Solution Paper

SGI® Data Management and Recovery Solutions for Homeland Security

1.0 Introduction

Following the tragic events of September 11, 2001, government and industry have rallied to the call for a revolution in homeland security. As new security challenges emerge, we must act quickly and provide answers for the prevention of terrorist attacks within the United States. SGI hopes to play an increasingly important and meaningful role in facing this new terrorist threat. Proven SGI solutions available today will have an immediate impact on reducing our nation's vulnerability to the threat of terrorist attack.

For over 20 years, SGI has been committed to meeting customer needs in their most complex technical computing visualization and data management environments. While technical computing is one of the many disciplines our competition might choose to address—the blend of technical computing, complex data management, and visualization is our entire focus at SGI.

We have partnered with some of the world's largest government agencies and system integrators to help address their HPC, visualization, complex information management, and services needs. Our in-depth knowledge and understanding of customer issues and challenges and our commitment to excellence in delivering superior solutions set us apart from the competition. One common thread connects all of our customers: their need to manage and distribute massive amounts of data—in most cases, the faster, the better.

In his 2003 State of the Union speech, President Bush called for the formation of an independent terrorist-threat integration center to enhance the ability of intelligence and law enforcement agencies, as well as the private sector, to share data and respond to the threat of imminent terrorist attacks.

Bush stated, "Since September 11th, our intelligence and law enforcement agencies have worked more closely than ever to track and disrupt the terrorists. The FBI is improving its ability to analyze intelligence, and transforming itself to meet new threats."

The president went on to say, "Tonight, I am instructing the leaders of the FBI, the CIA, the [Department of] Homeland Security, and the Department of Defense to develop a Terrorist Threat Integration Center to merge and analyze all threat information in a single location. Our government must have the very best information possible, and we will use it to make sure the right people are in the right places to protect our citizens."

2.0 Raising the Bar

With this challenge, the IT industry in partnership with government will be asked to create an information integration center that will push the frontier of high-performance data access, storage, and dissemination. By design, its "fused" products must provide more value to security and law enforcement agencies than the sum of their individual bits of data. The need for information management and data integration will not only exist at the federal level, but also at the state level and, in some cases (as in large urban centers), at the local level.

At SGI, we have found that most consolidation and data sharing efforts tend to dam up data as it tries to flow through a conventional data infrastructure. This might not be a problem when data is small and non-critical. But the data files that will need to be managed, fused, and delivered to the right person at the right time include HD and conventional video, audio, high-resolution satellite imagery, all types of geographical-based information system data, CAD drawings, weather, and environmental sensor data, to name a few. These files will not stand on their own, but will need to be "fused" and visualized to provide superior information products. The extreme nature of the data management challenges requires the best solution our IT community can offer. For the past 5 years, SGI has been delivering solutions that effectively consolidate storage infrastructures; and since our inception 20 years ago, we have been smashing the information bottleneck that restricts the flow of information and critical insight.

3.0 SGI Data Management Mission Statement

SGI is dedicated to providing an integrated, end-to-end solution that allows our customers to address their largest and most complex data and content management issues in a heterogeneous, high-performance computing environment.

3.1 Important Data Solution Areas

- **Data sharing**: Concurrent, heterogeneous access to critical information, as provided by high-performance file serving and clustered SAN filesystem
- **Database connectivity**: High-performance database foundation, any-data-anywhere heterogeneous database, and shared filesystem interoperability
- **Data life-cycle management**: Maximum performance and scalability, adding infinite storage for growing needs via a high-performance hierarchical storage management system
- **Data security**: Integrating best-in-class technologies to ensure the safety and integrity of critical information assets through multilevel security
- **High availability**: Always-on infrastructure through highly available power, system, data access, and application support

- **Data protection**: The ability to store and retrieve valuable information online and recover from catastrophic events, including disaster recovery
- **Data visualization**: Creating global, distributed collaborative visualization environments

3.2 Benefits for the Government Agency

- Impact on top-line value
  - –Faster project completion
  - –Increased availability of information provides increased ability to look at the big picture
- Lower total cost of ownership
  - –Optimal use of management and technical resources
  - –Fewer investments in hardware and skills
- Higher availability mitigates risk
  - –Secure heterogeneous environment
  - –Uninterrupted information availability following server failure
- Faster recovery of lost or corrupted information

3.3 SGI Data Management Capabilities

As you can see in the diagram below, SGI has a wealth of capabilities and expertise to bring to bear in solving each of the data management issues mentioned above. These capabilities are fully integrated in a seamless manner, but may be deployed in whatever combination is needed to customize a solution that meets the specific needs of your organization.

Most vendors expect data management solutions to cover (to varying degrees) storage management, backup and recovery, and some level of high availability.

SGI believes that although this may have been a typical infrastructure expectation in the past, government agencies in the post 9/11 environment should demand more from a solution provider to ensure that the information management infrastructure aligns closely with their organization's need for reliability, security, and collaboration.

