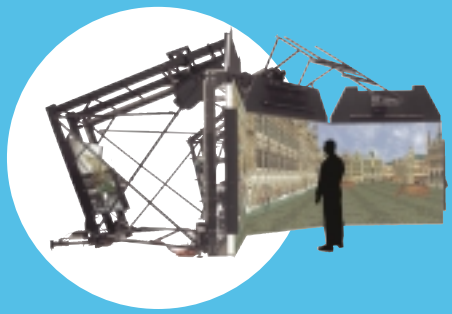
Solutions Brochure

SGI® Reality Center™ Solutions

Immersive Visualization Facilities



The Leader in *Immersive En*

Nothing energizes and empowers project teams like SGI Reality Center immersive visualization environments. The stimulus of team interaction with high-resolution, three-dimensional images generates an atmosphere of immediacy, quicker comprehension of larger data volumes, greater insight, better decision making, and swifter arrival at consensus. This leap forward in productivity translates immediately to accelerated workflow and immense cost savings and dramatically improved productivity.

vironments

Reality Center facilities deliver the highest quality performance and realism possible today, in the widest range of display configurations. You and your colleagues, immersed in the visualization, can explore, understand, and communicate about your data in ways not possible in the physical world. And you can now use SGI® Visual Area Networking technology to collaborate globally, enabling teams and individuals anywhere, using any computing device to share data and participate in meetings in your Reality Center environment.

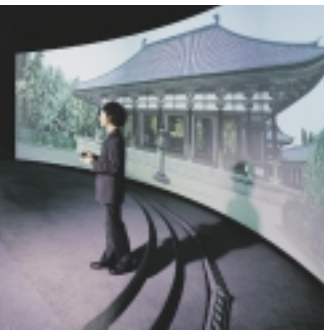


Image Above:
A demonstration being conducted in the Toppan Reality Center.

Image to Left:
SGI® Reality Center™ featuring EAI software and Trimension 25-foot semicircular screen.

Complete Collaborative and Interactive Solutions

Since SGI opened the world's first Reality Center facility in Reading, England in 1994, the SGI Reality Center concept has generated excitement in industry, academia, and the media. As the industry's pioneer, SGI has created solutions to ease your transition to immersive visualization. The goal is to help you implement advanced visualization technologies as powerful business tools, complementing and dramatically improving your business processes.

The Power of Group Visualization

SGI Reality Center solutions:

- Enable collaborative decision making
- Expedite insights into complex problems
- Significantly reduce production and labor costs
- Streamline project analysis, design, engineering, and testing
- Eliminate the impracticality, danger, or expense encountered in physical environments
- Demonstrate products, processes, and plans with unparalleled realism
- Improve skill acquisition and concept retention
- Enable intuitive exploration and precise analysis of relationships between variables
- Allow interactive analysis of high-resolution, time-varying data sets of unlimited scale
- Allow decision teams to analyze unprecedented data volumes in a single session

Breathtaking Speed and Performance

At the heart of every Reality Center facility is the SGI® Onyx® family of visual supercomputers, the world's most powerful scalable visualization engines. SGI Onyx family systems are the only computers designed for visual supercomputing and for simultaneously processing 3D graphics, imaging, and video data in real time.

Based on the acclaimed NUMAflex™ architecture, the SGI Onyx family provides the industry's richest, deepest feature set, including clip-mapping, texture-paging, volume rendering, and anti-aliased full-frame HDTV display—the kinds of features required for ultrarealistic, high-performance immersion in your interactive simulation. SGI Onyx family systems equip your Reality Center facility with multiple visual display channels and superb media tools such as digital audio, video reference input, optional real-time graphics-to-video, and optional digital video for routing multiple video and audio streams. Each Onyx visual supercomputer is a highly configurable, highly scalable, shared-memory system controlled from a single keyboard and mouse and designed from the ground up to support immersive visualization. The SGI Onyx family is available in a range of configurations for every level of visual supercomputing.

