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Solutions Brochure

# SGI® InfiniteStorage Solutions for Media

## Reducing Time to Insight through Sophisticated Data Management

# ADVANCED DATA MANAGEMENT, for Production

Over the past decade, a digital revolution has transformed the media industry. Increased reliance on digital processes in all facets of production and broadcast has changed the way that content is created and distributed, and resulted in a dramatic increase in the amount and availability of information. To help manage this wealth of new, rich content, leading media companies increasingly turn to SGI.

Digital processes have resulted in a massive increase in the amount of digital content—content that must be economically stored, readily accessed, and efficiently managed using scalable and highly reliable technologies. SGI® InfiniteStorage solutions deliver comprehensive data management designed to meet critical needs in all media market segment shares, providing cost-effective storage options with shared, fast access to content.

### Production

In production, accelerating workflow is the key to success. As the size of digital assets has increased, manually copying data from process to process over slow network connections has become an unacceptable bottleneck. Providing scalable, economical storage for critical media assets while accelerating data access to increase productivity are essential.

To meet the explosive data storage growth and performance demands created by the increase in 2K (2048 x 1080 resolution) film data and the rollout of 4K digital cinema masters, Pacific Title & Art Studio installed an SGI® InfiniteStorage TP9700 Fibre Channel array from SGI and Engenio Information Technologies—the industry's first storage array equipped with Engenio's 4Gb/s Fibre Channel interface. The new Storage Area Network (SAN) infrastructure performs up to 2 times faster than the previous solution to meet the scanning demands of 4K film. The studio currently stores 200TB of data and generates an additional 2-8TB each day. The SGI® InfiniteStorage Shared Filesystem CXFS™ provides shared high-speed access for the company's SGI, Macintosh® and Linux® systems.

### Broadcast

For broadcast companies, the desire for increased efficiency and technical innovation is bringing about dramatic change. Organizations that need to take advantage of the latest in Information Technology (IT) and move to distributed

news production and centralcasting models are no longer satisfied with dedicated, proprietary technology. Today, scalability, format agility, and integration with ingest, browse, rough-cut and news edit, graphics, automation, media management, and archive systems are critically important. Moving to robust open systems as the basis for media serving streamlines a broadcaster's workflow.

Premier Media Group recently selected a complete digital infrastructure with SGI InfiniteStorage to overhaul its ingest, asset management, edit, and transmission capabilities for FOX SPORTS. The new infrastructure is based on SGI® Media Server™ for broadcast systems for ingest and transmission, SGI InfiniteStorage Shared Filesystem CXFS SAN and Ardendo's suite of ingest and asset management software tools for content management. The SGI ingest and storage solution was chosen to overcome the workflow slowdowns and restrictions of tape-based ingest that the business was facing.

SGI Media Server systems with redundant SGI® TP900 storage are supported by SGI® TP9100 and SGI® TP9300 storage systems sufficient to store 70 hours of D10 material in the MXF format and years of on-line browse material. An archive based on the Sony PetaSite™ Tape Library for archiving low-resolution browsing material and 30Mbps high-resolution D10/MXF clips is supported using SGI® InfiniteStorage Data Migration Facility (DMF) data lifecycle management software.

## Data Management Challenges and Requirements

### Improving Workflow

With the move to digital processes and the increasing size of digital assets, old ways of working are breaking down in both production and broadcast. Workflows that require data copying from system to system between steps are becoming impractical. At the same time, content must be equally accessible to a wide variety of system platforms so that work is never impeded. For instance, in the course of a project a company might need to share the same media assets between a variety of systems running IRIX®, Linux, Mac® OS, Windows®, etc., and those systems may be in different geographic locations.

### Accommodating Exploding Data Set Sizes

Across the media industry, organizations are faced not only with a huge store of digital assets, but also tremendous increases in the rate of content creation. Accommodating these trends requires scalable storage systems with the I/O capability necessary to move data to and from storage at guaranteed data rates that can accommodate high resolution digital formats.

