Sun Enterprise™ 250 Server

Just the Facts

Sun microsystems®

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Positioning

Sun Enterprise™ 250 Server Overview

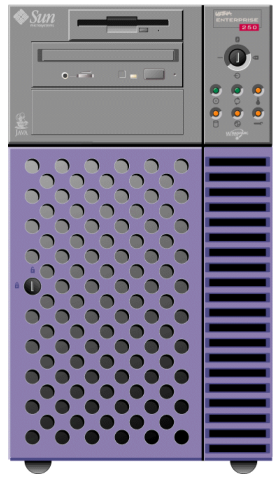


Figure 1. Sun Enterprise™ 250 server, front view

Rackmountable tower	• Fits in open office or standard 19-inch rack • 20.3 x 10.3 x 28.8 inches (517 x 262 x 732 mm)
One or two CPUs	• 250-MHz, 300-MHz, or 400-MHz UltraSPARC™-II
Up to 2-GB memory	• 16 DIMM slots • SPARCstation™ 20-style memory modules
Up to 108-GB internal storage	• Up to six 18-GB, 10000-rpm UltraSCSI disks
Up to 1.94-TB external storage	• Up to nine Fast/Wide or UltraSCSI channels
Four PCI slots	• All 64-bit slots • Three PCI33 (33 MHz) slots and one PCI66 (66 MHz) slot
Throughput	• PCI I/O buses
Datacenter RAS features	• Sun™ Remote System Control (RSC) • Automatic system recovery (ASR) • Hot-swap disks • Redundant hot-swap power supplies • Thermal sensing, auto fan control • Sun Enterprise SyMON™ system monitor
Solaris™ Operating Environment support	• Solaris 7 • Solaris 2.5.1 Hardware: 11/97 with extension for Sun Enterprise 250 server • Solaris 2.6 Hardware: 5/98

Typical customer applications	• Database, datamart • Business-critical applications • Workgroup support, groupware • Internet, intranet, web • Digital media, video
Key messages	• Scalable performance • Reliability and availability • Maximum up-time • Remote management

Introduction

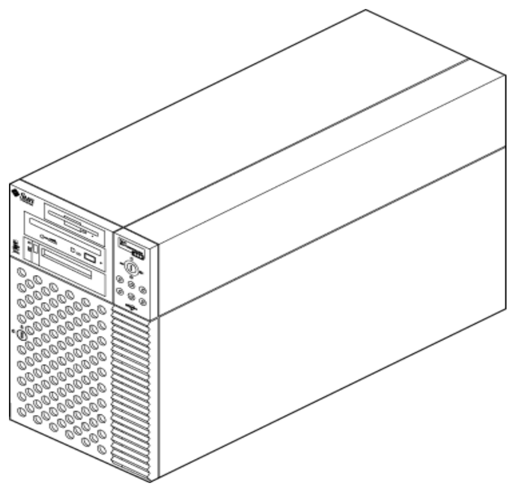


Figure 2. Sun Enterprise 250 server, side view

The Sun Enterprise 250 server is the latest member of Sun's powerful line of servers for enterprise network computing based on UltraSPARC technology. This versatile mid-range server delivers a potent combination of outstanding scalability and reliability, at a remarkably affordable price. This new rackmountable tower server has an exceptional blend of computing power, expandability, disk I/O throughput, network I/O performance, and remote monitoring features. It is perfect for running front-end databases from Oracle, Sybase, and Informix, delivering e-mail or web services to hundreds of concurrent users, running messaging groupware such as Lotus Domino, or for implementing thousands of other critical two-tier and three-tier client-server business applications.

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 drives, and four high-performance PCI I/O buses that can move over 350 MB of data per second. Because of its remote monitoring capability and other RAS features, the Sun Enterprise 250 server is ideal for applications running in a small or remote office. The emphasis on scalability and maximum uptime make the Sun Enterprise 250 server a reliable choice for remote, mission-critical applications. The Sun Enterprise 250 server is designed to satisfy many of the demanding information management, processing, and delivery requirements found in medium-sized businesses, branch offices, workgroups, and distributed applications within large-scale or global enterprises, such as:

- Database management or digital media management
- Distributed database access
- Distributed file management, HTTP and FTP services, and NC boot services

- E-mail, web mail services, Internet gateway, and legacy host gateway
- On-line transaction processing (OLTP), and electronic commerce
- Simulation
- Groupware (such as Lotus Notes)
- Print services
- Network management, message routing, and network backup

Key Features and Benefits

Features	Benefits
• Up to two 250-MHz, 300-MHz, or 400-MHz UltraSPARC-II CPUs; 1-MB Ecache on 250-MHz CPUs, and 2-MB Ecache on 300-MHz and 400-MHz CPUs; up to 2 GB of error correcting code (ECC) memory	• Proven UltraSPARC-II technology offers easy performance scalability providing support for heavy, compute-intensive applications such as database management, Internet/intranet service or simulation
• Three-segment Ultra™ port architecture (UPA) crossbar datapath moves up to 1.6 GB of data per second between CPUs, memory, and I/O channels	• High-speed parallel data flows provide 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 on-board UltraSCSI, 10/100 Ethernet, and serial and parallel ports deliver up to 350-MB per second total I/O throughput	• Superior I/O performance makes the Sun Enterprise 250 server an excellent file, web, or database server, especially for large workgroups; it is also a premier boot server for "thin client" desktop systems enabled by Java™ technology
• A 40 MB/second UltraSCSI controller supports up to six internal 18.2-GB, 10000-rpm disks	• With up to ten times the disk I/O performance of similarly priced systems, the Sun Enterprise 250 server surpasses every machine in its price range for file, web, database, or digital media server applications
• Multiple independent datapaths, ECC protection for memory and data paths, Automatic system recovery (ASR), redundant hot-swap power supplies, hot-swap disk drives, RAID 0, 1, 0+1, and 5, thermal sensing and auto fan control, overtemp protection, four levels of diagnostics, and high-availability cluster configuration options	• The extensive array of reliability, high-availability, and serviceability features of the Sun Enterprise 250 server allows customers to deploy these systems in their most business-critical environments with complete confidence

Features

- The Sun Enterprise 250 server runs Sun's powerful and dependable Solaris Operating Environment and is 100 percent binary compatible with all software that runs on the Sun Enterprise 450 server family
- Solaris for Intranets™ package includes many new features, such as Solaris easy installer, Sun Enterprise SyMON™, Sun WebServer™, DHCP, PPP, and file and print support for Microsoft Windows, Novell NetWare, and Macintosh clients

Benefits

- The Solaris Operating Environment, recognized as one of the industry's 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 Enterprise 250 server customers can deploy systems with confidence, knowing their applications can grow and their investment in network technology, software, and training will be protected
- Extensive software tools make it easier than ever to install and use Sun Enterprise servers for a wide range of applications throughout the enterprise network

Target Industries

Industry	Applications
Financial Services • Insurance • Banking • Securities traders and brokerages	• Branch office servers, customer management systems (CMS), and electronic commerce
Publishing	• Digital media management, web publishing, and electronic commerce
Manufacturing • Automotive • Aerospace • Electronics • Pharmaceuticals	• IT, finance and accounting, HR, manufacturing, engineering, sales and marketing, customer service, CMS, and electronic commerce
Telecommunications and Internet Services • Long-distance carriers, PTTs • RBOCs • Cable operators • Wireless operators • Internet service providers • Equipment OEMs	• Internet HTTP, e-mail, FTP, directory servers, electronic commerce • CMS, billing, fraud detection, network monitoring and reporting, and software development
Retail • Major retail chains	• In-store electronic retail systems, HQ customer management, merchandising systems, inventory management, distribution, and electronic commerce
Government • Federal/national • State/provincial	• Branch office systems

Industry	Applications
Health Care • Hospitals and clinics • HMOs and managed care providers • Medical equipment OEMs	• Satellite office servers, patient records, billing, claims processing, medical imaging systems, picture archival, and communications systems
Education • Colleges and universities	• Registration and student records, library management, financial aid administration, and academic research

Target Applications

Target 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 – Microsoft mail, UNIX® mail, POP3, IMAP • Exceptionally scalable multithread performance • Exceptional total system throughput
Database or digital media management • From 20 GB to 2000 GB • Oracle, Informix, Sybase	• Storage capacity (108 GB internal, 1.94 TB external) • Outstanding storage I/O performance • Exceptional network connectivity and I/O bandwidth
Distributed database access	• Outstanding network connectivity, computing power, network I/O performance, total system throughput • Reliability and availability features
On-line transaction processing (OLTP) **Electronic commerce** **Business applications**	• Outstanding computing power, storage I/O performance, network I/O performance, reliability and availability features • Over 12,000 top software applications • Robust development environment • Scalable O/S, broad product line for enterprise-wide deployment
Groupware, collaboration • Lotus Notes	• Enterprise networking and PC interoperability • Supports hundreds of UNIX or PC clients
Decision support **On-line analytical processing (OLAP)**	• Outstanding computing power • Storage capacity and storage I/O performance
Distributed file access, file management • Distributed NFS™, NetWare, LAN Manager file management • HTTP and FTP services • NC boot services	• Robust, secure, distributed file sharing with NFS version 3 • Enterprise networking and PC interoperability
Internet	• Secure, reliable, and cost-effective • Sun is the leading Internet provider; the majority of servers on the Internet are Sun servers
Simulation	
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

Sun Enterprise Server Family Comparisons

Sun Enterprise 250 versus Sun Enterprise 2 and 450 Servers

As a member of the Sun Enterprise family of servers, the Sun Enterprise 250 server is positioned between the Sun Enterprise 2 and the Sun Enterprise 450. Features of these three servers are compared below.

Key Features	Sun Enterprise 2 Server (2 CPU Configuration)	Sun Enterprise 250 Server (2 CPU Configuration)	Sun Enterprise 450 Server (4 CPU Configuration)
Product positioning	• Compact dual-processor network application server for medium-sized workgroups and compute-intensive applications • Suitable for small-to-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	• Affordable high performance 4-way SMP network application server • Reliable, high-capacity mid-range tower server • For larger web sites, branch offices, workgroups, or distributed enterprise applications • Ideal for managing larger files
Packaging	Desktop enclosure	Deskside or rackmounted	Rackmountable deskside tower
Dimensions	130 mm x 450 mm x 444 mm (H x W x D)	517 mm x 262 mm x 732 mm (H x W x D)	581 mm x 448 mm x 696 mm (H x W x D)
CPUs	• 300 MHz or 400 MHz • 2-MB Ecache • Up to two CPUs • Modular CPUs can be added one at a time	• 250, 300, or 400 MHz • 1-MB, 2-MB, or 2-MB Ecache • Up to two CPUs • Modular CPUs can be added one at a time	• 250, 300, or 400 MHz • 1-MB, 2-MB, or 4-MB Ecache • Up to four CPUs • Modular CPUs can be added one at a time
Memory	• 16 DIMM slots • 5V, 60-ns DIMMs • 64 MB to 2 GB • 576-bit-wide data path • Minimum/maximum latency: 30 to 170 nanoseconds • Memory added in groups of four DIMMs	• 16 DIMM slots • 5V, 60-ns DIMMs • 128 MB to 2 GB • 576-bit-wide data path • Minimum/maximum latency: 30 to 130 nanoseconds • Memory added in groups of four DIMMs	• 16 DIMM slots • 5V, 60-ns DIMMs • 128 MB to 4 GB • 576-bit-wide data path • Minimum/maximum latency: 30 to 130 nanoseconds • Memory added in groups of four DIMMs • Two-way or four-way interleaving
System bus	• Three-segment UPA • 100 MHz	• Three-segment UPA • 1.6 GB/second throughput • Runs at 83 MHz with 250-MHz CPU installed, or 100 MHz with 300-MHz or 400-MHz CPU installed	• Five-segment UPA • 1.6 GB/second throughput • Runs at 83 MHz with 250-MHz CPU installed, or 100 MHz with 300-MHz or 400-MHz CPU installed

