

Adding Video to a RamCT Course

Some Basics

Delivery Methods

A digital video file can be delivered over the Internet in two ways - either as a *downloadable file* or as a *streaming file*. Each has its own unique characteristics, advantages and disadvantages.

The *downloadable file* is basically a compressed package that is sent to the student's computer where it resides. If video quality is important, a downloadable file can help maintain that quality, since all the playback parameters are contained within the file. If a video clip is fairly short or highly compressed, and the student's wait time to receive the file won't be long, then delivering it as a downloadable file is probably a good choice. However, since the file is saved on the student's computer, copyright infringement could be an issue. A student could redistribute a downloaded file to others or post it on a Web site; if this is not a concern, then the downloadable file is a viable solution.

Downloadable files are stored on and played from a standard Web server.

The *streaming file* is a constant flow of information packets pushed out by a streaming server. It is similar to a radio broadcast – the information continues to be sent regardless of how well it is being received; therefore, quality can be impaired depending on Internet traffic and the speed of your connection. To avoid student frustration from waiting lengthy amounts of time for a large file to download, a streaming file is a good choice because it begins to play almost immediately. Therefore, longer programs (which require larger files) are better delivered as streaming files. Because streaming files are not saved on the student's computer, a streaming file is preferable if protecting copyrighted content is important.

Streaming files must be hosted from a media server set up with the appropriate server software for streaming.

File Formats

Video files can also be created and delivered in different formats. Computers typically come pre-loaded with a media player, depending on their platform. Apple computers include a *QuickTime* player for viewing video files with extensions such as .mov and .mp4. PCs typically include the *Windows Media* player that can play files such as .wmv, .avi, and .asf. Knowing which platform your students have access to may influence which format to use.

Please note: for both platforms, there are free players available online that can be downloaded. The QuickTime player can be downloaded onto a PC and will play QuickTime files. Microsoft offers a Windows Media player for the Mac, however, as of this writing, Microsoft had discontinued development of this player for the Mac and compatibility exist for some newer files. Therefore, not all Windows Media files will

play on all Macs. Flip4Mac and the open source VLC player are other possible solutions for playing Windows Media files on a Mac.

Download Information for Free Players

To download QuickTime player for Windows:

<http://www.apple.com/support/downloads/quicktime72forwindows.html>

To download Windows Media player for Mac OS X:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=1e974157-5031-4ac6-840a-6e07547b6aeb&DisplayLang=en>

To download Flip 4 Mac:

<http://www.flip4mac.com/download.htm>

To download the VLC media player for Mac OS X:

<http://www.videolan.org/vlc/>

If you want to avoid the need for students to download an additional player, and in some cases they may not have administrative rights to do so, then consider providing both file formats.

What About Flash?

Flash movie files are another option worth considering. These files are typically highly compressed and small in size. They make use of a progressive format, which means the file will begin playing while the remainder is still being sent from the server. Flash files require their own custom player. The good news is most Web browsers come bundled with the player. If a student does not have the player, it can be downloaded as a free plug-in. Flash files can be offered as either a downloadable file or a streaming-type file; however, in both cases file playback relies on a Web browser.

To offer video as a Flash file you must convert it to the Flash format (.swf or .flv) using a software program such as Adobe Premiere or Camtasia.

Flash files cannot be hosted on the University's streaming media server, but can be stored on and played from a standard Web server and linked through a URL within RamCT.

General Guidelines

Use a downloadable video file from a Web server for:

- a video clip of a relatively short length, e.g., 5 minutes or less;
- a self-produced video clip where copyright is not an issue;
- a video clip where quality is important to maintain;
- a highly compressed file of small size that does not require much server space;
- a few short video clips within a course at a time.

Use a streaming video file from a streaming media server for:

- a video clip longer than 5-10 minutes;
- a commercially produced program with copyright considerations;
- a larger file that requires substantial server space;
- several short video clips that must remain available throughout the course and take up substantial server space.

Hosting Downloadable Files

Our recommendation is to store both downloadable video files and Flash files on either a departmental Web server (check with your IT coordinator about the space required), or on the Learning@CSU Web site. For more information about Learning@CSU, contact The Institute for Learning and Teaching (TILT) at 491-3132 or TILT@Colostate.edu, or visit the TILT Web site at <http://tilt.colostate.edu>. Within RamCT you can add a URL link to the file.

WARNING: Windows Media files (.wmv and .wma) will NOT play in the Windows Media player when the files are embedded directly into a course on the RamCT server. To prevent this problem from occurring, our recommendation is to store the file on another server and a link to it from RamCT. If you already have Windows Media files embedded in our course, there is an alternative that seems to work, but we cannot guarantee it in every circumstance. Through the File Manager, locate the specific file and rename it, changing the extension to .asf. [View](#) documentation showing this step-by-step process.

Preparing a File for the Streaming Server from a Digital Video Format

Streaming video files can be served from the central University streaming media server as long as they are either Windows Media Video (.wmv) or QuickTime (.mov) files and have been compressed and converted for delivery from a streaming media server.

If you have a digital video clip that has not been compressed and converted for streaming, you may need software such as Sorenson Squeeze or QuickTime Pro to do so. There are specifications within these software programs that can guide you through this process. If you are doing your own desktop video editing, the option to output appropriate streaming files may be provided within your editing software.

When creating a streaming file there are several variables that can be altered with the student's Internet connection speed in mind. For example, you can alter the video frame size, the frame rate of the video, the quality of the audio, and the targeted data rate when creating a streaming file.

We recommend creating a smaller file for users on a lower speed connection, and a larger file for users on a higher speed connection. This enables accessibility to most students while delivering the best quality video. The student can either choose which file to play, or if the file has been encoded with different bandwidth settings in one file, the server will detect the student's connection speed and play the appropriate file.

Example of smaller file:

For a DSL subscriber with a relatively low-speed connection (e.g., 256 Kilobits per second or less), the video frame could be reduced to quarter screen size and the frame rate could be lowered to 15 frames per second.

Example of larger file:

For a DSL subscriber on a higher speed connection (eg., 512 Kilobits per second or greater), the video frame could be reduced to half screen size while maintaining a full motion video rate of 30 frames per second.

Both the amount of action within the video and the need for viewing detail can influence decisions on compression settings. Parameters can be changed within the software when creating streaming files to optimize the video playback for end users. You might want to experiment with the video clip to see what is acceptable based on content, need for clarity, and what you know about your end user's connectivity.

Preparing a File for the Streaming Server from an Analog Video Format

If you have an analog videotape (which includes older cassette types such as VHS and SVHS) Communications and Creative Services can digitize the program and compress it appropriately for delivery from the streaming server. Since they are a cost recovery operation and this process can be time consuming, there is a fee for converting from analog to digital format. Contact CSU-TV11 in Communications and Creative Services (CCS) at 491-6432 for further information on this service.

Adding a Video File to the University Streaming Media Server

If you have a digital file that has been prepared for streaming it can be uploaded for free to the University streaming media server by either CSU-TV in Communications and Creative Services (491-6432), or The Institute for Learning and Teaching (491-3132, TILT@Colostate.edu, or <http://tilt.colostate.edu/>). Once the file is uploaded, you will be sent a "pointer file" or text file which points to the file on the streaming server. You will add this pointer file into your RamCT course. When the student clicks on the link to play the video, the pointer file will invoke the streaming server file.

Copyright Information

Under the TEACH Act, a commercially produced program can be provided as course content as long as certain requirements are met. Please see the checklist provided at <http://www.lib.ncsu.edu/scc/legislative/teachkit/checklist.html>.