### Streamlining Management

With the volume of digital assets exploding in both production and broadcast, data management is becoming an increasing problem. Important content must remain online and accessible at a moment's notice to ensure that critical deadlines are met.

### Protecting Valuable Digital Assets

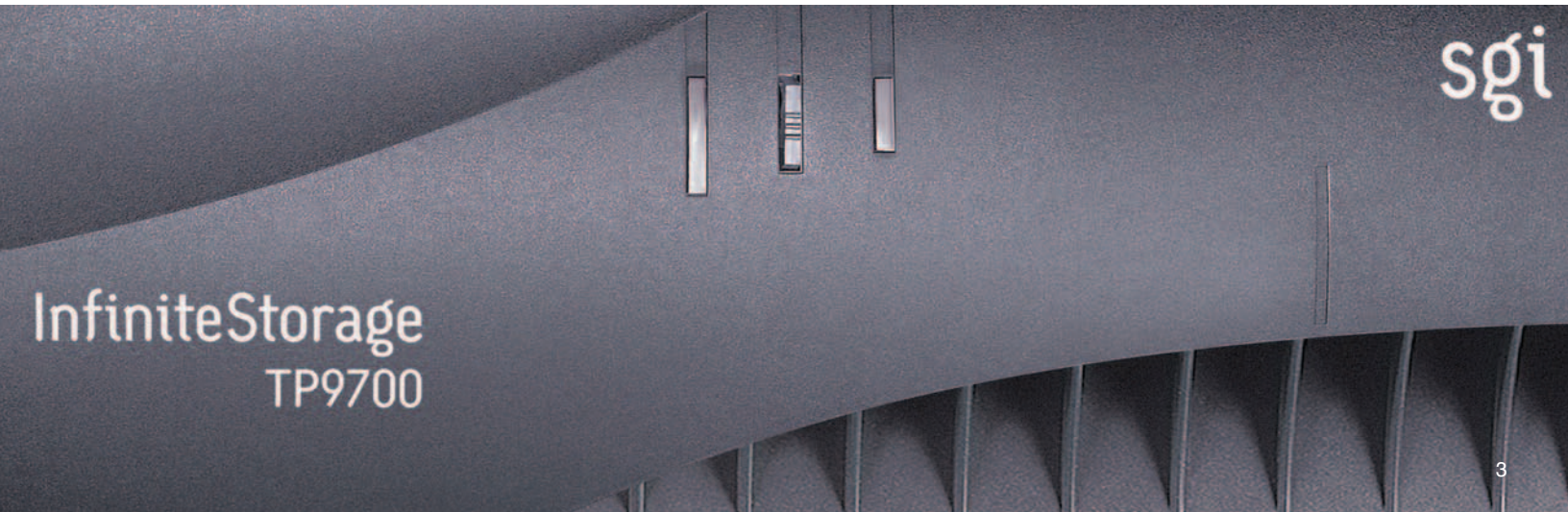
For most media companies, digitally-stored content is the lifeblood of the company. Ensuring that critical digital assets are protected from user error, theft and disaster is now an essential element of business planning.

### Controlling Spiraling Costs

No matter how important the project, storage cost remains a critical factor. Cost-effective storage systems that can scale to accommodate growing storage requirements without hampering access to digital assets are a necessity.

These critical challenges are driving a widespread need for storage systems with:

- High-speed data sharing
- Wide area data sharing
- Support for heterogeneous systems
- Improved scalability and performance
- Simplified management of digital assets



## A Data-centric Storage Architecture with High-speed, Heterogeneous Shared Access

SGI has developed a unique data-centric storage architecture that addresses the challenges faced by the media industry. SGI can help you centralize critical digital assets for improved storage utilization, security and economy while providing the scalability and performance to meet the needs of the most time-critical projects.

### High-speed, Shared Access

A key element of the SGI solution is the SGI InfiniteStorage Shared Filesystem CXFS. CXFS provides high speed, shared data access to eliminate the bottlenecks that hamper data-intensive digital operations. CXFS supports many of the most widely used system platforms, so it works seamlessly in heterogeneous environments.

