Sun Blade™ 100 Workstation

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Positioning

Figure 1. Sun Blade™ 100 workstation
(screen graphic courtesy of DS Group and Povarske Strojarne Letecke Motory

For a price comparable to a Wintel−based, 32−bit PC branded workstation, customers can buy an entry−level, 64−bit UNIX® workstation with workstation−class features. Workstation−class features are those required for demanding scientific or engineering applications, such as a powerful 64−bit CPU, large memory capacity, and high−performance graphics that support multiple displays, and highly integrated I/O connections. The entry−level Sun Blade™ 100 workstation meets this definition by providing:

- 500−MHz UltraSPARC™−IIe processor with 256−KB integrated L2 cache
- Up to 2−GB ECC error correcting SDRAM (PC133) memory
- Support for up to two Sun™ Expert3D−Lite graphics boards, which provide professional−quality, high−performance, 3−D graphics
- Full 64−bit hardware and software support
- Support for up to two 20−GB disk drives
- Integrated I/O features on the motherboard, such as:
  - 10/100BASE−T Ethernet connection
  - Four USB ports
  - Two IEEE 1394 (also called FireWire®) ports
  - On−board, 24−bit, 2−D Sun PGX64 graphics

In addition, the Sun Blade 100 workstation comes with the Solaris™ 8 (10/00) Operating Environment and the StarOffice™ 5.2 productivity suite preinstalled, which makes it ready to run right out of the box.

Features, Functions, and Benefits

Features	Functions	Benefits
• 500–MHz UltraSPARC–IIe processor with 256–KB L2 cache	• A highly integrated, low–cost, high–performance 64–bit CPU	• Allows cost of 64–bit system to be quite low without sacrificing performance
• Solaris 8 Operating Environment preinstalled	• A robust and well–supported 64–bit UNIX environment that retains full binary compatibility with previous versions • Supported throughout Sun's product line • Binary compatibility with the 12,000 Solaris applications	• Provides extensive virtual memory addressing for those applications that require 64–bit addressability • Develop on the Sun Blade 100 workstation, deploy in a Solaris Operating Environment–based datacenter
• Up to 2–GB of 168–pin JEDEC DRAM with error correction	• Enough memory to support demanding applications	• Provides excellent expandability —beyond what is providing by most PCs at this time
• Up to two 20–GB, 7200–rpm EIDE hard drives	• Provides large internal storage and expansion	• Excellent expandability —investment protection
• Three PCI slots	• Provides access to a variety of graphics cards, SCSI expansion cards, and audio/video input cards	• Provides excellent flexibility, system expansion, and support for both Sun and third–party PCI cards
• Built–in Sun PGX64 graphics with 8 MB of SDRAM	• Up to 1280 x 1024 resolution at 85 Hz in 8–bit or 24–bit mode and up to 1920 x 1200 resolution at 75 Hz in 8–bit–only mode	• Provides excellent quality 2–D graphics without additional cost
• Sun Expert3D–Lite graphics support	• 3–D graphics with hardware accelerated texture mapping and support for resolutions up to 1920 x 1080	• Provides professional–quality 3–D graphics for a very low cost
• Built–in USB and IEEE 1394 (FireWire) ports	• Provides access to some of the newer I/O peripherals, such as video conferencing cameras	• Able to use state–of–the art I/O devices (when Solaris Operating Environment drivers are available) without having to purchase additions to system
• FastEthernet, 10/100BASE–T autosensing and autoswitching	• Built–in high–performance Ethernet connection	• Aids performance and helps eliminate the need to add a card to support Ethernet connectivity

Product Family Placement

The Sun Blade 100 workstation is the latest addition to Sun's desktop workstation product family. Sun's desktop product family scales from the lowest entry–priced Sun Blade 100 workstation up to the four–way multiprocessing Sun Ultra™ 80 workstation.

Workstation	Features
Sun Blade 100	The Sun Blade 100 workstation is Sun's latest entry–level UNIX® uniprocessor workstation and is based upon the 500–MHz UltraSPARC™–IIe processor. The Sun Blade 100 workstation is designed to meet the needs of price–sensitive and high–volume customers without sacrificing performance in a desktop form factor. Target markets include software development, 2–D content creation, finance, EDA, telecommunications, and MCAD (with Sun Expert3D–Lite graphics configured).
Ultra 5 and Ultra 10	Designed as low–cost desktop solutions, Ultra 5 and 10 systems appeal to customers looking for a low–price system offering accelerated graphics, expandability, fast application performance, and investment protection. Target markets include software development, financial, government, telecommunications, manufacturing, and education.
Ultra 60 and Ultra 80	The Ultra 60 and Ultra 80 workstations are designed for technical users who require high–performance and multiprocessing capability. They also address the needs of graphics–intensive users and continue to support and build upon the upgradability features to which Ultra workstation users have grown accustomed. With the 450–MHz UltraSPARC–II processor with 4 MB of Level 2 cache, these workstations are on the high–performance end of Sun's workstation family. The target customer is the traditional "power desktop" user who has performance and expansion requirements that exceed the capabilities of the Ultra 5 and Ultra 10 systems.
Sun Blade 1000	The Sun Blade 1000 system is Sun's latest dual–processor workstation. It is based upon the UltraSPARC–III processor and runs at clock speeds up to 900–MHz and has Sun's optimal switching architecture. It supports Sun's highest end graphics cards. The intended markets are those that require optimal CPU and graphics performance such as high–end MCAD/MCAE, oil and gas, visualization and simulation.

Target Users

Sun Blade 100 systems are ideal for price–sensitive and volume–purchase customers who do not wish to sacrifice performance or who require the stability of a Solaris Operating Environment. Also, due to its slimline design and size the Sun Blade 100 workstation is optimal for customers who are space–constrained. Embedded systems are an ideal match for the Sun Blade 100 workstation.

Target Markets

The market opportunities for the Sun Blade 100 workstation are software development where a 64–bit environment is important, web content creation, electronic circuit design and verification, 2–D content creation, EDA, finance, research/development, telecommunications, embedded systems, and MCAD/MCAE.

Industry	Key Features to Highlight
Aerospace	
• Design	MCAD, MCAE (Unigraphics, PTC, SDRC, EAI)
• Imaging	Astrometrics/navigation
• Modeling	Space vehicle design (Alias Studio)
• Visualization	Mission data reduction
• Simulation	Orbital, thermal, propulsion, aerodynamic, weather
• Animation	Mission simulations (Java 3D™, Matte World Digital, Xaos)
• Mapping	Satellite imaging (ERDAS, ESRI, Mapinfo, Autometric)
• Application development	Mission control, guidance systems, downlinks
• E–Commerce development	Supply chain management (Oracle, i2, Rational)
Automotive	
• Design	MCAD, MCAE (CATIA, SDRC, PTC)
• Simulation	Crash analysis (ESI/PSI)
• Application development	Digital monitoring and control systems
• E–Commerce development	Supply chain management (Oracle, i2, Rational), retail web sites (iPlanet™ webtop), customer management centers (Siebel, etc.)
Oil and Gas	
• Design	Refinery design
• Modeling	Geological/oil field (Landmark, GeoQuest, Paradigm Geo)
• Simulation	Refinery process (Simulation Sciences)
• Mapping	Oil exploration (ERDAS, ESRI, Mapinfo, Autometric)
• Application development	Seismic data analysis, visualization and simulation
MCAD/MCAE	
• Design	Circuit analysis (SPICE), electronic design automation (Mentor, Cadence, Synopsis, Viewlogic), ASIC design (VLSI Logic)
• Modeling	Component databases/catalogs
• Simulation	Non–linear circuit analysis, operating system simulation
• Application development	Firmware for embedded systems
• E–Commerce development	Supply chain management (Oracle, i2, Rational), retail web sites (iPlanet), customer management centers
Medical/Health Sciences	
• Imaging	Medical imaging
• Modeling	X–ray tomography, MRI tomography
• Application development	Patient monitoring systems, medical imaging
• E–Commerce development	Hospital customer management centers

Industry	Key Features to Highlight
Chemistry/Pharmaceuticals	
• Design	Facility/plant design
• Modeling	Molecular modeling
• Simulation	Stochiastic analysis
• Application development	Analysis software, modeling software
• E−Commerce development	Drug information web sites (iPlanet)
Utilities	
• Design	Power plants, water supply systems, wastewater treatment plants
• Modeling	Flood plain assessment
• Simulation	Hydrologic systems, power grid loading
• Mapping	Facility/system maintenance management, power grid database, customer database
• Application development	Power grid control
• E−Commerce development	Customer management centers
Financial	
• Modeling/simulation	Economic modeling, market forecasting
• Visualization	Financial analysis
• Application development	Trading systems, back office accounting, transaction systems
• E−Commerce development	Customer management centers, retail web sites (iPlanet)
Entertainment	
• Modeling	3−D modeling (Electric Light & Magic, etc.)
• Animation	Line drawing and fill (Electric Image Universe)
• Application development	Production management
• E−Commerce development	Production company web sites (iPlanet)
Telco/ISP	
• Design	Facility design
• Application development	Switching logic design
• E−Commerce development	Customer management centers
Defense	
• Design	Vehicle/weapons design
• Simulation	Battlefield logistics
• Mapping	Terrain modeling
• Application development	Command and control

Compatibility

The Sun Blade 100 workstation is delivered with the robust 64−bit Solaris 8 (10/00) Operating Environment preinstalled. The latest version of the Solaris Operating Environment is binary compatible with previous versions–applications compiled on other versions run without the hassle of recompiling. 32−bit applications run perfectly well on the Sun Blade 100 workstation.

The Sun Blade 100 workstation only boots using the 64−bit kernel. In addition, customers with 32−bit−only drivers must migrate to 64−bit drivers to use this workstation.

Enabling Technology

UltraSPARC™–IIe Processor

The Sun Blade™ 100 workstation uses the UltraSPARC™–IIe processor, a highly integrated, 64–bit SPARC™ V9 superscalar processor. Created for the Sun Blade 100 workstations, the UltraSPARC–IIe processor is part of a second generation of products based on the UltraSPARC processor. In addition to using a new process technology, the UltraSPARC–IIe processor provides a higher clock frequency, multiple SRAM modes, and system–to–processor clock ratios that accommodate varying economics for a range of products. At the same time, it provides software compatibility with existing systems based on the UltraSPARC processor architecture.

The 500–MHz UltraSPARC IIe processor utilizes a four–way superscalar pipeline. This processor's 64–bit–wide memory interface with 800 MB/second capacity combines with 64–bit–wide internal buses to deliver significantly higher data throughput than a 32–bit processor operating at the same clock rate. In addition, an on–chip block load and store mechanism allows the system to read or write data to memory without significantly impeding instruction execution. To further enhance performance, the UltraSPARC–IIe supports the VIS™ multimedia/graphics instruction set, enabling the processor to provide a balance for general–purpose computing.

Manufactured in a cost–effective 0.18 micron 6–LM process, this processor includes the memory controller, controller, and Level 2 cache, which eliminates the need for an external Northbridge chip.

