

Sun “Marrakesh” Workstation

FAQ

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This version supercedes all previous versions
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The Sun "Marrakesh" Workstation

- **What's new with the Sun "Marrakesh" Workstation?**

The Sun "Marrakesh" Workstation is a 2nd in a new line of x86 workstation from Sun. It is designed to complement and eventually replaces the Sun Java Workstation W1100z. The Sun "Marrakesh" Workstation offers many new performance technologies and improvements highlighted in the following table:

	Sun Java Workstation W1100z	Sun "Marrakesh" Workstation
processor	AMD Opteron processor at speeds up to 2.4GHz	Faster, Next-Generation Opteron processors at speeds up to 2.6GHz
memory	Dual-channel registered PC3200 DDR-400 ECC memory	Dual-channel unbuffered PC3200 DDR-400 memory with or without ECC
graphics	AGP Graphics NVIDIA Quadro NVS 280 NVIDIA Quadro FX500 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NVIDIA Quadro FX 4000	PCI Express (x16) Graphics ATI Entry 2D, PCI NVIDIA NVS 280 PCI-E NVIDIA Quadro FX 1400, PCI-E NVIDIA Quadro FX 3450, (available October, 2005)
acoustics	Idle = 50dB Operating = 51dB	new quiet fan technology with Pulse Width Modulation Fans
power supply	550W	400W
communications	Sun Gigabit LAN 10/100/1000 by Broadcom	Integrated 10/100/1000 LAN (PCI-E)
SATA drives	Not available (80GB IDE only)	Integrated Serial ATA controller RAID 0 or 1 capable Up to 2* SATA drives, 500 GB max 80, 250 GB (7200 rpm)
SCSI drives	Not available	Ultra 320 SCSI controller/drives (opt)
I/O Connectors	USB 2.0: 3 back, 2 front	USB 2.0: 4 back, 2 front

- **Will I have to change my golden image on the new Sun "Marrakesh" Workstation?**

Yes. The new Sun "Marrakesh" Workstation is a completely new platform. Most of the system drivers are different than those used on the Sun Java Workstation W1100z, therefore our customers will have to create new golden images.

- **Is the floppy drive really not available on the new Sun "Marrakesh" Workstation?**

Yes. For ultimate price flexibility and/or security concerns by many customers, Sun has been offering workstations for over 10 years without the floppy drive. With the advancement of new technologies like USB Disk Keys, bootable CD-ROMs/CDRW's, external storage, etc. the necessity of a floppy drive has really declined over the past few years and many customers simply don't need them anymore.

- **Are legacy IDE hard drives available on the new Sun "Marrakesh" Workstation? What hard drives will be?**

No. The new chipset used in the Sun "Marrakesh" Workstation Workstation does not support the legacy IDE (parallel ATA) hard drives. Instead, the Sun "Marrakesh" Workstation has an integrated SATA controller for Serial ATA hard drives. We will offer the following SATA hard drives: 80GB and 250 GB (7200rpm) .

- **Does the new Sun "Marrakesh" Workstation offer and support Serial ATA (SATA) hard drives?**

Yes. The Sun "Marrakesh" Workstation has an integrated SATA controller for Serial ATA hard drives. Sun offers the following SATA hard drives: 80GB and 250GB (7200rpm). We also offer an optional Ultra 320 SCSI controller. We do not offer any Ultra 320 SCSI drives on the Sun "Marrakesh" Workstation.

- **Does the new Sun "Marrakesh" Workstation support Serial ATA (SATA) RAID?**

Yes. The chipset used on the new Sun "Marrakesh" Workstation has integrated SATA controller with RAID support for RAID 0 (striped) and RAID 1 (mirrored arrays). Customers can choose to have a high performance RAID 0 array of hard drives where data is striped across multiple hard drives (this RAID method greatly improves data access times and system performance), OR they can choose to have a highly reliable RAID 1 array of hard drives where data is duplicated to multiple hard drives at once (this RAID method essentially creates a backup copy of all your data in real time).

