Sun™ Blade 1500 & Sun™ Blade 2500 Workstations

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Positioning

The New Sun Blade Workstation Series Product Family

Introducing the second generation to the UltraSPARC IIIi workstation product line : Sun Blade 1500 workstation and Sun Blade 2500 workstation. Both workstations were the first to be based on the UltraSPARC ™ IIIi processor, the highly integrated, performance-scalable, 64-bit compute engine, derived from Sun's flagship UltraSPARC III processor. With the Solaris Operating System preinstalled, both the Sun Blade 1500 and Sun Blade 2500 maintain 100 percent binary compatibility with 12,000 Solaris applications and preserve billions of dollars of customer investments in software.

In addition, the Sun Blade 1500 and Sun Blade 2500 workstations are both equipped with a robust set of workstation-class features:

• Large memory capacity
• High-bandwidth memory controllers
• Expandable high-performance storage options
• Rewritable Optical Drives
• Independent PCI buses with slots dedicated for high-bandwidth devices
• High-performance graphics that support multiple displays and visualization software

Figure 1: Sun Blade 1500 and Sun Blade 2500 workstations

Sun Sun Blade 1500 and Sun Blade 2500 Workstations Comparison

The Sun Blade 1500 workstation is the latest mid-range addition to the Sun Microsystems workstation product family, while the Sun Blade 2500 workstation is the latest high-end addition to the workstation product family. The Sun Blade 1500 workstation enables a seamless migration from Sun Ultra ™ 5, Ultra 10, and Sun Blade 100 workstations to the uniprocessor UltraSPARC IIIi platform. The Sun Blade 2500 workstation enables smooth migration from Sun Ultra 60, Ultra 80, Sun Blade 1000 and Sun Blade 2000 to the multiprocessor UltraSPARC IIIi platform. Both the Sun Blade 1500 and Sun Blade 2500 are built with the latest UltraSPARC IIIi architecture, and include speedbumps, upgraded hard disk drives, and upgraded rewritable optical drives. All applications qualified on Solaris 8 and Solaris 9 will run flawlessly on the Sun Blade 1500 and Sun Blade 2500 workstations.

The key differences between Sun Blade 1500 and Sun Blade 2500 are shown in the following table:

Features, Functions and Benefits

Key Features	Sun Blade 1500 Workstation	Sun Blade 2500 Workstation
Placement	Mid-range 64-bit workstation	High-end 64-bit workstation
CPU	One UltraSPARC IIIi processor	Up to two UltraSPARC IIIi processors
Processor MHZ	1.5 GHz	1.6 GHz
Memory & Capacity	8 GB ECC DDR-1 DIMMs (8 GB requires 2 GB DIMMs) 4 DIMM slots, pairs required	16 GB ECC DDR-1 DIMMs (16GB requires 2 CPUs and 2GB DIMMs) 8 DIMM slots, pairs required
L2 Cache	1 MB (integrated on-die)	1 MB (integrated on die)

PCI Buses
PCI Slots
   64 bit / 66 MHz
   64 bit / 33 MHz
   32-bit / 33 MHz
	2 PCI Buses
	Five slots total, 3 available:
	1 slot
	2 slots
	2 slots
		4 PCI Buses
		Six slots total, 4 available:
		3 slots (One on dedicated PCI Bus)
		3 slots (One on dedicated PCI Bus)
		None

Drive Technology Type	ATA 100	Ultra 320 SCSI
Storage Capacity	Up to two 120 GB internal disk drives	Up to two 146 GB internal disk drives One external VHDCI connector for SCSI HDD
Graphics Support	Sun XVR-100 (3 maximum) Sun XVR-600 (2 maximum) Sun XVR-1200 (1 maximum)	Sun XVR-100 (3 maximum) Sun XVR-600 (3 maximum) Sun XVR-1200 (2 maximum)
Solaris OS Support	Solaris 8 2/04 or later Solaris 9 9/04 or later Software Express 11/04 for Solaris 10	Solaris 8 2/04 or later Solaris 9 9/04 or later Software Express 11/04 for Solaris 10
StarOffice Version	StarOffice 7.0, preinstalled	StarOffice 7.0, preinstalled
OBP Revision	4.16.3 or later	4.16.3 or later
Networking & I/O		
Ethernet	10/100/1000BASE-T	10/100/1000BASE-T
USB 1.1	4 ports (2 in front, 2 in back)	4 ports (on back panel)
USB 2.0	3 ports (in back)	3 ports (on back panel) + 2 internal
IEEE 1394a (FireWire®)	2 ports (in back)	2 ports (on back panel) + 1 internal
Parallel Port	1 port (in back)	1 port (on back panel)
Serial Port	2 ports (in back)	2 ports (on back panel); 1 on back panel, 1 on audio module

Features, Functions and Benefits

Sun Blade 1500 & 2500 Common Features	Functions	Benefits
• Solaris 8 2/04 & Solaris 9 9/04 operating systems preinstalled • Solaris Express 11/04 via download	• A robust OS architecture for multiprocessing and 64-bit UltraSPARC computing • 100% binary compatibility with previous versions of Solaris and 12,000+ Solaris applications • Scalable from Sun Blade workstations to massive SunPlex clusters with hundreds of CPUs	• Reliable, enterprise-class scalable 64-bit platform • Preserves billions of dollars in software investment • Peace of mind knowing the applications developed on Sun Blade will run flawlessly when deployed to the data center
• 1 MB L2 cache on-die	• Stores the most frequently used application data	• On-die cache reduces latencies by up to 4x, improving application performance without requiring more cache
• Combo optical drive	• Multiple drive functionality • Reads from DVD-ROM, DVD-R, DVD-RW, DVD+R, DVD+RW, CD-ROM, CD-R, CD-RW media • Writes to CD-R, CD-RW media	• Allows customers to write and or rewrite to the removable media
• SunPCi™ IIIpro coprocessor card supported	• One workstation runs two operating systems	• Allows customers and OEMs to run PC applications at GHz performance • Saves valuable desk space • Provides three additional USB2.0 ports, one 1394a port, one 10/100/1000BASE-T Ethernet port
• Sun XVR-100 graphics accelerator support	• 2D resolutions up to 1920 x 1200 resolution at 75 Hz with simultaneous 8-bit and 24-bit support	• Provides excellent quality, cost-effective 8-bit and 24-bit 2D graphics solution • Dual-display from a single board
• Sun XVR-600 graphics accelerator support	• Up to 1920x1200 2D/3D@ 75Hz resolution and up to 1280x1024 @112Hz stereo resolution	• Professional quality, cost-effective 3D graphics solution at 2X peak performance of XVR-500
• Sun XVR-1200 graphics accelerator support	• Up to 1920 x 1200 @ 75 Hz 2D/3D resolutions and up to 1280 x 1024 @ 112 Hz 3D stereo resolution	• Provides the highest performance professional-quality 3D graphics capability
• Built-in USB1.1, 2.0, and IEEE 1394a (FireWire) ports	• Provides access to a wide variety of connectivity devices	• Provides ability to use state-of-the-art I/O devices without having to purchase upgrades
• Integrated on-board Gigabit Ethernet (10/100/1000BASE-T)	• Highest-bandwidth networking standard available on the desktop today	• 10X networking performance of Fast Ethernet • Retain a valuable PCI slot

Sun Blade 1500 Specific Features	Functions	Benefits
• 1.5 GHz UltraSPARC IIIi processor	• A highly integrated, low-cost, high-performance 64-bit CPU	• Attractive cost of 64-bit system without sacrificing performance
• Up to 8 GB of DDR-1 DIMMs 133/266 MHz 168-pin Error Correcting	• Industry standard high-performance memory modules • Large datasets and applications stored in RAM instead of on disk	• Provides excellent RAM expandability, beyond typical 32-bit PCs.
• Up to two 120 GB, 7,200 rpm ATA 100 internal hard disk drives	• Large internal storage and expansion capabilities	• Excellent cost-effective expandability
• Five PCI slots	• Provides access to a variety of graphics cards, SCSI expansion cards, and audio/video input cards	• Provides support for a vast selection of both Sun and third-party PCI cards

Sun Blade 2500 Specific Features	Functions	Benefits
• Up to two 1.6GHz UltraSPARC IIIi processors	• Highly integrated, low-cost, high-performance 64-bit CPU	• Allows cost of 64-bit system to be attractive without sacrificing performance
• Up to 16 GB of DDR-1 DIMMs 133/266 MHz 168-pin Error Correcting (Two CPUs required for full memory capacity)	• Enough memory to support demanding applications and datasets	• Provides excellent RAM expandability for the most demanding 64-bit applications
• Up to two 146 GB internal disk drives: 10,000 rpm Ultra SCSI IV 320 3.5-inch hard drives	• Provides large internal storage and expansion	• Excellent expandability for investment protection
• Six 64-bit full-length 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

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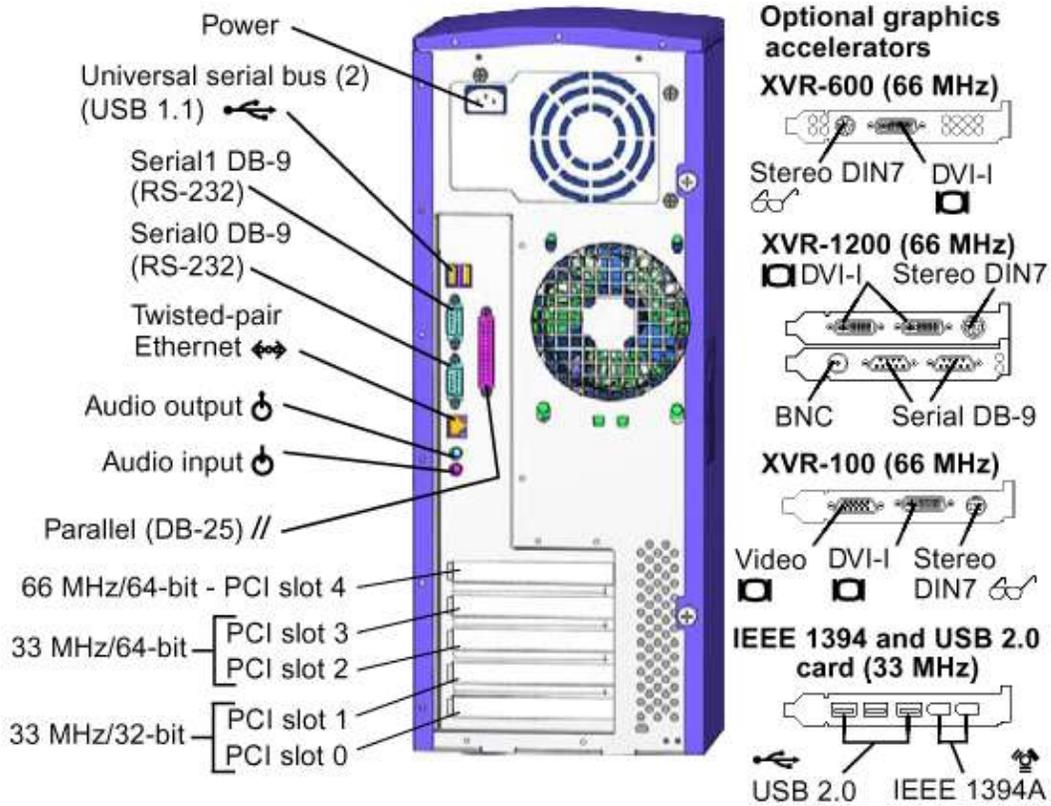
Figure 2.1: Sun Blade 1500 Rear View
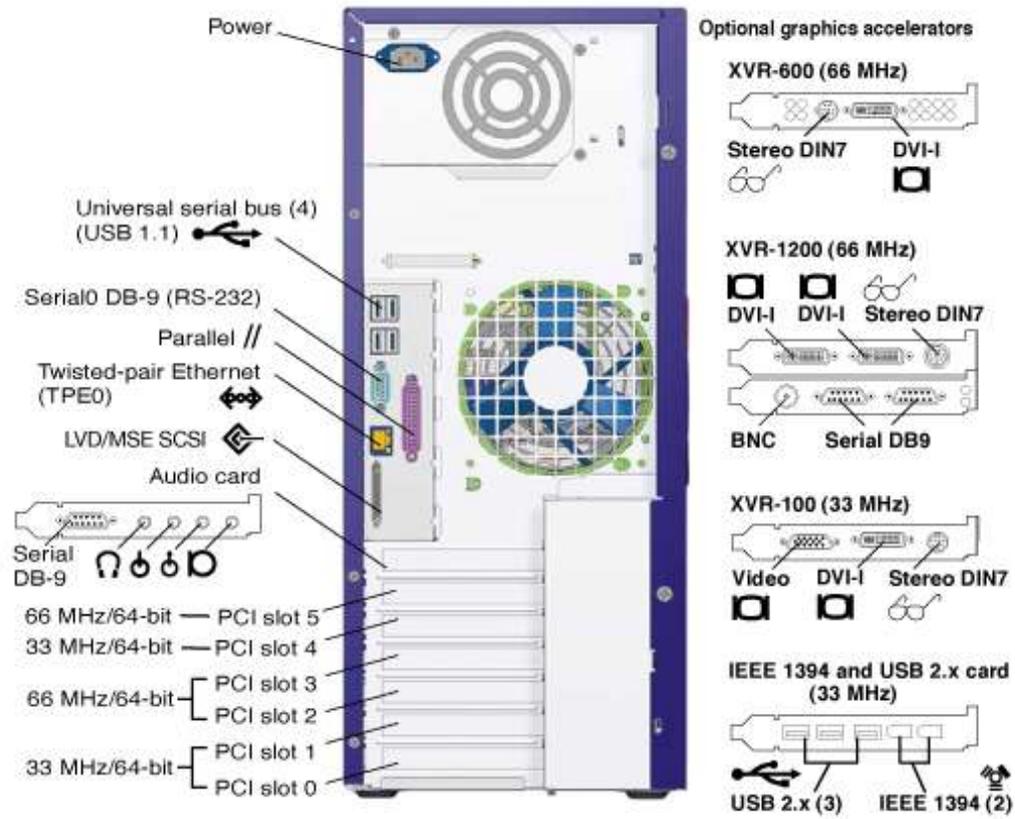
Figure 2.2: Sun Blade 2500 Rear View

