ServeRAID M5015 and M5014 SAS/SATA Controllers for IBM System x

IBM Redbooks Product Guide

The ServeRAID M5015 and ServeRAID M5014 SAS/SATA Controllers for IBM System x are the next-generation 6 Gbps SAS 2.0 RAID controllers. The adapters have two internal mini-SAS connectors to control up to 32 devices and support global and dedicated hot-spare drives. The ServeRAID M5014 controller delivers a full RAID 6 Gbps SAS 2.0 solution, while the ServeRAID M5015 provides additional performance advantages of an extended cache and a standard battery backup unit. With the attachment of the ServeRAID M5000 Advanced Feature Key, the ServeRAID M5015 and M5014 offer the option of RAID 6, RAID 60, and SED Encryption Key management.

Figure 1 shows the ServeRAID M5015 with its standard battery backup unit.

Figure 1. ServeRAID M5015 SAS/SATA Controller

Did you know

6 Gbps SAS 2.0 technology has been introduced to address data off-load bottlenecks in the direct-access storage environment. This new throughput doubles the transfer rate of the previous generation. SAS 2.0 is designed for backward compatibility with 3 Gbps SAS as well as with 3 Gbps SATA hard drives.

Self-encrypting drives are based on a new technology that helps prevent data from being accessed without authorization. These drives adhere to the Trusted Computing Group (TCG) Enterprise Security Subsystem Class specification and are National Security Agency qualified to provide government-grade encryption. With self-encrypting drives (SEDs), if a drive is removed from its storage system or the server that it is housed in, the data on that drive is encrypted and useless to anyone who attempts to access it without the appropriate security authorization.

Part number information

Table 1. Ordering part number and feature code

Description	Part number	Feature code
ServeRAID M5015 SAS/SATA Controller	46M0829	0093
ServeRAID M5014 SAS/SATA Controller	46M0916	3877
ServeRAID M5000 Series Battery Kit	46M0917	5744
ServeRAID M5000 Series Battery Remote Mount Cable	68Y7396	5862
ServeRAID M5000 Series Advanced Feature Key	46M0930	5106
ServeRAID M5000 Series Performance Accelerator Key	81Y4426	A10C

The ServeRAID M5015 option part number includes the following items:

- One ServeRAID M5015 adapter card with full-height bracket
- One replaceable low-profile (2U) bracket
- One attached ServeRAID M5000 battery
- Documentation CD
- The IBM Important Notices Document

Note: The ServeRAID M5015 option part number 46M0829 includes the M5000 battery, however the feature code 0093 does not contain the battery. Order feature code 5744 if you wish to include the battery in the server configuration.

The ServeRAID M5014 option part number includes the following items:

- One ServeRAID M 5014 adapter card with full-height bracket
- One replaceable low-profile (2U) bracket
- The ServeRAID M V1.10 Utility and Documentation CD
- The IBM Important Notices Document

The ServeRAID M5000 Series Battery Kit option part number contains the following items:

- ServeRAID M5000 Battery
- Battery Flyer
- Quick Install Guide
- Important Notices Flyer

Tip: The Battery Remote Mount Cable is a separately orderable item and is not part of the Battery Kit. The cable is also part of the IBM System x3650 M3 Hot-swap SAS/SATA 4 Pack HDD Upgrade option, 69Y4236.

Specifications

The ServeRAID M5015 and ServeRAID M5014 adapter cards have the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two Mini-SAS internal connectors (SFF-8087)
- 6 Gbps throughput per port
- 800 MHz PowerPC processor with LSI SAS2108 6 Gbps RAID on Chip (ROC) controller
- x8 PCI Express 2.0 host interface
- Onboard data cache (DDR2 running at 800 MHz):
    - ServeRAID M5015: 512 MB
    - ServeRAID M5014: 256 MB
- Intelligent Li-Ion-based battery backup unit with up to 48 hours of data retention:
    - ServeRAID M5015: Standard in the option part number
    - ServeRAID M5014: Optional
- Supports RAID levels 0, 1, 5, 10, and 50 (RAID 6 and 60 support with the optional M5000 Advanced Feature Key)
- Connects to up to 32 SAS or SATA drives
- SAS and SATA drives are supported, but the mixing of SAS and SATA in the same RAID array is not supported
- Supports up to 64 logical volumes
- Supports LUN sizes up to 64 TB
- Configurable stripe size up to 1 MB
- Compliant with Disk Data Format (DDF) configuration on disk (COD)
- S.M.A.R.T. support