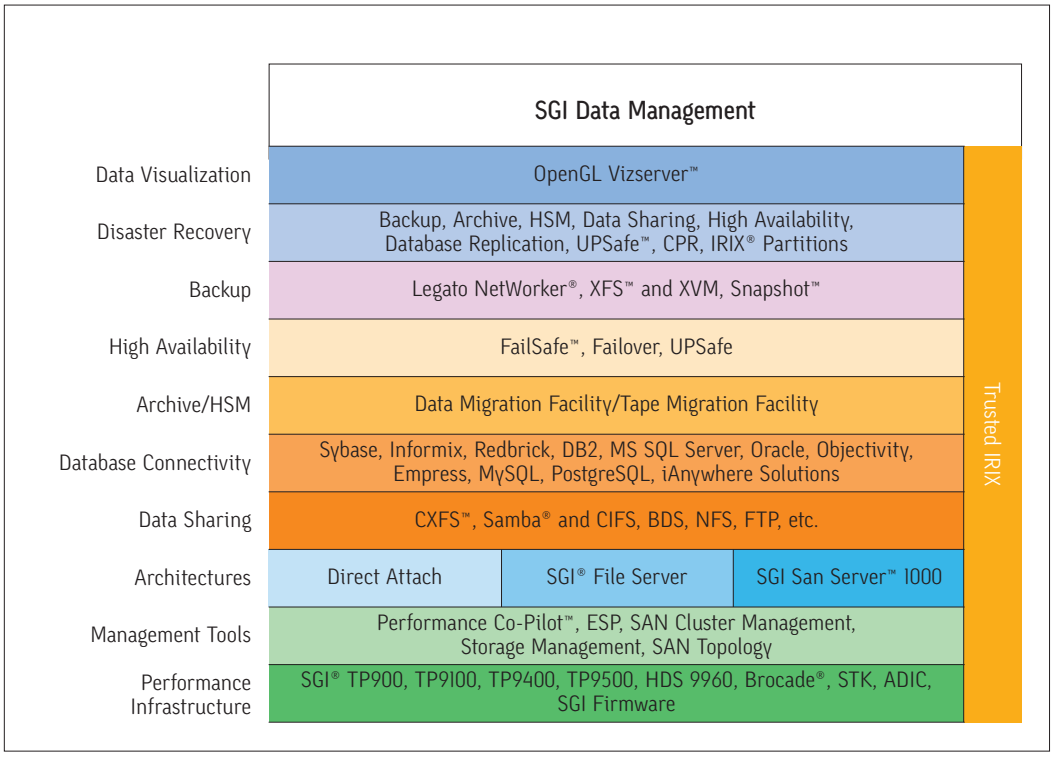
4.0 Storage Area Network Technology

SGI has extended its model beyond the traditional Storage Area Network (SAN) by adding the following:

- Data sharing promotes both local and long-distance high-performance collaboration and information sharing
- Database connectivity enables sharing and fusing of data among heterogeneous databases and the unique CXFS™ shared filesystem
- Multilevel security monitors and protects infrastructure, applications, and information
- Operational continuity and disaster recovery ensures that, in the event of failure, infrastructure is online in accordance with your organization's objectives (seconds, minutes, hours, or days)

SGI has set the new standard for data management solutions and is delivering TODAY. Let's look in more detail at the capabilities of this extended SAN model.

3.3 chart-SGI data management



5.0 Data Sharing

Data sharing at its simplest is the ability for two people to access the same information. This says nothing about optimizing access from a performance, heterogeneous system, versioning, or workflow perspective. The data sharing illustrated in figure 1shows the ability to share information on a single system, with no sharing of information between disparate systems. In today's world, this sort of data sharing is almost unheard of.

More common, data is shared between systems through a network interface layer. This allows disparate systems to share a copy of a file over a slow network connection. In situations where huge files (gigabyte size or larger) are not inherent, when timely access to the information is not critical, and when large amounts of information do not need to be moved, a host server form of data sharing can be very effective. This strategy is depicted in figure 2.

True data sharing is the ability for two or more users on different systems to access and modify the same file without having to make copies of that file, and to do so with performance and ease—as if the file were locally available on each user's system.

5. 1 Benefits of Data Sharing

- Heterogeneous, concurrent access to critical information across the entire workflow

Fig. 1. Traditional Data Sharing Approach

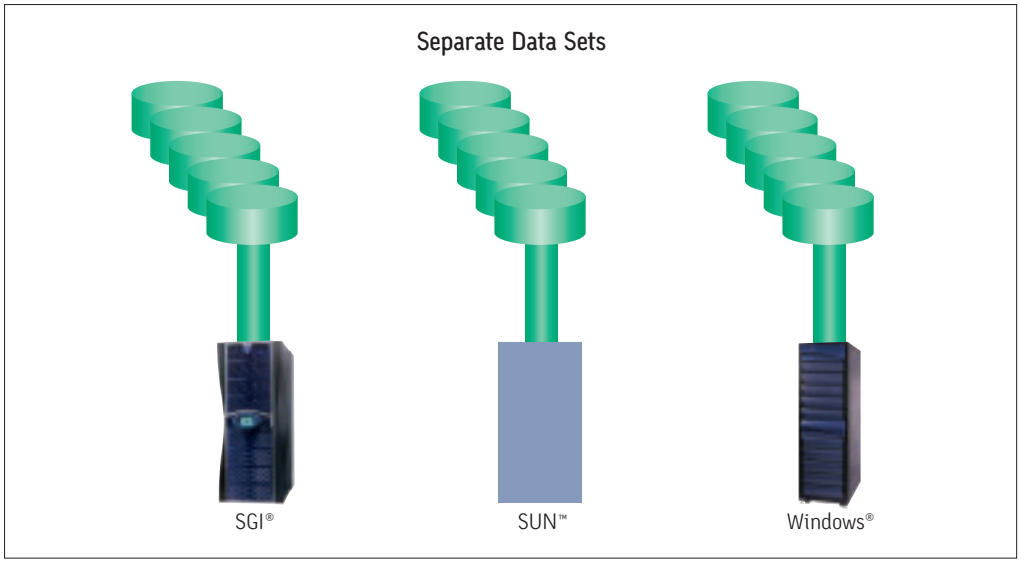
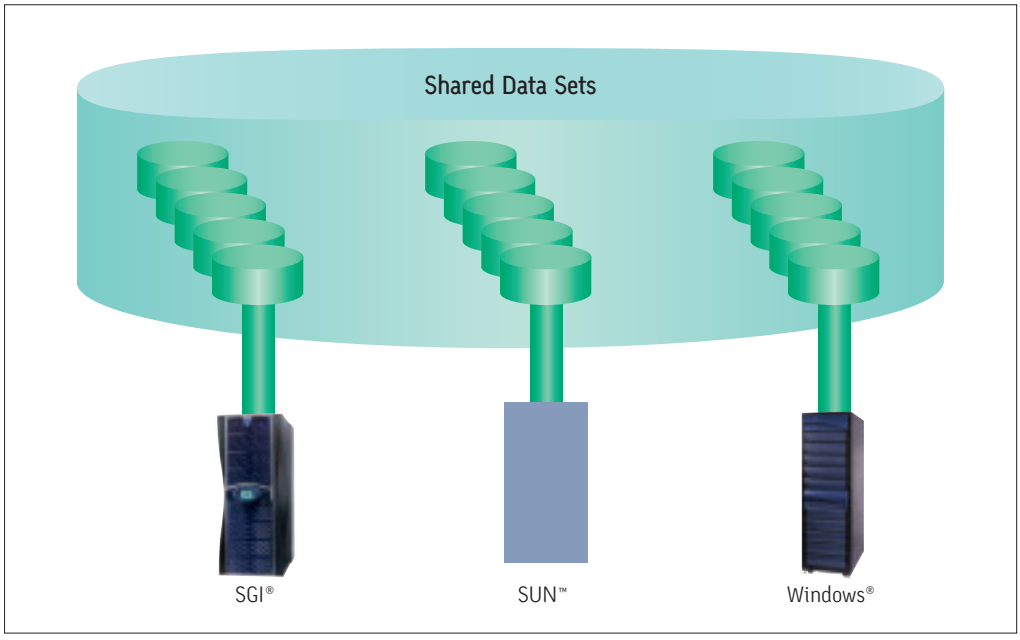


Fig. 2. Host Server Providing Agnostic Access



- Accessing a single filesystem with the widest data path available
- Workflow compression by eliminating file copies and moves
- Massive scalability to handle data extremes
- Uninterrupted information availability following server failure
- Integration of near-line and archived data

6.0 The SGI SAN Solution

A true data sharing capability is what SGI has been delivering as part of its SAN solution to customers in multiple technical disciplines. Our customers can have a complete storage area network architected, ordered, installed, tested, and verified. Recently, SGI has productized this capability as the SGI SAN Server™ 1000.

