Philips Technology Briefing

Asset Management: Distribution of Media Pool Video Server Content Over Wide Area Networks

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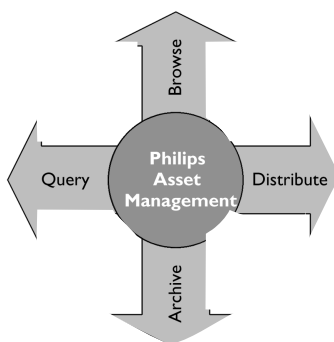*Philips Media Pool video server*

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Asset Management: Distribution of Media Pool Video Server Content Over Wide Area Networks

This paper describes an aspect of Philips Digital Video Systems' planned integration of browse, query, archive, and distribution technologies for asset management on Media Pool video servers. This development will afford Media Pool customers several new capabilities in the future.

Content Searching and Query

The use of primitive text databases or manual searching for tapes on a shelf will be replaced with rich multimedia queries based on picture content, dialogue, and descriptive metadata enabling faster and more economical retrieval.

Content Browsing

These searches will return ranked key-frames or low-bit rate proxy copies of the content which are suitable for viewing over remote studio connections, a newsroom LAN, or even a dial-up line from a employee's home or field location. Editorial approval, archive research, or legal review can be conducted from desktop computers without having to visit the studio.

Archiving

Emerging technologies will allow the Media Pool's archive capability to be extended to retain proxy copies and metadata for content removed from near-line storage or resident on other vendor's servers. Conceptually, this would allow content throughout a station network to be searched and browsed with a single application.

Versioning

Asset management tools will record the source content and operations used to create each version of an asset. A revision to any version can then be created by retrieving the original assets, edit decision lists, and effects parameters. All versions can be archived to off-line storage or retained as browse-resolution proxy copies. These tools can also provide an audit trail of creation, rights, usage, and destruction of content.
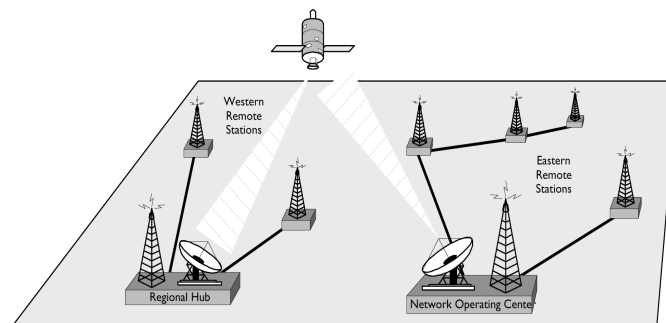
Transmission

The integration of video server technology with data communication networks and protocols will allow shipment of tapes to be replaced with electronic transfers over terrestrial or satellite networks. These networks will also enable control of broadcast facilities to be consolidated in remote operations centers.

Benefits

These asset management tools will enable users to streamline the creative workflow and reduce the time spent searching for content. The ability to browse content remotely through internet and intranet connections will enable faster collaboration on and approval of material. Additionally, the distribution of content over wide area networks not only allows consolidated control of facilities, but also enables casual exchange or sale of content. As a prelude to the development of a unified asset management solution, we'll now describe a demonstration of current asset distribution technology.

Video Distribution as Casual and Immediate as E-mail

In many cases, broadcasters equipped with Media Pool servers are discovering electronic distribution is less expensive than overnight shipment of tapes. This distribution may also be on a casual basis for the sale or exchange of content over dial-up ISDN or Frame Relay service or through connection to the Internet backbone. Our goal is to make the transfer of contribution-quality video as simple and ubiquitous as
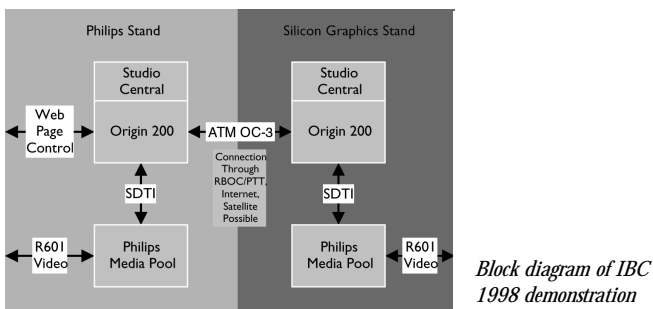

Possible distribution network for station group. Content may be distributed to any remote station through commands from the network operating center (NOC) or flagship station. A "pull" model may also be employed where personnel at a remote station can retrieve content from the NOC, a regional hub, or another remote station.