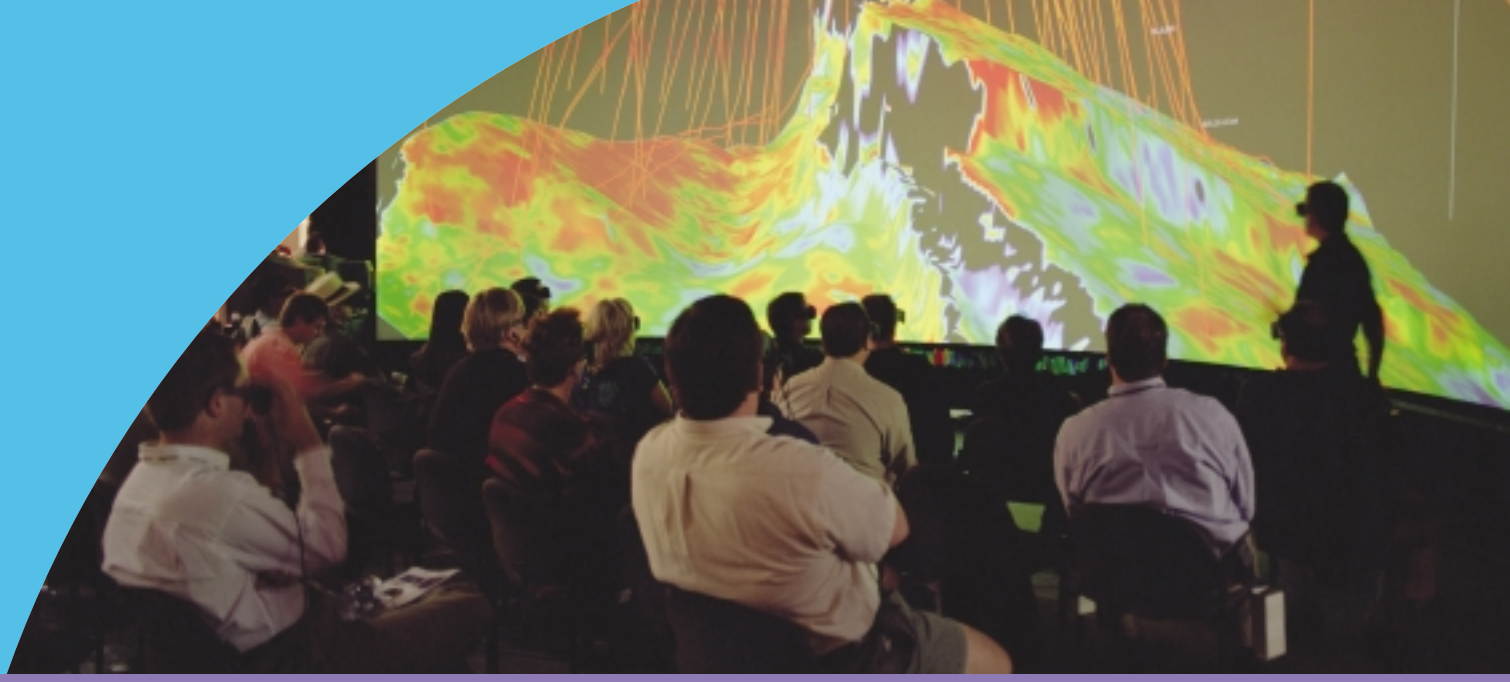
Widest Range of Display Solutions

Only SGI provides a wide variety of integrated display solutions to suit every organization's needs and budget, from full-scale 360° immersive environments to smaller group facilities, including stereoscopic display and tracking controls. [See the back page for Reality Center configurations.]

End-to-End Superior Technology Solutions

Our clients and partners recognize SGI as the premier provider of advanced visualization and immersive, multimedia technologies, from Visual Area Networking to evolving applications. Our solutions are based on proven excellence, including systems design, component selection, installation, and post-implementation customer support. Tightly integrated teams in Systems Engineering, Professional Services, Managed Services, and Support Services work closely with customers to ensure a seamless, superior, end-to-end solution.

The passion, dedication, and superior technical knowledge of our people are the backbone of our success. We work with internal resources and premier integrators to ensure the best possible solution, giving our customers a single point of contact to ensure that scope, budget, and schedules meet predefined project plans and expectations. As the originator of the Reality Center concept, we apply proven methodologies, cutting-edge technology, and the industry's greatest experience to make our customers' collaborative visualization goals a reality.



