

Sun StorEdge™ N8200 Filer

Just the Facts



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Positioning



Figure 1. Sun StorEdge™ N8200 filer

Introduction

The Sun StorEdge™ N8200 filer is the first offering of the new Sun StorEdge N8000 product line and Sun's first offering in the growing network-attached storage (NAS) market. The product integrates standard Sun products and technologies to provide customers with easy access to up to 800 GB of storage. It provides a complete file server solution that easily integrates into a customer's network.

The Sun StorEdge N8200 filer is ideal for rapidly changing storage environments that require high performance, high availability, and easy scalability. The system's low price and simple installation make it easy and cost-effective for service providers and workgroups to implement. The Sun StorEdge N8200 filer is based on proven Sun technology with a history of uptime and reliability. The flexible system scales either vertically or horizontally in a "pay as you grow" architecture. A customer can add more filers to a network or add more storage to a filer with pre-configured StorEdge N8200 filer expansion arrays.

Integrated NAS solution that installs in under 10 minutes

- Scalable architecture
- Easy-to-use GUI management interface
- NAS storage up to 800 GB
- 10/100BASE-T Ethernet performance
- Exclusive Sun StorEdge N8200 filer performance software
- Supports NFS and CIFS protocols
- Mirrored boot drive
- Hot spare
- Solstice Backup™ client provided
- VERITAS NetBackup supported



Product Family Placement

The Sun StorEdge N8200 filer is the low-end product in the Sun StorEdge N8000 filer family.

Key Messages

- Sun is a player in the NAS market
- Sun's NAS products are outstanding because Sun leverages their proven products and technologies
- The Sun StorEdge N8200 filer offers one of the best price/performance ratios in its class of NAS products
- Factory-configured solution that installs in less than 10 minutes and is tuned to provide high-performance NAS
- Enables customers to install storage at an affordable cost and expand capacity quickly and easily as needed with a flexible, scalable "pay-as-you-grow" architecture
- Simple management GUI for easy administration

Features and Benefits

Features

- The Sun StorEdge N8200 filer's GUI Administration Tool makes storage management easy
- Operating environment tuned to provide high performance
- Provides integrated support of NFS and CIFS protocols
- Modular filer architecture that allows customers to add more storage to the filer or add more filers to the network

Benefits

- Helps reduce administration costs, resulting in lower TCO
- Increases client productivity and satisfaction as a result of faster access to data files
- Allows UNIX® and Microsoft Windows workgroup environments to painlessly share storage
- Provides vertical and horizontal scalability, which allows for flexibility; pay for storage as needed

Availability

Sun StorEdge N8200 filer is currently available.

Target Markets

The target markets are service providers, dot-coms, and design and other workgroups who are concerned with quick installation, ease of administration, high performance, and affordable pricing.



Target Users

Customer	Key Features to Highlight
CEOs seeking to maximize employee productivity and bring products to market faster	Companies are able to bring products/services to market faster when groups are able to quickly share information using the Sun StorEdge N8200 filer.
CIOs concerned with reducing total cost of operations (TCO) and maintaining high availability	The Sun StorEdge N8200 filer provides a high-performance, highly reliable solution to a company's file serving needs. The flexible architecture of the Sun StorEdge N8200 filer means that customers can add more storage to a filer or more filers to a network without bringing down the system. Easy scalability reduces network administration costs and protects the existing storage investment.
IT managers and department managers who require ease of installation and ease of management to help reduce administration costs	The Sun StorEdge N8200 filer is pre-configured to provide ease of installation. The browser-based management interface enables IT managers to reduce administrative costs. The filer centralizes network storage, making it easier to set backup policies and administer backup procedures.



Selling Highlights

Market Value Proposition

The Sun StorEdge™ N8000 filer series provides Sun customers with one of the first turnkey NAS solutions based on proven Sun hardware and software. The Sun StorEdge N8200 filer is the first in a series of NAS products planned for release this year. Previously, customers have had to build their own Sun server/storage-based NAS solutions or look to other vendors for NAS.