Target Users and Markets

Sun Blade 1500 systems are ideal for the following users and markets:

Installed Base:

The Sun Blade 1500 serves as an ideal mid-range workstation as well as a transition and/or upgrade workstation for Sun Microsystem's installed customer base running entry to mid-range workstations. This includes the Sun Ultra 5, and Sun Ultra 10, as well as some of the high-end configurations of the Sun Blade 100 and Sun Blade 150 workstations. This workstation allows current customers to upgrade to a faster, low-cost system while minimizing software application and dataset transition issues.

Software Development:

The Sun Blade 1500 is attractive to software developers who want to minimize software application and dataset transition issues. This includes markets such as consumer electronics, higher education, government, and telco. It is also attractive to customers who require an extremely flexible, low-cost development platform that supports 32-bit and 64-bit environments, multiple operating systems and is 100% binary compatible with Sun Microsystem's entire system product line. When combined with the SunPCi IIIpro coprocessor card, the Sun Blade 1500 workstation allows software developers to simultaneously compile and test code for Microsoft Windows, Red Hat, and Solaris Operating Systems.

Education:

The low-cost yet stable and secure environment of the Sun Blade 1500 makes it appealing to the Education market in nearly all areas, where researchers create and use demanding applications which require the latest development tools, Solaris software, and 64-bit computing capabilities.

System Administration/IT:

The Sun Blade 1500 is appealing to departments that require a low-cost system that offers compatibility with their server and storage management applications, on the Solaris Operating System, to manage their enterprise networks and servers.

Financial Services:

The Sun Blade 1500 is ideal for customers who require low-cost seats for customer call centers and commodity traders who require up to four 2D displays.

Manufacturing:

The Sun Blade 1500 is good fit for the manufacturing market, where it will help design a more attractive, higher performance automobile in less time and at lower cost.

Entry 3D and Mid-range Markets:

Price/performance-sensitive segments of Sun's traditional and emerging technical 3D markets, where a Sun Blade 150 is not powerful enough, would benefit from the Sun Blade 1500. The Sun XVR-600 graphics accelerator provides the performance and capabilities demanded by professionals in many of the technical markets including MCAD/MCAE, geo-technical engineering/GIS, visualization, and health care.

OEMs:

The Sun Blade 1500 workstation is an attractive platform for many of Sun's OEM customers. The Sun Blade 1500 workstation will meet their requirements for a scalable and stable platform. I/O functionality, a critical component for OEM customers, must be compatible with industry-standard I/O peripherals and will be addressed through a transition plan during the Sun Blade 1500 life cycle. Most OEM customers have long-term relationships and familiarity with the architecture of Sun workstations.

The Sun Blade 1500 workstation is expected to provide competitive price/performance to protect the large installed base in the technical workstation market.

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Some of the key drivers in addition to system performance will be the Solaris Operating System and third-generation 64-bit computing architecture of the CPU. It will also provide a great transition for current customers who own Sun Ultra 10, Sun Ultra 60 and Sun Blade 100 workstations.

Sun Blade 2500 systems are ideal for the following users and markets:

Installed Base:

The Sun Blade 2500 serves as a transition and/or upgrade workstation for Sun's installed customer base running high end workstations, including the Sun Ultra 60, and Ultra 80, as well as the Sun Blade 1000 and Sun Blade 2000 workstations. This workstation allows current customers to upgrade to a faster, more expandable system while minimizing software application and dataset transition issues.

Energy:

The new capability of high-end graphics makes the Sun Blade 2500 an optimal solution in the oil and gas industry, where high-end graphics workstations are required for compute-intensive applications such as seismic data visualization and interpretation, terrain visualization, and reservoir engineering. This market is not price-sensitive and is typically controlled by SGI. Activity is dependent on compute-intensive applications and visual quality. The oil and gas industry uses visualization applications such as OpenVision, EarthCube, GeoViz, and VoxelGeo. These market segments are dominated by fully loaded high-end systems with features such as anti-aliasing.

Government:

In the area of defense, simulation is a typically used application where image quality and performance are key requirements, and memory is crucial. With features such as the high-performance UltraSPARC IIIi Processor, memory expandability and high-end graphics, the Sun Blade 2500 is ideal for the defense industry.

Manufacturing:

Electronic Design Automation (EDA):

Customers are price/performance sensitive and require high-performance CPUs (typically measured by SPEC2000 benchmarks), large memory capacity (needed to process large datasets), and fast application performance. The majority of EDA customers are in the semiconductor, motherboard, or PCB manufacturing industries, where large datasets are produced daily. With these datasets growing at exponential rates, the need for 64-bit computing has become more critical. Recent results from the EDA Consortium reveal that the EDA market has increased in growth every year since tracking started in 1994, including through the economic downturn of the last few years.

Mechanical Computer Aided Design (MCAD):

For high-end MCAD applications, typical MCAD customers utilize third-party ISV applications to design various metals or plastics, primarily in the automobile industry, and in other industries such as aerospace and electronics and heavy machinery as well. Although these applications can be used interchangeably, there are clear geo-based preferences. The four major applications used in MCAD are I-DEAS and Unigraphics [from EDS (PLM)], Pro/E, and CATIA. I-DEAS is most prominent in Detroit, in the automobile industry, a first choice among most US companies. Pro/E is the most worldwide of all the applications, and is considered the grandfather of MCAD applications. Unigraphics is not quite as worldwide as Pro/E, and a little less robust, but used in many countries. CATIA is first choice in the European auto industry and used often in military and nuclear reactor type environments. Models in the MCAD market are increasing in size and projects are most often collaborative, so robust systems are a necessity.

MCAE (Mechanical Computer Aided Engineering):

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The aerospace industry makes up the largest percentage of MCAE customers, with the automobile industry making up a small percentage. Finite Element Analysis is the core technology behind MCAE, and it is broken up into three distinct codes: crash code, structures code, and computational fluid dynamics code (CFD). Crash code, as it sounds, is defined as impact or crash. LS-Dyna and PAM Crash are popular applications in crash code. Structures code is defined as stress, such as noise, vibration, and harshness (NVH). Several well-known structures applications are Nastran, Ansys, and Abaqus. CFD is defined as aerodynamics, such as the external airflow over a car. Some widely used CFD applications are STAR-CD and Fluent. A few specialty codes exist, such as injection molding and acoustics. Depending on the code, engineering designs for some products require large amounts of memory, multi-threading, scalability, and I/O bandwidth.

Education:

The discovery research sector of life sciences is unregulated (not under control of the FDA) and presents opportunity for the high-end workstation in scientific research and life sciences, including bioinformatics (genomics and post-genomics), biosimulation, and bioengineering. Large data sets are typical of this market, with some applications being multithreaded, hence the need for extreme CPU power, and others are parallel. Some of the most common applications and uses, from our biggest ISVs are: DecisionSite allows users to access and merge data from a variety of sources, and dynamically interact with this data; Resolver technologies genomic research and data analysis focuses on how medical compounds affect biology, enabling more accurate selection of drug targets and more efficient drug development; VIBE highly sophisticated client/server system offers the bioinformatics researcher an unprecedented total and integrated solution to data mining and informatics discovery; GenePort offers users a secure, worldwide, portal-based interface to view genomic data in a concise, integrated manner.

Financial Modeling/Economics/Simulations:

This market consists mainly of economists, investment bankers, and analysts, where systems are used for analysis of economic trends and to calculate large and complex financial solutions, and also for market research analysis.

OEMs:

The Sun Blade 2500 workstation is critical for many of our OEM customers. The Sun Blade 2500 will meet their requirements for a scalable and stable platform. I/O functionality, a critical component for OEM customers, must be compatible with industry-standard I/O peripherals and will be addressed through a transition plan during the Sun Blade 2500 life cycle. Most of these OEM customers have long-term relationships and familiarity with the architecture of Sun workstations.

The Sun Blade 2500 will enable Sun to defend its number one position in the $5K - $10K market space. Although it will have competitive pressure in the low-end market space, the Sun Blade 2500 is expected to provide competitive price/performance to protect the large installed base in this market space. Some of the key drivers in addition to system performance will be the Solaris operating system and third-generation 64-bit computing architecture of the CPU. It will also provide a cost-competitive complement to Sun Blade 150 and Sun Blade 1500 in the upper end of their markets as the Sun Blade 2500 provides more expansion capability. The Sun Blade 2500 also allows Sun to target HP and SGI in the higher margin space.

Compatibility

Sun Microsystems ships Sun Blade 1500 and Sun Blade 2500 workstations with the robust 64-bit Solaris 8 2/04 & Solaris 9 9/04 operating systems preinstalled. Solaris Express 11/04 for Solaris 10 is available via download. The latest versions of the Solaris Operating System is 100% binary-compatible with previous versions — applications compiled on other versions run without the complexity of recompiling. 32-bit

applications run ideally on the Sun Blade 1500 and Sun Blade 2500 workstations.

The new Sun Blade workstations only boot using the 64-bit kernel. In addition, customers with 32-bit-only drivers must migrate to 64-bit drivers to use these workstations.

Market Value Propositions

Sun Blade 1500 Value Proposition

Simple Migration

The Sun Blade 1500 offers users of technical workstations from any vendor the perfect upgrade platform for the majority of their traditional workstation needs. Sun's commitment to these traditional workstation customers not only gives users of Sun Ultra 5, Sun Ultra 10, Sun Ultra 60, and Sun Ultra 80 a fantastic step forward, but also provides a simple migration path for traditional workstation customers of HP, IBM and SGI who are now faced with their vendors OS, CPU, and architecture transition challenges.