Sun™ PGX64 On–Board Graphics

Sun™ PGX64 graphics is built into the Sun Blade 100 workstation motherboard. PGX64 graphics is a 24–bit, 2–D graphics chipset supporting the widest range of Sun systems. Sun PGX64 on–board graphics includes the following features:

- ATI's RageXL graphics processor
- 2–D graphics acceleration
- 8–MB SGRAM provides
    - 24–bit–only true color video support up to 1280 x 1024
    - 8–bit–only pseudo color video support up to 1920 x 1200
- HD15 video connector on the motherboard supports composite and separate video sync timing
- Compatible with OpenWindows™ environment, CDE windowing, and the OpenGL API via a software pipeline
- Low power consumption
- Backwards compatibility with Sun's PGX24™ and PGX32™ graphics accelerators

Sun Expert3D–Lite Graphics

Sun Expert3D–Lite graphics is a derivative product based on the Sun Expert3D graphics board. Sun Expert3D–Lite graphics offers many of the same features as its predecessor, but at a lower cost. Features include on–board 3–D geometry acceleration, hardware–based texture mapping, and high–resolution, 24–bit, 3–D support for most of Sun's workstations and PCI–based workgroup servers.

Sun Expert3D–Lite graphics accelerates 3–D geometry at up to 4 million triangles/second and provides up to three times the texture mapping performance of Sun Elite3D m3 graphics, at a much lower price. Several Sun Blade 100 configurations come with Sun Expert3D–Lite graphics. Up to two boards can be installed.

System Architecture
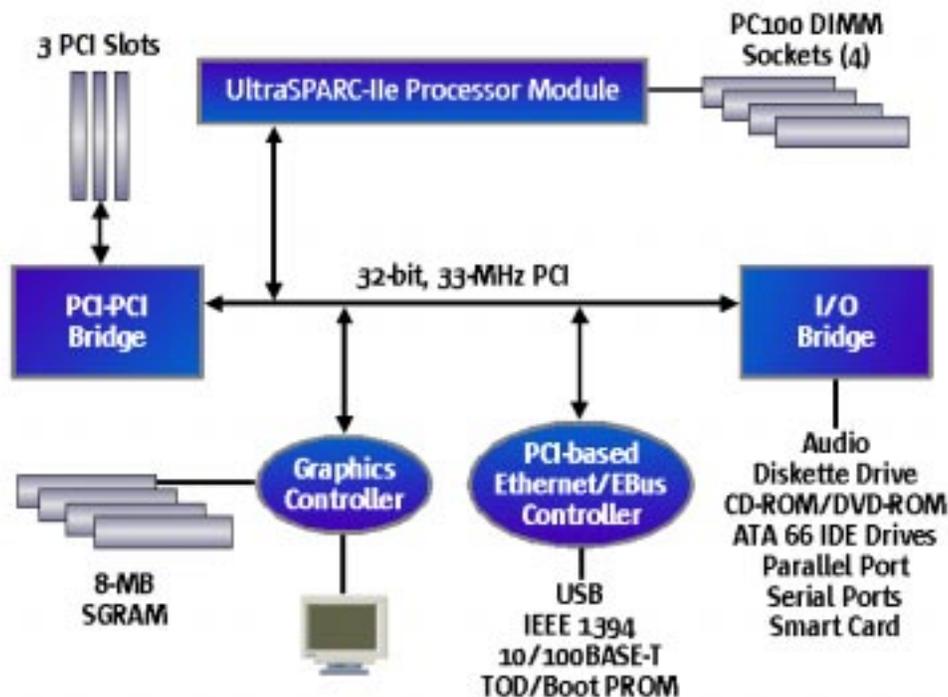
Figure 2. Sun Blade™ 100 workstation system block diagram

The Sun Blade™ 100 workstation is designed to provide high performance, scalability, and flexibility at a low cost. The use of high−volume components and application−specific integrated circuits (ASICs) have resulted in a greatly reduced part count, high reliability, and low cost without compromising access to a full complement of expansion options through standardized high−performance interfaces.

On the Sun Blade 100 workstation, a single LPX−sized motherboard is used. Features integrated into or supported by the motherboard include:

- 500−MHz UltraSPARC™−IIe processor with integrated 256−KB L2 cache
- Sun™ PGX64 on−board graphics with 8−MB SGRAM video RAM (DB15 connector)
- Four DIMM sockets, 168−pin JEDEC DRAM with error correction
- Riser card connector to support three full length, 32−bit, 33−MHz, 5/3.3−volt PCI slots
- 10BASE−T/100BASE−T Fast Ethernet, self−sensing
- Two ATA66 MB/second EIDE connectors for hard drive and CD−ROM
- One D−sub 9−pin, asynchronous serial port
- One Centronics−compatible, IEEE−1287, DB25 parallel−port interface
- Two IEEE 1394 (FireWire®) ports
- Four USB1.1−compliant ports

UltraSPARC–IIe Processor

The heart of the Sun Blade 100 workstation is the UltraSPARC–IIe microprocessor. Designed for high–performance embedded applications, the processor incorporates on–chip, Level 2 cache along with memory and I/O control to facilitated simple and economical system design. The CPU provides a highly integrated, superscalar processor implementing the SPARC–V9 64–bit architecture. The CPU supplies a direct interface with a 32–bit PCI version 2.1 compliant bus. It also manages all transactions to the PC SDRAM.

The UltraSPARC–IIe processor supports both 2–D and 3–D graphics as well as image processing, video compression and decompression, and video effects through the sophisticated VIS™ instruction set. VIS provides high levels of multimedia performance, including real–time H.261 video compression and decompression and two streams of MPEG–2 decompression at full broadcast quality with no additional hardware support.

The UltraSPARC–IIe processor interfaces have been optimized to the "sweet spot" of typical uniprocessor system requirements. This provides a balanced price–performance solution delivering the power and features that the majority of high–end applications need, optimizes power utilization and supports manufacturability and ease of use.

This processor is designed to scale gracefully, and it maintains complete binary compatibility as it evolves, providing enormous software leverage. Like all the other processors in the UltraSPARC family, the UltraSPARC–IIe processor offers binary compatibility with the over 12,000 applications developed for the SPARC family and is backed by the complete Sun development environment and world–class Solaris™ Operating Environment.

- **Excellent performance**

  The UltraSPARC–IIe processor includes a four–way superscalar pipeline to deliver up to 500–MHz clock performance. Composed of 23 million transistors, the processor delivers a peak performance of 174 SPECint2000 and 182 SPECfp2000 at 500 MHz. It achieves this performance by providing 64–bit addressing and data, along with an integrated Level–2 cache that delivers 2 GB/second sustained bandwidth and an integrated memory controller with a 800 MB/second peak bandwidth.

  The 64–bit buses provide a broad data pathway, delivering significantly higher data throughput than most 32–bit processors operating at the same clock rate. In addition, 64–byte block load and block store instructions, and supporting hardware registers and buffers, provide for high–bandwidth, memory–to–CPU and memory–to–memory transfers. Finally, the highly efficient four–way set associative, Level 2 cache, along with accurate branch prediction and explicit fetch–to–cache capability, helps ensure data is available on chip when needed, eliminating the lengthy delay associated with fetching data from external SDRAM memory. Moreover, the SDRAM memory interface has error correction and detection capability (ECC), making it highly reliable.

- **Lower power consumption**

  The UltraSPARC–IIe processor also includes power management logic to minimize overall system power consumption, supporting, in several ways, the design of systems compliant with the Energy Star initiative. For example, it supports a 1.65–volt core and 3.3–volt I/O. The processor also provides a mechanism to slow down the CPU clock rate, thereby reducing power consumption while running the operating system. It can be slowed to one–half and, under certain operating conditions, to one–sixth the normal operating frequency. The sleep mode enables the system to shut down external devices and self–refresh the SDRAM. Software can further reduce system power consumption by controlling system devices with power–down capabilities.

Features and Benefits

Features	Benefits
• Integrated VIS instruction set	• Ready for increased performance on multimedia and networking operations
• Uses the latest 0.18–micron process technology which greatly decreases the die size	• Results in a significant increase in performance and a decrease in power consumption (due to a lower core voltage of 1.65 volts)

Memory

The Sun Blade 100 workstation supports up to 2–GB of 168–pin ECC JEDEC DRAM with error correction. The Sun Blade 100 workstation supports 128–, 256–, and 512–MB DIMM modules.

The Sun Blade 100 workstation uses standard PC133 DIMMs. The memory sold with the workstation in factory configurations or as X–options has gone through extensive testing and qualification before being added to Sun's approved vendor list. Note that not all vendors perform equally, and some third–party memory does not provide the reliability and quality Sun customers expect. Sun recommends that customers use only Sun qualified memory.

Features	Benefits
• Lower cost, industry–standard memory modules	• Less expensive, allowing customers to move up to higher levels of memory at lower cost
• ECC memory	• Outstanding error code correction and system reliability, superior to parity error correction
• 64–bit architecture	• Extensive memory addressability

Storage

Internal data storage for the Sun Blade 100 workstation is provided by a high–capacity, internal, 20–GB, 3.5–inch enhanced IDE hard drive running at 7200 rpm.

• A 1.6–inch, 48X–speed EIDE CD–ROM drive is standard.

• A 1.44–MB, 3.5–inch, manual–eject floppy drive is standard.

• A second 20–GB, 7200–rpm disk drive can be installed optionally.

• 16X DVD–ROM drive on configurations with Sun Expert3D–Lite graphics

Although the Sun Blade 100 workstation uses EIDE internal drives (and does not have an external SCSI connector), the user can employ one of the PCI–SCSI host adapter cards to access Sun's external SCSI storage options. The four Sun SCSI hardware cards that have been tested for the Sun Blade 100 workstation are shown in the table below.

Part Number	Description
X5010A	PCI adapter single channel SCSI card
X6540A	PCI adapter Sun single–channel, single–ended UltraSCSI
X6541A	PCI adapter Sun dual–channel differential UltraSCSI
X1032A	PCI adapter UltraSCSI and 10/100–Mbit buffered Ethernet card

With the use of these cards, users have the option of using one of several Sun StorEdge products, such as the SCSI–based Sun StorEdge UniPack and MultiPack products listed below.

Part Number	Description
SG–XDSK010C–18G	18.2–GB, 10000–rpm Sun StorEdge UniPack system
SG–XDSK020C–36G	36.4–GB, 10000–rpm Sun Storage MultiPack system

There are several Sun Storage UniPack and MultiPack options available for external storage up to 218 GB. See the Options section later in this document for a complete list of compatible storage products.