Figure 2. ServeRAID M5014 SAS/SATA Controller

Features

The ServeRAID M5015 and ServeRAID M5014 adapter cards have the following features:

- Auto-resume on array rebuild or array reconstruction after loss of system power

  Auto-resume uses non-volatile NVRAM to save rebuild progress during a host reboot or power failure to automatically resume from the last checkpoint. Auto-resume will ensure data integrity is maintained through the process. The card supports a number of features that are able to be implemented without rebooting the server. Applications such as email and web server benefit from avoiding downtime during transition.

- Online Capacity Expansion

  Online Capacity Expansion (OCE) allows the capacity of a virtual disk to be expanded by adding new physical disks or making use of unused space on existing disks, without requiring a reboot.

- Online RAID Level Migration

  Online RAID Level Migration (also known as logical drive migration) provides the ability to migrate a virtual disk from any RAID level to any other RAID level without requiring a reboot. System availability and application functionality remain unaffected.

- Fast initialization for quick array setup

- Consistency check for background data integrity

  Consistency Check verifies that all stripes in a virtual disk with a redundant RAID level are consistent. The consistency check will mirror data when an inconsistent stripe is detected for a RAID 1 and recreating the parity from the peer disks when in the case of a RAID 5 or RAID 6. Consistency checks can be scheduled to take place periodically.

- Extensive online configuration options: advanced monitoring and event notification

  Management tools provide convenience for configuration of logical volumes plus alerting when errors have occurred or are about to occur.

- Patrol Read for media scanning and repairing

  Patrol read is a background sentry service designed to proactively discover and correct media defects (bad sectors) that arise normally as a disk drive ages. The service issues a series of verify commands and if a bad block is discovered, the card's firmware will use RAID algorithms to recreate the missing data and remap the sector to a good sector. The task is interruptible based on controller activity and host operations. The firmware also provides an interface where the patrol read task can be initiated, set up for continuous operation, and terminated from a management application. Patrol read can be activated by manual command or automatically.

- Global and dedicated Hot Spare with Revertible Hot Spare support:

  A hot spare rebuilds data from all virtual disks within the disk group in which it is configured. ServeRAID provides the ability to define a physical disk as a hot spare to replace a failed drive. Hot spares may be configured as either global or dedicated. A global hot spare allows any physical drive to be designated as a hot spare. A dedicated hot spare will allow the user to assign a hot spare drive to a particular array of the same drive type.

The ServeRAID M5000 Series Advanced Feature Key enables the following features:

● RAID levels 6 and 60

● LSI SafeStore: support for self-encrypting drive services:
    ● Instant secure erase
    ● Local key management

LSI SafeStore encryption services offer instant secure erase and local key management for self-encrypting drives. This technology represents a significant step forward in securing data on a disk drive from any unauthorized access or modification resulting from theft, loss, or repurposing of drives:

● Instant secure erase permanently removes data when repurposing or decommissioning SEDs.

● SafeStore local key management provides the necessary management and protection of SEDs using a simple pass phrase, security key identifier, and security key file that can be set and applied to all SEDs assigned to a ServeRAID adapter. This removes the complexity of managing each SED's unique encryption key, and essentially relieves the administrator from most of the daily tasks of securing data.

Note: To use the SED services of the ServeRAID M5000 Series Advanced Feature Key, you must use self-encrypting drives as listed in "Supported disk drives" below.

