Brochure

SGI® Broadcast System Solutions

A Simpler Broadcast Environment

Implementing a variety of proprietary technologies has made the broadcast production world a very complex place. New standards will help, but they will take time. And without the right partner, transitioning can add yet another layer of complexity. The challenge now is to simplify.

SGI Broadcast Project Timeline

1995: Avid Technology develops the first digital broadcast workgroup edit system using the SGI® Challenge® server. The system, which allowed up to eight Newscutters, MediaRecorders, and AirPlays to share content from the SGI server in real time, was installed at CNN and across Europe.

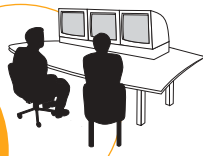
1996: CNN, using open-standards, works with SGI to design and install the first large-scale browse system at CNN headquarters in Atlanta, Georgia. The 24x7 system ingests up to 40 satellite or VT feeds, integrates to the news automation system, attaches metadata to the video files, and streams them to 300 client workstations throughout the news center. Journalists can select clips with frame accuracy and send the timecode selects to the edit rooms for final edit.

1997 to present: SGI has installed thousands of media servers at U.S. cable head-ends, including over 1,200 localization servers for the Weather Channel and another thousand caching servers for Internet media streaming. Additionally, there are now 1,300 sites throughout the world where Kasenna MediaBase software on SGI media servers is streaming MPEG video. SGI servers and video streaming technology are also the VOD servers for the two largest telco television services to go live this century: SoftBank/Yahoo! BB Cable in Japan and Chunghwa Telecom in Taiwan.

Today's Workflow Bottlenecks

Usually with a journalist or editor waiting impatiently, content flows into newsrooms and sports departments as satellite, microwave, VTR, or live studio feeds. Tape operators must identify, select, and switch feeds to a loaded tape deck or ingest server. The video clip must be hand-carried to the tape library for labeling and bar coding before it is dubbed and delivered.

If you don't know what's available or can't find what you want when you need it, content is valueless. Video clips may be archived digitally on a server, with metadata added by a tape operator. The challenge of proprietary archive systems is attaching enough metadata to make the content easily retrievable.



2 Edit

In urgent situations, with journalists and editors working with a single tape, recording voice-overs and editing story segments is often a hurry-up and wait scenario. When video clips reach a tape-based facility, each story or program must be edited in turn.

Nonlinear editing greatly speeds the process but also moves the bottleneck to the ingest stage. It often takes longer to get footage into individual edit rooms than it does to edit the piece.

3 Playout

Automation systems are unduly cumbersome and expensive because of their need to interface with and control all the separate digital islands in today's broadcast environment. Play to air already involves

4 Distribute

Transmission used to seem quick, moving video in real time. But in today's fast-paced world, real time is feeling slower every day. In a multistation environment, content is shared in one of two ways. Both of these methods—dubbing tapes and microwave/satellite transmission—usually require the intervention of personnel at both ends and across several time zones; manual intervention can become expensive. Dubbing and shipping tapes between stations is also time-consuming and slow while microwave/satellite transmission systems are costly to purchase and maintain.

The SGI Broadcast System:
Turning Workflow into Effective Dataflow

Ingest

Incoming SDI video from live feeds or tape playback is ingested into an SGI Media Server™ for broadcast system. This is similar to the process provided by proprietary systems; but from this point forward, the advantages of the third-generation architecture become obvious. Video content that is already in a digital format can be simultaneously ingested at speeds up to 30x real time via FTP and sent directly into a storage server for access by journalists and editors across the SGI shared storage. Simultaneous multichannel SDI and SDTI ingest is automated; material can be viewed on the desktop even while ingest is still in progress. Operators are automatically alerted to incoming, background FTP feeds.

Each segment of ingested video is converted to three data files: a broadcast-quality file (25Mb to 50Mb MPEG-2 or DVCPRO™), a low-resolution MPEG-1 or MPEG-4 browse version, and a metadata file, which enables clients to find material easily and identify specific segments frame accurately within a clip.