Seamless Transition

Transitioning to the Sun Blade 1500 is seamless. Through maintained binary compatibility with the existing operating system and hardware, the Sun Blade 1500 workstation provides the customer investment protection of Sun software, hardware, and knowledge base.

Solaris Operating Environment

Solaris is the most scalable, most secure, and most available operating system in the traditional workstation market and supports the largest number of technical applications in this class. With Solaris, the Sun Blade 1500 provides fast performance, near continual up-time, and the security and reliability required from a mission critical desktop.

Price Performance

The Sun Blade 1500 workstation has the highest performance and the lowest price among 64-bit workstations in the traditional workstation market, and Sun has the lowest overall 3 year hardware and software costs, including support, in the 64-bit UNIX workstation market (according to D.H. Brown).This price/performance benefit increases productivity by reducing manufacturing errors and eliminating cycles in design, at lower overall cost.

Sun Blade 2500 Value Proposition

Seamless Transition

Transitioning to the Sun Blade 2500 is seamless. Through maintained binary compatibility with the existing operating system and hardware, the Sun Blade 2500 workstation provides the customer investment protection of Sun software, hardware, and knowledge base.

Solaris Operating System

Solaris is the most scalable, most secure, and most available operating system in the traditional workstation market and supports the largest number of technical applications in this class. With Solaris, the Sun Blade 2500 provides fast performance, near continual up-time, and the security and reliability required from a mission-critical desktop.

Sun Workstation Technology

The Sun Blade 2500 workstation delivers a proven tool to visually analyze the largest and most critical datasets, because it is based on a robust 64-bit platform, has visualization-class graphics, and a very large memory footprint not found on a PC workstation.

Availability

The Sun Blade 1500 workstation reached Revenue Release on December 16, 2004, Presto announcement on January 11, 2005, and General Availability on February 1, 2005.

The Sun Blade 2500 workstation reached Revenue Release on December 22, 2004, Presto announcement on February 1, 2005, and General Availability on February 1, 2005.

UltraSPARC™IIIi Processor

The Sun Blade 1500 and Sun Blade 2500 workstations are based on the UltraSPARC IIIi microprocessor. This processor utilizes the latest 0.13-micron fabrication technology, which is the key to the UltraSPARC IIIi processor's higher clock rates and increased performance. This low-voltage solution provides relief from two major design issues in high-performance systems. Reduced power consumption allows the chip to operate at higher frequencies without increasing total power requirements or heat dissipation.

The UltraSPARC IIIi processor supports both 2D and 3D graphics as well as image processing, video compression and decompression, and video effects through the sophisticated visual instruction set.

VIS™ software 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 IIIi 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, while optimizing power utilization and supporting manufacturability and ease of use.

Features	Benefits
Integrated VIS instruction set	Ready for increased performance on multimedia and networking operations
Uses the latest 0.13-micron process technology which greatly decreases the die size	Results in a significant increase in performance and a decrease in power consumption

I/O Interfaces

The Sun Blade 1500 and Sun Blade 2500 workstations include two advanced I/O interfaces to greatly increase customer access to a vast array of cost-effective peripherals.

- **USB 1.1/2.0**

  USB support is provided for low-mid speed I/O devices. Devices such as the Sun USB keyboard and Sun USB mouse are supported. USB storage devices are also supported. Both workstations have 4 USB 1.1 connectors and 3 USB 2.0 connectors.

- **IEEE 1394a interface**

  IEEE 1394a, also known in the industry as FireWire — has emerged as a standard for medium-speed devices such as digital cameras and digital video cameras. IEEE 1394 interfaces provide an isochronous service through mini latency while delivering a 400-Mbps bandwidth for transferring large images and other multimedia data. The Sun Blade 1500 and Sun Blade 2500 workstations each have two IEEE 1394a (6-pin) connectors on the rear panel.

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System Architecture

The Sun Blade 1500 and Sun Blade 2500 workstations have been architected for high-performance, scalability, and flexibility at a cost-effective price. The unique blend of commodity devices and Sun-architected ASICs has resulted in a workstation with a lower part count and higher reliability. Without compromising the performance, scalability, and robustness of Sun's legendary workstation heritage, Sun has designed the Sun Blade 1500 and Sun Blade 2500 to be more cost-effective than previous workstations.

Both workstations are based on the industry-standard ATX motherboard form factor.

Figure 3.1: Sun Blade 1500 Workstation System Block Diagram
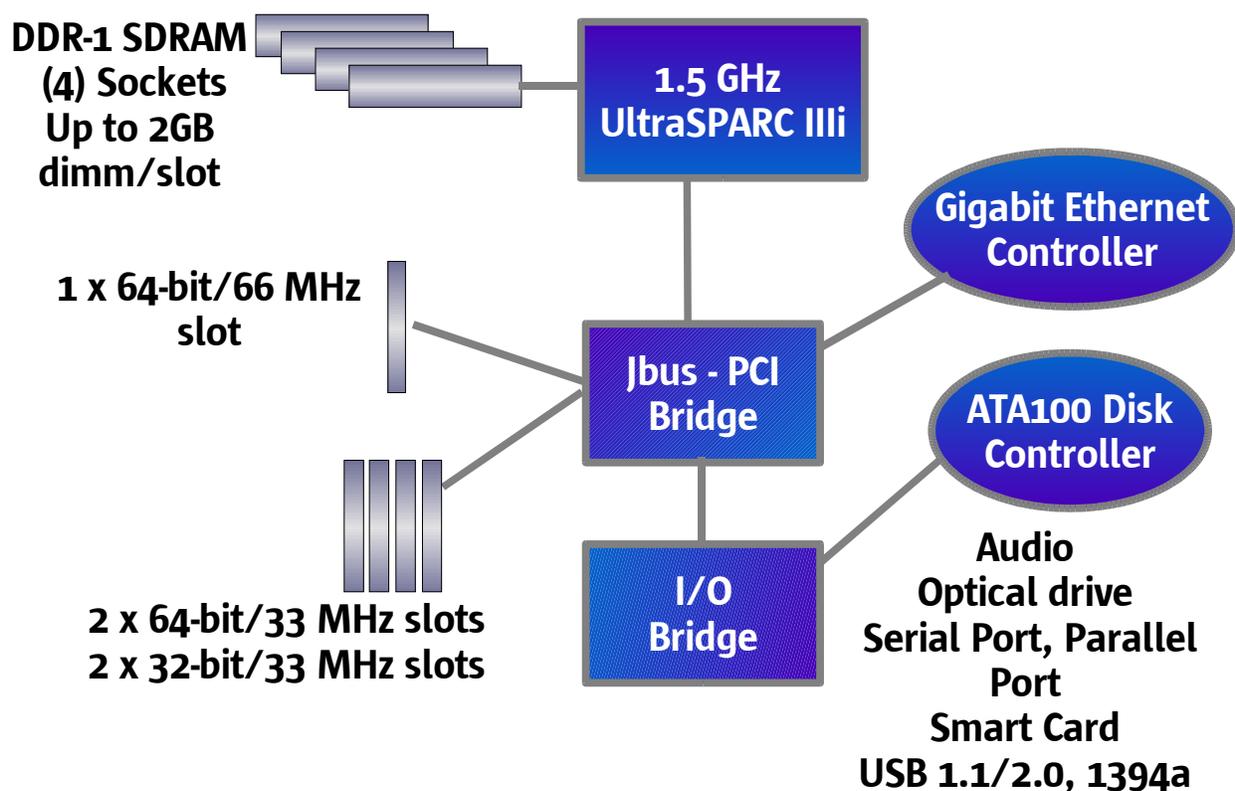
The Sun Blade 1500 workstation supports the following key features:

- 1.5 GHz UltraSPARC IIIi processor with integrated 1 MB L2 cache

- Four DIMM sockets, 168-pin JEDEC DDR-266 DRAM with error correction

- Five full-length PCI slots; 2x32-bit @ 33 MHz, 2x32/64-bit @ 33 MHz, 1x32/64-bit@33 or 66 MHz,

- 10/100/1000BASE-T Gigabit Ethernet, self-sensing

- Two ATA100 channels/connectors for hard disk drive and/or optical drive

- Two D-sub 9-pin, asynchronous RS-232 serial ports

- One Centronics-compatible, IEEE-1287, DB25 parallel-port interface
- Two IEEE 1394 a (FireWire) ports
- Four USB1.1-compliant ports
- Three USB 2.0-compliant ports

Figure 3.2: Side and Front Views of the Sun Blade 1500, Showing Connectors

Figure 4.1: Sun Blade 2500 Workstation System Block Diagram

*** Memory DIMMs are tied to CPU Architecture ***
** Two CPUs are required for full memory capacity.**

DDR-1 SDRAM Sockets (4)

DDR-1 SDRAM Sockets(4)

CPU 1

CPU 2

J BUS

Ultra 3 SCSI 160 Controller

1 PCI Slot 64-bit, 66 MHz

2 PCI Slots 64-bit, 66 MHz

I/O Bridge

2 PCI Slots 64-bit, 33 MHz

PCI-Based Gigabit Ethernet Controller

1 PCI Slot 64-bit, 33 MHz

Southbridge

Audio Optical Drive Serial Port, Parallel Port Smart Card USB 1.1/2.0, 1394a
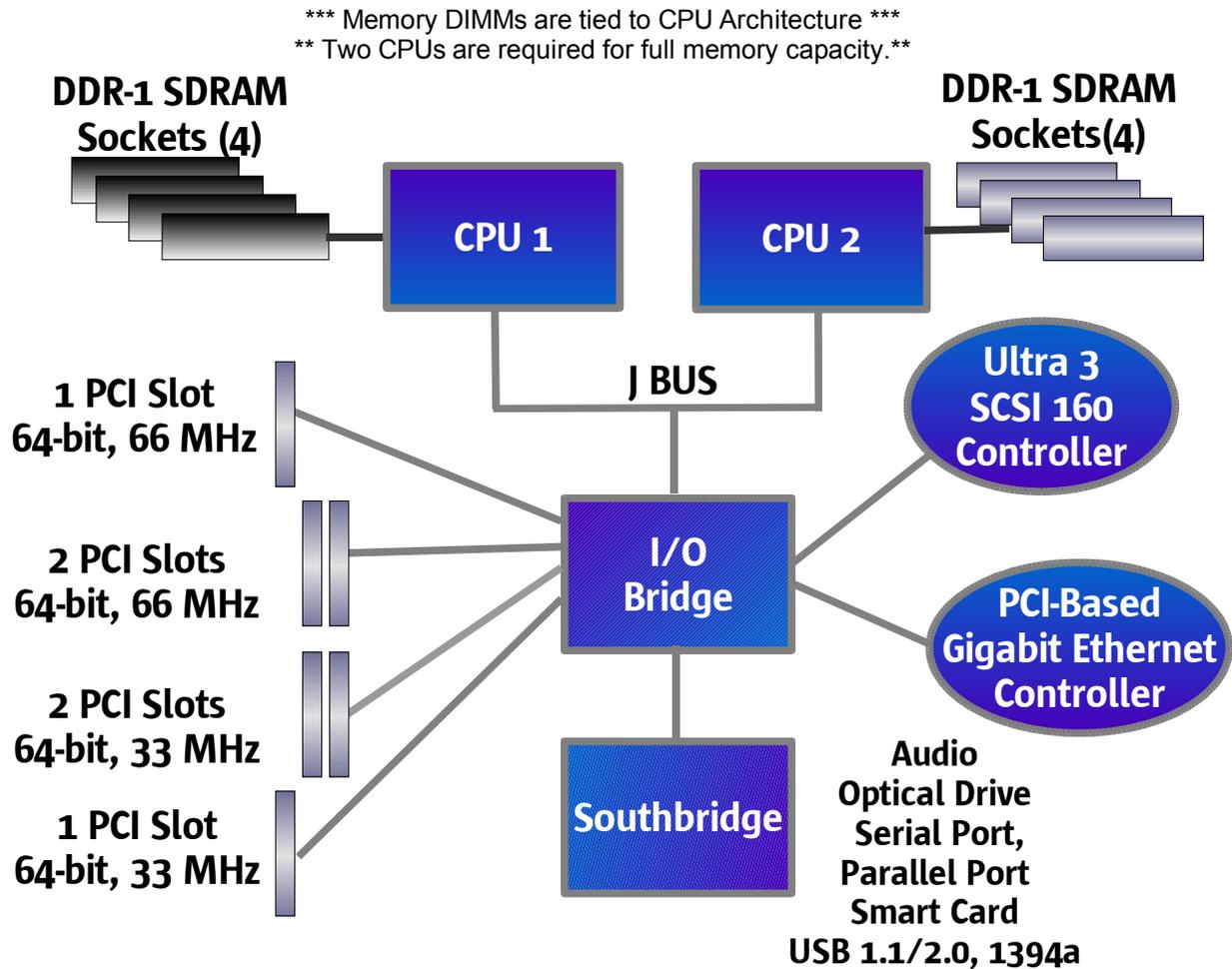
The Sun Blade 2500 workstation supports the following key features:

