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IBM ServeRAID Quick Reference - Archive

This document is a quick guide to the different ServeRAID adapters that IBM has produced since their introduction in mid-1996. If you have an older adapter, this document can help you identify the adapter with photos and a key features table.

Looking for current adapters? You can find reference information for the current range of ServeRAID controllers in the ServeRAID Quick Reference that is available from:

http://www.redbooks.ibm.com/abstracts/tips0054.html

Table of contents:

ServeRAID SCSI Adapter

Part number: 70G8489
Year of availability: 1996
US Announcement Letter: 196-134

Features:
- RAID 0, 1, 5
- SCSI Fast/wide
- Three internal connectors, one external

Visual identifiers:
- Single external 68-pin industry-standard SCSI connector (all other ServeRAID cards use VHDCI connectors)
- Three internal 68-pin industry-standard SCSI connectors
- Connector located vertically in the center of the board (unused)
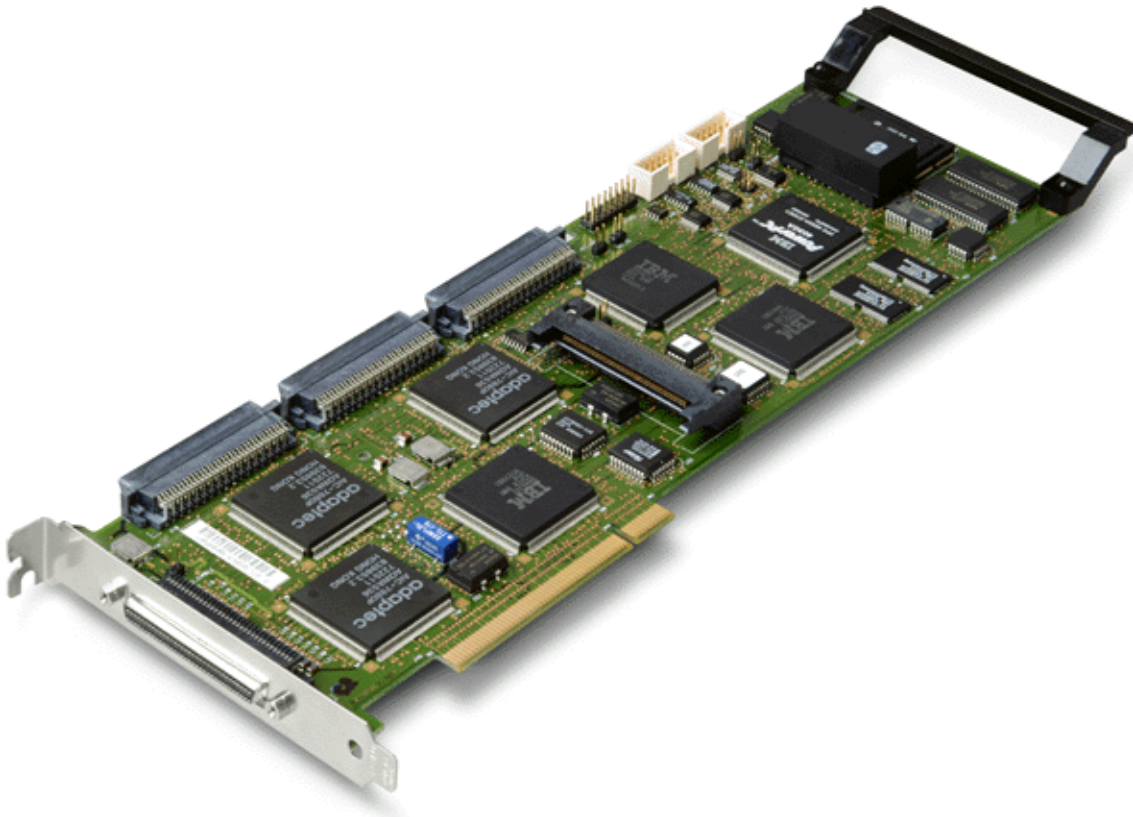
Figure 1. ServeRAID SCSI Adapter

ServeRAID II Ultra SCSI Adapter

Part number: 76H3584
Year of availability: 1997
US Announcement Letter: 197-256

Features:
- Supports both SCSI-2 and Wide Ultra SCSI modes
- RAID levels 0, 1, and 5
- 4 MB of cache
- Supports up to 45 drives
- Supports logical drive migration
- Three internal SCSI connectors, two or three external VHDCI connectors

Visual identifiers:
- Two external VHDCI (very high density connector interface) connectors
- Three internal 68-pin industry-standard SCSI connectors
- Optional cable to route channel 3 externally
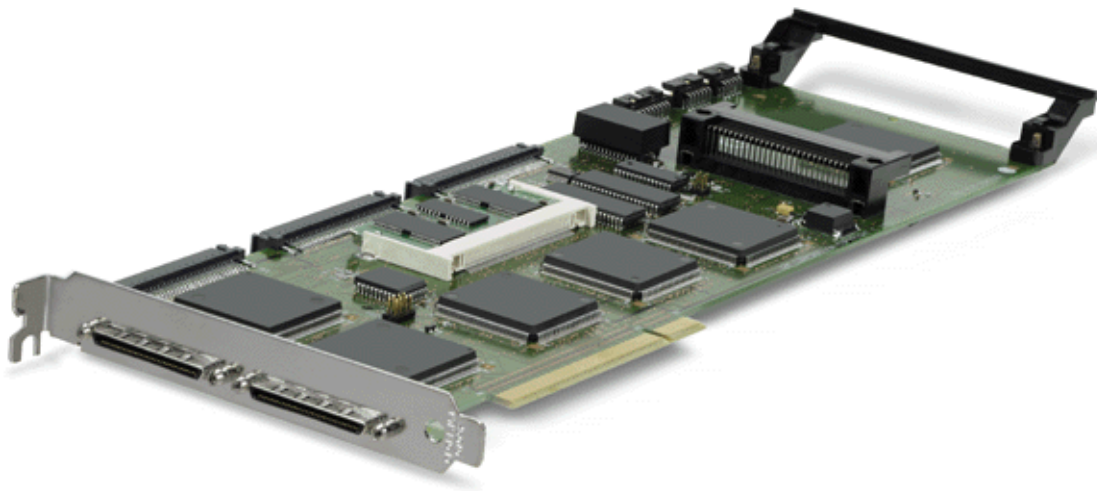
Figure 2. ServeRAID II Ultra SCSI Adapter

Optional cable (part 76H5400) routes channel 3 to an external connector:

Figure 3. ServeRAID II adapter with third channel cable

ServeRAID-3L Ultra2 SCSI Adapter
ServeRAID-3L Ultra2 SCSI Adapter II

ServeRAID-3L:
- Part number: 01K7364
- Year of availability: 1998
- US Announcement Letter: 198-232

ServeRAID-3L II:
- Part number: 19K0564
- Year of availability: 2000
- US Announcement Letter: 100-101

Features:
- 32-bit PCI adapter
- Single channel adapter supports up to 15 disk drives
- Low-voltage differential SCSI (LVDS) support for up to 80 MBps and cable lengths up to 25 m
- 4 MB of standard cache
- Hot-swap PCI support
- 25 MHz RISC processor
- RAID 0, 1 and 5

Visual identifiers:
- One external VHDCI connector, labeled "LVD/SE"
- One internal 68-pin industry-standard SCSI connector
- 32-bit PCI connector (short)

The photo below is that of the ServeRAID-3L. Note that the internal connector is not on an indentation in the circuit board.

Figure 4. ServeRAID-3L

The ServeRAID-3L was replaced by the ServeRAID-3L II (part 19K0564) in April 2000. The internal connector of the ServeRAID-3L II adapter was redesigned so that the adapter will fit in 3U servers, such as the Netfinity 4500R. This board design is the only difference. In fact, the two adapters are the same FRU, 01K7352.

ServeRAID-3H Ultra2 SCSI Adapter

Part number: 01K7207
Year of availability: 1998
US Announcement Letter: 198-232

Features:
- 64-bit PCI adapter (also supports 32-bit data path)
- Three-channel adapter supports up to 45 disk drives
- Low-voltage differential SCSI (LVDS) support for up to 80 Mbps and cable lengths up to 25 m
- 32 MB of standard cache
- Support for the new optional 32 MB battery-backup cache
- Hot-swap PCI support
- 25 MHz RISC processor
- RAID 0, 1 and 5

Visual identifiers:
- Two external VHDCI connectors, labeled "LVD/SE"
- Single internal 68-pin industry-standard SCSI connector
- Connector on the top edge of the card with EDO memory DIMM installed
- Might have an optional daughter card with a battery pack (part 28L1003) installed into the connector near the handle. This adapter looks similar to the ServeRAID-3HB.
- 64-bit PCI connector (long)

Note: The adapter also includes a cable similar to ServeRAID II option to route the internal channel 3 connector to an external VHDCI connector (not shown).
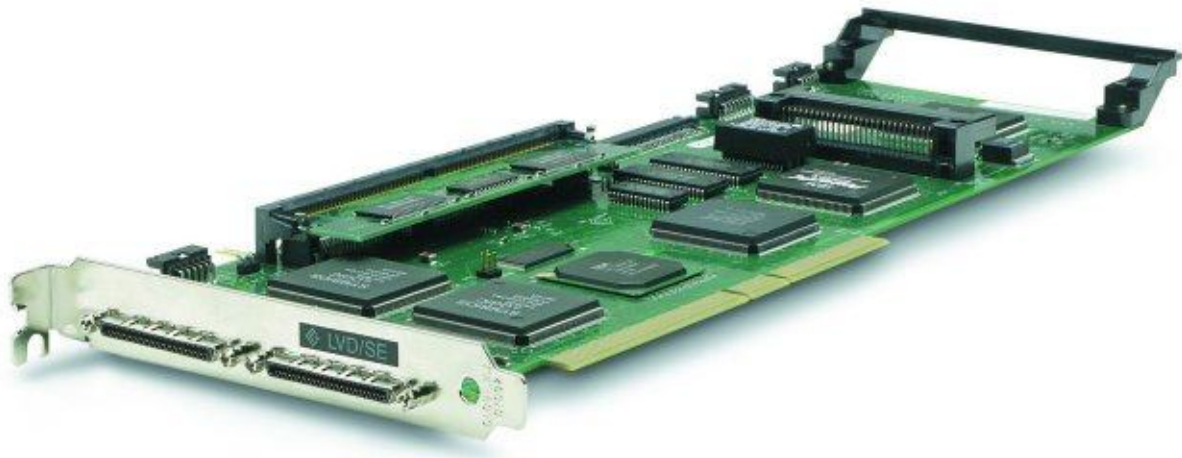
Figure 5. ServeRAID-3H

