supports both XIV and Storwize V7000 systems

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 tremendously time and cost savings in administering PBs of data. The IBM 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 users 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 optimised use of storage resources and reduced TCO. It can store and retrieve files in/out of any pool transparently and quickly without any administrator intervention, offering reduced administrative tasks and costs, as well as 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
- Massive scalability: Supports billions of files (up to 21 PB of storage) in a single file system and up to 256 file systems
- Flexibility:
  - 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 files to multiple locations quickly and cost-effectively
  - Offers internal (SAS, SAS-NL) and external (tape) storage pools and automated file placement and file migration based on policies; 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 PBs of files
- Operational savings and TCO:
  - Your organisation can consolidate multiple individual files and its management, thereby avoiding problems associated with administering an array of disparate NAS storage systems
  - Localises files to improve file access performance and reduced network costs
  - Automatically file placement by transparently moving files to another internal or external storage pool, optimises your storage resources and offers tremendous time and cost savings in administering PBs of files
  - Enables automated file migration to external storage devices (that is tape) managed by Tivoli Storage Manager to help lower TCO by up to 40 percent over the long term
  - Helps conserve floor space (up to a PB of data in less than a square metre), is highly scalable and can help to reduce your capital expenditure and enhance your operational efficiency; advanced architecture virtualises and consolidates your file space into a single, enterprise-wide file system, which can translate into reduced TCO

SONAS as a gateway allows both XIV and Storwize V7000 customers leverage SONAS for their rapidly growing file data
- Enables Tivoli Productivity Center (R1) to manage SONAS, providing discovery and visualisation, health status monitoring and capacity usage reporting; Tivoli Productivity Center provides support for Storage Management application program interface (API) for the Cloud which enables applications to do provisioning of SONAS
- Performance:
  - Scans billions of files in minutes with the robust SONAS Policy Engine and takes action (that is migrates, backups, deletes, replicates, 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 pools (back end)
  - Provides fast asynchronous replication performance with the ability to define up to 10 replication processes per node

Cloud storage
- 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 organisational needs without service interruption
- Highly resilient and secure applications and an underlying infrastructure help meet expected levels of availability, reliability and integrity
- Highly standardised 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 Virtualisation
Reduce storage complexity and lower costs through virtualisation, IBM System Storage SVC keeps it simple.

<table>
<thead>
<tr>
<th>Product</th>
<th>Function and value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM System Storage SVC</td>
<td>SVC is a disk storage virtualisation system that is designed to help businesses improve storage utilisation and reduce the costs associated with disk storage. SVC is designed to pool storage volumes from IBM and non-IBM storage systems into a reservoir of capacity for centralised management. Integrated Real-time Compression enhances the value of storage by enabling storing up to five times as much active primary data. SVC 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.</td>
</tr>
</tbody>
</table>

**Highlights**
- **SVC Innovative SSD support**: The scalable SVC architecture is designed to deliver outstanding performance with SSDs for critical applications, up to 856,000 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 optimise both performance and cost. And now announcing Easy Tier support for internal SVC SSDs.
- **Real-time Compression**: Designed to improve efficiency by enabling storage to help businesses improve storage utilisation and reduce the amount of data at risk and reduces the time to recover from almost any data loss to just a few minutes.
- **Flexible connectivity**: SVC can also be installed in a stretched configuration where a single SVC cluster supports storage and servers in two data centres. In this configuration, SVC enables a highly available stretched storage solution that can be concurrently accessed by servers at both data centres. When combined with server data mobility functions such as VMware vMotion or PowerVM Live Partition Mobility, SVC can be used for iSCSI server connections networks using FCoE for attachment to servers, storage and other SVC systems. The same ports may also be used for iSCSI server connections.
- **Improved storage utilisation**: By pooling capacity, storage administrators can make better use of the storage capacity. Improvements of up to 30 percent in storage utilisation have been seen in SVC customers. The SVC Space-Efficient Virtual Disks function helps to improve storage utilisation 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 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 user interface based on the popular XIV user interface, making it easier to use than ever.
- **Storage virtualisation support**: Storage virtualisation with SVC enables customers to obtain maximum benefit from virtualised 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 View.
- **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 centre, 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 data 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 centre 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 centres. In this configuration, SVC enables a highly available stretched volume to be concurrently accessed by servers at both data centres. When combined with server data mobility functions such as VMware vMotion or PowerVM Live Partition Mobility, SVC stretched clusters can be used to support a third data centre for applications that require both HA and DR in a single solution.