System I/O
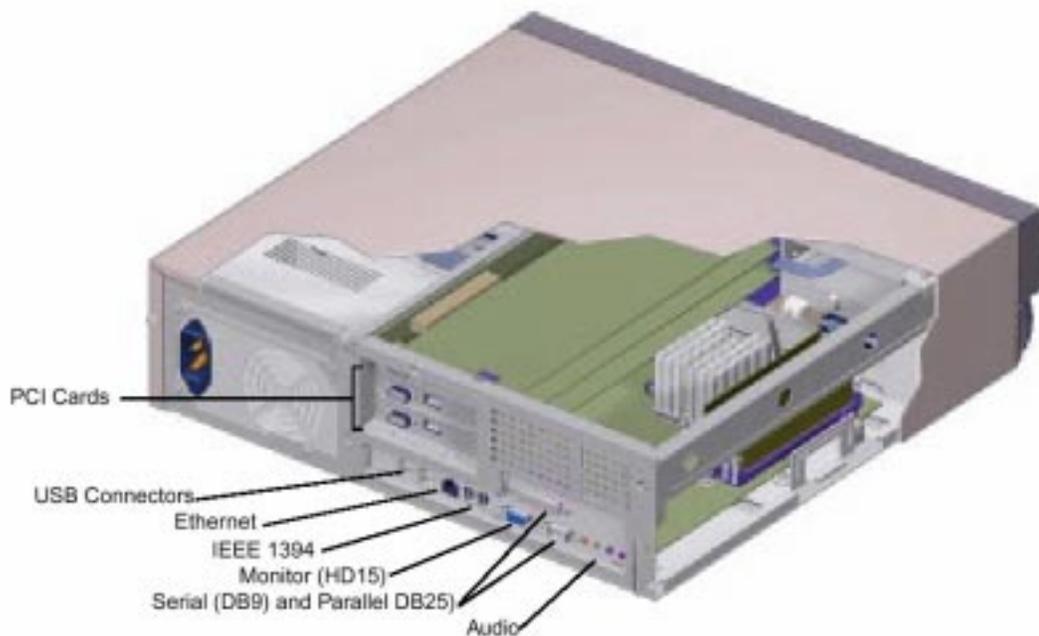
Figure 3. Rear view of Sun Blade 100 workstation, showing connectors

High–performance PCI Technology

System I/O for the Sun Blade 100 workstation is provided by the industry–standard peripheral component interconnect (PCI) data bus. The PCI bus in the Sun Blade 100 workstation complies with the 2.1 revision of the PCI specification, released in March 1995. To provide maximum expandability, the

Sun Blade 100 workstations feature three full length 32–bit, 33–MHz, 5–volt PCI slots (with 3.3 V power supplied).

Sun supports a variety of PCI–based adapter cards, including Ethernet, token ring, ATM, and FDDI networking cards, video and audio input, SCSI adapters, and high–speed serial and parallel interfaces. In addition, Sun is working with a host of third–party partners to develop PCI hardware and software that is certified for operation on Sun's entire line of workstations, including the Sun Blade 100 workstation.

USB Interface

The Sun Blade 100 workstation provides four USB ports for interface with a variety of devices. USB devices supported by the Solaris 8 (10/00) Operating Environment include:

- Human interface devices including the Sun USB keyboard and Sun USB mouse.

- USB storage devices, as indicated in the table below

Device Name	Medium Capacity
• Iomega Zip USB 100	• 100–MB Zip disks
• Iomega Zip USB 250	• 100/250–MB Zip disks
• Iomega Jaz 1–GB drive	• 1–GB Jaz disks
• Iomega Jaz 2–GB drive	• 1–/2–GB Jaz disks
• Castlewood ORG 2.2–GB external USB drive	• 2.2–GB ORB disks
• Hagiwara Sys–Com FlashGate (SmartMedia Reader/Writer USB version)	• 2/4 MB (5 volt) • 2/4/8/16/32/64 MB (3.3 volt)
• Hagiwara Sys–Com FlashGate CF (CompactFlash Reader/Writer USB Version)	• 8/16/32/48/64/96/128 MB (3.3 volt or 5 volt)

- Four and seven port expansion USB hubs (either bus or self–powered) are supported.

- Select Lexmark and Xerox USB printers are supported. Printers compliant with the USB printer class standards should function properly. Refer to the Solaris Ready program for details. The following PostScript™ printers are supported:

  - Lexmark Optra E310
  - Lexmark Optra M410
  - Lexmark Optra T616
  - Lexmark Optra W810
  - Lexmark Optra Color45
  - Xerox DocuPrint N2125

Sun PGX64 Graphics

Sun PGX64 graphics is the next–generation low–cost PCI graphics product in the PGX™ family. It is the PGX32™ graphics successor. Sun PGX64 graphics provides Sun with a very low–cost, flexible 24–bit, 2–D graphics board supporting the widest range of Sun systems and supporting up to four boards in systems that can accommodate four PCI boards. Sun PGX64 graphics is a PCI–based graphics board providing support for all Sun PCI–based workstations ,workgroup and enterprise servers including the Sun Blade 100, 1000, Ultra™ 5, 10, 60, and 80 workstations, Sun Enterprise™ 250, 220R, 420R, and 450 workgroup servers and Sun Enterprise 3500, 4500, 5500 and 6500 mid–range servers as well as future workstations and workgroup servers supporting PCI.

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Sun PGX64 graphics include the following features:

- ATI's RageXL graphics processor
  - 2–D graphics acceleration
  - 8–MB SGRAM
  - 24–bit–only true color video support up to 1920 x 1200
  - 8–bit–only pseudo color video support up to 1600 x 1000
- 33–MHz, 32–bit, 5–volt PCI card, short form factor (< 7–inch length)
- Low power consumption (< 8 watts)
- HD15 video connector on the motherboard supports composite and separate video sync timing
- Compatible with OpenWindows™ environment, CDE windowing, and supports the following APIs: X11, Motif, JDK, XGL, XIL, and OpenGL API via a software pipeline.
- Backwards compatibility with Sun's PGX24™ and PGX32 graphics accelerators (including MUX support, support for VESA/Sun resolutions, flexibility, and so on)
- Support for all Sun monitor products released since 1995
- A HD15–to–13W3 vide connector cable is included to connect to monitors with the 13W3 interface.

Sun PGX64 graphics supports the resolutions shown in the table below.

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio	Color Depth
1920 x 1200	70 Hz	Sun	16:10	8–bit
1920 x 1080	72 Hz	Sun	16:9	24–bit
1600 x 1280	76 Hz	Sun	5:4	24–bit
1600 x 1200	75 Hz	VESA	4:3	8–bit
1600 x 1000	66, 76 Hz	Sun	16:10	24–bit
1440 x 900	76 Hz	Sun	16:10	24–bit
1280 x 1024	60, 75, 85 Hz	VESA	5:4	24–bit
1280 x 1024	67, 76 Hz	Sun	5:4	24–bit
1280 x 800	76 Hz	Sun	16:10	24–bit
1152 x 900	66, 76 Hz	Sun	5:4	24–bit
1152 x 864	75 Hz	VESA	4:3	24–bit
1024 x 768	60, 70, 75, 85 Hz	VESA	4:3	24–bit
800 x 600	56, 60, 72, 75, 85 Hz	VESA	4:3	24–bit
720 x 400	85 Hz	VESA	9:5	24–bit
640 x 480	60, 72, 75, 85 Hz	VESA	4:3	24–bit

Note: *8–bit color support is via emulation in 24–bit window. Sun PGX64 graphics outputs separate sync for VESA resolutions and composite sync for Sun resolutions.*

Sun PGX64 graphics supports 64–bit/66–MHz, 64–bit/33–MHz, or 32–bit/33–MHz PCI slots in all PCI–based Sun workstations and servers, as indicated in the following table.

System	Standard Configuration?	X–option ?	Max. Number of Boards per System	Slot Configuration	Number Supported, if UPA Graphics also Configured
Sun Ultra 5		Yes	3		NA
Sun Ultra 10		Yes	4		1
Sun Ultra 60		Yes	4	1 in 66–MHz slots; 3 in 33–MHz slots	2
Sun Ultra 80		Yes	4	1 in 66–MHz slots; 3 in 33–MHz slots	1 or 2
Sun Blade 100	on–board version	Yes	3		NA
Sun Blade 1000	ATO	Yes	4	1 in 66–MHz slots; 3 in 33–MHz slots	1 or 2
Sun Enterprise 250, 450, 220R, 420R	ATO	Yes	4	1 in 66–MHz slots; 3 in 33–MHz slots	NA
Sun Enterprise 280R		Yes	4	1 in 66–MHz slots; 3 in 33–MHz slots	1 or 2
Sun Enterprise 3500, 4500, 5500, 6500	ATO	Yes	4		N/A

On the Ultra 60, Ultra 80, and Sun Blade 1000 systems, the Sun PGX64 graphics board cannot be installed if there is a double–wide UPA frame buffer (Sun Elite3D m6 graphics) installed in the adjacent UPA slot.

In addition, it is suggested for the Sun Enterprise server systems that at least one CPU be installed for each Sun PGX64 card.

Sun Expert 3D–Lite Graphics

Sun Expert3D–Lite graphics is a derivative product based on the Sun Expert3D graphics board. Sun Expert3D–Lite graphics offers many of the same features as its predecessor, but at a lower cost. Features include on–board 3–D geometry acceleration, hardware–based texture mapping, and high–resolution 24–bit, 3–D support for all of Sun's PCI–based workstations.

Sun Expert3D–Lite graphics accelerates 3–D geometry at up to 4 million triangles/second and provides up to three times the texture mapping performance of Sun Elite3D m3 graphics, at a much lower price.

Sun Expert3D–Lite graphics is a single, full–length, 64–bit PCI board. It is a 66–MHz card, and operates at 66 MHz when plugged into a 66 MHz–capable slot and at 33 MHz when plugged into a 33–MHz slot.

Key Features and Benefits

Features	Benefits
• High–performance 3–D graphics and texture mapping performance at an affordable entry–level cost–provides great geometry performance of up to 4 million tris/sec. with up to 88 Mpixels/sec. of texture fill rate	• Aggressive price/performance allows users to capitalize on 3–D application functionality in a cost–effective manner
• High resolution 24–bit 3–D double–buffering with 32–bit Z–buffer, up to 1920 x 1080 HDTV (16:9 aspect ratio) resolution	• Supports 24–bit, 2–D and 3–D graphics on all of Sun's displays including the 24–inch color monitor. With the 24–inch monitor, users can display many applications windows with little or no overlap
• Hardware–accelerated texture mapping with 16 MB of dedicated on–board texture memory	• Provides high–performance for texture mapping operations
	• Large texture storage accelerates complex 2–D and 3–D texturing
	• No trade–offs between resolution support and texture storage capabilities
• Stereoscopic graphics support at 960 x 680, 1152 x 900, and 1280 x 800 resolutions	• Allows customers to use stereoscopic viewing for immersive applications, which enhances data comprehension
• Support for up to four Sun Expert3D–Lite boards in a single system (depending on system)	• Enables applications to take advantage of more screen real estate
• 32–bit Z–buffer at all supported resolutions	• Provides high level of three–dimensional accuracy, helping to eliminate anomalies such as the flickering of objects when moving around a 3–D image
• Full acceleration support of Sun™ OpenGL® for Solaris™ 1.2.1 and Java 3D™ APIs	• Applications automatically receive performance benefits of these APIs. Single application binary for Sun graphics options

Sun Expert3D–Lite Graphics Specifications

- On–board geometry accelerator ASIC performs transform, clipping, and lighting
- On–board rasterization ASIC performs 2–D/3–D rasterization, 2–D/3–D texturing, pixel transfers, imaging and fragment processing
- High–resolution DAC with 10–bit RGB analog video at dot rates up to 350 MHz.
- Memory
    - 8–MB direct burst memory
    - 16–MB dedicated texture memory
    - 32–MB dedicated frame buffer memory

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- Standard HD15 video connector with support for Composite and Separate sync provides support for a DDC link for monitor query and control.
- VESA Standard 3–pin mini–DIN stereo connector

Sun Expert3D–Lite and Sun Expert3D Graphics Comparison

Feature	Sun Expert3D–Lite	Sun Expert3D
Maximum 3–D resolution	1920 x 1080	1920 x 1200
Maximum 3–D stereo resolution	1280 x 800	1280 x 1024
Total board memory	48 MB	128 MB
Frame buffer memory	32 MB	64 MB
Texture memory	16 MB	64 MB
Geometry acceleration	4 M tris/sec.	6 M tris/sec.
Max. texture fill rate	88 Mpixels/sec.	110 Mpixels/sec.
Superscene antialiasing support	No	Yes
Frame lock sync	No	Yes
Multiview (syncing for stereo)	No	Yes
Display connector	HD15	13W3

Note: *Sun Expert3D graphics is not available for the Sun Blade 100 workstation.*

Display Resolutions

Sun Expert3D–Lite graphics supports the following resolutions.