Visual Collaboration

Across Platforms and Geographies

Visual Area Networking

Reality Center technology has greatly increased the synergy and productivity of scientific and industrial teams by enabling them to interact collaboratively in an immersive environment. One challenge has remained: enabling team members to share immersive visualizations from remote locations. With digital data doubling every year, the million terabytes of storage capacity sold in 2002 will become 8 million terabytes by 2005. And as storage becomes cheaper, capacity increases swiftly to contribute to the data explosion. Today's immense data sets, and the people who need to work with them, can't always be in the same place at the same time, and bringing them together physically is costly and time-consuming. Now SGI Reality Center users can accelerate workflow and improve return on investment by extending the immersive environment to distant locations.

SGI developed new graphics infrastructure software, graphics hardware, and desktop systems to make its Visual Area Networking (VAN) vision a reality. VAN's visual serving power removes distance barriers between collaborative teams and individuals, enabling them to interact with advanced visualizations from any location on the globe using any computing device. Design teams at Reality Center facilities in North America and Europe can collaborate as if they were in the same room. Individuals at remote locations can participate using desktop or laptop computers. VAN brings people, data, compute power, and advanced visualization power together to take productivity to new levels of scientific and industrial productivity. It's a virtual world today. Now you can make your company a virtual company with VAN.

The combination of Reality Center and VAN technology improves workflow by providing transparent access to compute and visualization resources. It enables personnel at widely separated locations to interact collaboratively with large data sets, sharing results visually and participating in the decision-making process. A design team can accelerate projects by calling in specialists at distant locations who can manipulate the data with the team and provide needed feedback. Expert resources are more readily available when needed, because they can easily participate in meetings at widely separated locations without leaving their desks.

The VAN concept, developed and pioneered by SGI, does more than enhance workflow and productivity through collaboration. It also allows organizations to centralize data storage and save the costs of moving great amounts of data across the network. Users scattered globally across time zones can access central data storage and compute resources at different times, leading to potential 24x5 or 24x7 utilization of visual supercomputing facilities. On an Onyx family system with multiple graphics pipes, remote clients can use a single pipe each to access visualizations from their desktops, further improving return on investment (ROI) on the Onyx family system.

Researchers at Mississippi State University use the Reality Center for studying computational fluid dynamics.

Industries and *Applications*

Image to Left: GeoQuest exploration software in Schlumberger iCenter using Barco GALAXY WARP Stereo DLP Projectors.

Manufacturing

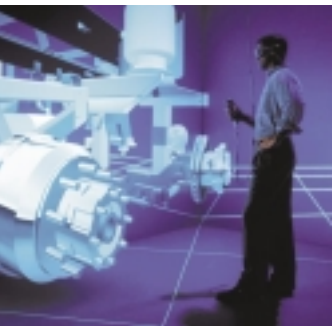
- Styling/industrial design
- Mechanical design review
- DMU—ergonomics/assembly sequencing
- MCAE visualization
- Factory layout, simulation, and robotics
- Virtual training
- Sales and marketing

Reality Center collaborative visualization facilities are indispensable tools for the manufacturing industry, providing rapid ROI and improved product development processes. Engineers and designers can create digital models and implement design changes in a fraction of the time it takes to build expensive physical prototypes, saving money, reducing time to market, and improving quality and safety. With Reality Center facilities, engineering, procurement, and marketing teams are now able to participate in high-fidelity, 1:1 scale real-time 3D walk-throughs to visualize and interact with every part of a complex design, achieving consensus and avoiding costly mistakes before beginning production.