The Sun StorEdge N8200 filer is an economically priced, easy-to-implement solution for rapidly changing storage requirements that require high performance, high availability, and easy scalability. It integrates easily into a customer's network using a standard Ethernet connection. The preconfigured system can be installed in less than 10 minutes without impacting data availability. The Sun StorEdge N8200 filer's low price and simple installation make it easy for ISPs and workgroups to implement. In addition, the system offers the NAS market's lowest latency, providing users with rapid access to data. In fitting with Sun's network storage approach, the Sun StorEdge N8200 filer scales in a modular fashion, either vertically or horizontally. The option Sun StorEdge N8200 filer expansion arrays allow the customer to increase their Sun StorEdge N8200 filer capacity in 200-GB increments to a total capacity of 800 GB.

The system's low entry cost enables customers to get started with a minimal initial investment. The "pay-as-you-grow" architecture and simple expandability make it easy and cost effective to increase capacity over time. The system's scalability enables customers to scale an existing system to accommodate high-end storage requirements, thereby extending the life of their original investment. In addition, the easy administration of the Sun StorEdge N8200 filer means that less time is spent managing the storage.



Enabling Technology

Technology Overview

The Sun StorEdge™ N8200 filer is based on proven Sun products and technologies. The Sun StorEdge N8200 filer controller is a Sun Enterprise™ 220R server, a shared-memory, multitasking system with two 450-MHz UltraSPARC™-II processors. The UltraSPARC CPU provides supercomputing power, and moves data through the UPA at a high speed. The Sun StorEdge N8200 filer controller contains 2-GB memory and two dual-channel, differential UltraSCSI host adapters.

The Sun StorEdge N8200 filer arrays (including expansion arrays) are Sun StorEdge A1000 arrays, high-availability, mass-storage subsystems that include 12 x 18-GB disks and 64-MB cache memory.

UltraSPARC Processor

The UltraSPARC-II processor is Sun's latest generation of the SPARC™ processor family and the second generation of 64-bit UltraSPARC chips. It utilizes 0.35-micron technology, which shrinks the die size to 149² mm. This reduced die size is the key to UltraSPARC-II CPU's higher clock rates and increased performance. This smaller die size also enables the UltraSPARC-II processor to operate at a core voltage of 2.5 volts, reducing power consumption and allowing the chip to operate at higher frequencies without increasing total power requirements or heat dissipation, both major design issues in today's high-performance systems.

The UltraSPARC-II processors used in the Sun StorEdge N8200 filer controller are individually mounted on 4-inch x 6-inch, field-installable module cards along with associated UPA data buffers and up to 4 MB of high-speed SRAM external cache memory.

UPA System Bus

The Sun StorEdge N8200 filer controller processors, memory, and I/O subsystems are interconnected by the high-speed Ultra™ port architecture (UPA) crossbar datapath. The CPU datapaths are 144-bits wide, with 128 bits for data and 16 bits for error correcting code (ECC). The UPA data path that support system I/O is 72 bits wide, with 64 bits for data and 8 bits for ECC. The memory interface supports a single 576-bit-wide datapath.

With 450-MHz CPU installed, the UPA transfers data at 112.5 MHz, or one transfer every 9 nanoseconds. CPU segments, which transfer 16 bytes of data in parallel every clock cycle, each have a maximum transfer rate of 1.8 GB per second.

Memory

The Sun StorEdge N8200 filer controller has eight memory slots supporting 2 GB of 60-ns, 5-volt, dynamic RAM memory. The dual in-line memory modules (DIMMs) used by the Sun StorEdge N8200 filer controller are the same type as those used in the Sun Enterprise 250, 420R, and 450 workgroup server products.



System I/O—High-Performance PCI Technology

System I/O for the Sun StorEdge N8200 filer controller is provided by two industry-standard peripheral component interconnect (PCI) data buses. All PCI buses in the Sun StorEdge N8200 filer comply with the 2.1 revision of the PCI specification, released in March 1995.