Key Features	Sun Enterprise 2 Server (2 CPU Configuration)	Sun Enterprise 250 Server (2 CPU Configuration)	Sun Enterprise 450 Server (4 CPU Configuration)
I/O	• One SBus, four slots • 20 MB/second Fast/Wide SCSI	• 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 async serial ports; DB25 • Parallel port • 350 MB/second max system I/O throughput	• Six PCI buses, ten PCI slots • 40 MB/second UltraSCSI, 20 MB/second Fast/Wide SCSI • 10/100 Ethernet port • One 384K sync serial port; one 460K async port; DB25 • Parallel port • 1 GB/second max system I/O throughput
Storage	• Internal bays for up to two 9.1-GB, 7200-rpm, 3.5-inch x 1-inch or 1.6-inch disk drives • 1 x 20 MB/second Fast/Wide SCSI • Up to 18-GB internal storage • Up to 1-TB external storage • 1.44-MB floppy drive (optional) • 32X CD-ROM (standard) • External SCSI tape devices (optional)	• Internal bays for up to six 9.1-GB or 18-GB 7200-rpm, 9.1-GB or 18-GB 10000-rpm, 3.5-inch x 1-inch or 1.6-inch hot-plug disk drives • 5 x 40 MB/second UltraSCSI • Up to 108-GB internal storage • Up to 1.94-TB external storage • 1.44-MB floppy drive (optional) • 32X CD-ROM (standard) • Internal 5.25-inch, half-height, SCSI 4-mm or 8-mm tape device (optional) • External SCSI tape devices (optional)	• Internal bays for up to twenty 9.1-GB 7200-rpm or 18-GB 10000-rpm 3.5-inch x 1-inch hot-plug disk drives • 5 x 40 MB/second UltraSCSI • Up to 360-GB internal storage • Up to 6-TB external storage • 1.44-MB floppy drive (optional) • 32X CD-ROM (standard) • Internal 5.25-inch, half-height, SCSI 4-mm or 8-mm tape device (optional) • External SCSI tape devices (optional)
System console	• TurboGX™ SBus frame buffer with 17-inch or 20-inch color monitor	• Low-cost PCI frame buffer with 17-inch or 20-inch color monitor	• Low-cost PCI frame buffer with 17-inch or 20-inch color monitor
Power	• 110 V/220 V • 400 W	• 110 V/220 V • 360 W	• 110 V/220 V • 1120 W
Performance	@ 2 x 400 MHz, 2 MB • SPECint_rate95 = 307 • SPECfp_rate95 = 344	@ 2 x 400 MHz, 2 MB • SPECint95 = 16.8 • SPECfp95 = 26.4 • SPECint_rate95 = 303 • SPECfp_rate95 = 334 • SPECweb = 4,277	@ 2 x 400 MHz, 4 MB • SPECint95 = 17.4 • SPECfp95 = 40.8 • SPECint_rate95 = 609 • SPECfp_rate95 = 758 • SPECweb = 9,115 • TPM = 17,674

Key Features	Sun Enterprise 2 Server (2 CPU Configuration)	Sun Enterprise 250 Server (2 CPU Configuration)	Sun Enterprise 450 Server (4 CPU Configuration)
RAS features		• Remote monitoring from a systems administration console via serial (ppp) or ethernet (SNMP)	
	• Integrated design, fewer connections		• Integrated design, fewer connections
			• Multiple independent datapaths
	• ECC protection for memory and datapaths	• ECC protection for memory and datapaths	• ECC protection for memory and datapaths
		• Automatic system recovery (ASR)	• Automatic System Recovery
		• Redundant hot-swap power supplies	• Redundant hot-swap power supplies
		• Hot-swap disk drives	• Hot-swap disk drives
	• RAID 0, 1, 0+1, and 5	• RAID 0, 1, 1+0, and 5	• Internal HW RAID 0, 1, 1+0, 5, and 5+0
		• External HW RAID support for RAID 0, 1, 5, 1+0, and 5+0	• External HW RAID support for RAID 0, 1, 5, 1+0, and 5+0
		• Thermal sensing and auto fan control	• Thermal sensing and auto fan control
		• Overtemp protection	• Overtemp protection
	• Four levels of diagnostics	• Four levels of diagnostics	• Four levels of diagnostics
	• High-availability cluster configuration options	• High-availability cluster configuration options	• High-availability cluster configuration options
Warranty (see note, below)	• 1 year, on-site, next-day service	• 3 year, on-site, second-day service	• 3 year, on-site, second-day service

Note: *Warranty may vary by geographical region. Check with your local SunService℠ representative for the warranty that applies in your region.*

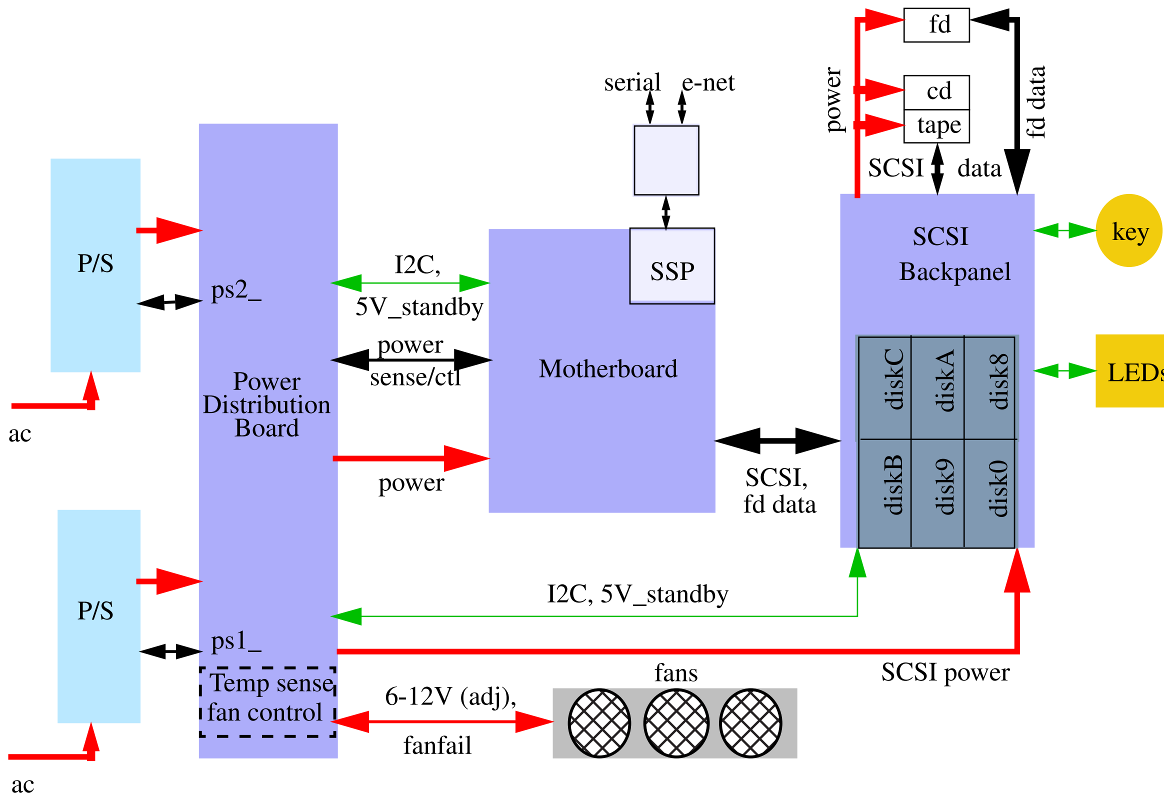


Figure 3. Sun Enterprise™ 250 server architecture

UltraSPARC™-II Processors

The Sun Enterprise™ 250 server is a shared-memory, symmetric-multiprocessing system built around the UltraSPARC™-II microprocessor. The UltraSPARC-II processor 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 of UltraSPARC-I processor), which shrinks the die size to 149^2 mm (from 218^2 mm). This reduced die size is the key to the higher clock rates and increased performance of UltraSPARC-II processor. This smaller die size also enables the UltraSPARC-II processor to operate at a core voltage of 2.5 Volts, rather than at the 3.3 Volts, of the UltraSPARC-I processor. 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.

The UltraSPARC-II processors used in the Sun Enterprise 250 server are individually mounted on 4-inch x 6-inch, field-installable module cards along with associated Ultra™ port architecture (UPA) data buffers and 2 MB of high-speed SRAM external cache memory (1-MB cache with 250-MHz CPU). These modules are similar to those used in the Sun Enterprise 2 server and Ultra 30 workstations. This modular design facilitates easy system expansion (adding additional CPUs), processor upgrades (to higher performance UltraSPARC processors), and system service.

The Sun Enterprise 250 server is designed to exploit the full processing power of up to two high-performance UltraSPARC-II CPUs. Processors with clock rates of 250 MHz, 300 MHz, and 400 MHz are supported; all processors installed in a single system must operate at the same clock frequency. The system's UPA interconnect, main memory, and I/O subsystems have been carefully architected to sustain the high data rates necessary to use these processors fully, resulting in system performance that scales remarkably well from a lightly loaded uniprocessor configuration to a dual-processor system.

Ultra Port Architecture System Interconnect

The processors, memory, and I/O subsystems of the Sun Enterprise 250 server are interconnected by a high-speed, three-segment UPA crossbar datapath. One UPA segment supports the CPU modules, one supports system I/O, and one provides the system datapath to main memory. The CPU datapath is 144 bits wide, with 128 bits for data and 16 bits for error correcting code (ECC). The UPA datapath that supports system I/O is 72 bits wide, with 64 bits for data and 8 bits for ECC. The memory datapath is 576 bits wide, with 512 bits (64 bytes) for data and 64 bits for ECC.

Each UPA segment operates independently of the others and moves data blocks over a parallel datapath between client buffers and UPA switch buffers. Transfers are completed at a clock rate that is automatically synchronized by the system controller to one-third or one-quarter of the system's CPU clock rate. With 250-MHz CPUs installed, the UPA clocks at 83.3-MHz, and with 300-MHz or 400-MHz CPUs installed, the UPA transfers data at 100 MHz (one transfer every ten nanoseconds). The CPU segment, which transfers 16 bytes of data in parallel per clock cycle, has a maximum transfer rate of 1.6-GB per second. I/O segments, which transfer 8 bytes in parallel per clock cycle, each have a maximum transfer rate of 800 MB/second. Memory transfers require three UPA clock cycles to complete (depending on clock speed), producing a maximum memory I/O throughput of 2.13 GB per second.

Because each UPA segment operates independently of the others, all segments can be transferring data between local and switch buffers concurrently. CPU segments move data from 64-byte buffers at the crossbar switch to 16-byte local buffers during four consecutive UPA clock cycles, and I/O segments move data from 64-byte crossbar buffers to 8-byte local buffers during eight consecutive UPA clock cycles. Once its local buffer is filled with outbound data, a client on a shared UPA segment arbitrates for control of the segment, then transfers its data to the segment's switch buffer during the requisite number of clock pulses.