- **What SCSI drives and controllers are offered on the new Sun "Marrakesh" Workstation?**

Sun does not offer any SCSI drives on the Sun "Marrakesh" Workstation. Sun does offer an optional full-featured PCI-X Ultra 320 SCSI controller with an external connector and HostRAID capability.

- **Does the new Sun "Marrakesh" Workstation offer a SCSI RAID option?**

Yes. The new Sun "Marrakesh" Workstation supports a SCSI RAID option via the Ultra 320 SCSI controller with an external connector and HostRAID capability.

- **What optical drives are available with the new Sun "Marrakesh" Workstation?**

The following table outlines the optical drives available on the Sun "Marrakesh" Workstation and the speed with each drive.

Optical Drive	Speed
DVD-ROM	16x (reads +/-)
DVD+RW/+R	DVD 16x/4x/12x CD 24x/10x/40x

Memory

- **What memory is used on the new Sun "Marrakesh" Workstation? Is it the same memory used on the Sun Java Workstation W1100z?**

The new Sun "Marrakesh" Workstation uses new buffered memory technology. This memory is quite different than the registered memory used on the Sun Java Workstation W1100z. The memory used on the Sun Java Workstation W1100z is slower, more expensive and does not allow ECC to be optional. To achieve higher performance, lower cost, and optional ECC, unbuffered memory was used on the Sun "Marrakesh" Workstation.

Unbuffered memory technology provides several benefits. First, the CAS latency for this memory technology is lower than that of registered memory, thus yielding higher performance. Second, unbuffered memory does not require additional "buffering" on the DIMM, hence is less than registered memory. Finally, unbuffered memory is available with ECC or without ECC, which will ultimately result in less expensive DIMMs and higher performance. Given these benefits of unbuffered memory, it is clear to see that this will be the memory of choice for the next entry-level generations of Sun workstations.

- **Why do I sometimes see DDR-400 memory in terms of PC3200? How does this relate to memory bandwidth?**

Clock rate is directly proportional to memory bandwidth. The bandwidth of 400MHz DDR memory is calculated as $400\text{MHz} * 8 \text{ bytes per channel} = 3,200 \text{ MB/s}$ or 3.2GB/s so it is also referred to as PC3200 DDR memory. This nomenclature is the official designation from JEDEC, the leading developer of standards for the solid-state industry.

The memory bandwidth of the system is improved upon by implementing dual-channel memory architecture. Above, notice the factor "8 bytes per channel". By implementing two channels you can essentially double your bandwidth. Instead of a single DIMM working alone, a pair of DIMMs essentially works together to split up the data exchange to and from the rest of the system. On the new Sun "Marrakesh" Workstation the dual channel memory architecture results in unprecedented memory bandwidths on a personal workstation. With PC3200 DDR (400MHz) memory, the system's memory bandwidth is an astounding 6.4GB/s.

- **Does the large DDR-400 memory bandwidth (6.4GB/s) drag system performance if the processor bandwidth is 8.0GB/s?**

No. Not all data is transferred between the processor and the system memory. For some tasks, system I/O and graphics pass data to the system memory. With the bandwidth headroom these tasks are carried out without interrupting the data flow between the memory and the processor. In benchmarks we've seen performance improvements as much as 11% resulting from the faster memory. In addition, this performance gain scales with the processor. So as the processors get faster the bandwidth benefit will become more important.

- **How does this memory bandwidth impact the Sun "Marrakesh" Workstation system performance?**

Many technical applications require huge amounts of memory bandwidth, especially those that use 3D graphics or that have a large percentage of floating point calculations. These applications will benefit from the massive memory bandwidth provided by the new Sun "Marrakesh" Workstation.

Memory latency is another very important factor. At the highest level, latency is a measure of how long it takes the memory subsystem to respond to a cache miss in the processor. The lower (shorter) the memory latency, the better the application performance, especially for applications that "thrash the cache."