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format
1920 x 1080	72 Hz	Sun	16:9
1600 x 1280	76 Hz	Sun	5:4
1600 x 1200	75 Hz	VESA	4:3
1600 x 1000	66, 76 Hz	Sun	16:10
1440 x 900	76 Hz	Sun	16:10
1280 x 800	112 Hz	Sun–Stereo	16:10
1280 x 800	76 Hz	Sun	16:10
1280 x 1024	60, 75, 85 Hz	VESA	5:4
1280 x 1024	67, 76 Hz	Sun	5:4
1152 x 900	120 Hz	Sun–Stereo	5:4
1152 x 900	66, 76 Hz	Sun	5:4
1024 x 800	84 Hz	Sun	5:4
1024 x 768	75 Hz	VESA	4:3
1024 x 768	60, 70, 77 Hz	Sun	4:3
960 x 680	108, 112 Hz	Sun–Stereo	Sun–Stereo
768 x 575	50i Hz	PAL	PAL
640 x 480	60 Hz	VESA	4:3
640 x 480	60i Hz	NTSC	NTSC

Sun Blade 100 Workstation System Configuration

Feature	Specifications
Dimensions	
• Height	• 118 mm (4.6 inches)
• Width	• 445 mm (17.5 inches)
• Depth	• 464 mm (18.3 inches)
• Weight	• 15.4 kg (34 lb.)
CPU	
• Architecture	• UltraSPARC−IIe
• Clock rate	• 500 MHz
• External cache	• 256−KB
• SPECint_2000	• 174
• SPECfp_2000	• 182
Memory	
• Memory type	• 168−pin JEDEC, error correction
• Number of slots	• Four
• Capacity	• 2−GB max. error correction SDRAM
• DRAM speed	• PC133 DIMMs
• DIMM sizes	• 128, 256, and 512 MB (DIMMs can be mixed and matched)
Storage	
• Maximum internal	• One or two 20−GB, 7200−rpm EIDE hard disk (standard configurations)
Graphics	
• On−board, 24−bit, Sun PGX64 2−D graphics	• Accelerated text, windowing, 2−D and 3−D wireframe • 1280 x 1024 resolution • Support for Sun color monitors up to 24−inch (in 8−bit mode)
• Sun Expert3D−Lite graphics	• 3−D imaging; hardware accelerated texture mapping • 1900 x 1080 max. resolution (support for HDTV 24−inch monitors) • 1280 x 800 stereo resolution
I/O Interfaces	
• PCI I/O bus	• Three full−size PCI slots, 33 MHz, 5 volt (3.3V power supplied)
• Serial port	• One D−Sub 9−pin, asynch

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Feature	Specifications
I/O Interfaces (cont.)	
• Parallel port	• One D–Sub 25–pin, IEEE 1284 bidirectional
• Smart card	• Requires Solaris 8 Operating Environment patches for operation
• Audio	• Four audio ports: line in/line–out
• USB	• Four USB 1.1 compliant
• IEEE 1394	• Two
Networking Ports	• 10BASE–T/100BASE–T Fast Ethernet, self–sensing, twisted pair
Backup and Distribution	
• Floppy	• 1.44–MB, 3.5–inch, manual–eject floppy
• CD–ROM	• 48X–speed EIDE, photo–CD compatible standard
• DVD–ROM	• 16X speed
Operating Environment	• Solaris 8 (10/00) or later (preinstalled)

Specifications and Regulations

Environment

AC Power	100 to 120; 220 to 240 VAC, 47 to 63 Hz, 0.3 K VA
Operating	5° to 35° C (40° to 95° F) IEC 60068−2−1, IEC 60068−2−2 Test Bb 10 to 90% relative humidity, noncondensing
Nonoperating	−40° to 65° C (−40° to 150° F) IEC 60068−2−1, IEC 60068−2−2 Test Bb Up to 93% relative humidity, noncondensing
Acoustic Noise • Operating • Idling	 • 5.0 bels • 4.5 bels
Declared Noise Emissions	In accordance with IDO 9206, measured at 23 degrees C

Regulations

Meets or exceeds the following requirements:

Safety	UL 1950, CSA C22.2 No. 950, EN 60950, CB Scheme with all Country Deviations including Nordic EMKO−TSE (74−SEC), IEC825−1, 2, and CFR21 part 1040
Ergonomics	EN 29241−3, −7, −8, ISO 9296, EKI 59−98, EKI 60−98, BildscharbV, A15 and A17, ISO 9241−4 and DIN2137
RFI/EMU	FCC Class B, ICES−003 Class B, VCCI Class B, EN55022 Class B BSMI Class B, EN61000−3−2, EN61000−3−3
Immunity	EN55024
X−ray	DHHS 21 Subchapter J; PTB German X−ray Degree
Power Management	Energy Star compliant on the following configurations: • A36UQE1Z9U−D128CY • A36UQE1Z9U−D256CY **Note:** *Adding PCI card X−options to these configurations may or may not be Energy Star compliant, depending on the power consumption of the PCI card.*

Sun Blade™ 100 Workstation Plug–and–Play Systems

The Solaris™ Desktop Edition is preinstalled on all Sun Blade™ 100 workstations. This plug–and–play feature provides users with a ready–to–run workstation right out of the box. Customers are up and running within minutes.

- Preinstalled on Sun Blade 100 workstations:
  - The Solaris 8 Operating Environment, Release 10/00
  - StarOffice™ 5.2 productivity suite
  - CDE Apache Web Server
  - Adobe Acrobat Reader
  - Caldera Graphics CameleoLIGHT
  - Java 2™ SDK
  - Netscape™ Navigator
  - Java 3D™ and Sun™ OpenGL® for Solaris™ Graphics drivers
- The Solaris Operating Environment preinstalled software comes with the following languages:
  - English
  - French
  - German
  - Italian
  - Spanish
  - Swedish
  - Traditional Chinese
  - Simplified Chinese
  - Korean
  - Japanese

The Solaris Operating Environment

The Solaris 8 Operating Environment is the latest release of one of the industry's leading enterprise operating environments. The Solaris 8 Operating Environment contains the complete functionality required for all supported Sun Workstation™ systems. The Solaris 8 Operating Environment is a solid, scalable 64–bit operating environment that also supports 32–bit applications. The Solaris 8 Operating Environment includes:

- Reliable, Internet–ready operating environment for 64–bit SPARC™ processor–based platforms
- Enhanced ease of use and PC–interoperability features

- Integrated, high−performance Java™ technology and tools
- Robust software developer environment
- Advanced, standards−based networking
- Improved systems installation and management tools
- Enterprise−class directory services
- Enhanced desktop tools, I/O standards, and security

The Solaris Operating Environment delivers a competitive advantage to businesses through networked computing, scalability, and multiarchitecture support. The Solaris Operating Environment provides an advanced, superior solution for all customer IT needs, both technical and business. With its strength in enterprise−class reliability, scalability, and performance, the Solaris Operating Environment is an industrial−grade solution with the quality and robustness required to deliver mission−critical computing.

Solaris Operating Environment Features and Benefits

Features	Benefits
• 100 percent binary compatibility	• Software investment protection–all of today's Solaris Operating Environment−certified 32−bit applications continue to run on Solaris 8 Operating Environment without modification
• Reliability, availability, and serviceability (RAS)	• Less downtime, more productivity, and faster project completion
• 64−bit computing	• Higher performance, capacity, and precision on 64−bit SPARC processor−based systems and Intel systems with 32−bit binary compatibility • Compliant with UNIX® 98 and Aspen Group LP64 standards
• 64−bit compilers	• Quickly develop and certify 64−bit applications for SPARC and IA−64 processors using Solaris Operating Environment APIs, 64−bit C/C++ and FORTRAN compilers, and ABI certification tools
• Java 2 SDK	• Provides a high−performance, scalable Java virtual machine • Offers improved memory management, optimized JIT compiler and faster Java thread synchronization
• IPv6/IPsec/Mobile IP	• Helps increase addressing range, provides better authentication and privacy, and enables new quality of service capabilities. Mobile IP permits intermittent connection to the Internet with no data loss.
• Scale from 1 to 512 processors per node	• Helps increase compute resources as a customer's needs grow. Expand to four processors on the desktop, or use up to 64 processors per server, with up to eight servers per cluster.
• LDAP directory services	• High−speed, enterprise−class directory service, using the Solaris 8 Operating Environment LDAP client and the iPlanet™ Directory Server, supports complex, data intensive network applications. Includes Microsoft Active Directory support.

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Features	Benefits
• System management tools	• Helps reduce the time spent on system administration duties using Web−based wizards and Java technology−powered graphical interfaces.
• Desktop management and productivity tools	• Helps increase productivity with intuitive Desktop, Printer, PDA sync, HotKey, and CDE 1.4 control panel tools. The StarOffice™ productivity suite easily handles Microsoft Office documents, and creates complex documents, spreadsheets, and presentations. Use PC Launcher and the SunPCi™ IIpro coprocessor card to run Windows, Lotus 1−2−3, and AutoCAD applications on Sun workstations.
• Extended device and support	• I/O Connect with Sun, using the customer's favorite devices, including DVD, ZIP, and JAZ drives, and USB, 1394, SCSI, UPA, and PCI buses.
• Internationalization	• The Solaris 8 Operating Environment is a comprehensive global product that supports 37 languages and over 90 locales, the euro currency symbol, and complex text formats for the Arabic, Thai, and Hebrew languages. Additional language installation tools, expanded Unicode support, and improved data interoperability utilities greatly simplify the development and testing of applications for international markets.
• X11R6.4	• Runs X applications in a browser and provides single logical screen across multiple display devices
• Real Time application	• Offers scalable, fixed−priority, and fully preemptive scheduling using multiple high−resolution, per−CPU interval timers. Provides priority inheritance for synchronization by multi−threaded realtime applications, such as simulation, telemetry, data acquisition, signal processing, and video−on−demand.
• Enhanced security features	• Increased support for security protocols and technologies including IPSec, AMI, Kerberos v5, and smart cards reduce the chance of security−related downtime

Solaris 8 Operating Environment Features

The Solaris 8 Operating Environment is Sun's latest release in this product family. The Solaris 8 Operating Environment continues the tradition of reliability, availability, and scalability (RAS) of the earlier operating environment releases, including features IPv6/IPsec/Mobile IP, realtime application support, filesystem logging, and remote console.

