

# Sun x64 and UltraSPARC® Systems for MCAD

Optimizing Mechanical Computer Aided  
Design with Sun Workstations



## Benefits to designers

- High-end performance at affordable prices
- Large memory capacity (up to 16 GB)
- CPU performance among the fastest on the market for MCAD applications
- High performance 3D graphics for fast rendering of textured surfaces
- Choice of operating system including Microsoft Windows, Red Hat and SuSE Linux, and of course, the Solaris™ Operating System
- Smooth 64-bit migration path

## Sun's x64 workstations featuring AMD Opteron™ and Sun UltraSPARC processors

- Sun Ultra™ 20 Workstation
- Sun Blade™ 1500 Workstation
- Sun Blade™ 2500 Workstation
- Sun Java™ Workstation W1100z
- Sun Java™ Workstation W2100z



“Since their introduction over a year ago, the AMD based Sun Java Workstations have dominated the top in performance among all commercially available workstations for Pro/ENGINEER.”

— Olaf Corten, Proprietor of [www.proesite.com](http://www.proesite.com) and developer of the OCUS Benchmark

## Creating Better Designs Requires High Performance, But Not High Prices

Product development is getting more attention these days as businesses recognize the strategic importance of their product offerings and the value of meeting specific customer needs before the competition can react. In order to stay close to customer needs and to consider all aspects of the product lifecycle, today's product development teams involve many people throughout the organization and can extend to include external suppliers and partners as well. The design process is often collaborative, but also requires structure and control. To foster collaboration and to achieve consistent processes for versioning, change control, and release of designs into production, Product Lifecycle Management (PLM) software solutions are often deployed as part of the computing infrastructure for the design process.

The creation of digital designs is also becoming more complex. Building a complete digital mockup of a large complex design such as an airplane or automobile requires sophisticated hardware and software for creation, manipulation, and visualization of the 3D design. If designers are to be productive and efficient with their output, they need powerful compute capacity and high end visualization features on their desktop. More specifically, mechanical designers need:

- The ability to load large models (often 2 GB or more) without overwhelming the system and degrading performance
- Fast performance for rendering 3D surfaces
- A realistic view of designs through tools such as virtual prototyping
- Low cost computing solutions
- The ability to deliver high quality designs in less time

“The W1100z is fast - so fast you feel like you need a seat belt to run it. It's ideal for running complex programs like Pro/Engineer. Model regens happen immediately, so I don't have to interrupt the creative thinking. And that allows me to work quickly and remain competitive.”

#### Eldon Goates

Synthesis Engineering Services, Inc.,  
Editor, Pro/Engineer Tip-of-the-Month

“Our Sun Blade workstations are very robust in terms of up-time, which is huge for us since we run a number of high-end CAD applications. Any one of our applications will work on a Sun workstation, which minimizes the amount of maintenance and upkeep required. It gets pretty complex, so you have to have a good way of standardizing, and you can't make it complicated for the user.”

#### Joe Kennedy

Manager, CAE Systems,  
Metaldyne

Sun's new x64 workstations featuring AMD Opteron™ processors and Sun's refreshed UltraSPARC® workstation product line offer great return on investment through productivity enhancing performance, high reliability, ease-of-use, and flexible deployment options.

#### Designed for Performance

Mechanical designs have grown in size and complexity with today's data sets often exceeding 2 GB. Many designs are even large enough to push the limits of the 4 GB memory space available on 32-bit operating systems. This 4 GB memory limitation on 32-bit systems can cause excessive memory paging and very poor performance when large models contend with the operating system for memory resources. Even multi-processor 32-bit systems can suffer when memory-constrained applications spend time thrashing memory instead of utilizing the power of additional processors.

In contrast, Sun's 64-bit workstations can offer scalability and real benefits. For example, a two-processor Sun Java Workstation 2100z running a 64-bit OS can support two or more large-memory 32-bit jobs simultaneously with good performance. This means it is possible for a designer to launch an MCAE (Mechanical Computer-Aided Engineering) simulation as a background job on the same workstation that is running the MCAD application.

