Sun Fire™ 280R Server

Just the Facts

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Sun Fire™ 280R Server Positioning

Introduction

UltraSPARC™-III Processing Power in a Compact Enclosure

The Sun Fire™ 280R server is the latest member of Sun's powerful generation of servers for enterprise network computing based on the UltraSPARC™ processor technology. Building on the SPARC™ and UltraSPARC-II generations of processors, the Sun Fire 280R server uses new the UltraSPARC-III processor technology. Sun Fire 280R servers offer many feature enhancements over previous generation products including the new Sun™ Fire-plane interconnect, Fibre Channel storage, advanced management tools, redundant components, and easy serviceability.

The Sun Fire 280R server provides these enterprise-level features in a compact, rack-optimized 4RU (rack unit) enclosure, giving customers high compute density and the flexibility to scale their processing needs without wasting precious space. The Sun Fire 280R server is an ideal system for service providers, financial institutions, compute-intensive environments, or any user who needs strong processing power in a small footprint.

Sun's commitment to high-performance computing means the Sun Fire 280R server delivers increasing levels of industry-leading performance that users expect from Sun™ servers, while at the same time preserving 100 percent binary compatibility with application software.

Sun Fire 280R Servers

The Sun Fire 280R server supports up to two 750-MHz UltraSPARC-III 64-bit RISC microprocessors each with 8 MB of Ecache (L2), 8 GB of main memory, two internal 18.2-GB or 36.4-GB hot-swap1-inch Fibre Channel disk drives, four PCI slots connected to two high-performance PCI I/O buses that can move over 2.4 GB of data per second, and up to two hot-swap power supplies for N+1 redundancy. The Sun Fire 280R server is designed to satisfy any application or enterprise in which compute density at an affordable price is a high priority.

Sun Fire 280R servers continue the Sun tradition of delivering balanced system design and innovation. The innovative 150-MHz Sun Fire-plane system interconnect, a powerful evolution over previous UPA architecture, provides increased bandwidth and enhanced performance.

The Sun Fire 280R server continues Sun's drive to deliver industry-standard PCI I/O bus, enabling access to hundreds of expansion and networking options. Sun has added innovation to the Sun Fire 280R server PCI I/O bus with dual bus channels providing sustained high performance to the system's PCI slots. In addition, Sun has delivered the advanced 66-MHz PCI, which is capable of 4.8 GB/sec. peak data bandwidth, ideal for high-performance networking requirements.

The Sun Fire 280R server is *not* just an Ultra™ system with a new processor. All UltraComputing™ technologies have been scaled to higher performance including UltraSPARC-III processing power, 150-MHz Sun Fire-plane interconnect, two internal FC-AL channels, and one external UltraSCSI channel for internal and external disks and peripherals. It also uses the revolutionary and innovative, multiple channel PCI bus—with 66-MHz support.

Some key applications are:

- E-mail services, web serving, Internet gateway, and search engines
- Manufacturing
- Government applications
- Encryption
- Database and datamart
- DNS, HTTP, and FTP services
- Financial services applications
- On-line transaction processing (OLTP) and electronic commerce (NetGravity, Broadvision, and Lawson)
- Simulation and compute farms
- Retail
- Education

Product Family Placement

The Sun Fire 280R server is a member of the next generation UltraSPARC-III processor-based workgroup server product family and builds on the existing full line of UltraSPARC-II processor-based products.

UltraSPARC-III Family—The new UltraSPARC-III family includes the dual processor SunBlade 1000 desktop and the Sun Fire 280R server. The Sun Fire 280R server is the first UltraSPARC-III product in the workgroup server product line.

UltraSPARC-II Family—The UltraSPARC-II family scales from single processor systems to a high performance 64-processor server. Workgroup server products in the UltraSPARC-II family range from the low-cost, high-performance uniprocessor Sun Enterprise Ultra™ 5S and 10S servers, the two-way Sun Enterprise 220R and 250 servers, and the four-way Sun Enterprise 420R and 450 servers.

Both generations of workgroup server systems have several things in common, including:

- The UltraSPARC processor
- 100 percent binary compatibility from the low end to the high end, including Sun's high-end server family
- Scalable from the low-end uniprocessor systems to the 64-way Sun Enterprise 10000 (also known as Starfire™) server
- Modular, easy-to-swap components within the product generations

Processor Generation	Servers	Target Users and Markets
UltraSPARC-II	Sun Enterprise Ultra 5S (1-way)	Designed as the lowest priced server solution, the Sun Enterprise Ultra 5S server appeals to customers looking for a low-price system offering expandability, fast application performance, and investment protection. With its "pizza box" form factor, this server is ideal in situations where space and cost are at a premium.

Processor Generation	Servers	Target Users and Markets
UltraSPARC-II	Sun Enterprise Ultra 10S (1-way)	With architecture similar to the Sun Enterprise Ultra 5S server, the Sun Enterprise Ultra 10S server offers an additional low-priced PCI-based system, but with added expandability and a tower enclosure.
UltraSPARC-III	**Sun Fire 280R (2-way)**	**Designed for customers who require a rack solution with Enterprise-class features, the Sun Fire 280R provides high compute density, hot swappable disk drives and power supplies, and Remote System Control (RSC) for remote monitoring from virtually anywhere on the network. Target customers are Internet, application, and network service providers, financial services, compute farms, branch office applications, or any customers running demanding applications in space-constrained environments.**
UltraSPARC-II	Sun Enterprise 220R (2-way)	Designed for customers who require a rack solution at an affordable price. The target customers are service providers, financial services, compute farms, or any customers running demanding applications in space-constrained environments.
UltraSPARC-II	Sun Enterprise 250 (2-way)	Designed for customers who are looking for the RAS features of a high-end system, but in an affordable tower package that is also rackmountable. The Sun Enterprise 250 server is built to handle the most demanding business-critical applications. The Sun Enterprise 250 server provides internal disk expansion and easy to use remote monitoring using Remote System Control (RSC).
UltraSPARC-II	Sun Enterprise 420R (4-way)	Designed to provide compute density at an affordable price. With the 450-MHz UltraSPARC-II processor with 4 MB of external cache, the Sun Enterprise 420R server offers exceptional processing power in a compact, flexible server package. Target customers for the Sun Enterprise 420R are Internet, application, and network service providers, along with financial services, compute farms, or any customers running demanding applications in space-constrained environments.
UltraSPARC-II	Sun Enterprise 450 (4-way)	The Sun Enterprise 450 system's blend of computing power, high storage capacity, disk I/O throughput, and network I/O performance make it ideal for running or front-ending databases from Oracle, Sybase, and Informix or for implementing thousands of other critical two-tier and three-tier client-server business applications.

Key Features and Benefits

Features

- Up to two 750-MHz UltraSPARC-III CPUs with 8-MB Ecache; up to 8-GB error correcting code (ECC) memory
- Space-efficient, rack-optimized 4RU enclosure
- Enterprise-class server features in a compact, versatile workgroup server enclosure

Benefits

- Next-generation UltraSPARC-III technology offers easy performance scalability, providing support for heavy, compute-intensive applications and high-traffic environments
- High compute density gives customers value per rack unit
- Remote monitoring, hot-swappable components, and availability features represent enterprise-class features at a workgroup server price point

Features	Benefits
• N+1 power, with separate power cords	• A fully configured system can run on one power supply; the second power supply is for redundancy
• Remote System Control (RSC)	• Monitor components, administer system via a remote console, receive fault notification and diagnose component faults from anywhere on the network through an easy to use GUI or CLI
• Five-segment SCSC architecture crossbar datapath moves up to 4.8 GB of data per second between CPUs, memory, and I/O channels	• High-speed parallel data flows help enable minimum latency and maximum system resource utilization for sustained high performance under very heavy workloads
• Two high-performance, industry-standard PCI I/O buses support four PCI slots plus onboard UltraSCSI, 10/100 Ethernet, and serial and parallel ports delivering up to 200 MB per second total I/O throughput	• Excellent I/O performance makes the Sun Fire 280R server an excellent web, e-commerce, or Internet gateway server
• A 100 MB/second FC-AL controller supports up to two hot-swap internal 1-inch 18.2-GB or 36.4-GB, 10,000-rpm disks	• Disk drives are front accessible and hot-swappable allowing for ease of servicing
• High-availability cluster configuration options	• This configuration offers increased availability and uptime with Sun Cluster software
• Front-accessible, hot-swap disks and power supplies	• Front doors require no tools to open, allowing easy access of disk drives and power supplies
• The Sun Fire 280R server runs Sun's powerful and dependable Solaris™ 8 Operating Environment and is 100 percent binary compatible with all software that runs on previous generation server products	• The Solaris Operating Environment, recognized as an industry-leading enterprise network operating system, runs over 12,000 of the most extensively tested, highest quality software packages available today for both commercial and technical applications. Sun Fire 280R server users can deploy systems with confidence, knowing their applications can grow and their investment in network technology, software, and training will be protected.
• Solaris Easy Access Server includes many new features, such as Solaris Easy Installer, Sun™ Management Center software, Sun WebServer™ software, DHCP, PPP, and file and print support for Microsoft Windows, NetWare, and Macintosh clients	• Extensive new software tools make it easier than ever to install and use Sun Enterprise servers for a wide range of applications throughout the enterprise network

Key Messages

The Sun Fire 280R server is a member of the new generation UltraSPARC processor-based workgroup server systems. UltraComputing technology has evolved to new levels of performance and technology innovation.

- **Rack-optimized chassis design provides modularity for flexibility, maximum system growth, and expansion potential**
  - Offers the flexibility of starting with a single CPU and adding another CPU later as compute needs grow
  - Provides memory capacity to 8 GB maximum (8 slots using new 128-MB, 256-MB, 512-MB, or 1-GB DIMMs)
  - Supports 18.2-GB or 36.4-GB, 10000-rpm, 1-inch, FC-AL disk drives. Two drive bays support up to 72.8 GB of drive space
  - Has expanded front-access capabilities: up to two hot-swap disk drives, power switch, 5.25-inch removable media bay for DVD or tape drive options, and up to two hot-swap power supplies
  - Allows for high I/O expansion with four long, industry-standard PCI bus slots
- **High-performance UltraSPARC-III CPU processor module**
  - 64-bit SPARC at 750 MHz
  - 8 MB of second-level cache memory
  - 100 percent binary compatibility with the Solaris Operating Environment
  - Runs 64-bit applications unmodified from the Solaris 8 Operating Environment
- **Exceptional throughput**
  - Sun Fire-plane interconnect provides a crossbar-oriented interconnection establishing a 256-bit wide, ECC-protected data path to the CPU
  - Clocked at up to 150 MHz, the Sun Fire-plane crossbar gives a peak throughput of 4.8 GB/second
  - Memory subsystem offers a 576-bit-wide memory path
  - FC-AL controller is integrated on the motherboard
- **One of the industry leaders for networking, connectivity, and I/O performance ratings**
  - 100 Mbps Fast Ethernet through twisted pair is a standard feature in all Sun Fire 280R servers, but the system also maintains connectivity with 10-Mbps networking technology through an autosensing speed switch feature
  - Standard MII port connects to external transceivers, which provide connectivity to media other than the standard integrated 10/100BASE-T twisted pair
  - Advanced networking options include FDDI and additional Fast Ethernet ports through industry-standard PCI option cards
  - Innovative, multiple-channel, industry-standard PCI I/O bus provides sustained high throughput on all four long PCI slots

Availability

The Sun Fire 280R server is scheduled for general availability in March 2001.