- Up to two 1.6 GHz UltraSPARC IIIi processors with integrated 1 MB L2 cache
- PCI-bus support for graphics accelerators
- Eight DIMM sockets, 168-pin JEDEC DDR-266 - DRAM with error correction
  - 4 DIMM slots per CPU. Two CPUs required for full memory capacity
- Six full-length , 64-bit PCI slots (3 x 33 MHz and 3 x 66 MHz)
- 10BASE-T/100BASE-T/1000BASE-T Gigabit Ethernet, self-sensing
- Two channels of Ultra 320 SCSI, for up to two high-performance hard disk drives
- Two connectors for Optical drive
- One VHDCI connector for external SCSI devices, one internal SCSI connector
- Two DB-9-pin, asynchronous serial ports (one is on audio card)
- One Centronics-compatible, IEEE-1284, DB25 parallel-port interface
- Four USB1.1-compliant ports

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- Three external USB 2.0-compliant ports, two internal ports
- Two external IEEE 1394a (FireWire) ports, one internal port

Figure 4.2: Side and Front Views of the Sun Blade 2500, Showing Connectors

Memory

The Sun Blade 1500 and Sun Blade 2500 workstations use DDR-1, 133/266MHz Registered ECC DIMMs. The DIMMs sold with the workstations in factory configurations and as X-options have gone through extensive testing and qualification before their manufacturers were added to Sun's approved vendor list. Note that not all vendors perform equally, and some third-party memory vendors do not provide the reliability and quality Sun customers expect. Sun recommends that customers use only Sun-qualified memory for maximum reliability.

The Sun Blade 1500 workstation delivers a memory bandwidth of up to 4 GBps. The Sun Blade 1500 supports up to 8 GB of memory through 512 MB, 1 GB and 2 GB DIMMs.

The Sun Blade 2500 workstation delivers a staggering memory bandwidth of up to 8.4 GBps. The Sun Blade 2500 supports up 16 GB of memory through 512 MB, 1 GB and 2 GB DIMM modules. **Two CPUs are required for full memory capacity because the memory is tied to the CPU architecture.**

All DIMMs must be installed in pairs.

Features	Benefits
JEDEC-standard DDR DIMMs	Cost-effective, high-performance, industry-standard memory
Registered ECC memory	More reliable system due to outstanding error detection and correction
64-bit architecture	Terabyte-class memory address range for the largest datasets
High memory bandwidth	Higher data through the system performance

Storage

One major area of difference between the Sun Blade 1500 and the Sun Blade 2500 is internal storage.

The Sun Blade 1500 workstation supports up to two internal high-capacity 120 GB,
3.5-inch enhanced ATA100 hard drives running at 7,200 rpm.

• The first 120 GB disk drive is standard.

• A second 120 GB, 7,200 rpm disk drive can be installed optionally.

Although the Sun Blade 1500 workstation uses ATA100 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 1500 are shown in the table below.

The Sun Blade 2500 workstation supports two high-capacity internal, 146 GB, 3.5-inch Ultra 320 SCSI hard drives running at 10,000 rpm.

• The first 146GB disk drive is standard.

• A second 146 GB, 10,000 rpm disk drive can be installed optionally.

The Sun Blade 2500 uses SCSI drives. Users can employ one of the following host adapter PCI cards:

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 installation of these cards, users have the option of one of several Sun StorEdge™ products. Please see the Options section of this document.

System I/O

The Sun Blade 1500 and Sun Blade 2500 workstations support the industry-standard Peripheral Component Interconnect (PCI) data bus. The PCI bus in the Sun Blade workstations complies with the 2.1 revision of the PCI specification, released in March, 1995.

To provide maximum expandability, the Sun Blade 1500 workstation features a total of five PCI slots, and the Sun Blade 2500 features at total of 6 PCI slots. All slots on both workstations are 5 v (with 3.3 v power supplied). Standard configurations of both workstations are shipped with a 1394a/USB 2.0 combination card preinstalled in one of the slots. Customers who have no need for the 1394a/USB 2.0 combination card can remove it for access to that slot. Standard configurations also come with one graphics card pre-installed in one of the slots. As with the combination card, customers who do not need the graphics card can remove it for access to that slot. See the following table for more details on the PCI slots in each workstation.

Sun Blade 1500	Sun Blade 2500
5 PCI slots total, 3 available:	6 full-length PCI slots total, 4 available:
• Two 32-bit slots at 33 MHz	• Three 64-bit slots at 33 MHz
• Two 32-bit or 64-bit slots at 33 MHz	• Three 64-bit slots at 66 MHz
• One 32-bit or 64-bit slots at 66 MHz	

Sun supports a variety of PCI-based adapter cards, including Ethernet, networking, 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 line of Sun Blade 1500 and SunBlade 2500 workstations.

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USB Interface

The Sun Blade 1500 and Sun Blade 2500 workstations provide four USB 1.1 ports and three USB 2.0 ports for interface with a variety of devices. USB devices supported by the Solaris 8 2/04 or later and Solaris 9 9/04 or later Operating Systems include:

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

- USB 1.1 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
Iomega USB 40MB PC Card Doc	
Iomega USB Zip CD, CDRW	
Addonics USB Pocket CDRW	
Addonics USB Pocket DVD	
Addonics USB ExDrive Hard Drive	
Castlewood ORB 2.2-GB external USB drive	2.2-GB ORB disks
Hagiwara Sys-Com FlashGate (SmartMedia Reader/Writer USB version, Type I only	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)
Hagiwara Sys-Com FlashGate Dual (SmartMedia+PCMCIA R/W)	
Hagiwara Sys-Com FlashGate USB CompactFlash R/W	
Hagiwara Sys-Com FlashGate USB SD Card/MMC R/W	
Plextor Plexwriter PX-W8432Ti CD-RW	
Plextor Plexwriter PX-W12432Ti CD-RW	
Plextor Plexwriter PX-W12432Te CD-RW	
Plextor Plexwriter PX-W8220Ti CD-RW	
Plextor Plexwriter PX-W8220Te CD-RW	
Plextor Plexwriter PX-W161040a CD-RW	
Plextor Plexwriter PX-W121032s CD-RW	
SCM Microsystems SCSI to USB Converter	
SCM Microsystems SwapBox PCMCIA	
Sony Spressa CRX140 e/ch	
Sony Spressa CRX140 s/c [EOL'ed}	

- Four-port and seven-port expansion USB 1.1 hubs (either bus or self-powered) are supported. At product introduction, USB 2.0 hubs will support all USB speeds.

- Selected 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

Supported Graphics

Sun™ XVR-100 Graphics Accelerator

The Sun XVR-100 graphics accelerator provides Sun customers with a very low-cost, flexible 8+24-bit, 2D graphics board. Sun Blade 1500 and Sun Blade 2500 each support up to three Sun XVR-100 Graphics Accelerators.

The Sun XVR-100 provides the following features:

• Up to 1920 x 1200 at 75 Hz 2D resolutions

• Support for all Sun displays released since 1997, including support for Sun's new 24-inch Flat Panel Display

• 64 MB DDR SDRAM

• HD15 and DVI-I video connectors

• Dual display capability with up to 1280 x 1024 resolution for each display

• Solaris 8 and Solaris 9 support

• FBPM support

• 33 MHz, 32-bit, 5-volt PCI card, short form factor (< 7-inch length)

• Low power consumption (< 6 watts)

• Compatible with OpenWindows™ environment and CDE windowing, and supports the following APIs: X11, Motif, JDK and OpenGL via a software pipeline.

• Backward compatibility with Sun's PGX64™ Graphics Accelerator

• 8+24 bit simultaneous color

Sun XVR-100 Display Resolution Specifications

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio	Color Depth
1920 x 1200	70, 75 Hz	Sun	16:10	24-bit
1920x1080	72 Hz	Sun	16:9	24-bit
1600 x 1280	76 Hz	Sun	5:4	24-bit
1600 x 1200	65, 70, 75, 85 Hz	VESA	4:3	24-bit
1600 x 1000	66, 76Hz	Sun	16:10	24-bit
1440 x 900	76 Hz	Sun	16:10	24-bit
1280 x 1024	60, 75, 85 Hz	VESA	16:10	24-bit
1280 x 1024	67, 76Hz	Sun	5:4	24-bit
1280 x 800	76 Hz	Sun	5:4	24-bit
1152 x 900	66, 76Hz	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

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio	Color Depth
800 x 600	56, 60, 72, 75 Hz	VESA	4:3	24-bit
720 x 480	85 Hz	VESA	9:5	24-bit
640 x 480	60, 72, 75 Hz	VESA	4:3	24-bit

Note: DVI-I port only supports resolutions up to 1280x1024

Video Display Ports

The Sun XVR-100 graphics accelerator HD15 video port only supports analog resolutions. The DVI video port supports both analog and digital resolutions. The DVI video port supports DVI analog (DVI-A) and DVI digital (DVI-D) resolutions. Although the DVI port supports both analog and digital resolutions, they cannot be used simultaneously from the same individual DVI port.

The DVI port must be used in digital mode (60Hz reduced blanking).

Technical Support

For assistance and other information not found in this document concerning the Sun XVR-100 graphics accelerator, see Support Services at:

http://www.sun.com/service/online/

For the most up-to-date version of the installation guide, go to:

http://www.sun.com/products-n-solutions/hardware/docs/Workstation_Products/Graphics_and_Media_Accelerators/XVR-100/index.html

Sun XVR-100 graphics supports 64-bit/66 MHz, 64-bit/33 MHz, or 32-bit/33-MHz PCI slots in all PCI-based Sun workstations, as indicated in the following table.

Workstation	Standard Configuration	X-option	ATO	Maximum Number of Boards per System	Slot Config
Sun Blade 1500	Yes	Yes	Yes	Three (3)	66 MHz slot
Sun Blade 2500	Yes	Yes	Yes	Three (3)	66 MHz slot

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Sun XVR-600 Graphics Accelerator

The Sun(tm)XVR-600 graphics accelerator is an affordable, entry 3D graphics product and is a new addition to the Sun XVR graphics family. The XVR-600 graphics accelerator is based on a single-pipeline version of the 3Dlabs Wildcat III architecture.. XVR-600 graphics accelerator offers 2D/3D geometry acceleration, hardware texture mapping, and high-resolution 24-bit support from a single-slot PCI form factor. In addition, the Sun XVR-600 graphics accelerator offers higher performance, more frame buffer and texture memory, higher resolution support, and DVI-I video output.