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 DR. 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 organisations to perform and manage frequent, near-instant, non-disruptive, 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 DB2, 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, SVC and XIV on AIX, HP-UX, Linux, Solaris and Windows; and DS5000, DS4000 and DS3000, as well as other VSI-capable storage systems on Windows. Also supports VMware vSphere v4 and v5 environments and includes a management plugin for vCenter. 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.

IBM Tivoli Storage Manager 6
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, server management, movement, and data protection 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, and 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, wide area networks (WANs), LANs or SANs. Tivoli Storage Manager also offers easy, to use APIs designed to enable ISVs to more easily adapt their solutions to IBM software, allowing customers to customise, better secure and extend the functionality of their storage environment.

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Tivoli Storage Manager 6</td>
<td>Designed to protect valuable data in the most cost-effective manner.</td>
</tr>
<tr>
<td></td>
<td>Designed to archive inactive data to help reduce costs.</td>
</tr>
<tr>
<td></td>
<td>Designed to help ensure continuity and recovery.</td>
</tr>
<tr>
<td></td>
<td>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 DRR planning.</td>
</tr>
<tr>
<td></td>
<td>Designed to help reduce storage capacity and bandwidth requirements using built-in source and target-side deduplication.</td>
</tr>
</tbody>
</table>

Notes:
1. Compression data based on IBM measurements. Compression rates vary by data type and content.
2. VMware: http://www.vmware.com/resources/techresources/0117
IBM Tivoli Storage Manager Extended Edition
IBM Tivoli Storage Manager Extended Edition expands on Tivoli Storage Manager backup, restore and archive abilities. It includes policy-based replication of backup data and metadata to provide ‘warm standby’ DR of the Tivoli Storage Manager environment and helps expedite DR with detailed planning and automated scripts. DR reporting functionality can track where off-site 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 midsize enterprises. Tivoli Storage Manager FastBack helps clients reduce the amount of data at risk by 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 non-disruptive block-level local backup and near-instant recovery; built-in deduplication to help reduce storage and bandwidth costs; plus highly efficient replication for off-site DR and business resilience.

IBM Tivoli Storage Manager for Workstations
IBM Tivoli Storage Manager 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 Manager offerings.

IBM Tivoli Storage Manager for Mail
IBM Tivoli Storage Manager for Mail protects data on email servers running Lotus Domino, Lotus Notes, 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 emails and mailboxes in Microsoft Exchange environments.

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 managing file system pruning tasks and can allow you to defer the need to purchase additional disk storage.

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

IBM 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 System Management Interface Tool menu interface.

IBM Tivoli Storage Manager for Virtual Environments
IBM Tivoli Storage Manager for Virtual Environments eliminates the burden of running backups on a VM by offloading backup workloads from VMware guests to a centralised vStorage backup server. It provides progressive incremental backups, removing the requirement to perform periodic full backups when using the VMware vStorage APIs for Data Protection. It also provides flexible recovery options - restore single files, individual disk volumes, or an entire VM - from a single pass, non-disruptive backup. Supports x86/vSphere and x86 also includes a management plug-in for vCenter.

IBM Tivoli Storage Manager HSM for Windows
IBM 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.

IBM Tivoli Storage Manager Suite for Unified Recovery
IBM Tivoli Storage Manager Suite for Unified Recovery is a bundle of ten Tivoli Storage Manager and Tivoli Storage Manager FastBack products, with a capacity-based pricing model that’s easy to order, deploy and manage. 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 Tivoli Storage Manager and FastBack servers on a tiered TB scale.

IBM Tivoli Storage Manager Suite for Unified Recovery Entry
IBM Tivoli Storage Manager Suite for Unified Recovery Entry is a bundle of ten Tivoli Storage Manager and Tivoli Storage Manager FastBack products, with a capacity-based pricing model that’s easy to order, deploy and manage. 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 Tivoli Storage Manager and FastBack servers on a tiered TB scale to a maximum of 10 TB.

