Solutions Brief

SGI® Visualization Solutions

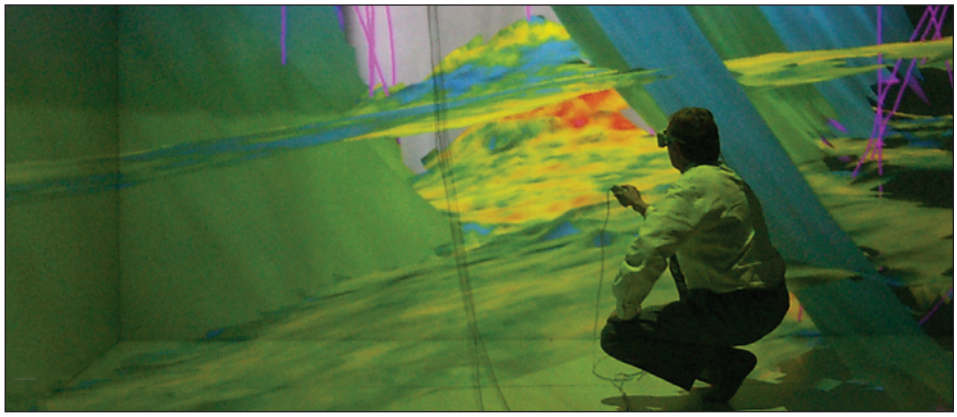

Image courtesy of the BP Center for Visualization

Virtual Environments for Innovation and Discovery

Breaking Barriers with Silicon Graphics Prism™ Visualization Systems

Real Insight from Virtual Worlds

How do you get inside hundreds of gigabytes of scientific data and find salient features? How do you simulate new levels of physical accuracy and visual realism? How do you simplify the creation and deployment of virtual environments? Whether you are using a virtual environment to treat phobias, design safer automobiles, or do computer science research, it's critical that you answer these questions in ways that maximize the success of your projects.

Virtual environments come in a range of sizes and styles. From single-user head mounted displays to fully immersive CAVE® environments that place you in the middle of a scene, virtual environments are used by individuals and teams in almost every industry imaginable. However, the deployment of today's virtual environments has been limited by the cost of custom solutions, the limited capability and high complexity of PC clusters, and the inability of most solutions to provide the real-time responsiveness with complex models that is demanded outside the research community. Using a solution that can't manage real world complexity can be like designing a new aircraft without including the hydraulic system—not very productive.

In order to maximize the benefit of a virtual environment, your team needs to leverage it, not build it. Team members need to spend their time creating and refining content instead of debugging distributed software and managing a PC cluster that can't simulate the physical dynamics of a complex environment. To optimize its results, your team needs a single system that can be scaled to fit any size of problem, is easy to deploy and manage, and leverages a wide array of commercial applications and open source tools.

Redefining What's Possible

Silicon Graphics Prism™ systems are the force behind a whole new generation of virtual environments. They combine the power of SGI's scalable system architecture, Intel® Itanium® 2 CPUs, the Linux® operation system and the industry's best image quality so you can accurately simulate the physical world and display it with eye-popping reality. With Silicon Graphics Prism systems, it's like being able to look out the window of an airplane for a sweeping panorama and at the same time examine beach erosion all the way down to a single grain of sand.

The scalability of Silicon Graphics Prism systems also lets your team take advantage of the latest visualization techniques without worrying about the underlying simulation exceeding the compute and memory capabilities of a single PC. Start with a Silicon Graphics Prism system that fits your current display configurations

and model sizes, and independently scale the compute, memory I/O and visualization as your need for physical accuracy, model size, or display resolution increase. And, with a starting price of under US$8,500, you can afford to deploy powerful virtual environments virtually anywhere.

Development and Deployment Flexibility

When creating virtual environments, you need to leverage the best solutions and tools available. Silicon Graphics Prism systems are ideal for developing and deploying applications that use either shared memory tools or distributed application frameworks since they provide the industry-leading memory bandwidth and synchronization latency that let all applications run fast. Using Silicon Graphics Prism systems, you can quickly create new applications using development tools like CAVElib or VR Juggler, and solve complex problems in less time using visualization applications like CEI Ensight Gold or AVS Express.

Silicon Graphics Prism systems also make virtual environments easier to deploy since everything is included inside a single system. Gone are the issues of trying to manage separate compute, data and synchronization networks across a PC cluster. Gone are the worries of what will happen if the model outgrows the compute or memory capacity of the head-node of the cluster. Gone are the headaches associated with keeping 5, 10, or 15 different systems running and up-to-date with multiple software packages. The scalable, single-system approach of Silicon Graphics Prism systems means that you can manage a high-performance, high-fidelity virtual environment as a single system. And, the compact form factor of Silicon Graphics Prism systems means that you can deploy them almost anywhere. For example, a four-wall CAVE can be driven with a 6-CPU, 4-pipe system that takes up less than one foot of rack space.

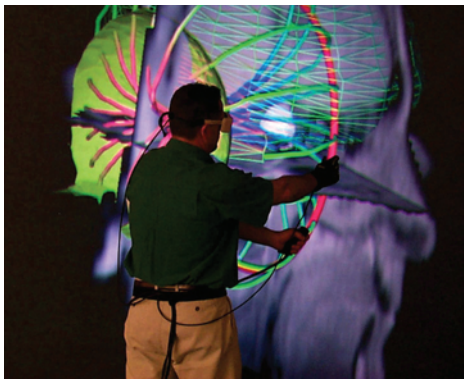

Image courtesy of the SCI Institute.

Raising the Bar on Realism

Realism in a virtual environment has many different aspects, and Silicon Graphics Prism systems are designed to maximize all of them. The combination of multiple CPUs with multiple graphics pipes in a single system places Silicon Graphics Prism systems in a class by themselves. With this unique combination, developers don't have to trade-off physical realism against visual realism—they can easily create applications that render highly accurate scenes with highly realistic results.

Physical realism is key when many objects are interacting with the environment. For instance, rain striking the window of a virtual car, forming into drops and being wiped away from the windshield is a complex fluid dynamics calculation that can easily be accelerated with multiple CPUs in a Silicon Graphics Prism system. Visual realism is also critical when human perception is the driving factor. For example, when treating phobias, high-quality visual cues allow a patient to experience and cope with real anxiety in a virtual environment. Silicon Graphics Prism systems help maximize visual realism with industry-leading graphics pipes, the support of OpenGL® and the OpenGL shading language, and the ability to combine the power of multiple graphics pipes to render a single scene.

Unlocking New Possibilities

Silicon Graphics Prism systems give you the power to explore gigabytes to terabytes of scientific data in an immersive environment. Their large memory and scalable computing power allow you to see the big picture and the fine detail, a critical element when exploring the unknown or solving mission-critical engineering problems. Whether you are developing new applications for a virtual environment or leveraging existing ones, Silicon Graphics Prism systems are powerful and affordable platforms on which to create and deploy innovative solutions.

Image courtesy of Fruanhofer IAO

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