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still images transferred by e-mail. Realization of this vision will require the development and integration of technology for selecting and pre-viewing content over low-bandwidth connections; scheduling and transaction facilities for transferring content in a secure, guaranteed, and timely manner; and protocols and interfaces to efficiently utilize high-capacity networks. Philips has developed a prototype demonstration of these technologies using Silicon Graphics' StudioCentral™ and Origin 200 servers with the Media Pool.

IBC '98 Demonstration

For this demonstration a prototype browser and file transfer utility have been built on Silicon Graphics' StudioCentral Digital Asset Management Environment. A user may view low bit rate proxy copies of video stored on the Media Pool Video Server or in Media Pool's near-line data tape storage using an Internet browser. Content may be

Block diagram of IBC 1998 demonstration

selected for transfer from local or remote StudioCentral servers using StudioCentral's powerful query tools and metadata descriptors. Selected content may be transferred from a Media Pool to an Origin 200 file server using SDTI (SMPTE 305M) protocol. SDTI is a standard for the transmission of digital data over ITU R-601 video links. Content on the Origin 200 can then be transferred to another Origin over telecom, Internet, or satellite links. For this showing, we have used a private OC-3 ATM link between the Philips and SGI stands. At the opposite end of the link, content is again transferred by SDTI to the receiving Media Pool. Since the video is transferred without encoding or decoding, there is no generational loss in transmission.

Abandon Video Circuits for Data Networks

As this system utilizes standard data communication links and protocols, broadcasters can purchase communications circuits from a variety of telecommunications providers. Specially provisioned circuits marketed to the video industry are no longer needed. This solution also enables the use of circuits or links with guaranteed quality of service and those where the transmission bandwidth is made available on a

"best-efforts" basis. In cases where material is transferred in advance of broadcast, best-efforts networks such as Internet backbone service allow economical delivery. StudioCentral's Asset Transfer Service facilities allow the use of efficient protocols for transferring video files over high-bandwidth connections. On wide-area networks where transmissions may occur over long distances, traditional protocols such as FTP are throttled to a fraction of the link bandwidth because of the latency in acknowledgements from the receiving site. Using ATS, users may transfer files at the full bandwidth of the link. In addition, Studio Central manages the transfer of all metadata associated with the content, and may be used to automatically replicate and synchronize content servers with those at remote sites.

QC Once, Distribute With Confidence

Since digital data protocols incorporate automatic detection and correction of transmission errors and operate without modifying the compressed video data, content may be checked for quality and subject matter as it is loaded into the Media Pool server. The time-consuming dubbing and checking of tapes becomes unnecessary.

Link	Typical Speed	Time to transfer content with 4:1 compression of R-601 Video	
		30 second spot	30 minute program
Primary Rate ISDN Dial-Up Line	1.5 Mbs	17 min.	17 hrs.
E1 Frame Relay Circuit	2.0 Mbs	13 min.	13 hrs.
DS-3 Circuit	45 Mbs	34 sec.	35 min.
OC-3 Circuit	155 Mbs	10 sec.	10 min.
OC-12 Circuit	622 Mbs	2.5 sec.	2.5 min.
Full Satellite Transponder	40 Mbs	39 sec.	39 min.

Transmission times for various links

Continuing Technology Development

At NAB 1998, the initial steps of this project were displayed with transfer of content metadata between the Media Pool and Studio Central. This demonstration shows the completion of the content transfer effort with full-resolution video transfers to Studio Central using SDTI. Further demonstrations will reveal our continuing efforts in content browsing and transfer scheduling. Philips is currently working with a major broadcaster to implement distribution of advertisements and programs over wide-area-networks to affiliate stations. In the future, digitized video will be transmitted on a scheduled basis from a central Media Pool content server to Media Pool servers in affiliate stations over terrestrial and satellite links. As this initial implementation matures, Philips will offer products and services to allow broadcasters to plan, install, and operate similar solutions.

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