Existing applications that adhere to the Solaris application binary interface (ABI) will run unmodified with Solaris 8 software on both SPARC processor−based platforms and Intel platforms. In addition, Sun provides an easy−to−use AppCert testing tool for developers, so they can verify existing Solaris application binaries and report on any potential incompatibilities.

• **Productivity features**

  Solaris 8 software offers enhanced diagnosing capabilities, availability, scalability, performance, Java technology, and graphics. With the Solaris 8 Operating Environment, the customer gets a full suite of

integrated tools for browsing, collaborating, and interoperating with PCs. The Solaris 8 Operating Environment provides a 32–bit and 64–bit UNIX platform that provides customizable workspaces, graphical system monitoring, and business/office productivity tools, including the StarOffice productivity suite.

- **Advanced networking**

  Support for IPv6 in the Solaris 8 Operating Environment is integrated into NFS, RPC, NIS, NIS+, and DNS. IPsec enables secure virtual private networks and network access control. Mobile IP provides Internet disconnect/reconnect capabilities with no data loss.

- **Bundled software**

  Includes Oracle 8i Enterprise Edition, `lxrun` for Linux application compatibility (for Solaris on Intel), Apache Webserver, Netscape™ Communicator, i–Planet Directory Server, `gzip`, `bash`, and `tcsh`.

  The Solaris 8 Operating Environment ships with support for a number of software components that increase overall availability including Solaris Resource Manager™ software for fine–grained control of system resources, Solaris Bandwidth Manager software for enhanced network resource availability, Sun Cluster 2.2 for high availability, and soon, Sun Cluster 3.0 (shipping in a subsequent update to Solaris 8 software) for even greater application availability through a clustered file system, scalable data services, and built–in load balancing.

- **Enhancements to the Common Desktop Environment (CDE)**

  The latest generation of the Common Desktop Environment (CDE) comes standard, providing workstation users with an easy–to–use, open, secure platform. Personal Digital Assistant (PDA) support synchronizes data from most Palm Computing devices with the CDE calendar, mail, memo, and address book. CDE now features streaming video using MPEG1, MPEG2, Quicktime, and AVI formats as well as MIDI audio using the Java Media Framework.

- **Improved system error messages, system debugging capabilities, and remote console capability**

  Allows the customer to apply scarce system expertise remotely across the enterprise.

- **File system logging**

  Logging file system features and parallel SCSI probes make rebooting faster.

- **Live Upgrade**

  Allows Solaris 8 software to be installed on a separate partition from the currently running version of the operating environment. When installation is complete, a simple reboot enables the Solaris 8 Operating Environment to take control. Since Live Upgrade includes a version migration and fallback feature, the customer can also fallback to the previous release—through a simple reboot—without losing administration information.

- **Real–time video creation and broadcast support**

  A Java Media Framework (JMF) player provides access to the latest industry–standard audio and video files, including MPEG1/2, Quicktime, VIVO, AVI, AIFF, GSM, WAV, RMF, AU, and MIDI.

Graphics Software Interfaces

The Sun Blade 100 system supports all Solaris 8 Operating Environment graphics and window system APIs, including OpenGL® and Display PostScript™. A large number of Sun and third–party graphics APIs are also supported, including IRIS GL, OpenGL, GKS, HOOPS, and Java 3D™ software. Industry–standard X–extension libraries, such as Xlib and PEXlib, are available.
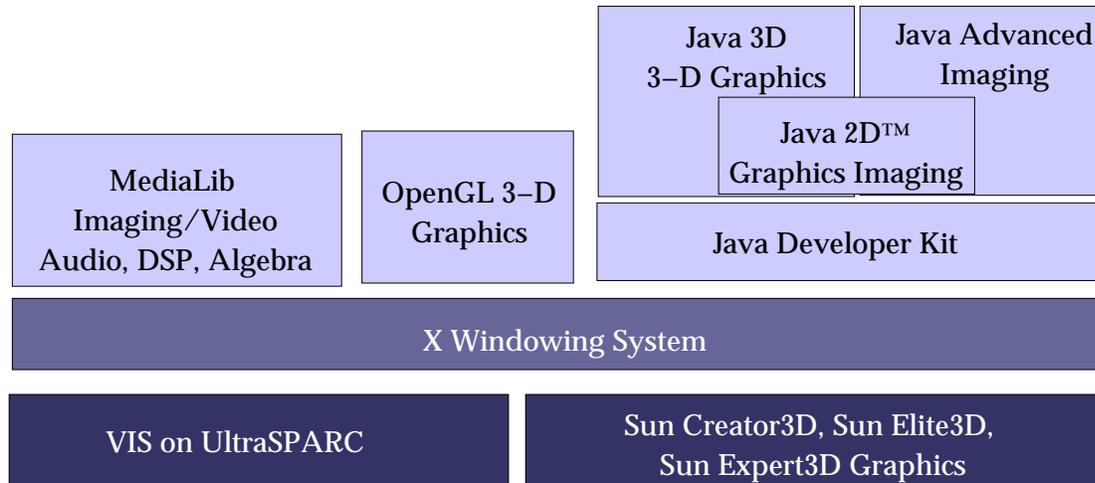
Figure 4. Graphics software interfaces

The Solaris Operating Environment System Requirements

Feature	Specification
• Memory	At least 64 MB
• Disk space	Typically 600 MB to 1 GB

Note: *Required disk space will vary based on OS packages selected, desktop or server use, desired swap tmp space, localization or translations, online documentation, and applications installed.*

The Solaris Operating Environment Licensing and Usage

Under the Free Solaris Binary License Program program, Sun is making the binary (runtime) version of its Solaris 8 Operating Environment available to everyone who accepts the terms of the Solaris 8 Binary Code License (BCL) and the Free Solaris Binary License Program. There are no fees for the right to use the software on computers with a capacity of eight or fewer processors; just a small charge for the media kit.

Refer to `http://www.sun.com/software/solaris` for current licensing details. Some features of the Solaris Operating Environment license include the following:

- No longer a distinction between desktop and server licenses
- Free binary (runtime) license for all systems of 8 or fewer CPUs for customers who accept the terms of the Solaris 8 Binary Code License and the free Solaris Binary License Program

- Solaris 8 Operating Environment software is provided via the Solaris 8 Media Kit available for purchase on–line at `http://www.sun.com/solaris/binaries`
- Single Solaris Media Kit can be used to install multiple systems
- Solaris Media Kit contains additional bundled software
- Solaris Supplemental CD of bundled user and system management tools
- Oracle 8i Enterprise Edition (with development license)
- StarOffice 5.2 productivity suite
- Solaris Software Companion CD of popular freeware
- iPlanet Advantage Software (with development licenses)

System Management

Many of the Sun™ workstations deliver the kind of power and graphics needed by the customers who use heavy compute–intensive applications in markets such as MCAE, oil and gas, simulation, visualization, and animation. Customers who run these compute–intensive applications generate and handle critical technical and scientific data, and require an operating environment that can deliver highly reliable, available, fast, and safe desktop computing environment. Built into the Solaris™ 8 Operating Environment are systems management and security features that help deliver the computing environment demanded by these customers. These features are described below.

Sun Grid Engine Software

As organizations grow, matching user's computing requirements to the most appropriate resource becomes increasingly difficult. The constantly varying priorities of users, teams, projects, groups, departments, and divisions, combined with the pressures for efficient utilization of computing resources, can make increasingly disproportionate demands on managers and staff.

In a typical network that does not have distributed resource–management (DRM) software, workstations and servers are used from 5 to 20 percent of the time. For example, machines sit idle most nights and weekends. Even technical servers are generally less than fully utilized. This means that there are many cycles that can be used productively if only users know where they are, can capture them, and put them to work.

Sun™ Grid Engine 5.2 software finds a pool of idle resources and harnesses it productively, so an organization gets as much as five to ten times the usable power out of systems on the network. It can help increase utilization to as much as 98 percent.

Sun Grid Engine software aggregates available compute resources and delivers compute power as a network service. Sun Grid Engine load management software is targeted to optimize utilization of all software and hardware resources in heterogeneous networked environments. Sun Grid Engine software distributes the computational workload across multiple systems (workstations or servers), increasing the productivity of machines and application licenses while helping to maximize the number of jobs that can be completed. Designed for high performance, flexibility, and scalability, Sun Grid Engine software provides robust load sharing and sophisticated batch scheduling.

Sun Grid Engine software supports the Sun Blade 100 workstation. This software helps users get even more value from their workstations.

Admintool

Admintool is a GUI–based administration tool that provides local systems administration. Admintool can be used to manage user accounts, groups, hosts, printers, serial ports, and installation/removal of software.

Sun Management Center Software

Sun Management Center software is a GUI–based system management tool for Sun systems. Sun Management Center software enables system administrators to proactively monitor and manage the health and status of many Sun workstations from a central location. Sun Management Center software simplifies the management of many workstations, establishing highly stable and reliable workstation

computing environment for running business–critical applications. In addition, Sun Management Center software is also scalable enough to run entirely on a workstation as a stand–alone application.

Key Features

- **Performance monitoring and management**

  Provides proactive monitoring and management of workstation hardware and the Solaris Operating Environment, by detecting impending failures

- **Predictive failure analysis**

  Enables administrators to predict potential memory and disk hardware failures on a statistical bases, thereby enhancing the decision making process and increasing machine availability

- **Fault and event management**

  Collects alarms and events, and then helps users identify the root cause of the problems

- **Physical view of workstations**

  Provides enhanced serviceability with visual view that highlights failed hardware components

Solstice AutoClient™ Software

Solstice AutoClient™ software reduces the cost of Sun workstation management by enabling centralized administration. This centralization eliminates the need to do backups, installations, and software management on the workstation itself. Solstice AutoClient software caches the Solaris Operating Environment, required applications, and user data onto the workstation's disk from a network server.

Key Features

- **Centralized software management model**

  Reduces workstation administration costs by allowing workstations to be managed from a server

- **Hands–off installation**

  When an application is needed, Solstice AutoClient automatically pulls the software from the server and loads it onto the workstation disk, resulting in built–in software distribution

- **Workstations become field replaceable units**

  Sun workstations can be replaced easily in the event of hardware failure, minimizing user down time

- **No workstation backups required**

  Solstice AutoClient workstations only have cached data, so there is no need to back up the workstation; the backup occurs on the server, saving considerable time and resources

Performance Meter

This GUI–based performance meter enables users to quickly monitor some of the key system resources such as CPU, load, disk, page, context, job swaps, interrupts, packets, collisions, and errors.

