

Video multicasting without client mgmt.

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Byline: JASON MESERVE

Start-up Video Furnace is looking to change the way TV-quality video is streamed over an IP Multicast-enabled LAN or WAN by delivering the video to a PC without the need for a preinstalled player client.

Part of the problem with streaming media is ensuring that viewers have the proper version of the player client installed on their machines for the format being streamed. Outdated versions of a player have a problem viewing content that is encoded in newer formats.

Video Furnace's answer to that problem is to deliver a small (200K-byte) software player with the stream. A viewer would visit a Web page and click "view stream," and a small Java applet would determine the operating system (Windows, Linux or Macintosh) on the target machine. Video Furnace first downloads the player from a central server and then plays the stream, usually a live multicast video, although video on demand also is supported.

all 20 channels consume only about 5% of available bandwidth in the school network, adds that the peak load to date is 2,700 simultaneous viewers. Students can watch more than one time, limited only by the processing capacity of the machine and the available space on the server.

When deciding to deploy the television network, Northwestern looked at a variety of Video Furnace competitors, including V-Brick and Cisco's VideoCast technology.

"What it came down to is quality of signal and ease of management, both on the server and client side," says. "The biggest barrier to success was a lack of management. We had a difficult time doing things like Media, QuickTime or Real because there are many versions of each."

If a new player update is available, the IT staff would add it to the server farm. "The next person watches TV gets the new client," he says.

Video Furnace's server hardware and software cost \$44,000.

Horizontal lines for notes.

Digital Video

Claire Stewart
 Northwestern University Library
 claire.stewart@northwestern.edu
<http://staffweb.library.northwestern.edu/staff/cstewart/ala2003>

Horizontal lines for notes.

Why digital video?

For preservation?
 Maybe

For access?
 Definitely

Horizontal lines for notes.

One size does not fit all

- Local or distributed user community?
- Public, special, school, academic?
- Small and poor, big and (sort of) rich?
- Circulating or non-circulating collection?

No **one tool** does everything you will want a video system to do

Start slowly, start small

Think through the issues

- What does your community need?
- Why choose digital?
- What can you afford?
- What is the long-term plan?
- Who are your partners?

Digital video is big

- MPEG2 @ 6Megabits per second (Mbps)
One hour = 2.7Gigabytes
- MPEG2 @ 50mbps
One hour = 22.5 Gigabytes
- Serial Digital transmission interfaces for HD
move data at 270Mbps

The entire Northwestern video collection would require about 94 Terabytes of disk if digitized at just 10Mbps

Digital video capture

Mechanics and strategies

Mechanics: capture

Parameters to control:

- Window size
720x480 common MPEG2
- Sample size & sample rate
- Bit depth
- Data rate

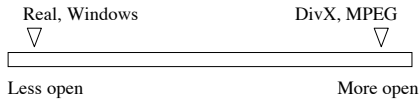
Mechanics: compression

- Lossless or lossy
- Spatial (within the frame) or Temporal (between frames)

Ability to access and control sample size, rate, frame rate, what codec (algorithm) will depend on software or hardware vendor

Mechanics: file formats

Spectrum of openness



Strategies

- Build a skunkworks
- Collaborative facility
- Outsourcing

Skunkworks

- Capture with built-in hardware (firewire)
- Compression in software
- Free or very cheap software
VersionTracker for free or shareware tools
(including MPEG tools), iMovie, Cleaner Lite.
- Do you have 2 or 3 staff machines that sit
vacant overnight? Compress video on them.
- Try a free (or eval copy) of a streaming
server

Management and delivery

- Metafiles
- Metadata is key
- Storage
- Streaming protocols/architectures
- Integrated asset management systems: MAM, DAMS, etc.

Metafiles

Lightweight pointers to actual streamed assets (RAM, QT ref movies, ASX)

- Strength: solves some problems with browsers, allows flexible mixing of assets (SMIL)
- Weakness: proliferation of additional files. QT uses a binary metafile format.

Metafiles

Lightweight pointers to actual streamed

```
123456.ram:
```

```
rtsp://xxx.xx.northwestern.edu:557/dms/mu  
sic/123456.rm
```

assets (SMIL)

- Weakness: proliferation of additional files. QT uses a binary metafile format.

Storage

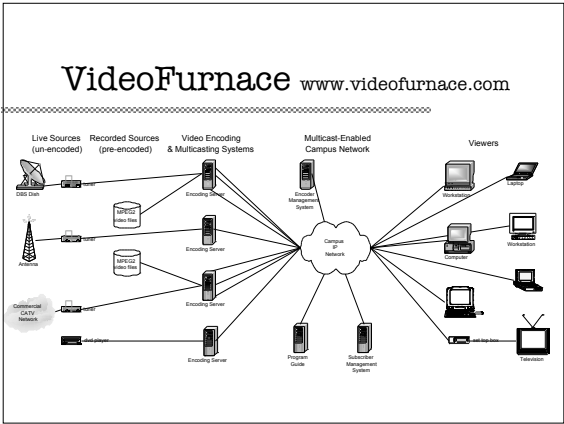
- Price of storage continues to drop
- Cost of managing storage still high
- Partners in mass storage?

Integrated asset management

- Course Management system, library management system, digital library system
- Security and access control
- Ability to create links and clips

Wish list

- MPEG1, MPEG2, MPEG4: purchased or created locally
- Capture once, transcode to many
- Unicast and multicast
- Search visual and audio contents of video
- Easy to discover, make clips and reassemble content, link securely from course management system
- End-to-end management for all media formats: video, audio, image, text



VideoFurnace www.videofurnace.com

- No resident client
- Multicast and unicast
- 4,350 unique campus locations
Peak day of 2,300 simultaneous sessions

CSPAN1 (2Mbps) and CSPAN2 (4Mbps):
www.i2-multicast.northwestern.edu

staffweb.library.northwestern.edu/staff/cstewart/ala2003