Features
- Turnkey SAN solution with integrated SAN filesystem
- High data availability
- Industry-leading bandwidth and scalability
- Lower total cost of ownership
- Expert installation
- Ease of administration

The SGI SAN Server 1000 system is an integrated storage area network solution for sharing files across heterogeneous platforms—simplifying data management and improving data-intensive workflows. Choosing and integrating the various hardware and software components that make up a modern SAN can be daunting. The SGI SAN product is a true, hands-off, turnkey solution. SGI provides hardware, software, and professional services for any customer requiring the quick, low-risk, high-performance implementation of a large, robust, reliable storage area network. Special SGI, software and firmware are installed to improve performance and system efficiency.

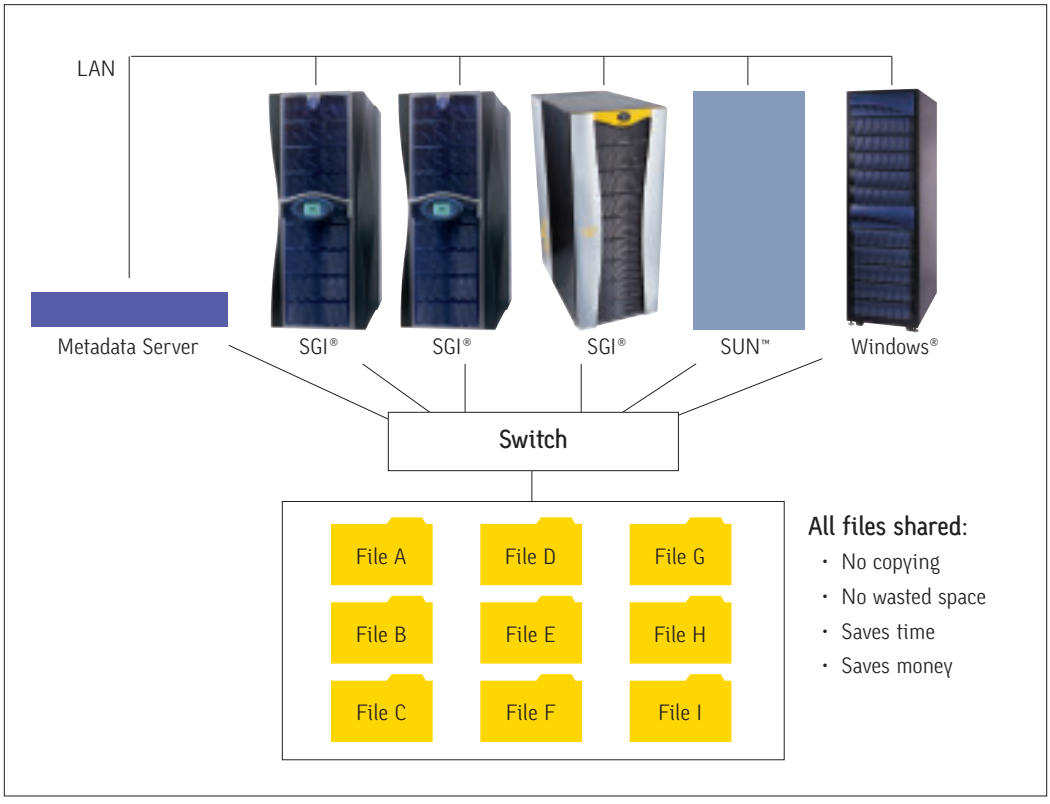
6.1 The CXFS Filesystem

The CXFS filesystem is the heart of the SGI SAN data sharing capability and the SGI SAN Server 1000.

SGI CXFS combines shared data access features of network-attached storage with the scalability and direct-connect performance of a SAN. It is the only kernel-level, shared filesystem that supports a heterogeneous network, providing fast access to your data, no matter what platform you use.

A SAN with CXFS provides the following features:
- **Heterogeneous client support** (for IRIX®, SolarisTM, Windows®, and 64-bit Linux® for SGI® Altix™[1]): This ensures quick access to your information from any system in your data center.

Fig. 3. SGI SAN Server benefits



[1] Altix support available summer 2003; support for IBM® AIX®, HP-UX, 32-bit Linux32bit, and Mac® OS is also planned.

- **Shared data access**: By making all files available to all users and eliminating transfer times and unsynched copies, CXFS enables users to simultaneously do multiple tasks that have historically been sequential; this can be a huge time-to-delivery advantage.
- **Data access and availability**: All systems have access to all files; if a server or connection fails, another server can retrieve the data, ensuring you always have access to your information.
- **High bandwidth**: The state-of-the-art 2GB Fibre Channel is 10 times faster than other data sharing technologies and is the basis for ensuring your data is available when you need local access performance.
- **Resource consolidation**: A single backup device may be shared among multiple servers and the entire shared file volume backed up without interruption. This reduces the cost in backup devices, frees up crowded Ethernet connections for their intended purpose, and shortens the backup window at times when backups are consuming more time than is allocated.
- **Centralized management**: Shared volumes are centrally configured and administered; in addition, the CXFS GUI serves as a single launching point for hardware-monitoring devices. This helps lower the cost of administration.
- **Modular scalability**: Change volume sizes among multiple shared filesystems, or reallocate to or from the shared file volume and dedicated file volumes, ensuring that you can quickly and seamlessly reallocate resources to different tasks, as your operational needs change.
- **Wide area file sharing**: Create a SAN environment with shared files in multiple locations thousands of miles apart, allowing all the benefits of heterogeneous shared files over a much wider area.