Sun XVR-600 graphics accelerator board is offered in the Sun Blade 1500 and SunBlade 2500 standard configurations, as well as through ATO and X-option. The rich feature set makes this a good choice for customers wanting both flexibility and performance at affordable cost.

Key Features

The Sun XVR-600 is a 64-bit/32-bit board and in the Sun Blade 1500 and Sun Blade 2500 workstations is supported only in the 66-MHz PCI bus slots.

 It provides many advanced features including the following:

- 2X geometry performance and 2.5 X texture fill rate performance of the XVR-500 graphics

  - Geometry: 17 M Tri/sec (Peak)

  - Texture Fill Rate: 200 M Pix/sec (Peak)

    - Single slot, 64-bit , 33/66-MHz PCI

    - 64-MB frame buffer memory

    - 32-MB dedicated texture memory

    - 32-MB display list memory

    - 2048 x 1536 @ 40Hz, 2D/3D resolution

    - 1280x1024 @112Hz stereo resolution

    - DVI-I and Stereo connectors

    - Display power management signaling to enable power-saving mode in support of Energy Star requirements

    - 8+24-bit simultaneous color support

Display Resolutions

The Sun XVR-600 graphics accelerator's video timings/monitor screen resolutions are listed below:

Sun XVR-600 Display Resolution Specifications			
Display Resolution	*Vertical Refresh Rate*	*Sync Standard*	*Aspect Ratio*
2048 x 1536	*40 Hz*	*Sun*	*4:3*
1920 x 1200	*60, 70, 75 Hz*	*Sun*	*16:10*
1920 x 1200	*60_240T Hz*	*Sun*	*16:10*
1920 x 1080	*72 Hz*	*Sun*	*16:9*
1792 x 1344	*75 Hz*	*VESA*	*4:3*
1600 x 1280	*76 Hz*	*Sun*	*5:4*
1600 x 1200	*65, 75 Hz*	*VESA*	*4:3*
1600 x 1000	*66, 76 Hz*	*Sun*	*16:10*
1440 x 900	*76 Hz*	*Sun*	*16:10*
1280 x 1024	*60, 75, 85 Hz*	*VESA*	*5:4*
1280 x 1024	*67, 76 Hz*	*Sun*	*5:4*
1280 x 1024	*112 Hz*	*Sun-stereo*	*5:4*
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	*66, 76 Hz*	*Sun*	*5:4*
1152 x 900	*120 Hz*	*Sun-stereo*	*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*	*7:5*
800 x 600	*75 Hz*	*VESA*	*4:3*
640 x 480	*60 Hz*	*VESA*	*4:3*

Sun XVR-600 graphics supports as indicated in the following table.

Workstation	Standard Configuration	X-option	ATO	Maximum Number of Boards per System	Slot Config
Sun Blade 1500	Yes	Yes	Yes	2	64-bit 66Mhz slot
Sun Blade 2500	Yes	Yes	Yes	3	64-bit 66 MHz slot

Sun XVR-1200 Graphics Accelerator
(Now supported on Sun Blade 1500 & Sun Blade 2500!)

The Sun XVR-1200 is the newest member of Sun's graphics family. The XVR-1200 has 1.5 times the geometry performance and over 4 times the texture-mapping performance of the Sun XVR-1000. The XVR-1200 graphics accelerator is the highest performing graphics solution for demanding 3D graphics applications from Sun. It provides Sun's fastest geometry performance and texture mapping performance. Key markets for the Sun XVR-1200 graphics accelerator are MCAD, MCAE, high-end EDA, GIS, energy markets and workstation-based visual simulation.

Sun XVR-1200 graphics accelerator board is offered in the Sun Blade 2500 standard configuration, as well as through ATO and X-option. It is also offered on the Sun Blade 1500, only as X-option or in ATO configurations. The rich feature set makes this a good choice for customers wanting both flexibility and performance. The XVR-1200 is one of the best performing professional-level, high-performance 3D graphics frame buffers available in the marketplace today. The XVR-1200 has over 416 Mbytes of memory to insure excellent performance, resolution support, and image quality. It combines excellent graphics image quality with high-performance 3D acceleration and the flexibility required by many professionals in Sun's technical markets.

Key Features

The Sun XVR-1200 is a 64-bit/32-bit board and in the SunBlade 2500 is supported only in the 66-MHz PCI bus slots. It is a Universal double-wide PCI (single PCI slot electrical, double PCI slot width physical).

It provides many advanced features including the following:

- 128 MB frame buffer memory
- 256 MB on-board texture mapping memory and acceleration
- 32 MB on board display list memory
- Support for resolutions up to 1920 x 1200 @ 75 Hz, at 32 -bit color
- Dual DVI-I video output
- Support for single video (default) or two independent video streams
- 10-bit gamma correction
- Stereoscopic viewing support (frame sequential)
- Framelocking of the video timing to an external timing source
- Multiview functionality for framelocking of multiple workstations
- Stereo output – stereo connector
- Multisampling support

Hardware acceleration for the features listed above in OpenGL applications using Sun OpenGL for Solaris API versions 1.2.3 or 1.3 and subsequent compatible Sun OpenGL versions.

Display Resolutions

The Sun XVR-1200 graphics accelerator's video timings/monitor screen resolutions are listed below:

Sun XVR-1200 Graphics Accelerator Screen Resolutions

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Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format	Maximum Number of spp Single Screen	Maximum Number of spp Dual Screen
2048 x 1536	40 Hz	Sun	16:10	1	1
1920 x 1200	60, 70, 75 Hz	Sun	16:10	1	1
1920 x 1200	60 Hz	Sun	16:10	1	1
1920 x 1080	72 Hz	Sun	16:9	2	1
1792 x 1344	75 Hz	VESA	4:3	1	1
1600 x 1280	76 Hz	Sun	5:4	1	1
1600 x 1200	60, 75 Hz	VESA	4:3	2	1
1600 x 1000	66, 76 Hz	Sun	16:10	2	1
1440 x 900	76 Hz	Sun	16:10	1	1
1280 x 1024	60, 75, 85 Hz	VESA	5:4	4	1
1280 x 1024	67, 76 Hz	Sun	5:4	4	1
1280 x 1024	112 Hz	Sun-stereo	5:4	2	1
1280 x 800	112 Hz	Sun-stereo	16:10	2	1
1280 x 800	76 Hz	Sun	16:10	4	1
1152 x 900	66, 76 Hz	Sun	5:4	4	2
1152 x 900	120 Hz	Sun-stereo	5:4	2	1
1024 x 800	84 Hz	Sun	5:4	4	2
1024 x 768	75 Hz	VESA	4:3	4	2
1024 x 768	60, 70, 77 Hz	Sun	4:3	4	2
960 x 680	108, 112 Hz	Sun-stereo	Sun-Stereo	4	2
800 600	75	VESA	4:3	8	4
640 x 480	60 Hz	VESA	4:3	16	8

Sun XVR-1200 graphics supports as indicated in the following table.

Workstation	Standard Configuration	X-option	ATO	Maximum Number of Boards per System	Slot Config
Sun Blade 1500	No	Yes	Yes	One (1)	64-bit 66 Mhz slot
Sun Blade 2500	Yes	Yes	Yes	Two (2)	64-bit 66 MHz slot

SunPCi IIIpro Coprocessor Card

The SunPCi IIIpro card is a cost-effective hardware and software product that allows customers to simultaneously share data, peripherals, and network connections between Microsoft Windows, Red Hat

and Solaris operating environment systems. The SunPCi IIIpro card allows popular PC productivity applications to run on Sun systems side by side with Solaris operating system applications at native speeds, saving valuable desk space and helping to improve personal productivity. Best of all, the SunPCi III card leverages Sun's biggest strength: reliable and robust network computing.

The SunPCi IIIpro card integrates a virtual PC system into the Sun Blade 1500 or Sun Blade 2500 workstation along with software to run Microsoft Windows 2000 (Professional and Server), Windows 2003 Server, Windows XP, (Microsoft Windows licenses are sold separately), and Red Hat 9 Personal/Professional and Enterprise Linux 3 WS/ES. Unlike software emulators such as Wabi™ and Insignia's SoftWindows, the SunPCi IIIpro card uses a 1.6GHz AMD Athlon XP Mobile processor (Model 2100+). Applications run natively and at Athlon-class speeds on the SunPCi IIIpro card.

The main card fits into a single PCI slot. Three full-size 32-bit or 64-bit PCI slots are required for full installation (Sun PCI IIIpro card, Daughter card/Firewire USB2, Parallel/Serial port). If installed, the serial/parallel port second PCI backplane (included with the SunPCi IIIpro card) obstructs access to the adjacent PCI slot. Up to two SunPCi IIIpro Coprocessor cards are supported on Sun Blade workstations.

Sun Blade 1500 & Sun Blade 2500 Workstation System Configurations

Feature	Sun Blade 1500 Specifications	Sun Blade 2500 Specifications
Dimensions		
Height	459.9 mm (18.1 inches)	483 mm (19.0 inches)
Width	175 mm (6.9 inches)	210 mm (8.3 inches)
Depth	465.1 mm (18.3 inches)	490 mm (19.3 inches)
Weight	14.8 kg (33 pounds)	22.5 kg (49.6 pounds) fully configured
CPU		
Architecture	UltraSPARC IIIi	
Clock rate	1.5 GHz	1.6 GHz
External cache	1 MB	
SPECint_2000	796	845
SPECfp_2000	1272	1353
Memory		
Memory type	Registered ECC	
Number of slots	Four	Eight
Capacity	8 GB max	16 GB max (2 CPUs required)
DRAM speed	PC2100 (DDR-1, 266 MHz)	
DIMM sizes	512 MB, 1 GB and 2GB (DIMMs must be in pairs only)	512 MB, 1 GB and 2 GB (DIMMs must be in pairs only)
Storage		

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Feature	Sun Blade 1500 Specifications	Sun Blade 2500 Specifications
Maximum internal	Two 120 GB 7,200 rpm Ultra ATA-100 hard disk drives	Two 146 GB 10,000 rpm Ultra 320 SCSI HDD
Graphics		
Sun XVR-100 2D graphics accelerator	Accelerated text, windowing, 2D and 3D wireframe 1920 x 1200 resolution Support for Sun color monitors up to 24-inch (in 8-bit mode)	
Sun XVR-600 3D graphics accelerator	3D imaging; hardware-accelerated texture mapping Up to 1920x1200 2D/3D@ 75Hz resolution and up to 1280x1024 @112Hz stereo resolution	
Sun XVR-1200 3D graphics accelerator	High-end 3D imaging; hardware-accelerated geometry & texture mapping 1920 x 1200 max. 2D and 3D resolution 1280 x 1024 max. stereo resolution	
I/O Interfaces		
PCI I/O bus	Five PCI slots: all 5 v (3.3 v power supplied) Two 32-bit slots at 33 MHz Two 32-bit/64-bit slots at 33 MHz One 32-bit/64-bit slot at 66 MHz	Six full length PCI slots: all 5 v (3.3 v power supplied) Three 64-bit slots at 33 MHz Three 64-bit slots at 66 MHz
Serial port	Two RS-232C/RS-423 (DB9-M) ports	
Parallel port	One D-Sub 25-pin, IEEE 1284 bidirectional	
Smart card	Fully supported by Solaris 8 HW 2/04 or later and Solaris 9 9/04 or later operating environments	
Audio	Four audio ports: line in, line-out, headphone, microphone	Four audio ports: line in, line-out, headphone, microphone, serial port
USB	Four USB 1.1 compliant Three USB 2.0 compliant, plus two internal ports	
IEEE 1394a	Two external ports, one 1394a internal port	
Networking Ports	10/100/1000BASE-T Ethernet, self-sensing, twisted pair	
Security	Smart card	
Backup and Distribution	One combo optical drive Reads from DVD-ROM, DVD-R, DVD-RW, DVD+R, DVD+RW, CD-ROM, CD-R, CD-RW media. Writes to CD-R, CD-RW media	
Operating Environment	Solaris 8 2/04 or later (preinstalled) Solaris 9 9/04 or later (preinstalled) Software Express 11/04 for Solaris 10 (via download)	

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Specifications and Regulations

Environment

Feature	Sun Blade 1500 Specifications	Sun Blade 2500 Specifications
AC Power	100 to 120; 220 to 240 V AC, 47 to 63 Hz, 0.3 K VA	90 to 264 V AC, single phase, 47 to 63 Hz, 0.4 K VA
Operating	5° to 35° C (41° to 95° F) IEC 60068-2-1, IEC 60068-2-2 Test Bb 10% to 93% relative humidity, noncondensing	
Nonoperating	-32° to 65° C (-25.6° to 149° 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	• 5.9 bels • 5.8 bels
Declared Noise Emissions	In accordance with ISO 9296, measured at 23° C	

Regulations

The Sun Blade 1500 & Sun Blade 2500 workstations meet or exceed the following requirements.