Energy

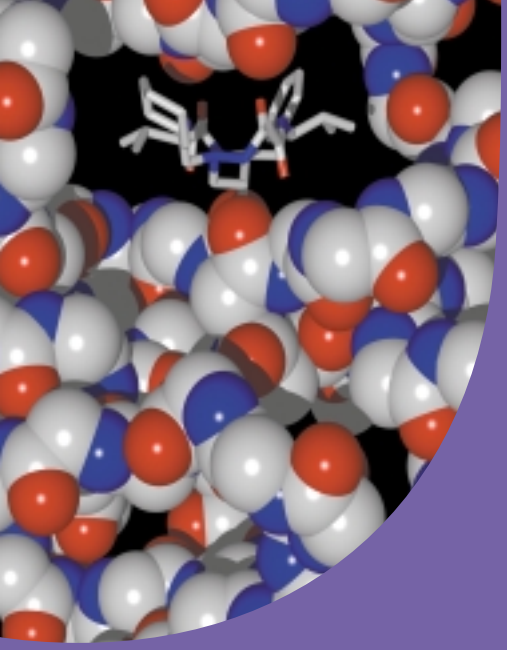
- Seismic volume interpretation
- Reservoir modeling and simulation
- Well planning and geosteering review
- Enhanced recovery design
- Asset team management and review
- Offshore platform design and maintenance training
- Real-time reservoir monitoring
- Remote robotic management of assets
- Disaster modeling, training and scenario planning

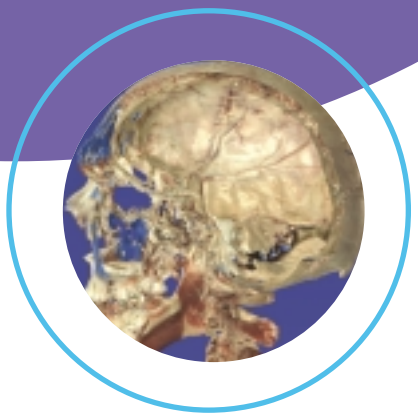
To achieve and maintain a competitive advantage in exploration and production, oil companies need to reduce risk and maximize ROI by interpreting the subsurface more accurately. Reality Center facilities allow geoscientists to visualize and collaboratively interact with large, high-resolution, 3D seismic and reservoir data sets to interpret subsurface structures and stratigraphy. Using this technology, a team of geoscientists and engineers can cost-effectively and more accurately predict and monitor drilling sites in real-time, run reservoir analyses, and design production facilities. Process cycles are shortened, dry holes are minimized, and undetected reserves are pinpointed allowing greater recoveries, resulting in improved project and company return on investment.



An automotive suspension system created with PTC/Division software and experienced in the Fakespace CAVE.

Teesside University's Hemispherium designed and installed by Trimension Systems.





Sciences

- Molecular modeling for drug discovery
- Anatomy simulation for surgical planning and training
- Physics and engineering simulations
- Volume rendering and visualization
- Archaeological reconstructions
- Art and architecture design and virtual construction
- Computer–human interface studies and cognitive science
- Networked collaboration

Whether being used to improve the effectiveness of surgical interventions, analyze molecular models, or simulate the creation of the universe, immersive visualization helps scientists make breakthrough discoveries. Researchers and cross-disciplinary groups of collaborators can visualize and interact with huge, multidimensional data sets and simulation codes in real time. Reality Center facilities enhance understanding, facilitate insight, and drive better decision making for scientists around the world.

The Orion Nebula at Hayden Planetarium.

Planetariums, Science Centers, and Museums

- Galaxy fly-throughs
- Scientific education
- Archaeological reconstructions
- Cultural heritage preservation
- Corporate visitor centers
- Expos

Reality Center facilities have spawned a whole new world of creative possibilities in planetariums, science centers, and museums. For the first time ever, people have the ability to explore our universe, fly through a strand of DNA, stroll through a virtual model of an Egyptian tomb, and examine minute details of priceless works of art—all interactively. In virtual space, we can even ride a roller coaster designed by a 10-year-old. These real-world examples combine the total immersion and unprecedented realism offered by SGI solutions. A new level of interactive education has made its debut.

Defense, Intelligence, and Homeland Security

- Collaborative command and control
- Surveillance and intelligence
- Mission preparation and rehearsal
- Geospatial imagery exploitation
- Training and simulation

Reality Center environments can be used by governments around the world for collaborative command and control, critical and time-sensitive decision-making, mission-preparation and rehearsal activities, and immersive training. The SGI Onyx family, with its superb resolution and real-time accuracy, supports data fusion of disparate data sources, including geospatial information, video, visual databases, and computational data. The Reality Center solution is the ultimate tool for visualizing information by providing a collaborative, immersive environment to enhance mission success and decision-making capability.

Immersive Software Partners

Automotive Styling using Opticore at Volvo Corporation.

