

# New Economics of Visualization in Oil and Gas

## Move Closer to Real-time Decision Making



With new breakthroughs in price/performance for Sun's ultra high-end graphics systems and new approaches to handling bigger models in software, affordable solutions for visualizing large volumes of complex scientific and engineering data are now available. These solutions have the potential to dramatically change the dynamics of this market by offering Exploration and Production (E&P) companies an opportunity to replace their expensive immersive 3D-visualization facilities with new solutions that offer similar performance at a fraction of the cost.



### Key Advantages of Sun Solutions

- Handle large datasets with cost-effective clusters
- Choice of operating systems including Red Hat and SUSE Linux, Windows XP Professional x64 Edition, and of course, the Solaris™ Operating System
- Optimize existing and future IT resources with Sun™ Grid Solutions to enhance productivity and reduce IT investment costs
- One of the industry's largest memory footprints for enhanced 3D visualization
- High performance 3D graphics based on industry standards and affordable components
- Whisper quiet operation on the Sun Ultra 40 workstation helps eliminate noise in office or conference room environments

### Collaborative Visualization with Complex Data Models

Sun understands that its customers in the Oil and Gas industry have a need for very high-end visualization collaboration rooms and that businesses want to procure cost-effective solutions that can serve their needs for collaborative team environments. In addition, new approaches to global collaboration are being explored so that geographically dispersed teams can simultaneously review data models.

With innovative new software solutions from Sun ISV partners and enhanced workstations from Sun, large complex data models can be broken up into smaller chunks that can be processed in parallel, enabling energy businesses to work with even larger data models, and to do so at a reduced cost.

### High-End Performance at Affordable Prices

Sun has made a major breakthrough in price/performance of 64-bit workstations with its Sun Ultra™ 20 and Ultra 40 systems featuring AMD Opteron™ processors. These systems offer breakthrough performance for 64-bit applications such as seismic processing and reservoir simulation at prices that compare to those of commodity 32-bit systems.

The power of Sun's new workstations is magnified when they are deployed in a grid configuration that uses multiple systems and graphics cards to process visualization tasks in

parallel. These systems offer compelling price/performance advantages for very high-end visualization collaboration rooms and can enable faster decision-making by delivering extreme performance.

### OS Flexibility

One of the greatest benefits of Sun's x64 platforms is the flexibility to run multiple operating systems. Linux has become the dominant OS environment for many types of solutions in the Oil and Gas market and Sun's x64 systems support the two most popular Linux distributions.

Sun x64 systems are supported with any of the following operating systems:

- *Solaris™ Operating System (x86 Platform Edition)*
- *Linux:* Both Red Hat Enterprise Linux and SUSE LINUX Enterprise Server are supported.
- *Microsoft Windows:* Sun Fire™ x64 systems are Windows Catalog Certified, enabling organizations to run their applications on Microsoft Windows 2003, Windows XP, or Windows XP Professional x64 Edition.

### Good for Your Environment

The availability of dual-core AMD Opteron processors on Sun Ultra 40 workstations also enable these systems to save a significant amount of power when compared to competitive servers that utilize single-core Xeon processors. Designed to be used in an office

environment, the Sun Ultra 40 workstation's cooling system includes low-noise fans with fan speed controlled by monitoring multiple component temperatures. Structure-borne vibration and acoustic noise are also minimized by rigid chassis design and control of disk drive vibration. The result is a whisper quiet chassis that has an idle acoustic noise level that is 55 percent lower than comparable HP workstations and a 39 percent lower operating noise level<sup>1</sup>.

### Driving Innovation From the Grid

Sun offers a complete grid solution, combining an integrated, custom-built hardware and software stack with a powerful management framework, best-practice methodologies, and architectures that have been proven and tested.

These grid technologies enable geo-scientists to access all the compute power they need, when they need it. Sun Grid Solutions allow E&P companies to make the most of their current IT investments, while allowing them to deploy new resources quickly and easily.

Looking forward, Sun customers can expect to see expanded support for rack and cluster configurations from Sun as well as continued advancements in graphics, memory capacity, and reliability features on Sun systems. As exploration and design applications reach for their next performance boost, Sun systems will provide the right architecture to optimize the execution of parallel application threads and to deliver high performance graphics to geographically dispersed teams.

By leveraging innovations from Sun and its partners, E&P customers can achieve business results such as:

- Faster and better decision making through easy and rapid access to 3D visualization data
- Increased employee productivity by using high performance tools and working in an environment with less noise from computer systems
- Lower IT costs based on more affordable hardware solutions and reduced costs for power and cooling
- Investment protection because software applications can run on a variety of operating systems

Fast, accurate exploration is a critical success factor for Oil and Gas companies and a high performance compute infrastructure can help streamline the exploration process. Sun's advancements in processor and memory performance, grid computing technology, industry-leading graphics and OS flexibility are helping Oil and Gas companies worldwide build the solutions they need to excel in exploration.

#### Learn More

For more information about Sun solutions for the Oil and Gas industry please visit [sun.com/energy](http://sun.com/energy) or talk to your local Sun representative.

## Key Features of Sun x64 Systems

Sun x64 systems offer a balanced architecture designed for performance while leveraging innovative aspects of the AMD Opteron processor:

- The AMD Opteron processor was designed from the beginning for 64-bit large-memory applications that need both fast processing and low memory latency
- 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 adequate bandwidth for large jobs and large datasets.
- Innovative point-to-point HyperTransport™ technology eliminates the I/O bottlenecks present in the front-side bus (FSB) Intel Xeon architecture, increasing overall system performance since I/O does not compete for bus bandwidth.
- High I/O throughput including PCI-Express graphics interface to enable faster response for visualization and high performance disk drives for storing and retrieving large data sets.

## NVIDIA Quadro Graphics Solutions



The Sun Ultra 40 workstation can support up to two NVIDIA high-end graphics cards, allowing E & P customers to double their texture memory capacity. The ultra-high-end NVIDIA Quadro FX 5500 graphics accelerator offers 1GB of GDDR2 memory with 33.6GB/second bandwidth, enabling a Sun Ultra 40 workstation to provide high performance for datasets up to 2GB.

(1) Based on tests conducted by Sun that show the Sun Ultra 40 workstation with operating noise levels at 49 decibels and 47 decibels while idle. By comparison, the test showed that the HP xw9300 workstation had an operating noise level of 52 decibels and 51 decibels while idle. Because decibels are measured on a logarithmic scale, the difference of 4 decibels in the idle noise levels translates to a 55 percent differential based on the assumption that loudness intensity triples for each 10 decibel increase. Likewise, the 3 decibel difference for operating noise levels translates to a 39 percent difference in perceived loudness.