Slot	Slot Width	Clock Rate	Card Input Voltages Supported
1	32 or 64 bits	33 or 66 MHz	3.3 volt or universal
2 to 4	32 or 64 bits	33 MHz only	5 volt or universal



System Architecture

Overview of System Architecture

The Sun StorEdge™ N8200 filer is an integrated suite of proven Sun products and technologies. The Sun StorEdge N8200 filer controller is a Sun Enterprise™ 220R server with two 450-MHz UltraSPARC™-II processors, 2-GB memory and two dual-channel, differential UltraSCSI host adapters.

The Sun StorEdge N8200 filer arrays (including expansion arrays) are Sun StorEdge A1000 arrays that include 12 x 18-GB disks and 64-MB cache memory. Base configurations come with one or two arrays.

The Sun StorEdge N8200 filer is shipped with a standard 19-inch rackmount kit (X9653A).

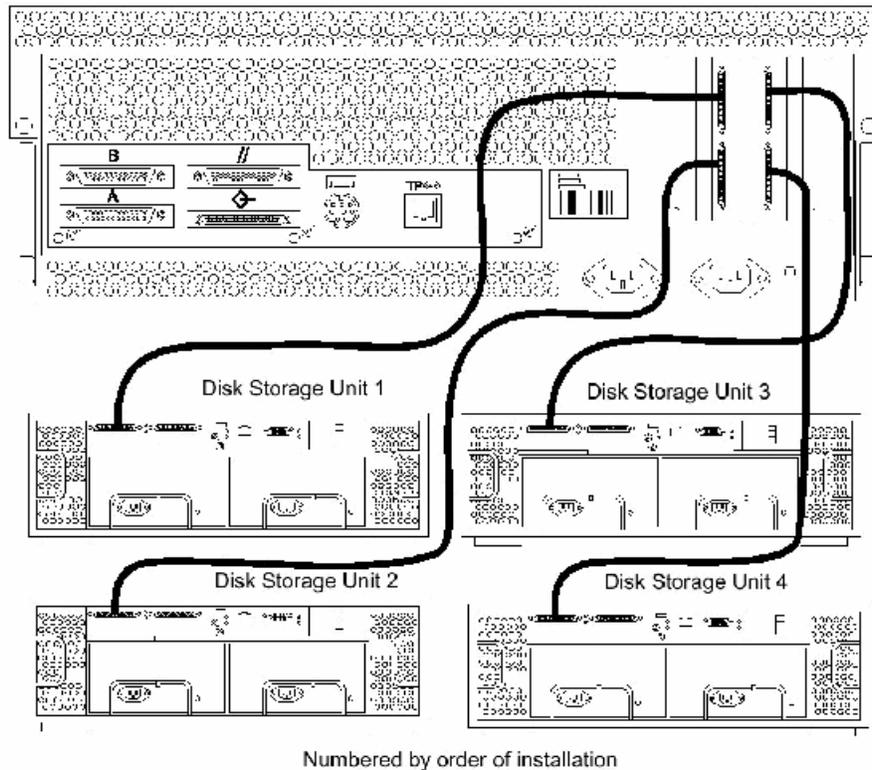


Figure 2. Sun StorEdge N8200 configured with four arrays

Sun StorEdge N8200 Filer Controller System Architecture

The Sun StorEdge N8200 filer controller is a Sun Enterprise 220R server, designed for balanced system performance, accelerating applications at every step. Faster I/O and networking, together with the UPA interconnect, allow fast data fetching. The UltraSPARC CPU provides supercomputing power, and moves data through the UPA at a high speed.

The Sun Enterprise 220R server has an integrated Ultra™ port architecture (UPA). This is based on a packet-switched, crossbar architecture. The controller has nine buffered crossbar-switched processors



that allow the memory to interconnect. This architecture is the basis for the high-powered computing found in the Sun Enterprise 220R server.

PCI Technology

- PCI slot 1 operates at 33 or 66 MHz and supports either a 32-bit or 64-bit, 3.3-volt or universal PCI card
- PCI slots 2 through 4 operate at 33 MHz and provide for 32- or 64-bit, 5-volt or universal PCI cards.
- Sun is an industry leader with PCI/66, which has twice the throughput of standard PCI.
- Two independent PCI buses deliver unparalleled I/O bandwidth—sustained throughput of up to 200 MB/second.