Figure 3 shows the ServeRAID M5000 Series Advanced Feature Key attached to the ServeRAID M5015 controller.
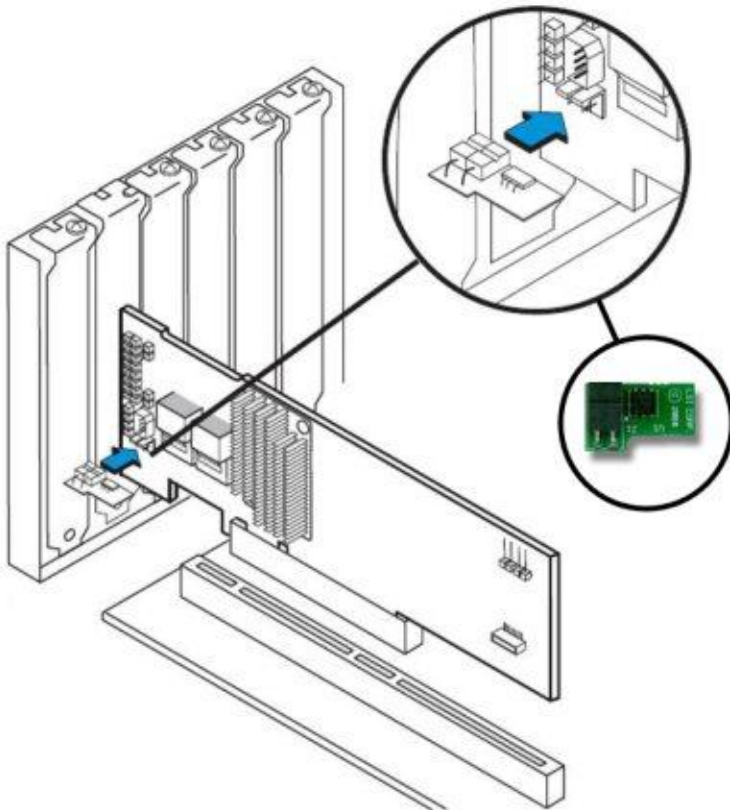

Figure 3. ServeRAID M5000 Series Advanced Feature Key

The ServeRAID M5000 Series Battery Remote Mount Cable is a 24-inch cable and enables the battery to be installed separately from the adapter.

The ServeRAID M5000 Series Performance Accelerator Key adds the following performance and data protection enhancements to the standard ServeRAID products:

- MegaRAID FastPath: An I/O accelerator that doubles the I/O operations per second (IOPS) on solid-state drives (SSDs)

- MegaRAID CacheCade: A data-tiering enabler to support hybrid environments of SSDs and HDDs, realizing higher levels of performance

- MegaRAID Recovery: A data recovery feature that works both in pre-boot and OS environments and provides snapshot capabilities for file-level and volume-level data restoration

- LSI SafeStore: Utility for enabling encryption and storing drive keys for self-encrypting drives (SEDs)

- RAID 6 and 60 support: Additional RAID levels for added data protection

The ServeRAID M5000 Series Performance Accelerator Key cannot be installed at the same time as the ServeRAID M5000 Series Advanced Feature Key, 46M0930. The Advanced Feature Key must be removed before the Performance Accelerator Key is installed. The functions of the Advanced Feature Key are provided by the Performance Accelerator Key. No further migration steps are needed.

Operating environment

The ServeRAID M5015 and ServeRAID M5014 adapter cards are supported in the following environment:

- Temperature:
    - At 0-1000 m (0-3000 ft): 10-35° C (50-95° F)
    - At 1000-2100 m (3000-7000 ft): 10-32° C (50-90° F)
- Relative humidity: 20-80% (non-condensing)

Warranty

One-year limited warranty. When installed on a System x server, these cards assume your system's base warranty and any IBM ServicePac upgrade. Batteries are consumables and therefore are not covered under the warranty.

Supported servers

The ServeRAID M5015 and M5014 adapter cards are supported on the IBM System x servers listed in Table 2.