Target Users

The Sun Fire 280R server is a powerful dual processor server that incorporates the latest generation processing power in a compact, rack-optimized form factor and offers a full range of enterprise-class RAS features.

Target users for the Sun Fire 280R include service providers, financial institutions, geographically dispersed branch office, and retail networks, or any user who would benefit from the raw processing power of a new generation UltraSPARC-III processor in a compact package that runs the Solaris 8 Operating Environment with enterprise-class RAS features.

Target Markets

Industry/Customer	Key Features to Highlight
Service Providers • Internet access providers • Application providers • Network providers • Portals • E-Commerce providers	• High-performance CPUs • Rackable, high processor density • High memory capacity • Remote component monitoring • Easy access to components • Reliability
Financial Institutions • Brokerage and banking • Transaction processing	• High performance • Compact design • Reliability and serviceability
Branch Offices and Retail • Bank branch offices • Geographically dispersed retail locations	• Reliability and serviceability • Remote monitoring features • Scalability • Compact design
Compute Farms • MCAD • EDA • Simulation • Scientific research	• High performance CPUs • Large external cache size • Flexible, rackmountable enclosure • Availability of applications

Selling Highlights

Market Value Proposition

The Sun Fire™ 280R server provides the latest UltraSPARC™-III processor technology to customers in a compact enclosure that offers enterprise-class RAS features.

- UltraSPARC-III processors help optimize system performance and provide up to 8-MB external cache for maximum throughput.
- The Sun Coherent Scalable Crossbar (SCSC) bus architecture, clocked at 150 MHz, provides performance enhancements over previous generation products.
- The Sun Fire 280R server's compact, rack-optimized enclosure provides high processor density in a package that can be easily rack-mounted and that provides easy access to components without tools for easy serviceability.
- Hot-swappable components, redundant FCAL drives, N+1 redundant 560-watt power supplies and dual power cords ensure reliability and serviceability.
- Remote System Control (RSC) offers sophisticated GUI-based remote monitoring, diagnosis and console access. RSC keeps working even when the system OS goes down and on-board battery backup provides continued remote monitoring capability even when system power is lost.
- Sun Management Center software for full system remote monitoring

Applications

A number of applications ideal for the Sun Fire 280R server will be tested and certified with the Solaris™ 8 Operating Environment. Applications in the Sun Fire 280R server's target markets include the following:

- **Internet**
  - NetGravity
  - Inktomi
  - Remedy
- **E-commerce**
  - Broadvision
  - IBM Net Commerce Pro
  - Intershop
  - Netscape Alliance
  - OpenMarket
  - NetDynamics
- **Financial services**
- **Service providers (SPs)**

- **Retail**
  - JDA
  - GERS
  - ADS
  - Chickasaw Technologies Marcole

Enabling Technology

UltraSPARC™-III Processor

The UltraSPARC™-III processor is part of a third generation of UltraSPARC pipeline-based products. In addition to using a new process technology, the UltraSPARC-III processor provides a higher clock frequency, reduced on-chip latencies, support for greater amounts of level-one and level-two cache, and an integrated external memory controller. Other new features include support for increased reliability through enhanced error detection and correction. At the same time, this new generation of products provides software compatibility with existing UltraSPARC processor -based systems.

UltraSPARC-III processors offer the following features:

- Four-way associative on-chip 64-KB data and 32-KB instruction cache, with up to 8 MB of external level-two cache through an integrated memory controller
- Integrated DRAM controller with support for up to 8 GB of memory can transfer data at up to 2.4 GB/second
- SPARC™ Version 9 architecture compliant
- Binary compatible with all existing SPARC applications
- Enhanced VIS™ instruction set to support advanced multimedia capabilities
- 64-bit address pointers that enjoy transparent compatibility with 32-bit addressing
- 64-KB, 4-way, set-associative data cache
- 32-KB, 4-way, set-associative instruction cache steers up to four instructions per cycle to six execution pipes
- Integrated second-level cache controller supports 8-MB caches. Sustained throughput of one load per cycle and 3.2 GB/second processor-cache bandwidth

UltraSPARC-III processors are binary compatible with all Sun SPARC™ technology-based systems, continuing a characteristic of previous generation products. The UltraSPARC-III processor provides the highest integer and floating-point performance in the SPARC processor family, and is able to address the most computationally demanding applications.

The Sun™ Fire-plane Interconnect

With the Sun™ Fire-plane interconnect, Sun technology continues the tradition of providing superior memory and I/O bandwidth on its workgroup server systems.

Features of the Sun Fire-plane system interconnect include:

- Fast 150-MHz operating frequency for greatly increased performance over previous designs
- Low-latency memory access
- Completely separate address / control and data paths for flexible implementation
- Out-of-order transaction processing enables multiple "in-flight" transactions on the bus at one time.
- High throughput paths to memory clocked at 150 MHz (576-bit wide paths including ECC)

- Integrated support for multiprocessor configurations

FC-AL Storage Controller

The Sun Fire 280R server is the first workgroup server from Sun with standard support for Fiber Channel Arbitrated Loop (FC-AL), an industry-standard, high-speed serial data transfer interface. In addition to its strong performance characteristics, FC-AL also provides powerful networking capabilities, allowing switches and hubs to enable the interconnection of systems and storage into tightly-knit clusters. Such clusters can provide high levels of performance for file service, database management or general purpose computing.

FC-AL is also a high-reliability interconnect. The interface is robust enough to allow multiple devices to be removed from the loop at one time with no interruption in data transfer.

FC-AL has the following characteristics:

- *Industry standard.* The FC-AL development effort is part of the ANSI/ISO accredited SCSI-3 standard, helping to avoid the creation of non-conformant, incompatible implementations.
- *Broadly supported.* All major system vendors are implementing FC-AL as are major disk drive and storage subsystem vendors. Such broad support ensures that users can choose from a wide variety of devices.

On the Sun Fire 280R server, a single private loop connects both internal and external Fiber Channel devices. A single copper HSSDC external connector is provided.

Remote System Control (RSC) and System Service Processor (SSP)

The Sun Fire 280R server is Sun's second workgroup server to feature a System Service Processor (SSP) and Remote System Control (RSC) software, enabling complete console access, monitoring and control of the server from a remote location, using any client device on the network.

The System Service Processor is a fully independent processor card that resides on the system motherboard. Configured to allow communications with a variety of client devices through an Ethernet 10BASE-T interface or a PCMCIA-compatible on-board modem, the SSP allows administrators to remotely query the status of the system, diagnose faults and initiate a system power on/off or reboot. Because it operates independently of the server, the SSP can constantly monitor for a variety of conditions including:

- View of the server's front panel including keyswitch position and LEDs
- Ability to run diagnostic tests and and to configure the server from a remote console
- Remote system monitoring and error reporting, including output from power-on self-test (POST) and OpenBoot Diagnostics
- Remote server reboot, reset, power-on and power-off on demand
- Ability to monitor drive and fan status, and CPU temperatures without needing an administrator near the managed server
- Remote event notification of server problems and a detailed log of RSC events
- RSC battery backup, which allows RSC to operate for up to 40 minutes after a complete power failure

The Remote System Control firmware runs independently of the host and uses standby power drawn from the host system. The System Service Processor includes a battery that provides approximately 40 minutes of power in the event of a power failure. This allows RSC hardware and software to continue to be

effective even when the server operating system goes offline, and can send notification of hardware failures or other events to administrators via pager or e-mail.

System Architecture

Key Facts

- The Sun Fire™ 280R server uses the new generation, UltraSPARC™-III processor architecture.
- A 750-MHz processor with 8-MB external cache is available at the time of the product announcement.
- Internal Fibre Channel storage controller
- Optimized system design
- High-performance Sun™ Fire-plane system interconnect. Bus speed of 150 MHz with 2.4 GB/second throughput
- Significant performance enhancement in I/O compared to the UltraSPARC-II processor implementation

Technical Fact Summary

- **High-performance Sun™ Fire-plane interconnect provides improved performance and more than twice the system bandwidth than in previous generation products**
- **Advanced remote monitoring capability with Remote System Control (RSC)**
  - Remote console access available from any network interface
  - Extensive diagnostic and notification capability
- **Internal Fibre Channel drive expandability**
  - Up to two internal 36.4-GB, hot-swappable Fibre Channel hard drives
  - Up to 72.8 GB total internal Fibre Channel storage
- **High-performance memory subsystem**
  - Up to 8-GB memory using eight 1-GB DIMMs; DIMMs installed in groups of four
  - Supports 128-MB, 256-MB, 512-MB, and 1-GB DIMMs
- **High performance I/O**
  - Once PCI channel supporting three 32/64-bit 33-MHz 5v or universal PCI slots
  - One PCI channel supporting one 32/64-bit 33- or 66-MHz 3.3v or universal PCI slot
  - External 40-MB/second UltraSCSI interface
- **Expansion to advanced networking**
  - Fast Ethernet, 100BASE-T, autosensing, and autoswitching to 10BASE-T for backward compatibility
  - MII connector to Fast Ethernet for connection to other types of Ethernet transceivers and media
  - PCI networking options include Gigabit Ethernet, ATM, token ring, and FDDI

- **Power supplies**
  - N+1 fully redundant 560-watt power supplies
  - Power supplies are hot-swappable
  - Dual independent power cords
- **System enclosure**
  - Rack optimized 4 rack unit (RU) chassis
  - Fits into a standard 19-inch wide, 36-inch deep standard commercial rack
  - Front access to disk drives and power supplies for servicing system in a rack

UltraSPARC-III Processor

The Sun Fire 280R server uses next generation UltraSPARC-III processor technology. The latest generation of the SPARC processor family and the third generation of 64-bit UltraSPARC chips. The UltraSPARC-III processor operates at significantly higher processor speeds than those available with previously available processor architectures. The Sun Fire 280R server will be available with 750-MHz processors. UltraSPARC-III processors are available with up to 8 MB of high speed SRAM external cache memory for excellent system performance and high throughput.

Like previous generations of SPARC processors, the Sun Fire 280R server's processors are mounted on field-installable cards for ease of installation and upgrades.

Features	Benefits
• UltraSPARC-III processor architecture	• Latest generation processor technology being offered on a highly flexible workgroup server product
• 750-MHz processor speed	• Fastest application performance of any Sun workgroup server
• The Sun Fire 280R server CPU is mounted on a field-installable module card with associated, data buffers, up to 8 MB of external cache and an on-board memory controller	• Field-installable CPU cards facilitate ease of upgrades and system service

Sun Fire-plane System Interconnect

Integral to the Sun Fire 280R server system design is a new generation, high-speed Sun Fire-plane system interconnect. This enhanced implementation of previous system bus designs includes a 144-bit-wide CPU datapath and a 576-bit-wide memory datapath.

The Sun Fire-plane bus data transfer rate is 150 MHz, 33 to 50 percent higher than in previous workgroup server implementations.

Features	Benefits
• 150-MHz data transfer rate	• Supports advanced, high-speed UltraSPARC-III processors
• 144-bit wide CPU datapath and 576-bit wide memory datapath	• High-performance CPU and memory access
• On-board memory controller	• Helps reduce memory latency

Memory

The Sun Fire 280R server has eight memory slots supporting up to 8 GB of DRAM memory. Memory is organized into groups of four DIMMs. DIMMs must be installed in groups of four identical DIMMs.

Feature	Benefit
• Up to 1-GB DIMMs supported	• Provides up to 4-GB memory per processor for enhanced system performance

System I/O - High-performance, Next-generation PCI Technology

System interconnect for the Sun Fire 280R server is provided by two industry-standard peripheral component interconnect (PCI) data buses.