Host Bus Adapter

The PCI differential UltraSCSI host bus adapter:

- Supports data transfers up to 40 MB/second per channel
- Provides dual UltraSCSI channels per card
- Measures 7.5-inches long by 4-inches wide
- Uses the following input power from the host's PCI slot: +5.0VDC @ 3A max., +3.3VDC @ 130ma max., +12.0VDC @ 50ma max.
- Weighs less than 1 pound (0.45 kg)

Controller Key Facts

- Uses the 450-MHz UltraSPARC-II processor
 - Balanced system design
 - High performance UPA at 112.5 MHz or 1.8 GB/second throughput
 - Matching performance enhancement in I/O, networking, and memory access
 - High-performance system bus provides fast access to memory and graphic
 - High-performance I/O
 - Two channels at 40 MB/second UltraSCSI
 - Innovative high performance PCI I/O bus offering dual independent PCI buses, plus 66-MHz PCI support
 - Power supply
 - Second power supply allows for complete redundancy
 - Power supplies are hot-swappable
 - Each power supply has its own power cord
 - System enclosure
 - Rack-optimized 4RU system fits in a standard 19-inch rack
- Front-accessible disk drives and power supplies



Sun StorEdge N8200 Filer Array System Architecture

The heart of the Sun StorEdge N8200 filer array, a Sun StorEdge A1000 array, is the controller module, an intelligent RAID controller. There are redundant power supplies and cooling units in the system, as well as backup batteries on the controller board. Power and fan components in the disk enclosure are redundant and may be replaced while the subsystem is operating.

- Dual power supplies, choice of DC or AC power
- Dual fan trays, each with two fans. Fans speed up in response to higher temperatures. Three fans active out of four will cool the controller indefinitely. Two fans will support the tray for at least 8 hours.
- One controller module with 80 MB of DRAM and battery pack.

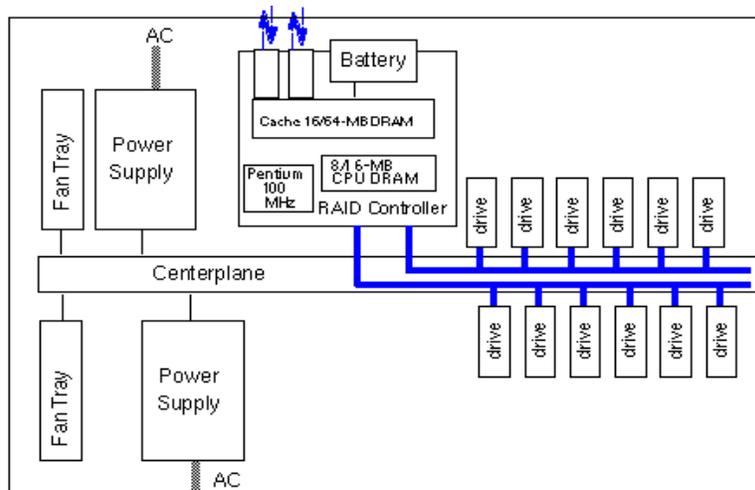


Figure 3. Sun StorEdge A1000 system architecture

Array Key Facts

- Single RAID 5 LUN with hot spare
- 12 x 18-GB data disks; 178-GB usable storage per array
- High RAS is achieved through the use of redundant components.
- The system includes two cooling units (two fans each) and two power supplies.
- The battery system includes battery cells and charger.
- Requires two 100-volt to 240-volt AC power sources.
- The enclosure is designed to be mounted in a standard Sun rack, in a tower stand, or on a table top. No cables are used inside the Sun StorEdge N8200 filer array disk enclosure.
- The intelligent hardware controller in the Sun StorEdge N8200 filer array supports RAID 5. The controller microprocessor does all RAID calculations for I/O and volume management. This helps improve system performance by reducing the CPU load and I/O traffic between the controller and the array.
- The Pentium chip is a 100-MHz processor, which is a socketed PGA part.

