Sun Enterprise™ 2 Server

Just the Facts

Sun microsystems®

Positioning

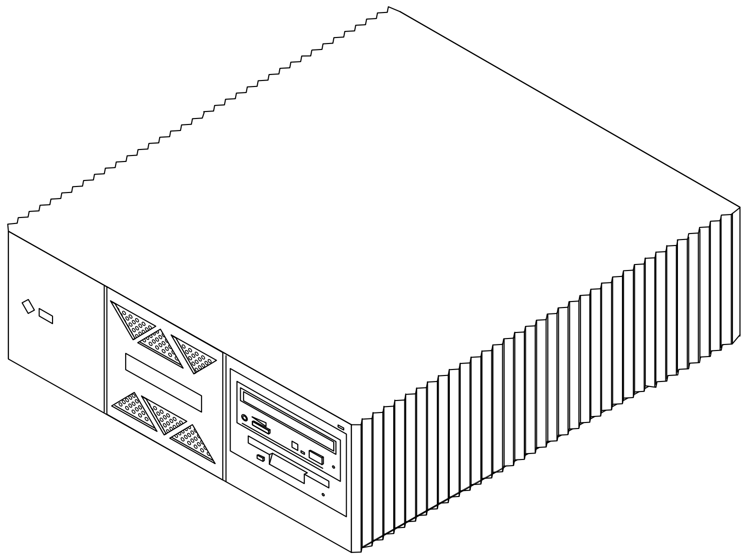


Figure 1. The Sun Enterprise™ 2 Server

The Sun Enterprise™ 2 server is Sun's high-performance, entry-level, multiprocessing workgroup server. By incorporating the latest advances and technology in CPU, I/O, networking, memory, and software, the Sun Enterprise 2 server delivers capacity, networking, and performance in a compact package for demanding business and technical applications at a great price.

What Is New with the Sun Enterprise 2 Server?

- New configuration

  The Sun Enterprise 2 workgroup server now includes 400-MHz UltraSPARC™-II processors each with 2 MB of external cache.

- Enhanced internal storage

  A technology enhancement allows up to 18.2 GB (2 x 9.1 GB) of hard disk storage internally for every system. In addition the SunCD™ 32 has been incorporated.

Key Messages

- High performance
  - Latest advances in technology

    Incorporates the 400-MHz UltraSPARC processor with 2-MB external cache
  - Scalable multiprocessing

    Supports up to two 400-MHz UltraSPARC processors with 2-MB external cache
  - Ultra™ port architecture (UPA)

    A low-latency, packet-switched interconnect between the processors, system memory, and I/O; delivers up to 1.6 GB per second peak throughput and 720 MB per second sustained throughput.
- High-speed, enterprise-wide connectivity and interoperability
  - On-board 100BASE-T Fast Ethernet for high-speed networking
  - Compatible with 10BASE-T through autosensing
  - Supports every major networking protocol for interoperability with existing environments, ONC+™, SMB, NCP, AFP, NFS™, TCP/IP, IPX™/SPX, X.25, PPP, Frame Relay, XTL, and more
  - Supports other advanced networking options including ATM, ISDN, and FDDI
- High capacity for demanding workgroups
  - Up to 2 GB of memory
  - Four SBus expansion slots
  - Two internal disk drives; support for over 1 TB of data using external Sun SPARCstorage™ Array subsystems
- Expandable
  - Modular architecture can be easily upgraded as workgroup needs grow
  - CPUs can be upgraded to faster speed processors
  - Memory, disks, and other components can be easily upgraded
- Reliable, easily serviceable, secure
  - Simple, modular design for high reliability and serviceability
  - Field-serviceable components
  - Error checking and correction (ECC) memory
  - MTBF of 20,000 hours
  - Runs the Solaris™ 2.5.1 and 2.6 and 7 operating environment, which have undergone extensive internal and external testing
  - Backed by SunService℠
  - Bundled with a one-year, on-site, next-day warranty
- Easy to manage
  - Solstice™ tools bundled with the Solaris software to help with workgroup management
  - Solaris™ Web Start for easy, web browser-based automatic install
  - Solstice AdminSuite™ for administering hosts, clients, printers, and more
  - Solstice DiskSuite™ for volume management
  - Solstice Backup™ for automated network-based backup
  - NIS+ for managing global naming and resources

– Other Solstice products are available separately, including Solstice SunNet Manager™, Solstice Site Manager™ and Solstice Domain Manager™ software

- Application availability
  – Binary-compatible, so all Solaris 2 applications run unmodified
  – Access to over 12,000 applications, including system administration tools, and a wide selection of workgroup and enterprise-class applications

Sun Enterprise 2 Server Models

Sun Enterprise 2 Server	Model 1300	Model 2300	Model 1400	Model 2400
Availability	Available	Available	Available	Available
CPU Speed	300 MHz	300 MHz	400 MHz	400 MHz
Number of CPUs	1	2	1	2
External cache	2 MB	2 MB	2 MB	2 MB
UPA Speed	100 MHz	100 MHz	100 MHz	100 MHz
UPA Peak Throughput	1.6 GB/sec.	1.6 GB/sec.	1.6 GB/sec.	1.6 GB/sec.
UPA Sustained Throughput	720 MB/sec.	720 MB/sec.	720 MB/sec.	720 MB/sec.
Estimated TPM	2,785	5,400	TBD	TBD

- Sun Enterprise 2 server Models 1300 and 2300 began shipping in April 1997.
- Sun Enterprise 2 server Models 1400 and 2400 began shipping in May 1999.

Product Family Placement

Sun Enterprise Workgroup Servers

The table below highlights the key differences among the Sun Enterprise Ultra™ 10S, the Sun Enterprise 2 server, and Sun Enterprise 250 workgroup servers.

Key Features	Sun Enterprise Ultra 10S Server	Sun Enterprise 2 Server	Sun Enterprise 250 Server
Product Positioning	• Entry to the Sun Enterprise family of servers • For small-sized workgroups • Affordable • High-performance file and print, e-mail, network application server	• Compact dual-processor network application server • For medium-sized workgroups • Compute intensive applications • Medium database applications and web sites	• Compact, versatile dual-processor network application server for medium-sized workgroups and compute-intensive applications • Suitable for small to medium database applications and web sites
Packaging	• Minitower enclosure • 17.6 mm x 40.2 mm x 43.5 mm (W x H x D)	• Expanded desktop enclosure • 450 mm x 130 mm x 452 mm (W x H x D)	• Deskside or rackmounted • 262 mm x 517 mm x 732 mm (W x H x D)