Archive

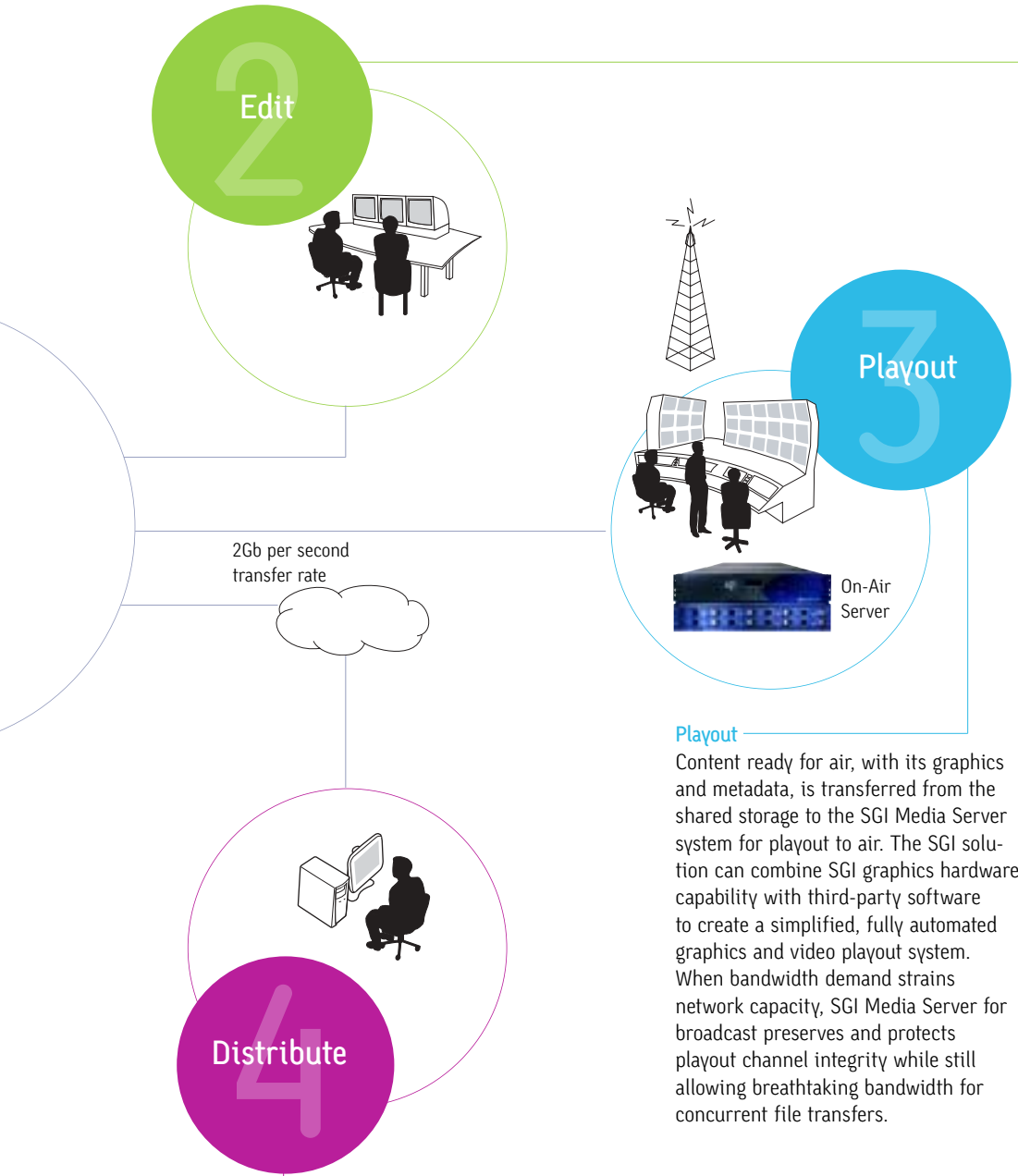
Metadata is inserted at ingest, and industry-leading media management applications from Masstech, Blue Order, and Ardendo enable journalists to find archived clips quickly for review and editing.

Hierarchical storage management software applications from SGI, IBM, and ADIC manage the storage of content assets across disk and tape libraries, maintaining a constant user interface by managing content location via a metadata file server.

SGI® Data Migration Facility (DMF) software automatically moves files between online, near-line, and offline for efficient use of storage and optimal access for clients. It interfaces smoothly with libraries from StorageTek, Sony, IBM, and ADIC, as well as SGI storage.

Infinite Structure:

Digital infrastructure provides simultaneous high-speed access to remote data across all media devices in the broadcast facility and across the multiple operating systems used in broadcast. The SGI broadcast system incorporates a hybrid data access approach, balancing shared storage area network (SAN), network-attached storage (NAS), and direct-attached storage so that all devices in the facility have the access speed they need and your storage budget is optimized. This flexible use of IT connectivity allows for seamless upgrades as the broadcast facility needs change.



Edit

Working with video as data in the SGI architecture accelerates workflow dramatically for producers, journalists, and editors.