All UPA addressing and arbitration occurs over signal lines that are separate from the datapaths. This arrangement allows arbitration and addressing to occur in parallel with data transfers, reducing transfer latency and improving datapath utilization.

Memory

The Sun Enterprise 250 server supports up to 2 GB of 60-nanosecond, 5-Volt dynamic RAM memory. DIMMs used by the Sun Enterprise 250 server are the same type as those used in the Sun Enterprise 2 and Sun Enterprise 450 servers. Memory is organized into four banks of four dual in-line memory modules (DIMMs). All four DIMMs within the same bank must be identical, and can range in capacity from 32 MB each to 128 MB each. DIMMs in different banks can have different capacities.

Data moves between memory and the UPA crossbar switch buffers over an ECC-protected, 64-byte-wide datapath. A memory read or write operation to a single memory location requires approximately ten UPA clock cycles to complete (approximately 100 nanoseconds with current memory chips).

System I/O

All system communication with storage peripherals and network interface devices is mediated by one UPA-to-PCI bridge, located on the system's main logic board. This bridge chip manages communication between the UPA bus and two industry-standard peripheral component interconnect (PCI) data buses.

The bridge chip provides buffered data transfers between the UPA and one 66-MHz PCI bus and one 33-MHz PCI bus. The bridge is capable of sustained data transfer rates of over 334 MB per second with either one or both supported PCI buses active.

Together, the system's two PCI buses support slots for up to four PCI interface cards. One PCI bus (bus B) also handles communications between the system and devices connected to the main logic board's SCSI, FastEthernet, serial, parallel, and keyboard/mouse ports. PCI buses in the Sun Enterprise 250 server comply with the 2.1 revision of the PCI specification, released in March 1995.

Sun Enterprise 250 Server PCI Bus/Slot Layout and Slot Characteristics

PCI Slot Number	PCI Bus	Widths Supported	PCI Clock Rate (MHz)	Card Input Voltages Supported
4	A	64/32 bit, 64	33, 66	3.3V or Universal
1–3	B	64/32 bit, 64	33	5V or Universal

- PCI bus A operates at 33 MHz or 66 MHz and provides one slot for either a 32-bit or 64-bit, 3.3-Volt or universal PCI card.
- PCI bus B operates at 33 MHz and provides three slots for either 32-bit or 64-bit, 5-Volt or universal PCI cards.

In addition to the I/O capabilities available through PCI option cards, the Sun Enterprise 250 server provides the following I/O channels directly from the main system board:

- One internal-only 40 MB/second UltraSCSI-3 channel which supports the system's six standard 3.5-inch UltraSCSI disk bays and two internal Fast/Wide removable media devices
- One external 40 MB/second UltraSCSI-3 channel; one external 68-pin SCSI connector supports connections to up to nine external SCSI Sun StorEdge™ UniPack devices or a single Sun StorEdge MultiPack system
- One internal-only floppy drive controller port supports an optional 3.5-inch, 1.44-MB floppy drive
- One external 10/100 auto-select Ethernet port supports either a Cat-5 UTP (RJ45 connector) or 40-pin miniature "D" MII connection
- There are two external EIA-232D or EIA-423 serial ports. Each can be either synchronous or asynchronous. Each supports EIA-423 synchronous data rates from 50 baud to 384 Kbps, and asynchronous data rates from 50 baud to 460.8 Kbaud
- One external 2 MB/second Centronics-compatible, bi-directional EPP parallel port with one DB25 connector
- One external standard Sun keyboard/mouse port (mini DIN-8 connector)

Storage

Primary (internal) data storage for the Sun Enterprise 250 server is provided by up to six 18-GB, 3.5-inch by 1-inch or 1.6-inch hot-swappable UltraSCSI-3 disk drives. These 7200-rpm and 10000-rpm drives have an average access time of 14 milliseconds and a peak internal transfer rate of up to 140 Mbits per second. Each drive offers a peak data transfer rate of 40 Mbits per second, twice the transfer rate of Fast/Wide SCSI controllers.

To satisfy the needs of customers with larger data storage requirements, the Sun Enterprise 250 server supports a variety of external storage subsystems. PCI storage controllers provide support for Sun StorEdge disk arrays. With nine fully configured Sun StorEdge A5000 disk arrays attached through four dual-channel UltraSCSI storage controllers, the Sun Enterprise 250 server can access over 1.9 TB of local data.

Storage management software such as Sun's Solstice DiskSuite™ and VERITAS Volume Manager software enables the Sun Enterprise 250 server to support disk striping (RAID 0), mirroring (RAID 1), striping with parity (RAID 5), and striping plus mirroring (RAID 0+1).

In addition to its internal and external high-speed fixed storage capabilities, the Sun Enterprise 250 server provides a standard 32X CD-ROM drive and an optional 1.44-MB, 3.5-inch, manual-eject floppy drive for software installation and system management. An internal 5.25-inch, half-height (1.6-inch high) drive bay is provided for an additional narrow (8-bit) SCSI device, such as a 4-mm DDS-2 or DDS-3 tape drive, or an 8-mm tape drive. Additional externally attached tape drives, autoloaders, or libraries can be attached to the system's external UltraSCSI port or to optional PCI SCSI controller cards.

Sun StorEdge SRC/P Intelligent SCSI RAID Controller™ Systems

The Sun StorEdge SRC/P Intelligent SCSI RAID Controller™ system was announced on May 25, 1999 to support external Sun StorEdge MultiPack systems on the Sun Enterprise 250. Up to three SRC/P cards can be installed in the Sun Enterprise 250 server to support up to 9 external Sun StorEdge MultiPack systems.

For additional information on SRC/P and configuration on this product, refer to the Sun StorEdge SRC/P Intelligent SCSI RAID Controller *Just the Facts*.

Console System

The Sun Enterprise 250 server can be managed from either a local or remote (network) console device. A local character terminal console device can be attached through one of the system's two serial ports, or a color monitor, keyboard, and mouse can be attached to any supported PCI graphics controller/framebuffer and the keyboard/mouse port. The system can be managed remotely from any X/windows terminal or workstation.

The four-position front panel key switch controls system power as well as administrator access to the system's power-on self-test (POST) diagnostics and flash-upgradable PROM.

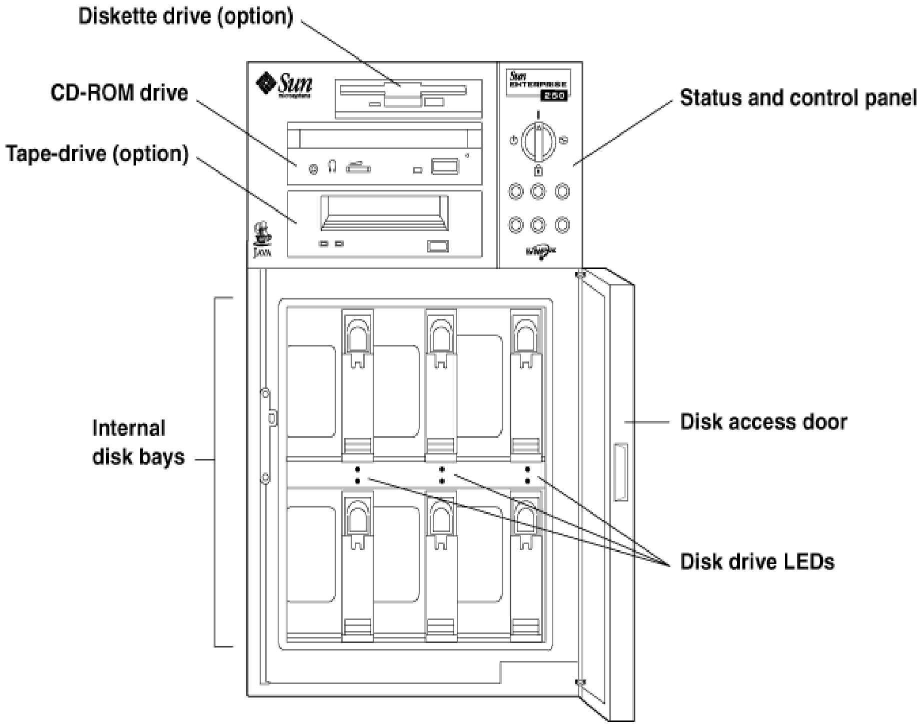


Figure 4. Front view of Sun Enterprise 250 server, disk access door open

The system flash-upgradable boot PROM provides standard OpenBoot™ capabilities, power-on self-test, and extensive OpenBoot diagnostics.

Six front panel LEDs provide system administrators with easy to interpret status information about the health of the system motherboard, CPUs, memory, disks, cooling fans, and power supplies.

Sun™ Remote System Control

The Sun Enterprise 250 server includes remote monitoring and administration capability provided by the Sun™ Remote System Control (RSC). RSC allows access to the Sun Enterprise 250 server independent of the Solaris Operating Environment and sends e-mail or pager notice of hardware and software events to the systems administrator.

To run RSC, the Sun Enterprise 250 server has a dedicated system service processor (SSP) built into the system motherboard. Access to the SSP is via a serial or 10-Mbit connection.

RSC features include:

- Power cycling
- Hard or soft resets
- Display boot and run logs
- Access to environmental sensing including CPU temperature and voltage
- E-mail or pager notice of server shutdown, over temperature and over voltage events
- Remote console access

Additional information about RSC is available at:

`http://sunsolve2.Sun.COM/sunsolve/E250_RSC/`

Power Distribution System

System power is provided by one or two 360-Watt universal DC power supplies. These redundant modular hot-swap units are easily installed and removed from the rear of the system, even while the machine is operating. Maximally configured systems will operate continuously with one power supply installed.

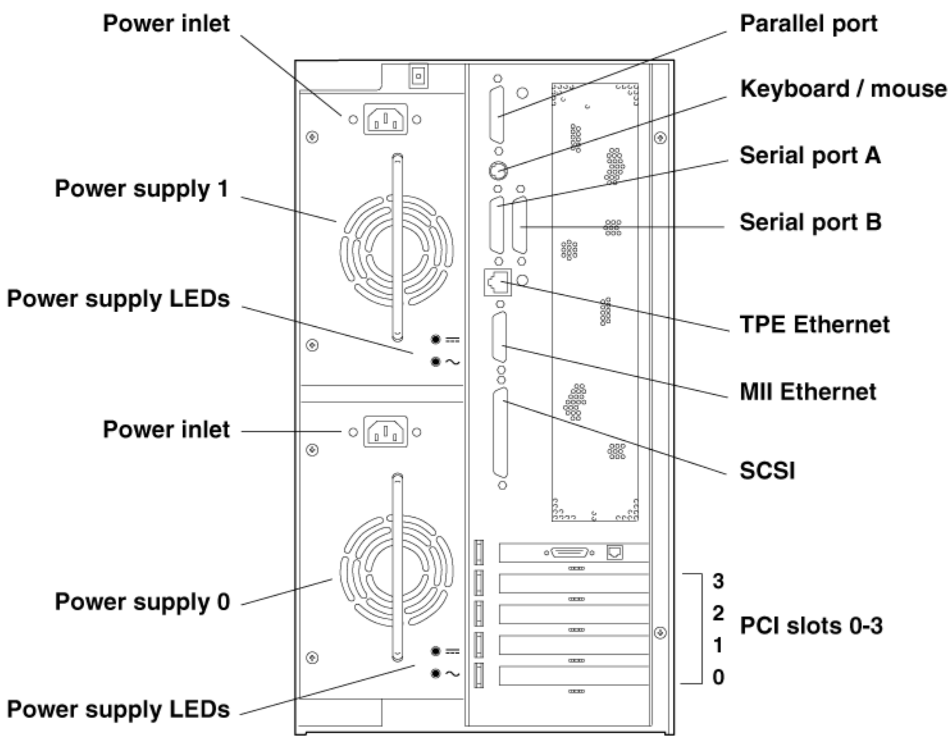


Figure 5. Rear view of Sun Enterprise 250 server

Power supplies feed all active system components through a common power distribution board. Power is drawn equally from all supplies installed in the system. If service from one power supply is interrupted, the system power demand shifts automatically to the remaining active supply. With a hot standby or “N+1” power supply installed, the system can continue operating while a replacement power supply is installed.