Table 2. Supported System x servers (Part 1)

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)
ServeRAID M5015 SAS/SATA Controller	46M0829	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ServeRAID M5014 SAS/SATA Controller	46M0916	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ServeRAID M5000 Series Battery Kit	46M0917	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ServeRAID M5000 Series Battery Remote Mount Cable	68Y7396	N	N	N	N	Y	Y	Y	Y*	Y	N
ServeRAID M5000 Series Advanced Feature Key	46M0930	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ServeRAID M5000 Series Performance Accelerator Key	81Y4426	Y	Y	Y	Y	Y	N	N	Y	N	Y

* The Remote Mount Cable ships with the IBM System x3650 M3 Hot-swap SAS/SATA 4 Pack HDD Upgrade option, 69Y4236

Table 2. Supported System x servers (Part 2)

Product description	Part number	x3100 M4 (2582)	x3250 M4 (2583)	x3300 M4 (7382)	x3500 M4 (7383)	x3530 M4 (7160)	x3550 M4 (7914)	x3630 M4 (7158)	x3650 M4 (7915)	x3690 X5 (7147)	x3750 M4 (8722)	x3850 X5 (7143)	dx360 M4 (7912)
ServeRAID M5015 SAS/SATA Controller	46M0829	Y	Y	N	N	N	N	N	N	Y	N	Y	N
ServeRAID M5014 SAS/SATA Controller	46M0916	Y	Y	N	N	N	N	N	N	Y	N	Y	N
ServeRAID M5000 Series Battery Kit	46M0917	Y	Y	N	N	N	N	N	N	Y	N	Y	N
ServeRAID M5000 Series Battery Remote Mount Cable	68Y7396	N	N	N	N	N	N	N	N	Y	N	N	N
ServeRAID M5000 Series Advanced Feature Key	46M0930	Y	Y	N	N	N	N	N	N	Y	N	Y	N
ServeRAID M5000 Series Performance Accelerator Key	81Y4426	N	N	N	N	N	N	N	N	Y	N	Y	N

See IBM ServerProven® for the latest information about the System x servers that support each adapter:
http://ibm.com/servers/eserver/serverproven/compat/us/

Supported disk drives

The ServeRAID M5015 and M5014 adapter cards support the disk drives that are supported on the servers listed in Table 2. The maximum number of drives that can be connected to the RAID controller is limited by the number of internal drive bays for a supported server.

Supported 2.5-inch simple-swap hard disk drives and the servers with which they are supported are listed in the following table.

Table 3. Supported 2.5-inch simple-swap hard disk drives

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)	x3100 M4 (2582)	x3250 M4 (2583)	x3690 X5 (7147)	x3850 X5 (7143)
IBM 146GB 15K 6Gbps SAS 2.5" SFF G2SS HDD	90Y8935	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 146GB 15K 6Gbps SAS 2.5" SFF SS HDD	49Y1996	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 300GB 10K 6Gbps SAS 2.5" SFF G2SS HDD	90Y8895	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 300GB 10K 6Gbps SAS 2.5" SFF SS HDD	49Y1991	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 300GB 15K 6Gbps SAS 2.5" SFF SS HDD	81Y9674	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 600GB 10K 6Gbps SAS 2.5" SFF G2SS HDD	90Y8890	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 600GB 10K 6Gbps SAS 2.5" SFF SS HDD	49Y2027	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 900GB 10K 6Gbps SAS 2.5" SFF SS HDD	81Y9654	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 250GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	81Y9734	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 500GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	81Y9738	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
IBM 1TB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	81Y9742	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N

Supported 3.5" simple-swap hard disk drives and the servers with which they are supported are listed in the following table.

Table 4. Supported 3.5" simple-swap hard disk drives

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)	x3100 M4 (2582)	x3250 M4 (2583)	x3690 X5 (7147)	x3850 X5 (7143)
250GB 3.5" Simple-Swap SATA II HDD	39M4508*	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	N
IBM 250GB 7.2K SATA 3.5" Simple-Swap HDD	43W7750*	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	N
500GB 3.5" Simple-Swap SATA II HDD	39M4514	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	N
IBM 500GB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	81Y9802	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	81Y9806	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 1TB 7.2K SATA 3.5" Simple-Swap HDD	43W7622	Y	Y	N	N	N	Y	N	N	N	Y	Y	Y	N	N
IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	81Y9810	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 2TB 7200 NL SATA 3.5" SS HDD	42D0787	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	N
IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	81Y9814	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 3TB 7.2K 6Gbps NL SATA 3.5" SS HDD	81Y9778	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	N

* Withdrawn, not available for ordering.