Key Features	Sun Enterprise Ultra 10S Server	Sun Enterprise 2 Server	Sun Enterprise 250 Server
CPU	• 440 MHz • 2 MB Ecache • Uniprocessor	• 300 MHz or 400 MHz • 2-MB Ecache • Up to two processors • Modular CPUs can be added one at a time	• 250 MHz, 300 MHz, or 400 MHz • 1-MB, 2-MB or 2-MB Ecache • Modular CPUs can be added one at a time
Memory	• 4 DIMM slots • 64 MB to 1 GB • Memory added in groups of two	• 16 DIMM slots • 64 MB to 2 GB • 576-bit-wide path • Memory added in groups of four	• 8 DIMM slots • 64 MB to 1 GB • 288-bit-wide path • Memory added in groups of two
System Bus	• Runs at 100 MHz	• Three segment UPA • Runs at 100 MHz for 300-MHz systems • 1.6 GB/sec. throughput	• Three-segment UPA • Runs at 83 MHz with 250-MHz CPU installed or 100-MHz with 300-MHz or 400-MHz CPU installed • 1.6-GB/sec. throughput
I/O	• Four PCI slots • 10/100BASE-T Ethernet • Two 16.7 MB/sec. internal EIDE connectors	• Four SBus slots • 100-Mbit/sec.; Fast Ethernet standard on motherboard • 20 MB/sec.; fast/wide SCSI standard on motherboard	• Two PCI buses, four PCI slots • 40-MB/second UltraSCSI, 20-MB/second fast/wide SCSI • 10/100 Ethernet port • Two 384K sync or 460K asynch serial ports; DB25 • Parallel port • 350 MB/sec. max. system I/O throughput
Storage	• Up to two internal 9.1-GB EIDE drives • Up to 436-GB external storage	• Up to two 9.1-GB 7,200-rpm 3.5-inch x 1-inch disk drives for internal storage • Up to 1-TB external storage	• Internal bays for up to six 4.2-GB, 9.1-GB, or 18-GB, 7200-rpm; 9.1-GB 10000-rpm, 3.5-inch x 1-inch or 1.6-inch hot-plug disk drives • 5 x 40 MB/sec. UltraSCSI • Up to 108-GB internal storage • Up to 1.94-TB external storage
Removable Media	• 1.44-MB floppy drive (standard) • 32x CD-ROM (optional) • External SCSI tape devices (optional)	• 1.44-MB floppy drive (optional) • 32x CD-ROM (standard) • External SCSI tape devices (optional)	• 1.44-MB floppy drive (optional) • 32x CD-ROM (standard) • External SCSI tape devices (optional)
System Console	PGX™ graphics card with 17-inch, 19-inch or 21-inch color monitor	TurboGX™ SBus frame buffer with 17-inch or 20-inch color monitor	PGX graphics card with 17-inch, 19-inch, 21-inch or 24-inch color monitor
System Monitor	Solstice SunNet Manager™	Sun Enterprise SyMON™	Sun Enterprise SyMON

Key Features	Sun Enterprise Ultra 10S Server	Sun Enterprise 2 Server	Sun Enterprise 250 Server
Support	1 year	1-year, on-site, next-day warranty	1-year, on-site, next-day warranty
Power	240 Watts	350 Watts	450 Watts

Sun Enterprise 2 Server

With higher database, NFS, and compute performance, the Sun Enterprise 2 server is targeted at medium-sized workgroups that need maximum performance for running business or technical applications. It has the following advantages over the Sun Enterprise Ultra 10S server:

- Multiprocessing
- Modular CPU; upgradable to next-generation processors
- Twice the memory capacity, and faster access to memory
- Greater external storage

Sun Enterprise Ultra 10S Server

The Sun Enterprise Ultra 10S server is an entry-level server based upon the UltraSPARC-IIi processor running at 300 MHz. The Sun Enterprise Ultra 10S server features industry-standard components and PCI I/O. It is enclosed in a minitower, which allows for additional PCI-card and memory expansion.

The Sun Enterprise Ultra 10S server allows Sun to compete on both price and performance with the fastest available Pentium II-class PC server computers. Key messages for the Sun Enterprise Ultra 10S include

- Entry-level price point
- Multiple PCI options
- Up to two internal 9.1-GB, 7200-rpm EIDE hard drives
- Single MHz UltraSPARC-IIi processor

Sun Enterprise 250 Server

The Sun Enterprise 250 server is a versatile mid-range server that delivers a potent combination of outstanding scalability and reliability at a remarkably affordable price. This new rackmountable tower server's exceptional blend of computing power, expandability, disk I/O throughput, network I/O performance, and remote monitoring features make it perfect for running or front-ending databases from Oracle, Sybase, and Informix. This makes it possible to deliver e-mail or web services to hundreds of concurrent users, run messaging groupware such as Lotus Domino, or implement thousands of other critical two-tier and three-tier client-server business applications.

The Sun Enterprise 250 server is the first workgroup server product that includes remote system control (RSC), allowing users to have full access to server administration and monitoring from a variety of client environments including Microsoft Windows 95, UNIX®, and X-terminals.

The Sun Enterprise 250 server supports

- Up to two 250-MHz, 300-MHz or 400-MHz UltraSPARC-II 64-bit RISC microprocessors
- 2 GB of memory
- Six internal, 18-GB UltraSCSI-3 disk drive
- Four high-performance PCI I/O buses

Target Industries for the Sun Enterprise 2 Server

Industry	Key Features to Highlight
Financial • Stock and commodity traders • Banking • Insurance	Branch office servers, customer management, electronic commerce
Publishing	Digital media management, web publishing, electronic commerce
Retail	In-store electronic retail systems, merchandising systems, inventory management, distribution
Government	Branch office systems
Telecommunications • Long distance carriers • Cable operators • Equipment OEMs	CMS, billing, fraud detection, network monitoring and reporting FTP, mail, directory servers, electronic commerce
Manufacturing	IT, engineering, sales and marketing, electronic commerce
Education	Registration and student records, library management
Health Care	Satellite office servers, billing, claims, medical imaging

Target Applications

Applications	Key Features to Highlight
Distributed Database, Database Management • Oracle, Informix, Sybase • Workgroup database applications	• Scalable computing power, high I/O performance • Reliable, secure • Comprehensive network management and connectivity • Rich set of enterprise-class applications from ISVs
Groupware, Collaboration • Lotus Notes	• Enterprise networking and PC interoperability • Supports hundreds of UNIX or PC clients
Decision Support and On-line Analytical Processing (OLAP)	• High-computational multiprocessing CPU performance • Large external cache • Storage I/O performance
Distributed File Access, File Management • Distributed NFS • NetWare LAN Manager file management • HTTP and FTP services	• NFS version 3 for robust, secure, distributed file sharing • Enterprise networking and PC interoperability
Internet	• Secure, reliable, and cost effective • Sun is the leading Internet provider; the majority of the servers on the Internet are Sun servers

Applications	Key Features to Highlight
E-mail **Web Mail Services** **Internet Gateway** **Legacy Host Gateway**	• Connectivity with heterogeneous systems and networks – TCP/IP, IPX/SPX, NetBEUI, NetBIOS, OSI, X.25, SNA, DECnet – Ethernet, token ring, FDDI, ATM, ISDN, T1, E1 – MS mail, UNIX mail, POP3, IMAP
Network Monitoring and Management **Message Routing** **Network Backup**	• Infrastructure and tools to reduce systems management effort • Proven expertise in large-scale networking; eases difficulties in managing PC LANs
Business Applications • SAP	• Rich set of enterprise-class applications from ISVs • Robust development environment • Scalable product line and operating environment for enterprise-wide deployment

System Architecture

The Sun Enterprise™ 2 server is highly leveraged from Sun's successful Ultra™ desktop family. Both product lines incorporate the same high-performance multiprocessing design, advanced CPU, networking, and I/O components, and compact packaging. To address workgroup server requirements, the Sun Enterprise 2 server includes software for ease of installation and system management, network administration, volume management, tape backup, and connectivity for heterogeneous environments.

The design goals of the Sun Enterprise 2 server were to use the latest technologies to create a high-performance, highly reliable platform for workgroup applications. This new-generation system inherits and expands upon the modularity, expandability, and configurability that have been the trademark of all Sun™ products. The continued commitment to the SPARC™ architecture provides compatibility with the largest installed base of networked systems. The SPARC architecture also enables the 64-bit UltraSPARC™ processor and boosts performance.

The following sections summarize the major components of the Sun Enterprise 2 server.