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

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-bit or 64-bit, 5-volt or universal PCI cards.

Feature	Benefit
• 66-MHz PCI with 200 MB/second bandwidth	• Provides high-performance, high-reliability, industry-standard internal storage

Reliability, Availability, and Serviceability (RAS)

Reliability, availability and serviceability are three aspects of a system's design contributing to continuous operation and minimizing system downtime for services. Together, reliability, availability, and serviceability provide for near continuous system operation.

- **Reliability**

  Reliability refers to a system's ability to operate continuously without failures and to maintain data integrity.

- **Availability**

  System availability refers to the percentage of time that a system remains accessible and usable.

- **Serviceability**

  Serviceability relates to the time it takes to restore a system to service following a system failure.

The Sun Fire™ 280R server's reliability, availability, and serviceability features include:

- Remote System Control (RSC) remote monitoring and administration capability
- Error correction and parity checking for improved data integrity
- Easily accessible LED status indicators
- Hot-pluggable disk drives
- Support for RAID disk configurations
- Environmental monitoring and fault protection
- Redundant power supply support
- Hot-swappable power supplies
- Improved system monitoring and diagnostics software

Installation Data

Cabinet

Hardware Dimensions

	U.S.	Metric
Height	6.95 inches	17.6 cm
Width	17.25 inches	43.8 cm
Depth	27.25 inches	69.2 cm
Shipping Weight (approximate)	75.0 lb.	34.0 kg
Fits into a 19-inch wide 36-inch deep standard commercial rack.		

Environmental Specifications

Power	
• Operating	• 100–240 VAC (47–63 Hz)
Operating Environment	
• Relative humidity	• 20% to 80% noncondensing, 27° max. wet bulb
• Temperature	• 5 to 40° C (41 to 104° F)
• Altitude	• 0 to 3,000 meters (0 to 10,000 feet)
• Vibration	• 0.0002 G 2 /Hz, flat from 5–500 Hz (0.31 GRMS); z-axis only
• Shock	• 3 G peak, 11 milliseconds half-sine pulse
• Declared acoustics	• 69 dB(A)
Nonoperating Environment	
• Relative humidity	• 93%, noncondensing
• Temperature	• -20 to 60° F (-4 to 140° F)
• Altitude	• 0 to 12,000 meters (0 to 40,000 feet)
• Vibration	• x-axis and y-axis: 0.0004 G 2 /Hz flat from 5–500 Hz (0.472 GRMS); z-axis: 0.0008 G 2 /Hz flat from 5–500 Hz (0.629 GRMS)
• Declared acoustics	• 69 dB(A)
• Handling drops	• 25 mm

Regulations

Meets or exceeds the following requirements:

Safety	UL 1950, CSA C22.2 No. 950, TUV EN 60950, IEC950, CB Scheme with full deviation including Nordic deviations EMKO-TSE (74-SEC) 203, ZH1/618
RFI/EMI	FCC Class A, Industry Canada Class A, VCCI Class A, EN 55022 Class A, EN61000-3-2:1995, EN61000-3-3:1995
X-ray	DHHS 21 Subchapter J; PTB German X-ray decree

System Management

System Administration

Built into the Solaris™ 8 Operating Environment are systems management and security features that will help deliver the computing environment demanded by these customers. Sun also offers unbundled systems management products that will supplement the systems management features in the Solaris 8 Operating Environment. Together, the Solaris 8 Operating Environment management features and Sun's unbundled systems management products create one of the most stable and available computing environment, in the industry.

Virtually any administrative task can be executed over a remote connection from any client by an authenticated administrator. And since a Solaris Operating Environment rarely requires rebooting, administrators will not lose their network connection when adding new software or reconfiguring the system. Solaris Operating Environment applications can be installed or upgraded on a Solaris server without affecting users and without disabling the network services running on that computer.

Management Function	**Sun Management Tools**	**Standard or Sold Separately**
System installation, software installation	• Sun OpenBoot™ firmware • Solaris Web Start and Solaris Web Start Wizards™	• Standard • Standard
System configuration	• Solstice AdminSuite™ • Solaris Management Console™ • Remote System Control (RSC)	• Standard • Standard • Standard
User administration	• Solstice AdminSuite • Solaris Management Console • Remote System Control (RSC)	• Standard • Standard • Standard
Security management	• Solstice AdminSuite • Sun Enterprise Authentication Mechanism™ • SunScreen™ Secure Net • SunScreen SPF-200	• Standard • Standard • Sold separately • Sold separately
Storage management	• Solstice AdminSuite • Solstice DiskSuite™ • Solstice Backup™ • VERITAS Volume Manager • VERITAS File System • Sun StorEdge LibMON™ • VERITAS NetBackup • Sun StorEdge™ Instant Image	• Standard • Standard • Standard • Sold separately • Sold separately • Sold separately • Sold separately • Sold separately
System monitoring	• Solstice AdminSuite • Solaris Management Console • Sun™ Management Center • Solstice Site Manager™ • Solstice Domain Manager™ • Remote System Control (RSC)	• Standard • Standard • Sold separately • Sold separately • Sold separately • Sold separately

Management Function	Sun Management Tools	Standard or Sold Separately
Tuning, resource, and performance management	• Solstice AdminSuite • Solaris Resource Manager™ • Solaris Bandwidth Manager • Sun Bandwidth Allocator	• Standard • Sold separately • Sold separately • Sold separately
Fault detection and recovery	• ShowMe How™ • Power On Self Test (POST) • OpenBoot Diagnostics • SunVTS™ • Sun Management Center • Sun Cluster	• Standard • Standard • Standard • Standard • Standard • Sold separately
Upgrade administration	• ShowMe How	• Standard
Management application development environments	• Sun Management Center • Solaris WBEM Services • Solstice Enterprise Agents™ • Solstice Enterprise Manager™ • Solstice CMIP • Solstice™ TMN Product Set	• Standard • Standard • Standard • Sold separately • Sold separately • Sold separately

OpenBoot Diagnostics

OpenBoot Diagnostics (OBDiag) reside in flash PROM on the server's main logic board. OBDiag can isolate errors in the following system components:

- Main logic board
- Diskette drive
- CD-ROM drive
- Tape drive
- Disk drives
- Any option card that contains on-board self-test capabilities

OBDiag tests not only the main logic board, but also its interfaces:

- PCI
- SCSI
- Ethernet
- Serial
- Parallel
- Keyboard/mouse

OBDiag reports test results via the LEDs located on the system front panel. OBDiag also displays detailed diagnostic and error messages on a local console or terminal, if one is attached to the system.

OBDiag tests run automatically under certain conditions. Users can also run OBDiag interactively from the system OK prompt. When users run OBDiag interactively from the OK prompt, they invoke the OBDiag menu, which lets users select which tests they want to perform. The system also provides configuration variables that users can set to affect the operation of the OBDiag tests.

OpenBoot Firmware

The OpenBoot firmware is stored in the boot programmable read-only memory (PROM) of the system. It is executed immediately after the customer turns on the system. The primary task of the OpenBoot firmware is to boot the operating system from either a mass storage device or from a network. The firmware also provides extensive features for testing hardware and software interactively.

The OpenBoot firmware provides a command line interface for customers at the system console. Customers can enter the OpenBoot environment by halting the operating system, using the Stop-A key sequence from the keyboard, or by power-cycling the system.

The OpenBoot device tree is a data structure that describes both the permanently installed and plug-in devices attached to a system. Both the user and the operating system can determine the hardware configuration of the system by inspecting the OpenBoot device tree.

Power On Self Test (POST)

The POST diagnostic code resides in flash PROM on the system's main logic board. It runs whenever the system is turned on or when a system reset command is issued. POST tests the following system components:

- CPU modules
- Memory modules
- NVRAM
- Main logic board

POST reports its test results via LEDs located on the system keyboard and on the system front panel. POST also displays detailed diagnostic and error messages on a local terminal, if one is attached to the system's serial port A.

ShowMe How Software: State of the Art Installation and Maintenance Instruction

ShowMe How software is a documentation system that presents information in a highly understandable multimedia format. ShowMe How software is included in Solaris Easy Access Server package. Installation and service tutorials, as well as reference information provide users with comprehensive, easy-to-use instruction. The ShowMe How tool streamlines installation and maintenance to help lower service costs and maximize system uptime. Some of the features of this CD-ROM distributed tool are:

- Movies of installation and replacement procedures (can be played through ShowMe TV™ software)
- Photo sequences with narrated installation and replacement procedures
- Text-based instructions (can be viewed on-line and printed, excerpted from standard Sun documentation)
- Photos with active callouts link to more detailed photos and text-based reference information

Solaris Bandwidth Manager Software

Solaris Bandwidth Manager software, available with Solaris ISP Server software, allows the administrator to control the bandwidth assigned to particular applications, users, and departments that share the same Internet link. By installing Solaris Bandwidth Manager software on their network's major links and application servers, and by setting consistent policies, customers can distribute bandwidth evenly. And customers can prioritize traffic, preventing a small number of applications or users from consuming all available bandwidth.

Solaris Bandwidth Manager software enables customers to:

- Provide differentiated classes of service to users, and bill accordingly
- Provide bandwidth to priority users, applications, or servers
- Reduce traffic congestion and increase network efficiency
- Control users and applications in their access to network resources
- Gather detailed network use statistics and accounting data for usage-based billing

Solaris Bandwidth Manager enables network service providers to get the most out of their existing network resources. It helps them to enable adequate levels of service to their customers, and collect accurate accounting information for usage-based billing.

Solaris Management Console Software

Solaris Management Console software, an integral component of Solaris Easy Access Server, makes it easy for administrators to configure and administer Solaris Operating Environment systems. Based on Java™ technology, Solaris Management Console software can launch any UNIX® application on any Solaris server in a network. It provides views of servers on the network as well as applications on those servers, which allows for easy local and remote administration of multiple servers running Solaris Management Console software. It also delivers powerful capabilities to make the process of adding users, hosts, or applications as simple as pointing and clicking from virtually any client on the network.

Solaris Management Console software enables administrators to register other Solaris Management Console servers and applications on the network. When the console is accessed, it dynamically configures tree views of registered hosts and services, making it easier to manage each Solaris server. Solaris Management Console software enables administrators to view activity on all their servers and modify applications and services running on them.

Solaris Management Console software allows administrators to launch applications, such as administration tools on a remote server, while monitoring the application via a light front-end GUI on the client. This eliminates the need to download large applications over the network and install and run them on the client. With Solaris Management Console software, remote servers can be managed easily with tools already located on the server. This remote capability allows administrators to manage administrative and network services from home or virtually any other location without having to come in to the network operation center when a trouble call comes in.

Solaris Management Console software makes Solaris Operating Environment administration easier by providing:

- Centralized administration—current Solaris Operating Environment administration tools can be integrated and run from one location
- Centralized management—all servers on a network can be managed from a single console
- Single login—eliminates multiple logins into applications launched by Solaris Management Console software
- Instant access to administration tools by running existing Solaris Operating Environment administration tools found in Solaris Easy Access Server software

Solaris Management Console software also provides a set of wizards to simplify complex administration tasks:

- DNS server configuration
- DNS client configuration

- Default router modification
- Change root password
- Network connection configuration
- Shutdown/restart computer

Solaris Administration Wizards can be run from Solaris Management Console software or invoked via the command line. The wizards make the Solaris Operating Environment easy to administer by providing a point-and-click, Java technology-based graphical user interface (GUI) for configuring Solaris systems.