ServeRAID-3HB Ultra2 SCSI Adapter

Part number: 37L6086
Year of availability: 1999
US Announcement Letter: 199-152

Features:
- Three channels that support up to 45 disk drives
- Wide Ultra2 SCSI with up to 80 MBps data transfers and cable lengths up to 25 m
- 32 MB EDO cache memory
- Supports 64- or 32-bit PCI data paths
- RAID 0, 1, 1E, 5, 5E
- 32 MB cache
- Battery backup standard

Visual identifiers:
- Same as ServeRAID-3H adapter except battery backup module is standard

Figure 6. ServeRAID-3HB

ServeRAID-4L Ultra160 SCSI controller

Part number: 37L6091
Year of availability: 2000
US Announcement Letter: 100-099

Features:
- Single-channel controller
- Supports 64- or 32-bit PCI installations
- 16 MB ECC cache
- Supports new Ultra160 SCSI technology – 160 MBps data transfers
- Support for RAID 0, 00, 1, 1E, 1E0, 5, 50, 5E, and 10
- IBM Active PCI
- Supports clustering and failover

Visual identifiers:
- One external VHDCI connector
- One internal 68-pin industry-standard SCSI connector
- Space for two internal connectors, but only one present (same circuit board as the 4M)
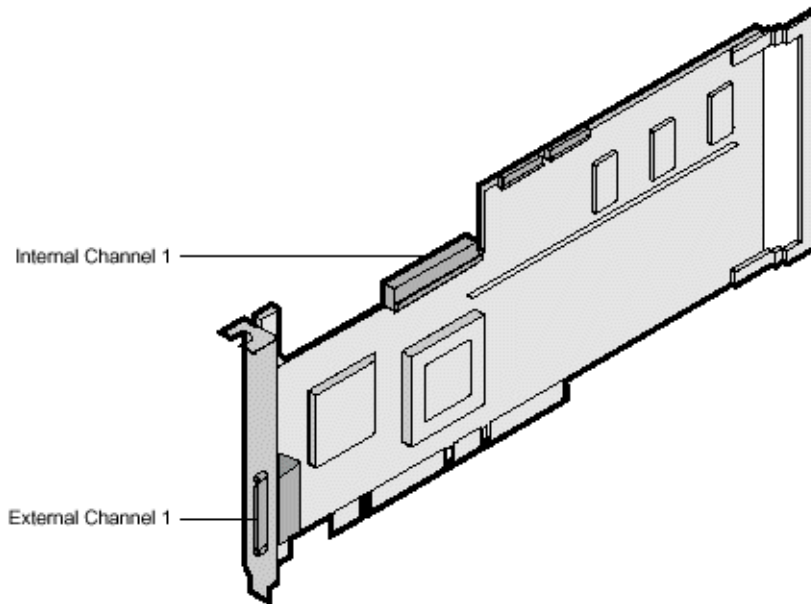
Figure 7. ServeRAID-4L

ServeRAID-4Lx Ultra160 SCSI controller

Part number: 06P5740
Year of availability: 2001
US Announcement Letter: 101-146

Features:
- Updated to 66 MHz PCI bus performance
- Supports 64- or 32-bit PCI installations
- Single-channel controller
- 16 MB ECC cache
- Supports new Ultra160 SCSI technology, 160 MBps data transfers
- Support for RAID 0, 00, 1, 1E, 1E0, 5, 50, 5E, and 10
- IBM Active PCI
- Supports clustering and failover

Visual identifiers:
- Half-length card
- Square heat sink in the middle of the card
- One external VHDCI connector
- One internal 68-pin industry-standard SCSI connector
- 64-bit PCI connector (long)

Figure 8. ServeRAID-4Lx

ServeRAID-4M Ultra160 SCSI controller

Part number: 37L6080
Year of availability: 2000
US Announcement Letter: 100-099

Features:
- Two-channel controller
- Supports 64- or 32-bit PCI installations
- 64 MB ECC cache
- Supports new Ultra160 SCSI technology, 160 MBps data transfers
- Support for RAID 0, 00, 1, 1E, 1E0, 5, 50, 5E, and 10
- IBM Active PCI
- Supports clustering and failover

Visual identifiers:
- Two external VHDCI connectors
- Two internal 68-pin industry-standard SCSI connectors
- Battery integrated into a daughter card lengthwise along card, near handle
- No heat sinks (4Mx has heat sinks)
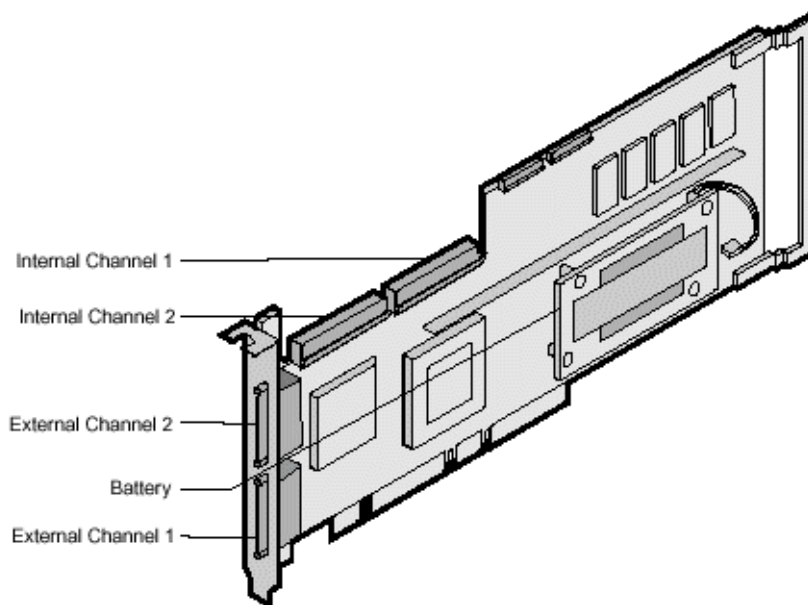
Figure 9. ServeRAID-4M

ServeRAID-4Mx Ultra160 SCSI controller

Part number: 06P5736
Year of first availability: 2001
US Announcement Letter: 101-146

Features:
- Updated to 66 MHz PCI bus performance
- Two-channel controller
- Supports 64- or 32-bit PCI installations
- 64 MB ECC cache
- Supports new Ultra160 SCSI technology, 160 MBps data transfers
- Support for RAID 0, 00, 1, 1E, 1E0, 5, 50, 5E, and 10
- IBM Active PCI
- Supports clustering and failover

Visual identifiers:
- Similar to ServeRAID-4M (check for heat sinks)
- Two external VHDCI connectors
- Two internal 68-pin industry-standard SCSI connectors
- Battery integrated into a daughter card lengthwise along card, near handle
- Heat sink on central chip and smaller chip near PCI connector
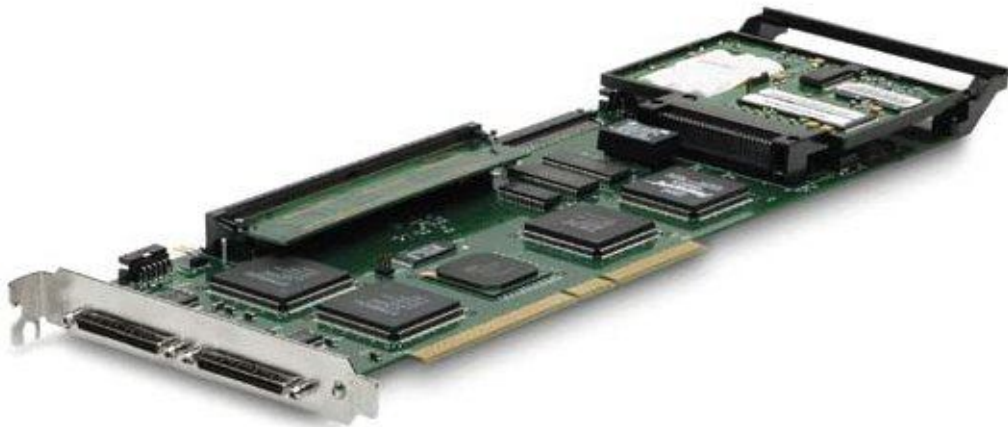

Figure 10. ServeRAID-4Mx

ServeRAID-4H Ultra160 SCSI controller

Part number: 37L6889
Year of first availability: 2000
US Announcement Letter: 100-099

Features:
- Four-channel controller
- 128 MB ECC battery-backed cache
- Removable/transferable cache for high-availability environments
- 266 MHz PowerPC 750
- Supports 64- or 32-bit PCI installations
- Supports new Ultra160 SCSI technology, 160 MBps data transfers
- Support for RAID 0, 00, 1, 1E, 1E0, 5, 50, 5E, and 10
- IBM Active PCI
- Supports clustering and failover

Visual identifiers:
- Four external VHDCI connectors
- Two internal 68-pin industry-standard SCSI connectors
- Large daughter card with battery attached to the main board

Figure 11. ServeRAID-4H

ServeRAID-5i Controller

Part number: 25P3492
Year of first availability: 2002
US Announcement Letter: 102-170

Features:
- Wide-bandwidth, high-speed 64-bit, 66 MHz PCI controller
- 128 MB of ECC write-back cache with battery backup
- Supports mixed environments of Ultra320 and Ultra160 SCSI HDDs
- RAID levels 0, 00, 1, 10, 5, 50, and IBM exclusive 1E and 1E0
- Support for up to eight logical drives composed of 16 physical drives
- Logical drive migration and auto synchronization support
- Support for stripe unit sizes of 8 KB, 16 KB, 32 KB, or 64 KB
- Up to 28 physical drives supported per controller
- Support for hot- and cold-swapping of HDDs

Visual identifiers:
- No internal or external SCSI connectors (uses the server's onboard SCSI)

Figure 12. ServeRAID-5i

ServeRAID-6M Ultra320 SCSI controller

Part numbers:
- 128 MB cache: part 32P0033 (2003) and 39R8815 (2006)
- 256 MB cache: part 02R0988 (2003) and 39R8816 (2006)

US Announcement Letter: 103-206

Features:
- 64-bit, 133 MHz PCI-X adapter
- 128 or 256 MB ECC DDR SDRAM battery-backed cache
- Two channels
- Support for up to 28 HDDs
- Ultra320 SCSI interface; Wide bandwidth for multi-drive, concurrent, streaming data transfers
- RAID support for 0, 00, 1, 10, 1E, 1E0, 5, 50, and 5EE
- Clustering and failover support

Visual identifiers:
- Two external connectors and two internal connectors
- Adaptec name and logo printed on the board (not IBM)
- Two notches in the PCI connector, not three - indicating that it is a 3.3V adapter, not a combo 3.3V+5V adapter
- One DIMM attached to the bottom edge of the card (see photo) for the cache
- The 128 MB DIMM has five chips (as shown in the photo); the 256 DIMM has nine chips