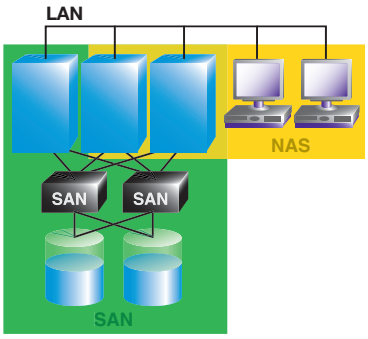
CXFS avoids the bottlenecks associated with manual copying and dramatically streamlines workflow. The ability to concurrently access data without copying delays significantly improves productivity. More work can be completed in the same amount of time—or larger more complex projects can be undertaken.

### Unifying NAS and SAN

Traditional network-attached storage (NAS) and storage area network (SAN) storage systems do not easily interoperate. Many organizations maintain separate storage pools for each function. SGI brings NAS and SAN together with its data-centric architecture, unifying storage systems to enable efficient workflow, enhance collaboration, and improve data management. Applications can quickly migrate from NAS to SAN storage as bandwidth requirements change.

## Intelligent Consolidation

SGI delivers optimal efficiency for storing, organizing, accessing and managing digital assets. We tailor the storage architecture to reduce storage complexity, streamline management, increase performance, improve availability, and reduce TCO. By eliminating the bottlenecks that limit other storage solutions, SGI delivers unparalleled data performance that can unleash the creative talents of your organization to ensure success.




Our unique data-centric approach enables all digital assets to be managed from a central, consolidated storage architecture for:

- Better disk utilization
- Improved load balancing
- Zero data replication
- Reduced storage capacity requirements
- Reduced management costs

Intelligent Consolidation gives you the ability to scale your digital infrastructure independently in different dimensions over time including storage capacity, bandwidth, performance, connectivity, and supported operating systems—providing virtually unlimited growth paths to meet your storage needs now and in the future.


## Production—EFILM

EFILM LLC, a cutting-edge digital film laboratory in Hollywood, California, was among the first companies in the United States to create complete digital masters of feature length films. A wholly owned subsidiary of Panavision and Deluxe Laboratories, EFILM was responsible for groundbreaking work on such films as We Were Soldiers, Blue Crush, XXX and the Academy Award®-winning Frida. Since that time, EFILM has been responsible for digital work on dozens of films including Master and Commander, The Passion of the Christ, The Day after Tomorrow, and Spider-Man 2.

EFILM relies on SGI technology to help create the digital intermediates that are becoming a critical part of modern film production. Digital intermediates require high-resolution scanning, color correction, laser film recording, and video mastering.

## Wide Area Data Sharing

Until now, sharing digital assets across significant geographical distances has been almost completely dependent on maintaining local copies of data. The result is duplication, added expense and increased complexity. Multiple copies of data result in inevitable problems with data integrity since changes in one copy of the data are not reflected in the others, and the level of security is reduced every time an additional copy is made.

A special version of CXFS for wide area networks (WANs) is available through SGI Professional Services. Wide Area CXFS utilizes networking technologies from either LightSand or YottaYotta to create a shared storage infrastructure that can span the globe. SGI and YottaYotta have demonstrated a CXFS cluster reading and writing to a shared file across thousands of miles at hundreds of megabytes per second. With the ability to intelligently share data at near local performance rates between widely distributed locations, this solution enables digital assets to be easily shared without wasting valuable time and storage capacity.

Digital distribution masters are ultimately created for film output, digital cinema releases, and home video/DVD.

EFILM uses an SGI storage area network (SAN) with hundreds of terabytes of storage capacity and bandwidth to support multiple simultaneous streams capable of real-time (24-frames-per-second), 2K resolution film images. An InfiniteStorage SAN Server with SGI InfiniteStorage Shared File System CXFS allows files to be shared between multiple applications running on different operating systems without data replication. The SGI SAN gives EFILM the capability to configure multiple systems; each working on a different project with a number of parallel processes all happening at the same time for greater productivity.

