Success Story

Instant Multi-Platform Data Sharing Accelerates Projects

UNLV Campus

UNLV's National Supercomputing Center

The Challenge

Improve efficiency by accelerating access to data; give multiple users simultaneous access to files; provide cross-platform file access in a heterogeneous environment

The Solution

Create a SAN with the SGI® InfiniteStorage Shared File System CXFS™ for instant data sharing among IRIX®, Solaris™, and Windows® operating system resources, eliminates data access wait time and removes file duplication

The Result

Greatly reduced file access times; enhanced workflow; reduced administration costs; faster project turnaround

The NSCEE at UNLV: A National R&D Resource

The U.S. Congress established the renowned National Supercomputing Center for Energy and the Environment (NSCEE) at the University of Nevada Las Vegas (UNLV) in 1990. The Center has since developed into a powerhouse national resource for customers in industry, academia, the research community, and government. It fills the needs of UNLV researchers for massive compute power and provides a state-of-the-art facility in support of federal government projects.

Since its inception the NSCEE (www.nscee.edu) has supported more than 200 scientific projects for users in 24 states, Japan, Germany and Canada. Most have been related to energy and environmental concerns. From its Air Resources Laboratory in Las Vegas, the National Oceanic and Atmospheric Administration (NOAA) runs the Regional Atmospheric Modeling System, a high resolution weather simulation model, at least once a day on the NSCEE's SGI® 3800 system. The model, known as RAMS, predicts the weather for Nevada, California, Arizona, and Utah at resolutions down to two kilometers.

SGI Technology: Heartbeat of the Center

"We are excited and proud of the role that SGI technology plays in supporting the NSCEE's mission," said NSCEE Director Joseph Lombardo. "Our goal is to apply the very best science and technology to enhance University research programs. We accomplish this with advanced capabilities such as remote interactive graphics, nationwide digital libraries, and network-based, high-definition visualization laboratories."

The NSCEE's central computing resource, installed in August, 2002 and upgraded with additional processors in February, 2003, is a 32-processor SGI® Onyx® 3800 visualization system with 32 gigabytes of memory and InfiniteReality3™

graphics. This system, with its high-bandwidth CC-NUMA architecture, combines supercomputing and visualization technologies to support 3D graphics, and video streaming in real time. Its ability to run both number-crunching and scientific visualization software make it an ideal resource for engineering, science, and entertainment research.

The NSCEE user community currently utilizes the SGI Onyx 3800 system for demanding high-performance computing applications that include computational fluid dynamics, weather modeling, modeling of radiation detection systems, computational chemistry, telehealth, medical records, compressible fluid flow, groundwater contaminate transport, and outdoor and indoor air quality.

Enhancing Efficiency for Users: CXFS and a SAN

When the NSCEE acquired its SGI Onyx 3800 visualization system in 2002, it wanted more than supercomputing and visualization power. Its other goals included cost reduction, fast cross-platform file access, and greater efficiency. "Efficient data access is not only desirable but is critical to the success of the NSCEE'.s scientific, engineering and data-intensive computing applications," says Lombardo.

SGI engineers installed a high-speed Fibre Channel storage-attached network (SAN) that links the SGI® Onyx® server with an SGI® InfiniteStorage TP9400 Fibre Channel RAID storage system; three servers, a disk array, and a tape library from Sun Microsystems; an automated cartridge system from StorageTek; and an RS1100 cluster from RackSaver. SGI InfiniteStorage Shared File System CXFS gives NSCEE customers seamless file access across the Center's heterogeneous compute environment. "The ability to instantly share data across multiple platforms and operating system environments, such as IRIX, Solaris and Windows, is a unique and powerful feature provided by CXFS," says Lombardo.

In addition to providing cross-platform file access, CXFS™ enhances workflow and reduces costs in the data-intensive NSCEE environment by eliminating file duplication. Users access and view files across the SAN without the need for time-consuming network mounts and copies.

"CXFS is about ROI," says Lombardo. "Our primary goal at the Center is to simplify data management by lowering costs, reducing risks, improving service levels while increasing productivity. With CXFS, the time we save by not having to wait for network-based data sharing translates directly into greater productivity. The fact that there are no copies means we have lower costs both in administration and in buying storage capacity."

Extending the Center's Reach

The NSCEE's SGI Onyx 3800 system also serves as the image generator for its new Internet2 Graphics Visualization Lab, a high-performance interactive facility for projects that flow from UNLV academic and research programs. The Lab is equipped with complete facilities for interactive file-sharing and audiovisual collaboration with colleagues and industry partners at remote locations.

The NSCEE is currently developing an interface that will provide remote data access and interactive teleconferencing to Nevada health care providers under the Nevada Telehealth Technology Initiative. The Center plans to use SGI® OpenGL Vizserver™ software to enable medical professionals at rural locations across the state to view medical images and other graphics files from their desktops, and to teleconference with other professionals to improve the timeliness and quality of medical care for Nevada residents.

These and other innovative uses of SGI technology continue to build the NSCEE's reputation as a leading international resource for research and development.

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