Note: The battery shown in the photo is not a production-level battery.
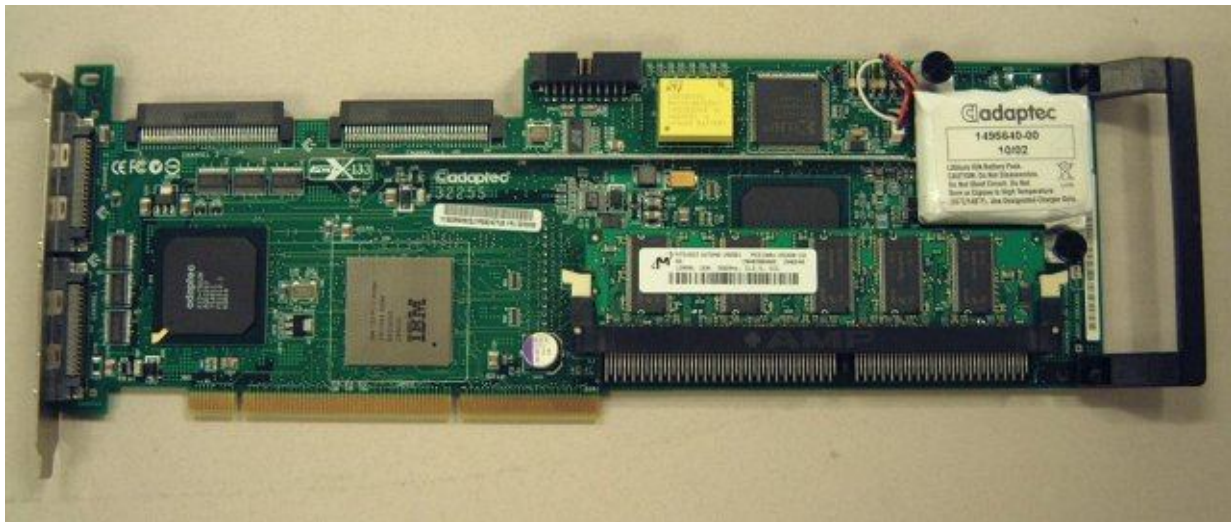
Figure 13. ServeRAID-6M

ServeRAID-6i Controller

Part number: 71P8595
Year of first availability: 2003
US Announcement Letter: 103-210

Features:
- Innovative design works with the onboard SCSI chipset of selected xSeries servers
- Wide-bandwidth, high-speed 64-bit, 133 MHz 1 PCI-X controller
- 128 MB of ECC write-back cache with battery backup with up to 48 hour battery life
- Support for mixed environments of Ultra320 and Ultra160 SCSI HDDs
- Support for RAID levels 0, 00, 1, 10, 5, 50, and IBM exclusive 1E, 5EE, and 1E0
- Support for up to 8 logical drives composed of 16 physical drives
- Logical drive migration and auto synchronization support
- Support for stripe unit sizes of 8 KB, 16 KB, 32 KB, or 64 KB
- Up to 28 physical drives supported per controller
- Support for hot- and cold-swapping of HDDs
- FlashCopy support; Application for tape backup, software application test, and image rollout

Visual identifiers:
- No internal or external SCSI connectors (uses the server's onboard SCSI)
- Two notches in the PCI connector (versus four notches in the ServeRAID-5i)

Notes:
- The 6i and 6i+ are physically identical adapters. The only difference is that the 6i+ is flashed at the factory to V7.0 firmware to support the x206 and x306. A ServeRAID-6i+ is supported in servers that support the ServeRAID-6i.
- The battery shown in the photo is not a production-level battery.

Figure 14. ServeRAID-6i

ServeRAID-6i+ Controller

Part number: 13N2190 (2004) and 39R8793 (2006)
Year of first availability
US Announcement Letter: 104-078

Features:
- Innovative design works with the onboard SCSI chipset of selected xSeries servers
- Wide-bandwidth, high-speed 64-bit, 133 MHz 1 PCI-X controller
- 128 MB of ECC write-back cache with battery backup with up to 48 hour battery life
- Support for mixed environments of Ultra320 and Ultra160 SCSI HDDs
- Support for RAID levels 0, 00, 1, 10, 5, 50, and IBM exclusive 1E, 5EE, and 1E0
- Support for up to 8 logical drives composed of 16 physical drives
- Logical drive migration and auto synchronization support
- Support for stripe unit sizes of 8 KB, 16 KB, 32 KB, or 64 KB
- Up to 28 physical drives supported per controller
- Support for hot- and cold-swapping of HDDs
- FlashCopy support; Application for tape backup, software application test, and image rollout

Visual identifiers:
- No internal or external SCSI connectors (uses the server's onboard SCSI)
- Two notches in the PCI connector (versus four notches in the ServeRAID-5i)

Notes:
- The 6i and 6i+ are physically identical adapters. The only difference is that the 6i+ is flashed at the factory to V7.0 firmware to support the x206 and x306. A ServeRAID-6i+ is supported in servers that support the ServeRAID-6i.
- The battery shown in the photo is not a production-level battery.

Figure 15. ServeRAID-6i+

ServeRAID 7t SATA RAID Controller

Part number: 71P8648 (2004) and 39R8805 (2006)
Year of first availability: 2004
US Announcement Letter: 104-075

Features:
- Four-port SATA controller for entry-level servers
- Four SATA ports and associated cabling
- 64 MB SDRAM cache
- Universal PCI design
- MD2 card design with Notch for installation in 3U server systems
- Uses Intel 80302 processor
- SMART enabled
- Support for RAID levels 0, 1, 5, 10
- Support for one logical drive per array
- Support for stripe unit sizes of 16 KB, 32 KB, or 64 KB
- Up to four physical drives supported per controller

Visual identifiers:
- Four internal Serial ATA (SATA) connectors
- No external connectors
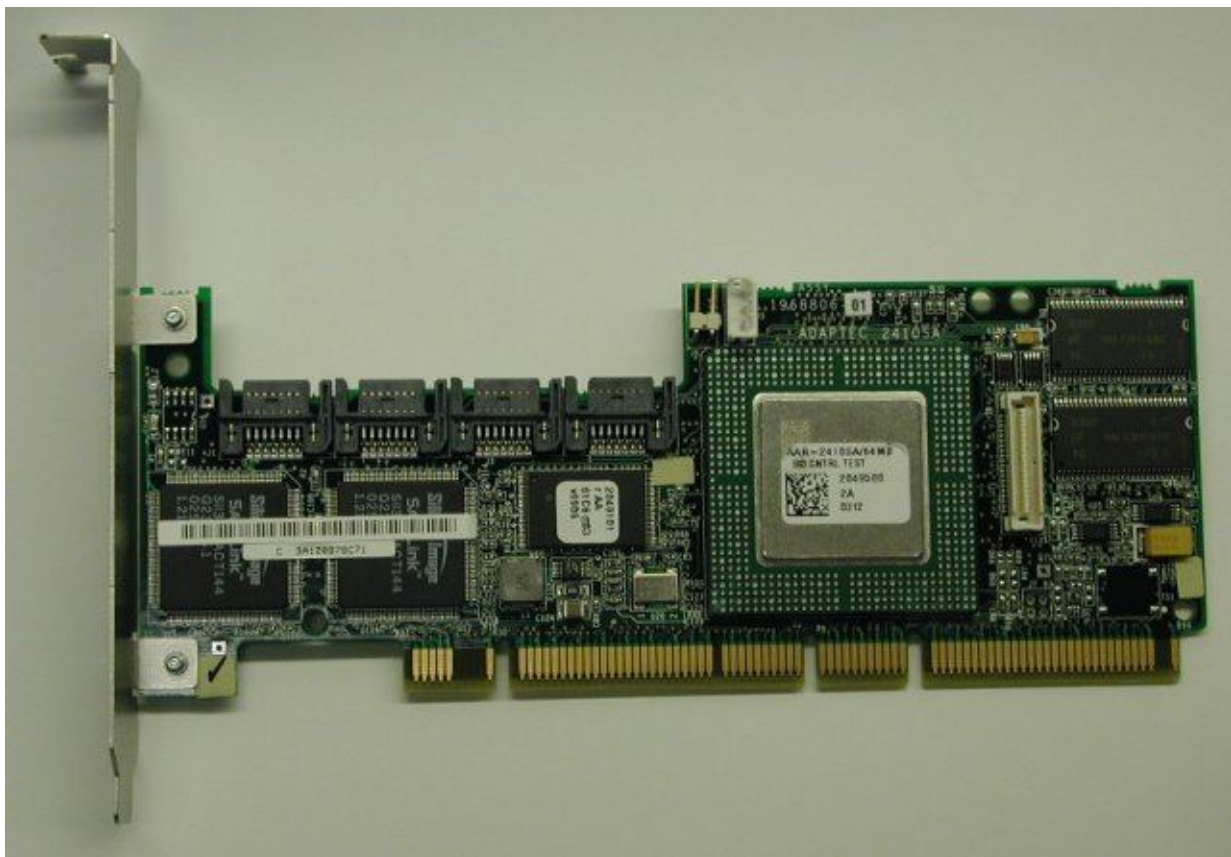
Figure 16. ServeRAID 7t

ServeRAID 7e SATA RAID Controller

Part number: None
Year of first availability: Varies by server
US Announcement Letter: Varies by server

Features:
● RAID controller integrated into specific servers providing RAID-0 and RAID-1

Visual identifier:
● No extra hardware
● Function is integrated into the SCSI controller, SATA controller, or both of specific xSeries servers and enabled with software
● See the Supported servers table for the servers with this controller built in.

ServeRAID 7k SATA RAID Controller

Part number: 71P8642 (2004) and 39R8800 (2006)
Year of first availability: 2004
US Announcement Letter: 104-284 (announced with the x346)

Features:
● DIMM-shaped controller - installs in dedicated slot
● 256 MB DDR1 333 MHz
● RAID-0, 1, 10, 5, 50 and 5EE
● Copyback
● FlashCopy
● Stripe-unit size: 8 KB, 16 KB, 32 KB, and 64 KB
● Enables 33 hours of battery life for 3 years at 50°C

Visual identifiers:
● The option is shipped as a special memory DIMM with a battery attached (for battery-backup purposes)
● Memory is 256 MB, 133 MHz (PC2100) DDR1 memory

Figure 17. ServeRAID 7k

ServeRAID 8e SATA RAID Controller

Part number: None
Year of first availability: 2005
US Announcement Letter: Varies by server

Features:
- RAID controller integrated into specific servers providing RAID-0 and RAID-1

Visual identifiers:
- No extra hardware
- Function is integrated into the SAS or SATA controller of specific xSeries servers and enabled with software
- See the Supported servers table for the servers with this controller built in.