UltraSPARC Processors

- The Sun Enterprise 2 server accommodates up to two SPARC-V9-compliant, 64-bit UltraSPARC-II processor modules. The UltraSPARC-I processors operate at 300- or 400-MHz each with 2 MB of external cache.
- The UltraSPARC-II is Sun's latest generation of the SPARC family and the second generation of 64-bit UltraSPARC chips. It utilizes the latest 0.35-micron technology (versus the 0.5-micron technology used in UltraSPARC-I), which shrinks the die size. This reduced die size is the key to the UltraSPARC-II CPU's higher clock rates and increased performance. This smaller die size also enables the UltraSPARC-II to operate at a core voltage of 2.5 volts, rather than 3.3 volts as in the UltraSPARC-I. This lower voltage reduces power consumption and allows the chip to operate at higher frequencies without increasing total power requirements or heat dissipation, both major design issues in today's high performance systems.
- Each UltraSPARC processor is mounted on an independent module that plugs directly into the system board. This modular design facilitates easy system expansion (adding additional CPUs), processor upgrades (to next-generation UltraSPARC processors), and system service.
- To ensure proper response to an over-temperature condition, each module has an independent sensor that can be used to issue both warning and shutdown signals.
- The processor module retains complete backward compatibility with SPARC-V8-compliant applications.
- The 64-bit UltraSPARC processor includes on-chip 16-KB data and 16-KB instruction caches.

High-bandwidth, Low-latency UPA Interconnect

Sun completely redesigned the memory interface for the Ultra product line, in order to take advantage of the huge performance gains of the UltraSPARC processor. The result is the new Ultra port architecture (UPA), which is used in all Ultra systems and provides high-performance access to memory.

- UPA cache-coherent interconnect between processor, memory, and I/O subsystems
- Packet-switched for low-latency memory access and precise interrupt processing

  Unlike conventional cache-coherent systems, which use a globally shared, snooping address bus, the UPA interconnect relies on point-to-point packet-switched messages from a centralized system controller to maintain cache coherence. Packet switching provides much better bus bandwidth utilization by removing the latencies commonly associated with pure transaction-based designs. It permits minimum latency on cache misses, and effective pipelining in the interconnect allows maximum utilization of address, datapath, and main memory.
- 100-MHz operation
- Adjustable memory timing to ensure near-constant latencies and bandwidth across the range of bus frequencies
- High-speed memory transfers of 1.6 GB per second peak throughput for 300- or 400-MHz systems
- Sustained throughput of 720 MB per second
- Greatly increased performance over previous designs (three times faster than the SPARCserver™ 20 MBus)
- Wider paths to memory (576 bits, four times wider than the SPARCserver 20) handle a large data traffic volume

Memory

- Supports 64 MB to 2 GB using 5-volt DRAM DIMMs with 60-nanosecond access time
- 16 memory slots
- 32-MB, 64-MB, and 128-MB DIMMs available

  DIMMs must be added in sets of four. It is recommended that each set be the same size, as the largest DIMM of the set will be treated as if its capacity were equivalent to the smallest DIMM.
- Uses same DIMMs as the SPARCserver 20 for investment protection
- Data moves between memory and the UPA crossbar switch buffers over an error checking and correcting (ECC) protected datapath.
- Four-way interleaving

Fast Ethernet

- Uses high-speed, on-board 100-Mbit per second IEEE 802.3 Fast Ethernet (100BASE-T) for fast access to network resources
- Uses twisted-pair Category 5 interfaces through an RJ45 connector
- Works with existing cabling; downward compatible with 10 Mbit per second (10BASE-T) through autosensing, for deployment in existing environments
- Media independent interface (MII) allows use with ThickNet, twisted pair, ThinNet, or Fiber interfaces

SCSI

- Fast/wide, 20-MB per second single-ended SCSI-2 for fast access and retrieval of mass storage
- Downward-compatible with Fast 10 MB per second and standard 5 MB per second SCSI peripherals
- Supports up to 15 SCSI devices with on-board SCSI connector

SBus

- Provides four 64-bit-wide IEEE 1496 SBus expansion slots operating at 25 MHz

  Allows expansion to a variety of I/O options, including network interfaces such as ATM, ISDN, and Fibre Channel, external disk arrays, printer interfaces, and hundreds of third-party SBus cards
- Offers high-performance, 133 MB per second peak bandwidth
- Compatible with existing 32-bit SBus for investment protection; supports SPARCserver 20 expansion cards

Compact Packaging

- Supports up to two 1-inch hard drives using single-connector drive brackets, one internal 12-speed, 5.25-inch, 644-MB SCSI CD-ROM, and one floppy drive
- Compact package; occupies less desk or floor space
- Easy access to peripherals for upgrades or servicing
- Easily rack-mountable; fits into any standard 19-inch computer equipment rack using third-party rack-mount enclosures such as the Sphinx rack-mount chassis available from Artecon, Inc. or SunStore℠

External Expansion Options

- Supports external QIC, 8- and 4-mm tape, 4-mm tape stacking units, and tape library systems
- Support for external disk array (RAID) and tape library systems for highly reliable storage and backup needs
- Supports same peripherals as the SPARCserver 20 to preserve existing investments in hardware

Power and Cooling

- 350-Watt power supplies designed with better power-dissipation characteristics and support for 3.3-volt operation
- Power supply supports programmable core voltages
- Innovative internal plastic plenums regulate airflow within the enclosure, ensuring optimum cooling

Reliability, Availability, and Serviceability (RAS)

The clean, modular design of the Sun Enterprise™ 2 server contributes to its reliability and offers easy serviceability and upgradability. No tools are required to open the box or to install CPU, memory, or disk modules. Nearly every component is modular and easily plugged in. There is a minimum number of cables, making it very easy to service.

RAS features include the following:

- Extensive power-on self-test (POST)
- ECC on all data transfers
- Software memory scrubbing
- Parity on cache RAMs
- Temperature-sensitive variable-speed fans
- Internal thermal sensors to control cooling
  - Thermal faults result in customer alerts or shutdowns to avoid component damage
- SunVTS™ diagnostics can run at scheduled times to periodically validate system functionality
- Simple clam-shell enclosure for easy access to system components
- Easily replaceable disks and DIMMs
- Minimal internal cabling, with no cables for internal disks
- Common fastener used throughout
- Minimal use of jumpers
- Extensive internal and external testing of Solaris™ software

Requirements and Configuration

A Note on Sun Enterprise™ 2 Server Memory Configurations

Because memory must be upgraded in groups of four DIMMs of the same type in Sun Enterprise™ 2 server systems, a customer anticipating adding more memory in the future should purchase a large initial memory configuration.

Amount of Memory in Standard Configurations	DIMMs	Maximum Memory Using 16-MB DIMMs	Maximum Memory Using 32-MB DIMMs	Maximum Memory Using 64-MB DIMMs	Maximum Memory Using 128-MB DIMMs
128 MB	4 x 32 MB	320 MB	512 MB	896 MB	1664 MB
256 MB	4 x 64 MB	448 MB	640 MB	1024 MB	1792 MB
512 MB	4 x 128 MB	704 MB	896 MB	1280 MB	2048 MB

The Sun Enterprise 2 System at a Glance

Product Specifications	Sun Enterprise 2 Server
CPU	
• Architecture	UltraSPARC™-II processor
• Clock rate	300 or 400 MHz
• Cache on chip	16-Kbit instruction; 16-Kbit data
• External cache	2 MB
• CPU module slots	Two slots
• Multiprocessing	Two CPUs maximum
Memory	64 MB to 2 GB
• Memory type	ECC
• DRAM speed	60 nanoseconds
• Bus width	576 bits
• DIMM sizes	32 MB, 64 MB, or 128 MB
Disk Storage	20 MB/sec. SCSI supports up to 15 devices
• Maximum internal	18.2 GB
• Number of bays	2 x 1-inch drive bays
• Maximum total disk storage	>1 TB
• External disk options	One 50.4-GB Sun StorEdge™ MultiPack (12 x 4.2-GB disks) plus a 4.2-GB Sun StorEdge UniPack using on-board SCSI Supports up to 15 devices per SBus slot, or up to two arrays per slot Supports up to eight SPARCstorage™ Array Model 100 series *or* three SPARCstorage Array subsystems Model 200 series or a combination of the above options
I/O Architecture	
• SBus	Four 25-MHz, 64-bit slots
• Graphics	One dedicated slot (UPA)
• Serial ports	Two asynch (76.8 Kbaud)/synch (64 Kbaud) DB25
• Parallel port	One Centronics-compatible (DB25)