- **Does the memory for the Sun "Marrakesh" Workstation have to be ordered in pairs? What is the maximum memory configuration?**

No, but to take advantage of the dual-channel memory architecture memory must be installed in pairs; however, a single DIMM will work in the system (i.e. We offer a configuration with 1x256MB in the system). It is highly recommended that memory be added in pairs, as the performance benefit is substantial. The 1x256MB is the only single DIMM standard configuration (ready-to-ship) offered. All other configurations are offered in two-DIMM configuration only. When installing memory in the new Sun "Marrakesh" Workstation, pairs must be matched in size and speed (i.e. 2x256MB/5333MHz, not 1x256MB/400, 1x512MB/533) and multiple pairs must be matched in speed. The new Sun "Marrakesh" Workstation has 4 DIMM slots (2 dual-channels) and supports up to 4GB of physical memory.

- **Does the new Sun "Marrakesh" Workstation offer ECC and non-ECC memory? If so, what speeds are offered?**

Yes. The new Sun "Marrakesh" Workstation offers both ECC and non-ECC memory. The following table outlines memory availability:

	128MB	256MB	512MB	1GB	2GB
DDR-400MHz , ECC	not available	not available	available	available	not available
DDR-400MHz , non-ECC	not available	available	not available	not available	not available

- **What is ECC memory? Why is ECC memory important?**

"ECC" stands for Error Correcting Code or Error Checking and Correction memory depending on which resource you refer to. ECC memory modules have an extra chip that performs a comparison of the data that is read in and written out. This chip has the capability of detecting single and multiple bit errors and correcting single bit errors on the fly. If this extra chip detects a single bit error it will correct the discrepancy and the system will continue to function without any interruption. If a multiple bit error (which is extremely uncommon) is detected, the memory module will issue a non-maskable interrupt (NMI) which will shutdown the system avoiding any data corruption in the system. Single and multiple bit data errors can go undetected without ECC memory.

Data integrity is always important, but when you are designing an airplane or automobile part, under a tight deadline on your customer's TV commercial production, analyzing population densities for domestic policy reform, or managing your clients' financial portfolios of millions of dollars, data integrity is absolutely vital. And in today's cut-throat competitive environment, work flow efficiency and utilization rates are also crucial. Sun workstations, including the new Sun "Marrakesh" Workstation, offer ECC memory which provides an extra level of data integrity, reliability, and greater system uptime.

- **How do I order memory on the new Sun "Marrakesh" Workstation?**

Given the complexity of the memory situation (with multiple speeds, single channel, dual channel, ECC and non-ECC) predefined memory configurations will be defined and made available. This greatly simplifies the ordering process for internal and external customers. The following table outlines the "menu" of memory configurations available:

Memory	Product Number
512MB (2x256) DDR-400 non-ECC unbuffered	
1GB (2x512) DDR-400 ECC unbuffered	
2GB (2x1GB) DDR-400 ECC unbuffered	

AMD64 Technology

AMD64 Technology is currently available on the Sun Java Workstation W2100z, Sun Java Workstation W1100z, and will be on the Sun "Marrakesh" Workstation

- **How will I benefit from AMD64 Technology?**

With the new AMD64 Technology, you will be able to support larger than 4GB of addressable memory space to aid in the design and manipulation of large data sets or models.

This enhancement to AMD's processor portfolio will provide workstation customers with a "friendly" transition path from 32-bit to 64-bit computing since support for both 32-bit and 64-bit operating systems is planned.

32-bit applications should run at full performance on architecture capable of also supporting 64-bit operating systems and applications.

- **What value does AMD64 Technology bring to personal workstations?**

Today's 32-bit operating systems limit users to 32-bits (4GB) of memory address space. This limits the type and amount of I/O (input/output) and physical, configurable memory. I/O cards with on-board memory (e.g. graphics) and the system memory both consume the same address space. When I/O cards with large memory are present, this leaves less addressable space, thus limiting the amount of physical memory one can effectively put in a system. Some examples can be shown where physical system memory is actually limited to less than 3GB.

A 64-bit architecture will expand addressable memory space from 4GB to 16TB. This should allow the large I/O to work in harmony with 4GB (on the Sun "Marrakesh" Workstation), and above, physical memory.