ServeRAID 8i SAS controller

Part number: 13N2227 (2005), 39R8729 (2005)
Year of first availability: 2005
US Announcement Letter:
- Part 13N2227: 105-125 (announced with the x366)
- Part 39R8729: 105-414 (announced with x206m)

Features:
- RAID 0, 1, 5, 1E, 00, 10, 50, 1E0, 5EE
- Zero Channel RAID (ZCR) controller
- Half-length adapter
- Dedicated PCI-X 64-bit ZCR slot at 133 MHz
- Supports independent and adjustable stripe sizes of 256 KB and 512 KB
- 256 MB cache
- 600 MHz processor
- Supports Logical Drive Migration, Global Hot Spare, Copyback, and FlashCopy
- Battery backup

Visual identifiers:
- Blue circuit board
- The card will either have a blue handle attached (for use with x260, x366, x460) or a PCI bracket attached (for use with x206m and x306m)
- No connectors for disks
- Battery attached
- The two part numbers are identical electronics - the difference is the level of firmware installed at the factory. Packaging is also different as follows:
- Part 13N2227: Has the blue handle attached by default, with the PCI bracket in the box
- Part 39R8729: Has the PCI bracket attached by default, with the blue handle in the box

A note about the two part numbers and firmware: 13N2227 was introduced with the x366 and may have V8.00 or later firmware. 39R8729 was introduced with the x206m and ships with V8.15 or later firmware. 39R8729 will replace 13N2227. The cards are interchangeable, but a ServeRAID-8i installed in the x206m and x306m must have V8.15 firmware or later. A card with firmware earlier than V8.15 will not function in an x206m or x306m. In addition, you cannot upgrade the firmware of the card to V8.15 while it is installed in an x206m or x306m if it has older firmware . You must upgrade the firmware in another system.

Figure 18. ServeRAID-8i

ServeRAID 8k SAS Controller

Part number: 25R8064
Year of first availability: 2006
US Announcement Letter: 106-379 (announced with the System x3650)

Features:
- 256 MB DDR2 533 MHz
- Enables 72 hours of battery life for 3 years at 45°C
- RAID-0, 1, 1E, 10, 5, 6,
- Copyback
- FlashCopy
- Stripe-unit size: 16 KB, 32 KB and 64 KB, 128 KB, 256 KB, 512 KB, and 1024 KB

Visual identifiers:
- The option is shipped as a special memory DIMM with a battery attached through wires (for battery-backup purposes)
- The DIMM is installed in a special DIMM socket in supported servers
- Five DRAM chips on the DIMM
- FRU on label is 25R8076; Stamped "Adaptec ATB-200" on battery side
- Write-back cache memory is 256 MB, 533 MHz DDR2 unbuffered memory
- Battery is connected to the DIMM by wires and is typically mounted on the server chassis

Figure 19. ServeRAID 8k (battery not shown)

Figure 20. ServeRAID 8k installed in an x3650

ServeRAID 8k-I SAS Controller

Part number: None (standard in supported servers)
Year of first availability: 2006
US Announcement Letter: 106-379 (announced with the System x3650)

Features:
● Supports RAID-0, 1, and 10

Visual identifiers:
● A special memory DIMM, but no battery attached (unlike ServeRAID 8k)
● One DRAM chip on the DIMM
● No cache for data (see RETAIN tip H187701 for clarification)
● See the Supported servers table for the servers with this controller standard

Photo not currently available. The DIMM is similar to the ServeRAID 8k but with only one DRAM chip and no battery.

ServeRAID 8s SAS PCIe Controller

Part number: 39R8765
Year of first availability: 2007
US Announcement Letter: 107-028

Features:
- Two x4 Internal SFF-8470 connector / One x4 external SFF-8484 connector
- RAID levels: 0, 1, 1E, 10, 5, 6, 50, and 60
- 8-lane 2.5 Gbps PCI Express
- Up to 3 Gbps of performance throughput for each port at full duplex
- Supports independent and adjustable stripe unit sizes up to 1024 KB, default 256 KB
- Logical Drive Migration, Global Hot Spare, and Rebuild and Rapid Restore features
- 3/4 Length, Full Height adapter
- Optional ServeRAID-8s Battery (39R8812)

Visual identifiers:
- One x4 external SFF-8470 SAS connector
- Two x4 internal SFF-8484 SAS connectors
- 3/4 length, full height board
- Large fan on the board
- Optional battery (option part number 39R8812)
- Optional internal cable for hot-swap System x3250 models and hot-swap x3200 models (43W4908)
- Optional internal cable for simple-swap x3200 models (43W4910)

Figure 21. ServeRAID-8s

IBM SAS HBA Controller

Part number: 25R8060
Year of first availability: 2006
US Announcement Letter: 106-646

Features:
- 3 Gbps per SAS port
- PCI Express host interface
- Small form-factor design (MD-2)
- Four x1 internal 7 pin connectors / one x4 external SFF8088
- 8-lane 2.5 Gbps PCI-Express
- Connects to both SAS and SATA HDDs and tape drives
- Connects to external storage controllers via optional mini-SAS cable
- SAS hard disk support with integrated RAID 0, 1, 1E (specific systems only)
- SAS tape support

Visual identifiers:
- 1 external Mini-SAS x4 connector (SFF-8088)
- 4 internal SATA x1 connectors

Figure 22. IBM SAS HBA Controller

MegaRAID 8480 adapter

Part number: 39R8850
Year of first availability: 2006
US Announcement Letter: 106-640

Features:
● Two SAS SFF8470 x4 external connectors
● Support up to 48 HDDs, using four EXP3000 external disk enclosures
● Performance up to 3 Gbps throughput at full duplex
● Support for independent and adjustable stripe unit sizes for 8 KB up to 128 KB configurable per logical drive
● Support for 256 MB DDR2 SDRAM for data caching
● An intelligent Transportable Battery Backup (iTBBU) that protects cached data for up to 72 hours in the event of power failure
● Support for RAID-0,-1,-5,-10, and 50

Visual identifiers:
● Two SAS SFF8470 x4 external connectors
● Full-height half-length adapter
● Attached battery

Figure 23. MegaRAID 8480 adapter

ServeRAID-MR10il SAS/SATA II Controller

Part number: 44E8767
Year of first availability: 2008
US Announcement Letter: AG08-0353 (announced in Asia Pacific countries only)

Features:
- Low-profile MD2 half-length 2U form factor adapter card
- Two internal x4 SFF-8087 connectors
- PCI Express x8 host interface
- SAS Controller: LSI 1078e
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- 128 MB cache
- Stripe unit sizes up to 1024 KB, default 256 KB
- RAID levels : RAID 0, 1, 1E, 5, 6, 10, 50, 60
- Support for Logical Drive Migration, Global Hot Spare, and Rebuild and Rapid Restore features

Visual identifiers:
- No external connectors
- Low-profile MD2 half-length 2U form factor adapter card.
- Two x4 SFF-8087 connectors on left side of card
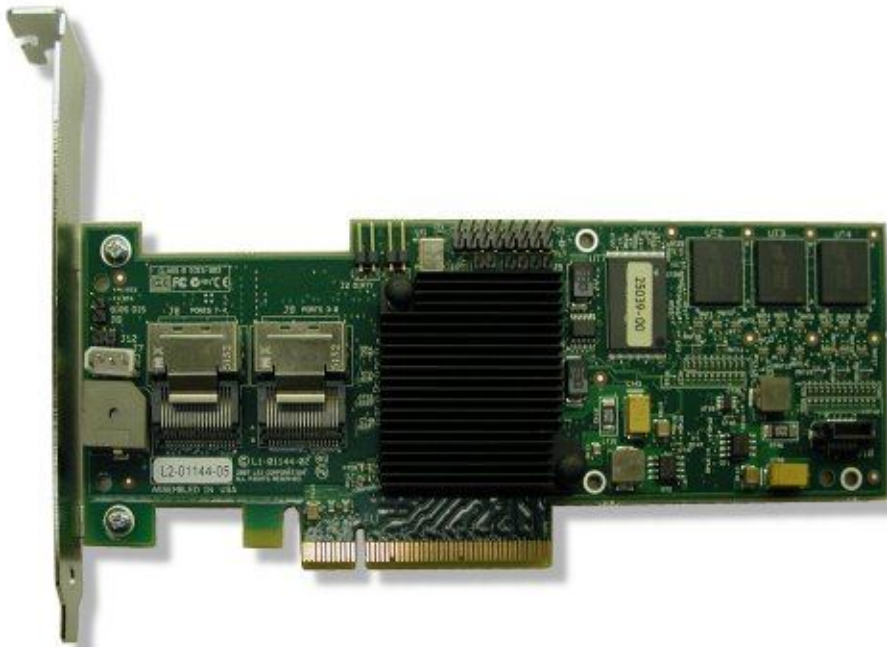
Figure 24. ServeRAID-MR10iI SAS/SATA II Controller

ServeRAID BR10il SAS/SATA Controller

Part number: 44X0411
Year of first availability: 2008
US Announcement Letter: US108-352

Features:
- Form factor: Rectangular card with mini-PCIe connector
- One internal x4 SFF-8087 connectors
- PCI Express x4 host interface
- SAS Controller: LSI 1064e
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- Cache: None
- Maximum stripe size: 64 KB (fixed)
- RAID levels : RAID 0, 1, 1E

Visual identifiers:
- No external connectors
- Rectangular card with mini-PCIe connector
- One x4 SFF-8087 connector

Figure 25. IBM ServeRAID-BR10il SAS/SATA PCIe Controller

ServeRAID MR10k SAS/SATA Controller

Part number: 43W4280
Year of first availability: 2007
US Announcement Letter: US107-594

Features:
- Installs in a dedicated connector on the system planar
- DIMM form factor (uses existing SAS connections as provided by the server)
- PCI Express x8 host interface
- SAS Controller: LSI 1078E
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- 256 MB cache
- External Intelligent Transportable Battery Backup (iTBBU) connected via wires (FRU 44W4283)
- Maximum stripe size: 1024 KB
- RAID levels: RAID 0, 1, 5, 6, 10, 50, 60

Visual identifiers:
- The option is shipped as a special memory DIMM with a battery attached through wires (for battery-backup purposes)
- The DIMM is installed in a special DIMM socket in supported servers
- Five DRAM chips on the DIMM
- FRU on label is 25R8076; Stamped "Adaptec ATB-200" on battery side
- Battery is connected to the DIMM by wires and is typically mounted on the server chassis

Figure 26. ServeRAID MR10k SAS/SATA Controller

ServeRAID MR10is VAULT SAS/SATA Controller

Part number: 44E8695
Year of first availability: 2008
US Announcement Letter: US108-444

Features:
- Stored data encryption
- Full height (3U), half length card
- Two internal x4 SFF-8087 connectors
- PCI Express x8 host interface
- SAS Controller: LSI 1078DE
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- 256 MB cache
- Li-Ion battery backup
- Maximum stripe size: 1024 KB
- RAID levels : RAID 0, 1, 5, 6, 10, 50, 60