Product Specifications	Sun Enterprise 2 Server
Networking Ports	TP Ethernet 100BASE-T/10BASE-T, external transceiver using MII connector, plus optional ISDN, FDDI, and ATM using SBus cards
Backup and Distribution	
• Internal	644-MB SunCD™ 12 installed Optional 3.5-inch floppy drive
• External tape	2.5-GB QIC 14-GB 8-mm, 12- to 24-GB 4-mm DDS-3 140-GB Sun StorEdge L140 140- to 280-GB SPARCstorage DLT™ 4700 autoloader
Software	
• Operating environment	Solaris 2.5.1, 2.6 or Solaris 7 operating environment™, includes server license with an unlimited number of users
• System management	Solaris™ Web Start, Solstice AdminSuite™, Solstice DiskSuite™, and Solstice Backup™ Other Solstice products are available separately
• Networking	ONC+™, NFS™, TCP/IP, IPX™/SPX; OSI, DCE, SNA, X.25, PPP, Frame Relay, and XTL are available separately
• Languages	Available: C, C++, Pascal, Fortran, Fortran MP, Cobol, and Java™ programming language
Power	350 Watts
Dimensions and Weight	
• Height	13.0 cm (5.12 inches)
• Width	45.0 cm (17.72 inches)
• Depth	45.2 cm (17.94 inches)
• Shipping weight	12.27 to 15.88 kg (27.0 to 35.0 pounds)

System Management

Overview

The Sun Enterprise™ 2 server delivers leading performance for workgroups in its class in the areas of database, compute, and networking.

Performance Specifications

Sun Enterprise 2 Server	Model 1300	Model 2300	Model 1400	Model 2400
CPU speed	300 MHz	300 MHz	400 MHz	400 MHz
Number of CPUs	1	2	1	2
SPECint_95	12.1	12.3	17.2	TBD
SPECfp_95	15.5	20.2	22.3	25.9
SPECrate_int95	110	219	153	307
SPECrate_fp95	142	254	198	344
SPECrate_int92	N/A	N/A	N/A	N/A
SPECrate_fp92	N/A	N/A	N/A	N/A
Estimated tpm	2,785	5,400	TBD	TBD
LADDIS	N/A	N/A	N/A	N/A

Software

- Requires the Solaris™ 2.5.1, Solaris 2.6 or Solaris 7 operating environment; includes a server license that supports an unlimited number of clients
- Hard disk comes with Solaris™ Web Start preinstalled for easy, automatic and customized installation of host and clients
- Comes standard with Solstice AdminSuite™, Solstice DiskSuite™, and Solstice Backup™ software for network management
- ONC+™, TCP/IP, NFS™, NIS+, and IPX™/SPX bundled for interoperability and advanced networking services
- Binary compatible; runs the thousands of applications already available for the Solaris operating environment

Solaris Operating Environment

The Sun Enterprise 2 server offers customers the reliability, performance, scalability, and interoperability of Sun's industry leading Solaris operating environment. Sun Enterprise 2 server customers who are ready for the latest Solaris release will be able to take full advantage of all the powerful server features added to Solaris 7 operating environment with this system. Sun Enterprise 2 server customers will be especially interested in the installation and administration features, intranet and Internet capabilities, and desktop services for PC, Macintosh, UNIX® workstations, and Java™ technology-based NC systems added to the latest Solaris operating environment release.

Advantages of Solaris 7 over Solaris 2.6 Operating Environment

The Solaris 7 base operating environment delivers the following major enhancements over the Solaris 2.6 operating environment:

- **Data center-class reliability, availability, and serviceability (RAS)**

  Data center-class RAS features that can provide greater system stability and lower system downtime by allowing customers to add, remove, or replace defective hardware without rebooting the system.

- **Higher performance**

  A complete 64-bit computing environment provides greater capacity, precision, and performance. By increasing capacity from 32-bits to 64-bits, customers can realize significantly better performance for certain functions. The 64-bit virtual addressing and file system allows greater application flexibility enabling the creation of a new class of applications. 64-bit applications unleash the full power of Sun systems based on UltraSPARC™ technology. Some newly architected applications offer a performance boost of 10-100 over customers' existing systems.

  An updated version of the JDK™ 1.1.6 (Java™ Development Kit), with software-enhanced Java™ virtual machine and optimizing "Just-In-Time" (JIT) compiler technologies, provides significantly improved scalability. These benefits will be significantly enhanced in the JDK 1.2 software version (currently available in early access from the Web). The JDK 1.2 enhancements include a highly tuned, multithreaded VM architecture with faster thread synchronization, a memory system with generational garbage collection, and a highly optimizing JIT compiler.

- **Improved scalability**

  The complete 64-bit kernel also provides increased scalability by enabling access to more system resources, by allowing many more applications to be consolidated onto a single server that utilizes the Solaris software and to handle much larger problem sets, and by adding more capacity to existing hardware.

  The benefits of improved scalability are not limited to servers. The Solaris 7 operating environment enables a new application environment for desktop users. No model is too complex or too large to visualize and solve as a whole.

- **Greater ease of use**

  The easy-to-use, Web-based installation, GUI-based text/voice notes, and process manager make Solaris software easy to install and use. Command line entries are no longer required for some of the most often used desktop utilities.

- **Comprehensive global product**

  The Solaris operating environment includes support for the euro currency symbol, complex text formats for Arabic, Thai, and Hebrew languages, and support for the development of multilingual applications.

- **Software investment protection**

  Complete binary compatibility enables all of today's Solaris operating environment certified 32-bit applications to continue running on the Solaris 7 operating environment without modification.

Key Workgroup Server Features in the Solaris Operating Environment

Feature	Solaris 2.5.1 Operating Environment	Solaris 2.6 Operating Environment	Solaris 7 Operating Environment
Ease of Installation and Administration	**Bundled** • Solstice AdminSuite • Solstice DiskSuite • Solstice Backup (single server) **Available separately** • Solstice AutoClient™	• Solaris Web Start • Solstice AdminSuite • Solstice AutoClient (server plus 1 client) • Solstice DiskSuite • Solstice Backup (single server)	• Solaris™ Web Start/ Solaris Web Start Wizards™ • Solstice AdminSuite • Solstice AutoClient (server plus 1 client) • Solstice DiskSuite • Solstice Backup (single server) • Solaris Management Console
Reliability/ Serviceability	• Sun Enterprise SyMON™ • SunVTS™	• ShowMe How™ • Sun Enterprise SyMON • SunVTS	• ShowMe How • SunVTS
Web Features/Java Technology	**Available separately** • Sun Internet Mail Server™	• Sun WebServer™ • HotJava™ Browser • Java virtual machine • Simple Key Management for IP (SKIP) • Dynamic host configuration protocol (DHCP) • WebNFS™ • Solstice PPP • Sun Internet Mail Server (30-day Try and Buy)	• Sun WebServer • HotJava Web Browser • Java virtual machine • Simple Key Management for IP (SKIP) • Dynamic Host Configuration Protocol • WebNFS • Solstice™ PPP
PC Connectivity / Interoperability	**Available separately** • Syntax TotalNET • Solstice NFS Client™	• Syntax TotalNET (server plus one client) • Solstice NFS Client (one client)	• SunLink™ PC (server plus one client) • Solstice NFS Client (one client) • Sun Directory Services

Sun Enterprise 2 server customers who are ready for the latest Solaris operating environment release will be able to take full advantage of all the powerful new server features added to Solaris 7 operating environment. The Solaris 7 operating environment has a 64-bit kernel and provides enhancements in overall performance, scalability, reliability, availability, security, and ease of use while maintaining backwards compatibility for all Solaris operating environment-certified existing 32-bit applications.

