Europe's DTV roll-out

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Parallel to digital

Reinhard Wagner talks to Kevin Burrows, manager of Engineering Systems at Channel 4, about new storage, production and delivery operations

by Reinhard Wagner

Kevin Burrows: "Our new transmission server system, based on MediaStream servers, is ready to go live"

Launched with full nation-wide UK coverage, Channel 4's mission is to cater for tastes, interests and audiences not served by other UK channels, as well as devote a proportion of its airtime to educational programming. It was, and remains, the only public service television channel in the world to operate without a licence fee, public subscription or state subsidy.

The average age of Channel 4 employees is 30-35 years. With this young team, Channel 4 hopes to serve its subscribers and viewers with the best-ever programme and services. To this end, Channel 4 has made some major refurbishment and invested in digital equipment dedicated to editing and playout.

"In the near future, we will need to offer more services, and that includes data and interactive services," says Kevin Burrows, manager of engineering systems. "But in order for customers to receive them, they will have to upgrade to digital set-top boxes.

"Currently on the digital terrestrial platform we have a useable bandwidth of 18MB shared with ITV (Channel 3), which is a limitation. In addition, there is a return path necessary to offer all possible features to our clients. We are in competition with others, like BskyB, in this area. The infrastructure for service enhancements like interactive game shows is being planned."

IMPROVEMENTS IN SERVICE

To widen its programme area, Channel 4 boasts four wholly owned subsidiaries: Channel 4 International, 124 Facilities, Channel 4 Learning and Film Four Ltd. For analogue/digital terrestrial, analogue cable and analogue/digital satellite services, Channel 4 currently employs a mainly tape-based playout system, although that will be transitioned to a more integrated server architecture over the next three years. First steps have already been completed, and the new all-digital, server-based playout system runs successfully in beta test.

When Channel 4 moved in 1995 to its new premises at Horseferry Road, London, its only option was to use tape-based playout equipment, because broadcast servers were not yet commercially available and the issues involved with various data compression

schemes were not well understood. "We decided to build an all-digital infrastructure based on SDI video and AES audio with D5 machines," explains Burrows.

High-level, customised automation software filled the facility's requirements for presentation and advertising sales. Nevertheless, implementing changes proved difficult. With the UK launch of digital TV in 1999, the new film subscription service FilmFour and the 'change' started. FilmFour programming runs from GVG Profiles for its analogue/digital satellite and digital terrestrial services. To offer highest playout security, a mirrored, FC-connected Profile server system in conjunction with data tape storage (as nearline store) holds 4.5 hours of material on the server and approximately 40 hours on data tape storage.

Changing all playout services from tape to servers will make the system more flexible. "The large system should be browseable. This would make it more convenient for users to find current-month material on the NT-based servers or, after archiving, stored on the DVD automated archiving system," Burrows explains. "All non-live programming should be capable of being transmitted from the server, which is another key factor to be included in the new architecture."

The system must allow easy addition of channels or facilities, without interruption to existing on-air services. By selecting an architecture that consists of an advanced automation control system and well-proven RAID servers, the addition of other channels and facilities can be handled at minimum disruption and cost. The new system should have an infrastructure with maximum networking capabilities to easily exchange and transfer material between servers. Material acquisition must be as efficient and automated as possible. All files should be accessible over the network from any location and useable across any channel without operational intervention, by use of the centrally managed database.

SERVING TRANSMISSION

To ensure a smooth transition from the current to the new operation system, the implementation project is scheduled over a three-year period. The first stage of the project was the installation of a new control and server system to provide an additional channel for playout. Initial tests showed that the single encode and decode process from the originally uncompressed SDI video caused minimal degradation because the transmission environment does not include any requirements for material post production.

For this reason, it was determined that 15Mbps would provide acceptable results while offering cost-effective storage capacity, and the MPEG-2 standard was chosen for the server architecture. The server capacity is 400GB (excluding RAID), providing more than 50 hours of storage at 15Mbps. The playout control software, originally from Ibis, changed to Pro-Bel automation. UK-based Pharos programmed the archiving software that provides the browsing capabilities.

The second stage is installation of new transmission servers -- MediaStream servers from Pinnacle Systems running at MPEG-2 4:2:2@15Mbps. Material is ingested onto the servers from digital VTR machines. At the time of ingest, browseable copies of the material are created automatically. All incoming commercials and trailers are dubbed onto long-form DigiBeta videotape while checks are performed for technical quality and any levels are adjusted. Input for the browse system comes from three sources: transmission servers, material ingested during the technical review process and manual acquisition of

any required source.

Users and outputs from the browse system include programme and interstitial viewing clients, editing clients, VHS and CD/DVD copies of stored material for external use. The DVD library system currently in use at Channel 4 has a total capacity of approximately 1.6TB, which equals 600 DVD Ram discs at 2.7GB. The advent of double-sided and double-density disks in the near future will make a big difference.

"The browse capability is totally independent and includes data from playout for re-use and repurpose of material," Burrows explains. "The network backbone of our client system is based on Gigabit Ethernet to provide highest performance. There are simple clients for review of material, others to log shots and for trimming, and finally, some for EDL generation. Our new transmission server system, based on MediaStream servers, is ready to go live. We are currently running the system in the final testing phase, which is a parallel operation." The new service started in January, and the browse system will be ready at the end of the year, he added.

Plans for a data archiving system are under development, with implementation slated for the near future. "When you move to archiving, you should be able to throw away your tape!" Burrows quips. "Nevertheless, today there is no solution on the market which supports such behaviour. Our archived material is stored on DVD, and each DVD contains information on where to find the original tape."

Cart machines are still used for commercial playout. To provide the highest quality and best support for its customers, Channel 4 has not yet changed to server-based commercial playout systems. Channel 4's Engineering Systems Department is currently evaluating MediaStream servers that are connected via FC to the transmission server. A future system will look like a huge server farm consisting of several MediaStream servers all connected via FC to support all playout needs at Channel 4 without the need for machine playback and playout.

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