Visual identifiers:
- No external connectors
- Full-height half-length form factor adapter card.
- Two x4 SFF-8087 connectors on right side of card
- Battery is mounted on left side of card
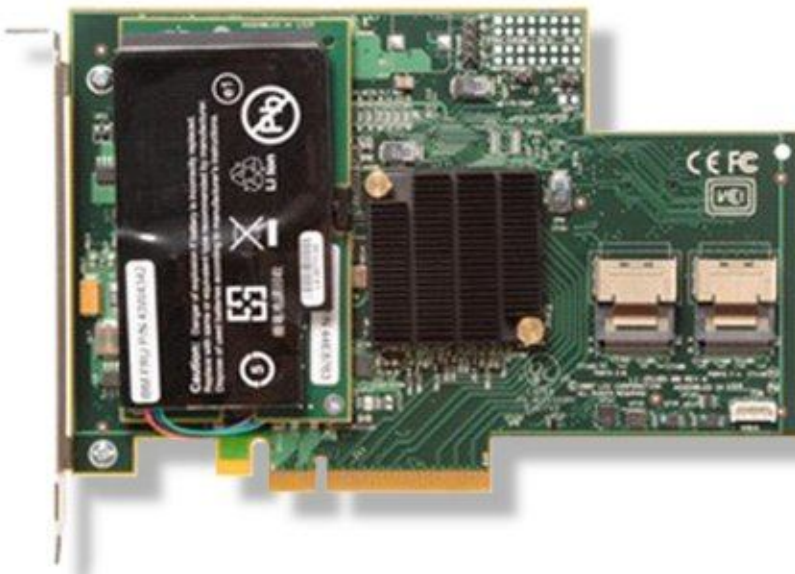
Figure 27. ServeRAID-MR10is VAULT SAS/SATA Controller

IBM 3Gb SAS HBA v2

The IBM 3Gb SAS HBA v2 provides an ideal solution for all servers and workstations needing ultra high-speed data transfer in disk connectivity for data backup and mission critical applications. This HBA provides support for SAS and SATA HDDs and tape drive configurations.
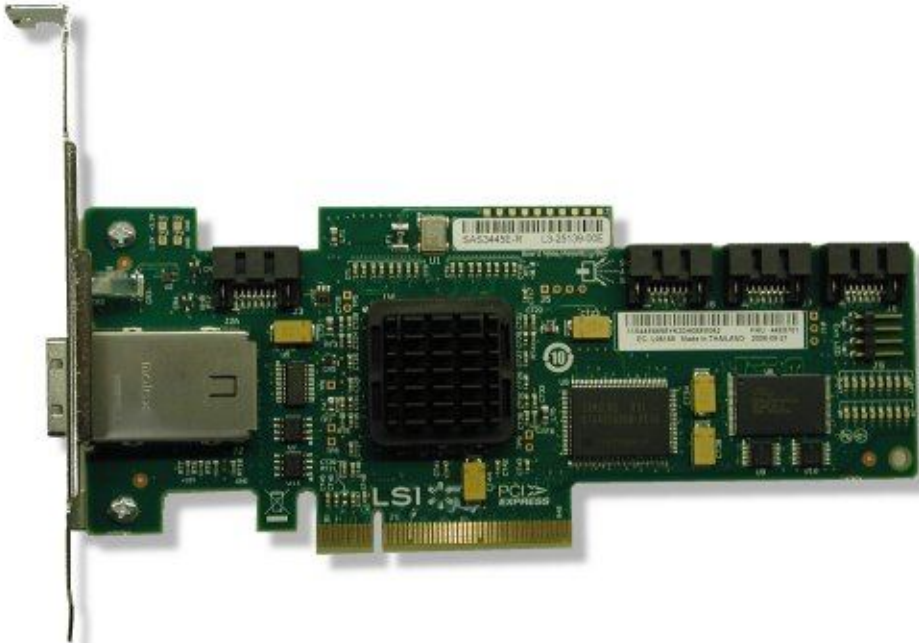
Figure 28. IBM 3Gb SAS HBA v2

Table 1. IBM 3Gb SAS HBA v2 part number and feature code

Description	Part number	Feature code
IBM 3Gb SAS HBA v2	44E8700	3583

IBM 3Gb SAS HBA v2 specifications

- 1 external Mini-SAS x4 connector (SFF-8088)
- 4 internal SATA x1 connectors
- LSI 1068E SAS controller
- PCI Express x8 host interface
- RAID levels : None*

* The 3Gb SAS HBA v2 supports RAID but only on the System x3455 (RAID levels 0, 1, 1E are supported). All other supported systems support tape connectivity only. See the announcement letter (link below) for details.

Resources

- IBM 3Gb SAS HBA User's Guide
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5084130

- IBM Announcement Letter
  US: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS109-099
  EMEA: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=877/ENUSZG09-0132

ServeRAID MR10M SAS/SATA Controller

The ServeRAID-MR10M SAS/SATA Controller is a high performance PCIe RAID Controller for external direct-attached storage, including IBM System Storage EXP3000. This RAID adapter provides investment protection by supporting SAS and SATA hard drive configurations, and providing performance enhancements enabled by a standard battery. The battery enables cached data protection during unexpected power outages when the controller is operating in its higher performance, write back mode.

Figure 29. ServeRAID-MR10M SAS/SATA Controller

Table 2. ServeRAID-MR10M SAS/SATA Controller part number and feature code

Description	Part number	Feature code
ServeRAID MR10M SAS/SATA Controller	44E8825 43W4339*	3559

* Part number 43W4339 is withdrawn

ServeRAID MR10M specifications

The ServeRAID MR10M has the following specifications:

- MD2 form factor card (2U low profile height)
- Two SFF-8088 SAS x4 external connectors
- PCI Express x8 host interface
- SAS Controller: LSI 1078e
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- 256 MB cache
- Li-Ion battery backup
- Maximum stripe size: 1024 KB
- RAID levels : RAID 0, 1, 5, 6, 10, 50, 60

Resources

- ServeRAID MR10M User's Guide
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5074105

- ServeRAID software and drivers
  http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-RAID

- IBM Announcement Letter
  US: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS107-594
  EMEA: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=877/ENUSZG08-0660

ServeRAID MR10i SAS/SATA Controller

The ServeRAID-MR10i SAS/SATA Controller is a low-cost PCIe RAID controller for Internal System RAID 0, 1, 10, 5, 50, 6, 60. This full height, half length adapter uses an LSI 1078 controller with an x8 PCI Express host interface and eight internal SAS/SATA II 3 Gb/s ports. MegaRAID Storage Manager (MSM), included with ServeRAID-MR10i, is a robust RAID management, configuration, and reporting application.

Figure 30. ServeRAID-MR10i SAS/SATA Controller

Table 3. ServeRAID-MR10i SAS/SATA Controller part numbers and feature codes.

Description	Part number	Feature code
ServeRAID MR10i SAS/SATA Controller	43W4296	3571
ServeRAID-MR10i NiMH Battery	43W4299*	None
ServeRAID-MR10i Li-Ion Battery	44E8826	5864

* Withdrawn from marketing

ServeRAID MR10i specifications

The ServeRAID MR10i has the following specifications:

- Full height (3U), half length card
- Two internal x4 SFF-8087 connectors
- PCI Express x8 host interface
- SAS Controller: LSI 1078e
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- 256 MB cache
- Optional battery backup; two options: NiMH (now withdrawn from marketing) or Li-Ion
- Maximum stripe size: 1024 KB
- RAID levels : RAID 0, 1, 5, 6, 10, 50, 60

Note: Not all servers that support this controller also support the battery. See IBM ServerProven® for details.

Resources

- ServeRAID MR10i User's Guide
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5074114

- ServeRAID software and drivers
  http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-RAID

- IBM Announcement Letter
  US: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS108-055
  EMEA: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=877/ENUSZG08-0114

ServeRAID BR10i SAS/SATA Controller

The ServeRAID-BR10i SAS/SATA Controller provides an ideal solution for all servers requiring solid performance with RAID 0, 1 and 1E capability. This RAID adapter provides investment protection by supporting SAS and SATA hard drive and tape drive configurations.
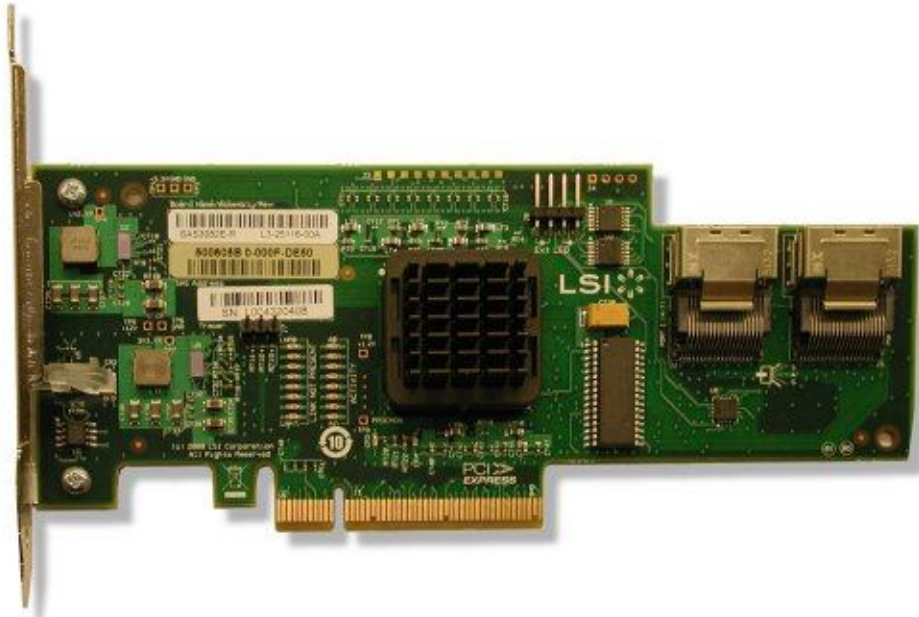
Figure 31. ServeRAID-BR10i SAS/SATA Controller

Table 4. ServeRAID-BR10i SAS/SATA Controller part number and feature code

Description	Part number	Feature code
ServeRAID BR10i SAS/SATA Controller	44E8689	3577

ServeRAID BR10i specifications

The ServeRAID BR10i has the following specifications:

- Low-profile MD2 half-length 2U form factor adapter card
- Two internal x4 SFF-8087 connectors
- PCI Express x8 host interface
- SAS Controller: LSI 1068e
- 3 Gbps per port data transfer rate
- Supports SAS 3 Gbps and SATA 2
- Cache: None
- uEFI support
- Maximum stripe size: 64 KB (fixed)
- RAID levels : RAID 0, 1, 1E

Resources

- ServeRAID BR10i User's Guide
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5084255

- ServeRAID BR10 software and drivers
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-65666

- IBM Announcement Letter
  US: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS109-099
  EMEA: http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=877/ENUSZG09-0132

ServeRAID B5015 SSD Controller

Today's business-critical servers require more protection, performance, and manageability than ever. An enterprise-grade RAID solution needs to provide the greatest level of data protection, the highest performance, and easy-to-use management tools. The ServeRAID B5015 SSD Controller combines the PM8013 maxSAS RAID-on-Chip (RoC) controller and the RAID stack from PMC-Sierra to accommodate the most rigorous server environments and to support high-performing SSDs.

