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SYSTEMS DESIGN SHOWCASE

SWR's tapeless

A faster and more efficient news operation is just one of the benefits afforded to the news staff of SWR by its recently integrated tapeless digital newsroom designed by SGI.

Südwestrundfunk (SWR), or Southwestern Broadcasting, is one of the first German public broadcasting stations. It belongs to ARD, the first German public television network. The station has three broadcast sites, one each in the cities of Mainz, Baden-Baden and Stuttgart. With more than 14 million viewers, it is the second-largest station of Germany's public broadcasting network. The broadcasting area stretches over the states of Baden-Württemberg and Rheinland-Pfalz.

Beginning the digital migration

With the increasing availability of advanced broadcast technology, the age of its current studio at approximately 15 years and the desire to better serve its viewers, SWR decided to migrate to a digital newsroom.

The station recently implemented a tapeless digital newsroom that enables its 50-person news team at the Mainz facility to streamline its operations for distributed news production and play to air.

Project goals

The station's team required the system to provide "fast and efficient news production with an easy reuse of content." To meet that goal, it further defined the system requirements with the following mandates:

- Tapeless production/editing.
- Server-based editing with direct server playout.
- Nearly paperless production.
- Concurrent access to all video

SWR went live with the SGI-based digital production/editing system in February.

digital newsroom

BY C. JASON MANCEBO

material by all staff members.

• Browse-quality rough-cut editing on the journalists' desktop PCs.

While the station has built a complete new studio for this project, some newer equipment would not be replaced, and the integration of the new digital system with these existing systems was necessary. Seamless workflow with its BDL teleprompter, Aston Ethos character generation system and Signum Sigi still store was mandatory.

Additionally, the completed solution also had to interface with the facility's production planning system and archive as well as allow for easy reuse of the news story texts and video clips on the station's Web site. With this in mind, the station's team selected SGI as the systems integrator.

New infrastructure is the key

As with other broadcast facilities migrating to a digital workflow, the SWR team called on the new digital infrastructure, which was going to be integrated, to become increasing critical in its news workflow. Rather than strictly a means of transporting a video signal, the new digital infrastructure would enable the station to enhance its workflow and create efficiencies. As such, it must be dependable and both flexible and scalable enough to allow the station to grow and service its viewers. The systems integrator designed and integrated the tapeless digital newsroom-based around its data-centric broadcast technology.

The new digital newsroom is based on IT technologies and is centered on networking for computers and storage. It uses a switched 100/1000 Mb/sec (also known as Gigabit Ethernet) backbone linked to a central content store, which is provided for users and systems automatically accessing content through efficient distribution systems. The network also provides the link from the newsroom to the balance of facility's systems in addition to connections to the outside world.

For example, due to this approach, it was easy to link the graphics department to this infrastructure. Now the graphics staff members can easily access all video raw material and send back the finished clip for insertion into the editing process at the NLE system or transfer single frames to the still store.

Ingest

For feed and tape ingests, the station's team chose the SGI Media Server for broadcast system. It is configured with eight ports (four for ingest, two for backup playout, one for low resolution encoding and one for content review) as well as 44 hours of protected RAID-3 storage. Coupled with the RAID-3 storage, the server uses a protected filesystem for high reliability.

The implementation of the system offered the benefits of digital broadcasting without investing in format-specific pieces of equipment. It treats video as data files and takes advantage of the newly installed IT infrastructure. When video is managed as data files, it can be distributed over IT networks at speeds that are much faster than real-time. To provide as efficient workflow as possible, content should be viewed only when it needs to be.

Operators schedule ingest from their workstations, and upon the scheduled ingests, two versions of clips are created. The high-resolution version is created on the ingest server, and the low-resolution version is created on the SGT VideoBrowse MPEG-1 browse/edit system. The low-resolution version can be browsed and pre-edited using the company's Media Manager software on any of the 50 PC-based Dalet A.N.N. Open-Media newsroom computer system station clients. All files ingested are referenced in SGT's Media Asset Management database and are updated via a Media Object Server Protocol (MOS) gateway to the newsroom computer system. Additionally, information about all clips available in the SGT DBOS Automation News system is dispatched through the same gateway to update the newsroom computer system.

While the system is ingesting content, the high-resolution files are simultaneously transferred from the ingest server to the central content server. This server acts as the central point at which all content is stored while it will be used in the news process. It's equipped with 100 hours of SGI TP9400 RAID storage, which allows for it to also act as the network attached storage server for the five Pinnacle Systems Liquid Blue NLEs.