Remote System Control (RSC) and System Service Processor (SSP)

The Sun Fire 280R server is Sun's second workgroup server to feature a System Service Processor (SSP) and Remote System Control (RSC) software, enabling access, monitoring, and control of the server from a remote location, using any client device on the network.

The System Service Processor is a fully independent processor card that resides on the system motherboard. Configured to allow communications with a variety of client devices through an Ethernet 10BASE-T interface or a PCMCIA-compatible on-board modem, the SSP allows administrators to remotely query the status of the system, diagnose faults and initiate a system power on/off or reboot. Because it operates independently of the server, the SSP can constantly monitor for a variety of conditions including:

- Remote console functions available through both the Ethernet port and modem
- View of the server's front panel including keyswitch position and LEDs
- Ability to run diagnostic tests and and to configure the server from a remote console
- Remote system monitoring and error reporting, including output from power-on self-test (POST) and OpenBoot Diagnostics
- Remote server reboot, reset, power-on and power-off on demand
- Ability to monitor drive and fan status, and CPU temperatures without needing an administrator near the managed server
- Remote event notification of server problem and a detailed log of RSC events
- RSC battery backup allows RSC to operate for up to 40 minutes after a complete power failure

The Remote System Control firmware runs independently of the host and uses standby power drawn from the host system. The System Service Processor includes a battery that provides approximately 40 minutes of power in the event of a power failure. This allows RSC hardware and software to continue to be effective even when the server operating system goes offline, and can send notification of hardware failures or other events to administrators via pager or e-mail.

Solaris Resource Manager Software

Solaris Resource Manager software is a tool for enabling resource availability for users, groups and applications. It provides the ability to allocate and control major system resources such as CPU, virtual memory, and number of processes. Solaris Resource Manager software is the key enabler for server consolidation and increased system resource utilization. With this product, multiple applications and groups receive a consistent level of service on a single server. In fact, resources can be allocated to the individual user. Resource utilization can actually increase because unused capacity is dynamically allocated to active users and applications. Systems can become easier to manage because system

administrators have the ability to set and enforce resource usage policies. Solaris Resource Manager software makes resource usage data available for use in user-defined reports, accounting tools and scripts.

Solaris Resource Manager software includes the following features:

- Ability to control CPU, virtual memory, number of processes, number of logins, and connect time
- Dynamically allocate resources according to predefined policies
- Map resources to groups within applications and individual users within groups
- Ability to automate dynamic resource allocation through easy to set resource policies

Solaris WBEM Services

Part of the Solaris Easy Access Server, Solaris WBEM Services makes the Solaris Operating Environment manageable by tools from other enterprise management vendors. It also allows Solaris software tools to manage existing heterogeneous networks. This is because WBEM is compatible with existing major protocols, such as Simple Network Management Protocol (SNMP), Desktop Management Interface (DMI), and Common Management Information Protocol (CMIP). Developers can write WBEM agents or providers to convert information from these protocols to the CIM schema.

Solaris WBEM Services contains a set of tools (Sun WBEM SDK) and services to make it easier for software developers to create applications based on the CIM schema and XML/HTTP communication standards that manage Solaris software systems and administer the Solaris Operating Environment. By combining information from diverse applications, objects from different vendors can be managed as if they were from one vendor, which can greatly reduce the complexity and cost of managing such a heterogeneous system.

Solaris Web Start Software

Solaris Web Start software, a key component of the Solaris Operating Environment, is an easy-to-use Java technology-based application that guides system administrators through the installation of both the Solaris Operating Environment and copackaged application software. Solaris Web Start software makes installing the Solaris Operating Environment as simple as clicking a button. Solaris Web Start software offers the industry's first Web-based installation process, enabling all of the setup and administration to be done locally or remotely through a web browser. It also virtually eliminates the UNIX system administration normally associated with software installation and setup. As a result, Solaris Operating Environment and co-packaged software can be installed by less-experienced administrators, or administrators familiar with Microsoft Windows installations, safely and easily.

Solaris Web Start Wizards Software

Solaris Web Start Wizards technology extends the point-and-click simplicity of Solaris Web Start software, bringing this same ease of use to applications written for the Solaris Operating Environment. Built into new applications, Solaris Web Start Wizards software simplifies the installation, setup, and administration of native Solaris Operating Environment and Java technology-based applications.

Applications built with Solaris Web Start Wizards software can be installed on a Solaris Operating Environment system locally or remotely from virtually any client running a web browser supporting the Java programming language.

With Solaris Web Start Wizards software, the source for an application may be a CD-ROM drive on the administrator's PC, a drive on the network, or a URL on the Web. The administrator may be using a Solaris Operating Environment workstation, a Microsoft Windows or Macintosh PC, or a network computer.

Solaris Web Start Wizards software is based on technology supplied by and supported by InstallShield Software Corporation, a industry-leading install tools vendor. For administrators, the inclusion of Solaris Web Start Wizards software with the Solaris Operating Environment makes installing applications as easy as installing Microsoft Windows applications.

Solstice AdminSuite Software

Solstice AdminSuite software is a collection of graphical user interface tools and commands that enable system administrators to locally or remotely perform tasks such as managing users, groups, hosts, system files, printers, disks, file systems, terminals, and modems.

Solstice Backup Software

The Solstice Backup software products provide a tightly integrated backup and storage management solution for distributed enterprise environments. It provides scalable, high-performance, lights-out data protection and management services for environments ranging from a stand-alone server to networks with hundreds of multi-platform systems and multi-gigabytes of data. This solution delivers the best heterogeneous data protection available today and provides consistent, reliable data protection as well as comprehensive, automated storage management. These products help reduce administrative overhead, improve data accessibility to users and applications, and reduce cost of ownership.

Solstice Backup software allows a Solaris Operating Environment server to provide automated, high-performance backup, recovery, and storage management services to a wide array of machines on the network. This heterogeneous platform support enables a consistent, centralized approach to data storage management across the enterprise. Solstice Backup software, through the use of its SNMP module, can be integrated with Solstice Site Manager software, Solstice Domain Manager software, and Solstice Enterprise Manager software for improved, centralized network management of larger, complex environments.

Solstice Backup software provides simple, centralized administration through a single, unified view of the entire data management operation from any point on the network. All Solstice Backup software applications are cooperatively managed and fully integrated, greatly simplifying administration in a large, dynamic environment. Intuitive user interfaces simplify administrative tasks such as configuring clients and servers and setting up enterprise-wide backup schedules for file systems and databases. Network users can also backup, recover, or archive their local files without assistance from the system administrator.

Solstice Backup software delivers high-speed backup through parallel processing of client backup that can be directed to multiple devices simultaneously. This dramatically improves client performance and backup throughput for reduced backup time.

Through archival services, data can be optionally removed from disk for conservation of storage space once it has been safely stored off-line. Hierarchical storage management services automatically moves less frequently used data on disk to less expensive media, freeing up on-line storage space. Automated media handling such as labeling and mounting media reduces operator intervention.

Solstice Backup Server Edition software brings high-performance, automated, unattended parallel backup and restore capabilities to stand-alone servers. The Server Edition software is ideally suited for backup/restore services for high-volume database and file servers. The Server Edition software can be upgraded to the Network Edition software to support network backups.

Solstice Backup Network Edition software delivers network storage backup for distributed networks of servers and clients. The Network Edition software is ideally suited for multiplatform, enterprise-wide installations.

Solstice CMIP Software

Solstice CMIP 8.2.1 software is the foundation of the Solstice Telecommunications Management Network (TMN) product family. It is the Common Management Information Protocol (CMIP) for other Solstice TMN software products such as Solstice Enterprise Manager software, Solstice TMN Agent Toolkit, Solstice TMN Agent Tester, Solstice TMN/SNMP Q-Adaptor, and Solstice TMNscript software.

Solstice CMIP software is the ideal solution for system integrators and telecommunications equipment manufacturers who want to develop CMIP-based management applications for their products and to deploy these applications to their customer base.

Solstice CMIP software enables the development and deployment of TMN applications and is delivered as two related products. The Solstice CMIP Standard Development Environment (SDE) is used to develop management applications that conform to the TMN management model.

Solstice CMIP Runtime (RT) is a standard implementation of the CMIP and the Common Management Information Service (CMIS). When it is combined with the SunLink™ OSI Communications Platform, Solstice CMIP RT forms a TMN Q3 stack and supports any application developed using Solstice CMIP SDE.

Solstice DiskSuite Software

Solstice DiskSuite software, part of Solaris Easy Access Server, is a disk and storage management solution for enterprise environments. It provides high data availability and reliability, delivers excellent I/O performance, and simplifies large system and disk administration. With Solstice DiskSuite software, customers get a powerful set of tools to enhance data availability.

- **Mirroring**

  Solstice DiskSuite software provides a comprehensive data-redundancy solution. It transparently maintains a mirror copy of data on another disk, and automatically uses the surviving copy in the event of hardware failure.

- **RAID 5**

  The RAID 5 feature in Solstice DiskSuite software provides highly available data storage at a lower cost using less disk space than mirroring. By distributing parity information across all disks in the RAID array, it allows recovery from any single disk failure within the array without the loss of data.

- **Hot spare**

  Online system recovery is supplemented by the use of a hot-spare utility that automatically replaces failed mirror or RAID-5 components. This facility migrates new partitions to replace failing ones. Users continue to access the surviving copy of the data while a new mirror is automatically generated, with no interruptions of operation.

- **UNIX File System (UFS) logging**

  When coming back online after a reboot, UNIX software typically checks file systems for integrity. Although a time-consuming process, especially on large systems, it was necessary to avoid data corruption. With the UFS logging feature in Solstice DiskSuite software, the need for this process has been eliminated. Reboots are much shorter, and system recovery is faster.

Solstice DiskSuite software offers a powerful yet simple graphical user interface (GUI) in addition to the traditional command-line interface. The GUI provides error-free setup of disks such as mirrors and UFS logs, as well as easy, on-going administration of disk subsystems. It delivers a visual representation of the storage subsystem along with drag-and-drop capabilities, both of which are invaluable in managing large, complex disk subsystems.

Other Solstice DiskSuite software features:

- Disk striping enables parallel I/O and load balancing for improved performance
- Alternate pathing support enables Solstice DiskSuite software to use multiple data paths in the case of failure
- A performance monitor helps eliminate bottlenecks
- Concatenation and the grow file system command allow the construction of large, logical devices, and enable online expansion and reconfiguration

Solstice Domain Manager Software

Solstice Domain Manager software is designed for managing larger sites (1,000 to 10,000 nodes). Solstice Domain Manager software provides the scalability, extra features, and user tools needed to manage large sites or multiple sites effectively. Solstice Domain Manager software includes Solstice SunNet Manager™ 2.3 software with no restriction on the number of managed nodes, the full version of Solstice Cooperative Consoles, and an advanced layout tool. Solstice Domain Manager software also includes the same tools as Solstice Site Manager software.

To achieve a high level of scalability and remote management, the proxy agent is included in Solstice Domain Manager software. The proxy agent distributes the SNMP polling allowing Solstice Domain Manager software to manage up to 10,000 nodes. The proxy agent also facilitates remote management as all of the polling is localized at the remote site and information is sent back to console via reliable RPC.

Solstice Domain Manager software has full console distribution, meaning it can send and receive information to other consoles. Multiple Solstice Site Manager software systems can feed information into a Solstice Domain Manager software or multiple Solstice Domain Manager software systems, hooked up as peer-to-peer, to share administration capabilities. Solstice Domain Manager software also has an advanced topology Layout Tool. In a large network there are many icons, and users are concerned about the organization of these icons on the console. The Layout Tool addresses this concern by organizing icons by visual representation on the console.