- **Why has Sun chosen to add AMD64 Technology to their product line?**

Sun constantly monitors the industry for, or invents, new technologies that could benefit our customers. AMD64 Technology is a new technology that has shown great promise in meeting our customers' needs. We've chosen to add this technology to our workstation product line to provide our customers increased flexibility when choosing their workstation solutions.

- **If I don't need 64-bit today, why would I consider moving to a Sun Workstation enabled with a new AMD processor with AMD64 Technology?**

AMD64 Technology is not a special architecture just for users with 64-bit addressing needs. This technology is the an inherent ingredient on all AMD processors. Buying an AMD64 Technology enabled workstation should provide leading performance for 32-bit applications and the flexibility to change to a 64-bit operating system later on the same workstation, should your computing needs change.

- **What types of applications does Sun expect to take advantage of the AMD64 Technology enabled processors?**

At this time, Sun expects applications that require large memory (greater than 4GB) to benefit from this new architecture, including applications specifically for MCAD and EDA. As AMD64 is merely an extension of the existing pervasive 32-bit architectures, extensive porting assistance should not be required. Sun plans to continue assisting ISVs interesting in porting to AMD64 Technology.

- **What should set Sun Workstations enabled with AMD64 Technology apart from others' workstations?**

Sun is leading the industry to industry-standard 64-bit computing.

Sun has been developing 64-bit systems and operating systems for 20+ years.

Sun has an understanding of customer needs, operating systems, applications, and hardware that is unmatched in the industry.

Dual-Core Technology

- **What is Dual-Core Technology?**

Faster clock speeds are an important way to deliver more computing power, but clock speed is only half the story. The other route to higher performance is to accomplish more work on each clock cycle, and that's where Dual-Core Technology comes in. Dual-Core Technology enables the processor to utilize its execution resources more efficiently, delivering performance increases and improving user productivity. Dual-Core Technology presents the AMD Opteron processor to modern operating systems and applications as two processors that can work on two sets of chores simultaneously. The benefits of this technology include:

- Support for multi-threaded code and multi-tasking operations through better utilization of processor resources.
- Multiple threads/tasks running simultaneously to increase the number of transactions that can be executed.
- Improved reaction and response times for end users.

For more detailed information visit AMD's Dual site at:
<http://multicore.amd.com/>

- **Is Dual-Core Technology available on all Sun Personal Workstations?**

Yes. Dual-Core Technology will be offered on the Sun Personal Workstations starting in Q4 2005.

- **Is Dual-Core Technology something I can retrofit into my older Single-Core workstation from Sun?**

No. Sun does not recommend end-users to retrofit Dual-Core processors into older workstations from Sun. To maximize Dual-core technology, Sun has architected new platforms with improved I/O and BIOS optimizations. Dual-Core workstations from Sun will be available starting in Q4 2005 with the Sun "Marrakesh" workstation.

- **Does Dual-Core Technology improve performance in all situations?**

Not in all situations. Dual-Core Technology is beneficial in many circumstances, but in some cases it can actually hurt the performance of the system if older operating systems does not support it. However, with newer operating systems (Solaris 10, Windows XP Professional) the system can really take advantage of the Dual-Core Technology. Dual Core can really improve system performance when multi-tasking (running several applications at once) or when running multi-threaded applications. Most workstation applications are multi-threaded to take advantage of multiple processors. As a result, Dual-Core technology plays very well into the technical computing environment.

- **What operating systems take advantage of Hyper-Threading Technology?**

Solaris 10 and Windows XP Professional takes advantage of Dual-Core Technology. Some Linux distributions also support Dual-Core Technology but not all of them. Older operating systems (Windows NT, etc) may not work with Dual-Core.

Graphics

- **Will the new Sun Workstations Sun "Marrakesh" Workstation support the AGP 8X graphics?**

No. The chipset in the new Sun "Marrakesh" Workstation does not support the AGP interface. Instead, a new PCI Express (x16) graphics slot will be available. Graphics card vendors are launching a whole new line of graphics cards that will be compatible with the new PCI Express interface.

