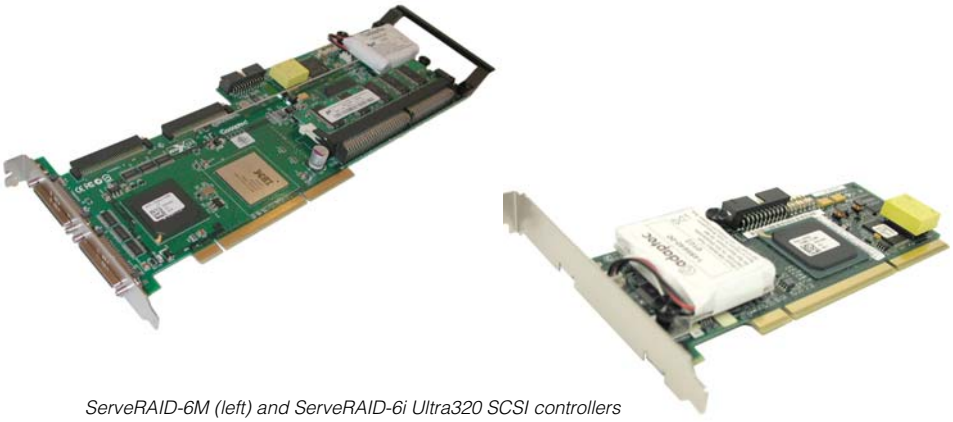
ServeRAID-6 Ultra320 SCSI Controllers



ServeRAID-6M (left) and ServeRAID-6i Ultra320 SCSI controllers

Highlights

- ***New 600MHz/400MHz Intel® IOP321 processor[1] based on Intel® XScale™ technology, large cache and Ultra320 SCSI improve overall storage subsystem performance***
- ***High-availability features include support for controller failover and clustering***
- ***IBM "zero channel" design lowers the cost of hardware RAID functionality***
- ***Backward compatibility helps enable smooth migration to new technology***
- ***Support for up to 2TB[2] of stored data per controller***

Two new ServeRAID™-6 Ultra320 SCSI controllers offer the performance, capacity and data protection that today's business-critical applications and storage environments require. These new ServeRAID-6 controllers offer a choice of power, features and price to match your data protection requirements.

ServeRAID-6M

ServeRAID-6M is a dual-channel Ultra320 SCSI PCI-X controller that combines an Intel IOP321 @ 600MHz processor and 128MB or 256MB of ECC battery-backed cache to deliver a robust RAID (Redundant Array of Independent Disks) solution for enterprise and midrange servers. The ServeRAID-6M takes advantage of the new overhead-reducing technologies and 320MBps data transfer rate[3] of Ultra320 SCSI and the 133MHz host bus speed of PCI-X to reduce bottlenecks and increase performance for data-hungry high-availability applications.

ServeRAID-6i

The cost-efficient "zero channel" design of the ServeRAID-6i Controller allows it to operate through the SCSI interface that's built into the mother-board of select IBM @server xSeries® systems. It delivers full hardware RAID functionality by taking control of the onboard Ultra320 SCSI chip in these servers and is powered by an Intel IOP321 processor @ 400MHz. It transforms the built-in basic mirroring capability of the chip into RAID channels that support nine different levels of RAID protection.

Technology for performance and reliability

With a data transfer rate[3] of up to 320MBps, Ultra320 SCSI delivers twice the performance of Ultra160 SCSI. New technologies—including packet support, quick Arbitration and Selection (QAS), read and write data streaming, flow control and enhanced filtering—allow data to transfer safely and reliably at 320MBps. Both Ultra320 and Ultra160 hard disk drives[4] can be used side by side with ServeRAID-6 controllers, letting you phase in some of the costs of upgrading to higher-performance Ultra320 drives.

Superior scalability

Each ServeRAID-6 controller can support up to 14 devices per Ultra320 SCSI channel — as much as 2TB of data. Install one or more controllers in an xSeries server and add EXP300 Storage Expansion Units to expand protected storage on a massive, large-enterprise scale.

Designed for availability

The sizable battery-backed cache of ServeRAID-6 controllers helps keep power interruptions from endangering your data. For high-availability environments, IBM ServeRAID-6M controllers are certified with Microsoft® Cluster Service (MSCS) for use in two-node clustering environments. Plus, ServeRAID-6M controllers support adapter failover under certain operating systems.

RAID levels enhance flexibility

In addition to RAID levels 0, 1 and 5, you can also choose IBM Enhanced RAID-1 (1E) or Enhanced RAID-5 (5EE). RAID-1E lets you mirror your data with three or more disks—odd or even—for more efficient utilization of hard disk drives. RAID-5EE uses the hot spare as an active participant in the array, improving performance.

ServeRAID-6 controllers also support striping of multiple RAID-0, 1, 1E or 5 arrays into spanned arrays, which allows the capacity of two or more arrays to be combined into a single storage array. These spanned array configurations use RAID levels 00, 10, 1E0 and 50. FlashCopy®, an IBM software feature, lets you back up logical drives instantly in many cases without shutting down your applications.

Superior usability and control

IBM ServeRAID Manager software provides the flexibility needed for small installations or large enterprise storage networks. ServeRAID Manager works smoothly with IBM Director systems management software for integration with larger systems.

IPSSEND makes configuring and rolling out large numbers of servers simple. With IPSSEND, you can copy and distribute ServeRAID controller configurations and data images across multiple servers, saving valuable time and resources.