Figure 32. ServeRAID B5015 SSD Controller

Table 5. ServeRAID B5015 SSD Controller part numbers and feature codes

Description	Part number	Feature code
ServeRAID B5015 SSD Controller	46M0969	3889

ServeRAID B5015 specifications

The ServeRAID B5015 SSD Controller has the following specifications:

- RAID 1 and 5 support
- Hot-spare support with automatic rebuild capability
- Background data scrubbing
- 6 Gbps per SAS port
- PCI Express 2.0 x8 host interface
- PCI MD2 low profile form factor
- Two x4 internal (SFF-8087) connectors
- SAS controller: PMC-Sierra PM8013 maxSAS 6 Gbps SAS RoC controller
- Up to 8 disk drives per RAID adapter
- Performance optimized for SSDs
- Three multi-threading MIPS processing cores
- High performance contention-free architecture
- Up to four ServeRAID B5015 adapters supported in a system
- Maximum stripe size: 1024 KB
- Support for up to 4 arrays/logical volumes

Resources

For more information, see the following documents:

- *ServeRAID B5015 SSD Controller for IBM System x Product Guide*
  http://www.redbooks.ibm.com/abstracts/tips0763.html

- ServeRAID B5015 Installation Guide (download the unpack the ISO file)
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5085047

- ServeRAID B5015 drivers, maxRAID software, and utilities
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5085047

- IBM US Announcement Letter
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS110-113

ServeRAID MR10ie (CIOv) SAS/SATA Controller

The ServeRAID-MR10ie Controller is a high-performance PCIe RAID Controller expansion card for BladeCenter for on-board and external Direct Attached Storage RAID 0, 1, 10, 5, 50, 6, and 60. This expansion card form factor (CIOv) with battery backed memory cache, utilizes an LSI 1078 controller for support with up to 26 disk drives. Option includes battery backup module (BBU) that installs in blade server DIMM socket.

The following table provides the ordering part numbers and feature codes.

Table 6. Ordering part numbers and feature codes

Description	Part number	System x feature code
ServeRAID MR10ie (CIOv) Controller for IBM BladeCenter (includes battery)	46C7167	0070
Battery for ServeRAID-MR10ie (CIOv) Controller	46M0800	5741

ServeRAID MR10ie (CIOv) specifications

The ServeRAID MR10ie (CIOv) Controller has the following specifications:

- Two SAS ports routed internally to the two hot-swap drive bays
- Two SAS ports routed internally to the chassis I/O bays 3 and 4
- Supports RAID levels 0, 1, 5, 6, 10, 50, and 60
- Provides 256 MB of ECC DDR-2 battery-backed cache
- 3 Gbps throughput per port
- PCI Express 1.0 x4 host interface
- Based on the LSI 1078 controller
- Supports up to 26 disk drives
- Supports connectivity to the BladeCenter S disk storage modules (via SAS Connectivity Modules) and tape drives
- Supports connectivity to the EXP3000, EXP2512 and EXP2524 storage expansion enclosures

Resources

For more information, see the following documents:

- *ServeRAID MR10ie SAS/SATA Controller Installation and User Guide*
  http://www.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5078830

- 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/entry/portal/docdisplay?lndocid=SERV-RAID

- IBM US Announcement Letter
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS108-761

Feature comparison

The following three tables provide a comparison of features between the members of the ServeRAID family and other RAID controllers sold by IBM.

RAID controller device driver downloads: http://ibm.com/support/entry/portal/docdisplay?lndocid= MIGR-65723

Feature comparison - ServeRAID 1-4 adapters

Table 7. Feature comparison - ServeRAID to ServeRAID 4H

Feature	SR	II	3L	3L-II*	3H	3HB	4L	4Lx	4M	4Mx	4H
SCSI or SATA	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI	SCSI
First available	1996	1997	1998	2000	1998	1999	2000	2001	2000	2001	2000
US Announcement Letter	196-134	197-256	198-232	100-101	198-232	199-152	100-099	101-146	100-099	101-146	100-099
Marketing part number	70G8489	76H3584	01K7364	19K0564	01K7207	37L6086	37L6091	06P5740	37L6080	06P5736	37L6889
FRU part number (adapter only)	06H9334	76H3587	37L6083 01K7352	01K7352	01K7396	01K7396	09N9540	06P5741	37L7258	06P5737	37L6892
Useful links	Drivers	Drivers	Drivers	Drivers	Drivers	Drivers	Guide Drivers	Guide Drivers	Guide Drivers	Guide Drivers	Guide Drivers
Internal connectors	3	3	1	1	1	1	1	1	2	2	2
External connectors (std/max)	1/1	2/3	1/1	1/1	2/3	2/3	1/1	1/1	2/2	2/2	4/4
Cable for extra external connector	None	Optional 76H5400	None	None	Included	Included	None	None	None	None	None
External connector type	68 pin	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI	VHDCI
Cache	4 MB	4 MB	4 MB	4 MB	32 MB	32 MB	16 MB	32 MB	64 MB	64 MB	128 MB
Battery backup for cache	No	Optional 76H5401 28L1003	No	No	Optional 28L1003	Yes	No	No	Yes	Yes	Yes
SCSI channels / SATA ports	3	3	1	1	3	3	1	1	2	2	4
Disks per channel (SCSI) or port (SATA)	15	15	15	15	15	15	15	14	15	14	15
SCSI level	SCSI F/W	Ultra	Ultra2	Ultra2	Ultra2	Ultra2	Ultra160	Ultra160	Ultra160	Ultra160	Ultra160
PCI or PCI-X or PCI Express	PCI	PCI	PCI	PCI	PCI	PCI	PCI	PCI	PCI	PCI	PCI
PCI bus speed	33 MHz	33 MHz	33 MHz	33 MHz	33 MHz	33 MHz	33 MHz	66 MHz	33 MHz	66 MHz	33 MHz
PCI bus width	32 bit	32 bit	32 bit	32 bit	64 bit	64 bit	64 bit	64 bit	64 bit	64 bit	64 bit
PCI bus voltage	5V	5V	5V	5V	5V	5V	3.3 or 5V	3.3 or 5V	3.3 or 5V	3.3 or 5V	3.3 or 5V
Autosync	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
"Optimal" SCSI speed setting	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LVDS support	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I_2O enabled	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Feature	SR	II	3L	3L-II*	3H	3HB	4L	4Lx	4M	4Mx	4H
Active PCI support (hot-swap)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering support	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Usable in a fault-tolerant pair	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data scrubbing	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FlashCopy	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Copyback	No	No	No	No	No	No	No	No	No	No	No
Maximum stripe size	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
RAID-0 and RAID-1 support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID-5 support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID-1E support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID-5E support	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID-5EE support (replaces 5E)	No	No	No	No	No	No	No	Yes	No	Yes	No
RAID-6	No	No	No	No	No	No	No	No	No	No	No
RAID-00 support	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
RAID-10 support	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
RAID-1E0 support	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
RAID-50 support	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
RAID-60 support	No	No	No	No	No	No	No	No	No	No	No

* The ServeRAID-3L II, part 19K0564, replaced the ServeRAID-3L. The ServeRAID-3L and ServeRAID-3L II have identical features and support the same servers. The ServeRAID-3L II has a different card design so that it will fit vertically in 3U servers.

Feature comparison - ServeRAID 5-7

Table 8. Feature comparison - ServeRAID 5i to ServeRAID 7k

Feature	5i	6M	6M	6i	SR-6i+	7t	7e	7k
SCSI or SATA or SAS	SCSI	SCSI	SCSI	SCSI	SCSI	SATA	SCSI, SATA	SCSI
First available	2002	2003	2003	2003	2004	2004	2004	2004
US Announcement Letter	102-170	103-206	103-206	103-210	104-078	104-075		104-284
Marketing part number	25P3492	32P0033 39R8815	02R0988 39R8816	71P8595	13N2190 39R8793	71P8648 39R8805	None	71P8642 39R8800
Processor		Intel IOP321 600 MHz	Intel IOP321 600 MHz		Intel IOP321 400 MHz	80302	Not applicable	Intel IOP332
Useful links	Guide Drivers	Drivers	Drivers	Drivers	Drivers	Drivers	Drivers	Drivers
Internal connectors	0	2	2	0	0	4	0	0
External connectors (std/max)	0	2/2	2/2	0	0	0	0	0
Cable for extra external connector	None	None	None	None	None	None	None	None
External connector type	None	VHDCI	VHDCI	None	None	None	None	None
Cache	128 MB	128 MB	256 MB	128 MB	128 MB	64 MB	None	256 MB
Battery backup for cache	Yes	Yes	Yes	Yes	Yes	No	No	Yes
SCSI channels / SATA ports / SAS ports	1 on server	2	2	1 or 2 on server	1 or 2 on server	4	1 or 2	2 on server
Disks per channel (SCSI) or port (SATA/SAS)	14	14	14	14	14	1	Varies	14

Feature	5i	6M	6M	6i	SR-6i+	7t	7e	7k
SCSI level	Ultra320	Ultra320	Ultra320	Ultra320	Ultra320	SATA	Ultra320	Ultra320
PCI or PCI-X or PCI Express	PCI	PCI-X	PCI-X	PCI-X	PCI-X	PCI	PCI-X	PCI-X 1.0
PCI bus speed	66 MHz	133 MHz	133 MHz	133 MHz	133 MHz	66 MHz	Varies	100 MHz
PCI bus width	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit
PCI bus voltage	3.3 or 5V	3.3V	3.3V	3.3V	3.3V	3.3V or 5V	Not applicable	Not applicable
Autosync	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
"Optimal" SCSI speed setting	Yes	Yes	Yes	Yes	Yes	Not applicable	Yes	Yes
LVDS support	Yes	Yes	Yes	Yes	Yes	Not applicable	Yes	Yes
I$_2$O enabled	Yes	Yes	Yes	Yes	Yes	No	Not applicable	Yes
Active PCI support (hot-swap)	No	No	No	No	No	No	No	No
Clustering support	No	Yes	Yes	No	No	No	No	No
Usable in a fault-tolerant pair	No	Yes	Yes	No	No	No	No	No
Data scrubbing	Yes	Yes	Yes	Yes	Yes	No	No	Yes
FlashCopy	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Copyback	No	No	Yes	Yes	Yes	No	No	Yes
Maximum stripe size	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
RAID-0 and RAID-1 support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID-5 support	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
RAID-1E support	Yes	Yes	Yes	Yes	Yes	No	No	Yes
RAID-5E support	No	No	No	No	No	No	No	No
RAID-5EE support (replaces 5E)	No	Yes	Yes	Yes	Yes	No	No	Yes
RAID-6	No	No	No	No	No	No	No	No
RAID-00 support	No	Yes	Yes	Yes	Yes	No	No	Yes
RAID-10 support	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
RAID-1E0 support	No	Yes	Yes	Yes	Yes	No	No	Yes
RAID-50 support	Yes	Yes	Yes	Yes	Yes	No	No	Yes
RAID-60 support	No	No	No	No	No	No	No	No