Supported 2.5-inch hot-swap hard disk drives and the servers with which they are supported are listed in the following table.

Table 5. Supported 2.5-inch hot-swap hard disk drives

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)	x3100 M4 (2582)	x3250 M4 (2583)	x3690 X5 (7147)	x3850 X5 (7143)
IBM 73GB 15K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0672*	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y
IBM 146GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0632*	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y
IBM 146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	90Y8926	Y	Y	N	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 146GB 15K 6Gbps SAS 2.5" SFF G2HS SED	90Y8944	Y	Y	N	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 146GB 15K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0677	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 146GB 15K 6Gbps SAS 2.5" SFF Slim-HS SED	44W2294	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y
IBM 300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	90Y8877	Y	Y	N	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 300GB 10K 6Gbps SAS 2.5" SFF G2HS SED	90Y8913	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 300GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0637	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 300GB 10K 6Gbps SAS 2.5" SFF Slim-HS SED	44W2264	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y
IBM 300GB 15K 6Gbps SAS 2.5" SFF HS HDD	81Y9670	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	90Y8872	Y	Y	N	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 600GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	49Y2003	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 600GB 10K 6Gbps SAS 2.5" SFF G2HS SED	90Y8908	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 900GB 10K 6Gbps SAS 2.5" SFF HS HDD	81Y9650	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 900GB 10K 6Gbps SAS 2.5" SFF G2HS SED	81Y9662	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	90Y8953	Y	Y	N	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 500GB 7200 6Gbps NL SAS 2.5" SFF Slim-HS HDD	42D0707	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	Y	Y
IBM 1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD	81Y9690	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 160GB 7200 NL SATA 2.5" SFF Slim-HS HDD	42D0747*	N	N	Y	Y	Y	N	Y	Y	N	N	N	N	N	Y
IBM 250GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	81Y9722	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 500GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	81Y9726	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y
IBM 500GB 7200 NL SATA 2.5" SFF Slim-HS HDD	42D0752*	N	N	Y	Y	Y	N	Y	Y	N	N	N	N	N	Y
IBM 1TB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	81Y9730	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y

* Withdrawn, not available for ordering.

Supported 3.5-inch hot-swap hard disk drives and the servers with which they are supported are listed in the following table.

Table 6. Supported 3.5-inch hot-swap hard disk drives

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)	x3100 M4 (2582)	x3250 M4 (2583)	x3690 X5 (7147)	x3850 X5 (7143)
IBM 300GB 15K 6Gbps SAS 3.5" G2HS HDD	49Y6092	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 450GB 15K 6Gbps SAS 3.5" G2HS HDD	49Y6097	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 600GB 15K 6Gbps SAS 3.5" G2HS HDD	49Y6102	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 300GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	44W2234	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 450GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	44W2239	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 600GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	44W2244	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 1TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	90Y8567	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 1TB 7.2K 6Gbps NL SAS 3.5" HS HDD	42D0777	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 2TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	90Y8572	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 2TB 7.2K 6Gbps NL SAS 3.5" HS HDD	42D0767	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 3TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	90Y8577	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 3TB 7.2K 6Gbps NL SAS 3.5" HS HDD	81Y9758	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 250GB 7.2K SATA 3.5" Hot-Swap HDD	43W7754*	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
250GB 3.5" Hot-Swap SATA II HDD	39M4526*	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
500GB 3.5" Hot-Swap SATA II HDD	39M4530	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9786	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9790	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9794	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 2TB 7200 NL SATA 3.5" HS HDD	42D0782	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9798	N	N	N	N	N	N	N	N	N	N	N	N	N	N
IBM 3TB 7.2K 6Gbps NL SATA 3.5" HS HDD	81Y9774	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N

* Withdrawn, not available for ordering.