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 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 DR 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.
<table>
<thead>
<tr>
<th>System Storage Services</th>
</tr>
</thead>
</table>

**IBM SmartCloud Virtual Storage Centre**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrate storage to an agile, cloud-based, service-oriented environment without replacing existing storage systems</td>
<td>Reduce unit cost for storage with advanced analytics that enable ‘right tiering’ of storage across the data centre</td>
</tr>
<tr>
<td>Boost availability and augment daily backups with advanced data protection capabilities</td>
<td>Implement a robust management system to keep your storage infrastructure functioning smoothly</td>
</tr>
</tbody>
</table>

**IBM Tivoli Storage Productivity Center**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designed to simplify the way you view and manage your storage infrastructure</td>
<td>The navigation is built around the tasks needed to manage a storage environment</td>
</tr>
<tr>
<td>Rapid visibility and access to storage</td>
<td>Reporting and analytical capabilities for enhanced decision making</td>
</tr>
</tbody>
</table>

**IBM Tivoli Storage Productivity Center**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customise your cloud storage management solution with optional, easy-to-integrate add-ons: IBM Real-time Compression, IBM Storage Services Catalogue, or IBM SmartCloud Cost Manager pay-per-use accounting</td>
<td>Help sets performance thresholds for storage devices based on selected performance metrics, generating alerts when those thresholds are exceeded</td>
</tr>
</tbody>
</table>

**SAN fabric management from a single management console**

| Supports multivendor SANs and includes automatic resource and topology discovery, monitoring and alerts, zone control and SAN error prediction capabilities | An autonomous computing capability, SAN Error Predictor, is designed to help predict SAN network outages before they become severe and impact data and application availability |
| This functionality incorporates predictive failure analysis into the storage network environment that allows administrators to be more proactive in ensuring SAN availability | Provides diagnostic capabilities that show which resources are impacted by an availability or performance issue in the SAN |

**IBM IBM Tivoli Storage Productivity Center 5**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replication services management for data protection and DR</td>
<td>Designed to meet data protection and DR requirements through control and monitoring of copy services operations in storage environments</td>
</tr>
<tr>
<td>Supports hundreds of replication sessions across thousands of volumes, supporting both open and IBM z/OS-attached volumes</td>
<td>Helps monitor performance of all copy session types and reports on the amount of data exposed at the DR site (not in synchronisation with the source site)</td>
</tr>
<tr>
<td>Provides configuration and management of IBM copy services such as FlashCopy, Metro Mirror, Metro/Global Mirror and multiple Global Mirror sessions</td>
<td>IBM Tivoli Storage Productivity Center Standard Edition, but is designed to licence by the number of storage devices managed.</td>
</tr>
</tbody>
</table>

**IBM Tivoli Storage Productivity Center Select**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designed to support DS4000, DS5000, Storwize V7000 and XIV as stand-alone devices or when attached to an IBM SVC</td>
<td>Also supports any storage devices that are attached to Storwize V7000</td>
</tr>
<tr>
<td>Licensed per storage device, such as disk controllers and their respective expansion units</td>
<td>IBM System Storage Productivity Center</td>
</tr>
</tbody>
</table>

**IBM System Storage Productivity Center**

<table>
<thead>
<tr>
<th>Function and value</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combines the power of a customised IBM System x server with preinstalled Tivoli Storage Productivity Center software that represents a significant point of centralised management</td>
<td>Enhances several rudimentary device utilities for easier, more intuitive, context-based administration and, on the whole, lowers resource overhead</td>
</tr>
</tbody>
</table>
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 utilisation, 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 organisation, implementing and integrating new solutions and technologies that meet your business and IT needs. IBM offers a comprehensive portfolio of data storage services including:

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

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 optimise 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](http://ibm.com/services/storage).

IBM Maintenance and Technical Support (MTS) Services for Storage

IBM MTS 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 maximise 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 proactive 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](http://ibm.com/services/maintenance).

IBM Global Financing (IGF)

Financing that supports the entire technology lifecycle

IGF 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, customised financing of your storage, server, PC, software and services investments. In addition, IGF 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, customised, competitive financing of the entire lifecycle of your IT equipment, IGF 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 (E2E) 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](http://ibm.com/financing).