



Xserve RAID

This high-performance, high-availability storage system delivers data protection and enormous capacity—up to 10.5 terabytes—at a groundbreaking price.

Key Features

Massive storage capacity. Fourteen drive bays hold up to 10.5TB of storage¹ with 750GB 24/7 enterprise-class rated, high-capacity 7200-rpm drives with 16MB on-drive cache. 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 Mac, Windows, Linux, Solaris, 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 up to 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. With pricing at \$1.31 per gigabyte for 10.5TB of storage, 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 Mac, Windows, Linux, Solaris, 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. 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*
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 10.5TB 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	Xserve RAID Admin Tools CD		
Service and support	90 days of telephone support and one-year limited warranty; optional extended service and support products		

*250GB and 750GB 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
- LSI Logic
- Cisco
- VERITAS
- ATTO Technology
- Emulex
- McData

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 Family
- Windows 2000 Professional Edition
- Windows 2000 Server
- Windows 2000 Server, Advanced
- Windows 2000 Server, Datacenter
- Sun Solaris SPARC v10 and 9
- Sun Solaris X86/X64 v10 (64-bit)
- Red Hat Enterprise Linux v2.1, v3, and v4
- Novell NetWare v5.x and v6.x and Cluster Services
- SUSE Enterprise Server 9



Xserve. Xserve RAID works seamlessly with Xserve, Apple's high-density 1U rack-optimized server. Equipped with Dual-Core Intel Xeon 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, 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 Ultra ATA channels supporting up to 10.5TB 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
 - 750GB 7200-rpm Ultra ATA with 16MB 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 and multiple hosts
- Background RAID set creation; automatic variable background rebuilding;⁶ 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 Apple 2Gb or 4Gb Fibre Channel PCI cards (sold separately) or compatible third-party PCI cards
- Support for point-to-point, loop, and switched fabric topologies
- Dual 10/100BASE-T Ethernet interfaces for remote management

Apple Fibre Channel PCI cards (sold separately)

- Dual- or quad-channel 2Gb or 4Gb Fibre Channel PCI cards with SFP Fibre Channel ports
- Two or four 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 10.5TB achieved through use of fourteen 750GB 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 November 2006 using preproduction Xserve RAID systems. Iometer (version 2004.07.30) testing of raw disk throughput on Xserve RAID in both Mac OS X v10.4.8 and Windows XP SP2 environments has shown that Xserve RAID is capable of delivering an average of up to 380MB/s read throughput, and an average of up to 301MB/s write throughput, on 7 x 750GB and 14 x 750GB raw disk configurations utilizing both RAID controllers. Mac OS X v10.4.8 Xserve RAID testing conducted using a directly attached Mac Pro 2.0GHz system; Windows XP SP2 Xserve RAID testing conducted using a directly attached Boxx 7300 Series dual-processor AMD Opteron 2.6GHz system. Since MBR disks support partition sizes up to only 2TB, sliced arrays were used for Windows XP tests. Performance tests are conducted using specific computer systems and reflect the approximate performance of Xserve RAID. 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, at www.apple.com/server/documentation. ⁶Host operating system limitations apply.