

Ingest Conform Deliver

1) Introduction

In 2002, CAPS-TV had an interesting dilemma, a new operation, with offices separated from playback, and a staff with little or no channel playback experience. Playback and the encoder were housed at City Hall because of the municipal meeting production requirements, and the lack of permanent facilities. Boxes of tape were taken from the office up to City Hall, where a staff member would sit and cycle through the encode process. Fortunately, the volume was fairly low, but it was still a drain on personnel resources (1 to 1.5 FTE).

When I was hired, one of the first things I did was a complete inventory of hardware and software. I found that we had a hardware based video editing system from Canopus (DVStorm) that had an MPEG encoder. After some weeks of tinkering, we were able to develop a process for encoding material onsite at the office, and then sneaker-netting the programming up to the playback server on external hard drives. With only DSL to link the two locations, over an encrypted VPN (maybe 240Kbps) pushing anything more than a 30 spot over the network was untenable. Network upgrades from 10/100Mb to gigabit Ethernet at both locations were the next step to accelerate the data transfer process.

2) Managing Bottlenecks

Ultimately, all management is about resource allocation and managing bottlenecks. In this instance, our goal was to reduce the labor requirements for ingest and playback and improve on-air look and technical performance.

3) Ingest

a) Process

- i) Forms / data collection & storage
- ii) Folder hierarchy and file naming conventions
- iii) Supported media types (source)
- iv) Required media types (destinations)

b) Technical

- i) Determine playback resolution
- ii) Determine storage & network bandwidth requirements and storage hierarchy
- iii) Equipment requirements (Encoder, VCRs, TBCs, monitoring)

c) Now I've got this file, what do I do with it?

4) Conform

- a) Trim for length – head & tail – update as appropriate
- b) Apply Naming Convention – update media data as appropriate
- c) Transcode to additional format as required
- d) Move media to appropriate storage level

5) Deliver

- a) Channel playback – per vendor spec
- b) Web streaming
- c) Web VOD

Tools and Tips

Encoding / Transcoding / Editing

SmartSoft Video Converter / Pro – \$29.90 / \$39.90

<http://www.smart-soft.net/video-converter/>

River Past Video Cleaner / Pro - \$29.95 / \$79.95

<http://www.riverpast.com/en/prod/videocleaner/>

Pinnacle Studio 11 / Plus / Ultimate - \$49.99 / \$99.99 - \$129.99

<http://www.pinnaclesys.com/PublicSite/us/Products/Consumer+Products/Home+Video/Studio+Family/>

ULead Video Studio 11 / Plus - \$69.99 / \$99.99

<http://www.ulead.com/vs/runme.htm>

Canopus ProCoder 3.0 - \$500

<http://www.canopus.com/products/ProCoderSW/index.php>

Offers very granular media file option manipulation. Bitrate, GOP type & structure etc.

Rhozet Carbon Coder - \$4,500

<http://www.rhozet.com/productCCfeatures.html>

Same GUI as Canopus ProCoder (same developers) massive scalability, MXF wrapping & unwrapping, very sophisticated automation.

Utilities

Bit Rate Viewer – Free -

Provides information about MPEG 2 streams including bitrate, quantization, GOP structure etc.

<http://www.tecoltd.com/bitratev.htm>

Snell & Wilcox MXF Desktop – Free – integrates MXF player functionality into Windows Explorer

www.snellwilcox.com

MOG Solutions - theScribe, MXFWrapper, MXFUnwrapper - ?? SDK and utility for playing MXF media

www.mog-solutions.com

OpenCube - MXFTX, XFReader, Utilities for

www.opencube.fr

MXF-GUI – Free – C++ platform for reading / writing MXF files

www.freemxf.org

All times estimated - network conditions may affect actual times

Bandwidth Requirements

	DSL	Cable	T-1	100Base-T
Nominal Upstream	384Kbits / sec	512Kbits / sec	1.5Mbits / sec	100Mbits / sec
Usable Upstream	345Kbits / sec	460Kbits / sec	1.3Mbits / sec	90Mbits / sec
# of 300K streams	1	1	4	300

Upload times MPEG2 - 4Mbits / sec

	1 hour	10 hours	20 hours	50 hours
DSL (384Kbps)	10.6 hours			
Cable (512Kbps)	8 hours			
T-1 (1.5Mbps)	2.7 hours			
100Base-T	3 minutes	30 minutes	1 hour	

Storage Requirements

	:30	2:00	1/2 hr	1 hr
DV video (AVI)	108 MB	435 MB	6.5 GB	13 GB
MPEG 2 (2Mbps)	7.6 MB	30.7 MB	460 MB	921 MB
MPEG 2 (4Mbps)	15.2 MB	61MB	921 MB	1.84 GB
Hrs / week (GB)	20	30	40	50
DV video (AVI)	260.0	390.0	520.0	650.0
MPEG 2 (2Mbps)	18.4	27.6	36.8	46.1
MPEG 2 (4Mbps)	36.8	55.2	73.6	92.0
Hrs / quarter (GB)	20	30	40	50
MPEG 2 (2Mbps)	239.5	359.2	478.9	598.7
MPEG 2 (4Mbps)	478.4	717.6	956.8	1196.0