



Xserve RAID

This high-performance, high-availability storage system delivers data protection and enormous capacity—up to 7 terabytes— at a groundbreaking price.

Key Features

Massive storage capacity. Fourteen drive bays hold up to 7TB of storage.¹ Independent Ultra ATA drive channels maximize bandwidth and availability.

High-speed throughput. The dual independent 2Gb Fibre Channel host interface transfers terabytes of data at up to 400MB/s.²

Superior data protection. A high-availability architecture and dual independent RAID controllers support RAID levels 0, 1, 3, 5, and 0+1.

Maximum uptime. Xserve RAID keeps running with redundant, hot-swappable power supplies and cooling modules.

Remote management. The Java-based RAID Admin application makes it easy to set up, manage, and monitor Xserve RAID systems from virtually anywhere on the Internet.

Cross-platform compatibility. Xserve RAID fits into Linux, Windows, NetWare, and mixed-platform environments and is certified for compatibility with leading storage infrastructure solutions.³

Comprehensive service and support. To ensure rapid issue resolution for your server and storage deployments, choose from a full range of AppleCare products designed to provide integrated expert support.

With massive capacity and high-availability features previously available only in much more expensive storage systems, Xserve RAID offers unmatched capabilities for an unprecedented price. Tiered storage environments can take advantage of its extreme versatility. Redundant components provide the continuous availability required for business-critical applications. The advanced Xserve RAID architecture delivers fast access to storage without compromising data integrity. Dual independent RAID controllers provide protected storage with unprecedented performance. In fact, Xserve RAID boasts an average read throughput of over 380MB/s⁴ and write throughput of up to 301MB/s.⁵ While throughput rates are measured differently in video applications, Xserve RAID is fast enough to support real-time, uncompressed, high-definition (HD) and multiple-stream (SD) video editing without dropping a frame. And with pricing at under \$2 per gigabyte, Xserve RAID is affordable enough for near-line storage deployments.

A platform-independent design and Java-based administrative tools make it easy to fit Xserve RAID into heterogeneous environments. Xserve RAID is qualified for use with Linux, Windows, and NetWare systems, and Apple has worked with leading storage infrastructure vendors to certify it for integration with existing Fibre Channel hardware and data management solutions.³ Integrated remote monitoring and notification features and hot-swappable components ensure that your data is online and available, all the time. And with intuitive tools for quick configuration of protected storage volumes, this revolutionary RAID solution delivers ease of use that could come only from Apple.

Xserve RAID Configurations

Order number	M9721LL/A	MA208LL/A	MA209LL/A
Price (U.S. MSRP)	\$5999	\$8499	\$12,999
Total available storage—RAID 0	1TB ¹	3.5TB ¹	7TB ¹
Usable storage—RAID 1	500GB ¹	1.5TB ¹	3TB ¹
Usable storage—RAID 3 and 5	750GB ¹	3TB ¹	6TB ¹
Apple Drive Modules	Four 250GB drives ¹	Seven 500GB drives ¹	Fourteen 500GB drives ¹
On-drive cache	8MB per drive	8MB per drive	8MB per drive
Controller cache	512MB per controller	512MB per controller	512MB per controller
Expansion	Fourteen drive bays with independent Ultra ATA channels for up to 7TB of storage ¹		
Also included	Mounting screws with M5, M6, and 10/32-inch threads; caged nuts; two agency-approved 12-foot power cables		
Software	RAID Admin Tools CD		
Service and support	90 days of telephone support and one-year limited warranty; optional extended service and support products		

Note: 250GB drives are also available in 7- and 14-drive configurations.

Specification Sheet

Xserve RAID

Third-party certifications

Leading storage infrastructure vendors have certified Xserve RAID for integration with existing Fibre Channel hardware and data management solutions, including:

- QLogic
- Brocade
- Emulex
- LSI Logic
- VERITAS
- ATTO Technology
- Cisco

In addition to Mac OS X and Mac OS X Server, Xserve RAID has been qualified for use on these operating systems:

- Windows Server 2003
- Windows 2000 Server
- Windows 2000 Professional
- Red Hat Enterprise Linux v2.1 and v6.x
- Novell NetWare v5.x and v6.x
- SUSE Enterprise Server 9
- Yellow Dog Linux v3



Xserve G5. Xserve RAID works seamlessly with Xserve G5, Apple's high-density 1U rack-optimized server. Equipped with single or dual PowerPC G5 processors, Xserve packs phenomenal power and a rich feature set into an affordable, easy-to-deploy system.



Xsan. Xserve RAID and Xsan create an enterprise-class storage solution. Xsan, Apple's 64-bit SAN file system for Mac OS X, allows computers to concurrently access shared storage over a high-speed Fibre Channel connection. Xsan streamlines workgroup collaboration and bandwidth-intensive workflows and increases the flexibility and scalability of server deployments.