The base server includes one power supply that provides sufficient power for maximum memory, four PCI cards, six internal disks, a CD-ROM drive, an optional tape drive, an optional floppy drive, and up to two CPU modules.

Environmental Monitoring and Control (EM&C) System

The environmental monitoring and control system of the Sun Enterprise 250 server continuously monitors temperatures at several critical locations throughout the machine. Readings from thermal sensors provide input to the server's airflow management system, which automatically adjusts fan speeds as necessary to keep component operating temperatures within acceptable ranges. If measured temperatures exceed safe operating limits and fans are already operating at maximum speed, the system automatically notifies the console and suspends operation.

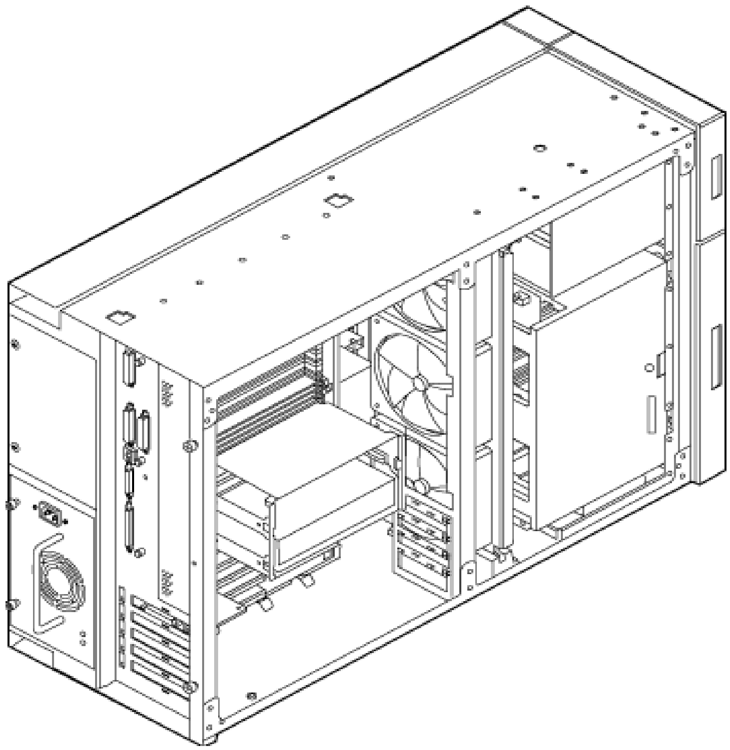


Figure 6. Rear cut-away view of Sun Enterprise 250 server

System Enclosure and Mechanical Specifications

The Sun Enterprise 250 system is housed in a rackmountable, deskside tower enclosure that measures 20.3 inches high x 10.3 inches wide x 28.8 inches deep (517 mm x 262 mm x 732 mm). Depending on the number and type of options installed, the system weighs between 100 and 118 pounds.

System Access, Tower Unit

Deskside system chassis are mounted on four foot glides. Optional swivel casters are available; casters lock to provide system stability. Operator controls and removable media are accessed from the front of the tower unit. Access to the drives is provided through a hinged door on the front of the system. The disk bay door has a key lock for added system security. All front panel status indicator LEDs are visible from the front of the tower unit.

Power supplies are easily accessible from the rear of the chassis for serviceability. Each power supply has status indicator lights visible from the rear of the system showing power-on and fault conditions.

Internal service access to the system requires simply unlocking and lifting off the system chassis left cover panel. CPU modules, memory DIMMs, and PCI option cards can be installed or removed easily through the side of the machine. The main system board, which is oriented vertically from front-to-back, can be removed or installed easily through the side of the system.

System Access, Rackmounted Unit

When rackmounted, internal service access is through the top of the system. Rackmounted systems include an easily removable top panel allowing quick access to the inside of the server. The main system board is oriented horizontally in rackmounted systems.

Airflow through the system is front-to-back, allowing the system to be rackmounted in any standard 19-inch EIA rack (minimum 30-inch depth required). Cooling is provided by a slide-mounted three fan tray assembly. These variable speed fans cool the system board electronic components as well as the disk drives. Cooling for power supplies is provided by dedicated fans inside each power supply. The fan tray assembly is easily removable through the side of the system.

System Rackmounting

The Sun Enterprise 250 server is available in a tower or a rack version. Rack configurations come without side panels and feet glides so that they can be installed in a rack enclosure. A Sun Enterprise 250 tower configuration system may be converted to a rackmounted system. To convert systems, users must purchase a rackmounting kit. The optional rackmounting kit consists of a depth-adjustable, slide-mounted shelf and retaining brackets and can be installed in any EIA 19-inch-wide rack with:

- Front and rear vertical-mounting rail flanges between 28.5 and 34.875 inches (724 cm x 886 cm) apart
- Standard front- and rear-facing mounting flanges
- At least 10.5 inches (267 cm) of available vertical mounting space
- Sufficient load-bearing capacity

To mount the Sun Enterprise 250 server in a rack, the system is placed on its side on the shelf and secured in position with brackets supplied in the rackmounting kit.

Solaris™ Operating Environment

The Sun Enterprise™ 250 server offers customers the reliability, performance, scalability, and interoperability of Sun's industry leading Solaris™ Operating Environment. Customers who plan to continue running Solaris 2.5.1 on their existing Sun servers and desktop systems can easily integrate the Sun Enterprise 250 server into their environments by installing the system with Solaris 2.5.1 Hardware: 4/97 (or later). Sun Enterprise 250 server customers who are ready for the latest Solaris release will be able to take full advantage of all the powerful new server features added to Solaris 2.6 and Solaris 7 with this system. Sun Enterprise 250 customers will be especially interested in the new installation and administration features, intranet and Internet capabilities, and desktop services for PCs, Macintosh systems, UNIX® workstations, and Java™ technology-based network computers added to this new Solaris Operating Environment release.

Key Workgroup Server Features in the Solaris 2.5.1 Operating Environment

Ease of Installation and Administration	Reliability/ Serviceability	Web Features	PC Connectivity
Bundled with Solaris 2.5.1			
• Solstice AdminSuite™ • Solstice DiskSuite™ • Solstice Backup™ (single server)	• Sun Enterprise SyMON™ • SunVTS™		
Available Separately			
• Solstice AutoClient™		• Sun Internet Mail Server™	• Solaris PC NetLink (server and unlimited clients) • Syntax TotalNET • Solstice NFS Client™

Key Workgroup Server Features Available with the Solaris 2.6 Operating Environment

Ease of Installation and Administration	**Reliability/ Serviceability**	**Web/Java™ Features**	**PC Connectivity**
• Solaris™ Web Start/ Solaris Web Start Server • Solstice AdminSuite • Solstice AutoClient • (server plus 1 client) • Solstice DiskSuite • Solstice Backup (single server)	• ShowMe How™ • Sun Enterprise SyMON • SunVTS	• Sun WebServer™ • HotJava™ Browser • Java™ virtual machine • Simple Key Management for IP (SKIP) • Dynamic host configuration protocol (DHCP) • WebNFS™ • PPP • Sun Internet Mail Server (30 day "Try & Buy" only)	• Solaris PC NetLink (server and unlimited clients) • SunLink PC™ (TotalNET) (server plus 1 client) • Solstice NFS Client (1 client)

Key Workgroup Server Features Available with the Solaris 7 Operating Environment

Ease of Installation and Administration	**Reliability/ Serviceability**	**Web Features**	**PC Connectivity / Interoperability**
• Solaris Web Start/ Solaris Web Start Wizards™ • Solstice AdminSuite • Solstice AutoClient (server plus 1 client) • Solstice DiskSuite • Solstice Backup (single server) • Solaris Management Console	• ShowMe How • SunVTS	• Sun WebServer • HotJava Browser • Java virtual machine • Simple Key Management for IP (SKIP) • Dynamic host configuration protocol (DHCP) • WebNFS • Solstice™ PPP	• Solaris PC NetLink (server and unlimited clients) • SunLink PC (server plus one client) • Solstice NFS Client (one client) • Sun Directory Services

Sun Enterprise 250 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.

The Solaris 7 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. New 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 Java Development Kit (JDK™) 1.1.6 software, 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 software enhancements include a highly tuned, multithreaded VM architecture with faster thread synchronization, a new 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 just 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.

Solaris Server Features and Benefits

Installation and Administration

Features	Benefits
• Solaris Web Start enables fast, easy network-based installation of the Solaris Operating Environment	• Eases and speeds the installation of the Solaris Operating Environment on hosts and clients
• Solaris Web Start Server, available free from the Web, makes it easier to perform replicated installs onto numerous systems simultaneously	• Lowers cost of deployment; easy-to-use graphical user interface increases the number and type of personnel who can install Sun software
• Includes Solstice AdminSuite software, 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™ software 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
• The Sun Enterprise 250 server runs Sun's powerful and dependable Solaris Operating Environment and is 100 percent binary compatible with all software that runs on the Sun Enterprise 3500–6500 server family	• Runs over 12,000 of some of the most extensively tested, highest quality software packages available today for both commercial and technical applications
• The 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, x86, and PowerPC platforms	• Makes it easy to deploy applications developed on SPARC platforms on other platforms

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 (MP) • 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 system	• 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	• Enables 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 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

Electronic Mail

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

Internet Services

Features	Benefits
• WebNFS is a robust and scalable file system that enables users to quickly access and share files over the Web	• 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 administration 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

PC Integration and PC Interoperability

Solaris™ PC NetLink 1.0 software, formerly code named Project Cascade, is a software product that allows Sun servers to run native Microsoft Windows NT 4.0 network services on the Solaris Operating Environment software. Solaris PC NetLink software provides Microsoft Windows NT naming, authentication, file, and print services on Sun Enterprise servers, increasing the reliability, scalability, and manageability of Microsoft Windows NT networks.

Solaris PC NetLink software is a key addition to Sun's Microsoft Windows NT interoperability product line. Based on AT&T's Advanced Server for UNIX product, Solaris PC NetLink software provides transparent connectivity into Microsoft Windows NT network environments, allowing customers to replace Microsoft Windows NT servers with the more reliable and scalable Sun solution. Solaris PC NetLink 1.1 software adds support for Solaris 7 Operating Environment (SPARC Platform Edition and Intel Platform Edition) and will be included in the Solaris Easy Access Server 3.0 (SEAS 3.0) product which is available with any WGS.

Sun's strategy is to support any client, including PCs, Macintoshes, UNIX workstations, and Java technology-based Network Computers. Because PCs are by far the most common desktop, Sun is focusing its integration strategy on PC services and PC interoperability.

To achieve this strategy, Sun remains focused on supporting open industry standards. By supporting interoperability and open standards, Sun is able to provide the same services (network services, including file, print, directory, security, messaging, and objects) required by PC clients.