Supported solid-state drives (SSDs) and the servers with which they are supported are listed in the following table.

Table 7. Supported solid-state drives

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)	x3100 M4 (2582)	x3250 M4 (2583)	x3690 X5 (7147)	x3850 X5 (7143)
IBM 50GB SATA 2.5" SFF Slim-HS High IOPS SSD	43W7714*	N	N	N	N	Y	N	N	Y	N	N	N	N	Y	N
IBM 200GB SATA 2.5" MLC HS SSD	43W7718	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y
IBM 64GB SATA 2.5" MLC HS Enterprise Value SSD	49Y5839	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y
IBM 128GB SATA 2.5" MLC HS Enterprise Value SSD	90Y8648	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	Y	Y
IBM 256GB SATA 2.5" MLC HS Enterprise Value SSD	90Y8643	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	Y	Y
IBM 512GB SATA 2.5" MLC HS Enterprise Value SSD	49Y5844	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y
IBM 200GB SATA 2.5" MLC SS SSD	43W7742	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
IBM 64GB SATA 2.5" MLC SS Enterprise Value SSD	49Y5849	N	N	N	N	Y	N	N	N	N	Y	N	Y	N	N
IBM 128GB SATA 2.5" MLC SS Enterprise Value SSD	90Y8668	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N
IBM 256GB SATA 2.5" MLC SS Enterprise Value SSD	90Y8663	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N
IBM 512GB SATA 2.5" MLC SS Enterprise Value SSD	49Y5854	N	N	N	N	Y	N	N	N	N	Y	N	Y	N	N
IBM 50GB SATA 1.8" MLC SSD	43W7726	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
IBM 50GB SATA 1.8" NHS SSD	43W7734*	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
IBM 200GB SATA 1.8" MLC SSD	43W7746	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
IBM 64GB SATA 1.8" MLC Enterprise Value SSD	49Y5834	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
IBM 512GB SATA 1.8" MLC Enterprise Value SSD	49Y5993	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y

* Withdrawn, not available for ordering.

Supported operating systems

The ServeRAID M5015 and ServeRAID M5014 adapter cards support the following operating systems:

- Microsoft Windows Server 2003, Web Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter x64 Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise x64 Edition
- Microsoft Windows Server 2003/2003 R2, Standard Edition
- Microsoft Windows Server 2003/2003 R2, Standard x64 Edition
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Small Business Server 2003/2003 R2 Premium Edition
- Microsoft Windows Small Business Server 2003/2003 R2 Standard Edition
- Microsoft Windows WebServer 2008 R2
- Red Hat Enterprise Linux 4 AS for AMD64/EM64T
- Red Hat Enterprise Linux 4 AS for x86
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server Edition with Xen
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- Solaris 10 Operating System
- VMware ESX 4.0
- VMware ESX 4.1
- VMware ESXi 4.0
- VMware ESXi 4.1

See the IBM ServerProven Web site for the latest information about the specific versions and service packs supported: http://ibm.com/servers/eserver/serverproven/compat/us/. Click **System x servers**, then **Disk controllers** to see the support matrix. Click the check mark that is associated with the System x server in question to see the details of the operating system support.

Related publications

For more information refer to the following documents:

- IBM US Announcement Letter:
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS109-416

- IBM US Announcement Letter for the M5000 Series Advanced Feature Key:
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS109-739

- IBM US Announcement Letter for the M5000 Series Battery Remote Mount Cable:
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS110-013

- System x RAID products home page:
  http://www.ibm.com/systems/storage/product/systemx/scsi_raid.html

- IBM ServeRAID software matrix:
  http://www.ibm.com/support/docview.wss?uid=psg1SERV-RAID

- IBM System x Configuration and Options Guide:
  http://www.ibm.com/support/docview.wss?uid=psg1SCOD-3ZVQ5W

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