## Broadcast—The BBC

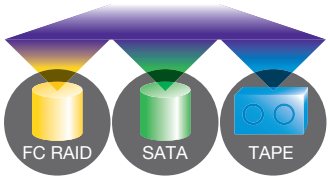
The BBC is one of the world's largest broadcasters, and it is also one of the most diverse with a huge range of output covering television, radio, online and print. To ensure maximum support for a diversity of needs, BBC Broadcast architected its Broadcast Centre in West London to be one of the most technologically advanced facilities in Europe. The BBC Broadcast infrastructure links together and allows interoperability between systems and processes for scheduling and campaign management, ingest, production, playout, transcoding, quality control, compliance and storage and archiving.

SGI technology was instrumental to the creation of the Central Storage System (CSS): the repository which takes in, houses, and makes available to all processes the media and data which make up the essential "currency" of the BBC Broadcast environment. Initial specifications for the CSS required that it be capable of supporting up to 250 concurrent read and write streams ranging in bandwidth from 1.5 to 400MBit/s. Initial storage capacity was set at 50TB online and 200TB nearline with the capability to grow to at least 200TB online and a petabyte nearline. In addition, BBC Broadcast specified that the solution be based on commodity hardware, support a range of operating systems and file protocols, and be designed for high availability with no single points of failure.

To meet these requirements, SGI architected the CSS solution using the SGI InfiniteStorage NAS 3000 and the instant sharing capabilities of SGI InfiniteStorage Shared Filesystem CXFS. CXFS provides a resilient, high-performance core for high bandwidth activities, while the NAS 3000 supplies access to the same data at bandwidths suitable for hundreds of concurrent desktop browse video users. The storage system also provides a high-bandwidth gateway to a multiple drive Datatape archive. SGI partnered with Front Porch Digital to provide this capability. The resulting solution enables BBC Broadcast to implement new ways of working to meet the challenges created by more channels, more formats, and new opportunities, while increasing productivity and lowering technology costs.

## Data Lifecycle Management

Important digital content has to be retained on appropriate media to provide continuing access. For example, broadcast companies frequently re-use file footage that is months or years old. Cost-effective management is a critical element for success. Media companies must control and manage their data throughout its entire usable lifetime—from creation, storage and protection to eventual archiving.




SGI data lifecycle management (DLM) solutions integrate seamlessly with the SGI data-centric storage architecture to take the guesswork out of data management by automatically and transparently moving digital assets from primary disk to secondary disk, tape or other storage devices according to your criteria, ensuring that valuable content is always stored on the most appropriate and cost-effective media. Data is recalled to primary storage immediately on first access without intervention.

DLM solutions from SGI virtualize your storage infrastructure, creating a scalable storage pool that is transparent to users and applications. This fully-automated, tiered approach to data storage adapts automatically to changing usage patterns to ensure media assets are always accessible and users are always productive.

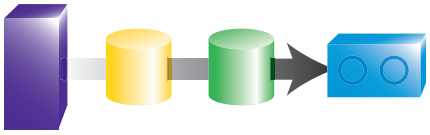
Only SGI DLM offers the scalability to tackle the challenges of today's media companies. SGI customers use DLM to manage hundreds of terabytes and even petabytes of storage at a fraction of the cost of disk-only solutions. Busy sites move more than 3TB of data per day between primary and secondary storage with no loss of user or administrator productivity.

## Data Protection and Security

Critical digital assets must be secure, protected from equipment failures or user error, and available around the clock. SGI offers a flexible array of data protection options from simple offline tape solutions to 100 percent redundant environments.

SGI's modular Backup and Restore solutions combine record performance with a choice of best-of-breed products from leading vendors. In 2003, SGI passed the world record for backup and restore performance by 3X. Disaster recovery strategies ensure that a site-wide disaster won't result in permanent loss of critical media assets. System uptime and user productivity can be maximized by protecting application availability against hardware or software failures.