Solstice Domain Manager software solutions should meet the majority of management needs. But just in case, there are 300+ applications that run on Solstice Site Manager and Solstice Domain Manager software for additional network management and data analysis.

Solstice Enterprise Agents Software

Solstice Enterprise Agents software, included in Solaris Easy Access Server, enables a Sun server to be managed from Simple Network Management Protocol (SNMP)-based system/network management tools. Solstice Enterprise Agents software is based on a new extensible agent technology or manager/subagent technology. The manager agents receive and respond to SNMP or desktop management interface (DMI) requests. After retrieving the appropriate values from the respective subagents, responses are sent. The subagents manage information bases (MIBs or MIFs) designed for specific components and applications.

Solstice Enterprise Manager Software

Solstice Enterprise Manager (Solstice EM) software is an advanced management platform designed for managing large enterprises or complex network element devices. It provides the scalability and features to better organize and manage large environments.

Solstice EM software is designed for customers who need to:

- Accommodate network growth
- Automate identification of network problems
- Manage multiple protocols from a single system

Solstice EM software is a standards-based, object-oriented, distributed network management platform that allows customers to monitor, evaluate, and refine the network. It provides tools for performing common network management tasks, such as fault management, performance management, and configuration management, and includes an application programming interface that allows developers to integrate Solstice EM software capabilities into their network management environment.

Solstice EM software provides the following features and functions:

- Support for CMIP, SNMP, and Solstice SunNet Manager software remote procedure call (RPC) protocols
- Full conformance with the TMN standards
- Support for multiple concurrent users
- Graphical user interface (GUI) applications for managing networks
- Application programming interface (API) for developing user-specific applications that integrate with the Solstice EM software platform

To help isolate complex system or network problems, the Solstice Enterprise Manager Nerve Center technology provides advanced event correlation. Plus, Solstice Enterprise Manager supports multiple protocols such as SNMP, CMIP, and allows support for proprietary protocols.

Solstice Cooperative Consoles™ software will connect Solstice Site Manager software and Solstice Domain Manager software to Solstice Enterprise Manager software.

Solstice Site Manager Software

Solstice Site Manager software is designed for small site management of PC-LAN servers, networking, and UNIX technology-based devices. Solstice Site Manager software is intended to address small site management by cost-effectively centralizing the management efforts.

Solstice Site Manager software includes Solstice SunNet Manager 2.3 software with a license restriction of 100 nodes, along with the sender portion of Solstice Cooperative Consoles software which allows management data (topology, events, and traps) to be forwarded to Solstice Domain Manager software.

All of the Solstice SunNet Manager software tools are incorporated into Solstice Site Manager software. Discover Tool automatically finds devices on the network and populates the database. Request Management handles data or event requests. Browser Tool simplifies reviewing problem areas. Finally, Grapher Tool allows data to be quickly displayed in 2D or 3D graphics.

Solstice Site Manager software also includes the SNM Proxy agents for remote management. In this scenario, all of the polling is localized at the remote site and sent back to the console via reliable RPC.

Solstice Site Manager software can centralize LAN management by accessing the NetWare Management Agent (NMA) 2.0. This agent resides on a NetWare server that also has TCP/IP installed on it. The NMA agent allows Solstice Site Manager software to manage the NetWare server's file system, print queues, user groups (who is logged in), and other key attributes.

Solstice Site Manager software can also import the topology data from the Novell ManageWise network management console. With this feature, Solstice Site Manager software can view the PCs that are on the NetWare LAN as a separate view from the IP network that it is managing.

Solstice TMN Product Set

Sun provides a range of telecommunications management network (TMN)-based products that let customers develop and deploy both agent and manager applications for the network. The products in the Solstice TMN product set are listed below:

- Solstice GDMO Builder
- Solstice TMN Agent Toolkit
- Solstice TMN Agent Tester
- Solstice Enterprise Manager software
- Solstice TMNscript Toolkit™
- Solstice TMNscript Runtime™
- Solstice TMN/SNMP Q-Adaptor Toolkit
- Solstice CMIP Runtime
- Solstice Enterprise Manager Dev Plus Kit
- Solstice OSI
- Solstice CMIP SDE
- Solstice TMN/SNMP Q-Adaptor Runtime

The definition of managed objects, software abstractions representing the management view of resources, is the core of network management using the TMN model. The Solstice GDMO Builder includes most of the object models that have been defined by standards organizations, for example ISO and the ITU-T. This means that customers can import and use objects from these models and then either modify them or add to them to tailor the object model to their own needs.

The Solstice GDMO Builder software provides the following tools:

- The Model Editor—a graphical tool for browsing and editing GDMO templates
- A GDMO/ASN.1 Semantic Checker—so customers can check the validity of the GDMO model
- A Proforma generator—a graphical tool for producing conformance statements
- A central database for storing GDMO models—so users can reuse objects they have created

Solstice TMN Agent Toolkit software greatly simplifies the development of TMN agent applications. It does this by automating a large part of the agent development process.

Solstice TMN Agent Toolkit has the following components:

- An ASN.1/GDMO compiler
- A library of functions common to all TMN agents (referred to as the core agent) with APIs to use when adding functions
- Commonly used object modules, used for logging information and forwarding events

Solstice TMNscript software provides a simple interface to CMISE services, allowing easy management of information model data. This facilitates the integration of systems based on the telecommunications management network (TMN) model and legacy systems. Solstice TMNscript software can also be used to build stand-alone applications, to create dedicated test tools quickly or to prototype complex management services.

Solstice TMNscript software allows customers to develop applications in the following languages:

- **Tcl**

  Solstice TMNscript software provides an extension to the generic Tcl scripting language so that customers can access CMISE services from within an application written in the Tcl language.

- **Java programming language**

  Solstice TMNscript software provides Java programming language classes that allows customers to access CMISE services from within an application written in the Java programming language.

- **C**

  An example C API allows customers to execute Solstice TMNscript commands from within programs written in the C language.

Solstice TMNscript provides client interfaces which make it possible to access the functions of Solstice TMNscript from programs written in the Java programming language or Tcl. This allows access to CMISE services from any hardware platform and not just from machines that are running Solstice TMNscript software and Solstice CMIP software.

The Solstice TMN Agent Tester software accelerates the testing of TMN agents, allowing them to be tested in isolation before they are integrated with TMN managers and deployed on the network.

Solstice TMN Agent Tester software is fully compatible with Solstice GDMO Builder and Solstice TMN Agent Toolkit software, but can also be used to validate TMN agents developed using other development tools.

To deploy a TMN application, customers require a protocol stack and a manager application. In TMN, managers and agents are connected by the Q3 protocol stack. The Solstice Enterprise Manager TMN Q3 software Interface has the following component parts:

- Solstice CMIP Runtime
- Solstice OSI
- The CMIP Management Protocol Adaptor (MPA) that forms part of Solstice Enterprise Manager software

Solstice CMIP software comes with an RFC 1006 module, which means that it is also possible to use it over the TCP/IP protocol set, allowing TMN applications to be deployed in TCP/IP environments. Both CMIP over OSI and CMIP over TCP/IP are valid Q3 stacks.

TMN applications can be managed using Solstice Enterprise Manager (Solstice EM) software. Solstice EM software is particularly well-suited for use in large, complex networks and has been designed for customers who need to:

- Accommodate network growth
- Automate identification of network problems
- Manage multiple protocols from a single system

Solstice EM software is a standards-based, object-oriented, distributed network management platform that allows customers to monitor, evaluate and refine the network. It provides tools for performing common network management tasks, such as fault management, performance management, and configuration management, and includes an application programming interface that allows developers to integrate Solstice EM software capabilities into their network management environment.

Solstice EM software provides the following features and functions:

- Support for CMIP, SNMP and Solstice SunNet Manager software remote procedure call (RPC) protocols

- Full conformance with the TMN standards
- Support for multiple concurrent users
- Graphical user interface (GUI) applications for managing networks
- Application programming interface (API) for developing user-specific applications that integrate with the Solstice EM platform

Solstice TMNscript software can be used to develop simple manager applications for use with a straightforward agent, or on a small system or network. This avoids the overheads involved in deploying a more complex system, such as Solstice Enterprise Manager software. Solstice TMNscript software can also be used to develop large applications for situations where the services provided by Solstice Enterprise Manager software are not required and for integration with legacy management systems.

The Solstice TMN/SNMP Q-Adaptor software enables a TMN management network and an SNMP management network to interoperate by enabling CMIP managers to manage SNMP agents. Using Solstice TMN/SNMP Q-Adaptor software, telecommunications operators and service providers can immediately integrate SNMP subnetworks within their TMN management framework. Telco manufacturers can immediately upgrade their existing SNMP devices to TMN standards.

There are two versions of the Solstice TMN/SNMP Q-Adaptor software. Solstice TMN/SNMP Q-Adaptor Runtime software provides a default translation dictionary that supports the standard SNMP MIB-II and Sun-specific extensions to MIB-II. Solstice TMN/SNMP Q-Adaptor Toolkit software allows customers to extend the capabilities of the runtime product to support proprietary SNMP MIBs.

Sun Bandwidth Allocator Software

Sun Bandwidth Allocator software allows Internet service providers (ISPs) and enterprise MIS departments to perform bandwidth provisioning and accounting to help ensure quality of service to their customers.

MIS departments need to be able to help ensure their users quality of service, and ISPs need to offer their customers Service Level Agreements. In order to do this, they must to be able to:

- Provide increased bandwidth and quality of service
- Monitor the levels of bandwidth and quality of service they are providing
- Keep corresponding accounts

Sun Bandwidth Allocator software is a product that provides the means to perform all of these actions. By installing Sun Bandwidth Allocator on the network's major links and known congestion points—and by setting consistent policies—customers can implement bandwidth control throughout the network.

By enabling control of the bandwidth allocated to users, applications, and organizations which are sharing the same link, Sun Bandwidth Allocator software provides the means to enable service providers to deliver adequate levels of service without overprovisioning their network equipment. The traffic prioritization provided by Sun Bandwidth Allocator software can reduce the risk of network congestion and prevents a small number of applications or users from consuming all the available bandwidth.

Sun Bandwidth Allocator software controls traffic sent over a link. It can be installed as a Traffic Manager or as an Application Performance Manager. Installed in "IP-transparent mode" on a device which controls access to the network (LAN, WAN, or Internet), it controls traffic while remaining transparent to IP users. The IP traffic is prioritized by application, traffic type, or customer.

Installed as an Application Performance Manager, Sun Bandwidth Allocator software controls IP traffic from a server to the network (LAN, WAN, or Internet). The server may be a file server, a web server, or any applications server. Traffic can be controlled by application and/or by customer.

Sun Bandwidth Allocator software provides the following functions:

- Provisioning by rule enforcement
- Remote monitoring
- Web flow accounting
- Provisioning rules

Sun Bandwidth Allocator software manages traffic transmission based on provisioning rules which sort and prioritize traffic according to:

- Traffic type (for example, HTTP, FTP, e-mail, news, Telnet, or NFS software traffic)
- End-user source or destination address
- Network source or destination address

Sun Bandwidth Allocator software provides real-time statistics on resource usage. These can be accessed via a Java technology-based GUI, Solstice Enterprise Manager software, or any SNMP manager (for example, Solstice Domain Manager or Solstice Site Manager software). A statistics API enables customers to integrate Sun Bandwidth Allocator software statistics into their own monitoring systems.