Feature	Sun Blade 1500 & Sun Blade 2500 Specifications
Safety	UL 60950, EN 60950, CSA C22.2-60950, IEC 60950 CB Scheme with all national differences
Ergonomics	EK1-ITB-2000
RFI/EMC	EN 55022/CISPR22 Class B, FCC CFR47 Part 15 Class B; EN 61000-3-2, EN 61000-3-3
Immunity	EN55024
Regulatory Markings	UL/cUL, TUV/GS, CE, FCC, ICES-003, C-Tick, VCCI, GOST-R, BSMI, CCC, S-Mark, MIC
Power Management	Registered configurations are EPA Energy Star Compliant

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Operating Environment

Sun Blade Workstations Plug-and-Play Systems

The Solaris Desktop Edition is preinstalled on all Sun Blade 1500 & Sun Blade 2500 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 the Sun Blade 1500 & Sun Blade 2500 workstations:
    - The Solaris 8 2/04 operating system
    - The Solaris 9 9/04 operating system
    - StarOffice™ 7.0 StarSuite
    - Apache™ Web Server
    - CDE
    - GNOME 2.0.2 (preinstalled in Solaris 9 only)
    - Adobe™ Acrobat™ Reader
    - Java 2™ SDK 1.4.2
    - Mozilla 1.4
    - Java 3D™ and Sun OpenGL for Solaris graphics drivers
    - Java Communications API
    - Java Media Framework
    - Sun One Studio Community Edition 4.0
    - Sun One Grid Engine 5.3
    - Solstice Disk Suite
    - Sun PCI III
    - Sun Trunking
    - Perl
    - Sun Forum
- 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 System

The Solaris operating system is one of the industry's leading enterprise operating environments. The Solaris operating system contains the complete functionality required for all supported Sun workstations. The Solaris operating system is a solid, scalable, 64-bit operating environment that also supports 32-bit applications. The Solaris operating system 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 system delivers a competitive advantage to businesses through networked computing, scalability, and multiarchitecture support. The Solaris operating system 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 system is an industrial-grade solution with the quality and robustness required to deliver mission-critical computing.

Solaris Operating System Features and Benefits

Features	Benefits
100% binary compatibility	Software investment protection — all of today's Solaris-certified 32-bit applications continue to run on the Solaris 8 2/04 and Solaris 9 9/04 operating systems 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 system APIs, 64-bit C/C++ and FORTRAN compilers, and ABI certification tools

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Features	Benefits
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 system LDAP client and the iPlanet™ Directory Server supports complex, data intensive network applications. Includes Microsoft Active Directory support.
System management tools	Helps reduce the time spent on system administration duties using Web-based wizards and graphical interfaces, powered by Java technology.
Desktop management and productivity tools	Helps increase productivity with intuitive Desktop, Printer, PDA sync, HotKey, and CDE 1.4 and GNOME 2.0 control panel tools : GNOME, through an intuitive user interface, combines advanced desktop organization and navigation features to enable easy access to information and increase efficiency. It earns top marks for usability, appearance, and personalization to match a user's unique working style.
	The StarOffice™ productivity suite easily handles Microsoft Office documents, and creates complex documents, spreadsheets, and presentations. Use PC Launcher and the SunPCi™ IIIpro coprocessor card to run Windows, Red Hat, Lotus 1-2-3, and AutoCAD applications on Sun workstations.
Extended device and support	I/O Connect with Sun, using customer's devices, including DVD, ZIP, and JAZ drives, and USB, 1394, SCSI, UPA, and PCI buses.
Internationalization	The Solaris operating system 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 a 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.

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Features	Benefits
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 Operating System Features

Solaris™ 9 OS improves performance over Solaris™ 8 OS in the following areas:

Sun™ Java System Architecture Foundation:
- The performance of Solaris 9 OS embedded Sun™ Java System Directory Server on complex search (number of ORs in search filter) up to 40% faster than same version on Solaris 8 OS.
- Upgrading from the Solaris 8 OS with Directory Server 4.x to the embedded Solaris 9 OS Directory Server can increase overall performance by up to 5 times.

Provisioning and Change Management
- Solaris™ Flash: Allows you to create a snapshot of the entire software stack and then copy it to another system. This 4-5 hour task can now be done in 20 minutes.
- **The time to install Sun™ Cluster software, using Solaris JumpStart™ technology, can be reduced by over 70%.**
- **Sun™ Management Center Change Manager makes deployment of Flash archives to multiple machines fast, easy, and efficient.**
- **Secure WANboot – boot machines securely via public networks**

Data Management
- UFS logging performance up to 140% faster than Veritas
- UFS Direct I/O enhancements provide an 87% TPC-C database performance improvement over default UFS.
- Multi-terabyte volume management and file system support

Performance
- Enhancements to the Page coloring algorithm increases system performance by up to 10% for general loads in servers.
  - Greatest benefit realized when machines are heavily loaded - large number of processes.
- Memory Placement Optimization increases system performance by 5-40% for high-end systems.
- Enhanced threading library improves OLAP (Oracle Express on Sun internal test) by up to 4x.
- Multiple page size increases HPC performance by nearly 3x (measured using SWIM benchmark).
- The performance of the Java™2 Platform, Standard Edition (J2SE™) embedded in Solaris 9 OS is 3x faster than that of Solaris 8 OS (compares 1.2.2 with 1.4).
- Web server/service performance on Solaris 9 OS is greater than 2 times over the Solaris 8 OS FCS version on the same configuration.

Security
- Solaris^{TM} Secure Shell for secure system management
- Flexible cryptography for passwords
- Password aging and history using LDAP
- Stack overflow protection (disabling stack execution)

Graphics Software Interfaces

The Sun Blade 1500 & Sun Blade 2500 systems support all Solaris operating system graphics and window system APIs, including OpenGL and Display PostScript. A large number of Sun and third-party graphics APIs are also supported, including OpenGL, and Java 3D software. Industry-standard X-extension libraries, such as Xlib are available.

		Java 3D 3-D Graphics	Java Advanced Imaging
MediaLib Imaging/Video Audio, DSP, Algebra	OpenGL 3-D Graphics	Java 2D™ Graphics Imaging	
		Java Developer Kit	
X Windowing System			
VIS on UltraSPARC	Sun XVR-100, Sun XVR-600, XVR-1200 graphics		
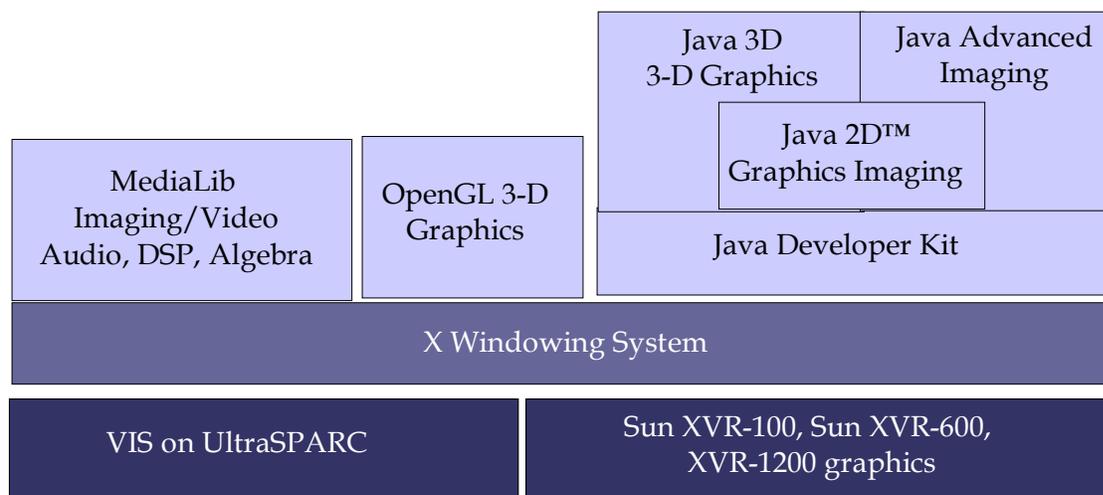
Figure 4. Graphics Software Interfaces

The Solaris Operating System - 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 System Licensing and Usage

Under the Free Solaris Binary License Program program, Sun is making the binary (runtime) version of its Solaris 8 and Solaris 9 operating environments available to everyone who accepts the terms of the Solaris 8/9 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. There is only 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 system license include the following:

• No 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 8/9 Binary Code License and the free Solaris Binary License Program

- Solaris 8/9 operating system software is provided via the Solaris 8/9 Media Kit available for online purchase 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 7.0 productivity suite

- Solaris Software Companion CD of popular freeware

- iPlanet Advantage Software (with development licenses)

Solaris Express 11/04 is available via download from the following site:
- http://www.sun.com/software/solaris/solaris-express/get.jsp

System Management

Sun Blade workstations deliver the 64-bit performance and graphics needed by customers who use heavy compute-intensive applications in markets such as EDA, MCAE, MCAD, 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. Built into the Solaris™ operating environment are systems management and security features that help deliver the computing power and functionality demanded by these customers. These features are described below.

Sun One 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% 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 One Grid Engine 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%.

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.

The Sun Blade 1500 and Sun Blade 2500 workstations fully support Sun Grid Engine software to help users maximize their investments.

Sun Remote Services (SRS) Net Connect

A Collaborative Approach to System Support and Maintenance

Sun Remote Services (SRS) Net Connect is a collection of services designed to help you better manage your IT environment, providing access to Sun knowledge and a channel for collaborative support when you need assistance from Sun experts. These Web-delivered services give you the ability to self-monitor systems and storage, create performance, trend and availability reports, and receive automatic notification so you can act more quickly when a system event occurs and manage potential issues before they become problems. When you do need to engage Sun for support, important system information is accessible to your Sun support technician enabling collaboration that can help reduce time to resolution.

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SRS Net Connect is designed for anyone who maintains and manages Sun IT environments. SRS Net Connect uses Internet-based technology requiring no additional hardware or software. It requires minimal system resources and is easy for Solaris system administrators to install, use and manage.

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 the installation and 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 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.

AnswerBook2™: Solaris Software Documentation

The AnswerBook2™ product is Sun's on-line documentation system for Solaris Software Documentation. 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.

- Enables the user to define a subset of document collections (a personal library) to be displayed when using a specific documentation server.

- Enables users to 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 books, either wholly or in part,directly from the AnswerBook2 interface in a PostScript™ format that is near print-quality output.

- Enables 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.

Sun Blade 1500 & Sun Blade 2500 User and Service Documentation

Both the Sun Blade 1500 & Sun Blade 2500 are delivered with complete documentation for setup, use, and service:

- Start Here poster – provides wordless instructions for cabling the system, starting up, and configuring the preinstalled software.

