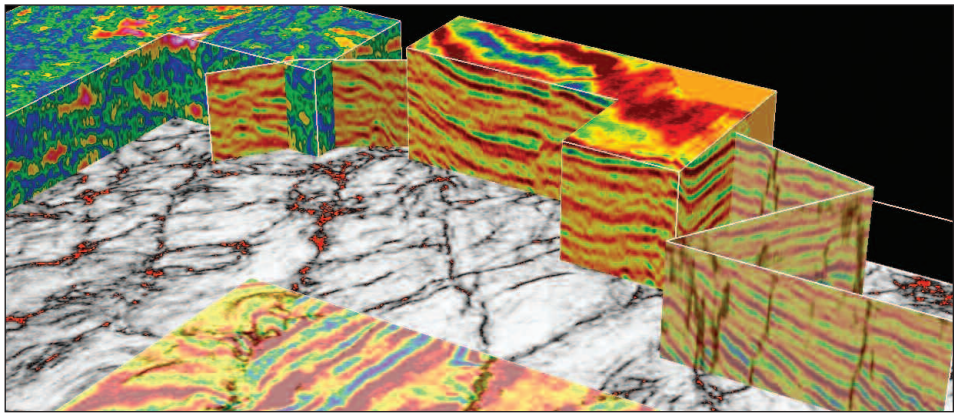
Solutions Brief

SGI® Visualization Solutions



Multi-attribute image: Signal envelope, amplitude and coherency. Courtesy of Paradigm.

Visualization for Multi-attribute Seismic Analysis

Accelerate Discovery and Increase Recovery with Silicon Graphics Prism™

Making the Most of Your Experts and Your Data

How can you minimize risk? How can you assure your sealed acquisition bids are competitive yet commensurate with recovery? How can you differentiate between economic and sub-economic wells in marginal areas? And how can you maximize the impact of your scarce personnel resources? For years, you've asked these questions, but trying to answer them takes too long and, even then, your answers don't fully reflect the valuable information in your treasure trove of multi-attribute seismic data.

A lot of data has been amassed from a decade of mapping regional features. The big problem has been that there was no way to get a good look at it. Visualizing combinations of complex of seismic attributes like amplitude, continuity, sheer wave, and amplitude versus offset (AVO) provides a far more accurate picture of oil potential and in less time than viewing those attributes discretely. But when the size of even small seismic surveys exceeds 10 billion data points and you need 30 to 100GB of memory to visualize multiple attributes, you risk missing significant results if you break the data up into small fragments or reduce its resolution to visualize it on a PC.

In fact, the disconnect between the multi-attribute data you possess and that which you can visualize grows greater daily. Over the past two decades, the size of 3D seismic surveys has increased 500,000 fold, to the point where a PC can no longer visualize even a single seismic attribute. Before a geophysicist sees results on a PC, a dataset may be reduced by 10x to 100x so that it will fit in this limited system. Restricting the scale, resolution, and number of attributes with which an experienced geophysicist works is comparable to throwing ten years of his experience down the drain! To reduce finding and lifting cost per barrel and increase productivity, your experts need a way to interact with all your multi-attribute data, all of the time, from all locations and to collaborate with each other in real time.

Redefining What's Possible

Silicon Graphics Prism provides a new way to visualize, understand, and manage multi-attribute seismic data that is so revolutionary that it constitutes a genuine breakthrough. It allows you to interactively explore regional datasets, integrate live well log data into your reservoir model, and understand everything in association with a 4D predictive model. Silicon Graphics Prism is a single system that combines the ability to visualize large amounts of seismic data with the scalable 64-bit compute, memory, and I/O of an SGI® Altix server.

The world's most powerful and flexible visualization system, Silicon Graphics Prism features an unprecedented combination of Intel® Itanium® 2 CPUs, ATI® graphics processors, Linux® operating

system, and SGI® scalable system architecture. Its scalable shared memory design allows individual users and small teams to start small and work up to projects with hundreds of gigabytes of seismic data representing a single lease. Entire organizations can scale up and interact with multi-attribute regional datasets with up to 4TB of memory. Combined with SGI® Visual Area Networking (VAN) technology, Silicon Graphics Prism delivers its full interactive visualization, compute, and I/O power directly to desktops enterprise-wide, allowing geographically dispersed teams to collaborate with large data without having to move the data and even to share application control wherever they may be: in a team room, across a campus or metro area, or offshore.

Innovation Without Limits

The shared memory architecture of Silicon Graphics Prism liberates seismic analysis from the limitations of small memory PCs and the complexity of clustered systems. Unlike clusters, Silicon Graphics Prism leverages a single high-performance I/O subsystem, requires only a single copy of data and a single operating system, and eliminates the need to break data into PC-sized chunks. Instead, it gives you a flexible combination of large shared memory and multiple powerful processors that you can dynamically allocate to meet demand wherever, and whenever, it arises. Its integrated HPC capability allows the system to compute attributes in the background or on-the-fly during interpretation sessions. It also means that your team members can submit large computing tasks before they leave at the end of the day and have answers waiting for them when they return.

Designed for Maximum Flexibility

Although the scalable shared-memory architecture of Silicon Graphics Prism makes it uniquely capable of visualizing regional multi-attribute datasets, it is also uniquely flexible, offering advantages in performing all your everyday operations. In addition to visualizing your largest problems, Silicon Graphics Prism can deliver multiple concurrent lease-specific or single attribute visualizations. It facilitates worldwide collaboration by allowing distributed experts to interactively view and manipulate multi-attribute data in real time and monitor oil field operations over the network. And since Silicon Graphics Prism supports multiple concurrent visualization sessions on a single shared memory platform, there is no need to physically reconfigure the system to support different operating modes. Concurrent user support and transparent change-over of specific system resources from one mode to another helps boost individual productivity and corporate ROI.

Do The Math

Drilling deep-water wells is expensive, averaging about $20 million per well. A good field, however, pays off handsomely, producing 500M barrels of oil—and $250 billion at $50/barrel. Even a small field yielding 50M barrels returns a tidy $2.5 billion. Conversely, the true cost of bidding on the wrong lease and drilling an exploration dry hole is not merely $20 million, but the $2.5 to $250 billion in lost opportunity and unrealized revenue.

In fact, the rewards for improving recovery are even greater than that for drilling. Doubling the reserves that are recovered from known fields does not entail any exploration risk, but it doubles corporate book value as proven recoverable reserves are an asset on corporate balance sheets. The sooner you analyze your fields with multi-attribute visualization and the large memory capabilities of Silicon Graphics Prism, the sooner you increase your company's book value and can leverage that value to acquire additional exploration and production capabilities.

The New Standard for Seismic Interpretation

Quite simply, when it comes to visualizing and working with multi-attribute seismic data, Silicon Graphics Prism has no peer. Its extraordinary capabilities combined with the time-value of money make the case for it so compelling that it's not a question of whether your energy company should use Silicon Graphics Prism, but how quickly it can start benefiting from its unequalled power. Only with Silicon Graphics Prism can you affordably manage and visualize multi-attribute data, understand high-resolution surveys, and operate digital oilfields—all in real time. The promise of Silicon Graphics Prism is this: you will get more oil, faster, from fewer wells for a longer time at lower cost.

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Corporate Office
1500 Crittenden Lane
Mountain View, CA 94043
(650) 960-1980
www.sgi.com

North America +1 800.800.7441
Latin America +55 11.5509.1455
Europe +44 118.912.7500
Japan +81 3.5488.1811
Asia Pacific +1 650.933.3000

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