- **Will I be able to plug my AGP graphics cards into the new Sun "Marrakesh" Workstation?**

No. AGP and PCI Express are completely different interfaces. An AGP card will not plug into a PCI Express slot, nor will a PCI Express card plug into an AGP slot.

- **What's the advantage of PCI Express for graphics? What are the differences?**

PCI Express is the next generation interface not only for graphics cards, but also for I/O cards. PCI Express is a scalable interface, and depending on the chipset the system can have multiple PCI Express connections with various bandwidths. For graphics cards, the defined standard is "by sixteen" (or x16). This implementation of PCI Express provides twice the unidirectional bandwidth and four times the peak bandwidth as AGP 8X. The PCI Express specification also allows for 75W from the motherboard to the graphics cards. This is three times as much power as the standard AGP 8X specification.

- **What graphics cards are/will be available on the new Sun "Marrakesh" Workstation?**

The new Sun "Marrakesh" Workstations supports Entry 2D up through our High-end 3D graphics cards. The following table outlines the integrated graphics cards that are/will be available on each system.

	Sun "Marrakesh" Workstation	Notes
Entry 2D	ATI Entry 2D	VGA only. No DVI. Carries no ISV certification
Professional 2D	NVIDIA NVS 280	Dual DVI
Entry 3D	None	
Mid-range 3D	NVIDIA Quadro FX 1400	Dual DVI
High-end 3D	NVIDIA Quadro FX 3450	Dual DVI. Available in Q4 2005.

All graphics cards are PCI-E unless otherwise noted. NVIDIA Quadro FX 3450 will be available in Q4 2005.

ISV Certifications

- **What is the ISV Certification plan for the new Sun "Marrakesh" Workstation?**

Sun has very strong relationships with independent software vendors (ISV's). The software vendors recognize that Sun is a critical partner in the industry, not only as a hardware OEM, but as a marketing and support partner. Sun, in many cases, has engineering personnel located full-time on site at these software vendors' location providing technical support, application performance tuning, and graphics driver optimization.

ISV certification is a critical aspect of the workstation value proposition. Workstation customers are running very complicated, high-end, technical applications and reliability and stability are an absolute requirement. The entry workstation is targeted at specific technical applications, many of which were listed above. The following table outlines the applications that are critical for ISV certification for the Sun "Marrakesh" workstation.

Table 1. Primary hardware and applications certifications planned for the Sun "Marrakesh" Workstation

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SW Development	MCAD/MCAE	EDA
Oracle	UGS	Cadence Design Systems
BEA Systems	PTC	Synopsys
IBM	ProE	Mentor Graphics
Borland	Dassault	
	MSC	
	Fluent	
	LSTC	
	Computational Dynamics	
	ESI	

Operating Systems

Microsoft Windows

- **What Operating Systems will be preinstalled on the new Sun "Marrakesh" workstation? Will dual OS preload be an option?**

The Sun "Marrakesh" Workstation is currently available with Solaris 10 preloaded only. Windows XP Professional, Red Hat Enterprise Linux WS, and SuSE Linux Enterprise Server will also be available as qualified operating systems only, not pre-loaded. Dual OS preload will not be offered.

- **Is Windows 2000 supported on the new Sun "Marrakesh" Workstation?**

No. Sun will not support customers who wish to run Windows 2000 on their new Sun "Marrakesh" Workstation. Microsoft has discontinued OEM sales of Windows 2000 from OEMs. Since then they've also reduced their level of technical support for the aging operating system. Many of the new technologies in the Sun "Marrakesh" Workstation is not even available or technically feasible on the Windows 2000 operating system.

- **Is Windows NT supported on the new Sun "Marrakesh" Workstation?**

No. Windows NT is not supported on the new Sun "Marrakesh" Workstations. Microsoft discontinued OEM sales of Windows NT from OEMs on June 30, 2002. Since then they've also reduced their level of technical support for the aging operating system. Many of the new technologies in the new Sun Workstations are not even available or technically feasible on the Windows NT operating system.

- **Will Microsoft be supporting the Intel AMD64 enabled workstations?**

Yes. Microsoft has publicly announced their support for the Windows 64-bit extended operating system.