6.2 Wide Area File Sharing Explained

At Supercomputing 2002, SGI and LightSand Communications announced a breakthrough in providing instant access to terascale data with the successful demonstration of a high-speed, multi-OS shared filesystem over a wide area network (WAN).

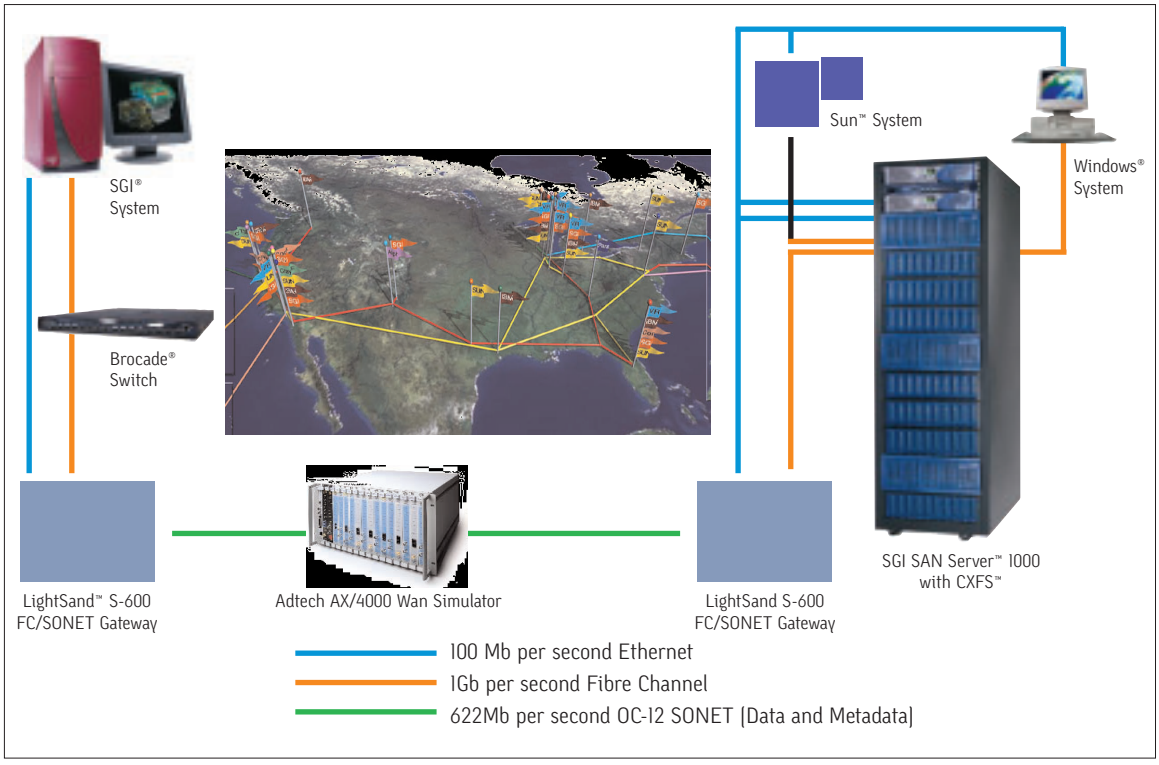
7.2 How it Works

SGI CXFS shared filesystem technology is the cornerstone of SGI SAN solutions. To enable the WAN implementation, LightSand provided its S-600 gateway, which efficiently transports both Fibre Channel and IP data across the wide area network. This revolutionary device provides a high-throughput WAN gateway and dramatically exceeds the performance of systems that use routed IP across the WAN.

In the initial test on the exhibit floor, two groups of SGI® Origin® 300 servers were connected via Fibre Channel to SGI® TP9400 disk arrays, creating two separate data centers that were linked using the LightSand S-600 gateway. A WAN simulator operated as a delay line to add latency to the test. The performance was measured with each Origin 300 server controlling disk arrays at the opposite data center and resulted in a one-way disk I/O or data access speed in excess of 60MB per second at a distance of 1,000 km. The combined disk I/O was greater than 120MB per second across the wide area network.

Wide area network shared files provide the next major step in the maturity of SANs by allowing government agencies in geographically distributed offices to

Fig. 4. Topology of SGI SAN Server and Multi-OS Shared filesystem over WAN



effectively share a single copy of a file as well as back up files or mirror files across the country. SGI is currently further testing this capability with several customers.

7.0 Database Connectivity

Government agencies (at all levels) have an increasing need to share their critical information with other agencies, and "data fusion" promises to play a central role in countering future terrorist efforts. In every case, information from many sources will have to be acquired, integrated, and appropriately interpreted to support decision makers, from emergency response units to intelligence organizations.

For effective data fusion, it is important that databases work together to accelerate the workflow with efficient, flexible, high-performance data interoperability across multiple database servers and filesystems.

The industry-leading features of SGI® NUMAflex™ systems offer uniquely powerful support for mission-critical IRIX and Linux® applications, as well as native high-performance database infrastructure support for those applications, wherever needed.

Multivendor database support for NUMAflex and IRIX includes Sybase, Informix (IDS and Red Brick), Objectivity, Empress, PostgreSQL, and MySQL.

These and other leading database vendors are working with SGI on a new way that databases can leverage NUMAflex—using Intel® Itanium® 2 microprocessors and a standard Linux operating system running on SGI® Altix™ 3000. IPF-Linux ports of many of the major databases will likely be available in 2003.

7.1 SGI NUMAflex: The Future for High-Productivity Database Serving

SGI solutions allow customers to attach to heterogeneous databases with industry-standard mechanisms (database gateways) and share information across those heterogeneous servers through our CXFS filesystem (data access pipe).

Our CXFS filesystem provides the fastest available means to share heterogeneous database information, delivering more information and removing another of the formidable roadblocks to uninterrupted information flow between various repositories of information critical for homeland security.