- Troubleshooting Card – a 6-panel brochure showing visual references to system cabling and internal components, and listing pointers to commonly used troubleshooting routines and URLs for online service and documentation.

- Where to Find Sun Blade 1500 & Sun Blade 2500 Documentation

- Important Safety Information for Sun Hardware Systems

- Sun Blade 1500 & Sun Blade 2500 Hardware Documentation CD runs on Solaris, PC, Macintosh platforms and contains a full set of online PDF and HTML workstation dosumentation, all easily accessible through a graphical user interface (GUI):

  - Sun Blade 1500 & Sun Blade 2500 Getting Started Guide describes the system and the preinstalled software. This document is translated into French, German, Italian, Spanish, Swedish, Korean, Simplified Chinese, and Traditional Chinese versions.

  - Sun Blade 1500 & Sun Blade 2500 Service, Diagnostics and Troubleshooting Manual provides troubleshooting flowcharts, instructions on using diagnostics tools, procedures for the removal and installation of components, system specifications, and theory of operations. The HTML version of this document contains links to the ShowMe How animations that demonstrate the removal and installation procedures.

  - Sun Blade 1500 & Sun Blade 2500 ShowMe How Multimedia (animated service procedures)

- Sun Blade 1500 & Sun Blade 2500 Product Notes (Web only)

- Sun Blade 1500 & Sun Blade 2500 Safety and Compliance Guide (Web only)

ShowMe How: State-of-the-Art Installation and Maintenance Instructions

ShowMe How presents information in a highly understandable multimedia format. Narrated animations describe installation and service procedures clearly and comprehensively to streamline installation and maintenance, reduce service costs and maximize system uptime.

Key Features

- Distributed on CD-ROM with every system.

- Can be launched from the HTML version of the Sun Blade 1500 or Sun Blade 2500 Service, Diagnostics and Troubleshooting Manual or played in stand-alone mode.

- Playable through MPEG-players such as Java Media Player and Real One Player.

Assemble To Order (ATO) Program Sun Blade 1500

 Through the Assemble To Order (ATO) program, customers will be able to configure a Sun Blade 1500 workstation with optional components to suit their needs.

The base configuration includes:

• 1.5GHz CPU

Required Options:

• Zero, one or two 120 GB HDD

• Up to 8 GB Memory (via 512MB, 1GB and 2GB DIMMs)

• Up to three Sun XVR-100 graphics accelerators, up to two Sun XVR-600 graphics accelerators, or up to one XVR-1200 graphics accelerators. Three total graphics cards maximum.

Non-required Options:

• Combo (DVD-R, CD-R, CD-RW)

• SunPCi IIIpro Coprocessor Card

Part Number	Option Description	Min Sup	Max Sup
A43-AB	Sun Blade 1500 base Workstation in deskside tower; 1*1.5GHz UltraSPARC IIIi processor, 1*smart card reader Solaris license	1	1
7703A	1 GB Memory Expansion Kit for ATO (2*512 MB low-profile DDR PC2100 registered ECC DIMM)	1	2
7704A	2 GB Memory Exansion Kit for ATO (2*1 GB low-profile DDR PC2100 registered ECC DIMMs)	1	2
7711A	4 GB expansion kit for ATO (2x2GB DIMM) low profile DDR PC2100 registered ECC DIMMs)	1	2
RA-PT1C-120G7K	One 120GB Hard Disk without Solaris installed. ATO component	0	2
9002A	One Combo Optical Drive. ATO Option
Reads from DVD-ROM, DVD-R, DVD-RW, DVD+R, DVD+RW, CD-ROM, CD-R, CD-RW media
Writes to CD-R, CD-RW media	0	1
9008A	Filler panel for empty optical drive slot	0	1
5419A	One XVR-100 Graphics Card factory installed ATO Option with documentation	1	3
5420A	One XVR-100 Graphics Card factory installed ATO Option Sun(tm), without documentation	1	3

Part Number	Option Description	Min Sup	Max Sup
5411A	One XVR-600 Graphics Card factory installed ATO Option with documentation	1	2
5412A	One XVR-600 Graphics Card factory installed ATO Option without documentation	1	2
9000A	One XVR-1200 Graphics Card factory installed ATO Option, 3D graphics, 24-bit color, 128MB frame buffer memory, single slot PCI, max resolution 1920x1200, DVI connectors, dual video support, Solaris 8 and above (PCI systems only). Documentation included.	0	1
9001A	One XVR-1200 Graphics Card factory installed ATO Option, 3D graphics, 24-bit color, 128MB frame buffer memory, single slot PCI, max resolution 1920x1200, DVI connectors, dual video support, Solaris 8 and above (PCI systems only). Without documentation	0	1
2136A	SunPCi IIIpro Coprocessor PCI (ATO option) mobile AMD Athlon XP 2100+ 256MB PC2100 onboard memory (SODIMM)	1	1

Assemble To Order (ATO) Program Sun Blade 2500

Customers start with a Base Configurations, add at minimum of one of each of the following required options, and then add any non-required additional options.

Required Options:

- One or two 1.6 GHz CPUs

- One or two 146 GB Hard Disk Drives

- Up to 16GB Memory (via 512MB, 1GB and 2GB DIMMs)

- Up to three Sun XVR-100 graphics accelerators, up to two Sun XVR-600 graphics accelerators, or up to two XVR-1200 graphics accelerators. Three graphics cards maximum.

Non-required Options:

- Combo (DVD-R, CD-R, CD-RW)

- SunPCi IIIpro Coprocessor Card

Part Number	Option Description	Max Sup
A39-AB	Sun Blade 2500 ATO Base Workstation in deskside tower; 2 * CPU slots, 8 * memory slots, 2 * internal SCSI disk drive bays, 2 * removable media bays (for DVD Dual or Combo), 1 *10/100/1000 BaseT Ethernet port, 2 * Serial ports, 1 * Parallel port, 4 * USB1.1 ports, 3 * USB2.0 ports, 2 * IEEE1394a ports, 1 * 1394a/USB2.0 Combo Card, 1 * SmartCard Reader, 6 * PCI slots, Solaris license, no CPU, disk, memory, or graphics included.	1
9015A	Sun Blade 2500 Motherboard with 1 x 1.6GHz UltraSPARC IIIi CPU.	1
9016A	Sun Blade 2500 Motherboard with 2 x 1.6GHz UltraSPARC IIIi CPU.	1
RB-SC1CA-146G10K	SCSI 146GB 10Krpm disk drive	2
7703A	1 GB Memory Expansion Kit for ATO (2*512 MB low-profile DDR PC2100 registered ECC DIMM)	4
7704A	2 GB Memory Exansion Kit for ATO (2*1 GB low-profile DDR PC2100 registered ECC DIMM)	4
7711A	4 GB expansion kit for ATO (2x2GB DIMM) low profile DDR PC2100 registered ECC DIMMs)	4
5419A	One XVR-100 Graphics Card factory installed ATO Option, 2D graphics, 24-bit color, 64MB Frame Buffer Memory, Single slot PCI, Max resolution 1920x1200, DVI and HD-15 connectors, Dual Video support, Solaris 8 and above, (PCI systems only). Documentation included.	3
5420A	One XVR-100 Graphics Card factory installed ATO Option, 2D graphics, 24-bit color, 64MB Frame Buffer Memory, Single slot PCI, Max resolution 1920x1200, DVI and HD-15 connectors, Dual Video support, Solaris 8 and above, (PCI systems only). Without documentation.	3
5411A	One XVR-600 Graphics Card factory installed ATO Option, 24-bit color 3D graphics, 64MB frame buffer memory,32MB Display memory, single slot PCI, 1920X1200 resolution, 1820x1024 stereo resolution, DVI-Connector, single video, Solaris 8 and 9. Documentation included.	3
5412A	One XVR-600 Graphics Card factory installed ATO Option, 24-bit color 3D graphics, 64MB frame buffer memory, 32MB display memory, single slot PCI, 1920x1200 resolution, 1820x1024 stereo resolution, DVI-connector, single video, Solaris 8 and 9. Without documentation	3
9000A	One XVR-1200 Graphics Card factory installed ATO Option, 3D graphics, 24-bit color, 128MB frame buffer memory, single slot PCI, max resolution 1920x1200, DVI connectors, dual video support, Solaris 8 and above (PCI systems only). Documentation included.	2
9001A	One XVR-1200 Graphics Card factory installed ATO Option, 3D graphics, 24-bit color, 128MB frame buffer memory, single slot PCI, max resolution 1920x1200, DVI connectors, dual video support, Solaris 8 and above (PCI systems only). Without documentation	2

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Part Number	Option Description	Max Sup
9002A	One Combo Optical Drive. ATO Option Reads from DVD-ROM, DVD-R, DVD-RW, DVD+R, DVD+RW, CD-ROM, CD-R, CD-RW media Writes to CD-R, CD-RW media	2
9007A	Filler panel for empty optical drive slot	2
2136A	SunPCi III Coprocessor PCI (ATO option) mobile AMD Athlon XP 1600+256MB PC2100 onboard memory (SODIMM) 24 bit graphics onboard Mainboard connectors - HD15, line out, mic in, RJ45, 1 USB 2.0 port Optional daugher card connectors - 2 USB 2.0 ports, one 1394a port Optional backplate - 1 serial, 1 parallel backplate. Docs include Windows drivers and Solaris application. Windows license not included.	1

Options

Below is a comprehensive list of system expansion, networking, graphics and multimedia options that are supported by the Sun Blade 1500 & Sun Blade 2500 workstations. Please always 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.

Part Number	Option Description	Max Sup Sun Blade 1500	Max Sup Sun Blade 2500
Memory			
X7703A	1 GB (2 x 512 MB DIMMS), installed in pairs only	2	4
X7704A	2 GB (2 x 1 GB DIMMs), installed in pairs only	2	4
X7711A	4 GB (2 x 2 GB DIMMs), installed in pairs only	2	4
Mass Storage Internal			
XRB-SC1CA-146G10K	Internal 146 GB 10,000 rpm Ultra SCSI 320 hard disk drive	0	2
XRA-PT1C-120G7K	Internal 120 GB 7,200 rpm ATA 100 drive	2	0
Mass Storage Sun StorEdge™ MultiPack			
SG-XDSK060C-36G	36 GB MultiPack (2 x 36.4 GB, 10,000 rpm)	2	2
SG-XDSK060C-218G	218 GB MultiPack (6 x 36.4 GB, 10,000 rpm)	2	2
StorEdge A1000			
	18.2 GB, 10,000 rpm, SCSI		
	StorEdge A1000 (4 x 18.2 GB, 10,000 rpm) – any form factor	1	1
	StorEdge A1000 (12 x 18.2 GB, 10,000 rpm) – any form factor	1	1
	36.4 GB, 10,000 rpm, SCSI		
	StorEdge A1000 (4 x 36.4 GB, 10,000 rpm) - any form factor	1	1
	StorEdge A1000 (12 x 36.4 GB, 10,000 rpm) - any form factor	1	1
StorEdge D2			
	1-12 Drives, up to 436 GB, 10,000 rpm, SCSI 1 unit supported	1	1