SunVTS™ Software

The SunVTS™ system exerciser is a graphically oriented UNIX® application that permits the continuous exercising of system resources and internal and external peripheral equipment. Used to determine if the

system is functioning properly, SunVTS software incorporates a multifunctional stress test of the system through operating–system–level calls, and allows the addition of new tests as they become available.

ShowMe How™: State–of–the–Art Installation and Maintenance Instruction

ShowMe How™ is a documentation system that presents information in a highly understandable multimedia format. Installation and service tutorials as well as reference information provide users with comprehensive, easy–to–use instruction. ShowMe How streamlines installation and maintenance for lower service costs and maximum system uptime.

Key Features

- Distributed on CD–ROM with every system
- Movies of installation and replacement procedures played through ShowMe TV™ software
- Photo sequences with narrated installation and replacement procedures
- Text–based instructions, taken from standard Sun documentation that can be viewed on–line and printed
- Photos with active callouts link to more detailed photos and text–based reference information

AnswerBook2™: System Administration Guide

The AnswerBook2™ product is Sun's on–line documentation system. It uses a web–browser interface that lets the customer view and print a variety of Solaris information, including SGML–based AnswerBook™ collections, Display PostScript™ AnswerBook collections, and man pages.

The AnswerBook2 product provides a search engine that lets the customer find information throughout the documentation library. Users can install AnswerBook2 document collections on a centralized documentation server or on a local server.

Features and Functions

- Uses a web–browser–based interface so that the customer can view on–line documentation from any platform (running any operating system), provided that their web browser supports HTML 3.2
- Contains support for multimedia (video and audio) content
- Provides a search engine for finding words and word phrases throughout the documentation library
- Lets the user define a subset of document collections (a personal library) to be displayed when using a specific documentation server
- Lets users copy information from AnswerBook2 documents and paste it into other locations, such as the command line, depending on the web browser's functionality
- Gives users the ability to print sections and books directly from the AnswerBook2 interface in a PostScript™ format that is near print–quality output
- Allows the user to choose a language in which to view on–screen instructions and Help information
- Provides a command–line interface (CLI) and a browser–based interface (GUI) for performing documentation server administration functions

The Sun Blade™ 100 workstation utilizes a marketing part–number scheme that includes the Solaris™ Operating Environment version preinstalled on the hard drive and the choice of Country Kit in the marketing part number. This page explains how to read the part number scheme, and the next section explains the changes in specifying or ordering the Country Kit.

A11AAA1A1A-A111AAC

- System
- Microprocessor family
- Microprocessor speed
- Ecache Size
- Number of Microprocessors
- Country Kit code
- Monitor
- Frame Buffer
- Operating Environment Version Preinstalled
- Memory
- Hard drive/CD-ROM
- "Non-standard" System
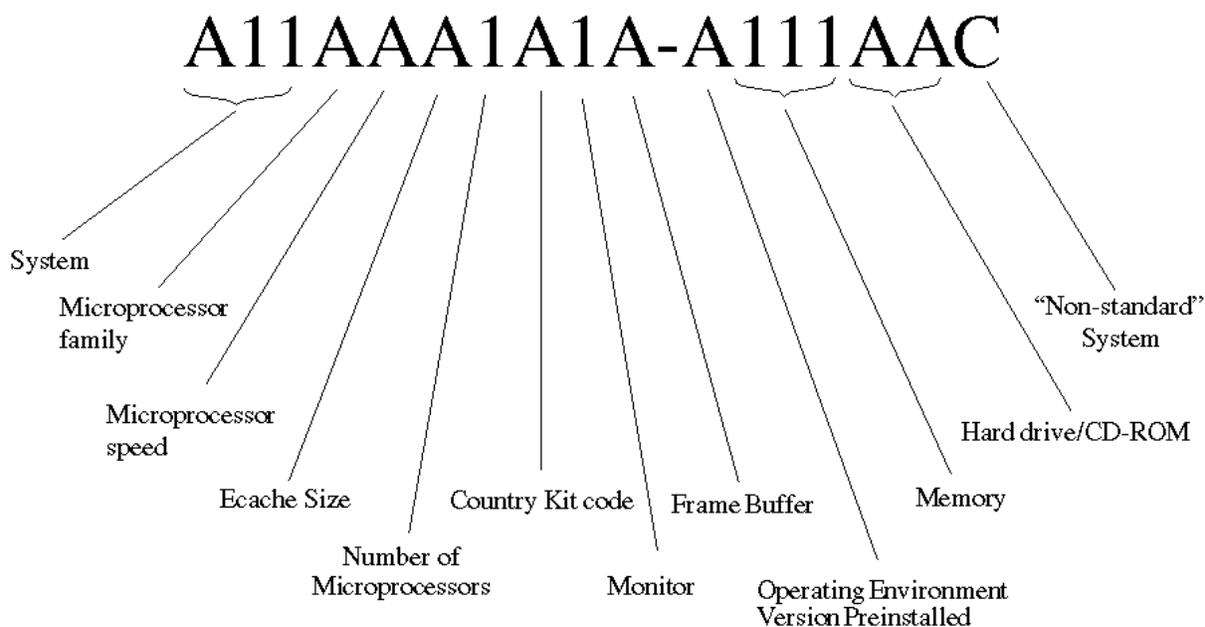
(Note: A = alpha character, 1 = numeric character, C = optional alpha or numeric character)

Model Key (Subset of Part Number Definitions)

System	Number of Processors	Operating Environment Version Preinstalled	Hard Drive/CD–ROM
A36 = Sun Blade 100	1 = Single processor	D = Solaris™ 8 Operating Environment	CY = 20–GB, 7200–rpm hard drive, 48X CD–ROM
Microprocessor Family	**Country Kit**		DJ = 20–GB, 7200–rpm hard drive, 16X DVD–ROM
U = UltraSPARC™–IIe	Z = Universal	**Memory**	
		128 = 128 MB	
Microprocessor Speed	**Monitor**	256 = 256 MB	
Q = 500 MHz	9 = No monitor	512 = 512 MB	
		2GB = 2 GB	
Ecache Size	**Frame Buffer**		
E = 256 KB	A = Sun™ Expert3D–Lite		
	U = Only on–board Sun PGX64		

Sun Blade 100 Workstation with Sun PGX64 Graphics

Part Number	System
A36UQE1Z9U−D128CY	Sun Blade 100 workstation with 500−MHz UltraSPARC−IIe CPU; 256−KB Ecache; Sun PGX64 on−board graphics; 128−MB DRAM (1 x 128−MB DIMM); 20−GB, 7200−rpm disk drive; 48X CD−ROM; smart card; 1.44−MB floppy; Solaris 8 Operating Environment preinstalled; Universal language; standard configuration
A36UQE1Z9U−D256CY	Sun Blade 100 workstation with 500−MHz UltraSPARC−IIe CPU; 256−KB Ecache; Sun PGX64 on−board graphics; 256−MB DRAM (1 x 256−MB DIMM); 20−GB, 7200−rpm disk drive; 48X CD−ROM; smart card; 1.44−MB floppy; Solaris 8 Operating Environment preinstalled; Universal language; standard configuration

Sun Blade 100 Workstation with Sun Expert3D−Lite Graphics

Part Number	System
A36UQE1Z9A−D512DJ	Sun Blade 100 workstation with 500−MHz UltraSPARC−IIe CPU; 256−KB Ecache; Sun Expert3D−Lite graphics; 512−MB DRAM (2 x 256−MB DIMM); 20−GB, 7200−rpm disk drive; 16X DVD−ROM; smart card; 1.44−MB floppy; Solaris 8 Operating Environment preinstalled; Universal language; non−standard configuration
A36UQE1Z9A−D2GBDJ	Sun Blade 100 workstation with 500−MHz UltraSPARC−IIe CPU; 256−KB L2 cache; Sun Expert3D−Lite graphics; 2−GB SDRAM (4 x 512−MB DIMMs; see note on memory under Ordering Notes); 2 x 20−GB, 7200−rpm internal disks; 16X DVD−ROM; smart card; 1.44−MB floppy; Solaris 8 Operating Environment preinstalled; Universal language; non−standard configuration

Ordering Guidelines and Notes

- **Software**

  - The Solaris 8 Operating Environment (10/00) and the StarOffice™ productivity suite are preinstalled on all Sun Blade 100 systems.

  - The Solaris 8 media kit is not included. Order it using one of the media kit part numbers given in the Options section of this document (or in Sun's Pricebook). Country kits, monitors, and other options such as PCI cards and external storage also need to be ordered separately.

- **Memory**

  - The Sun Blade 100 workstation supports up to 2 GB of SDRAM with ECC error correction with 128−MB, 256−MB, and 512−MB DIMM modules.

  - The factory installed 2−GB configurations consist of 4 x 512−MB DIMMs; there are no empty memory DIMM slots remaining. There are two 20−GB internal hard drives.

  - The workstation can accommodate up to four DIMM modules. Sizes can be mixed.

Part Number	Memory Expansion Options
X6991A	128−MB single DIMM
X6992A	256−MB single DIMM
X6993A	512−MB single DIMM

- **Keyboard**

  Keyboards are not included in the Sun Blade 100 workstation configurations. The appropriate Type6 USB country kit must be ordered with the system.

- **External SCSI devices**

  A PCI SCSI adapter card is required to attach any external SCSI device since SCSI is not a feature of the Sun Blade 100 workstation. In addition, all internal SCSI options are not compatible with the Sun Blade 100 workstation.(See list of PCI expansion cards in the Options section of this document.)

- **Monitors**

  Monitors are not included in the Sun Blade 100 workstation configurations. Customers are not required to order a monitor. Monitors are ordered as a separate line item. The Sun Blade 100 workstation supports the Sun monitors listed below. For some monitor and frame−buffer combinations, a video adapter cable may be required; consult the table below.

Supported Monitors	Video Adapter Required for On−board 24−bit PGX64
17−inch color (X7143A)	none
18−inch TFT LCD color (X7127A)	X471A
19−inch color (formerly X7135A)	none
21−inch color (X7136A)	X471A
24−inch color (X7124A)	X471A

Options

Below is a comprehensive list of system expansion, networking, graphics, and multimedia options that are supported by Sun Blade 100 systems. Refer to the Sun Price Book and configuration guides for currently available option listings, configuration notes, and ordering information. When no maximum number is listed, refer to ordering or configuration notes for that option. Options in italics are discontinued and are presented here for reference purposes only.