Feature comparison - ServeRAID 8, SAS HBA, MegaRAID

Table 9. Feature comparsion - ServeRAID 8i - ServeRAID 8s, SAS HBA, and MegaRAID

Feature	8i	8e	8k-l	8k	8s	SASHBA	MegaRAID
SCSI or SATA or SAS	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA
First available	2005	2005	2006	2006	2007	2006	2006
US Announcement Letter	105-125			106-379	107-028	106-646	106-640
Marketing part number	13N2227 39R8729	None	None	25R8064	39R8765	25R8060	39R8850
Processor	Intel IOP321	Not applicable	Vitesse VSC7250	Vitesse VSC7250		LSI 1064E	Intel *Brockton* IOP XScale processor
Useful links	Drivers	Drivers	Drivers	Drivers	Drivers	Support	Support

Feature	8i	8e	8k-I	8k	8s	SASHBA	MegaRAID
	Install Guide		Install Guide	Install Guide	Install Guide		
Internal connectors	1	0	1	1	2	4 (x1)	0
External connectors (std/max)	0	0	1	1	1	1 (x4)	2 SAS x4
External connector type	None	None	None	None	SFF-8470	SFF-8088	SFF-8470
Cache	256 MB	None	None	256 MB	256 MB	None	256 MB
Battery backup for cache	Yes	No	No	Yes	Optional 39R8812	None	Yes
SATA / SAS ports	6 or 8	Varies	8	8	2	4	2
SAS level	SAS SATA 2	SAS SATA 2	SAS SATA 2	SAS SATA 2	SAS SATA 2	SAS SATA 2	SAS SATA 2
PCI or PCI-X or PCI Express	PCI-X 1.0	PCI-X	PCIe	PCIe	PCIe	PCIe	PCIe
PCI bus speed	133 MHz	Varies	x4	x4	x8	x8	x8
PCI bus width	64-bit	Varies	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
PCI bus voltage	3.3V	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Autosync	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active PCI support (hot-swap)	No	No	No	No	No	No	No
Clustering support	No	No	No	No	No	No	No
Usable in a fault-tolerant pair	No	No	No	No	No	No	No
Data scrubbing ("Patrol read")	Yes	No	Yes	Yes	Yes	No	Yes
FlashCopy	Yes	No	No	Yes	Yes	No	No
Copyback	Yes	No	No	Yes	Yes	No	No
Maximum stripe size	1024 KB	64 KB	1024 KB	1024 KB	1024 KB	64 KB	128 KB
RAID-0 and RAID-1 support	Yes	Yes	Yes	Yes	Yes	Yes*	Yes
RAID-5 support	Yes	No	No	Yes	Yes	No	Yes
RAID-1E support	Yes	No	No	Yes	Yes	Yes*	No
RAID-5E support	No	No	No	No	No	No	No
RAID-5EE support (replaces 5E)	Yes	No	No	No	No	No	No
RAID-6	Yes	No	No	Yes	Yes	No	No
RAID-00 support	Yes	No	No	No	No	No	No
RAID-10 support	Yes	Yes	Yes	Yes	Yes	No	Yes
RAID-1E0 support	Yes	No	No	No	No	No	No
RAID-50 support	Yes	No	No	No	Yes	No	Yes
RAID-60 support	Yes	No	No	No	Yes	No	No

* The SAS HBA only supports the System x3455 for disk RAID (RAID 0, 1, 1E). All other supported systems support tape connectivity only.

** The 3 Gb SAS HBA v2 only supports the System x3455 for disk RAID (RAID 0, 1, 1E). All other supported systems support tape connectivity only. See the announcement letter 109-099 for details.

Table 10. Feature comparison - ServeRAID MR and BR

Feature	MR10ie	B5015	MR10is	MR10k	BR10il	MR10M	MR10i	BR10i	3Gb SAS v2
Port interface	SAS	SAS	SAS	SAS	SAS	SAS	SAS	SAS	SAS
Port speed, Gbps	3	6	3	3	3	3	3	3	3
Number of ports	8	8							
PCIe spec	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PCIe lanes	x4	x8	x8	x8	x4	x8	x8	x8	x8
Int. connectors	2	2	2	0	1	0	2	2	4
Ext. connectors	0	0	0	0**	0	2	0	0	1
SAS controller	LSI SAS 1078	PMC 8013	LSI SAS 1078 DE	LSI SAS 1078	LSI SAS 1064	LSI SAS 1078	LSI SAS 1078	LSI SAS 1068	LSI SAS 1068
Cache (MB)#	256	None	256	256	None	256	256	None	None
Battery	Y	N	Y	Y	N	Y	Opt	N	N
Flash	N	N	N	N	N	N	N	N	N
Data encryption	N	N	Y	N	N	N	N	N	N
Max stripe size (KB) (F=fixed)	1024	1024	1024	1024	64-F	1024	1024	64-F	N/A
Mixing SAS & SATA drives‡	Y	N/A							
SSD support	Y	Y				N	N	Y	N
Tape support	Y	N	N	N	N	N	N	N	Y
Max volumes	64	4							N/A
Max LUN size	>2TB								N/A
UEFI support	Y	Y	Y	N	Y	Y	Y	Y	Y
Patrol read (data scrubbing)	Y	Y	Y	Y	Y	Y	Y	Y	N/A
Consistency check	Y								
Online RAID Level Migration†	Y			Y		Y			N/A
Online Capacity Expansion	Y								N/A
AutoSync	Y	Y	Y	Y	Y	Y	Y	Y	N/A
Copyback§	N	N	Y	Y	N	Y	Y	N	N
FastPath	N	N	N	N	N	N	N	N	
CacheCade	N	N	N	N	N	N	N	N	
RAID-0	Y	N	Y	Y	Y	Y	Y	Y	Y*
RAID-1	Y	Y	Y	Y	Y	Y	Y	Y	Y*
RAID-1E	N	N	N	N	Y	N	N	Y	Y*
RAID-5	Y	Y	Y	Y	N	Y	Y	N	N
RAID-6	Y	N	Y	Y	N	Y	Y	N	N
RAID-10	Y	N	Y	Y	N	Y	Y	N	N
RAID-50	Y	N	Y	Y	N	Y	Y	N	N
RAID-60	Y	N	Y	Y	N	Y	Y	N	N

Opt=optional
** The ServeRAID-MR10k does not have an external connector; however, the System x3850 M2 and x3950 M2 servers have a SFF-8088 external SAS port to which the MR10k connects.
* The IBM 3Gb SAS HBA v2 only supports RAID on the System x3455. All other supported systems support tape connectivity only.
‡ Support for arrays comprised of SAS drives connected to the same controller as arrays comprised of SATA drives (but not SAS & SATA drives in the same array). Requires that the server also supports the mixing of SAS & SATA.
† Online RAID Level Migration (RLM) is also known as Logical Drive Migration (LDM)
§ Copyback is also known as Revertible Hot Spare.

Supported servers

The following tables lists which servers support each of the ServeRAID adapters. For the latest information about supported adapters, see ServerProven at http://www.ibm.com/servers/eserver/serverproven/compat/us/

IBM Netfinity servers

Note: RAID controllers newer than the ones shown are not supported.

Table 11. Supported IBM Netfinity servers

Server	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M
Netfinity 1000	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
Netfinity 3000	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Netfinity 3500	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Netfinity 3500 M20	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
Netfinity 4000R	No	No	No	No	No	No	No	No	No	No	No	No
Netfinity 4500R	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 5000	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No
Netfinity 5100	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 5500 family*	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Netfinity 5600	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 6000R	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 7000	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Netfinity 7000 M10	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	No
Netfinity 7100	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 7600	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Netfinity 8500R	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

* The Netfinity 5500, 5500 M10, and 5500 M20 have a ServeRAID-II controller built in on the server's planar. Two internal connectors: one to the internal hot-swap backplane and one that can be routed externally using an optional cable 03K9313.

IBM eServer xSeries servers

Note: RAID controllers newer than the ones shown in the table are not supported.

Table 12. Supported IBM eServer xSeries servers

xSeries	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M	6i	6i+	7t	7e	7k	8i	8e	8k-I	8k	8s
x130 Value	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x130 Perf	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x135 Value	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x135 Perf	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x150	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x200 (8478)	No	No	No	No	No	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No	No
x200 (8479)	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x205	No	No	No	No	No	No	Y	No	Y	No	No	No	No	No	No	No	No	No	No	No	No	No