Flexible accounting schemas allow payment by class of service, per customer, or by actual bytes or packets transferred. A web-flow agent collects statistics information and outputs it in ASCII format, which can be automatically sent to a billing system.

Sun Bandwidth Allocator software manages any type of IP-based traffic. It is transparent, and works within a heterogeneous environment without any modification of the systems accessing the gateway.

A comprehensive and user-friendly Java technology-based configuration utility makes it easy to specify bandwidth allocation policies and perform remote management from virtually anywhere on the network.

Reporting utilities can be used to monitor network use by traffic type and by IP address.

The product runs over WAN and LAN links such as Ethernet and FDDI. It can also be integrated with web servers to provide outgoing flow control.

Sun Cluster Software

Sun Cluster software provides higher levels of availability than is possible with a single server. This solution automates recovery from any single hardware or software failure by automatically restarting a failed application or migrating the application and its resources to a backup server in the event of a hardware failure.

Sun Cluster software provides mainframe-class reliability, availability, and scalability for e-commerce, ERP, data warehousing and other mission-critical applications and services. It delivers an easy-to-use, continuously available, multiplatform clustering solution that is completely integrated with the Solaris Operating Environment.

Key features of Sun Cluster software include support for Solaris 2.6 and 8 Operating Environment, up to four clustered nodes from Sun's entire line of servers, failover agents for key applications, and a unified clustering foundation for standard and parallel applications.

Highlights include the following:

- Cluster up to four servers to meet the needs of any workgroup, department, or data center
- Run both standard and parallel applications on the same cluster
- Dynamically add nodes

- Manage the cluster through the easy-to-use Sun Cluster Management Console
- Fault management API to customize applications for high availability
- Individual application failover, local application restart, and local network adaptor failover for fast recovery
- High-speed cluster interconnects and high-bandwidth networking deliver exceptional throughput

Sun Enterprise Authentication Mechanism (SEAM) Software

Sun Enterprise Authentication Mechanism (SEAM) software, a component of Solaris Easy Access Server software, delivers an extra layer of security inside the firewall to protect the enterprise from unauthorized access. Through powerful authentication and single sign-on capabilities, SEAM software provides increased data privacy and integrity.

While firewalls are designed to fend off intruders from the outside, they cannot address security incidents that originate from within. Today, growing evidence indicates that most security breaches start with people inside—or known to—the enterprise. For true network security, customers need to take steps to protect the company's valuable data resources from unauthorized access—from both inside and outside the enterprise.

Sun Enterprise Authentication Mechanism software provides the extra layer of security customers need to protect the enterprise. By combining centralized authentication with strong encryption, SEAM software provides a more secure login process, which helps customers to better protect their data privacy and integrity.

- **Centralized authentication and management**

  Sun Enterprise Authentication Mechanism software offers a single repository for enterprise authentication information called the Key Distribution Center (KDC). The KDC maintains a database of user, server, and password information. Through that database, SEAM software can authenticate users, servers, and applications. Anyone and everyone attempting to access information must first be checked against the KDC database before being ticketed as an authenticated user. Because security information is centralized, SEAM software allows customers to manage and control all enterprise-wide logins from a single console, which helps their enterprise reduce the total cost of administering and managing security.

- **Strong encryption support**

  Sun Enterprise Authentication Mechanism software provides strong encryption support. During the authentication process, all the information exchanged between customers and the KDC is encrypted for an extra level of security. SEAM software also uses an encrypted channel when storing KDC entries over the network.

- **Ease of use**

  Sun Enterprise Authentication Mechanism software supports a Java technology-based administrative tool for easy access and configuration. It also enables users to load authentication information in batch mode, which is particularly useful if the enterprise loses or gains large numbers of users each year.

  Sun Enterprise Authentication Mechanism software supports single sign-on capabilities. With single sign-on, SEAM software can authenticate users (to gain access to multiple applications) by ticketing them only once when they first log in. It also spares users the need to memorize multiple passwords, or enter passwords multiple times in a session.

- **Higher availability**

  Sun Enterprise Authentication Mechanism software's distributed architecture provides enterprises with higher availability. With SEAM software, customers can replicate their security information. This

provides faster access to information as well as duplicate copies in the event of an emergency. Should the master KDC fail, the read-only replicated slave KDC still holds the necessary information for the authentication process to take place without interruption. What's more, if the master becomes unrecoverable, customers can easily convert the replicated slave to be the new master.

- **Faster performance**

  Sun Enterprise Authentication Mechanism software is faster and more reliable because its replicated KDCs reduce contention for security verification from across the enterprise. For example, replicas may be created for use by different business divisions or remote offices. Instead of competing for a single copy, the division or office has its own copy. Consequently, access to secured applications becomes faster.

- **Multiple realms**

  Sun Enterprise Authentication Mechanism software supports multiple realms. A realm is the set of users or servers registered with a specific KDC—basically, the scope of authentication for a given KDC. Separating an enterprise into multiple realms enables SEAM software to operate across organizational boundaries and between different systems. A client in one realm can be authenticated to a server in another.

  SEAM software allows enterprises to isolate individual departments from each other, decentralizing control to local network administrators. For large corporations, realms enable SEAM software to be configured to allow administration at the local level.

- **A more secure environment**

  Currently, Sun Enterprise Authentication Mechanism software supports secure FTP, NFS software, Telnet, and r* commands. These secure network services, combined with strong encryption support, enable the enterprise to preserve data privacy and data integrity by eliminating snooping around the network and tampering with data. With SEAM software, users can access files securely over the network.

- **Interoperability**

  Sun Enterprise Authentication Mechanism software is compliant with Internet RFC 1510 and RFC 1964. These RFCs define the Kerberos V5 protocols, the de facto industry standard. Through this standards compliance, SEAM software allows enterprises to integrate with other vendors' compliant security products.

- **Cost-effective**

  Because Sun Enterprise Authentication Mechanism software is included in Solaris Easy Access Server software, it offers feature-rich security mechanisms—with unlimited usage—at a significantly lower cost than many third-party solutions available today.

  It requires fewer administrators because it is centrally managed, enabling customers to lower the cost of securing their enterprise.

- **Programmable security APIs**

  Sun Enterprise Authentication Mechanism software allows ISVs to secure their applications by Remote Procedure Call API (RPCSEC_GSS). This API is an implementation of the RPCSEC_GSS security protocol defined in Internet RFC 2203. When future security products from Sun or third-parties become available, these products can be easily plugged into the interface without requiring modifications to the application, enabling customers to adopt evolving security technologies quickly and easily. For example, if Sun developed a public-key security mechanism in the future, this mechanism would be easily accessible by any application that uses the RPCSEC-GSS interface.

Sun Management Center Software

Sun Management Center software is a scalable, SNMP-based platform for managing Sun servers. The most advanced systems management solution from Sun to date, Sun Management Center software offers a single point of management for all Sun servers, desktops, storage systems, the Solaris Operating Environment, applications, and data center services.

Sun Management Center software lets customers scale from management of a single system to thousands of systems on a single, unified management platform. And it integrates easily with leading third-party platforms for added flexibility.

With predictive failure reporting and comprehensive event and alarm management, Sun Management Center software warns customers of potential problems—so they can solve them before they cause downtime.

Sun Management Center software simplifies the management of their Sun environment, so customers can use their administration staff and technical resources more efficiently and help reduce the cost of delivering network services.

Sun Management Center software enables administrators to spend more time optimizing service delivery, less time dealing with management complexity. For example, Sun Management Center software provides remote online control, so administrators can work from virtually anywhere. “No cease” management provides uninterrupted monitoring while new features are added or existing features are reconfigured. And built-in security enables multiple administrators with different responsibilities to manage the environment.

Sun Management Center software provides real-time system performance and configuration data, enabling administrators to isolate bottlenecks. It even provides optional centralized data storage and performance analysis, including historical trend analysis.

Sun Management Center software delivers everything administrators need to perform Remote System Configuration, monitor performance, and isolate hardware and software faults—all through an easy-to-use Java technology interface. It provides:

- A single point of management, enabling administrative resources to be used more effectively
- Active configuration management controls, providing a secure interface for remote dynamic reconfiguration capabilities and helping to ensure availability
- A single event model, enabling information to be shared with multiple consoles or users with ease
- Multiple system support, enabling administrators to monitor and manage all Solaris Operating Environment systems remotely
- Predictive failure analysis, enabling administrators to predict potential failures before they occur
- Health monitoring, along with suggested steps for problem resolution, resulting in simplified administration
- Logical element grouping, enabling Sun systems to be grouped by geographical location, server role, administrative responsibility, among others.
- A comprehensive topology map, providing a high-level view of all the objects that are being managed, along with hierarchies
- Automatic discovery of Sun systems, including IP address, subnet address, hostnames, and more
- Event and alarm management, providing administrators with the information they need when they need it

- Enterprise-wide security measures, such as authentication, data integrity, and access control lists for management of data and active management functions
- Standard interfaces and protocols, enabling integration with third-party management tools, including Tivoli, Computer Associates, and BMC
- A Java technology interface, providing heterogeneous GUI support, a common look and feel for all Sun Management Center applications, and the flexibility to manage the enterprise from any platform using Java technology

SunScreen Secure Net Software

SunScreen Secure Net software is a bundled solution which includes SunScreen EFS™ and SunScreen SKIP software. It enables users to establish a secure business network. SunScreen Secure Net software is a comprehensive security solution (including one of the industry's fastest firewalls) that builds on the power of the Solaris Operating Environment.

The customer can configure SunScreen Secure Net software to be a stealth box like the current SunScreen SPF-200 software, including hardening the operating system. Or the customer could select a few interfaces to be stealth and elect for other interfaces to be SunScreen EFS software interfaces, thereby allowing for functionality such as proxies. This gives SunScreen Secure Net software a unique capability of using stealth when connecting to untrusted networks (for example, the Internet), while providing added functionality of proxies in other interfaces.

SunScreen SPF-200 Software

SunScreen SPF-200 software is Sun's strongest platform for perimeter defense, providing secure business operations over the Internet. SunScreen SPF-200 software uses a stealth design to prevent attack and state-of-the-art SunScreen SKIP encryption to protect data going over the network. SunScreen SPF software's advanced dynamic packet filtering coupled with Sun's high-speed hardware is designed to meet the most demanding performance requirements.

SunScreen EFS software was rated the fastest firewall in a recent Data Communications performance test that included the top firewall vendors. Given SunScreen SPF software's internal design and optimization, SPF should run even faster. The performance of SunScreen SPF software enables it to keep up with the demands required to screen large amounts of Internet traffic.

The stealth design, which makes SunScreen SPF software not addressable with an IP address, provides two benefits. The stealthing makes SunScreen SPF software more secure as potential intruders can not address the machine running SunScreen SPF-200 software. Also, installation of SunScreen SPF software into the network is easy, since the administrator can install it without changing routing tables.

The stealth design "hardens" the operating system and turns the system into a dedicated SunScreen SPF software system that only runs SunScreen SPF-200 software. Hardening the operating system enhances security since other applications do not run on the system, there is less exposure. SunScreen SPF software uses a separate administration station that can be any SPARC machine and need not be dedicated. State-of-the-art SunScreen SKIP encryption technology provides secure network communication and acts as the infrastructure for electronic commerce, Extranets, and secure remote access. SunScreen SKIP software protects the data being transmitted, helps ensure its integrity, and provides a high level of authentication.