Part Number	Option Description	Maximum Number Supported	Comments
Memory			
X6991A	128–MB single DIMM	4	
X6992A	256–MB single DIMM	4	
X6993A	512–MB single DIMM	4	
Mass Storage Internal			
X6174A	Internal 20–GB, 7200–rpm EIDE hard disk drive	1	
X6175A	Internal 16X–speed DVD–ROM	1	
X6172A	*Internal 15–GB, 7200–rpm ATA hard disk drive*	*1*	
X6173A	*Internal 12X–speed DVD–ROM*	*1*	
Mass Storage UniPack			
SG–XDSK010C–9G	9–GB UniPack Disk	4	SCSI cables required
SG–XDSK010C–18G	18–GB UniPack Disk	4	
SG–XDSK010C–36G	36–GB UniPack Disk	4	
Mass Storage Sun StorEdge™ MultiPack			
SG–XDSK020–18G	18.2–GB MultiPack (2 x 9.1–GB, 100000–rpm) UltraSCSI	1	
SG–XDSK020–36G	36.4–GB MultiPack (2 X 18.2–GB, 100000–rpm) UltraSCSI	1	
SG–XDSK020–72G	72–GB MultiPack (2 X 36–GB, 10000–rpm) UltraSCSI	1	
SG–XDSK040–36G	36.4–GB MultiPack (4 x 9.1–GB, 100000–rpm) UltraSCSI	1	
SG–XDSK040–72G	72.8–GB MultiPack (4 X 18.2–GB, 10000–rpm) UltraSCSI	1	
SG–XDSK040–144G	144–GB MultiPack (4 x 36–GB, 10000–rpm) UltraSCSI	1	
SG–XDSK060–54G	54–GB MultiPack (6 x 9–GB, 10000–rpm) UltraSCSI	1	
SG–XDSK060–109G	109–GB MultiPack (6 x 18–GB, 10000–rpm)UltraSCSI	1	
SG–XDSK060–218G	218–GB MultiPack (6 x 36–GB, 10000–rpm) UltraSCSI	1	
X5234A	9–GB UltraSCSI 10000–RPM disk (for Packs)		
X5237A	18–GB UltraSCSI 10000–RPM disk (for Packs)		
X5242A	36–GB UltraSCSI 10000–RPM disk (for Packs)		
Mass Storage – Sun StorEdge FlexiPack			
SG–XTAP4MM–021A	12–GB, 4–mm DDS–3 in a Sun StorEdge FlexiPack desktop enclosure	2	

Part Number	Option Description	Maximum Number Supported	Comments
SG–XTAP4MM–031A	72–GB, 4–mm DDS–3 in a Sun StorEdge FlexiPack desktop enclosure	1	
SG–XTAP8MM–020A	*7–GB, 8–mm drive in a Sun StorEdge FlexiPack desktop enclosure*	2	
SG–XTAP8MM–021A	20–GB, 8–mm drive in a Sun StorEdge FlexiPack desktop enclosure	2	
SG–XTAPDLT–021A	36–GB DLT7000 tape drive	2	
X6236A	20 to 40–GB, 8–mm internal tape drive for Sun StorEdge FlexiPack		
X6166A	32X internal CD–ROM drive		
X6212A	*7–GB, 8–mm internal tape (for workstations)*		
X6282A	12–GB, 4–mm DDS–3 internal tape drive, OEM ready		
X6295A	20–GB, 4–mm DDS–4 tape drive		
Mass Storage – Sun StorEdge A1000/D1000 Arrays			
SG–XARY144A–36G	36–GB (4 x 9.1–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY146A–36G	36–GB (4 x 9.1–GB, 10000–rpm disks) Sun StorEdge A1000 rackmount array	2	
SG–XARY151A–72G	72–GB (4 x 18–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY155A–72G	72–GB (4 x 18–GB, 10000–rpm disks) Sun StorEdge A1000 rackmount array	2	
SG–XARY144A–109G	109–GB (12 x 9.1–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY170A–145G	145–GB (4 x 36–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY171A–145G	145–GB (4 x 36–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY151A–218G	218–GB (12 x 18–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY155A–218G	218–GB (12 x 18–GB, 10000–rpm disks) Sun StorEdge A1000 rackmount array	2	
SG–XARY170A–436G	436–GB (12 x 36–GB, 10000–rpm disks) Sun StorEdge A1000 tabletop/deskside array	2	
SG–XARY171A–436G	436–GB (12 x 36–GB, 10000–rpm disks) Sun StorEdge A1000 rackmount array	2	
SG–XARY145A–36G	36–GB (4 x 9–GB disks) Sun StorEdge D1000 tabletop/deskside array	1	
SG–XARY147A–36G	36–GB (4 x 9.1–GB, 10000–rpm disks) Sun StorEdge D1000 rackmount array	1	

Part Number	Option Description	Maximum Number Supported	Comments
SG−XARY153A−72G	72−GB (4 x 18−GB, 10000−rpm disks) Sun StorEdge D1000 tabletop/deskside array	1	
SG−XARY154A−72G	72−GB (4 x 18−GB, 10000−rpm disks) Sun StorEdge D1000 rackmount array	1	
SG−XARY145A−109G	*109−GB (12 x 9.1−GB, 10000−rpm disks) Sun StorEdge A1000 tabletop/deskside array*	1	
SG−XARY172A−145G	145−GB (4 x 26−GB, 10000−rpm disks) Sun StorEdge D1000 tabletop/deskside array	1	
SG−XARY173A−145G	145−GB (4 x 26−GB, 10000−rpm disks) Sun StorEdge D1000 rackmount array	1	
SG−XARY153A−218G	218−GB (12 x 18−GB, 10000−rpm disks) Sun StorEdge D1000 tabletop/deskside array	1	
SG−XARY154A−218G	218−GB (12 x 18−GB, 10000−rpm disks) Sun StorEdge D1000 rackmount array	1	
SG−XARY172A−436G	436−GB (12 x 36−GB, 10000−rpm disks) Sun StorEdge D1000 tabletop/deskside array	1	
SG−XARY173A−436G	2436−GB (12 x 36−GB, 10000−rpm disks) Sun StorEdge D1000 rackmount array	1	
Tape Libraries			
SG−XAUTODLT8D−L9	Sun StorEdge L9 (360−GB) tape autoloader desktop	1	
SG−XRACKIT−L9	Sun StorEdge L9 rackmounting kit	1	
SG−XLIBDLT71−L20	Sun StorEdge L20 700−GB tape library, desktop	1	
SG−XLIBDLT1−280G	Sun StorEdge L280 tape library autoloader, desktop model	1	
SG−XLIBDLT2−280G	Sun StorEdge L280 tape library autoloader, rackmount	1	
Input Devices			
SUNX−MICII/G5	SunMicrophone™ II	1	
X3682A	Visual Collaboration Kit (with IEEE 1394 Camera)		
PCI Expansion Cards			
X1032A	10/100BASE−T Ethernet with Sun PCI UltraSCSI	3	
X1033A	10/100BASE−T with MII PCI adapter	3	
X1034A	PCI Quad FastEthernet controller PCI adapter	1	
X1141A	PCI Gigabit Ethernet network interface card	3	
X1150A	GigaSwift Ethernet (UTP)		
X1152A	*FDDI single−attach PCI adapter*	*3*	
X1153A	*FDDI dual attach*	*3*	
X1155A	High−speed serial − 4 port	3	
X1157A	Sun ATM™/P−155 MMF	3	
X1158A	Sun ATM/P−155 UTP	3	
X2069A	FC−AL Gigabit Ethernet	1	
X2154A	*Token ring interface*	*3*	
X2156A	Serial Asyn interface − 8 port	3	
X5010A	Single channel SCSI	3	

Part Number	Option Description	Maximum Number Supported	Comments
X6540A	Dual–channel, single–ended UltraSCSI adapter	3	
X6541A	Dual–channel, differential UltraSCSI controller	3	
X2132A	SunPCi™–IIpro coprocessor card	1	
X7042A	128–MB DIMM memory expansion for SunPCi IIpro card		
X7044A	256–MB DIMM memory expansion for SunPCi IIpro card		
Monitors and Graphics			
X7143A	17–inch entry color monitor		* X471A adapter needed
X7135A	*19–inch color monitor**		
X7136A	21–inch color monitor*		
X7124A	24–inch wide screen color monitor		
X7127A	18.1–inch TFT LCD color monitor*		
X471A	13W3F–to–HD15M video adapter cable		
X3872A	HD15F–to–13W3 video adapter		
X3684A	Sun™ Expert3D–Lite PCI–based graphics	2	
X3768A	Sun PGX64 PCI–based graphics	3	
X3668A	*PGX32™ PCI–based graphics board*	*3*	
Other Options	A PCI SCSI adapter card is required to attach any external SCSI device to the Sun Blade 100 workstation		
X3682A	Sun Visualization Kit (with IEEE 1394 digital camera)	1	
X901A	0.8–meter wide–to–narrow 68–68–pin UltraSCSI		
X902A	2.0–meter wide–to–narrow 68–68–pin UltraSCSI	1	
X903A	1.2–meter wide–to–narrow 50–68–pin SCSI adapter cable	1	
X904A	2.0–meter wide–to–narrow 50–68–pin SCSI adapter cable	1	
X3856A	Fast–wide 68 to 68 pin SCSI cable and GEO–specific power cord		
X3857A	Fast–narrow 50 to 68 pin SCSI cable and GEO–specific power cord		
Solaris 8 Media Kit	Customer must order media kit to get recovery CD and Solaris documentation		
SOLZS–08CB9AY9	English Kit		
SOLZS–08CB9AY9A	French Kit		
SOLZS–08CB9AY9B	German Kit		
SOLZS–08CB9AY9C	Japanese Kit		
SOLZS–08CB9AY9D	Simplified Chinese Kit		
SOLZS–08CB9AY9E	Italian Kit		
SOLZS–08CB9AY9F	Spanish Kit		
SOLZS–08CB9AY9G	Swedish Kit		

Part Number	Option Description	Maximum Number Supported	Comments
SOLZS−08CB9AY9H	Korean Kit		
SOLZS−08CB9AY9J	Traditional Chinese		
SOLZS−08CB9AY9M	English (Worldwide)		
Type6 USB Country Kits			
X3531A	North American Universal ("PC style")	1	
X3532A	French	1	
X3533A	German	1	
X3534A	Swiss−French	1	
X3535A	Swiss−German	1	
X3536A	Swedish	1	
X3537A	United Kingdom	1	
X3538A	United States UNIX	1	
X3539A	Japanese UNIX	1	
X3554A	Taiwanese	1	
X3555A	Korean	1	
X3556A	Japanese	1	
X3558A	United Kingdom UNIX	1	
X3559A	European UNIX	1	
X3560A	Norwegian	1	
X3561A	Portuguese	1	
X3562A	Spanish	1	
X3563A	Danish	1	
X3564A	Italian	1	
X3565A	Dutch (Netherlands)	1	
X3566A	Australian	1	
X3567A	Finnish	1	
X3568A	European Universal	1	
X3582A	Chinese	1	
X3583A	Euro UNIX (Power Cordless)	1	

Upgrade Information

Sun™ upgrades offer customers superior investment protection for their existing Sun equipment.

Key Messages

- Sun offers customers a variety of flexible upgrade paths to the most popular Sun systems
- Choose from full array of chassis upgrades
- Existing investments in non–Sun hardware can be leveraged by upgrading to Sun through competitive upgrades

Sun Upgrade Allowance Program (Sun UAP)

The Sun UAP program offers customers a simple, flexible, and easy–to–understand way of ordering desktop workstation upgrades. This program uses a percentage–based upgrades model. This model simplifies the upgrades process by providing a trade–in value as a percentage allowance. This percentage allowance can then be applied to the list price of a regular Sun system configuration.