Fig. 5. Separate Databases

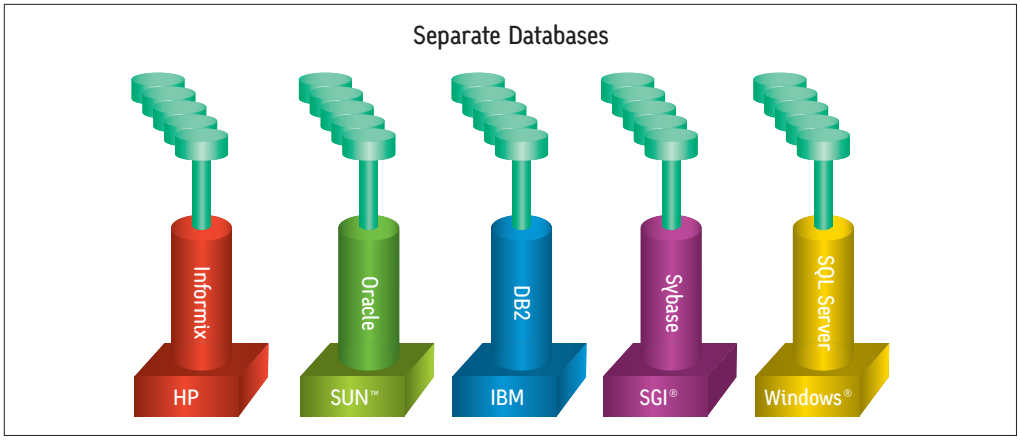


Fig. 6. Shared Databases using CXFS

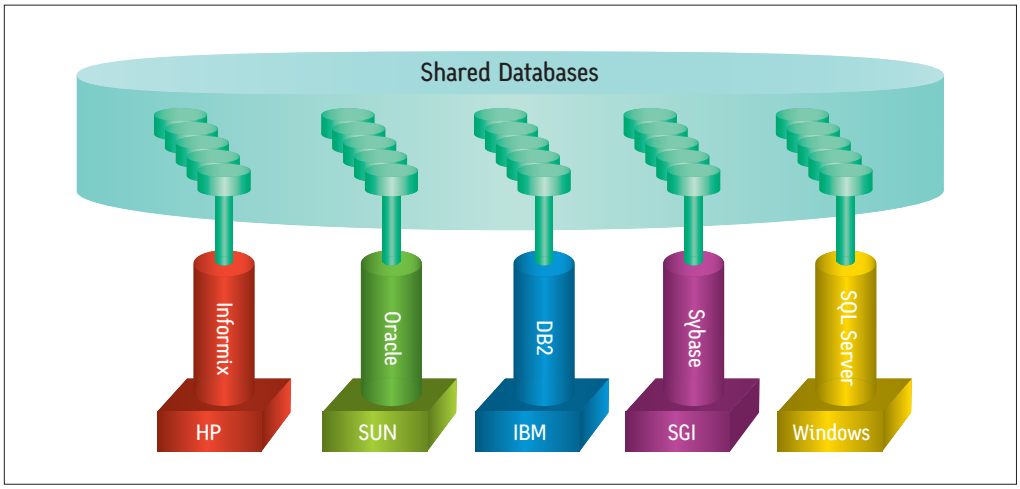
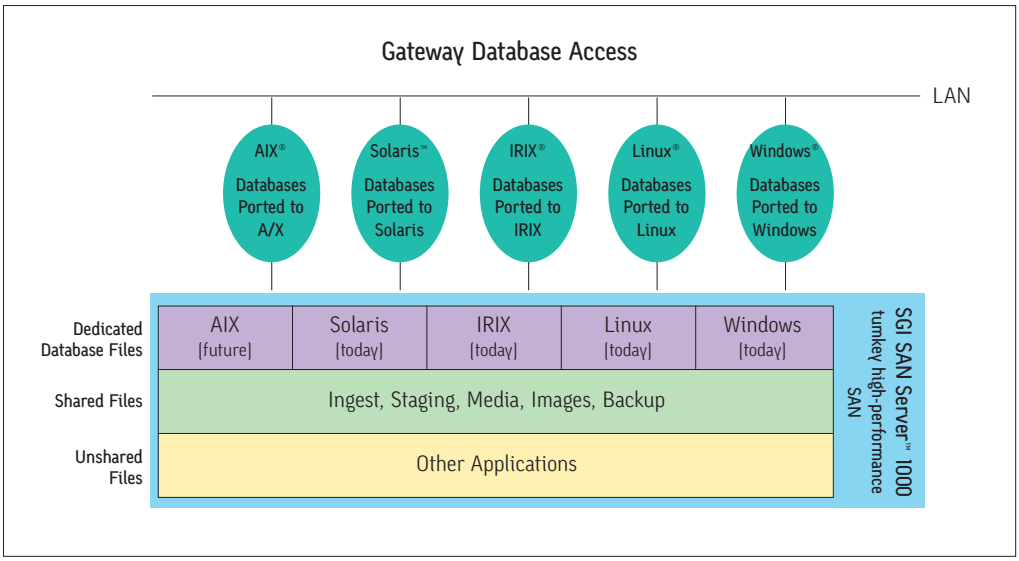


Fig. 7. SGI San Server provides a powerful framework for data interoperability



7.2 Separate Databases

SGI SAN with CXFS enables the sharing of heterogeneous databases.

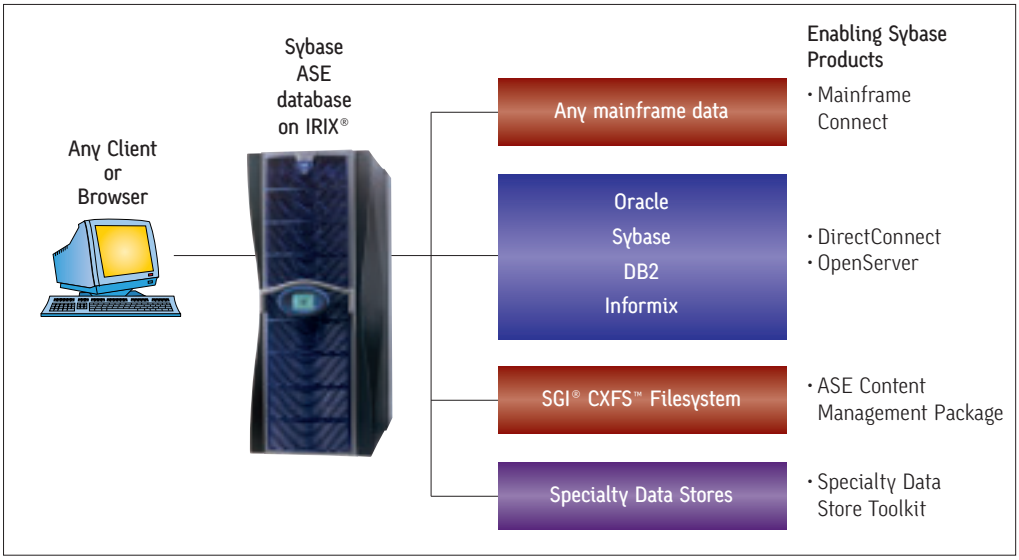
In addition to enabling applications to take advantage of many databases directly through native support of SGI NUMAflex systems, SGI and its database and middleware partners offer flexible, dynamic, standards-based options for data interoperability in heterogeneous environments.