Solaris Server Features and Benefits

Installation and Administration

Features	Benefits
• With Solaris 2.6 and Solaris 7 operating environment, every Sun server comes available with Solaris Web Start for fast network-based installation of the Solaris operating environment	• Eases and speeds the installation of Solaris software on hosts and clients
• Includes Solstice AdminSuite, which provides a consistent, easy-to-use, graphical interface for common system administration functions; includes a user manager for managing user accounts, a database manager for manipulating Solaris administration data, a host manager for connecting client systems to the network, a software manager for controlling installation of Solaris software packages, a serial port manager for managing serial ports remotely, and a print manager for network printing	• Eases system administration
• Includes AnswerBook™ for on-line network access to all Sun manuals, including browse and network print capability	• Speeds access to information, reduces cost
• Solstice SunNet Manager enables administration, monitoring, and troubleshooting of LANs and WANs	• Remote monitoring and control of networks lowers costs, increases uptime
• Third-party network and system-management tools provide administration, monitoring, and troubleshooting tools for distributed systems	• Users have a choice of network-management solutions

Compatibility

Features	Benefits
• Solaris operating environment is binary-compatible across all SPARC™ platforms, from desktops to enterprise servers	• Allows customers to deploy systems with confidence, knowing their applications can grow and their investment in network technology, software, and training will be protected
• The Solaris operating environment is supported on SPARC™, c86, and PowerPC platforms	• Makes it easy to deploy on other platforms the applications developed on SPARC platforms
• The Sun Enterprise 2 server runs Sun's powerful and dependable Solaris operating environment network operating system, and is 100 percent binary compatible with all software that runs on Sun Enterprise3000–6000 server family	• Runs over 12,000 of the most extensively tested, highest quality software packages available today for both commercial and technical applications

Performance and Scalability

Features	Benefits
• Outstanding performance and functionality in a variety of application areas, including database, networking, groupware, and multiuser business applications	• Provides maximum productivity for individuals and workgroups
• Highly scalable symmetric multiprocessing (SMP)	• Accelerates application throughput by distributing tasks among multiple processors • Delivers exceptional MP system price/performance and investment protection
• Multithreading	• Enables a single application to be partitioned into independent components that can be executed simultaneously, reducing response time and increasing throughput

Reliability

Feature	Benefit
• Proven and reliable network operating systems	• Maximum uptime for running business-critical applications

Low-cost Data Management and Backup

Features	Benefits
• Solstice DiskSuite provides data redundancy and enhanced disk system performance using RAID technology	• Increases data availability and speeds system throughput
• Journaling file system improves performance of directory operations and reduces file system check times during system restarts	• Enhances system throughput and increases system availability
• Solstice Backup automates network backup, recovery, and media management	• Simplifies data administration, improves data security and availability

Global Networking and Resource Sharing

Features	Benefits
• Connectivity for TCP/IP, NFS, NetWare, IPX/SPX, LAN Manager, and AppleTalk	• Provides complete corporate-wide connectivity and integration
• NFS	• Provides easy transparent network access to remote file systems, applications, and data on heterogeneous computer systems

Security

Feature	Benefit
• Simple Key Management for IP (SKIP) is a standard protocol that provides privacy and authentication services for data over the network	• Allows for secure communications over the Internet or intranet, without requiring any changes to the application

Internet Services

Features	Benefits
• WebNFS is a robust and scalable file system	• Enables users to quickly access and share files over the Web
• Dynamic host configuration protocol (DHCP) allows administrators to easily add clients to the intranet by dynamically assigning IP addresses	• Eliminates need for administrator to assign IP addresses manually to each client
• HotJava Browser provides an easy-to-use, customizable user interface	• Provides easy-to-use interface for installing software, performing Web-based administrative tasks, and accessing data over the Web
• Sun WebServer	• Provides fast response for accessing data over the Internet or when performing Web-based administration tasks

Electronic Mail

Feature	Benefit
• Sun Internet Mail Server (SIMS), a high performance, Internet-standard mail server that supports diverse types of mail clients from a single mail server	• Provides fast e-mail response and scalability to support lots of users and data

PC Integration and PC Interoperability

Sun's strategy is to support any client, including PC, Macintosh, Java NC, and UNIX systems. Because PCs are by far the most common desktop, Sun is putting focus on PC services and PC interoperability.

Sun is focusing on open industry standards, which are evolving Internet standards for all network services, including file, print, directory, security, messaging, and objects. In addition, Sun will provide or work with ISVs to provide a bridge to popular standards such as Microsoft's standards.

Future Interoperability Features

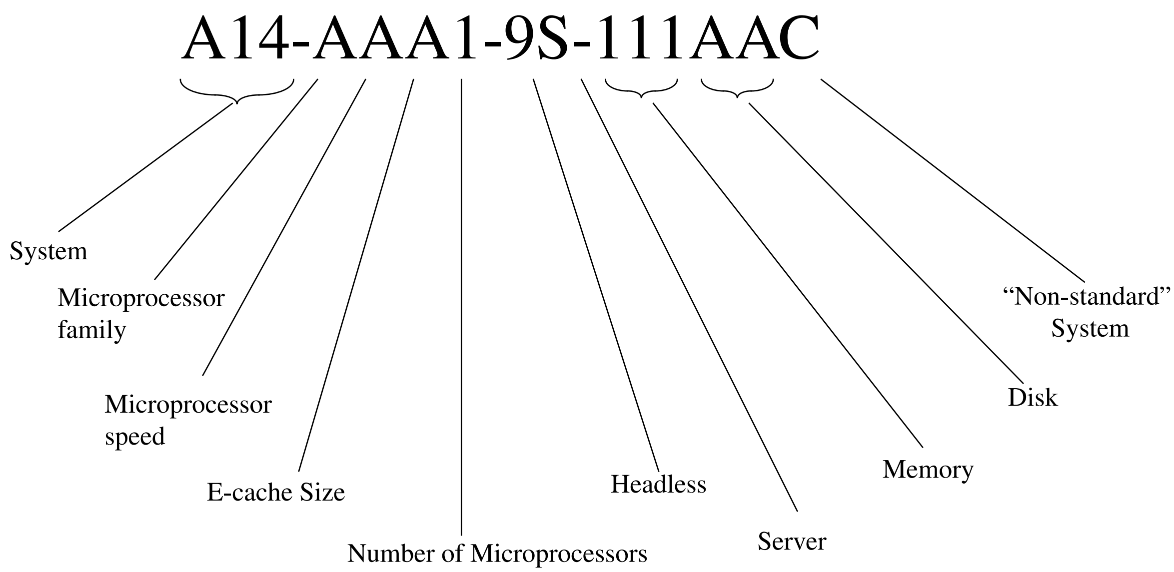
Management	
• Manage PC clients	Sun's ISVs, including CA and Tivoli, offer best-of-breed software tools for managing PC clients. In addition, once these are enhanced with Java technology, these products can be integrated into our Solstice family of tools. Over 40 management ISVs, including CA and Tivoli, will enhance their applications with JMAPI.
• Manage from anywhere, manage from a PC	Sun's Solstice tools are being enhanced with Java technology and will soon conform to the Java Management API (JMAPI). That means they will be managed over the Web from any console that has a Java technology-enabled browser.
Directory	
• NDS	Sun has announced a partnership with Novell to port their directory service, NDS, to the Solaris operating environment. This will be available at the beginning of next year.
• LDAP	Also, Sun will be supporting LDAP, an industry-standard protocol for interoperating with Microsoft Windows NT's future directory service.