SunScreen SPF software covers both TCP and UDP services. SunScreen SPF software keeps track of the sequence of events that occur with a UDP service even though UDP is in fact a stateless protocol. This is done to improve security and performance.

SunScreen SPF software allows flexibility in logging what has passed or failed through the screen. Administrators can choose what they want to monitor and also be alerted to problems through alerts to network management stations.

To provide additional protection of the internal network, network address translation (NAT) converts internal address to a different set of public addresses. This also helps those customers that didn't formally register internal host IP addresses. NAT supports both static and dynamic translation of internal addresses to public addresses. Since hackers do not know internal addresses of hosts, attacks are minimized.

Administration is done through secured remote administration stations, enhancing security, and meeting the needs of organizations for remote management.

VERITAS NetBackup Software

VERITAS NetBackup software provides high-performance, industrial-strength backup, archive, recovery and space management services for UNIX and PC clients in the large enterprise. With high-speed backup of large databases, centralized management capabilities, mainframe-class media management, and support for high-end tape drives and robotics, VERITAS NetBackup software is specially geared for the large data center customer.

VERITAS NetBackup software cost-effectively automates backup and recovery for thousands of nodes across multiple servers, while enabling the enterprise to manage its storage from a single console. With optional add-on modules, VERITAS NetBackup software provides high-performance hot or cold database backup, as well as archive capabilities that allow the enterprise to effectively manage data that is rarely accessed yet requires long-term storage. VERITAS NetBackup software features sophisticated media and device management capable of managing media across the enterprise from a single location, and enabling sharing of tape robotics hardware with other applications.

Sun StorEdge Instant Image Software

Sun StorEdge Instant Image software is a point-in-time copy facility which runs on a Solaris Operating Environment application or storage server. Instant Image will enhance the ability of businesses to achieve non-stop business processing by capturing frequent snapshots of live data for independent read and write purposes. Sun StorEdge Instant Image software enables point-in-time copies, or shadow volumes, to be created on a Sun storage system. A shadow volume is a replicated view of data which has been frozen at a specific point in time and is used to enable a secondary application to non-disruptively access a primary application's data. Product applications include the following:

- **Backups**—Enable on-line processing to continue while backup processes backup a point-in-time snapshot image of on-line data
- **Data warehouse loading**—Populate a data warehouse from a snapshot image of on-line data
- **Application development and testing**—Make a snapshot image of production data available as test data for new applications
- **Data migration**—Use Sun StorEdge Instant Image software to help migrate from one storage platform to another

Sun StorEdge LibMON Software

Sun StorEdge LibMON software is host-based software used to monitor and administer tape libraries via a web browser enabled by Java technology. Sun StorEdge LibMON software allows for event logging and notification as well as remote monitoring of library activity.

Sun StorEdge LibMON software will monitor library status and activity through periodic polling of the library, providing status on the DLT drives, library robotics, inventory, and cartridge slot status. Library status can be monitored from virtually anywhere on the network.

Library activity and Sun StorEdge LibMON software commands will be logged. Notification of important events can be sent to defined recipients via e-mail.

Sun StorEdge LibMON software will allow the operator to remotely control certain library features, such as placing the library online/offline, downloading new firmware for the library robotics, initiating the actuator self-test, and deleting libraries.

VERITAS Volume Manager (VxVM) Software

VERITAS Volume Manager (VxVM) software provides easy-to-use on-line disk storage management for enterprise computing environments. Traditional disk storage management is a labor intensive process often requiring machines to be taken off-line—a major inconvenience to users. Once the system is off-line, the system administrator is faced with the tedious process of backing up existing data, manually changing system parameters, and reloading the data. In today's distributed client/server environments, users are demanding that databases and other resources be available 24 hours a day, are easy to access and are safe from corruption or loss caused by hardware malfunction.

VxVM software provides system administrators with the tools to dynamically configure disk storage, to perform administrative tasks while the system is active, and to analyze disk usage.

VxVM software provides on-line administration of disk resources so that the disk subsystems can be managed without interrupting users or applications. Disk spanning helps eliminate media size limitations and allows load balancing and extension of file systems and databases. Disk mirroring increases data availability in the case of disk failures. It also provides a hot relocation algorithm, allowing subdisks to be relocated from a failing disk.

VxVM software provides disk striping and RAID features to increase I/O throughput and fault tolerance. It provides support for performance monitoring, and flexible allocation of free space for application load balancing.

VxVM software provides an easy-to-use graphical administrative interface, providing the ability to quickly create disk configurations, reducing administrative costs. It also presents a logical pool of free space which can be automatically or directly allocated. The on-line architecture allows the partitioning of arbitrary areas on a disk, and the creation of sparse non-contiguous mirrors, enabling the replication of critical disk areas.

SunVTS Software

The Sun Validation and Test Suite, or SunVTS software, is an online diagnostics tool and system exerciser for verifying the configuration and functionality of Sun hardware controllers, devices, and platforms. SunVTS software is included in Solaris Easy Access Server software.

Customers can run SunVTS software using any of these interfaces: a command line interface, a tty interface, or a graphical interface that runs within a windowed desktop environment.

SunVTS software lets customers view and control a testing session over modem lines or over a network. Using a remote system, customers can view the progress of a SunVTS testing session, change testing options, and control all testing features of another system on the network.

The SunVTS system exerciser is a graphically oriented UNIX application that permits the continuous exercising of system resources and internal and external peripheral equipment. Used to determine if the system is functioning properly, SunVTS software incorporates a multifunctional stress test of the system through operating-system-level calls, and allows the addition of new tests as they become available.

VERITAS File System Software

VERITAS File System (VxFS) software is a high-performance, quick-recovery file system. VxFS software augments UNIX file management with high availability, increased bandwidth, and up-to-date and reliable structural integrity. It provides scalable performance and capacity to meet the demands of increased user loads and client/server environments.

VxFS software provides fast recovery following a system crash or reboot. The system completes a file system check (fsck) in seconds, regardless of file system size. In addition, VxFS software supports on-line backup, on-line resizing (shrinking and growing of a file system), and on-line defragmentation. These capabilities allow administrators to respond to dynamic data capacity and performance requirements while reducing scheduled maintenance interruptions.

VxFS software allocates disk space to files in large, contiguous areas called extents, rather than in small fixed-size blocks. This results in a significant reduction in the number of I/O operations required to read and write large amounts of data.

Ordering Information

Ordering the Sun Fire™ 280R Server

Assemble to Order Configurations

Step 1 - Required - Enter Product Family

Specify	**A35**	Sun Fire 280R server

Step 2 - Required - Order Base Configuration

Order	**A35-AA**	Sun Fire 280R server base configuration

Step 3 - Required - Add CPU modules

Order one or two	**6990A**	750MHz UltraSPARC-III processor with 8MB external cache

Step 4 - Required - Add Memory

Order one or two	**7050A** **7053A** **7051A** **7052A**	512MB DIMM option - four 128MB DIMMs 1GB DIMM option - four 256MB DIMMs 2GB DIMM option - four 512MB DIMMs 4GB DIMM option - four 1GB DIMMs

Step 5 - Required - Add Internal Disk Drives

Order one or two	**6724A**	36.4GB 10000rpm 1-inch FCAL disk drive

Step 6 - Required - Specify Power Cord / Country Kit

Order one at no charge Order a Power Cord Kit when the server does not require a local graphics console. Order a Type 6 Country Kit when the server includes a local graphics console. Order one Power Cord for each external peripheral if required.	**X311L** **X386L** **or:** **X3531A**	North American / Asian Power Cord Australian Power Cord North American Universal

Step 7 - Optional - Add PCI Interfaces and Host Adapters

Order up to four	**1032A** **1033A** **1034A** **1141A** **2132A** **2156A** **3768A** **3668A** **6540A** **6541A** **6542A** **6727A** **6799A**	SunSwift PCI (FastEthernet + UltraSCSI) Sun Fast Ethernet Card, PCI Sun Quad Fast Ethernet Card, PCI Sun Gigabit Ethernet Card, PCI SunPCi Iipro Coprocessor Card, PCI Sun Multiport Serial Interface, PCI PGX64 24-bit Color Frame Buffer PGX32 Graphics Card Dual-channel Serial UltraSCSI Host Adapter Dual-channel Differential UltraSCSI Host Adapter Three-channel SCSI RAID Host Adapter PCI Dual FC Network Adapter Single Channel FCAL Network Adapter

Step 8 - Optional - Add additional power supply

Order one	**9699A**	560W power supply for Sun Fire 280R

Step 9 - Optional - External Disk Storage Devices

See configuration rules. Other options are available. Host bus adapters may be required.	**SG-XFDSK020C-146G** **SG-XFDSK060E-218G** **SG-XDSK020C-36G** **SG-XDSK060C-218G** **SG-ARY171A-436R4** **SG-ARY173A-436R4** **SG-XARY561A-800G** **NS-XDSKD130-72GAC** **XT3WG-TT-11-660** **XT3WG-RR-11-660**	146GB Sun StorEdge MultiPack-FC 218.4GB Sun StorEdge MultiPack-FC 36.4GB Sun StorEdge MultiPack 218.4GB Sun StorEdge MultiPack 436GB Sun StorEdge A1000, Rackmountable 436GB Sun StorEdge D1000, Rackmountable 800GB Sun StorEdge A5200 72GB Netra D130 660GB Sun StorEdge T3 Tabletop 660GB Sun StorEdge T3 Rack Ready

Step 10 - Optional - External Tape Storage Libraries

See configuration rules. Other options are available. Host bus adapters may be required.	**SG-XLIBDLT4-1TB-2** **SG-XLIBDLT16-11TB** **SG-XAUTODLT8D-L9**	DLT1000 Tape Library DLT11000 Tape Library StorEdge L9 Autoloader

Step 11 - Optional - Solaris 8 Operating System

See configuration rules. Other options are available. Host bus adapters may be required.	**SOLZS-080B9AYM**	Solaris 8 Standard, Latest Release, Worldwide Media and English Install Documentation

Fixed Configurations

Marketing Part Number	Configuration Description
A35-WRF1-512PA1	Sun Fire 280R server with – one 750-MHz 8-MB UltraSPARC™-III CPU – 512-GB (4 x 128-MB DIMMs) memory – one 18-GB 1-inch FCAL hard drive – one 560-watt power supply – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty
A35-WRF1-1GQA1	Sun Fire 280R server with – one 750-MHz 8-MB UltraSPARC™-III CPU – 1-GB (4 x 256-MB DIMMs) memory – one 36-GB 1-inch FCAL hard drive – two 560-watt power supplies – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty
A35-WRF1-2GQB1	Sun Fire 280R server with – one 750-MHz 8-MB UltraSPARC™-III CPU – 2-GB (4 x 512-MB DIMMs) memory – two 36-GB 1-inch FCAL hard drives – two 560-watt power supplies – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty
A35-WRF2-2GQB1	Sun Fire 280R server with – two 750-MHz 8-MB UltraSPARC™-III CPU – 2-GB (4 x 512-MB DIMMs) memory – two 36-GB 1-inch FCAL hard drives – two 560-watt power supplies – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty
A35-WRF2-4GQB1	Sun Fire 280R server with – two 750-MHz 8-MB UltraSPARC™-III CPUs – 4-GB (4 x 1-GB DIMMs) memory – two 36-GB 1-inch FCAL hard drives – two 560-watt power supplies – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty

Marketing Part Number	Configuration Description
A35-WRF2-8GQB1	Sun Fire 280R server with – two 750-MHz 8-MB UltraSPARC™-III CPUs – 8-GB (8 x 1-GB DIMMs) memory – two 36-GB 1-inch FCAL hard drives – two 560-watt power supplies – DVD-ROM – Solaris™ server license – 3-year, second-day, on-site hardware warranty – 90-day Sun Spectrum℠ program software warranty

Supported Internal Options

Part Number	Option Description	Maximum Number Supported	Comments
CPUs			
X6990A	750-MHz UltraSPARC™-III CPU module with 8-MB external cache	2	
Memory			
X7050A	512-MB memory expansion (4 x 128-MB DIMMs)	2	See memory configuration requirements
X7053A	1-GB memory expansion (4 x 256-MB DIMMs)	2	
X7051A	2-GB memory expansion (4 x 512-MB DIMMs)	2	
X7052A	4-GB memory expansion (4 x 1-GB DIMMs)	2	
Internal Mass Storage			
X6724A	36-GB, 10,000-rpm, 1-inch FC-AL disk drive	2	
X6286A	12-GB 4mm DDS-3 internal tape drive	1	
X6295A	20-GB 4mm DDS-4 internal tape drive	1	
X6168A	Internal 10X DVD-ROM Drive	1	
Power Cord Kits			
X386L	Australian	2	One power cord is required per system power supply.
X312L	Continental European	2	
X383L	Danish	2	
X348L	Italian	2	
X311L	North American/Asian	2	
X314L	Swiss	2	
X317L	U.K.	2	
PCI Cards			
X1032A	10/100BaseT Fast/Wide UltraSCSI Adapter, PCI	4	
X1033A	10BaseT FastEthernet Adapter, PCI	4	
X1034A	Quad FastEthernet Adapter, PCI	4	
X1141A	Gigabit Ethernet Network Interface Card, PCI	4	
X1155A	High Speed Serial Interface Adapter 2.0, PCI	4	
X1157A	SunATM-155/MFiber Adapter 4.0, PCI	4	
X1158A	SunATM-155/UTP Adpater 4.0, PCI	4	
X1159A	SunATM-622/MFiber Adapter 4.0, PCI	4	
X2156A	Serial Asynchronous Interface Adapter 3.0, PCI	4	
X3768A	PGX64 24-bit Color Frame Buffer, PCI	4	
X6540A	Dual-channel single-ended UltraSCSI Adapter, PCI	4	
PCI Cards, continued			

Part Number	Option Description	Maximum Number Supported	Comments
X6541A	Dual-channel differential UltraSCSI host adapter, PCI	4	
X6542A	UltraSCSI Hardware RAID Controller, PCI	4	
X6727A	Dual FC Network Adapter, 100MB/second, PCI	4	
X6799A	Single FC Network Adapter 100MB/second, PCI	4	

Upgrades

Sun Upgrade Allowance Program and Sun Upgrade Allowance Program PLUS

Today is a dot-com world and it is very critical that a company's technology scales as it's business grows. Whether a customer has a Sun or non-Sun system, Sun's Upgrade Allowance Program offers a broad range of options for their two plus year old servers to Sun's latest technology.

The Sun Upgrade Allowance Program PLUS gives even more flexibility to meet customer needs for trading in product within one and two years of purchase. This is extended to Sun to Sun selected system and storage upgrades. Non-Sun and component upgrades are excluded.

Sun UAP simplifies the upgrades process by providing a trade-in value as a percentage allowance. This percentage allowance is applied to the list price of any new Sun Fire 280R system configuration.

Upgrades to Sun Fire 280R are available as a full system swap. No components migrate such as CPUs, memory and drives. Sun Fire 280R uses UltraSPARC-III technology. Customers can upgrade from older SPARC, SPARCserver 4,5,10,20, Enterprise 1, Ultra 5s or 10s server, Enterprise 2, SPARCserver 1000 or 2000, Enterprise 250 and 220R to the new Sun Fire 280R.

Systems being upgtaded must be owned by, used by, and in the possession of the customer at least ninety (90) days prior to upgrading. To qualify for the upgrade allowance, customers must return within 60 days, a bootable working system.

How To Order

An allowance code is used when upgrading to Sun Fire 280R. Workgroup server Sun UAP product matrices containing standard upgrade allowance codes as well as accelerated allowances for one and two year trade-ins are included in the Sun configuration guide. The Sun UAP matrices provide instructions for using codes

ALLOWANCE CODE NUMBERING SCHEME:

Standard Allowance Code - ALW-12-S-J-A35 (Two + year old trade-ins)

Accelerated Allowance Code - ALW-24-S-J-A35-XXX (Four to twentry-three month old trade-ins)

---->Accelerator Eligibility Field

---->Product Family

--->Residue Group

---->Product Category (T=desktop, D=Disk, S=Server)

---->Percentage allowance

------>Every code will start with the letter ALW = Allowance

To determine the upgrade allowance value, apply the allowance code percentage to the list price of the Sun Fire 280R server. This allowance is in addition to any contracted discounts that the customer may be eligible for.

Customers will need to return a full functioning system within 30 days of reciept of the hardware. RMA kits (UG-RMA) must be ordered with each allowance code. UG-RMA kits provides customers instructions on where to return the used (residual) equipment. Customers will be billed for all non-returned equipment.

Upgrade Paths

Sun Upgrade Allowance Program - Sun UAP

Component Migration and Allowance Matrix

	From	To	Allowance Code Part Number	Return
Memory				
	512MB DIMMS (X)7050A	1GB DIMMS (X)7053A	ALW-30-S-4XMEM	4X128MB DIMMS
	1GB DIMMS (X)7053A	2GB DIMMS (X)7051A	ALW-30-S-4XMEM	4X256MB DIMMS
	1GB DIMMS (X)7053A	4GB DIMMS (X)7052A	ALW-20-S-2XMEM	4X256MB DIMMS
	2GB DIMMS (X)7051A	4GB DIMMS (X)7052A	ALW-20-S-4XMEM	4X512MB DIMMS
CPUs				
	600MHz (X)6898A	750MHz (X)6990A	ALW-30-S-1XMOD	600MHZ

Service and Support

The SunSpectrum℠ 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 Solaris™ Operating Environment software, and telephone support for Sun™ 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.

FEATURE	SUNSPECTRUM PLATINUM℠ Mission-critical Support	SUNSPECTRUM GOLD℠ Business-critical Support	SUNSPECTRUM SILVER℠ Systems Support	SUNSPECTRUM BRONZE℠ Self Support
Systems Features				
Systems approach coverage	Yes	Yes	Yes	Yes
System availability guarantee	Customized	No	No	No
Account Support Features				
Service account management team	Yes	No	No	No
Local customer support management	No	Yes	No	No
Personal technical account support	Yes	Yes	Option	No
SunStart℠ installation service	Yes	No	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semiannual	No	No
Skills assessment	Yes	No	No	No
Site activity log	Yes	Yes	No	No
Coverage / Response Time				
Standard telephone coverage hours	7 day/24 hour	7 day/24 hour	8 a.m.–8 p.m., Monday–Friday	8 a.m.–5 p.m., Monday–Friday
Standard on-site coverage hours	7 day/24 hour	8 a.m.–8 p.m., Monday–Friday	8 a.m.–5 p.m., Monday–Friday	N/A
7-day/24-hour telephone coverage	Yes	Yes	Option	Option
7-day/24-hour on-site coverage	Yes	Option	Option	N/A
7-day/12-hour on-site coverage	No	Option	No	No
5-day/24-hour on-site coverage	No	Option	No	No

FEATURE	SUNSPECTRUM PLATINUM Mission-critical Support	SUNSPECTRUM GOLD Business-critical Support	SUNSPECTRUM SILVER Systems Support	SUNSPECTRUM BRONZE Self Support
Coverage / Response Time (cont.)				
Customer-defined priority setting	Yes	Yes	Yes	Option
• Urgent (phone/on site)	Live transfer/ 2 hour	Live transfer/ 4 hour	Live transfer/ 4 hour	4 hour / N/A
• Serious (phone/on site	Live transfer/ 4 hour	2 hour/next day	2 hour/next day	4 hour / N/A
• Not critical (phone/on site)	Live transfer/ customer convenience	4 hour/ customer convenience	4 hour/ customer convenience	4 hour / N/A
2-hour on-site response	Yes	Option	Option	N/A
Additional contacts	Option	Option	Option	Option
Premier Support Features				
Mission-critical support team	Yes	For urgent problems	No	No
Sun Vendor Integration Program (SunVIP℠)	Yes	Yes	No	No
Software patch management assistance	Yes	No	No	No
Field change order (FCO) management assistance	Yes	No	No	No
Hardware Support Delivery				
Replacement hardware parts	On-site technician	On-site technician	On-site technician	Courier
Two day parts delivery	N/A	N/A	N/A	Yes
Overnight parts delivery	N/A	N/A	N/A	Option
Same-day parts delivery	Yes	Yes	Yes	Option
Remote Systems Diagnostics				
Remote dial-in analysis	Yes	Yes	Yes	Yes
Remote systems monitoring	Yes	Yes	No	No
Remote predictive failure reporting	Yes	Yes	No	No
Software Enhancements and Maintenance Releases				
Solaris Operating Environment enhancement releases	Yes	Yes	Yes	Yes
Patches and maintenance releases	Yes	Yes	Yes	Yes
Sun unbundled software enhancements	Option	Option	Option	Option
Internet and CD-ROM Support Tools				
SunSolve℠ license	Yes	Yes	Yes	Yes
SunSolve EarlyNotifier℠ Service	Yes	Yes	Yes	Yes

Warranty

The standard warranty is a three year, second day on site hardware warranty. A 90-day software SunSpectrum program warranty is available.

Glossary

100BASE-T	See Fast Ethernet.
ASR	Automatic System Recovery. A RAS feature that initiates a system reboot sequence that bypasses failed system components or a software failure.
DIMM	Dual inline memory module. A memory unit that can come in a variety of capacities, such as 128 MB, 256 MB, 512 MB, or 1 GB.
DIMM group	A group of four DIMMs.
Fast Ethernet	IEEE standard for 100-Mb/second Ethernet. This technology supports a data transfer rate of 100 megabits per second over special grades of twisted-pair wiring.
FC-AL	Fibre Channel arbitrated loop. A loop topology used with Fibre.
I2C	A bus used for environmental monitoring.
Hot-plug	A component that can be electrically safe to remove or add while the system is still running. Typically, the system must be rebooted before the hot-plug component is configured.
NFS	Sun's distributed computing file system.
PCI	Peripheral component interconnect. An industry-standard for connecting peripherals such as disk drives, tape drives and other external devices.
RAID	Redundant array of independent disks. A set of disk drives that appear to be a single logical disk drive to an application such as a database or file system. Different RAID levels provide different capacity, performance, high availability, data protection and cost per unit of storage.
RAS	Reliability, availability, and serviceability, Three aspects of a system's design contributing to continuous operation and minimizing system downtime for services. Together reliability, availability, and serviceability provide for near continuous system operation.
RSC	Remote System Control. A remote monitoring and administration feature that allows systems administrators to access the system console from any host on the network, sends e-mail or pager notice of system faults and provides boot and run logs of system events.
Redundancy	Duplication for the purpose of achieving fault tolerance. Refers to duplication or addition of components.
SCSI	Small computer systems interface. An ANSI standard for controlling peripheral devices by one or more host computers.
UPA	Ultra™ port architecture. A high speed, crossbar-oriented, packet-switched motherboard interconnect.
V9	Version 9 of the SPARC™ definition.