These options include simple or transparent access, aggregation, acceleration, and replication of one, many, or all of an organization's distributed, heterogeneous, standards-compliant databases, as well as value-added ways to link databases with industry-leading SGI filesystem technologies.

A high-performance SAN fabric running CXFS, such as that provided by SGI SAN Server 1000, is the heart of this efficient and powerful framework for data interoperability. There is space for dedicated database files, for shared files, and for unshared files needed by other applications.

Running a database on top of the ultrafast CXFS filesystem can accelerate database performance, effectively substituting for a filesystem slower than IRIX native to the database platform used. The shared

Fig. 8. Data extraction from multiple databases using Sybase software on SGI IRIX



file space, accessible by all CXFS clients, can be used to accelerate data-intensive workflows by moving database query results, database-controlled content, and database backup files into, and out of, the high-performance CXFS filesystem, rather than moving that data over the LAN.

In addition, high-speed big data ingest can be absorbed by CXFS first, before loading a database server that would be unable to handle the needed bandwidth. Access among databases running on a variety of heterogeneous platforms is provided, using database gateways over a LAN. All database vendors provide various gateway options.

The example below shows how Sybase's industry-leading data connectivity tool allows extraction of data from multiple databases and filesystems into one common user view.

The Sybase ASE database with CIS (Component Integration Services) runs on an SGI server based on MIPS and IRIX and using NUMAflex and can access data from a variety of sources in a heterogeneous environment, providing a transparent user view of required data.

Sybase Mainframe Connect™ products provide access to mainframe data, and DirectConnect™ provides access to databases on a variety of heterogeneous platforms. Sybase Open Server can be used to write an application to connect to other ODBC-compliant databases, and the Content Management Package for Sybase ASE database enables access to files in a filesystem, external to the database. This Content Management Package can connect to CXFS, maximizing its value due to CXFS's high-performance and multi-OS file sharing capabilities.

7.3 Database and Filesystem Interoperability Example Using SGI SAN with CXFS

Problem: Ingest data at higher I/O rate than Sun server could support
Solution: SGI SAN Server 1000 with CXFS share filesystem

1. SGI server ingests data in real time to shared filesystem.
2. Sun loads Oracle® at its maximum transfer rate from shared filesystem.
3. Oracle query-results files are stored in CXFS shared filesystem where they are accessed at local speeds by all CXFS clients.
4. Images are fed to SGI® OpenGL Vizserver™ for image export to the Visual Area Network.

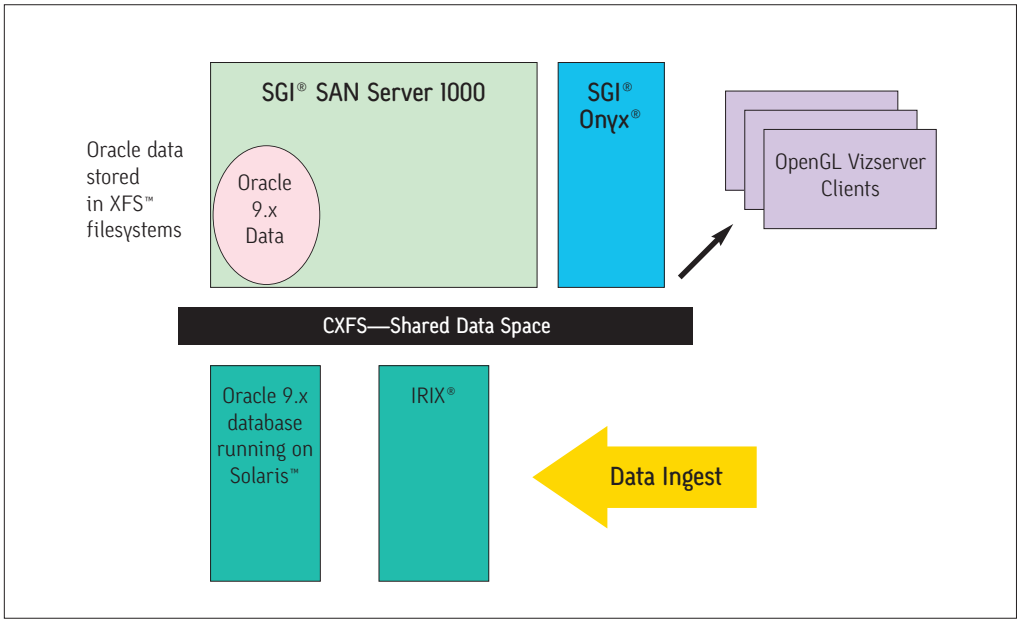
In conclusion, SGI database connectivity solutions provide the following:

Database support for best-of-breed solutions
- Provides optimal support for mission-critical technical and creative applications
- SGI NUMAflex delivers high performance for databases
- Ensures organizational core objectives are met

Access, aggregate, or replicate any database, anywhere
- Transparent access to heterogeneous, distributed databases
- Efficient database movement for disaster recovery or data distribution

Unique database and shared filesystem interoperability
- Leverage industry-leading CXFS shared filesystem
- High-speed ingest and content management of big data
- Shared file access for heterogeneous data-intensive workflows
- Database acceleration

Fig. 9. Database and Filesystem Interoperability Example Using SGI SAN with CXFS



8.0 Data Security: Multilevel Security (MLS)

Offering multilevel security and providing flexibility for our government customers have been an inherent part of SGI strategy since 1989. The SGI® Trusted IRIX™ security-enhanced feature set of its IRIX operating system provides an environment for users to do their ordinary and necessary work, while it enforces a multilevel security policy crafted by site security administration. Trusted IRIX provides a strict security framework that limits user access to data permitted by the MLS policy.

8.1 Trusted IRIX Features

- Limits privilege a program receives
- Documents system misuse
- Finely specifies user access
- Strongly separates users

8.2 Trusted IRIX Benefits

- Prevents sensitive data sets from being viewed or manipulated by unauthorized users or applications
- Eliminates unauthorized access to computer system resources
- Prevents interception of sensitive data over network communication connections

8.3 Multilevel Security Government Example

The U.S. Air Force, a commercial weather forecasting network, and undergraduate university students share a single Trusted IRIX supercomputer. This system is a large SGI® Origin® 3000 system that is shared by three different groups. While all three groups share the system, none of them interacts with the others. They cannot see the information that the other groups are processing or the applications that they are running. For all intents and purposes, each group has it's own SGI Origin 3000 system.