Under the Sun UAP program, allowance codes or part numbers have been created and the percentage allowance is built into this part number (see below). These allowance codes replace the previous UG/CU marketing codes used for all desktop upgrades.

Allowance codes can be found in the Sun Pricebook starting with the September 2000 version. Please note that allowance codes apply to configured systems and **cannot be applied to X–options , other than monitors** (see ordering notes below).

Allowance Code Numbering Scheme

Below is an example allowance code, along with a breakdown of the components.

Allowance code = ALW–15–T–D–A36–P2

- **ALW** = Upgrade identifier (All allowance codes start with ALW.)
- **15** = Allowance percentage–Percentage is applied to the list price of a standard marketing part number . "15" means 15% off of list price , "08" means 8% off of list price, and so on.

  (Note: Any other discounts such as volume discounts should also be taken off the list price and not the net of the above.)
- **T** = Desktop upgrades, S for server upgrades, and D for storage upgrades.
- **D** = Indicates the residue group–a way of grouping system in the Sun installed base. The letters A through X are reserved for Sun systems. The letter Z is used for competitive systems.
- **A36** = Identifies the product family that the customer is purchasing.
- **P2** = Promotion code, used for tracking corporate sponsored and other types of promotions.

How to Determine the Right Allowance Code

Scenario: My customer has a SPARCstation™ 10 workstation and would like to upgrade to an Sun Blade™ 100 workstation. What allowance part number should I select?

1. From left hand column select the platform the **customer has.**

2. From the top row select the platform the customer would like to **UPGRADE TO.**

3. Where the UPGRADE FROM column and the UPGRADE TO row intersect (noted with **) is the allowance part number that is applied to the list price of the standard marketing part number.

DESKTOP SYSTEM MIGRATION AND ALLOWANCE MATRIX

UPGRADE TO:	Sun Blade 100	Ultra 10	Ultra 60	Ultra 80
FROM:	**(A36)**	**(A22)**	**(A23)**	**(A27)**
Early Sun SPARCstation™ systems	ALW–08–T–A–A36	ALW–08–T–A–A22	ALW–08–T–A–A23	ALW–06–T–A–A27
SPARCstation 4, 5, 10, or 20 workstations	ALW–12–T–B–A36	**ALW–12–T–B–A22	ALW–10–T–B–A23	ALW–08–T–B–A27
Ultra™ 1, 5, 10, and 30 workstations	ALW–14–T–C–A36	ALW–16–T–C–A22	ALW–16–T–C–A23	ALW–12–T–C–A27
Ultra 2 and 60 workstations	ALW–14–T–D–A36	ALW–16–T–D–A22	ALW–18–T–D–A23	ALW–16–T–D–A27
Non–Sun workstations	ALW–10–T–Z–A36	ALW–12–T–Z–A22	ALW–10–T–Z–A23	ALW–10–T–Z–A27

Answer: Allowance part number ALW–12–T–B–A36 should be selected. The customer gets a 12 percent allowance off the list price of any Sun Blade 100 workstation configuration for returning the SPARCstation 10 system.

Ordering Notes

- No disks, memory, or CD–ROM drives migrate to the Sun Blade 100 workstation.

- Country kits (keyboard and localized manuals)

  - Country kits (keyboards) are not provided with upgrades. If the user requires a keyboard, they can order the correct X option.

  - The Sun Blade 100 workstation does not support non–USB keyboards.

- Monitors

  - Monitors are not included with any Sun Blade 100 workstation upgrades. If a monitor is needed, order the appropriate X–option or refer to monitor upgrade section of the pricebook and apply the appropriate allowance code.

  - Sun–branded 17–inch and 20–inch monitors migrate from previous generation Sun systems; however, the customer may need to purchase a monitor adapter X470A.

  - For some monitors, a video adapter may be required. Please order correct adapter (example: a 21–inch color monitor with on–board 8–bit graphics requires X471A). Adapter choices are:

    - X3872A–HD15F–to–13W3 video adapter
    - X471A–13W3F–to–HD15M video adapter (10–inch cable)

– N1 (Sony GDM 17E10), N2 (Sony GDM 20E20, GDM 17E20), P4 (Sony GDM20D10) are supported monitors on Sun Blade 100 workstation. Customer may migrate any of these monitors. However, an adapter is required for operation.

Service and Support

Sun Enterprise Services Offerings

Sun Enterprise Services now provides two service offerings: SunClient℠ program or low−level, low−cost support and SunSpectrum℠ program for high−level support and mission−critical response. Both support programs are available to service Sun Blade 100 workstations.

SunClient Program

There is a way to reduce hardware and software support costs for network computers and Sun workstations. The SunClient support program is a suite of offerings that is separate, yet complementary to the SunSpectrum program. SunClient Support provides:

- A choice for optimizing low−cost workstation support
- Flexibility to select only the services needed
- Administrative simplicity, saving time and money
- Access to world−class UNIX® networking experts

Feature	SunClient Maintenance	SunClient Central Maintenance	SunClient Software Tech Support Option*
Systems approach coverage	*	*	—
Solaris™ and unbundled software technical support	—	—	*
9 a.m.−5 p.m., M−F telephone coverage	*	*	*
8 a.m.−5 p.m., M−F on−site coverage	*†‡	*‡	—
Response times (phone/onsite)	4−hour callback/next business day response	4−hour callback/second business day response	4−hour callback
Centralized on−site repair of multiple units	—	*	Not Applicable
Patches	Not Applicable	Not Applicable	*
SunSolve℠ license	Not Applicable	Not Applicable	*
SunSolve EarlyNotifier℠ Service	Not Applicable	Not Applicable	*
Software Updates	Not Applicable	Not Applicable	Not Applicable

* Can only be sold as an option to SunClient Maintenance or SunClient Central Maintenance.
† Next business day on−site response requires that the request for service be received by 3:00 p.m. If the call is received after 3:00 p.m., service will be provided on the second business day.
‡ Customers located more than 50 miles from an authorized service provider or reseller will be charged an additional fee for service activity.

Features and Benefits of the SunClient Program

Features	Benefits
• Unbundled hardware and software support	• **Flexibility**: Select the type and amount of coverage needed for desktop systems, so service dollars are targeted where they are needed most. • **Cost savings**: Pay only for the support services needed.
• Next business day (SunClient Maintenance) or second business day (SunClient Central Maintenance) on–site response	• **Cost efficiency**: Because Sun can more efficiently manage spare inventory and labor scheduling, the savings can be passed on to the customer.
• Single contract with choice of automatic warranty upgrade	• **Simplicity**: One contract covers a predefined number of systems at one low price. New systems acquired can be upgraded to the SunClient service level.
• SunClient Central Maintenance	• **Cost savings**: Sun realizes an economy of scale by repairing multiple systems with one visit and leverages existing support infrastructures, so cost efficiency is maximized while duplication of effort is minimized.
• Service delivery by Sun experts	• **Consistency**: Selected desktops can be deployed anywhere with assurance of cost–effective, quality service and support.

For more information, visit the SunClient Support (external) web site at:
`http://www.sun.com/service/support/sunclient`

The SunSpectrum Program

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

SunSpectrum program support contracts are available both during and after the warranty program. Customers may choose to uplift the service and support agreement to meet their business needs by purchasing a SunSpectrum contract.

The four levels of SunSpectrum support contracts are outlined below.

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

Glossary

3D–RAM	Dual–ported video memory with graphics functionality built into the memory chip.
100BASE–T	*See* Fast Ethernet.
Antialiasing	A graphics technique that greatly enhances the quality of images by eliminating many of the inaccuracies (jaggies) inherent to rendering on a raster display. Typically found only in high–end graphics systems.
DIMM	Double inline memory module. A memory unit that can come in a variety of sizes, such as 16, 32, 64, and 128 MB.
Fast Ethernet	IEEE standard for 100–Mb Ethernet.
MII	Media independent interface. Used for connecting external transceivers to Fast Ethernet.
ODBC	Open database connectivity.
OpenGL®	A standard software interface for graphics hardware that allows programmers to create interactive 3–D applications. OpenGL provides a full–featured, network–transparent application programming interface.
PCI	Peripheral component interconnect. An industry standard for connecting peripherals such as disk drives, tapes drives, and other devices used in the PCs.
PGX32™	The 32–bit graphics capabilities built–in to the Sun Blade 100 and Ultra 10 workstations.
Sun™ PGX64	Sun PGX64 graphics. A very low cost, flexible 24–bit, 2–D graphics board supporting the widest range of Sun systems and supporting up to 4 boards in a single system.
V9	Version 9 of the SPARC™ definition.
VIS™	Visual instruction set. The UltraSPARC™ processor implements a special instruction set that is aimed primarily at image and video processing. Some of the instructions allow the CPU to directly access and operate on image data with a high degree of parallelism. Other instructions provide facilities for formatting and moving data at very high rates of speed both within the CPU, and between the CPU and the other system components.
XGL™	A foundation geometry–oriented 2–D/3–D graphics library that provides high functionality and performance to geometry applications and application program interfaces (APIs).

Materials Abstract

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

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
PowerPack				
– *Sun Blade™ 100 Workstation: Just the Facts*	Reference Guide (this document)	Training Sales Tool	SunWIN, Reseller Web	125028
– *SunPCi™ IIpro Coprocessor Card: Just the Facts*	Reference Guide	Training Sales Tool	SunWIN, Reseller Web	92629
References				
– *Sun Blade 100 Workstation Technical White Paper*	Technical Brief	Sales Tool	SunWIN	125032
Quick Reference Cards				
– *Sun Workstation™ Product Line Overview*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web	10826
– *Sun Workstation Graphics Products Overview*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web	24507
– *Competitive Summary Workstations*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web	12259
– *Upgrades Paths*	Quick Reference Card	Sales Tool	SunWIN, Reseller Web	24513
Competitive Analysis				
– *Sun Blade 100 Competitive Brief*	Short document about competition	Sales Tool	SunWIN, Reseller Web	129880
– *Sun Blade 100 Workstation Competitive Guide*	White Paper	Sales Tool	SunWIN	129879
Product Collateral				
– *Sun Desktop Family Brochure*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	69376 BE604–3
– *Sun Blade 100 Workstation Data Sheet*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	121322 DE219–0
– *SunPCi IIpro Coprocessor Data Sheet*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	97842

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Presentations				
– *Introducing the Sun Blade 100 Workstation*	Customer Presentation	Sales Tool	SunWIN, Reseller Web	125031
– *Graphics Product Presentation*	Product Presentation, with Slide Notes	Sales Tool	SunWIN, Reseller Web	75254
– *Sun Expert3D–Lite Graphics Customer Presentation*	Customer Presentation	Sales Tool	SunWIN, Reseller Web	130164
External Web Sites				
– *Workstation Home Page*	`http://www.sun.com/desktop/`			
– *Sun™ Store System Purchases*	`http://store.sun.com/`			