Examples of open industry standards include:

Network	TCP/IP, FTP, HTTP, Telnet
File and print	SMB, CIFS, NFS, WebNFS
Directory	LDAP, X.500, DNS
Security	X.509, Kerberos, SSL, IPV6Sec
E-mail	SMTP, MIME, POP, IMAP
Objects	IIOP (CORBA), RMI, DCOM

Data Access	X/Open® XA, OLEDB/ODBC, Java Database Connectivity (JDBC™)
Management	SNMP, CIM, WBEM, Java

PC Interoperability Features in the Solaris 7 and Solaris 2.6 Operating Environments

File/Print	
• Solaris PC NetLink (Cascade)	Allows Sun servers to run native Windows NT 4.0 network services on the Solaris Operating Environment software. Solaris PC NetLink provides Windows NT naming, authentication, file, and print services on Sun Enterprise servers. Software installed only on server, not on the client. No per client licensing.
• SunLink PC (TotalNET)	This server-side software allows a Sun server to provide file and print services to PCs running LAN Manager or Novell NetWare and Macintosh systems running AppleTalk. Nothing is required on the client.
• Solstice NFS Client	This client software allows a PC running Microsoft Windows 95 or Microsoft Windows NT to use NFS file and print services on a network without having to install and pay for additional network applications and functionality that the average user does not require. It provides higher performance and more robust services than Syntax TotalNET, but requires changes to the client.
E-mail	
• Sun 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	Solstice NFS Client allows a PC running Microsoft Windows 95 or Microsoft Windows NT to use NFS file and print services. It provides higher performance and more robust services than Syntax TotalNET, but requires changes to the client.

Future Interoperability Features

Management	
• Manage PC clients	Sun's ISVs, including Computer Associates (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 the Solstice family of tools. Over 40 management ISVs, including CA and Tivoli, will enhance their applications with Java Management API (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 browser enabled by Java technology.

Ordering the Sun Enterprise™ 250 Server

The Sun Enterprise™ 250 system is an assemble-to-order system. Assemble-to-order configurations begin with a base chassis that includes one power supply, a CD-ROM drive, internal and external UltraSCSI buses, PCI and EPCI buses, six internal hard disk bays, and removable media bays for optional floppy and internal tape devices. Valid system configurations must include at least one CPU module, at least two identical memory options, and at least one internal disk.

Assemble-to-order Configurations

Assemble-to-order configurations are customized from the options listed below. Assemble-to-order sales orders must specify either a floor or rackmounted base configuration. Valid sales orders must also specify at least one CPU module, at least two identical memory options and at least one internal disk.

Note: *When ordering CPU, memory, and disk for assemble-to-order configurations, use the appropriate part number without the preceding "X."*

All customer-specified system components and buildable options that appear on a sales order on the same line item with a base system will be installed in that system at the factory for no additional charge.

Assemble-to-order sales orders for the Sun Enterprise 250 server must specify:

- The Family Part Number (A26) as the first entry in a line item
- A base system configuration: either tower or rack
- System components: CPU module, memory, internal disk
- Internal options: memory, I/O cards, and so on.

Base System Configurations

Order Number	Description

A26-AA	Base configuration. The Sun Enterprise 250 Server base configuration includes:
	• SunCD™ 32 drive
	• External SCSI port
	  – Ultra/Wide SCSI or Fast/Wide SCSI
	  – 68-pin SCSI connector
	• 10/100 Ethernet with both RJ45 and MII connectors
	• Two serial ports
	• Parallel port with DB25 connector
	• One 360-Watt power supply
	• Solaris™ Server License
	• 3-year, second-day, on-site hardware warranty
	• 90-day software SunSpectrum℠ warranty *
	• Foot glides
	
	* Product warranty may vary by geographical location. Check with SunService for local warranty coverage.

A26-AA-R	Rack version of base configuration. The A26-AA-R has no side panels or feet. Other features are the same as on A26-AA.

System Components

Follow the steps listed below to prepare a complete and valid sales order.

- **Steps 1 to 7 are required.**
- **Steps 8 to 12 are optional.**

Step 1: Enter the Family Part Number *(Required)*

Specify:	**A26**	Sun Enterprise 250 server

Step 2: Order Base Configuration *(Required)*

Order one:	**A26-AA**	Sun Enterprise 250 server base configuration
	A26-AA-R	Sun Enterprise 250 server base configuration, rack version

Step 3: Add CPU Modules *(Required)*

Order one or two:	**(X)1190A**	250-MHz UltraSPARC™-II CPU module with 1-MB Ecache
	(X)1191A	300-MHz UltraSPARC-II CPU module with 2-MB Ecache
	(X)1194A	400-MHz UltraSPARC-II CPU module with 2-MB Ecache

Note: *Each Sun Enterprise 250 system must include at least one CPU. Up to two identical processor options can be ordered and factory installed.*

Step 4: Add Internal Memory *(Two Required, Maximum of Eight)*

Order two, four, six, or eight:	**(X)7002A**	64-MB memory (2 x 32-MB DIMMs)
	(X)7003A	128-MB memory (2 x 64-MB DIMMs)
	(X)7004A	256-MB memory (2 x 128-MB DIMMs)

Note: *A total of 16 memory expansion DIMM slots are available.*
Maximum memory configuration is 2 GB.

DIMMs must be added in matched groups of four (e.g., two, four, six, or eight X7004A).

For best system performance, four or eight identical memory options (8 or 16 modules) should be configured.

Ordering Information

Step 5: Add Internal Disk *(Required)*

Order from one to six:	**(X)5229A**	9-GB, 7200-rpm, 1-inch, Ultra/Wide SCSI disk
	(X)5232A	18-GB, 7200-rpm, 1.6-inch, Ultra/Wide SCSI disk
	(X)5234A	9-GB, 10000-rpm, 1-inch, Ultra/Wide SCSI disk
	(X)5237A	18-GB, 10000-rpm, 1-inch, Ultra/Wide SCSI disk

Note: *Each Sun Enterprise 250 base system order must include a minimum of one disk drive option. Additional disk drives may be added up to a maximum of six. Disk drives may be mixed in any combination of the disk options above.*

Step 6: Order Power Cord Kit *(One Required Per Power Supply)*

Order a minimum of one:	**X386L**	Australian
	X312L	Continental European
	X383L	Danish
	X348L	Italian
	X311L	North American/Asia
	X314L	Swiss
	X317L	U.K.

Note: *Order two power cords if ordering 9683A, optional redundant power supply. Additional power cord kits are listed under **Other Options.***

Step 7: Order Sun Enterprise 250 Server Supplemental Software CD (*Required*)

Order one:	**250M9-100-W999**	Software Supplement CD for Sun Enterprise 250 server

Note: *The Sun Enterprise 250 Supplemental Software CD includes RSC software and Solaris Operating Environment extensions and patches needed for the Sun Enterprise 250 server. The RSC software is available via web download at:* `http://sunsolve2.Sun.COM/sunsolve/E250_RSC/`

Step 8: Base Tower Accessories (*For Configuration*)

Order one:	**(X)9604A**	Casters for base unit

Note: *Casters may be installed on the tower version of the Sun Enterprise 250 server (A26-AA), but not on rack versions of the Sun Enterprise 250 server (A26-AA-R).*

Step 9: Order Internal Removable Media Drive *(Optional)*

Order one:	**(X)6286A**	12- to 24-GB, 4-mm, DDS-3 internal tape drive
	(X)6213A	20- to 40-GB, low-cost, 8-mm, internal tape drive
	(X)6107A	4- to 8-GB, internal SLR5 tape drive

Note: *Maximum of one internal 5.25-inch half-height tape drive may be installed.*

Step 10: Order Internal Floppy Drive *(Optional)*

Order one:	**(X)6005A**	3.5-inch 1.44-MB floppy drive

Note: *Maximum of one 3.5-inch, 1.44-MB floppy drive may be installed.*

Step 11: Order PCI Cards *(Optional)*

Order a maximum of four:	**(X)6540A**	Dual-channel single-ended Ultra/Wide SCSI host adapter, PCI
	(X)6541A	Dual-channel differential Ultra/Wide SCSI host adapter, PCI
	(X)1032A	10/100BASE-T Fast/Wide Ultra/Wide SCSI adapter 1.0, PCI
	(X)1152A	SunFDDI™ single-attach PCI
	(X)1153A	SunFDDI dual-attach PCI
	(X)1154A	Sun token ring interface, PCI
	(X)1156A	Sun multiport serial interface PCI
	(X)3668A	PGX32™ graphics card, PCI
Order a maximum of three:	**(X)1155A**	Sun HSI/P™ high-speed serial interface, PCI
	(X)1033A	SunFastEthernet™ controller, PCI

Note: *The PCI cards above are available as factory-installed options. For other PCI cards see **Sun Enterprise 250 Options**.*

Step 12: Order Additional Power Supply *(Optional)*

Order one:	**(X)9683A**	360-Watt universal power supply

Note: *Maximum configuration: two power supplies (one is standard). Adding a power supply requires an additional Power Cord Kit.*

Typical Sun Enterprise 250 Server Configuration

Sun Enterprise 250 server base configuration with two 300-MHz UltraSPARC-II processors, 512-MB main memory, internal SunCD 32, three disk drives with 27 GB of internal disk storage, internal 12- to 24-GB, 4-mm DDS tape drive, PGX32 graphics card, and power cord.

Quantity	Order Number	Description
1	**A26-AA**	Sun Enterprise 250 server family, tower version
2	**1191A**	UltraSPARC-II CPU module, 300 MHz, 2-MB external cache
2	**7004A**	256-MB memory (2 x 128-MB DIMMs)
3	**5234A**	9-GB, 10000-rpm, 1-inch high Ultra/Wide SCSI disk
1	**6286A**	12–24-GB, 4-mm, DDS-3 internal tape drive
1	**3668A**	PGX32 graphics card, PCI
1	**X311L**	Power cord

Maximum Sun Enterprise 250 Server Configuration

Sun Enterprise 250 server base configuration with rackmounting hardware, two 400-MHz UltraSPARC-II CPUs, 2-GB main memory, six internal disk drives with 108 GB of storage, internal SunCD 32, floppy drive, 4- to 8-GB SLR internal tape drive, fully redundant power supply, PGX32 graphics card, fast Ethernet adapters, and power cord.

Quantity	Order Number	Description
1	**A26-AA-R**	Sun Enterprise 250 server family, rack version
2	**1194A**	UltraSPARC-II CPU module, 400-MHz, 2-MB external cache
8	**7004A**	256-MB memory (2 x 128-MB DIMMs)
6	**5237A**	18-GB internal hot plug disk drive, 10000-rpm, 1-inch disk
1	**6107A**	Internal 4 to 8-GB SLR tape drive
1	**3668A**	PGX32 graphics card, PCI
1	**9683A**	360-Watt power supply
1	**6005A**	3.5-inch, 1.44-MB floppy drive
1	**6541A**	Dual-channel differential UltraSCSI host adapter, PCI
2	**1032A**	10/100BASE-T Fast/Wide UltraSCSI adapter 1.0, PCI
2	**X311L**	Power cord

Options

Below is a partial list of options available for the Sun Enterprise 250 system. Refer to the Sun Price Book for complete option listings, configuration notes, and ordering information. When no maximum number is listed, consult the configuration information for that option.