- The data cache uses 60-ns DRAM, organized x 36 (either 2 MB x 36 or 8 MB x 36) in a 72-pin package.
- The data cache is controlled by the RPA (RAID parity assist) chipset.
- The data cache is protected from a power failure by a lead acid rechargeable battery. A fully charged battery will protect the cache for a minimum of three days.
- The array controller module has six LEDs visible from the rear of the tray. They indicate the status of the array controller module.



Reliability, Availability, and Serviceability (RAS)

The Sun StorEdge™ N8200 filer was designed to be easy-to-install, easy-to-manage, high-performance, highly available, network-attached storage.

Reliability

- Mirrored boot drive
- Industry-standard Solaris™ Operating Environment
- Installation in under 10 minutes

Availability

- Mirrored boot drive
- RAID 5
- Logging file system minimizes FSCK time
- Hot-spare is default

Serviceability

- Administrator e-mail notification both with and without RAID Manager 6
- SNMP functionality



Installation Data

The Sun StorEdge™ N8200 filer is rackmountable in a standard 19-inch rack.

Sun StorEdge N8200 Filer Controller

Dimensions

	U.S.	Metric
Height	7.0 in.	17.8 cm
Width	17.7 in.	44.9 cm
Depth	27.2 in.	69.6 cm
Weight	65.0 lb.	29.5 kg

Sun StorEdge N8200 Filer Array

Dimensions

	U.S.	Metric
Height	7.0 in.	17.8 cm
Width	21.0 in.	53.3 cm
Depth	17.6 in.	44.7 cm
Weight	62.5 lb.	28.4 kg

Environment

Power Requirements

Sun StorEdge N8200 Filer Controller	100 to 240 VAC, 47 to 63 Hz, 0.4 K VA, 6.25 A
Sun StorEdge N8200 Filer Array	100 to 240 VAC, 50 to 60 Hz, 24 A



Temperature

	Fahrenheit	Celsius
Sun StorEdge N8200 Filer Controller		
• Operating	41°F to 104°F	5°C to 40°C
• Nonoperating	-40°F to 140°F	-40°C to 60°C
Sun StorEdge N8200 Filer Array		
• Operating	41°F to 104°F	5°C to 40°C
• Nonoperating	-4°F to 140°F	-20°C to 60°C

Humidity (noncondensing)

Sun StorEdge N8200 Filer Controller	
• Operating	20 to 80% relative humidity
• Nonoperating	5 to 95% relative humidity
Sun StorEdge N8200 Filer Array	
• Operating	20 to 80% relative humidity
• Nonoperating	93% relative humidity

Noise (in accordance with ISO 9296)

Operating acoustic noise	63.7 dBA
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Regulations

Meets or exceeds the following requirements

Safety	
• Sun StorEdge N8200 Filer Controller	UL 1950, CSA C22.2-No. 950, TUV-EN 60950, CB Scheme to IEC 950 with full deviations
• Sun StorEdge N8200 Filer Array	UL 1950, CSA C22.2-No. 950, TUV-EN 60950
RFI/EMI	
• Sun StorEdge N8200 Filer Controller	FCC Class A, DOC Class B, VCCI Class A, EN 55022 Class B
• Sun StorEdge N8200 Filer Array	VCCI Class 2, FCC Part 15 Class B, EN 55022 Class B/CISPR 22 Class B
X-ray	
• Sun StorEdge N8200 Filer Controller	DHHS 21 Subchapter J: PTB German X-ray Decree



System Management

Operating System

The Sun StorEdge™ N8200 filer is a packaged solution that is delivered with the Solaris™ 7 Operating Environment pre-installed and tuned for performance. The Sun StorEdge N8200 filer will use the Solaris 8 Operating Environment in future releases.

System Administration

The Sun StorEdge N8200 filer is a hardware/software integrated solution that is configured at the factory. The system includes Sun StorEdge N8200 filer performance software, which is a combination of enhancements to help increase performance and restrict functionality to a level expected of an appliance solution, and various modifications to ease administrative tasks. The Sun StorEdge N8200 filer administration tool provides customers with a simple and accessible method of managing a Sun StorEdge N8200 filer that is consistent with other appliance-like solutions in the marketplace.