- **Will all Windows applications that run on current Sun Personal Workstations today run on the new Intel AMD64 enabled workstations?**

Current 32-bit applications should run on AMD64 enabled workstations under 32-bit operating systems. On 64-bit operating systems, there may be some exceptions where 32-bit applications may need 64-bit updates.

Linux

- **Do the new Sun "Marrakesh" Workstation support Linux?**

Yes! The new Sun "Marrakesh" Workstations will be qualified for Red Hat Enterprise Linux or SuSE Linux Enterprise Server.

- **Which version of Linux does the Sun "Marrakesh" Workstation be qualified for ?**

The new Sun "Marrakesh" Workstations will be qualified for Red Hat Enterprise Linux WS v3 and v4, 32-bit and 64-bit. Additionally, The new Sun "Marrakesh" Workstations will be qualified for SuSE Linux Enterprise Server 9 (SLES 9)

- **Does the Sun "Marrakesh" Workstation support Community Linux?**

No.

- **Why is Sun supporting Linux on workstations?**

Sun's technical workstation markets and customers heavily rely upon the Solaris operating environment, both in their infrastructure and the applications that they use. Linux on personal workstations is a very viable and attractive Solaris alternative that many of these customers are considering. In addition, many OEM's are turning to Linux as a cost effective open source operating system for many different applications. We see the Linux desktop emerging quickly as more and more applications on Linux become available. This is especially true in the EDA , Oil & Gas, OEM, and some MCAD markets.

Offering Sun Workstations with Linux is part of Sun's overall multi-OS strategy which provides Solaris, Linux and Windows solutions to customers.

Manageability

- **What manageability features are available on Sun "Marrakesh" Workstation?**

Solaris 10 helps you simplify management of our workstations and reduce total ownership costs. These integrated solutions are a result of extensive customer studies. Solaris 10 is pre-installed standard with the Sun "Marrakesh" workstation. It allows you to centrally track, monitor and manage the hardware aspects of the Sun "Marrakesh" workstation. Other benefits include:

- Ability to get valuable hardware information such as CPU, memory, video and security settings
 - Monitor system health to fix problems before they occur
 - Install drivers and BIOS updates without visiting each workstation
 - Remotely configure BIOS and security settings
 - Automate processes to quickly resolve hardware problems
 - Local recovery
- **What other manageability SW is available on the Sun "Marrakesh" Workstation?**

PC-Check is a preloaded utility which performs over 500 tests on the Sun "Marrakesh" Workstation to confirm reliable hardware. Tests including customer favorites: PXE Network Boot, SMART hard drive testing, Memory Microtopology Locality Testing. PC-Check, available only on the Sun "Marrakesh" Workstation, can help save both time and money and increase overall productivity.

For more information on the PC Check, go to: http://www.eurosoft-uk.com/pc_check.htm

Options

- **What options are available for the new Sun "Marrakesh" Workstation?**

For a complete list of all options for the Sun Workstations, please go to: <http://www.sun.com>

Warranty and support

- **What is the warranty and support for Sun Workstations with Solaris?**

The standard warranty for the Sun Personal Workstations is 1-1-1 (1-years parts, 1-years labor and 1-years next business day on-site).

- **What is the warranty and support for Sun Workstations with Linux?**

The warranty for Sun Workstations with Linux is the standard 1-1-1 with ninety days of OS support.

- **Will Sun stand behind Linux when I have problems?**

Sun is the first place for support. Hardware and software warranties for the workstations with Linux will be that same as that of the Windows workstations. Extended hardware warranties and software support options will also be available for purchase for if you need extended coverage.

- **Why should you use Sun support instead of LinuxCare or Red Hat?**

Sun Linux support services are available on a global basis. Sun offers predictable multi-platform expertise providing you with a single vendor who can effectively support Linux and Windows environments. Sun has leveraged its proven support processes and extensive UNIX expertise to open source environments. Sun offers a full portfolio of Linux services, ranging from phone-in assistance through proactive and mission critical services. In addition, a global education, installation and integration services and multi-vendor network services are available to meet Linux and multi-platform support