Partnering with the Experts

Great hardware is only part of the solution. SGI works closely with the world's leading software companies to deliver fully integrated, optimized solutions. As a result of these strong alliances, only SGI provides you with a suite of applications and toolkits to help you achieve the greatest performance and unsurpassed return on your investment.

- Manufacturing

  Alias|Wavefront, Cadcentre, Computational Engineering International (CEI), Dassault Systemes, DELMIA, EDS' PLM Solutions, ENOVIA, ICEM Technologies, Intelligent Light, Matrix One, MultiGen-Paradigm, Opticore, Parametric Technology Corporation (PTC), Tecnomatix, VirCinity, vrcom

- Energy

  Austin GeoModeling, BP Center for Visualization, Dynamic Graphics, Earth Decision Sciences, Landmark Graphics, Magic Earth, Paradigm Geophysical, Roxar, Schlumberger, Rock Solid Images

- Sciences

  Advanced Visual Systems, Bracco Group/Volume Interactions, Chemical Computing Group, Computational Engineering International, EDS PLM Solutions, Muse, TGS, Tripos, Visual Concepts, Visual Influence, Inc., Visual Molecular Dynamics, VRCO

- Planetariums, Science Centers, and Museums

  ACS Studio, Alias|Wavefront, ART+COM, de pinxi, DigitaLight Pictures/Science Data, Imagination Computer Services GesmbH, Infobyte, MultiGen-Paradigm, Toppan Printing Co., UCLA Cultural VR Lab, UCLA Urban Simulation Team

- Defense, Intelligence, and Homeland Security

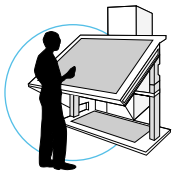
  VRCO, Mak Technologies, Lockheed-Martin, General Dynamics, MPI, Aechelon, and TerraSim

Decision Support Center for Government and Homeland Security.

Delivering the Right Solution

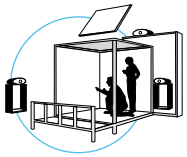
SGI partners with a select group of display providers to deliver SGI Reality Center facilities. These companies are an integral part of our solution delivery, and each has been selected for its excellent products, state-of-the-art technology, and proven ability to deliver and support high-quality solutions. Around the world, in every industry, SGI and its partners have the expertise and capability to deliver products that meet your needs today and tomorrow.

NASA's new FutureFlight Central facility is a full-scale air traffic control tower that tests ways to solve potential air and runway traffic problems at commercial airports.



Desks

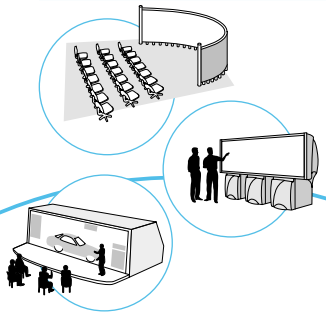
These immersive devices are suitable for small groups or individual work and are ideal when the working environment requires high degrees of natural interaction with models. Their size provides enhanced scale while maintaining the workdesk style of interaction.



Rooms

The most immersive of facilities, rooms may be configured with three to six surfaces to enclose the users within the data.

From virtual worlds to complex data analysis and models of physical phenomena, these highly immersive facilities add the ability to maintain a sense of place within the model.



Walls

Ideal for large groups, walls are available in front- and rear-projected configurations. Cylindrically or spherically curved walls provide both scale and a high degree of immersion while encompassing the audience's peripheral vision. Flat wall environments are typically rear-projected (no shadows cast by collaborators) and display images with true dimensions while allowing optimal perception from all viewpoints.

Reality Center Components

- SGI Onyx family visual supercomputer, available in various configurations
- A wide range of high-brightness projectors and display screens to support various functions and numbers of participants
- Software applications, toolkits, and utilities
- Central data, audio, and lighting control system, including touch-screen panels
- Stereoscopic viewing devices
- Input controllers
- High-fidelity, multichannel audio/video playback
- Support for networked, high-bandwidth interaction between geographic locations
- Innovative software:

–OpenGL Multipipe™ graphics system software allows OpenGL® API–based applications to transparently drive multipipe, multifrustum displays

–OpenGL Multipipe™ SDK provides run-time portability of OpenGL applications between single-user and large-scale environments such as SGI Reality Center facilities

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