Protocols

The Sun StorEdge N8200 filer includes support for these protocols:

- NFS v2/v3 UDP and TCP
- Network time protocol (NTP) 3.4y
- SMTP
- Telnet
- SNMP traps from RAID Manager software

MTBF

As of 5/23/00:

- MTBF - 8397 (for 200-MB configuration, hardware only)
- MTBF - 6073 (for 400-MB configuration, hardware only)

Software

- **Performance:** To enhance performance, several things were done which included fine-tuning file system parameters as well as adjusting kernel parameters in the `/etc/system` file.
- **Restricted Functionality:** Modifications were made to the Solaris Operating Environment to restrict functionality to be more consistent with an appliance solution. The result is a system that provides minimal opportunity for user intervention and, more importantly, user error. These modifications included the following:
 - Disabling of start-up scripts found in `/etc/rc2.d`
 - Disabling of unneeded network services in `/etc/inetd.conf` and `/etc/services`
- **Enhanced Functionality:** Additional value was added by installing and configuring several pieces of standard software products:



- Solstice DiskSuite™ v4.2 software was added to mirror the internal system disks of the Sun StorEdge N8200 filer controller. In addition, a monitoring script was developed and added to Solaris Operating Environment's `cron` facility, this script runs hourly and will notify administrators in the event of a problem with the mirrored system disks.
- The Sun StorEdge N8200 filer uses RAID Manager 6.22; an edit was made to the RAID Manager's notification script to allow notifications of array events. This modification is described in the RAID Manager 6 "Installation and Support Guide AnswerBook."
- Solaris PC NetLink software version 1.2 is used to provide CIFS support for Microsoft Windows NT and Microsoft 2000 clients. The Sun StorEdge N8200 filer functions as a member server only, it does not provide authentication services in an NT environment.
- The Solstice Backup v5.5.1 client is pre-installed on the Sun StorEdge N8200 filer.
- **Easy Administration:** A browser-based administration tool was created to simplify the administration of the system. This tool itself does not introduce any new functionality to the system, but provides automation of various administrative processes, such as adding, changing, or deleting users, groups, hosts, and shares. In order to make this tool accessible, the Apache 1.3.6 Web server was added to the system. The administration tool is password protected and allows super-user access only.



Ordering Information

Sun StorEdge™ N8200 Filer Part Numbers

Order Number	Title and Description
SG-FLRN8200-200G	<p>Sun StorEdge™ N8200 filer 200-GB base configuration (one array). Includes the following:</p> <ul style="list-style-type: none">• Two 450-MHz UltraSPARC™-II processors• 2-GB memory• 10/100 BASE-T Ethernet• 12 x 18-GB, 10000-rpm disks• RAID 5• Hot spare• Mirrored boot drive• NFS/CIFS support• Solstice Backup™ client• Sun StorEdge N8000 administrative software
SG-FLRN8200-400G	<p>Sun StorEdge N8200 filer 400-GB base configuration (two arrays). Includes the following:</p> <ul style="list-style-type: none">• Two 450-MHz UltraSPARC-II processors• 2-GB memory• 10/100 BASE-T Ethernet• 24 x 18-GB, 10000-rpm disks• RAID 5• Hot spare• Mirrored boot drive• NFS/CIFS support• Solstice Backup client• Sun StorEdge N8000 administrative software

The Sun StorEdge N8200 filer ships with the controller and array, and is preinstalled with the Solaris™ Operating Environment, Solaris PC NetLink software, Solstice Backup software, and the GUI management tool.



Options

Order Number	Description	Maximum Number Supported
SG-FLRN8200E-200G	Expansion array to add additional capacity to Sun StorEdge N8200 filer (either base configuration)	Three with SG-FLRN8200-200G Two with SG-FLRN8200-400G

Upgrade Ordering

Upgrade offerings to this product will be announced on August 29, 2000 conjunction with the announcement of the new percentage-base model, Sun Upgrade Allowance Program (Sun UAP).