#### Sun's x64 Systems Featuring AMD Opteron Processors

Sun's x64 systems featuring AMD Opteron processors offer a balanced architecture that is designed for performance while leveraging innovative aspects of AMD Opteron processor technology:

- The 64-bit AMD Opteron processor provides compatibility by supporting 32-bit x86 instructions (no emulation mode) with 64-bit extensions to support large-memory applications and larger capacity for system memory.

- An integrated DDR DRAM memory controller on each processor provides lower memory latency for shorter runtimes. Both available memory and memory bandwidth can scale with the number of processors — enabling the system to provide up to 19.2 GB per second of bandwidth for really big jobs.
- Innovative point-to-point HyperTransport™ technology eliminates the I/O bottlenecks in front-side bus (FSB) architectures, increasing overall system performance since I/O does not compete with bandwidth.
- High I/O throughput including PCI-Express graphics interface to enable faster response for visualization and high performance SCSI disk drives for storing and retrieving large data sets.

#### Industry-leading Benchmark Results

These architectural strengths are already yielding substantial performance benefits along with record setting results on standard benchmarks.

The AMD Opteron-based Sun Java W2100z and W1100z have claimed top spots in well-recognized industry standard and application benchmarks. They consistently outperform the competition on the OCUS (Olaf Corten's Utilities) benchmark v4 for PTC® Pro/ENGINEER® Wildfire™ 2.0<sup>1</sup>. OCUS is an industry accepted, independent benchmark that compares the performance of top workstations running Pro/ENGINEER.

At its introduction, the dual processor Sun Java Workstation W2100z demonstrated outstanding performance on the SPEC CPU2000 benchmark, including a world record floating point result in the two CPU x86 category, as of July 26, 2004<sup>2</sup>. SPEC CPU2000 is an industry-standard benchmark measuring CPU and memory intensive computing tasks.

Additional information about benchmarks for Sun AMD Opteron systems can be found at [www.sun.com/amd](http://www.sun.com/amd).

## Next Generation Visualization

Sun provides a range of graphics options to offer both affordable and high-end graphics solutions designed to meet the complex imaging and visualization requirements of MCAD applications. NVIDIA Quadro graphics accelerators are used with Sun's x64 systems featuring AMD Opteron processors, and the Sun Blade 1500 and Sun Blade 2500 workstations utilize the Sun™ XVR-600 and Sun™ XVR-1200 graphics accelerators.

### NVIDIA Quadro FX 1400 Graphics Accelerator

The NVIDIA Quadro FX 1400 graphics accelerator provides a mid-range 3D graphics solution for professional MCAD applications. This graphics card includes the following features:

- 128 MB of DDR memory (256-bit interface)
- Connection to drive a single display monitor
- Up to 1920 x 1200 resolution with Sun 24.1-inch LCD monitor
- High performance PCI-Express bus interface with 19.2 GB/second memory bandwidth