9.0 Data Protection and Storage Management

Government agencies fighting terrorism can't afford to lose critical data or have systems go down during a crisis. SGI provides a comprehensive data protection solution, with the SGI SAN Server 1000 system as its centerpiece technology.

9.1 Disaster Recovery and Continuity of Operation

SGI has the most comprehensive disaster recovery and continuity-of-operations solution available, including all the components necessary to ensure the safety of your critical information as well as the tools to quickly and effectively recover from a disaster, no matter how large or small. The solution includes the following capabilities:

Infrastructure availability—Redundant hardware and capabilities to ensure there is always a path to your data:

- Removal of single-points failures
- Multiple system partitions
- Fully redundant RAID systems and SAN fabrics
- Uninterrupted power for your systems
- Notification of potential failures with proactive system monitoring

Data availability—Capabilities ensure your data is always safe and that you can quickly and efficiently get to your information after a disaster:

- Copies of your data in case of failure
- Data mirroring and replication
- Data migration for online and near-line storage
- Filesystem/data backup
- Database replication
- Immediate access to your data when a system fails
- Database hot standby

Fig. 10.Trusted IRIX example for weather forecasting

Application availability—Ensures that, once you retrieve your data, you are up and running as quickly as possible:

- Minimizing loss of application run time
- Full failover application support and data access point
- Checkpoint restart

All three major capabilities mentioned above can be customized to create a complete disaster recovery and business continuity strategy. SGI—through alliances with companies such as Legato, Sybase, Brocade, and LSI Logic Storage Systems—is well positioned to provide your organization with a complete, integrated, and comprehensive disaster recovery and continuity-of-operation solution.

The following sections outline some of the capabilities available from SGI to support a disaster recovery and business continuity solution.

9.2 Uninterrupted Power Supply

The SGI® UPSafe® Implementation protects computers against electrical anomalies and sudden shutdowns, with an uninterruptible power system and power monitoring software.

The system is positioned between the raw main lines and the electrical equipment being protected. It conditions and filters power, eliminating electrical spikes or surges that may cause damage to the server and its data.

In the event of a complete power failure, UPSafe provides backup power sufficient to support a planned and sequential shutdown of connected systems. This averts a system crash and ensures that data is not lost or corrupted.

9.2.1 Features

- Uninterruptible power system, power monitoring software, and support available
- Solutions ranging from small 500 VA models to large three-phase systems
- Compact system design
- Rack-mount versions available
- Highly scalable solutions available
- Network or direct monitoring included
- User-installable (plug-and-play) for most single-phase models
- Global support contracts

9.2.3 Benefits

- Maximum protection from power disturbances and power outages
- Easy to monitor, maintain, and manage over the agency's network
- Increased system uptime with power regulation
- Advanced Battery Management that doubles battery service life

9.3 Off-Site Data Replication through a Wide Area Network (WAN)

SGI storage solutions include off-site data replication and mirroring to safeguard valuable customer data sets as mentioned earlier in this paper. We offer several options for replicating your crucial data across large geographic distances and provide flexibility in cost, performance, interface, platforms, and distances in developing a solution tailored to meet specific environmental requirements.

9.4 FailSafe™

SGI FailSafe enables applications and services to be highly available, at a fraction of the cost of specialized fault-tolerant systems. In an environment clustered for high-availability, FailSafe automatically fails over applications from one system in the cluster to another. In combination with a RAID or mirrored disk configuration, a FailSafe cluster provides resilience from any single point of failure and acts as insurance against unplanned outages. It also helps minimize downtime due to planned outages by selectively isolating systems for routine maintenance. Applications do not need to be modified in order to realize the high level of availability provided by FailSafe. The solution is scalable to include multiple systems in the cluster, thus bringing together the power of distributed computing, enhanced throughput, and high service availability.

Many of the technologies included in a disaster recover and continuity-of-operation solution can also be used as part of a general storage management strategy to improve access to data and to maximize cost-effective storage infrastructure outside of extraordinary circumstances. The following sections discuss several of these technologies related to data retrieval and archive and data protection.

9.5 Data Archive and Retrieval

Traditionally, data is stored within online storage devices, commonly RAID disks, and after some specified interval, the data is moved to a near-line HSM (hierarchical storage management) system. In the past, each system was engineered for a particular site. Thus, there were substantial costs beyond the initial investment in hardware. Expanding storage, allowing new devices to access the storage subsystem, or adding new types of storage devices often involved substantial engineering and expenditure.

SGI has addressed these issues through its SAN infrastructure and software support with the CXFS mentioned above, as well as with our software products:

Data Migration Facility (DMF)
Tape Migration Facility (TMF)

SGI Data Migration Facility (DMF)
SGI® Data Migration Facility is the industry's leading data migration tool, with over a decade of real-world usage and petabytes of data under management. DMF not only enables users to enhance their storage performance and management, but also allows them to do so at a lower cost.

DMF is unsurpassed in
- **Scalability.** DMF can efficiently manage more data than any HSM solution on the market; in fact, it is almost limitless.
- **Data integrity.** Redundant mechanisms ensure data is verified on every transaction at every step of the process, and a comprehensive integrity-checking tool reports and helps repair any discrepancies that may occur.
- **Stability.** In production for over 10 years, with hundreds of customers around the world.

What does all this mean to the user?
- Reduced costs for expensive high-performance storage systems.
- Reduced costs for management of many disparate storage systems attached to different platforms.
- Data is stored logically, where end users expect to find it.
- Never need to add a new filesystem or break up files unless it fits programmatic requirements.
- You will not lose data, and it will not be corrupted.