Service and Support

The SunSpectrumSM program is an innovative and flexible service offering that allows customers to choose the level of service best suited to their needs, ranging from mission-critical support for maximum solution availability to backup assistance for self-support customers. The SunSpectrum program provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the SolarisTM Operating Environment software, and telephone support for SunTM software packages. The majority of Sun's customers today take advantage of the SunSpectrum program, underscoring the value that it represents. Customers should check with their local Sun Enterprise Services representatives for program and feature availability in their areas.

SunSpectrum program support contracts are available both during and after the warranty program. Customers may choose to uplift the service and support agreement to meet their business needs by purchasing a SunSpectrum contract. For more information on the SunSpectrum program offerings refer to the following URL:

http://service.central/TS/ESP/SunSpectrum/Feature_Matrix/index.html.

The four levels of SunSpectrum support contracts are outlined below.

Program	Description
Mission-Critical SunSpectrum PlatinumSM Support	Designed to support client-server, mission-critical solutions by focusing on failure prevention, rapid recovery and year round technical services planning. Support is provided 24 x 7.
Business-Critical SunSpectrum GoldSM Support	Includes a complete package of proactive and responsive services for customers who require maximum uptime for their strategic business critical systems. Support is provided 24 x 7.
System Coverage SunSpectrum SilverSM Support	Combines the service expertise, responsive on-site support, technical support by telephone, and SunSolve SM CD/on-line services. Support is provided 8 a.m. to 8 p.m. Mon. through Fri.
Self-Directed SunSpectrum BronzeSM Support	Provided for customers who rely primarily upon their own in-house service capabilities. Enables customers to deliver high-quality service by giving them access to UNIX [®] expertise, Sun-certified replacement parts, software releases and technical tools. Support is provided 8 a.m. to 5 p.m. Mon. through Fri.

Warranty

The Sun StorEdge N8200 filer comes with a standard 3-year warranty and second business day on-site service, and is backed by SunSpectrum enterprise-level support programs.



Glossary

CIFS	Common Internet File System. Enhanced version of the SMB file sharing protocol for the Internet that allows Web applications to share data over the Internet and intranets; similar to WebNFS™ software.
Filer/filer server	A filer is a NAS device which has been designed solely to serve up files to the network. It consolidates storage, simplifies the management of network data, and provides consistent improved performance and increased data availability while reducing administrative complexity and operating costs. Filers are attached directly to a network to provide file-level access to data. A file server has a single focus, to serve up data to the network. An application server's focus is to run user applications.
Latency	Latency is an expression of how much time it takes for a packet of data to get from one designated point to another on a network.
Network-attached storage (NAS)	Network-attached storage is a concept of shared storage on a network. A NAS device is typically a dedicated, high-performance, high-speed communicating, single-purpose server or device.
NFS	Network File System. This is a client/server application that allows a computer user view and optionally store and update files on a remote computer as though they were on the user's own computer. NFS was developed by Sun Microsystems and has been designated a file server standard. Most UNIX® clients use NFS for remote file access.

Materials Abstract

All materials will be available on SunWIN except where noted otherwise.

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Literature				
– <i>Sun StorEdge™ N8200 Filer Just The Facts</i>	Reference Guide (this document)	Training Sales Tool	SunWIN	120359
– <i>Sun StorEdge N8000 Filer Series Data Sheet</i>	Data Sheet	Training Sales Tool	SunWIN	129667 DE1416-0
– <i>Sun StorEdge N8000 Filer Series Customer Presentation</i>	Customer Presentation with Speaker Notes	Training Sales Tool	SunWIN	120157
– <i>Network-Attached Storage White Paper</i>	White Paper	Sales Tool	SunWIN	119836
References				
– <i>Sun StorEdge N8200 Filer PocketFacts</i>	Quick Reference Card	Sales Tool	SunWIN	117531
Competitive				
– <i>Competitive Bulletin (5/00)</i>	Competitive Bulletin	Training	SunWIN	119292
External Web Site				
– <i>Sun StorEdge N8200 Filer Web Site</i>	http://www.sun.com/storage/nas/n8200			
Internal Web Site				
– <i>Sun StorEdge N8200 Filer Internal Web Site</i>	http://webhome.ebay/networkstorage/products/N8200			