PC Interoperability Features in the Solaris 2.6 Operating Environment

File/Print	
• TotalNET	This server-side software allows a Sun server to provide file and print services to LAN Manager PCs, Novell NetWare PCs and Appletalk Macintoshes. Nothing is required on the client.
• Solstice NFS Client	This client software allows a Microsoft Windows 95 or NT PC to use NFS file and print services on a network without having to install and pay for other network applications and functionality that the average user does not require. It provides higher performance and more robust services than TotalNET, but requires changes to the client.
E-mail	
• Solstice Internet Mail Server (SIMS)	SIMS supports IMAP4 and POP3. Most PC e-mail solutions today, including Microsoft Exchange, support POP3. Eventually, the industry will move to IMAP4, which is the internet mail standard.
• Solstice NFS Client	This client software allows a Microsoft Windows 95 or NT PC to use NFS file and print services. It provides higher performance and more robust services than TotalNET, but requires changes to the client.

Ordering

Sun Enterprise™ systems use a marketing order number scheme that is designed to provide greater flexibility and expandability.



(Note: A = alpha character, 1 = numeric character, C = optional alpha or numeric character)

Key (Subset of Order Number Definitions)

Microprocessor/System	Monitor	Frame Buffer	Disk
System A14 = Sun Enterprise 2 **Microprocessor Family** U = UltraSPARC™ **Microprocessor Speed** D = UltraSPARC 250 MHz E = UltraSPARC 300 MHz J = UltraSPARC 400 MHz **Ecache Size** C = 2 MB	1 = 20-inch color 2 = 17-inch color 3 = 17-inch color, low cost 4 = 20-inch color (Southern Hemisphere) 5 = 17-inch color (Southern Hemisphere) 6 = 17-inch color, low cost (Southern Hemisphere) 9 = Headless 13 = 17-inch low-cost PC compatible monitor **Memory** 064 = 64 MB 128 = 128 MB 256 = 256 MB 512 = 512 MB 001 = 1 GB	A = TurboGX™ B = TurboGXplus™ C = Reserved D = Reserved E = Creator F = Creator3D G = Reserved H = Reserved N = No frame buffer S = Server	CJ = 9.1 GB + SunCD™ 32

Options

Below is a partial list of CPU, memory, storage, and networking expansion options available for Sun Enterprise 2 systems. Refer to the Sun Price Book for complete option listings, configuration notes, and ordering information.

Part Number	Option Description	Maximum Number Supported	Comments
Memory			
X7002A	64-MB 60-nanosecond DIMM memory expansion (2 x 32 MB)	4	These are all pairs of DIMM units; order two
X7003A	128-MB 60-nanosecond DIMM memory expansion (2 x 64 MB)	4	
X7004A	256-MB 60-nanosecond DIMM memory expansion (2 x 128 MB)	4	
Mass Storage			
X6001A	3.5-inch 1.44-MB internal floppy drive	1	
X5153A	2.1-GB internal fast/wide SCSI-2 int exp disk	2	
X5214A	4.2-GB internal fast/wide SCSI-2 int exp disk	2	
X6212A	14-GB 8-mm internal tape	1	
X6282A	12–24-GB 4-mm DDS-3 internal tape		
Sun StorEdge™ UniPack	*The following Sun StorEdge UniPack options come with a 68–68 pin SCSI cable:*		
X5209A	4.2-GB, 7200-rpm fast/wide SCSI-2 disk Sun StorEdge UniPack		
X5151A	2.1-GB, 7200-rpm fast/wide SCSI-2 disk Sun StorEdge UniPack		
X5253A	9.1-GB, 7200-rpm fast/wide SCSI-2 disk Sun StorEdge UniPack	10	
X6261A	4-8-GB DDS-2 4-mm tape Sun StorEdge UniPack	10	
X6280A	12–24-GB DDS-3 4-mm tape Sun StorEdge UniPack	10	
X6208A	14-GB 8-mm tape Sun StorEdge UniPack	10	
X6230A	20–40-GB 8-mm tape Sun StorEdge UniPack	10	
X6101A	2.5-GB QIC tape Sun StorEdge UniPack	4	
X6157A	SunCD 12 Sun StorEdge UniPack		
Sun StorEdge MultiPack*			
X5511A	4.2-GB, 7200-rpm SCSI-2 (2 x 2.1-GB fast/wide disks)		
X5512A	12.6-GB, 7200-rpm SCSI-2 (6 x 2.1-GB fast/wide disks)		
X5513A	25.2-GB, 7200-rpm SCSI-2 (12 x 2.1-GB fast/wide disks)		
X5514A	8.4-GB, 7200-rpm SCSI-2 (2 x 4.2-GB fast/wide disks)		
X5515A	25.2-GB, 7200-rpm SCSI-2 (6 x 4.2-GB fast/wide disks)		
X5516A	50.4-GB, 7200-rpm SCSI-2 (12 x 4.2-GB fast/wide disks)		
X5504A	18.2-GB, 7200-rpm SCSI-2 (2 x 9.1-GB fast/wide disks)		
X5505A	36.4-GB, 7200-rpm SCSI-2 (4 x 9.1-GB fast/wide disks)		
X5506A	54.6-GB, 7200-rpm SCSI-2 (6 x 9.1-GB fast/wide disks)		
X6071A	140–280-GB DLT™ 4700 autoloader in desktop enclosure		
X6227A	140-GB 8-mm library with 1 internal disk in tower unit		
X6225A	400–800-GB 8-mm library model L400, stackable unit		

* *An SWIS/S host adapter with Solaris™ 2.3 operating environment or later is required for SCSI functionality*

Part Number	Option Description	Maximum Number Supported	Comments
Sun StorEdge FlexiPack			
X6060A	35–70-GB DLT 7000 tape with 68–68 pin SCSI cable		
X6057A	20–40-GB DLT 7000 tape with 68–68 pin SCSI cable		
X6290A	72–144-GB 4-mm DDS-3 autoloader tape with 68–68 pin SCSI cable	2	
	The following devices have 68–68 pin SCSI cable and one additional open half height expansion bay:		
X6232A	20-–40-GB 8-mm tape		
X6210A	14-GB 8-mm tape		
X6284A	12–24-GB 4-mm DDS-3 tape		
X6263A	4–8-GB 4-mm DDS-2 tape		
X6159A	SunCD 12 FlexiPack		
X6265A	4-–8-GB 4-mm DDS-2 internal tape drive for the Sun StorEdge FlexiPack		
X6236A	20–40-GB 8-mm internal tape drive for the Sun StorEdge FlexiPack		
X6161A	SunCD 12 internal CD-ROM for the Sun StorEdge FlexiPack		
Arrays			
X6590A	SPARCstorage™ Array Model 112 (6 x 2.1-GB, 7200-rpm disk)	4	
X6591A	SPARCstorage Array Model 112 (18 x 2.1-GB, 7200-rpm disk)	4	
X6592A	SPARCstorage Array Model 112 (30 x 2.1-GB, 7200-rpm disk)	4	
X6517A	SPARCstorage Array Model 114 (6 x 4.2-GB, 7200-rpm disk)	4	
X6518A	SPARCstorage Array Model 114 (18 x 4.2-GB, 7200-rpm disk)	4	
X6519A	SPARCstorage Array Model 114 (30 x 4.2-GB, 7200-rpm disk)	4	
Note: Model 200 series SPARCstorage Array trays in an enterprise expansion cabinet are available along with expansion drives for the Model 100 and 200 series. Refer to the Sun Price Book.			