SGI has the technology and expertise to help architect complete backup and disaster recovery solutions. You can select components according to your specific needs:



- Synchronous mirroring for real-time data replication to a secure remote location.
- Fail-over technology to enable applications and services to achieve a projected 100 percentage system uptime at a fraction of the cost of specialized fault-tolerant systems.
- A range of disaster recovery solutions to reduce the effect of outages that impact an entire site.

## Intel® Itanium® 2 Processors for Data-Intensive Applications

Data-intensive applications such as SGI InfiniteStorage Shared File System CXFS and SGI InfiniteStorage Data Migration Facility (DMF) benefit tremendously from the massive on-die resources and proven performance offered by the Intel® Itanium® 2 processor. Based on Explicitly Parallel Instruction Computing (EPIC), Intel Itanium architecture supports highly parallel processing, large memory addressability (up to 1,024TB), and innovative, compiler-based optimization that greatly improve performance for data-intensive operations. With up to 9MB of L3 cache, and 10.6GB/sec I/O bandwidth, the Intel Itanium 2 processor can readily cache the large volumes of metadata required to accelerate data management applications and move data on and off chip without bottlenecks. Because SGI technologies are frequently deployed in the most data-intensive environments in the world, SGI selected the Intel Itanium 2 processor to power all SGI InfiniteStorage SAN and NAS Solution Platforms.

## SGI Helps You Succeed

Rapidly Deployed Solutions. SGI offers complete, integrated solutions that make it easy for you to realize the benefits of our data-centric storage architecture. Architecting a complete storage solution can be difficult and time-consuming. Mistakes can be painful and have lasting impacts throughout your organization. SGI InfiniteStorage solutions eliminate these difficulties with pre-configured, turnkey solutions for Media Server, NAS, SAN and DLM deployment.

SGI Professional Services. SGI is increasingly active in the integration and implementation of full-scale media solutions. SGI's strong pool of technical services professionals—systems engineers, architects and project managers, all with many years of media experience—can solve the most difficult digital infrastructure problems.

Our solutions intelligently combine SGI products and expertise with industry-leading third-party hardware and software solutions. SGI's award-winning systems integration services are helping media companies worldwide to become more efficient at producing and delivering media. In 2004—to satisfy the demand created by rapid deployment of digital broadcasting throughout Europe—SGI launched Silicon Graphics Broadcast Europe, a dedicated media business unit that offers IT-based broadcast solutions and system integration services specifically for European broadcasters.

SGI Professional Services provides a complete suite of services to cover every aspect of storage infrastructure deployment from initial design and planning to ongoing optimization and support. Experienced SGI consultants work on-site to implement storage strategies specifically tailored to your environment.

Will your company benefit from SGI's data-centric storage solutions? Ask yourself the following questions:

- Is access to stored media assets becoming a bottleneck?
- Is your current storage infrastructure able to accommodate the volumes of data you ingest?
- Would a partial or complete loss of digital assets impact your company?
- Would you like to ensure that digital assets are automatically migrated to the most cost-effective storage?
- Are your storage costs out of control?

If you've answered "yes" to any of these questions, SGI InfiniteStorage solutions can help.

## SGI® InfiniteStorage RM Series

Media applications insist that data be delivered when expected and without delay. Control of latency is the most important storage feature for these applications. To address the specific needs of media market segment shares, SGI offers the SGI? InfiniteStorage Rich Media (RM) series of storage systems—specifically tuned for low latency media applications. The RM series is designed to minimize latency and optimized for the sequential file I/O common in media applications. Exceptional bandwidth and scalability are also designed into the series.

SGI RM storage systems enable newsrooms and broadcast centers to accelerate the conversion from video-centric infrastructures to an IT-based digital workflow, providing greater efficiency, cost reduction and faster time-to-air. SGI RM products enable production facilities to create, manage and distribute high resolution content efficiently and cost effectively. Guaranteed latency provides a rock-solid, reliable source of data for film printers and scanners to ensure projects stay on schedule and quality remains high.

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