Part Number	Option Description	Maximum Number Supported	Comments
CPUs			
(X)1190A	250-MHz UltraSPARC-II CPU module with 1-MB external cache	2	
(X)1191A	300-MHz UltraSPARC-II CPU module with 2-MB external cache	2	
(X)1194A	400-MHz UltraSPARC-II CPU module with 2-MB external cache	2	
Memory			
(X)7002A	64-MB memory expansion (2 x 32 MB DIMMs)	8	See memory configuration requirements
(X)7003A	128-MB memory expansion (2 x 64 MB DIMMs)	8	
(X)7004A	256-MB memory expansion (2 x 128 MB DIMMs)	8	
Internal Storage Devices			
(X)5229A	9-GB, 7200-rpm, 1-inch Ultra/Wide SCSI disk drive	6	
(X)5234A	9-GB, 10000-rpm, 1-inch Ultra/Wide SCSI disk drive	6	
(X)5232A	18-GB, 7200-rpm, 1.6-inch Ultra/Wide SCSI disk drive	6	
(X)5237A	18-GB, 10000-rpm, 1-inch Ultra/Wide SCSI disk drive	6	
Power Cord Kits			
X386L	Australian	2	One power cord per power supply is required
X312L	Continental European	2	
X383L	Danish	2	
X348L	Italian	2	
X311L	North American/Asian	2	
X314L	Swiss	2	
X317L	U.K.	2	
Sun Enterprise 250 Server Supplemental Software CD			
250M9-100-W999	Software Supplement CD for Sun Enterprise 250 server	1	
Base Tower Accessories			
(X)9604A	Casters for base tower unit	1	
Internal Removable Storage Devices			
(X)6286A	12- to 24-GB, 4-mm, DDS-3 internal tape drive	1	
(X)6213A	20- to 40-GB, 8-mm, internal cost reduced tape drive	1	
(X)6107A	4- to 8-GB, SLR5 internal tape drive	1	
Internal Floppy Drive			
(X)6005A	3.5-inch, 1.44-MB floppy drive	1	

Part Number	Option Description	Maximum Number Supported	Comments
PCI Cards			
(X)6540A	Dual-channel single-ended UltraSCSI host adapter, PCI	4	These PCI cards are available either as factory installed options or as X-options
(X)6541A	Dual-channel differential UltraSCSI host adapter, PCI	4	
(X)1032A	10/100BASE-T Fast/Wide UltraSCSI adapter 1.0, PCI	4	
(X)1033A	SunFastEthernet™ controller, PCI	3	
(X)1152A	SunFDDI™/P single-attach adapter, PCI	4	
(X)1153A	SunFDDI/P dual-attach adapter, PCI	4	
(X)1154A	SunTRI/P™ token ring interface, PCI	4	
(X)1155A	SunHSI/P™ high-speed serial interface, PCI	3	
(X)1156A	Sun SAI/P multiport serial interface, PCI	4	
(X)3668A	PGX32™ m64 graphics card, PCI	4	
Additional PCI Cards			
X6729A	PCI FC-AL single-loop host adapter 100 MB/sec. optical interface	4	These PCI cards are available only as X-options
X1034A	Quad Fast Ethernet controller PCI adapter	1 or 2	
X1157A	SunATM™/P-155MMF card, PCI	1 or 2	
X1158A	SunATM/P-155UTP card, PCI	1 or 2	
X1159A	SunATM/P-622MMF card, PCI	1 or 2	
Note: *Options X1034A, X1157A, X1158A and X1159A, require at least 300 MHz of CPU per card. Each system supports either one or two of these cards depending on the number and type of processors per system.*			
Ethernet Switch			
X1046A	Gigabit Ethernet switch	N/A	
Additional Power Supply			
(X)9683A	360-Watt universal power supply	1	
Note: *Sun Enterprise 250 server systems ship with one power supply as standard. Order up to one additional power supply for a maximum of two per system. Each power supply requires a power cord. Maximum number of power cords per system is two.*			
Hardware RAID Controller			
X6542A	Sun StorEdge SRC/P Intelligent SCSI RAID Controller™	3	
X3832A	2-meter SCSI data cable for SRC/P Controller	3	
Note: *Sun Enterprise 250 server systems support SRC/P to control external Sun StorEdge MultiPack systems. The Sun Enterprise 250 server supports one additional two-meter SCSI data cable per card in addition to the two cables supplied with each (X)6542A.*			
Server License Media Kit			
SOLMS-070-W9999	Solaris™ 7 English server media kit, includes CD and documentation	1	
SOLMS-26EW9999	Solaris 2.6 English server media kit, includes CD and documentation	1	
SOLS-2.5.1NOV97	Solaris 2.5.1 English server media kit, includes CD and documentation	1	

Part Number	Option Description	Maximum Number Supported	Comments
Localized Documentation			
E250-45-D	Hard copy owner's guide, Korean	N/A	
E250-44-D	Hard copy owner's guide, Simplified Chinese	N/A	
E250-47-D	Hard copy owner's guide, Traditional Chinese	N/A	
External Differential SCSI Disk Storage			
SG-XARY144A-36G	36-GB Sun StorEdge A1000 tabletop or deskside, with hardware RAID Controller	8	Sun StorEdge A1000 and D1000 arrays require Solaris 2.6 Operating Environment
SG-XARY144A-109G	109-GB Sun StorEdge A1000 tabletop or deskside, with hardware RAID controller	8	
SG-XARY151A-72G	72-GB Sun StorEdge A1000 tabletop or deskside, with hardware RAID controller	8	
SG-XARY151A-218G	218-GB Sun StorEdge A1000 tabletop or deskside, with hardware RAID controller	8	
SG-XARY145-109G	109-GB Sun StorEdge D1000 tabletop or deskside	8	
SG-XARY153A-72G	72-GB Sun StorEdge D1000 tabletop or deskside	8	
SG-XARY153A-218G	218-GB Sun StorEdge D1000 tabletop or deskside	8	
Note: *The Sun Enterprise 250 supports two Sun StorEdge A1000 or D1000 disk arrays per bus or four disk arrays per adapter card. If A1000 and D1000 storage arrays are daisy-chained, then the Sun Enterprise 250 server can support up to 16 arrays.*			
SG-XARY366A-72G	72-GB Sun StorEdge A3500-Light, with rack rails	2	Sun StorEdge A3500 array requires Solaris 2.6 Operating Environment
SG-ARY370A-91G	91-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-ARY372A-182G	182-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-XARY360A-545G	545-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-XARY374A-273G	273-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-ARY380A-182G	182-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-ARY382A-364G	364-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
SG-ARY384A-546G	546-GB Sun StorEdge A3500, in Sun StorEdge expansion cabinet	2	
External FC-AL Disk Storage			
SG-XARY530A-91G	9.1-GB Sun StorEdge A5100	4	Sun StorEdge A5100 array requires Solaris 2.6 Operating Environment
SG-XARY530A-254G	254.8-GB Sun StorEdge A5100	4	
SG-XARY531A-254G	254.8-GB Sun StorEdge A5100, rackmountable	4	

Part Number	Option Description	Maximum Number Supported	Comments
External Sun StorEdge Tape Libraries			
X6077A	Sun StorEdge L1800 with 2 DLT™7000 tape drives	1	
X6078A	Sun StorEdge L1800 with 4 DLT 7000 tape drives	1	
X6079A	Sun StorEdge L3500 with 2 DLT 7000 tape drives	1	
X6080A	Sun StorEdge L3500 with 7 DLT 7000 tape drives	1	
SG-XLIBDLT1-280G	280- to 560-GB Sun StorEdge L280 tape autoloader	1	
SG-XLIBDLT1-1TB-2	Sun StorEdge L1000: deskside tape library with one DLT 7000 tape	1	
SG-XLIBDLT4-1TB-2	Sun StorEdge L1000: deskside tape library with four DLT 7000 tapes	1	
SG-XLIBDLT1R-1TB-2	Sun StorEdge L1000: rackmountable tape library with one DLT 7000 tape	1	
SG-XLIBDLT4R-1TB-2	Sun StorEdge L1000: rackmountable tape library with four DLT 7000 tapes	1	
Expansion Tape Drives for Sun StorEdge Libraries			
SG-XTAP8MM-400G	Internal tape drive: 8-mm internal tape drive for Sun StorEdge L400		See configuration rules for maximum supported
SG-XTAPDLT1-1TB	Tape drive: DLT 7000 for Sun StorEdge L1000		
X6063A	Tape drive: DLT 7000 for Sun StorEdge L1800 or L3500		
Sun StorEdge Expansion Drives for Sun StorEdge MultiPack Systems			
X5229A	9.1-GB, 7200 rpm UltraSCSI expansion drive for MultiPack	4	
X5232A	18.2-GB, 7200 rpm UltraSCSI expansion drive for MultiPack	4	
Note: *External Sun StorEdge MultiPacks systems hold up to six disk drives. Up to four drives may be ordered in addition to those purchased with the Sun StorEdge MultiPack.*			

Part Number	Option Description	Maximum Number Supported	Comments
Sun StorEdge MultiPack Systems			
SG-XDSK020C-18G	18.2 GB (2 x 9.1 GB, 10000 rpm)	12	
SG-XDSK020C-36G	36.4 GB (2 x 18.2 GB, 10000 rpm)	12	
SG-XDSK040C-36G	36.4 GB (4 x 9.1 GB, 10000 rpm)	12	
SG-XDSK040C-72G	72.8 GB (4 x 18.2 GB, 10000 rpm)	12	
SG-XDSK060C-54G	54.6 GB (6 x 9.1 GB, 10000 rpm)	12	
SG-XDSK060C-109G	109.2 GB (6 x 18.2 GB, 10000 rpm)	12	
Note: *The Sun Enterprise 250 server supports up to 12 external Sun StorEdge MultiPack systems when the Sun StorEdge SRC/P Intelligent SCSI RAID Controller™ is used. Without SRC/P, the maximum supported is 9.*			
Sun StorEdge Tape Drive Sun StorEdge UniPack Systems			
SG-XTAPSLR-010A	4- to 8-GB SLR tape drive	2	
SG-XTAP4MM-011A	12- to 24-GB, 4-mm, DDS-3 tape drive	2	
SG-XTAP8MM-010A	7- to 14-GB, 8-mm tape drive	2	
SG-XTAP8MM-011A	20- to 40-GB, 8-mm tape drive	2	
Sun StorEdge Disk Drive UniPacks			
SG-XDSK010A-9G	9.1-GB, 7200-rpm disk drive	9	
SG-XDSK010B-18G	18.2-GB, 7200-rpm disk drive	9	
Sun StorEdge FlexiPacks			
SG-XTAPSLR-020A	4- to 8-GB, SLR tape drive	2	
SG-XTAP4MM-021A	12- to 24-GB, 4-mm, DDS-3 tape drive	2	
SG-XTAP4MM-031A	72- to 144-GB, 4-mm, DDS-3 autoloader	2	
SG-XTAP8MM-020A	7- to 14-GB, 8-mm tape drive	2	
SG-XTAP8MM-021A	20- to 40-GB, 8-mm tape drive	2	
SG-XTAPDLT-020A	20- to 40-GB DLT 4000 tape drive	2	
SG-XTAPDLT-021A	35- to 70-GB DLT 7000 tape drive	2	
Expansion Drives for Sun StorEdge FlexiPack Systems			
X6106A	Tape drive: 4- to 8-GB SLR5	1	See configuration rules for number supported
X6166A	CD-ROM drive: 32X	1	
X6212A	Tape drive: 7 GB, 8 mm	1	
X6236A	Tape drive: 20 to 40 GB, 8 mm	1	
X6282A	12-GB, 4-mm DDS-3 tape drive for FlexiPack	1	
Rack and Tower Conversion Kits			
X9691A	Sun Enterprise 250 tower-to-rack sidegrade kit	1	
X9696A	Sun Enterprise 250 rack-to-tower sidegrade kit	1	