For More Information

For more information about Xserve RAID, Xserve G5, Xsan, and other Apple server solutions, visit www.apple.com/server.

For information on AppleCare service and support products, visit www.apple.com/support/products.

Technical Specifications

Storage

- Fourteen drive bays on independent 100MB/s channels supporting up to 7TB of total storage¹ using Apple Drive Modules, available in the following capacities:
 - 250GB 7200-rpm Ultra ATA with 8MB disk cache
 - 500GB 7200-rpm Ultra ATA with 8MB disk cache and rotational vibration safeguard
- Empty drive bays contain blank modules
- Support for reading SMART data from Apple Drive Modules for prefailure notification

RAID controllers and cache memory

- Dual independent controllers, each with an environment management coprocessor for out-of-band remote management and monitoring
- 512MB of cache memory per controller (1GB total)
- Cache Backup Battery Modules (sold separately) for over 72 hours of memory protection

RAID operation

- Support for RAID levels 0, 1, 3, 5, 0+1, 10, 30, and 50 (10, 30, and 50 using host-based software RAID)
- Support for multiple RAID sets, multiple hosts, and LUN masking and mapping
- Background RAID set creation; automatic variable background rebuilding⁶; online expansion; LUN slicing; global drive hot sparing (per RAID controller)

Fibre Channel storage-to-host connection

- Dual 2Gb Fibre Channel ports (SFP); 200MB/s throughput per channel with guaranteed bandwidth (400MB/s full duplex)²
- Host connectivity using 2Gb Apple Fibre Channel PCI-X Card (sold separately) or compatible third-party PCI and PCI-X cards
- Support for point-to-point, loop, and switched fabric topologies
- Dual 10/100BASE-T Ethernet interfaces for remote management

Apple Fibre Channel PCI-X Card (sold separately)

- 64-bit, 133MHz card with two SFP 2Gb Fibre Channel ports; compatible with 32-bit, 66MHz PCI slots and 64-bit, 100MHz or 133MHz PCI-X slots
- Two 2.9-meter Fibre Channel copper cables with SFP transceivers; compatible with short- and long-haul SFP transceivers and fiber-optic cables

Cooling

- Redundant, hot-swappable cooling modules with self-regulating speeds and front-to-back cooling
- Environmental monitoring system for automatically maintaining optimal ambient temperature

Electrical

- Redundant, load-sharing hot-swappable power supplies (450W); universal input (100V to 240V AC), power factor corrected
- Maximum input current: 7.6A (100V to 127V) or 3.6A (200V to 240V)
- Power usage: 300W typical continuous power, 400W maximum continuous power
- Dual DB-9 serial ports for UPS systems
- Frequency: 50Hz to 60Hz, single phase

Environmental requirements and approvals

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum thermal output: 1365 BTUs per hour
- Maximum altitude: 10,000 feet
- FCC Class A approved

Size and weight

- Height: 3U rack-optimized, 5.25 inches (13.3 cm)
- Width: 17 inches (43.2 cm)
- Depth: 18.4 inches (46.7 cm)
- Fits EIA-310-D-compliant, industry-standard 19-inch-wide four-post racks from 24 to 36 inches deep; deeper racks require third-party extender
- 60 to 110 pounds (27 to 45 kg), depending on configuration

¹For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less. Maximum capacity of 7TB achieved through use of fourteen 500GB Apple Drive Modules. Usable capacity depends on drive configuration and RAID level. ²Actual rates will vary depending on drive configuration and RAID level. ³See www.apple.com/xserve/raid for more information on third-party certifications and qualifications. ⁴Testing conducted by Apple in August 2005 using preproduction Xserve RAID systems. Iometer (version 2004.07.30) testing of raw disk throughput on Xserve RAID in both Mac OS X Server v10.4.2 and Windows XP environments has shown the Xserve RAID is capable of delivering up to 192MB/s on the standard shipping 4 x 250GB disk configuration utilizing a single controller, and an average of over 380MB/s on standard shipping 7 x 500GB and 14 x 500GB raw disk configurations utilizing both RAID controllers. Mac OS X Server v10.4.2 Xserve RAID testing conducted using directly attached Xserve G5 dual processor 2.3 GHz systems; Windows XP Xserve RAID testing conducted using directly attached Dell Precision 670 dual processor 3.6 GHz Xeon systems. Since MBR disks only support partition sizes up to 2TB, sliced arrays were used for Windows XP 14-disk tests. ⁵For additional information on Xserve RAID performance in an Xsan environment, please refer to the Xsan Deployment and Tuning Guide which provides examples for configuring and optimizing Xsan storage volumes, www.apple.com/server/documentation. ⁶Host operating system limitations apply.