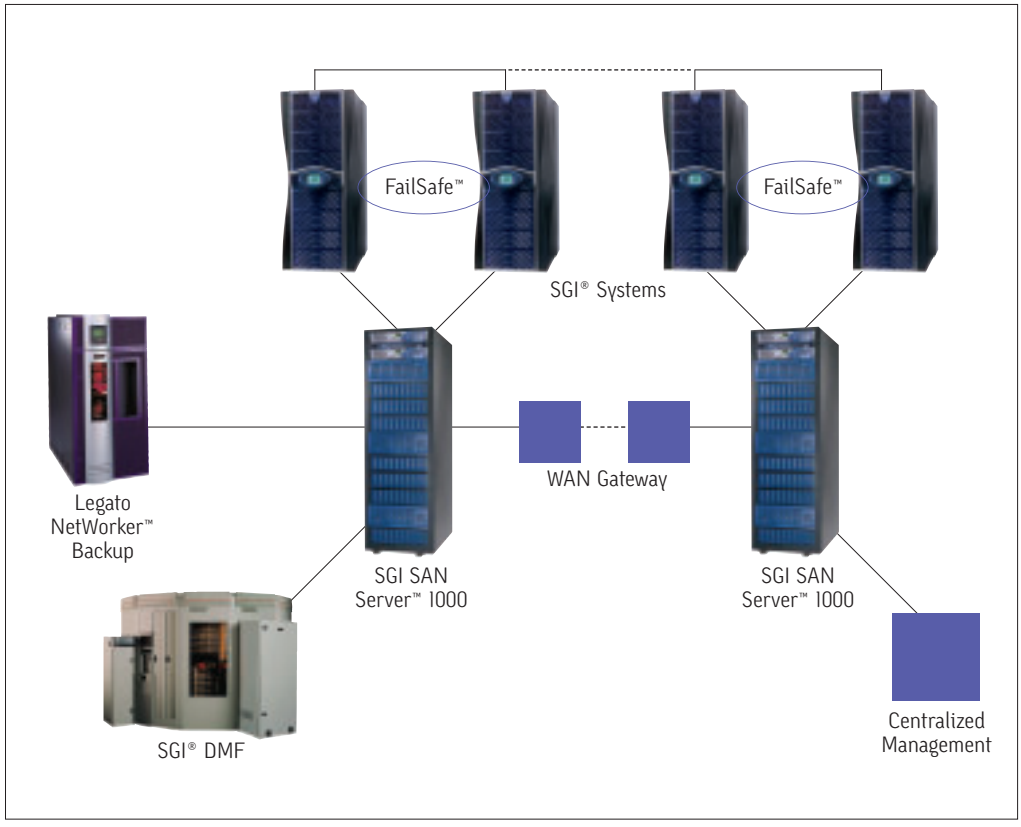
All this reduces costs for the government agency through greater system throughput, lower capital investment, and less time searching for the needed information. In addition, SGI offers specialized conversion services that allow you to easily move data to DMF management with little or no user inconvenience.

9.6 Tape Management Facility (TMF)
TMF supports processing of labeled tape, including multifile volumes and multivolume sets. TMF is most important to customers who run production tape operations that require tape-label recognition and verification and tape security.

TMF also offers a well-defined set of advanced functionalities on all devices that TMF supports: dynamic resource control, ANSI and standard label support, nonlabeled tape support, bypass label processing, dynamic configuration control, multivolume and multifile support, embedded filemarks, distributed operator control, loader domains, user end-of-volume processing, front-end servicing, absolute positioning, OpenVault™ support, and automatic volume recognition.

The basic elements of TMF are the TMF daemon and TMF tape device driver. TMF provides operating personnel with a means to view and manage the tape resources configured within TMF. It also mounts services for the Data Migration Facility.

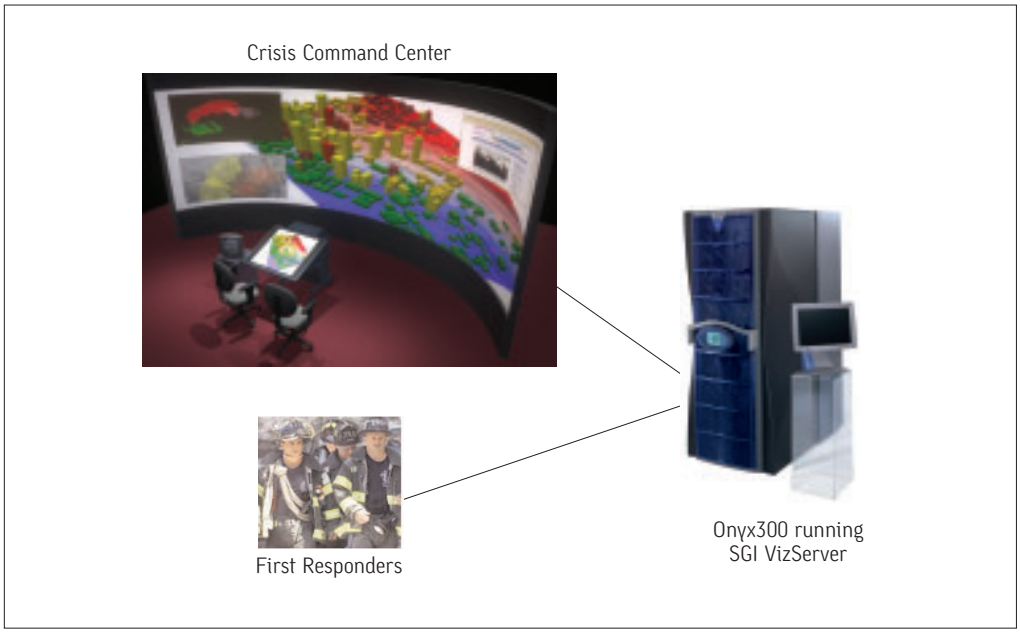
Fig. 11. Example of SGI data protection and storage management products



10.0 Data Visualization

With the visual area network technology developed by SGI, any displayed information from a crisis command center using an SGI® Onyx® family system can be transmitted to a PC, laptop, or wireless personal digital assistant (PDA) to reach the first responder or tactical commanders at the site. Situational awareness gained at the command center is thus shared with those who need it at the crisis site. The SGI visual area network allows remote observers and partner organizations—both state and local—to view the situation and participate in the decision process from remote locations over a secure network using SGI Trusted IRIX, the secure multilevel security (MLS) network environment outlined earlier.

Fig. 12. Example of SGI VAN technology as used in a HLS command center



11.0 Conclusion

SGI is uniquely qualified to help coordinate the nation's vast resources and build an integrated homeland security infrastructure. As part of SGI's proven leadership in converting data into information through technical superiority in visualization and management of complex data, SGI invests hundreds of millions of dollars in solving these most complex problems. SGI has hundreds of engineers with over 400 patents engaged in research to make the industry's leading visualization and data management solutions even better. Our products and solutions offer a distinctive set of capabilities suited to support an innovative class of homeland security solutions. As we move forward together, SGI offers the best solution to support our homeland defense.

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