Part Number	Option Description	Maximum Number Supported	Comments
Networking			
X1053A	SBus fast SCSI-2/buffered Ethernet card (FSBE/S)	2	
X1055A	SBus SCSI host adapter	2	
X1042A	SBus Sun Quad FastEthernet™ controller (QFE)	2	
X1025A	SunFDDI™ 5.0 single-attach SBus adapter (SAS)	2	
X1026A	SunFDDI 5.0 dual-attach SBus adapter (DAS)	2	
X1019A	High-speed serial interface/SBus (SunHSI/S™)	2	
X1021A	Sun SBus Prestoserve NFS™ accelerator	1	
X1014A	Token ring interface/SBus (SunTRI/S™)	1	
X1054A	SBus SCSI/buffered Ethernet card	2	
X1059A	SunFastEthernet™ 10/100 SBus adapter 2.0	2	
X1060A	SunATM™-155/MFiber SBus adapter 2.0	2	
X1061A	SunATM-155/UTP5 SBus adapter 2.0	2	
X1062A	SBus fast/wide diff intelligent SCSI-2 host adapter (DWIS/S)	2	
X1063A	SBus single-ended fast/wide diff int SCSI-2 host adapter (SWIS/S)	2	
X1064A	SunATM-622/MFiber SBus adapter 2.0	2	
X1012A	SunISDN™ SBus expansion kit	2	
X1030A	PCMCIA interface/SBus card	2	
X1008A	Serial parallel controller (SPC)		
X1018A	SunSwift™ 100BASE-T fast/wide SCSI SBus adapter		
Graphics and Multimedia			
X322A	TurboGX frame buffer with 17-inch color monitor	2	In addition to standard frame buffer
X359A	TurboGX frame buffer with 20-inch color monitor	2	
X367A	TurboGXplus frame buffer with 20-inch color monitor	2	

Ordering

Upgrades

Sun offers a variety of flexible upgrade paths to the most popular Sun™ systems. Customers can choose between chassis-only and full-system upgrades. Sun upgrades allow customers to carry as many components forward as possible to protect the investment of the customer. Existing investments in non-Sun hardware can be preserved by upgrading to Sun through competitive and full-system upgrades.

Upgrades to Sun Enterprise™ 2 Server Model 1300

Part Number	Description
UA12-UEC1-9N-000NN	Chassis upgrade from Sun Enterprise™ 1 server Model 170E, Sun Enterprise 1 server, or SPARCstation™ 20ZX to Sun Enterprise 2 server Model 1300, no graphics
UG-S-14UEC19S128CJ	Chassis upgrade from any SPARCserver™ to Sun Enterprise 2 server Model 1300 server, 1 x 300-MHz UltraSPARC™-I processor, 128-MB memory, 9.1-GB internal Fast SCSI-2 disk, SunCD™ 32
US20UEC1-9S-000NK	Chassis upgrade from SPARCserver 20 to Sun Enterprise 2 server Model 1300 server, 1 x 300-MHz UltraSPARC-I processor, SunCD 32
CU14UEC1-9S-128CJ	Chassis upgrade from SPARCserver 20 to Sun Enterprise 2 server Model 1300 server, 1 x 300-MHz UltraSPARC-I processor, 128-MB memory, 9.1-GB internal Fast SCSI-2 disk, SunCD 32

Upgrades to Sun Enterprise 2 Server Model 2300

Part Number	Description
UA12-UEC2-9N-000NN	Chassis upgrade from Sun Enterprise 1 server Model 170E, Sun Enterprise 1 server, or SPARCstation 20ZX to Sun Enterprise 2 server Model 2300, no graphics
U-S-UEC2-9S-256CJ	Chassis upgrade from any SPARCserver to Sun Enterprise 2 server Model 2300 server, 2 x 300-MHz UltraSPARC-I processor, 256-MB memory, 9.1-GB internal Fast SCSI-2 disk, SunCD 32

Part Number	Description
US20UEC2-9S-000NK	Chassis upgrade from SPARCserver 20 to Sun Enterprise 2 server Model 2300 server, 2 x 300-MHz UltraSPARC-I processor, SunCD 32
CU14UEC2-9S-256CJ	Chassis upgrade from SPARCserver 20 to Sun Enterprise 2 server Model 2300 server, 2 x 300-MHz UltraSPARC-I processor, 256-MB memory, 9.1-GB internal Fast SCSI-2 disk, SunCD 32

Upgrades to Sun Enterprise 2 Server Model 1400

Part Number	Description
UG-S-14UJC19S128CJ	Chassis upgrade from any SPARCserver to Sun Enterprise 2 server Model 1400, 1 x 400-MHz 2-MB ecache, UltraSPARC-I processor, 128-MB memory, 9-GB internal Fast SCSI-2 disk, SunCD 32
US20UJC1-9S-000NK	Chassis upgrade from SPARCserver 20 or Sun Enterprise 1 server to Sun Enterprise 2 server Model 1400, 1 x 400-MHz 2-MB ecache UltraSPARC-I processor, SunCD-32
CU14UJC1-9S-128CJ	Chassis upgrade from SPARCserver 20 to Sun Enterprise 2 server Model 1300, 1 x 300-MHz UltraSPARC-I processor, 128-MB memory, 4.2-GB internal Fast SCSI-2 disk, SunCD 32
UG14-UJC1-9S-000NK	Chassis upgrade from Sun Enterprise 2 server to Sun Enterprise 2 server Model 1400, 1x 400-MHz UltraSPARC-I processor, 0-MB memory, 0-GB internal disk, SunCD 32

Upgrades to Sun Enterprise 2 Server Model 2400

Part Number	Description
UG-S-UJC2-9S-256CJ	Chassis upgrade from any SPARCserver to Sun Enterprise 2 server Model 2400, 2 x 400-MHz UltraSPARC-I processor, 256-MB memory, 9-GB internal Fast SCSI-2 disk, SunCD 32

Part Number	Description
US20UJC2-9S-000NK	Chassis upgrade from SPARCserver 20 or Sun Enterprise 1 server to Sun Enterprise 2 server Model 2400, 2 x 400-MHz UltraSPARC-I processor, SunCD-32
CU14UJC2-9S-256CJ	Chassis upgrade from Sun Enterprise 2 server to Sun Enterprise 2 server Model 2400, 2 x 400-MHz UltraSPARC-I processor, 256-MB memory, 9-GB internal Fast SCSI-2 disk, SunCD 32

CPU Upgrades to 300 MHz and 400 MHz

Part Number	Description
UG-M1XXX-M1300	Module upgrade from Sun Enterprise 2 server Model 1170, 1200 or similar to Sun Enterprise 2 server Model 1300, CPU only
UG-M1XXX-M1400	Module upgrade from Sun Enterprise 2 server Model 1170, 1200 or similar to Sun Enterprise 2 server Model 1400, CPU only
UG-M300-M400	Module upgrade from Sun Enterprise 2 server Model 1300 or similar to Sun Enterprise 2 server Model 1400, CPU only

Memory Upgrades

Part Number	Description
UG-MEM128-MEM512	Memory upgrade from 128-MB to 512-MB memory (4 x 128-MB DIMMs)

Configuration Guidelines

- **Memory**
  - All DIMMs supported in the SPARCserver 20 and Sun Enterprise 1 server are also supported in the Sun Enterprise 2 server. The Sun Enterprise 2 server requires memory to be installed in like groups of four per bank. If additional memory is required, order SPARCserver 20 or Sun Enterprise 1 memory options to obtain additional like DIMMs.
- **Disk**
  - Internal single-connector fast SCSI-2 disks from the SPARCserver 20 are supported in the Sun Enterprise 2 server but require a shift of the plastic bracket. Two plastic brackets come with the Upgrade kit.
  - The 1-inch fast SCSI-2 and fast/wide SCSI-2 disks from the Sun Enterprise 1 works in the Sun Enterprise 2 server.
  - Disk performance is limited by the performance of the transferred disk.
  - The internal floppy drive can be moved to the Sun Enterprise 2 server system from SPARCserver 20 or Sun Enterprise 1 systems.
- **AUI**
  - The Sun Enterprise 2 server has an MII connector in place of the AUI connector. Customers need to order an MII-AUI adapter if the environment requires connection to an external transceiver through an AUI connection (see the “Options” section).
- **SCSI**
  - The SCSI connector of the Sun Enterprise 2 server is a wide SCSI-2 connector (68 pin). The customers need to order a wide-to-narrow SCSI adapter cable if external narrow SCSI devices are to be connected to the system (see the “Options” section).
- **CD-ROM and tape devices**
  - The only internal CD-ROM and tape devices that can be moved to the Sun Enterprise 2 system are those from Sun Enterprise 1 systems.