Part Number	Option Description	Max Sup SB1500	Max Sup SB2500
StorEdge D1000			
	18.2 GB, 10,000 rpm, SCSI		
	StorEdge D1000 (4 x 18 GB, 10,000 rpm) – any form factor	1	1
	StorEdge D1000 (12 x 18 GB, 10,000 rpm) - any form factor	1	1
	36.4 GB, 10,000 rpm, SCSI		
	StorEdge D1000 (4 x 36 GB, 10,000 rpm) – any form factor	1	1
	StorEdge D1000 (12 x 36 GB, 10,000 rpm) - any form factor	1	1
StorEdge A5200 (EOL)			
	9.1 GB, 10,000 rpm, FC-AL	1	1
	18.2 GB, 10,000 rpm, FC-AL	1	1
External Tape Storage			
SG-XTAPDAT72-D	StorEdge DAT 72 SCSI Desktop Tape Drive	1	1
SG-XTAP4MM-021A	DLT7000 FlexiPack Tape Drive (12 GB 4 mm DDS-3 in Flexipack)	1	1
Tape Storage Products			
	L8-LTO-LVD	1	1
	L20-LTO-HVD	1	1
	L25-SDLT320-LVD	1	1
	SDLT-320-HVD	1	1
Power Cord Kits			
X311L	Power Cord Kit, U.S./Asia	1	1
X312L	Power Cord Kit, Continental Europe	1	1
X386L	Power Cord Kit, Australia	1	1
X317L	Power Cord Kit, U.K.	1	1
X314L	Power Cord Kit, Switzerland	1	1
X384L	Power Cord Kit, Italy	1	1
X383L	Power Cord Kit, Denmark	1	1

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Part Number	Option Description	Max Sup SB1500	Max Sup SB2500
PCI Network Adapters Ethernet			
X1033A	10/100BASE-T with MII PCI adapter	1	1
X1034A	PCI Quad FastEthernet controller PCI adapter	1	1
X1141A	PCI Gigabit Ethernet network interface card	1	1
X1150A	GigaSwift Ethernet (UTP)	1	1
X1151A	Gigabit Ethernet-Fiber PCI66 Adapter (Cassini)	1	1
PCI Network Adapters ATM			
X2222A	Dual FastEthernet + Dual SCSI PCI Adapters (Cauldron)	1	1
X6762A	Sun Crypto Accelerator 1000 PCI bus-based SSL accelerator board (Deimos)	1	1
X4011A	Venus Crypto Card – Crypto Bd for SSL/IPSec- copper (requires driver version 1.1 or later)	1	1
X4012A	Venus Crypto Card – Crypto BD for SSL/IPSec – Fibre (requires driver version 1.1 or later)	1	1
PCI Communication (Serial) Adapters			
X1155A	High-speed serial – 4 port	1	1
PCI Fibre Channel Adapters			
SG-XPCI1FC-QF2	PCI Dual FC Network Adapter with internal FC interface. (Crystal+)	1	1
SG-XPCI2FC-QF2	Sun Single Loop PCI FC-AL Host Adapter 1Gbit/sec (FABRIC AWARE) (Amber)	1	1
SG-XPCI1FC-QF2	2Gb Single Fibre Channel Network Adapter	1	1
SG-XPCI2FC-QF2	2Gb Dual Fibre Channel Network Adapter	1	1
Smartcards			
	Cyberflex Access Java Card	1	1
	Payflex low-end smartcard	1	1

Part Number	Option Description	Max Sup SB1500	Max Sup SB2500
PCI SCSI Adapters			
X6540A	Dual-channel, single-ended UltraSCSI adapter	1	1
X6541A	Dual-channel, differential UltraSCSI controller	1	1
X6758A	Dual Ultra 3 LVD SCSI PCI Adapter (Jasper)	1	1
X5010A	Single-channel SCSI	1	1
Sun PCi IIIpro			
X2136A	SunPCi™ IIIpro Coprocessor Card	1	2
X7066A	1 x 256 MB DIMM memory expansion for SunPCi III Card	2	2
X7067A	1 x 512 MB DIMM memory expansion for SunPCi III Card	2	2
Graphics			
X3769A	Sun XVR-100 graphics accelerator board	3	3
X3780A	Sun XVR-600 graphics accelerator board	2	3
X3689A	Sun XVR-1200 graphics accelerator board	1	2
Monitors	Refer to XVR-100, XVR-600, XVR-1200 SODs for monitor support listings		
X7147A	17-inch color CRT		
X7144A	19-inch TFT flat panelLCD		
X7149A	22-inch flat screen CRT		
X7197A	24.1-inch LCD		

Part Number	Option Description	Max Sup SB1500	Max Sup SB2500
Type 6 USB Country Kits			
X3531A	North American Universal ("PC style")	1	1
X3532A	French	1	1
X3533A	German	1	1
X3534A	Swiss-French	1	1
X3535A	Swiss-German	1	1
X3536A	Swedish	1	1
X3537A	United Kingdom	1	1
X3538A	United States UNIX	1	1
X3539A	Japanese UNIX	1	1
X3554A	Taiwanese	1	1
X3555A	Korean	1	1
X3556A	Japanese	1	1
X3538A	United Kingdom UNIX	1	1
X3509A	European UNIX	1	1
X3560A	Norwegian	1	1
X3561A	Portuguese	1	1
X3562A	Spanish	1	1
X3563A	Danish	1	1
X3564A	Italian	1	1
X3565A	Dutch (Netherlands)	1	1
X3566A	Australian	1	1
X3567A	Finnish	1	1
X3508A	European Universal	1	1
X3582A	Chinese	1	1
X3583A	Euro UNIX (Power Cordless)	1	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.

- Customers can 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 Advantage 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 upgrade model. This model simplifies the upgrade 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. 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-08-T-D-A43-P2

- **ALW** = Upgrade identifier (All allowance codes start with ALW.)

- **08** = Allowance percentage, which is the percentage applied to the list price of a standard marketing part number. "08" means 8% off of list price, "05" means 5% 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 residual group, a way of grouping systems in the Sun installed base. The letters A through X are reserved for Sun systems. The letter Z is used for competitive systems.

- **A43** = Identifies the product family that the customer is purchasing. "A43" refers to Sun Blade 1500 Workstation. "A39" refers to Sun Blade 2500 Workstation.

- **P2** = Promotion code, used for tracking corporate-sponsored and other types of promotions.

How to Determine the correct Allowance Code

Scenario: My customer has a Sun Ultra 10 workstation and would like to upgrade to an Sun Blade 1500 workstation. What allowance part number should I select?

1. From the UPGRADE FROM 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 X) is the allowance part number that is applied to the list price of the standard marketing part number.

UPGRADE FROM:	UPGRADE TO: Sun Blade 1500 A43-ULB1-9WW-D1GDM A43-ULB1-9AB-D1GDM	UPGRADE TO: Sun Blade 2500 A39-UXB1-9ZZ-D2GDN A39-UXB1-9WW-D2GDN A39-UXB2-9AB-D2GDN
– **Ultra 1 Workstation** – **Ultra 2 Workstation** – **Ultra 30 Workstation**	ALW-03-T-A-A43 X X X	ALW-03-T-A-A39 X X X
– **Ultra 5 Workstation** – **Ultra 10 Workstation** – **Ultra 60 Workstation** – **Ultra 80 Workstation**	ALW-07-T-B-A43 X X X	ALW-07-T-B-A39 X X X X
– **Sun Blade 100 Workstation** – **Sun Blade 150 Workstation** – **Sun Blade 1000 Workstation** – **Sun Blade 2000 Workstation**	ALW-10-T-C-A43 X X	ALW-10-T-C-A39 X X X X
– **Sun Blade 1500 Workstation** – **Sun Blade 2500 Workstation**		
– **Any Non-Sun Workstation, less than two years old**	ALW-07-T-Z2-A43	ALW-07-T-Z2-A39
– **Any Non-Sun Workstation, two to five years old**	ALW-03-T-Z1-A43	ALW-03-T-Z1-A39

Note: Please visit http://ibb.eng/upgrades for the latest upgrade allowance matrix.

Ordering Notes

• No disks, memory, or CD-ROM drives migrate to the Sun Blade 1500 & Sun Blade 2500 workstations.

• Country kits (keyboard and localized manuals)

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

- The Sun Blade 1500 & Sun Blade 2500 workstations workstations require USB keyboards. (They do not support non-USB keyboards.)

- Monitors

  - Monitors are not included with any Sun Blade 1500 & Sun Blade 2500 workstations workstation upgrades. If a monitor is needed, order the appropriate X-option or refer to the 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 X471A.

    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 both Sun Blade 1500 and Sun Blade 2500 workstations. Customers may migrate any of these monitors. However, an adapter is required for operation.

Sun Blade 150 Workstation

Sun Blade 150 will continue to be sold. The Sun Blade 1500 workstation is positioned as the UltraSPARC IIIi alternative for some current Sun Blade 150 customers. Sun Blade 150 will EOL in December, 2005, with the following key dates. There is no direct replacement product.

End of life for Sun Blade 150

- End of life announcement   Q2FY06
- Last order date   Q3FY06
- Last ship date   Q4FY06

Service and Support

Sun Enterprise Services Offerings

Sun Enterprise Services now provides two service offerings: SunClient℠ program for 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 1500 & Sun Blade 2500 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.

![Sun microsystems logo]

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 enables customers to choose the level of service best suited to their needs, ranging from mission-critical support for maximum solution availability to back-up 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, and Sun-certified replacement parts, software releases, and technical tools. Support is provided 8 a.m. to 5 p.m. Monday through Friday.

Materials Abstract

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

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Just the Facts				
– *Sun Blade 1500 & Sun Blade 2500 Workstation: Just the Facts*	Reference Guide (this document)	Training Sales Tool	SunWIN, Reseller Web	428665
– *SunPCi™ IIIpro Coprocessor Card: Just the Facts*	Reference Guide	Training Sales Tool	SunWIN, Reseller Web	92629
– *Sun™ XVR-100 Graphics, Just the Facts*	Reference Guide	Training Sales Tool	SunWIN, Reseller Web	373333
– *Sun™ XVR-600 Graphics, Just the Facts*	Reference Guide	Training Sales Tool	SunWIN, Reseller Web	397282
– *Sun™ XVR-1200 Graphics, Just the Facts*	Reference Guide	Training Sales Tool	SunWIN, Reseller Web	368791
Competitive Analysis				
– *Sun Blade 1500 Competitive Matrix*	Short description of the competition	Sales Tool	SunWIN, Reseller Web	387873
– *Sun Blade 2500 Competitive Matrix*				383483
– *Sun Blade 1500 Workstation Competitive Beat Sheets:*	Analysis	Sales Tool	SunWIN	
– *Dell Precision 360*				380620
– *HP b2600*				380622
– *Hpzx2000*				386958
– *IBM 44P-170*				380621
– *SGI Fuel*				380618
– *Sun Blade 2500 Workstation Competitive Beat Sheets:*	Analysis	Sales Tool	SunWIN	
– *(HPJ6750/HPC8000)*				380596
– *(Hpzx6000)*				386957
– *(IBM p630)*				380594
– *(SGI Tezro/SGI Octane2)*				380614

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Collateral				
– *Sun Blade 1500 Data Sheet* – *Sun Blade 2500 Data Sheet*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	428663 428668
– *Sun Blade 1500 Pocket Facts* – *Sun Blade 2500 Pocket Facts*	Pocket Facts	Sales Tool	SunWIN, Reseller Web, COMAC	428664 428669
– *Sun XVR-600 Data Sheet*	Data Sheet	Sales Tool	SuWIN, Reseller Web, COMAC	 397283
– *SunPCi IIIpro Coprocessor Data Sheet*	Data Sheet	Sales Tool	SunWIN, Reseller Web, COMAC	123626
Product Presentations				
– *Sun Blade 1500 & Sun Blade 2500 Workstations Technical Presentation*				 428667
– *Sun Workstation Customer Presentation*				428666
– *Sun XVR-600 Customer Presentation*				397285
External Web Sites				
– *Sun Blade 1500 Workstation Site*	`http://www.sun.com/sunblade1500`			
– *Sun Blade 2500 Workstation Site*	`http://www.sun.com/sunblade2500`			
– *SunPCi Coprocessor Card Site*	`http://www.sun.com/desktop/products/sunpci/index.html`			
– *Sun™ Store System Purchases*	`http://store.sun.com/`			
– *Product Documentation*	`http://www.sun.com/products-n-solutions/hardware/docs/`			