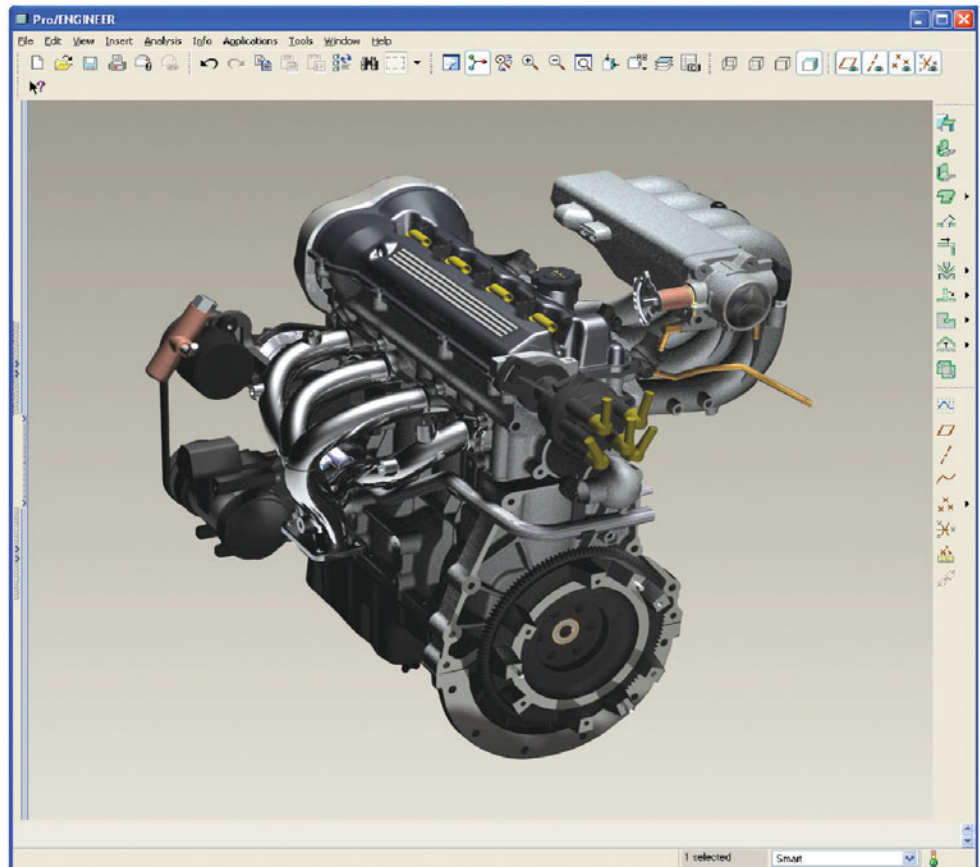
### NVIDIA Quadro FX 4000 Graphics Accelerator

The NVIDIA Quadro FX 4000 graphics accelerator provides a high-end solution for 3D visualization needs. This graphics card includes the following features:

- 256 MB of DDR memory
- Connections to drive any two Sun displays, including two 24.1-inch LCD monitors.
- Up to 2048 x 1536 x 32 bpp analog resolution at 75 Hz (1920 x 1440 x 32 bpp at 85 Hz) on both displays. Maximum resolution over digital port: 3840 x 2400 at 24 Hz (1920 x 1200 x 60 Hz with reduced blanking).
- High performance AGP 8X bus interface with 32.0 GB/second memory bandwidth

### Sun™ XVR-600 Graphics Accelerator

The XVR-600 Graphics Accelerator is a high-value, low-cost graphics board that delivers professional-level 3D graphics technology for Sun workstations. It is ideal for cost-conscious



*PTC Pro/ENGINEER software and the high performance graphics of Sun's x64 workstations help improve designer productivity in industries ranging from automotive and engine design to consumer products.*

customers who need 3D graphics for MCAD and MCAE applications. Key features Sun XVR-600 graphics accelerator include:

- 128 MB memory including 32 MB texture memory
- Connection to drive a single display monitor
- Up to 2048 x 1536 resolution
- High-speed PCI bus interface

### Sun™ XVR-1200 Graphics Accelerator

Based on leading-edge architecture and technology, the Sun XVR-1200 graphics accelerator delivers high-quality graphics, provides a wide range of functionality, and delivers exceptional rendering performance for 3D and textured surfaces. Its key features include:

- More than 400 MB of memory
- Hardware-based texture-mapping and 256 MB of dedicated texture memory

- Up to 1920 x 1200 resolution
- Support for dual monitors
- 33 MHz and 66 MHz PCI slot support

### Flexibility

One of the greatest benefits of Sun's x64 platforms is the flexibility that results from their ability to run multiple operating systems and their support for both 32-bit and 64-bit applications. Sun's x64 workstations offer the highest degree of flexibility for organizations that need to run existing 32-bit operating systems and applications, and be able to gracefully migrate to 64-bit when they are ready.