Part Number	Option Description	Maximum Number Supported	Comments
Miscellaneous/Other Options			
X7121A	21-inch color monitor	3	Use of a monitor requires the PGX32 color frame buffer and cable (X)3668A
X7119A	19-inch color monitor	3	
X7126A	17-inch, entry color monitor	3	
X7124A	24-inch, wide-screen color monitor	3	
X3872A	Video Adapter, HD15F/13W3M	3	
X3830A	4-meter, VHDC- to-68 pin, SCSI adapter cable	8	
X3831A	10-meter, VHDC- to-68 pin, SCSI adapter cable	8	
X3856A	Fast/Wide 68-68 pin SCSI cable and geo-specific power cord		
Note: *X3830A and X3831A require X6541A, the differential Ultra/Wide SCSI host adapter card. Up to two X3830A or X3831A options may be used per differential SCSI card*			

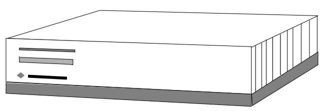
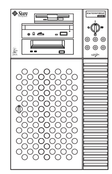
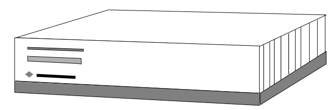
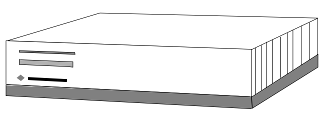
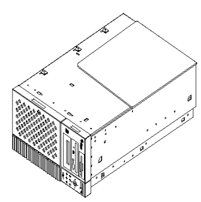
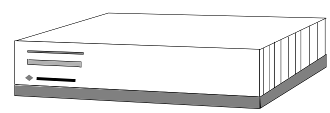
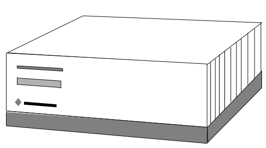
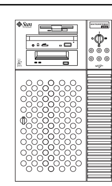
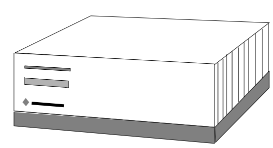
Part Number	Option Description	Maximum Number Supported	Comments
Country Kits			
X3500A	North America	1	Correct power cord supplied based on ship-to address
X3540A	UNIX®	1	
X3576A	Australia	1	
X3579A	Canada (Bilingual)	1	
X3573A	Denmark	1	
X3552A	European UNIX	1	
X3578A	European Universal	1	
X3548A	European UNIX	1	
X3577A	Finland	1	
X3502A	France	1	
X3503A	Germany	1	
X3574A	Italy	1	
X3546A	Japan	1	
X3542A	Japanese UNIX	1	
X3545A	Korea	1	
X3575A	Netherlands	1	
X3550A	North American Universal	1	
X3570A	Norway	1	
X3571A	Portugal	1	
X3572A	Spain	1	
X3506A	Sweden	1	
X3504A	Swiss (French)	1	
X3505A	Swiss (German)	1	
X3544A	Taiwan	1	
X3507A	United Kingdom	1	
X3547A	United Kingdom UNIX	1	
X3551A	UNIX Universal	1	

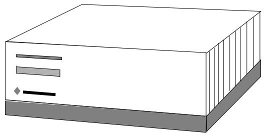
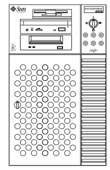
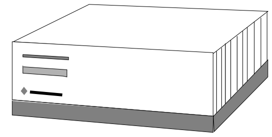
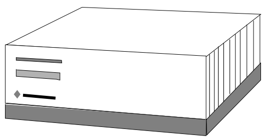
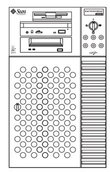
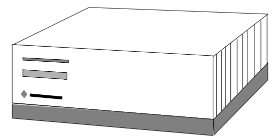
Upgrades

Key Messages

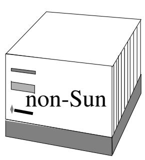
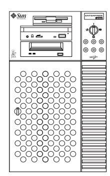
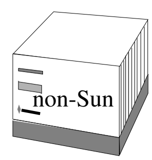
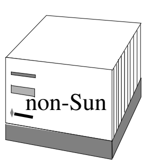
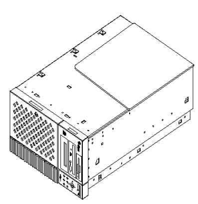
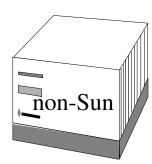
Sun offers customers a variety of flexible upgrade paths to the most popular Sun systems. Customers can choose among full system, non-full system, CPU and memory upgrades. To protect customers' investments, Sun upgrades allow customers to carry as many components forward as possible. Existing investments in non-Sun hardware can also be preserved by upgrading to Sun systems through competitive upgrades.

System Upgrades

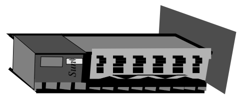
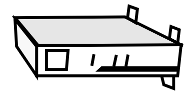
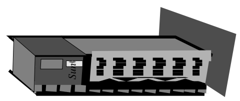
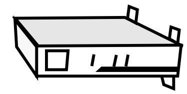
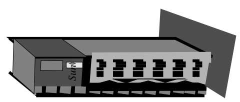
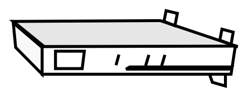
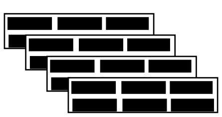
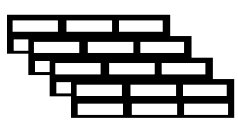
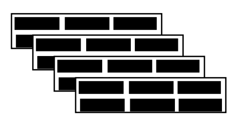
UG10-A26-AA	**Receive**	**Return**
Any SPARCstation[M] 10 or earlier Sun server to Sun Enterprise 250 server 	 Sun Enterprise 250 server zero base BTO system plus required choice of CPU, memory, and disk	 Complete SPARCstation 10 or earlier Sun server system including chassis, CPU, memory, disk, and CD-ROM
UG10-A26-AA-R	**Receive**	**Return**
 Any SPARCstation 10 or earlier Sun server to Sun Enterprise 250 rackmounted server	 Sun Enterprise 250 server zero base rackmountable system plus required choice of CPU, memory, and disk	 Complete SPARCstation 10 or earlier Sun server system including chassis, CPU, memory disk, and CD-ROM
UG14-6UNC-9S-000NK	**Receive**	**Return**
 Any Sun Enterprise 2 Model 1300 or 2300 to Sun Enterprise 250 server	 Sun Enterprise 250 server chassis, 32X CD and four disk brackets. Assumes CPU, disk, and memory are migrated	 Sun Enterprise 2 Model 1300 or 2300 chassis, and CD-ROM

UG14-A26-9S-000NK	Receive	Return
 Any UltraSPARC™ server with 7200- rpm, 1 inch high, 2.1-GB, or 4.2-GB disks and memory to Sun Enterprise 250 Server	 Sun Enterprise 250 server chassis, 32X CD, and four disk brackets plus required choice of CPU. Assumes disk and memory are migrated	 UltraSPARC server chassis, CPU, and CD-ROM
UG14-A26-9S-000-AA	**Receive**	**Return**
 Any UltraSPARC server with 32-MB, 64-MB or 128-MB memory DIMMs for 128-MB to 512-MB memory in Sun Enterprise 250 server.	 Sun Enterprise 250 server chassis and 32X CD plus required choice of CPU, and disk drive. Assumes 32-MB, 64-MB, or 128-MB DIMMs memory is migrated	 UltraSPARC server chassis, CPU, disks and CD-ROM

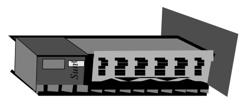
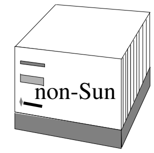
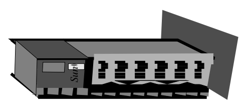
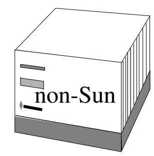
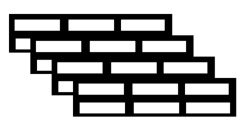
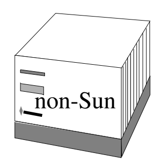
Competitive Upgrades

CU-PC-A26-AA CU-UX-A26-AA	Receive	Return
 Any Category 2 or 3 competitive PC or UNIX® server to Sun Enterprise 250 server	 Sun Enterprise 250 server zero base system plus required choice of CPU, memory, and disk	 Any category 2 or 3 competitive server system including chassis, disk, and CD-ROM
CU-PC-A26-AA-R CU-UX-A26-AA-R	**Receive**	**Return**
 Any Category 2 or 3 competitive PC or UNIX server to Sun Enterprise 250 rackmounted server	 Sun Enterprise 250 rackmountable zero base system plus required choice of CPU, memory, and disk	 Any category 2 or 3 competitive server system including chassis, disk, and CD-ROM

Module Upgrades—CPU and Memory

UG-M1XXX-M1300 **field installed**	**Receive**	**Return**
Any UltraSPARC CPU Module to 300-MHz UltraSPARC-II CPU module with 2-MB Ecache	 300-MHz UltraSPARC-II CPU module with 2-MB Ecache	 Any UltraSPARC CPU module
UG-M11XX-M1194 **field installed** **UGFA-M11XX-M1194** **factory installed**	**Receive**	**Return**
UltraSPARC-II 300 MHz, 2-MB Ecache CPU Module to 400-MHz UltraSPARC-II CPU module with 2-MB Ecache	 400-MHz UltraSPARC-II CPU module with 2-MB Ecache	 UltraSPARC-II 300 MHz, 2-MB Ecache CPU module
UG-MXXXX-M1194 **field installed** **UGFA-MXXXX-M1194** **factory installed**	**Receive**	**Return**
Any UltraSPARC 167-MHz, 200-MHz, or 250-MHz CPU Module to 400-MHz UltraSPARC-II CPU module with 2-MB Ecache	 400-MHz UltraSPARC-II CPU module with 2-MB Ecache	 Any UltraSPARC 167-MHz, 200-MHz, or 250-MHz CPU module
UG-MEM128-MEM512 **field installed** **UGFA-MEM128-MEM512** **factory installed**	**Receive**	**Return**
 Upgrade from 128 MB of Sun memory to 512 MB of memory (4 x 128-MB Sun DIMM modules)	 512 MB of memory (4 x 128-MB Sun memory DIMM modules)	 Any Sun memory SIMMs totaling 128 MB of memory

Consolidation Module Upgrades

CU-CONSL-A26-M1194 field installed CUCONSLFA-A26M1194 factory installed	**Receive**	**Return**
Any qualifying competitive work group server or Sun platform for 400-MHz UltraSPARC-II CPU module with 2- MB Ecache either in combination with consolidation CPU or alone after meeting the required number of server consolidation points and base configuration Requires `CU-CONSOL-RMA`	 400-MHz UltraSPARC-II CPU module with 2-MB Ecache	 Any qualifying competitive work group server chassis, system board, CPU, memory and drive
CU-CONSL-A26-M1191 field installed	**Receive**	**Return**
Any qualifying competitive work group server or Sun platform for 300-MHz UltraSPARC-II CPU module with 2-MB Ecache either in combination with consolidation CPU or alone after meeting the required number of server consolidation points and base configuration Requires `CU-CONSOL-RMA`	 300-MHz UltraSPARC-II CPU module with 2-MB Ecache	 Any qualifying competitive work group server chassis, system board, CPU, memory and drive
CU-CONSL-512MB field installed CUCONSLFA-512MB factory installed	**Receive**	**Return**
Any qualifying competitive work group server or Sun platform for 512 MB of memory either in combination with consolidation CPU or alone after meeting the required number of server consolidation points and base configuration Requires `CU-CONSOL-RMA`	 512 MB of memory (4 x 128-MB Sun memory DIMM modules)	 Any qualifying competitive work group server chassis, system board, CPU, memory and drive

Note: *Consolidation upgrades require a Consolidation Return Merchandise Authorization kit be order with each consolidation module ordered.*

Ordering Process for Chassis and Base System Upgrades

The Sun Enterprise 250 server is a build-to-order (BTO) product. All required customer-specified system components and configurable options appearing on a customer's order on the same line item with a base system will be installed in that system at the factory for no additional charge.