For advanced editing, voice-overs, and effects, editors can choose popular editing platforms such as Pinnacle Systems, Avid Technology, or Panasonic. The SGI® CXFS™ shared filesystem can easily accommodate 20 Pinnacle editing systems directly across the 2Gb-per-second Fibre Channel fabric. Hundreds of additional edit systems can be interfaced with Gigabit Ethernet into a seamless broadcast dataflow. Journalists can choose desktop browsing from ANN, ENPS, I-News, Octopus, AutoCue, and others.

Editors and journalists can shave precious time off the editing process by working simultaneously on the same content. Semi-complete news stories no longer need to be carried or copied to the edit suite for completion, because the edit suite has simultaneous high-speed access to the broadcast-quality versions of the files.

Playout

Content ready for air, with its graphics and metadata, is transferred from the shared storage to the SGI Media Server system for playout to air. The SGI solution can combine SGI graphics hardware capability with third-party software to create a simplified, fully automated graphics and video playout system. When bandwidth demand strains network capacity, SGI Media Server for broadcast preserves and protects playout channel integrity while still allowing breathtaking bandwidth for concurrent file transfers.

Distribution

Content as data can be more reliably distributed across inexpensive leased lines or faster than real-time fiber networks using push or pull technologies and standard FTP or Internet protocols. Transferring video as files also eliminates encode/decode and audio/video sync problems. Facilities across the country begin to work as a single seamless environment.

Infinite Structure:
The SGI Digital Infrastructure

It Starts with the Architecture
SGI is implementing third-generation digital broadcast solutions. They create a true bridge between the broadcast environment and the swiftly advancing world of IT technology. SGI helps you convert workflow into simplified dataflow in an integrated, vendor-neutral architecture.

Industry-leading SGI video processing and secure storage technologies move and store content efficiently throughout the broadcast workflow. Using Fibre Channel and Ethernet topologies, digital file transfers move media across the facility at many times faster than real-time rates. Theis reduces time to air and improves presentation by enabling news, sports, weather, feature programming, advertising, and post-production personnel to more efficiently share content for collaboration and more rapidly access archived material. This allows for automating the total process from ingest through edit to playout, reducing the total cost of ownership of broadcast production systems and improving reliability and on-air quality.

Distribute Data, View Video
SGI's third-generation broadcast server technology, the SGI Media Server for broadcast system is based on the modular SGI® Origin® 300 platform. SGI Media Server for broadcast has up to eight standard-definition video channels, with up to eight audio channels per video channel. It supports MPEG-2 long GOP and "I" frame profiles from 3Mb to 50Mb per second. It provides flexibility in the choice of picture quality and editing formats. DVCPRO™ 25, DVCPRO™ 50, D10/IMX, and MXF formats can be supported in the same system.

But more importantly, SGI Media Server is also a gateway to an open-system IT world in which video flows easily in the form of data files. Optional networking connections include Gigabit Ethernet and ATM, enabling faster than real-time file transfers of media files locally or over wide area data networks. Within the storage area network, video files can move even faster with 2Gb-per-second Fibre Channel connectivity. Instead of a proprietary system that simply holds and serves video clips, SGI Media Server for broadcast systems integrate

It is the secure sharing of video as data files across high-speed networks that enables the real transformation of the broadcast workflow.

Timeline (continued)
1998: Tektronix develops digital infrastructure for Profile™ video server installations around SGI® Origin® servers.

1999: Panasonic® develops Digital News Automation system using SGI Media Server for broadcast systems fully integrated with Newsbyte™ editors.

2000 to present: Sveriges Television (SVT), the Swedish public broadcasting company, has installed 35 SGI Media Server for broadcast systems. Its all-digital news production facility is designed entirely around an SGI® Origin® 3400 central content file server as the hub for all servers on the network. SGI Media Server systems provide ingest, low-resolution browse, asset management, and playout-to-air functions.

SGI Media Server for Broadcast

the latest IT advances in networking speed into the broadcast facility. Much of the secret to all of this is the most powerful, filesystem used in broadcast today: SGI® XFS™ and its shared version, CXFS.

SGI's expertise in integrating these servers with best-of-breed hardware and software into an open-system environment enables production staff to access and share large files over high-bandwidth networks. It is the secure sharing of video as data files across high-speed networks that enables the real transformation of the broadcast workflow.

The Cornerstone of Infinite Structure

The SGI XFS filesystem is a robust, high-performance, 64-bit filesystem able to massively scale to 18 million terabytes. That's 2,400 years of 50Mb broadcast material. Although filesystems routinely impose limitations on broadcasters, the SGI filesystem provides an essentially limitless growth path. File transfer speed will not be an issue again either. Multiple Fibre Channel connections enable roughly the equivalent of 300 simultaneous 50Mb streams within facilities today. The XFS file-journaling technology guarantees high reliability and restarts in less than one second after an unexpected interruption, regardless of the number of files it manages.

