

Audio/Video Standards Working Group (AVWG)
Minutes – September 7, 2006 @ 2:00 p.m.
Alexander Library 4th Floor Heyer Conference Room

Present: I. Beard, I. Bogus, N. Gonzaga, B. Nahory, R. Sandler,

Topics Covered:

- **Update on the Matrox repairs**
 - Bob Nahory has indicated that at this time, the Matrox Axio video encoder is functional. Lee Palmiter visited Dana library, along with a representative from Hewlett-Packard. The problem turned out to be minor: the wrong DVD burner had been installed on the system. A replacement unit was installed and the system began to work fine.
 - I. Beard will visit Newark the following week and do a test encode.
- **Reviewing the draft for video format standards**
 - A draft for video object standards was reviewed (see pages 2 and 3 for the draft, plus corrections). Some questions were raised regarding the draft:
 - (B. Nahory and I. Bogus) Should we in fact be specific about the codecs required to create the presentation files? Codecs change frequently as new methods are developed and video compression quality is improved. As long as the video is of good quality and is compatible with the players of the specified file formats, should we avoid dictating the required codec, when something as good better might be out there?
 - **Resolution:** Specific codec references will be removed from the final revision. The frame and bit rates should be adequate indicators of what we are looking for in presentation formats. Information about what codec was being used will be recorded in the technical metadata for each object, to make it clear what was used.
 - (N. Gonzaga and I. Bogus) Should we really create a presentation file for high speed and low-speed internet connections? It would appear that the changes made for low speed connections are very minute and probably not significant enough to warrant. To make drastically smaller video files that can be downloaded more quickly, a great sacrifice in quality would be needed.
 - **Resolution:** We will instead shoot for good quality video clips that are not too large, but will not be geared toward being specifically “dialup friendly.” Video will be a significant challenge for any dialup user regardless of what we do to try and support dialup. With the cost of broadband coming down, the prevalence of WiFi, and the library facilities providing easy access, a single standard for moderate-speed internet connections should be fine. Additionally, dialup users will be better supported when streaming video is enabled in RUcore.
 - (N. Gonzaga) Why have two presentation formats? Should one not be sufficient?
 - **Resolution:** Having two presentation formats will better assure compatibility with multiple computer platforms. The Flash video format is easily embedded into web browsers that have the flash plugin (most do), allowing for a very quick and easy view of the video clip. Meanwhile, Quicktime assures compatibility with Macintosh computers, and those users who are using esoteric browsers (other than IE or Firefox) that may not play nice with Flash. So for now, we will keep two presentation formats.

- I. Beard will be at Dana library to conduct tests on video clips based on these standards, and B. Nahory will work with some files as well to ensure these standards are practical. Based on those experiences, and the revision recommendations made at this meeting, a new draft will be put together and reviewed at the next meeting.

Next meeting date: TBD. Meeting dates will be coordinated with all group members by e-mail.

RU-CORE and NJDH Standards Analysis for Audio Objects

Recommended minimum requirements for preservation sampling of moving image objects

DRAFT

Introduction

This document will set forth a standards recommendation for moving images and digital video. In particular, this video object standard will recommend specific file formats for the preservation master and derivatives, for implementation into the Workflow Management System (WMS), as well as recommend sampling rates and specifications for presentation derivatives.

As with all other standard types established thus far, it will be mandatory to archive an uncompressed archival master, to ensure an object of the highest quality is preserved. Additionally, two downsampled and compressed presentations copies will be made available for end users wishing to access these objects online. These presentation copies are to be stored and accessible in formats that users will find easy to play back, and will use file formats and codecs that are compatible with multiple computer platforms.

Sampling and Digitization Rationale

The handling and preservation of digitized moving images presents a unique challenge to digital repositories. Presently, uncompressed digital video demands an extremely large amount of storage space, and produces incredibly large files. Yet, the need to store an uncompressed or reliable lossless-compressed object is paramount to ensure its longevity. In spite of this need, it is obvious that delivering the preservation object to end users would be impractical given current average connection speeds. Consequently, there is an additional need for downsampled, compressed presentation formats for video objects, more than any other object type addressed by the repository.

Additionally, the Audio and Video Standards Working group realizes that not all end users have internet connections that are of the same speed. While broadband usage is increasing, there are still a sizeable number of dialup and slow-speed internet users who may be interested in viewing video objects from the repository. Our handling of moving image objects should accommodate broadband users who will demand video playback that is of good quality, while still serving the needs of those who do not use broadband and may not have the same high expectations for video playback. To that end, we have proposed two different presentation formats: a downloadable format suitable for high speed connections, and a progressive download presentation format that compromises video quality, but is more suitable for an optimized experience on slower connections.

As always, the guidelines presented here are recommendations, and there may be cases where judgment calls will need to be made about objects that would be better preserved by modifying the recommended guidelines for this purpose. The Audio/Video Working group or the repository advisory committee should be consulted for guidance when such adaptations are required.

Recommended Standards for NJDH and RU-CORE Video Digitization

DRAFT

For preservation masters:

File format: Uncompressed, Full Frame Video (AVI file format)

Sampling rate for analog video: 29.97 frames per second, 640 x 480 resolution for Standard Definition (SD). Recommended data rate: 1,000-2,000 kb/s.

This is the minimum acceptable rate to ensure a good preservation master of analog SD video archives, and will be the most common sampling rate for objects that come to us as SD analog video.

For Digital objects, including high definition (HD) video: use same frame rate, resolution and bit rate as the original

For born-digital video objects such as DV or MPEG-2, the logical course of action is to preserve the exact specifications of the original. It will not be wise to downsample the original as that will cause a loss of object data, and no improvement in quality will be gained from upsampling.

For presentation derivatives:

- **One downloadable video clip for broadband connections**
 - **Quicktime Format (.MOV), using H.264 MPEG-4 codec**
 - For SD: Frame size of **320 x 240 resolution , 25 frames per second, multi-pass encoding**
 - For HD: Frame size of **720 x 480 resolution , 25 frames per second, multi-pass encoding**
 - Automatic key frames enabled, data rate of **300-500kbps**

This is widely considered an ideal compromise of a good quality downloadable video clip, viewable at acceptable quality on a computer screen while providing a reasonably manageable file size. This format will best accommodate users on a high speed campus or corporate network, wireless broadband (such as WiMax, UMTS or EVDO) or on a home broadband connection such as DSL or cable modem. Dial-up users may also use this datastream, however they can expect to wait a significant period of time for the clip to download before they can play its contents. Users choosing to view this format will need to download a free Quicktime player from Apple Computer, Inc.

- **One progressive-download video clip for low-speed connections**
 - **Flash Video Format (.FLV), using Sorenson Squeeze Codec**
 - For SD: Frame size of **320 x 240 resolution , 15 frames per second**
 - For HD: Frame size of **720 x 480 resolution , 24 frames per second**
 - Automatic key frames enabled, data rate of **300kbps**

This recommendation is a further compromise, aimed at reducing the file size of the presentation video clip at the expense of playback quality. This format will be a good choice for users of 56K dial-up internet connections, WiFi networks, and slower wireless data networks such as EDGE or 1xRTT. This presentation format simulates the experience of streaming video, allowing the user to view the beginning of the video object while the remainder continues to download in the background. Users choosing to view this format will need to download the latest version of a free Macromedia Flash Plug-in, provided by Adobe Systems, Inc.