xSeries server	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M	6i	6i+	7t	7e	7k	8i	8e	8k-I	8k	8s
x206	No	No	No	No	No	No	Y	No	No	No	No	Y	No	Y	Y	Y	No	No	No	No	No	No
x206m	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	Y	No	No	Y	Y	No	No	No
x220 (8645)	No	No	No	No	No	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No	No
x220 (8646)	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x225 (8647)	No	No	No	No	No	No	Y	No	Y	Y	Y	Y	No	Y	No	No	No	No	No	No	No	No
x225 (8649)	No	No	No	No	No	No	Y	No	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No
x226	No	No	No	No	No	No	No	No	No	No	No	Y	No	Y	Y	Y	No	No	No	No	No	No
x230	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x232	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x235	No	No	No	No	No	No	Y	No	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No
x236	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	No	Y	Y	No	No	No	No	No
x240	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x250	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x255	No	No	No	No	No	Y	Y	Y	Y	Y	No	Y	No	No	No	No	No	No	No	No	No	No
x260	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	No	No	No	Y	No	No	No	No
x300	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x305	No	No	No	No	No	No	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x306	No	No	No	No	No	No	Y	No	No	No	No	No	No	Y	Y	Y	Y	No	No	No	No	No
x306m	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	Y	Y	No	No	No
xSeries server	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M	6i	6i+	7t	7e	7k	8i	8e	8k-I	8k	8s
x330 (8654)	No	No	Y	No	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x330 (8674)	No	No	Y	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x330 (8675)	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x335	No	No	No	No	No	No	Y	No	Y	Y	No	Y	No	No	No	No	No	No	No	No	No	No
x336	No	No	No	No	No	No	No	No	No	No	No	Y	No	Y	Y	No	No	No	No	No	No	No
x340	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x342	No	No	No	No	No	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x343	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x345	No	No	No	No	No	No	Y	No	Y	No	Y	Y	Y	Y	No	No	No	No	No	No	No	No
x346	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	No	Y	Y	No	No	No	No	No
x350	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x360	No	No	No	No	No	Y	Y	Y	Y	Y	No	Y	No	No	No	No	No	No	No	No	No	No
x365	No	No	No	No	No	No	Y	No	Y	Y	No	Y	Y	Y	No	No	No	No	No	No	No	No
x366	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	No	No	No	Y	No	No	No	No
x370	No	No	Y	Y	Y	Y	Y	Y	Y	Y	No	No	No	No	No	No	No	No	No	No	No	No
x380	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
x382	No	No	No	No	No	No	Y	No	Y	No	No	Y	No	No	No	No	No	No	No	No	No	No
x440	No	No	No	No	No	No	Y	No	Y	Y	No	Y	No	No	No	No	No	No	No	No	No	No
x445	No	No	No	No	No	No	Y	No	Y	Y	No	Y	No	No	No	No	No	No	No	No	No	No
x450	No	No	No	No	No	No	No	No	Y	No	No	Y	No	No	No	No	No	No	No	No	No	No
x455	No	No	No	No	No	No	No	No	Y	No	No	Y	No	No	No	No	No	No	No	No	No	No
x460 & MXE-460	No	No	No	No	No	No	No	No	No	No	No	Y	No	No	No	No	No	Y	No	No	No	No
xSeries server	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M	6i	6i+	7t	7e	7k	8i	8e	8k-I	8k	8s

IBM eServer systems

Note: RAID controllers newer than the ones shown in the table are not supported.

Table 13. Supported IBM eServer systems

Server	SR	II	3L	3H	3HB	4L	4Lx	4M	4Mx	4H	5i	6M	6i	6i+	7t	7e	7k	8i	8e	8k-l	8k	8s
eServer 325	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No
eServer 326	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No
eServer 326m	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No

IBM System x servers

Note: RAID controllers **older** than the ones shown in the table are not supported.

Table 14. Supported IBM System x servers (Part 1)

Server	6M	6i	6i+	7t	7e	7k	8i	8e	8k-l	8k	8s
x3100 M3	N	N	N	N	N	N	N	N	N	N	N
x3105	N	N	N	Y	N	N	N	N	N	N	N
x3200	N	N	N	N	N	N	N	N	N	N	Y
x3200 M2	N	N	N	N	N	N	N	N	N	N	N
x3200 M3	N	N	N	N	N	N	N	N	N	N	N
x3250 SATA	N	N	N	N	N	N	N	N	N	N	N
x3250 SAS/SATA	N	N	N	N	N	N	N	N	N	N	Y
x3250 M2	N	N	N	N	N	N	N	N	N	N	N
x3250 M3	N	N	N	N	N	N	N	N	N	N	N
x3350	N	N	N	N	N	N	N	N	N	N	N
x3400 SATA	N	N	N	N	N	N	N	Y	N	Y	Y
x3400 SAS/SATA	N	N	N	N	N	N	N	N	Y	Y	Y
x3400 M2	N	N	N	N	N	N	N	N	N	N	N
x3400 M3	N	N	N	N	N	N	N	N	N	N	N
x3450	N	N	N	N	N	N	N	N	N	N	N
x3455	N	N	N	N	N	N	N	N	N	N	Y
x3500	N	N	N	N	N	N	N	N	N	N	Y
x3500 M2	N	N	N	N	N	N	N	N	N	N	N
x3500 M3	N	N	N	N	N	N	N	N	N	N	N
x3550 SATA	N	N	N	N	N	N	N	Y	N	Y	N
x3550 SAS/SATA	N	N	N	N	N	N	N	N	Y	Y	N
x3550 M2	N	N	N	N	N	N	N	N	N	N	N
x3550 M3	N	N	N	N	N	N	N	N	N	N	N
x3610	N	N	N	N	N	N	N	N	N	N	N
x3620 M3	N	N	N	N	N	N	N	N	N	N	N
x3650	Y	N	N	N	N	N	N	N	Y	Y	Y
x3650 T	N	N	N	N	N	N	N	N	N	N	N

x3650 M2	N	N	N	N	N	N	N	N	N	N	N
x3650 M3	N	N	N	N	N	N	N	N	N	N	N
x3655	N	N	N	N	N	N	N	Y	Y	Y	N
x3690 X5	N	N	N	N	N	N	N	N	N	N	N
x3755	N	N	N	N	N	N	N	N	N	Y	Y
x3800	Y	N	N	N	N	N	Y	N	N	N	Y
x3850	Y	N	N	N	N	N	Y	N	N	N	Y
x3850 M2	N	N	N	N	N	N	N	N	N	N	N
x3850 X5	N	N	N	N	N	N	N	N	N	N	N
x3950 / E	Y	N	N	N	N	N	Y	N	N	N	N
x3950 M2	N	N	N	N	N	N	N	N	N	N	N
x3850 X5	N	N	N	N	N	N	N	N	N	N	N
x3950 X5	N	N	N	N	N	N	N	N	N	N	N

Table 14. Supported IBM System x servers (Part 2)

Server	SAS HBA	MR 8480	MR 10is	MR 10k	BR 10il	3 Gb SAS HBA	MR 10M	MR 10i	BR 10i	B5015
x3100 M3	N	N	N	N	N	N	N	N	N	N
x3105	Y*	N	N	N	N	N	N	N	N	N
x3200	Y*	N	N	N	N	N	N	N	N	N
x3200 M2	Y*	N	Y	N	Y	Y†	N	Y	N	N
x3200 M3	N	N	Y	N	N	Y†	Y	Y	N	N
x3250 SATA	Y*	N	N	N	N	N	N	N	N	N
x3250 SAS/SATA	Y*	N	N	N	N	N	N	N	N	N
x3250 M2	Y*	N	Y	N	Y	Y†	Y	Y**	N	N
x3250 M3	N	N	Y	N	N	Y†	Y	Y**	N	N
x3350	Y*	N	Y	N	Y	Y†	Y	Y	N	N
x3400 SATA	Y*	N	N	N	N	Y†	Y	Y	N	N
x3400 SAS/SATA	Y*	N	Y	N	N	Y†	Y	Y	N	N
x3400 M2	N	N	Y	N	N	Y†	Y	Y	Y	N
x3400 M3	N	N	N	N	N	Y†	Y	Y	Y	N
x3450	N	N	N	N	N	N	N	N	N	N
x3455	Y*	N	N	N	N	Y†	N	N	N	N
x3500	Y*	Y	Y	N	N	Y†	Y	Y	N	N
x3500 M2	N	N	Y	N	N	Y†	Y	Y	Y	N
x3500 M3	N	N	N	N	N	Y†	Y	Y	Y	N
x3550 SATA	Y*	Y	N	N	N	Y†	Y	Y	N	N
x3550 SAS/SATA	Y*	Y	Y	N	N	Y†	Y	Y	N	N
x3550 M2	N	N	Y	N	N	Y†	Y	Y	Y	Y
x3550 M3	N	N	N	N	N	Y†	Y	Y	Y	Y
x3610	N	N	N	N	N	N	N	N	N	N
x3620 M3	N	N	N	N	N	Y†	N	N	N	N
x3650	Y*	Y	Y	N	N	Y†	Y	Y	N	N
x3650 T	N	N	N	N	N	N	N	N	N	N
x3650 M2	N	N	Y	N	N	Y†	Y	Y	Y	Y
x3650 M3	N	N	N	N	N	Y†	Y	Y	Y	Y
x3655	Y*	N	N	N	N	Y†	N	N	N	N
x3690 X5	N	N	N	N	N	Y†	N	N	Y	N
x3755	Y*	Y	N	N	N	Y†	Y	N	N	N
x3800	N	Y	N	N	N	N	N	N	N	N
x3850	N	Y	N	N	N	N	N	N	N	N
x3850 M2	Y*	N	Y‡	Y	N	Y†	Y	N	N	N
x3850 X5	N	N	N	N	N	Y†	N	N	Y	N
x3950 / E	N	N	N	N	N	N	N	N	N	N
x3950 M2	Y*	N	Y‡	Y	N	Y†	Y	N	N	N
x3850 X5	N	N	N	N	N	Y†	N	N	Y	Y
x3950 X5	N	N	N	N	N	Y†	N	N	Y	Y

* The SAS HBA and 3 Gb SAS HBA v2 supports disk connectivity on the x3455 only. All other supported systems support tape connectivity only.

** The ServeRAID MR10i is only supported on models of the x3250 M2/M3 with 2.5" drive bays. The MR10i is not supported on models with 3.5" drive bays.
§ The ServeRAID MR10il is available in China, Korea, Hong Kong, Taiwan, India and ASEAN countries.
† The IBM 3Gb SAS HBA v2 supports disk connectivity on the x3455 only. All other supported systems support tape connectivity only.
‡ The ServeRAID MR10is is supported on the x3850 M2 and x3950 M2 machine type 7141 only, not type 7233

IBM iDataPlex servers

Note: RAID controllers **older** than the ones shown in the table are not supported.

Table 15. Supported IBM iDataPlex servers

Server	SAS HBA	MR 8480	MR10is	MR10k	BR10il	3 Gb SAS HBA	MR10M	MR10i	BR10i
dx320	N	N	N	N	N	N	N	N	N
dx340	N	N	N	N	N	N	N	Y	Y
dx360	N	N	N	N	N	N	N	N	Y
dx360 M2	N	N	N	N	Y	N	N	Y	Y
dx360 M3	N	N	N	N	Y	N	N	N	N

IBM BladeCenter servers and expansion blades

Note: RAID controllers **other** than the ones shown in the table are not supported.

Table 16: Supported IBM BladeCenter servers and expansion blades

Server	6M	8k-I	8k	MR10ie
HS12 8014	No	No	No	No
HS12 8028	No	No	No	Yes
HS20 8843	Yes‡	No	No	No
HS21	Yes‡	Yes†	Yes†	No
HS21 XM	Yes‡	Yes†	Yes†	No
HS22	No	No	No	Yes
HS22V	No	No	No	Yes
LS21	No	Yes†	Yes†	No
LS22	No	No	No	No
LS41	No	Yes†	Yes†	No
LS42	No	No	No	No
SIO 39R7563	No	Yes	Yes	No
PEU2 25K8373	Yes	No	No	No

‡ With the addition of the BladeCenter PCI Expansion Unit 2 (PEU2), 25K8373
† With the addition of the BladeCenter Storage and I/O (SIO) Expansion Unit, 39R7563
* With the addition of the BladeCenter PCI Express I/O Expansion Unit, 43W4391

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