Rather than emulating a 32-bit environment which can result in poor performance for 32-bit applications, Sun x64 systems provide native

execution of 32-bit applications. This innovation is possible because the AMD64 instruction set architecture (ISA) extends the existing 32-bit x86 ISA. As a result, 32-bit applications perform well (often faster than on 32-bit platforms) and can coexist on the same system with 64-bit applications. Organizations can therefore deploy 64-bit Sun workstations featuring AMD Opteron processors now, while choosing 32-bit or 64-bit operating systems as their needs dictate.

These platforms also offer a wide choice of operating systems. A total of 8 different operating system versions are supported including:

- **Solaris™ Operating System (x86 Platform Edition):** The 64-bit/32-bit Solaris 10 OS will also support Linux binaries.
- **Linux:** Both Red Hat Enterprise Linux and SUSE LINUX Enterprise Server are supported on Sun AMD Opteron systems.
- **Microsoft Windows:** The Sun Ultra 20 and the Sun Java Workstation 2100z are Windows Catalog Certified, enabling organizations to run the Windows XP operating system for their MCAD applications.

#### Providing More Choice with UltraSPARC Workstations

For customers that prefer the high reliability and ease of administration offered by UltraSPARC processors and the Solaris OS, systems such as the Sun Blade 1500 and Sun Blade 2500 workstations are the answer. In addition to low total cost of ownership (TCO), these Sun UltraSPARC workstations provide speed, a customizable work environment, unparalleled ease of use, and smooth operations. All of these features are critical when working with complex design parts.

#### Sun Leads the Way in MCAD Performance

Sun has a long history in the MCAD marketplace with roots that date back to Sun's early days as the first open systems workstation platform for MCAD applications.

Now Sun is back in the lead with record setting performance, high-end graphics, and greater flexibility than is offered by any other platform vendor.

With the powerful combination of Sun and AMD processors, and the reliability and stability of UltraSPARC processors running the Solaris OS, Sun is once again positioned to help companies gain the productivity and time-to-market advantages they need from their mechanical design solutions. In addition to their inherent reliability, Sun workstations are also backed by reliable and responsive service and support programs that can help improve designer productivity by minimizing downtime and service interruptions.

#### Learn More

For more information on Sun's x64 systems, visit [sun.com/workstations](http://sun.com/workstations) or talk to your local Sun representative about scheduling a half-day session to learn more.

## Sun x64 Workstations Featuring AMD Opteron Processors for MCAD



#### Sun Ultra 20 Workstation

- One AMD Opteron 100 series processor
- Up to 4 GB of PC3200 memory
- NVIDIA Quadro FX1400 graphics accelerator

#### Sun Java Workstation W1100z

- One AMD Opteron 100 series processor
- Up to 8 GB of PC3200 ECC memory
- NVIDIA Quadro FX1100 or FX4000 graphics accelerator

#### Sun Java Workstation W2100z

- Up to two AMD Opteron 200 series processors
- Up to 16 GB of PC3200 ECC memory
- NVIDIA Quadro FX1100 or FX4000 graphics accelerator

## Sun UltraSPARC Workstations for MCAD



#### Sun Blade 1500 Workstation

- One UltraSPARC IIIi processor
- Up to 8 GB DDR memory
- One Sun XVR-1200 or up to two Sun XVR-600 graphics accelerators

#### Sun Blade 2500 Workstation

- Up to two UltraSPARC IIIi processors
- Up to 16 GB of DDR memory
- Up to two Sun XVR-1200 or two Sun XVR-600 graphics accelerators

(1) The Sun Java Workstation W2100z equipped with two AMD Opteron 250 processors, 4 GB of memory and Nvidia FX 4000 video card, was running the OCUS V4 benchmark with PTC Pro/ENGINEER Wildfire under Windows XP Professional. For the latest OCUS benchmark results, visit <http://www.proesite.com/OCUSB4/>.

(2) The Sun Java Workstation W2100z produced SPECCompM2001 score of 5085. SPEC and the benchmark name SPECComp are registered trademarks of the Standard Performance Evaluation Corporation. Comparisons are based upon published results as of 10/13/04. For the latest SPEC OMP benchmark results, visit <http://www.spec.org/omp/results/>.