BBC Broadcast's Digital Production Village

ATG Danmon is one of the world's most successful providers of high–end reliable and easy-to-operate integrated systems for broadcasters and programme makers.

Active in Europe, Asia, Africa and the Middle East, ATG Danmon is part of the Dan Technologies Group which operates from offices in the United Kingdom, Germany, Denmark, Norway, Sweden, Vietnam and Dubai.

BBC Broadcast's massive new Broadcast Centre is sited adjacent to the BBC's White City building in West London. The Broadcast Centre is part of the neutrally branded Media Village. The Broadcast Centre's five floors provide a total working area of 270,000 square metres. When fully operational it will house the playout, channel management and creative teams for all BBC channels, as well as other UK commercial and international broadcasters.

Designed as a combination of themed meeting rooms and open plan environment, the Broadcast Centre is a very different model from Television Centre which dates from the 1950s. BBC Broadcast employs about 1,000 people who are housed on the first three floors of the building. The floors above are available for other broadcasters to co-locate in the Broadcast Centre. Shops in adjacent buildings provide local amenities for Broadcast Centre visitors and staff.

The Broadcast Centre is at the heart of BBC Broadcast's vision to lead a major shift in broadcast media management from the traditional tape-based formats to digital media, transforming its capability to playout, present, manage and repurpose rich media content for any platform and any broadcaster. BBC Broadcast is part of BBC Ventures Group, the BBC's commercial media services business comprising BBC Resources, BBC Broadcast and BBC Vecta. BBC Ventures Group is wholly owned by the BBC and is charged with the task of maximising income for investment in programmes and services.

ATG Danmon was selected to design and build

a fully Digital Production Village within the new Broadcast Centre. The village is equipped and configured to enable creative staff to create trails and interstitial material quickly and cost-effectively. The Digital Production Village went online in January and is now fully operational. It consists of 35 browse stations, six self-operating edit suites, six craft edit suites, a captioning suite, two audio dubbing suites and two voice-over booths.

Ingest

In phase 1 of the installation, ingest stations located around the building use Omnibus Ingest clients to digitise all required media into multiple Quantel sQ Servers. 50M MPEG-2 and 1.5M MPEG-1 copies are created in parallel. The proxy copies of the digitised content are then accessible from the qCut Browse stations where projects can be completed to a simple level. Complex editing or finishing of simple projects can be achieved in twelve edit suites – six are designated self-op suites for straightforward work and six craft suites are available for complex edits. Finished video edits are exported to the audio dubbing suites for final track laying as AAF audio files together with Quicktime video proxies. Gallery Virtual VTRs controlled from AMS-Neve AudioFiles provide proxy replay in the audio suites.

Phase 2 saw the introduction of a large Central Storage System (CSS). Omnibus clients will then ingest media from Sony Flexicarts and standalone VTRs into an Omneon Server system. Files are transferred into an SGI Origin on-line store, and then made available via gateway interfaces to the Quantel

Production Environment.

Pre-editing
The 35 Quantel qCut PC-based workstations enable editors to perform rapid access with the ability to view, log, choose and edit stored material. Video, audio and metadata can be drag-and-drop edited with a pen and tablet into a practically complete production, with multiple users accessing the same media and of course without waiting for tape shuttling. 150 creative staff were trained to operate the equipment during summer/autumn 2003 using a test-bed system installed at Television Centre to mimic the final workflow.

The 35 Quantel QCut browse stations allow editors to perform rapid access with the ability to view, log, choose and edit stored material. The Quantel qCut software runs on standard Dell PCs network- attached to the Quantel sQ Servers. This has proved to be far more efficient than the former editing systems based on Digi-Beta VTRs and standard non-linear editors, and has greatly reduced the amount of tape traffic movement needed. Previously each creative would arrive at the edit suite equipped with a lot of tapes and a lot of paper, and elements of the promo would then have been ingested one by one into the Avid systems from VTR.

Once processed on qCut, the material is completed if necessary in a craft suite, finalising audio mixes or completing any additional graphics that might be required.

The qCut edit stations are housed on two floors of the building in an open-plan environment, creative staff using either headphones or standard PC speakers to review material.

Craft editing
The Production Village's craft editors previously worked with a mixture of online tape suites and Avid non-linear editors. They took to qEdit relatively quickly and easily following training on the test bed system.

12 craft edit suites on two floors of the Broadcast Centre are equipped withQEdit Pro nonlinear editing systems.

Twelve craft edit suites on two floors of the Broadcast Centre are equipped with Quantel qEdit Pro systems providing extra facilities such as colour grading, keying and speed ramps, grading and blurs, enabling the elements of the promo to be given a coherent style.

The craft edit suites carry out basic audio track-laying; the final video edit and rough-cut audio edit is then passed to the audio suites for final mix-down. Two audio suites are being equipped as part of the Edit Village. Currently material is transferred using Digibeta, but the next stage of the project will see file exports from Quantel in AAF format being picked up over Gigabit Ethernet by the AMS-Neve Audiofiles.

Quantel Q-Scribe workstations are used for captioning, accessing a library of regularly-used graphic components. Work is underway to automate this process, which will enable multiple versions of trails such as "tonight", "next week" and "tomorrow" to be created as a background task.

Audio
Each of the two audio suites is equipped with a voiceover booth, AMS- Neve Audiofile and AMS-Neve Libra sound desk. Material is shared

Quantel qCut browse stations.

between suites using the AMS-Neve starnet networking system. The Edit Village works in stereo, Dolby 5.1, and, if necessary, multi-language. Requirements for different versions, their duration, on-air time, logos, etc, travel with each project as metadata.

Central storage

In the initial phase of implementation, D10 format files created using Omneon Video Servers under Omnibus control will be transferred to a 50TB SGI on-line store from where they can be accessed by the Digital Production Village. A 200TB ADIC Scalar 10K Archive Library controlled by Front Porch Digital's DIVArchive Hierarchical Storage Manager allows files to be archived either as a manual process or according to archive rules set within DIVArchive. It will be possible to archive files from multiple playout servers to the library, enabling programmes requiring repeat broadcasts to be ingested once only.

Disk array

The central disk array is a high-availability, high-bandwidth SGI RAID system with a rugged operating system. It is designed to support hundreds of software clients that will be attached to review material, and access material to create subtitle and audio description files. Other services such as transcoding, aspect-ratio conversion and making multiple copies for different delivery platforms will also be supported.

The current size of the on-line store is 50 terabytes, and it is capable of expansion to 200 terabytes in the future. It is a generic IT

store which can store anything from text up to uncompressed HD. It allows on-line access to 9 weeks of material, with material transferred to the ADIC archive device either manually or using rules set within the DIVArchive HSM software.

The future

Future phases of the storage project will introduce other services hosted by the SGI disk array, including automatic transcoding, aspect ratio conversion and delivery of content to a variety of platforms. Browse copies will be created and accessed via multiple PCs and decoders connected to the SGI disk array. They will be used for the review of programmes, the creation of subtitle files and other ancillary services. It is planned to enable each of the corporation's national centres to initiate file transfers of programmes to be broadcast in their areas, giving enhanced flexibility to their schedules. Asset Management tools have also been introduced to streamline the many concurrent processes that are needed.

The Production Village and Central Storage System represent a significant investment by BBC Broadcast in the future of tape-less broadcasting. The architecture selected, commissioned and system integrated by ATG Danmon will enable definable savings to be made, both in programme promotion budgets and in manpower efficiencies. These savings should be of great assistance to BBC Broadcast as it markets its services to other broadcasters, enabling extremely cost effective promotion and transmission packages to be offered.

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