CXFS adds to XFS the capability of sharing the filesystem and storage directly with other SGI IRIX systems and with other operating systems, including Windows NT®, Windows® 2000, and 64-bit and 32-bit Linux® (Mac® OS X available late 2003). True file sharing means unnecessary data motion and replication is eliminated, thus reducing network traffic, congestion, and storage needs.

Timeline (continued)

2001 to present: Danish Broadcasting Corporation (DR), Denmark's oldest and largest public-service radio and television network, is now using a completely integrated digital workflow system architected and implemented by SGI. It handles the complete content cycle from capture and ingest to playout to air. The solution will support 300 journalists in many departments and locations, serving two national networks and several stations.

DR now enjoys all-digital workflow for ingest, logging, indexing, browsing, editing, transmission automation, media management, and news system interface. Archived video storage, in Panasonic DVCPRO-DIF format, resides on SGI® TP9500 RAIDs and a StorageTek® tape library. It is accessed over Gigabit Ethernet.

From their desktops, users control ingest, search archives, perform low-resolution edits, and move soft clips to the Pinnacle Liquid blue or Liquid purple editors. SGI Media Server for broadcast systems provide parallel playout. Broadcast-resolution clips move between servers up to 30x real time. The production team can view and change the playlist right up to and during broadcast.

2002 to present: France Télévisions Publicité chose SGI to implement a centralcasting vision that fundamentally changes the methodology of television advertising placement, broadcast, and tracking.

2003: At Georgia Public Broadcasting, both broadcast and IT data reside within the SGI infinite structure environment. Automation commands ingest and playout via multiple SGI MSB 380 systems. The Virage VideoLogger® and Avid Technology Media Composer® are additional sources for content. MassTech's MassProxy™ transcodes MPEG-2 into MPEG-4 proxies used for streaming and LAN-based edits. Once MPEG-2 files are no longer needed online, they are transferred to an ADIC® Tape Library for Archive.

Return on IT, Integration, and Investment

A World Leader in Customer Support and Systems Integration

SGI has a sterling international reputation for the efficiency, responsiveness, expertise, and dedication of its Technology Solutions group. There are more than a thousand SGI service professionals and four major SGI support hubs around the world. As an open-system computer manufacturer, SGI can draw on dozens of hardware and software technology partners to assemble cost-effective broadcast solutions for its customers.

We apply years of experience in working with broadcast operations to transition your workflow into an effective dataflow. We do this by matching your needs to the most appropriate tools in the industry and then seamlessly integrating those tools into a digital infrastructure.

The Bottom Line: ROI for Broadcasters

SGI workflow-to-dataflow solutions deliver superb return on investment in broadcast production environments. These solutions leverage the best technology in the broadcast industry and the latest advances from the IT world. These solutions use open standards and open platforms to interface with broadcast and IT leaders such as Avid, Pinnacle, Sony, Discreet, VizRT, Hitachi, StorageTek, Oracle, and Brocade to create the most powerful site-specific solutions in the industry.

SGI solutions provide return on integration, bridging the digital islands in your operation. They reduce the reliance on proprietary black boxes and vendor-specific formats and protocols. They simplify and accelerate. They optimize broadcast workflow, increase collaboration, and improve results.

It's Simple

Proprietary systems have automated islands of the workflow but made it more complex at the boundaries. We understand this complexity, and we specialize in simplifying it. We are simplifying it in today's environment of mixed formats and simplifying it by preparing you for the integration of new standards. An integrated dataflow solution architected by the renowned SGI Technology Solutions group to mirror your operational needs and long-term goals can move your workflow processes into an open, scalable IT environment. It will improve everything from the timeliness of your on-air content to your bottom line.

A Growing List of SGI Technology Partners:

Ingest:
SGT, Harris/Louth, Crispin, Dalet, Virage, and Ardendo

Edit:
Pinnacle, Avid, and Panasonic

Newsroom Systems:
ANN, Ardendo, Dalet, ENPS, iNews, Octopus

Distribution:
Harris/Louth, SGT

Playout:
Harris/Louth, Crispin, SGT, Omnibus, and vizrt

Graphics Systems:
VizRT, Brainstorm, Sportvision, AWA TV, Meterologix, WSI, Weather Central, and Metaphor

Archive/Media Management:
ADIC, Dalet, IBM, Masstech, Sony, StorageTek, and Blue Order

Conversion:
Marquis, TeleStream

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