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
Personal technical account support	Yes	Yes	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semiannual	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	No
7-day/24-hour on-site coverage	Yes	Option	Option	N/A
Customer-defined priority setting	Yes	Yes	Yes	No
• 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
Additional contacts	Option	Option	Option	Option

FEATURE	SUNSPECTRUM PLATINUM℠ Mission-critical Support	SUNSPECTRUM GOLD℠ Business-critical Support	SUNSPECTRUM SILVER℠ Systems Support	SUNSPECTRUM BRONZE℠ Self Support
Enhanced Support Features				
Mission-critical support team	Yes	Yes	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
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 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

Glossary

Circuit-switched bus	Bus in which a transaction is normally implemented in an automatic fashion. Simple and easy to construct, a circuit-switched bus is often less efficient than comparable packet-switched buses. SBus is a circuit-switched bus.
ECC	Error checking and correction. ECC code is used to verify the integrity of data and can be used to correct some data errors.
FastEthernet	IEEE standard for 100-Mbit Ethernet. Also called 100BASE-T.
Fault-resistant	Systems that are fault-resistant are able to withstand and recover from many types of system problems and offer less than 100 percent uptime.
Fault-tolerant	Systems that are fault-tolerant are able to withstand and recover from any system problem and offer 100 percent uptime. These systems are typically much more expensive that comparable fault-resistant systems.
Hot plug	A hot-plug component can be removed, replaced, and automatically configured into the system without having to shut down or reboot the system.
Interleaved memory	Memory organization in which RAM chips are divided into banks. Access is arranged so that a single typical request is serviced by all banks simultaneously.
IPX™/SPX	NetWare's proprietary protocol stack, which provides basic connectivity between clients and servers and supports higher level services such as file- and print-sharing and remote administration.
MBus	The circuit-switched multiprocessor bus used in the SPARCserver™ 20.
Multiprocessing (MP)	Processing that runs concurrently on multiple CPUs, providing better performance and lowering latency. Multiprocessing systems are judged on the efficiency and linearity with which resources are allocated across a wide range of workloads. A system with a linear multiprocessing factor is said to be scalable in that system resources are not wasted and performance is predictable given the workload and hardware resources.
NFS™	Network File System. Sun's distributed computing file system, providing heterogeneous data sharing. NFS, in conjunction with NIS+, AutoFS, CacheFS™, and volume management, provides the user with automatic data location, navigation, and access over wide-area networks. The data appears instantly on the user's desktop, even if it is stored on a system in another city.
NIS+	Network information services plus. Naming service used as a data repository for network and system management information.
ONC+™	Sun's open systems distributed computing environment Provides heterogeneous data access through services, facilities, and APIs. Includes file and printer sharing, data exchange, remote procedure call, naming service, and several other file system technologies.

Packet-switched bus	A bus in which information is transmitted in small, fixed-sized units. Often associated with the use of split transactions. UPA is a packet-switched bus.
Parity	Parity is a simple technique used to verify the integrity of data.
PPP	Point-to-point protocol. Provides users with the full set of Internet and ONC services through low-cost modems and phone connections.
RAS	Reliability, availability, and serviceability. Reliability is a measure of the likelihood that problems will occur. A highly reliable system will have few problems. Once a problem occurs, availability is the measure of how the system protects the user from being adversely effected by the problem. Serviceability is a measure of how easy it is to repair the problem.
SBus	High-performance IEEE I/O interconnect for options such as disk expansion and networking cards.
TPC/IP	Transmission control protocol/Internet protocol. Most widely used transport stack in the world.
TPC-C	A database throughput benchmark that is representative of on-line transaction processing (OLTP) and decision support system (DSS) database usage. Results are stated as transactions per minute and TPC-Cs per dollar.
UPA	Ultra™ port architecture. A high-speed, crossbar-oriented, packet-switched motherboard interconnect.
V9	Version 9 of the SPARC™ definition.

Materials Abstract

All materials are available on SunWIN, except where noted otherwise.

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Powerpack				
– *Workgroup Server Golden Pitch*	Presentation on Sun's Workgroup Server Offerings; Slide Notes for Presentation	Sales Tool	SunWIN, Reseller Web	88148
– *Sun Enterprise™ 2 Server Just the Facts*	Reference Guide for the Sun Enterprise 2 Server (this document)	Training, Sales Tool	SunWIN, Reseller Web	52497
References				
– *Repricing of Workgroup Server Configurations and Modules 1/26/99*	Introduction E-mail	Sales Tool	SunWIN, Reseller Web, E-mail,	98918
– *Quick Reference Card: Competitive Server Overview*	Quick Reference Material	Sales Tool	SunWIN, Reseller Web, First Resort	24515
– *Quick Reference Card: Sun Server Overview*	Quick Reference Material	Sales Tool	SunWIN, Reseller Web, First Resort	24517
Training Materials				
– *NPI Training Materials Sales Presentation Technical Presentation*	Training Presentation and Notes	Sales Tool	SunWIN, Reseller Web	53361, 53364
Product Literature				
– *Product Overview*	Brochure	Sales Tool	COMAC	BE500-4
– *Sun Enterprise Server Brochure*	Brochure	Sales Tool	COMAC	BE529-3
– *Sun Enterprise 2 Server Datasheet*	Data Sheet	Sales Tool	SunWIN, COMAC	53206, DE649-0
– *Sun Enterprise 2 Server Product Brief*	Product Brief	Sales Tool	SunWIN, Reseller Web	53240
– *Product Catalog*	Product Catalog	Sales Tool	COMAC	EE240-0
– *The Sun Enterprise 1 and 2 Architecture Paper*	Technical Brief for Both the Sun Enterprise 1 and 2 Servers	Sales Tool	SunWIN, Reseller Web	53100
– *Solaris: Networked Computing for the Global Enterprise*	Technical Brief	Sales Tool	SunWIN, Reseller Web	49147
– *The UltraSPARC™ Processor Architecture*	White Paper	Sales Tool	SunWIN, Reseller Web	49231

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
– *UltraComputing™ for Business Solutions*	Detailed Description of how UltraComputing Benefits Business Solutions	Sales Tool	SunWIN, COMAC	53164, FE499-0
Performance				
– *Sun Enterprise Server Performance Data*	Performance Results	Sales Tool	SunWIN, Reseller Web	51149
Competitive Materials				
– *Sun's Workgroup Server Competitive Brief*	Competitive Brief	Sales Tool	SunWIN, Reseller Web	53106
Videos				
– *Intro to Go Video*	Introduction	Sales Tool	COMAC	ME1268-0
External Web Sites				
– *Sun Homepage*	`http://www.sun.com`			
– *Upgrades Information*	`http://www.sun.com/ultra/upgrades`			
– *UltraSPARC Information*	`http://www.sun.com/stb`			
Internal Web Sites				
– *Internal SE Information*	`http://fusion.corp`			
– *Competitive Profiles*	`http://abbey.corp/profiles/competitive.html`			
– *Solaris Competition*	`http://data.corp`			
– *Performance*	`http://perfwww.eng`			