As with other Sun build-to-order systems, sales orders for upgrading to the Sun Enterprise 250 server specify:

- The Family Part Number (UG-A26) as the first entry in a line item
- A full-system upgrade or non-full system upgrade
- Required system components—country kit or power cord
- Internal (configured) options—CPU, memory, disk, storage expansion kits, I/O cards, and so on
- External (non-configured) options

Sun Enterprise 250 Server Non-Full System Upgrades

Non-Full System upgrades require migration of Sun Enterprise 250 server-compatible components from the Sun server being upgraded (i.e., 300-MHz UltraSPARC CPU modules; 7200-rpm, 1 inch high, 2.1-GB or 4.2-GB disk drives; 32 MB or greater memory DIMMs). Valid non-full system upgrade orders must declare the compatible components that are migrating using Configtool 4.4. A Configuration List Report generated by Configtool must be attached to any non-full system upgrade quote to the customer. The following are Sun Enterprise 250 server non-full system upgrades:

Order Number	Description
UG14-6UNC-9S-000NK	**Tower system** Non-full system upgrade to Sun Enterprise 250 server in deskside tower enclosure includes: • SunCD™ 32 • Two internal 3.5 inch x 1 inch hot-swap UltraSCSI drive bays • Fast/Wide SCSI port (68-pin SCSI connector) • 10/100 Ethernet (with both RJ45 and MII connectors) • One 360-Watt hot-swap power supply • Two serial ports (via one DB25 connector) • Parallel port (DB25 connector) • Solaris™ Server License • Three-year, second day, on-site hardware warranty • 90-day software SunSpectrum℠ warranty • Assumes CPU, disk, and memory are migrated
UG14-A26-9S-000NK	• Enclosure includes the base TOWER SYSTEM • Assumes disk and memory are migrated • Requires ordering choice of CPU module.
UG14-A26-9S-000-AA	• Enclosure includes the base TOWER SYSTEM • Assumes memory is migrated • Requires ordering choice of CPU module and internal disk drive.

Sun Enterprise 250 Server Full-System Upgrades

Order Number	Description
UG10-A26-AA **CU-PC-A26-AA** **CU-UX-A26-AA** ***Note:*** *CU part number is for competitive non-Sun trade-ins*	**Tower system** Sun Enterprise 250 Server BTO zero base system in deskside tower enclosure includes: • SunCD 32 • Two internal 3.5 inch x 1-inch hot swap UltraSCSI drive bays • Fast/Wide SCSI port (68-pin SCSI connector) • 10/100 Ethernet (with both RJ45 and MII connectors) • One 360-Watt hot-swap power supply • Two serial ports (via one DB25 connector) • Parallel port (DB25 connector) • Solaris Server License • Three-year, second day, on-site hardware warranty • 90-day software SunSpectrum warranty • Disk drive, CPU, and memory vary with order

Sun Enterprise 250 Server Full-System Rack Upgrades

Order Number	Description
UG10-A26-AA-R **CU-PC-A26-AA-R** **CU-UX-A26-AA-R** ***Note:*** *CU part number is for competitive non-Sun trade-ins*	**Rackmounted System** Sun Enterprise 250 Server BTO zero base rackmounted system in includes: • SunCD 32 • Two internal 3.5 inch x 1 inch hot-swap UltraSCSI drive bays • Fast/Wide SCSI port (68-pin SCSI connector) • 10/100 Ethernet (with both RJ45 and MII connectors) • One 360-Watt hot-swap power supply • Two serial ports (via one DB25 connector) • Parallel port (DB25 connector) • Solaris Server License • Three-year second day, on-site hardware warranty • 90-day software SunSpectrum warranty • Disk drive, CPU, and memory vary with order

Ordering Sun Enterprise 250 Upgrades

Follow the steps listed below to prepare a complete and valid Sales Order.

Step 1: Enter the Family Part Number

Specify:	**UG-A26**	Sun Enterprise 250 server upgrades

Step 2: Order Base Package

Order:	**UG14-6UNC-9S-000NK**	Sun Enterprise 250 server chassis only
	UG14-A26-9S-000NK	Sun Enterprise 250 server, chassis, 250-MHz or 300-MHz CPU required
	UG14-A26-9S-000-AA	Sun Enterprise 250 server, chassis, 250-MHz or 300-MHz CPU and disk drive required
	UG10-A26-AA	Sun Enterprise 250 server BTO base system, CPU, memory, and drive required
	CU-PC-A26-AA	Sun Enterprise 250 server BTO base system, CPU, memory, and drive required
	CU-UX-A26-AA	Sun Enterprise 250 server BTO base system, CPU, memory, and drive required
	UG10-A26-AA-R	Sun Enterprise 250 server BTO base rackmountable system, CPU, memory, and drive required
	CU-PC-A26-AA-R	Sun Enterprise 250 server BTO base rackmountable system, CPU, memory, and drive required
	CU-UX-A26-AA-R	Sun Enterprise 250 server BTO base rackmountable system, CPU, memory, and drive required
	UG-RMA	Return Materials Authorization Kit required for all full or partial system upgrades

Note: *One UG-RMA must be ordered with each system ship set.*

Step 3: Add CPU *(Required for full-system BTO)*

Order one or two:	**(X)1190A**	250-MHz UltraSPARC-II CPU module with 1-MB Ecache
	(X)1191A	300-MHz UltraSPARC-II CPU module with 2-MB Ecache
	(X)1194A	400-MHz UltraSPARC-II CPU module with 2-MB Ecache

	UGFA-M11XX-M1194	400-MHz UltraSPARC-II CPU module with 2-MB Ecache (factory installed upgrade)
	UGFA-MXXXX-M1194	400-MHz UltraSPARC-II CPU module with 2-MB Ecache (factory installed upgrade)
	CUCONSLFA-A26M1194	400-MHz UltraSPARC-II CPU module with 2-MB Ecache (factory installed upgrade for qualifying competitive and Sun servers in consolidation program. SECOND CPU ONLY)

Note: *Each Sun Enterprise 250 system must include at least one CPU. Up to two identical processor options may be ordered and factory installed.*

Step 4: Add Memory *(Required for full-system BTO)*

Order two, four, six, or eight:	**(X)7002A**	64-MB memory (2 x 32-MB DIMMs)
	(X)7003A	128-MB memory (2 x 64-MB DIMMs)
	(X)7004A	256-MB memory (2 x 128-MB DIMMs)
	UGFA-MEM128-MEM512	512-MB memory (4 x 128-MB DIMMs) Same as two of 7004A, factory installed upgrade
	CUCONSLFA-512MB	512-MB memory (4 x 128-MB DIMMs) Same as two of 7004A. Factory installed upgrade for qualifying competitive and Sun servers in consolidation program. SECOND SET OF MEMORY ONLY

Note: *A total of 16 memory expansion DIMM slots are available.*
Maximum memory configuration is 2 GB.

DIMMs must be added in matched groups of four (e.g., two, four, six, or eight X7004A).

For best system performance, four or eight identical memory options (8 or 16 modules) should be configured.

Step 5: Add Internal Disks *(Required for full-system BTO)*

Order from one to six:	**(X)5229A**	9-GB, 7200-rpm, 1-inch, UltraSCSI-3 disk
	(X)5234A	9-GB, 10000-rpm, 1-inch, UltraSCSI-3 disk
	(X)5232A	18-GB, 7200 rpm, 1.6-inch, UltraSCSI-3 disk
	(X)5237A	18-GB, 10000-rpm, 1-inch, UltraSCSI-2 disk

Steps 6–11:

Identical to the New System orders and documented in that section. See ***Ordering Information*** for Sun Enterprise 250 systems.

Step 12: Submit "Sun Enterprise 250 Server Component Migration Assessment" with Order *(Required)*

Obtain assessment from Configtool 4.4:	**UG14-6UNC-9S-000NK** **UG14-A26-9S-000NK** **UG14-A26-9S-000-AA**	Valid non-full system upgrade orders must declare the compatible components that are migrating using Configtool 4.4.

Service and Support

The SunSpectrum[SM] 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[SM] Mission-critical Support	SUNSPECTRUM GOLD[SM] Business-critical Support	SUNSPECTRUM SILVER[SM] Systems Support	SUNSPECTRUM BRONZE[SM] 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 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

Materials Abstract

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

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Powerpack				
– *Sun Enterprise™ 250 Server Just the Facts*	Reference Guide (this document)	Training, Sales Tool	SunWIN, Reseller Web	88141
– *Sun Enterprise 250 Server Overview Presentation*	Customer Presentation and Notes	Sales Tool	SunWIN, Reseller Web	88147
References			web site	
– *Sun Product Intro: Sun Enterprise 250 Workgroup Server*	Introduction E-mail	Sales Tool	SunWIN, E-mail, Reseller web	88140
– *Sun Workgroup Server Product Line Overview*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web, First Resort	24517
– *Sun Workgroup Server/Competitive Summary*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web, First Resort	24515
– *Workgroup Sales and Marketing Tools Guide*	Reference Guide	Sales Tool	SunWIN	88195
Training				
– *NPI Training Materials: Sales Presentation*	Sales Training Kit	Training	SunWIN, Reseller Web	71583
– *NPI Training Materials: SE Presentation*	Technical Training Kit	Training	SunWIN	71590
Presentation				
– *Sun Solutions for the Enterprise Workgroup Golden Pitch Presentation and Slide Notes*	Information on Product Launch	Sales Tool	SunWIN, Reseller Web	88148
Product Literature				
– *Sun Enterprise 250 Architecture*	Technical White Paper	Sales Tool	SunWIN, Reseller Web	72523
– *Sun Enterprise 250 Data Sheet*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	85618 DE847-0
– *Solaris for ISPs™ Product Brief*	Product Brief	Sales Tool	SunWIN	88146
– *Sun Enterprise Server and Storage Family Brochure*	Enterprise Server and Storage Family Brochures	Sales Tool	COMAC	BE607-1

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Competitive				
– *Workgroup Sever Competitive Brief*	Competitive Brief	Sales Tool	SunWIN	53106
External Web Sites				
– *UltraSPARC™ information*	`http://www.sun.com/sparc.html`			
– *Sun Enterprise 250 Server Information*	`http://www.sun.com/servers/workgroup/250/`			
– *RSC Information*	`http://sunsolve2.Sun.com/sunsolve/e250_rsc/`			
– *RSC Demo*	`http://www.sun.com/servers/rsc-demo/index.html`			