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Editing

Low-resolution desktop-based browsing and editing is proving beneficial for the facility. Employing desktop viewing and editing access has reduced the amount of effort and cost required by the entire facility to provide viewing and editing stations, reducing the bottleneck of the edit room and speeding workflow. Journalists enjoy greater access to and greater collaboration with their critical content.

With access from the newsroom computer system, the media management system allows for the searching and accessibility to all clip content. Also included is the MPEG-1 low-resolution browse/edit module. This module enables the user to prepare a rough edited story or project based on the low-resolution version previously ingested to the server.

After completion of the proxy editing process, the user saves the project, and the EDL is sent directly to the central content store and then is automatically conformed. After conformation, the media management system then notifies the automation system, and the new clips are then automatically transferred at faster than real-time speed via the high-speed network to the playout server, ready for broadcast.

In the case of editing high-resolution files, the Liquid Blue NLEs have direct access to the complete central content store via the high-speed network. There is no need to move the clip via the network to the local disk, so both time and disk space is saved. The edit functionality is as if the clip was on the local disk. In addition to the time and space saved, more than one editor can access this file simultaneously. This feature eliminates bottlenecks and allows parallel editing to take place. The clip support between the server and NLEs is seamless. Key features of the intergration include automatic edit decision list generation (in ALE format), automatic continuous timecode generation and automatic clips segmenting.

The SGI infrastructure allows operators to schedule, insert, edit and play out all over a gigabit ethernet backbone.

Additionally, by integrating this functionality directly with the system, users now can edit while the clip or feed is in the ingest process as well as edit with jumps in continuous time code being recognized. This convenience provides the journalists not just with the tools they choose to use, but also with the tools to complete their work more quickly and with greater accuracy.

After editing is complete, the new clip is automatically identified by the media management systems, and if necessary, moved to the playout server immediately, as well as the ingest server where ports are dedicated to low-resolution encoding. The new clip is then encoded in low-resolution and when complete, the media management system is notified. This clip is now available for others to browse or edit, as they like.

Without the need to move a clip to the local system for editing, more than one editor can access content simultaneously, which saves both time and disk space.

Automation system

The DBOS system handles the news automation duties. It is designed with a modular distributed architecture, which allows for flexibility and expansion. This key feature provides a guarantee that the system will be able to adapt to the future growth needs of the facility.

The system was built with a distributed architecture, eliminating single points of failure and securing all broadcasts. Using the ingest server as a backup, the system plays broadcasts in parallel from both servers, providing security.

While the automation system supports a number of control protocols, the Media Server systems support multi-unit video control protocol (MVCP), a telnet-based protocol. Rather than using serial RS-232, the automation system controls the media servers via the MVCP protocol using the ethernet network. There was no need to install 20 serial cables between the automation system and the servers.

In addition to the MVCP protocol for server control, the

automation system communicates with the newsroom computer system using the Media Object Server (MOS) protocol. MOS is intended to be an open solution to the problem of communication between varied makes of broadcast equipment, including newsroom computer systems, automation systems and media servers. The flexibility that the automation system has with the MOS protocol also contributed to the decision to integrate the system.

The facility automation is controlled in two methods, remote and manual. When in remote mode, the automation system executes the playlist that is generated by the newsroom computer system via the MOS exchange. When operated manually, the operator controls the playout via the graphical user interface. This may be the case for breaking news or other special events.

Project success

Owing to the SWR team's involvement in the tender, specification and integration process, all vendors involved had continuous and complete updates and feedback on requirements in the system implementation. Due to this involvement, the systems integrator received final acceptance of the project in December 2002. The station's team spent the month of January working with the system to gain familiarity on trial news operations and went on-air in February 2003. In the short time it has been on-air, the facility is experiencing greater flexibility, faster time to air and smoother news operations. BE

SGI Media Server for broadcast systems along with SGI Origin 300 servers provide ingest, storage, editing and playout functionality for SWR's new digital infrastructure.

Faster time-to-air is achieved with the seamless integration between newsroom and automation software in the new SWR tapeless system.

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Design team

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Equipment list

SGI 7-channel Media Server for broadcast system
SGI 3-channel Media Server for broadcast system
SGI Origin 300 server
Dalet A.N.N. OpenMedia newsroom computer system
SGT VideoBrowse MPEG-1 browse/edit system
SGT DBOS automation system
Optibase MPEG-1 encoders
Pinnacle Systems Liquid Blue NLEs
Extreme Networks Summit 5i Ethernet switch