Help protect your data, your investment and your business

Logical Drive Migration enables ServeRAID-6 controllers to handle capacity changes in background mode and allows new RAID logical drives to be added while your server continues to operate.

ServeRAID-6 controllers store critical RAID configuration information in multiple places— nonvolatile RAM on the controller and in a reserved area on all the attached disks. This redundancy for the most crucial portion of your RAID subsystem data helps you recover more quickly and easily from a disaster.

Copyback automatically recreates your original array after a failed drive has been replaced.

IBM ServeRAID-6 Ultra320 SCSI controllers at a glance

Feature	ServeRAID-6M	ServeRAID-6i
Part number(s)	32P0033 / 02R0988	71P8595
Number of independent SCSI channels	2	0 (1 or 2 on server motherboard)
Processor	Intel IOP321 @ 600MHz	Intel IOP321 @ 400MHz
Cache memory	128MB / 256MB	128MB
Battery-backed cache	Yes	Yes
SCSI interface	Ultra320 SCSI	Ultra320 SCSI
SCSI data transfer speed[5]	Up to 320MBps	Up to 320MBps
Host bus interface	64-bit PCI-X	64-bit PCI-X
Host bus speed (max)	133MHz	133MHz
Number of drives supported	Up to 28	Up to 14 or 28
Storage capacity	Up to 2TB	Up to 1TB or 2TB
RAID levels supported	0, 1, 5, 1E, 00, 10, 50, 1E0, 5EE	0, 1, 5, 1E, 00, 10, 50, 1E0, 5EE
IBM @server xSeries systems supported	x220, x225, x232, x235, x255, x330, x335, x342, x345, x350, x360, x440, x445	x235, x345
Clustering support	Yes	No
Adapter failover	Yes (with Windows® 2000)	No
Logical Drive Migration	Yes	Yes
FlashCopy	Yes	Yes
External connectors	2	0
Internal connectors	2	0
ServeRAID management features	ServeRAID Manager: easy-to-use interface that provides configuration, monitoring and maintenance IPSSEND ServeRAID Command Line: allows you to perform many configuration functions from a command-line interface	
Operating systems supported[5]	Windows NT®, Windows 2000, Windows XP, Windows 2003, Linux, Novell NetWare, IBM OS/2®	
Warranty[6]	Three-year limited onsite warranty when installed in an xSeries server	

RAID levels at a glance

RAID	0	1	1E	5	5EE	00	10	1E0	50
Known as	Striping	Mirroring	Striped Mirroring with an odd or even number of drives	Striping with striped parity	Striping with striped hot spare and parity	Striping across multiple RAID-0 arrays	Striping across multiple RAID-1 arrays	Striping across multiple RAID-1E arrays	Striping across multiple RAID-5 arrays
Fault tolerance	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Redundancy type	None	Duplicate	Duplicate	Parity	Parity	None	Duplicate	Duplicate	Parity
Hot spare option	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Disks required	1 or more	2	3 or more	3 or more	4 or more	2 or more	4 or more	6 or more	6 or more

Why Intel XScale technology?

The Intel IOP321 I/O processor is Intel's fifth-generation I/O processor. It is the first I/O processor to integrate an Intel® XScale™ microarchitecture core and a PCI-X interface. Many storage, networking, and embedded applications require fast I/O throughput for optimal performance. The IOP321 is a highly integrated, cost-effective I/O system on a chip that delivers a twofold performance boost over its predecessor, the Intel IOP310 I/O processor chipset, in I/O-intensive applications.

The IOP321 is especially well suited to networked storage applications including RAID adapter cards, RAID on motherboard, and other storage applications. Its small package size, high data throughput and integrated Application Accelerator Unit (AAU)/XOR provide an optimized solution for these applications. In addition, the IOP321 is an ideal choice for applications requiring a high-performance I/O subsystem in a tightly integrated environment.

IBM at your service

The IBM three-year, onsite limited warranty[6] on select xSeries servers extends to cover the ServeRAID-6M and -6i Ultra320 SCSI controllers — saving you time and trouble if maintenance is ever required. So, why IBM? From system startup throughout its life cycle, whether you have a worldwide deployment or a lone server in your home office, IBM offers a wealth of flexible services and support offerings to help you find solutions to the IT challenges you face. With an xSeries server, you're never "on your own."

Need more information?

World Wide Web	
IBM @server xSeries	**ibm.com**/eserver/xseries
Intel IOP321 I/O processors, based on Intel XScale technology.	http://developer.intel.com/design/iio/80321.htm
SCSI RAID products	**www.pc.ibm.com**/ww/eserver/xseries/scsi_raid.html
IBM @server xSeries accessories and upgrades	**www.pc.ibm.com**/us/eserver/xseries/already.html
Buy Direct	
U.S.	1 888 SHOP-IBM
Canada	1 888 411-1WEB

1 Intel IOP321 processor based on Intel XScale technology.

2 When referring to storage capacity, TB = 1,000,000,000,000 bytes. Accessible capacity is less.

3 Data transfer rate depends on many factors and may be less than maximum stated.

4 Each disk operates at its designated data rate.

5 Visit the ServerProven® Web site at ibm.com/pc/ww/eserver/xseries/serverproven for operating system support updates.

6 For a copy of the IBM Statement of Limited Warranty, call 1 800 426-7378. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician.