Creating a Streaming file

By Stuart Castle

Contents.

There are two main streaming formats currently in use on the web. These are Real Media (descended from Real Audio which was one of the early Audio streaming formats) and Windows Media. Quicktime also has the ability to create streaming files, but does not seem to be as widely used as the other two, so is not really covered that much here. As with most things in life, Premiere offers two ways to create Real Media and Windows Media files: the easy way and the hard way. The easy way is to use the built-in copy of Media Cleaner 5 (which does not work outside of Premiere). The hard way is to use the built in copies of RealProducer and Windows Media Encoder. The advantage of the hard way is that it offers more control over how the clips are encoded, so may yield better results.

Things you need to consider for both options.

Where do I save my files?

You can save your files anywhere you wish, but be aware that to be accessible via the streaming media server, they need to be either in your "I:" folder, or a sub folder of this.

How do I access my files?

You can either access your files via embedding the player into the page, or creating a link to the file from the page. The easiest way is to create a link. For Windows Media clips, point it to "mms://stuweb.gre.ac.uk/<user-id>/<clipname>". Replace <user-id> with your own user id, and <clipname> with the sub-folder and name of your clip. For example, a Window Media clip called bill.wmv in the on the I drive of user "cs466" would be accessible via "mms://stuweb.gre.ac.uk/cs466/bill.wmv" . The same clip in the i:\media folder would be
"mms://cms-stu-iis.gre.ac.uk/cs466/media/bill.wmv".

Real media clips are accessed in a slightly different way. The address for the Real Server starts "rtsp://cms-stu-iis.gre.ac.uk/student/". Then, there is a single digit (which is the same as the first digit of your user id. After this is a slash ("/") followed by the user id. For example, if user cs466 had a file call "bill.rm" in his folder to stream, the address would be "rtsp://cms-stu-iis.gre.ac.uk/student/cs466/bill.rm". Quicktime files are accessed the same way, but use either a .QT or .MOV extension, instead of .RM. Quicktime streaming files can ONLY be created using the Premiere "Save For Web" option.

Bandwidth

It is beyond the scope of this guide to go into the ins and outs of communications bandwidth, as to do so would require me to write a book on this subject alone, so here is a short explanation of Bandwidth.

Put simply, each communications medium has a limited capacity. It may help you to think of the data going through the medium (be it a network, phone line or whatever) as being like water going through a pipe. The pipe has a limit on the amount of water it can carry. All communications media have a limit on the amount of data they can carry. This is the bandwidth. The bandwidth is usually specified in KBps (Kilobits per second), or may be specified in Mbps (Megabits per second). One Kilobit is one eighth of a Kilobyte. One Megabit is 1024 Kilobits.

Before you encode the video or audio that you will stream, you will need to decide what the bandwidth of your target audience is. Most users using the internet from home will have a 56Kps or less modem, where as users accessing the internet from work, or using ADSL. / Cable modems have bandwidths that can be up to 512Kps (sometimes more). You should be aware that if you encode a clip with a bandwidth that is to high, you may not get any video (in the case of a Windows Media clip), or will play back jerkily (in the case of a Real Media clip). Neither is very pleasant for the user.

All of our encoding software offers presets, so, for example, if you are encoding a clip for a 56Kps modem, you can pick 56K modem. If you pick a preset that uses Intelligent Streaming or SureStream (or QuickTime's Alternatives), then the streaming server will be able to test the connection bandwidth and adjust the clip accordingly.

Frame size and rate

This needs to be considered whenever you are editing video for computer use, but particularly when you are streaming. If you use the presets in Windows Media Encoder and Media Cleaner, you have no control over either of these, although Windows Media Encoder will tell you the frame size and rate in the bottom left hand corner of the window. RealProducer will allow you to alter the frame size, as will the other two if you do not use the presets.

Put simply, you need to consider that both the frame size and frame rate will affect both the size and bandwidth requirements of the final clip. The larger your frame size and/or frame rate, the larger both the size and bandwidth requirements for the clip are. A clip that is too large, or has to high a frame rate my cause problems for your target audience.

A clip that has a lot of action may look better with a higher frame rate, but lower frame size. If there is little action, then the clip may look better with a lower frame rate and higher frame size. It is best to experiment with a small section of the clip to see which looks best.

Encoding time

You should be aware that encoding media for streaming often takes a long time, especially if you are using Intelligent Streaming, SureStream or Quicktime Alternatives. For example, to encode a 12 minute video took 48 minutes on a Celeron 600 machine with 128 Meg of RAM. This was using a single 100Kps stream. Depending on which lab machine you use, it may take longer than this, or less time.

Why does it take longer for SureStream or Intelligent Streaming (or Alternatives)? This is simply because of the way they work. When you create a normal streaming clip, you are created a clip with one video track and one soundtrack. When you create a clip for use with Intelligent Streaming or SureStream, you are creating a clip with multiple video and soundtracks. When it is playing the clip back, the streaming server simply picks the video and audio tracks whose total bandwidth requirements are closest to the communication bandwidth available.

Advice for good streaming.

Filming

There are several pieces of advice you would be advised to follow to produce a well compressed streaming file with a good compression ratio.

1. Use a good quality camera, preferably with 3 "Charge Coupled Devices". The only cameras currently in our stock that have 3 CCDs are the two Sony VX cameras. Remember, there is an old computing adage that applies here. Garbage in Garbage out.

2. Try to light the scene evenly, and avoid shadows. Remember, any shadows may move, and if they do, the video will not compress as well.

3. Keep any camera movements to a minimum. Use a tripod, and don't pan the camera (move it side to side) if you can avoid it.

4. Use a plain, evenly lit background if possible. If this is not possible, then use Manual focus on the camera to put the main subject of the clip in focus, but keep the background out of focus.

5. If you are filming a person, try to get them not to wear any stripy clothes, as the stripes may well cause a visible "interference" on the streamed video. This advice is valid for any kind of video/TV filming.

6. Get any people to wear plain or muted colours.

The above may not be all possible (if you a streaming some sort of event for example, you would have very little control over lighting and background for instance., but if you follow most of the advice above, you should be able to video for streaming effectively.

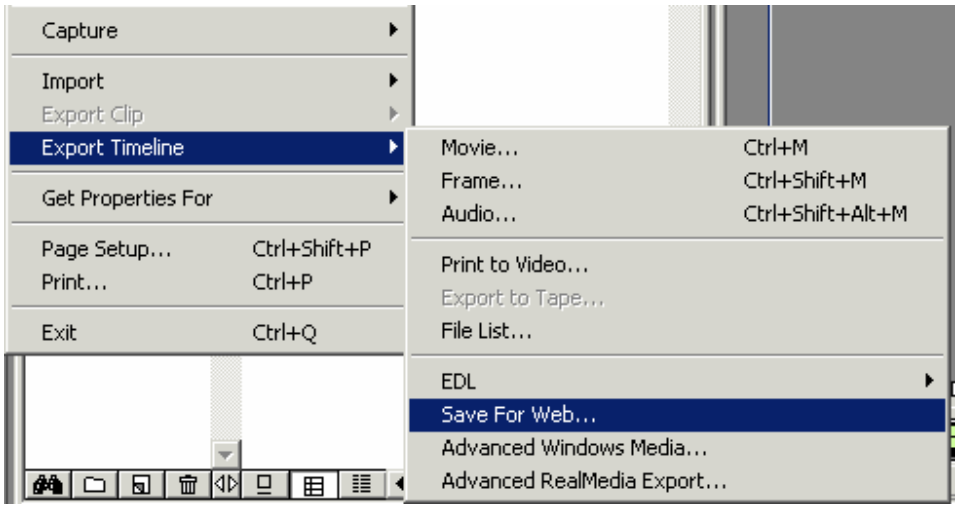
Streaming the video

When you have finished filming, or wish to stream a pre-recorded event, follow this advice.

1) If you a streaming from a video cassette, try to use MiniDV (or any digital tape format) via a firewire/DV/iLink/IEEE1394 (all the same thing) if possible. Try and avoid using analogue tape formats (ie Hi8, VHS) and analogue inputs.
2) If you do need to use an analogue input (which you may do in our labs), then use an S-VHS/SVideo connection
3) If you are going to use a wide range of bitrates (say 28.8K modem to LAN), encode the clip using a smaller frame size for the lower rates, and a higher size for the higher clips. So, if you were encoding for an audience that ranged from 28.8K modems to 1MBit broadband connections, you might use 160x120 for 28.8 and 56K modems, 320*240 for 100K up to 500K and 640 x 480 for 500K up. You will need to produce one clip for each framesize you want to use
4) When planning what bandwidths to use, bear in mind that the user may not always get the maximum bandwidth they have available on their connection., so try and encode a bitrate slightly lower than your target audience, to take into account that their connection may not be perfect.
5) If you are streaming from cms-stu-iis, please also take into account the fact you are limited to 200KBps for the bandwidth. Other hosts may have other limitations, so you will need to take these into account as well.

Getting ready for encoding: Using Premiere

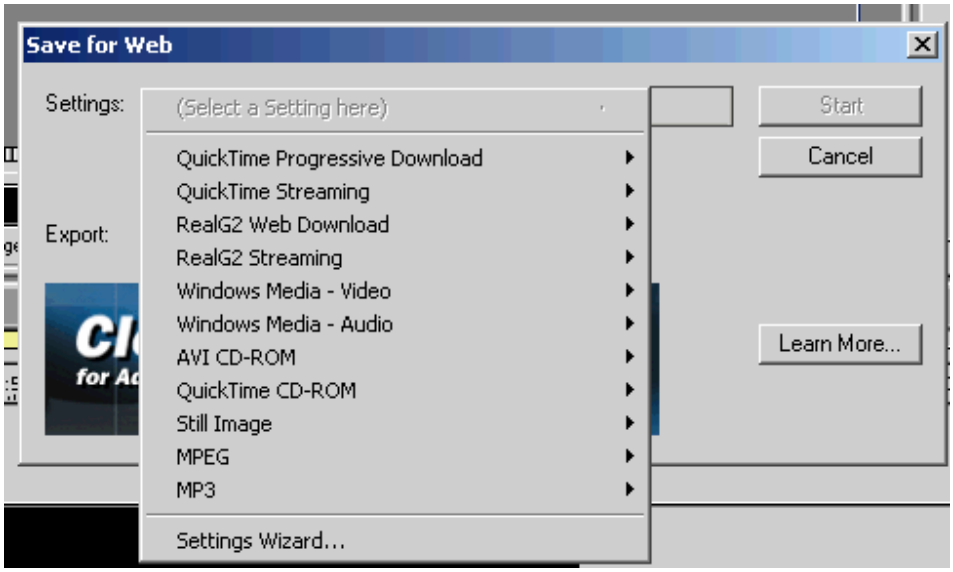
For both of these options, you need to start Premiere, open or create new project (adding some clips to the timeline if needed), then click “File”, “Export Timeline” as shown below:



Streaming with Media Cleaner: The easy way.

First, to start Media Cleaner, select “Save For Web” from the “Export Timeline” menu. You will see the first page of a wizard. The first thing you need to check is what it says next to the word “Export”. This controls what Premiere will export. If it says “Entire Project”, then the whole project (logically enough) will be exported. If it says “Selected Work Area”, you can select the area you want exported.

Now, take a look at the “Settings” area. The object next to the word “Settings” is, in actual fact, a button. If you click it, the following menu appears:



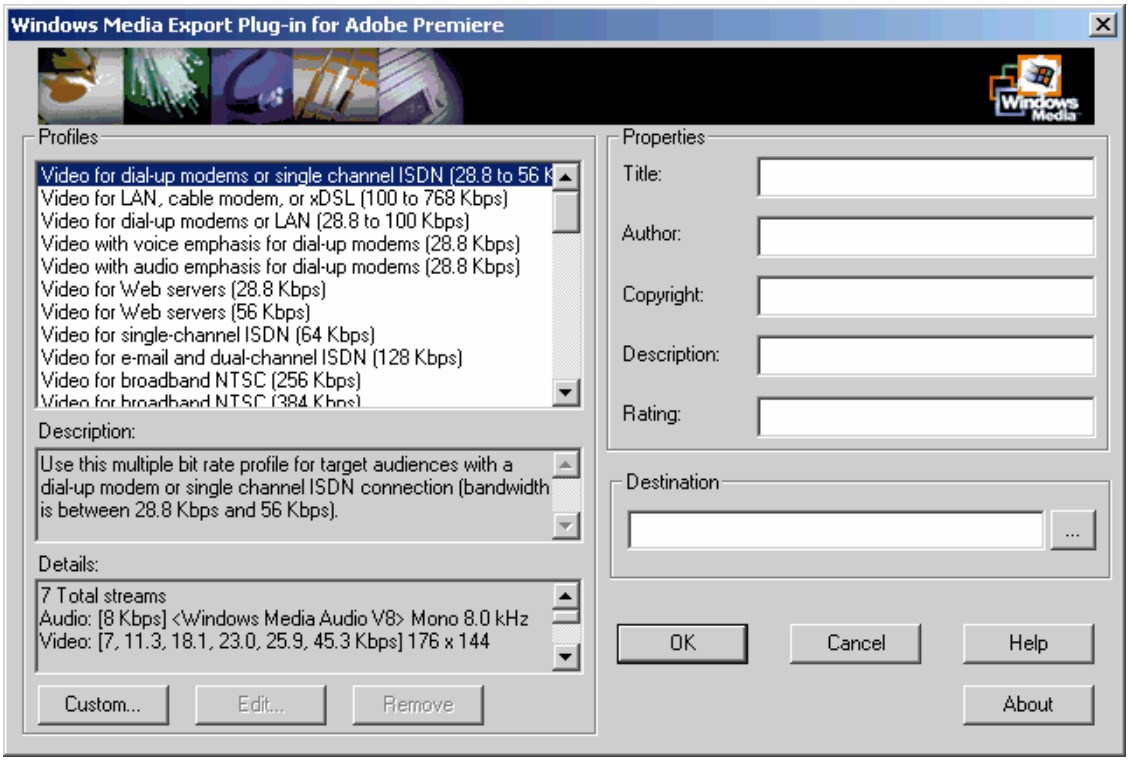
This is where you tell Media Cleaner what kind of file to export. You can either use one of the presets, or the settings wizard. To use the presets, select the type of file you want from this menu, and then select one of the bandwidth sizes from the sub-menu that follows. For best results, you can use either "Intelligent Streaming" or "SureStream" if they are offered, as we have a server that can stream using these formats. Intelligent Streaming is under Windows Media and SureStream is under RealG2 Streaming. See the section on Bandwidth for more information on this.

You will also be asked where to save the file.

The hard way

Windows Media Encoder

If you pick "Advanced Windows Media" from the export timeline menu, Premiere will start a cut down version of Windows Media Encoder



. As with Media Cleaner, you can use presets (or profiles as they are called here). You can pick a profile that matches up with your requirements. If there are none, you can pick custom and create your own (either from scratch, or by altering a copy one of the presets there). It is probably best if you use a preset to start with.

The entries under “Properties” are not really needed. They are stored in the encoded clip, and if you want to use them in the ASP or JavaScript code on your website, you can. They will also appear in Windows Media Player if they are present in the clip.

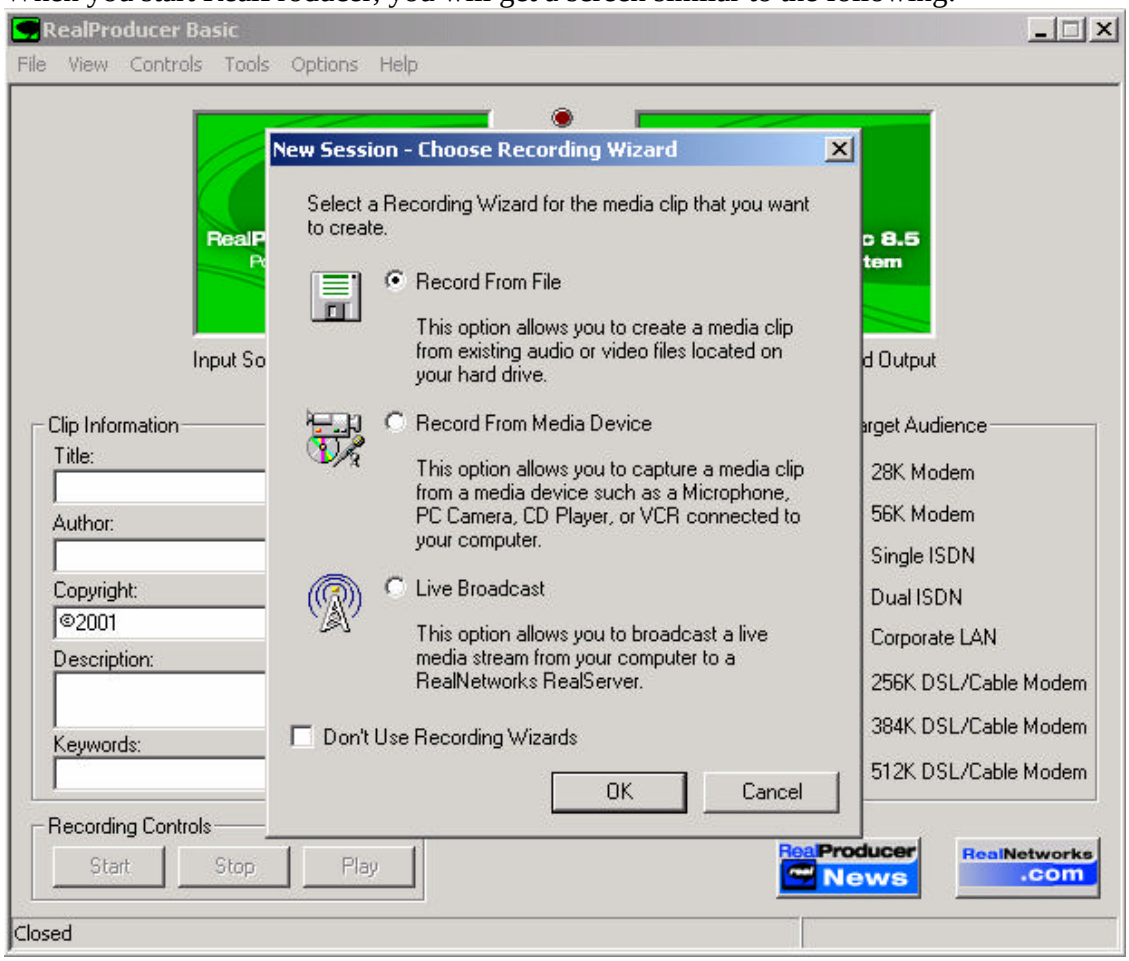
The only thing you need to worry about is the Destination. This tells the computer the path and filename that it should use to save the file.

Encoding without Premiere.

Using RealProducer

If you need to produce Real media, you will need to use RealProducer on your AVIs, Quicktime Movies or WAV sound files.

When you start RealProducer, you will get a screen similar to the following:

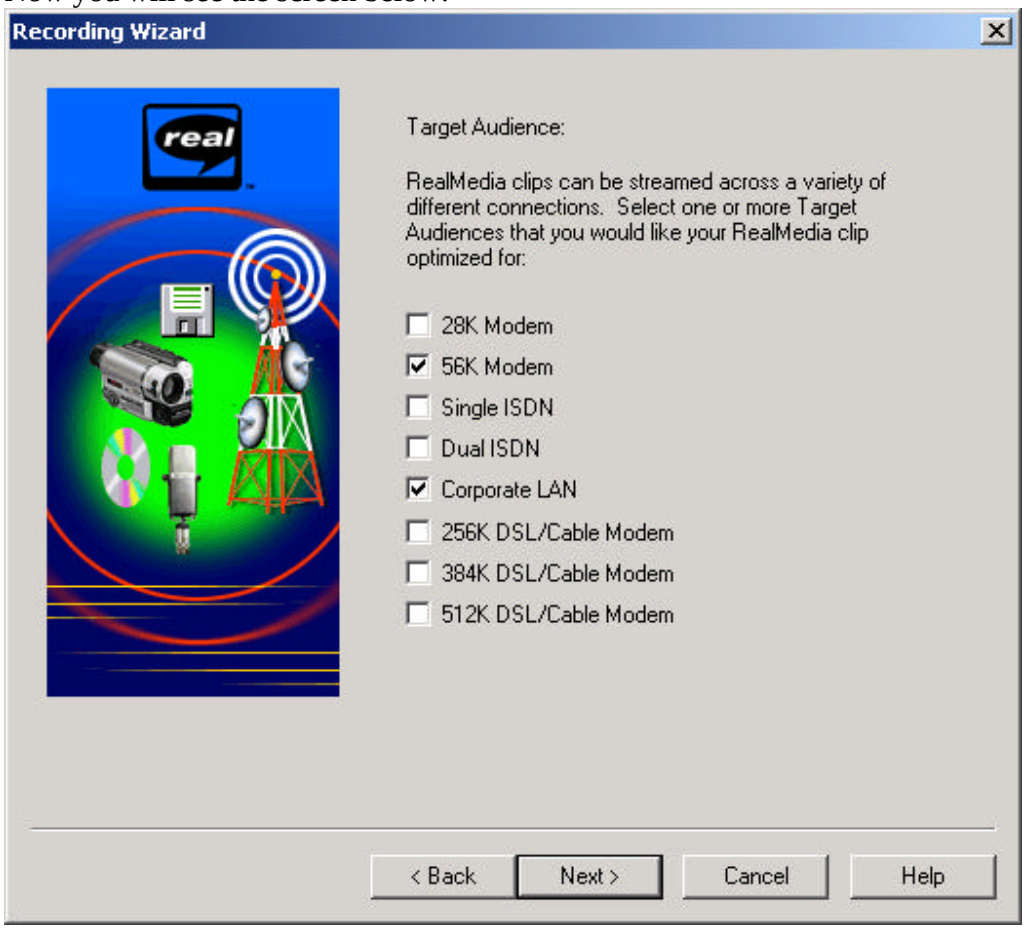


Record From File

If you use the wizard, the first thing you are asked for is the name of the file you will be encoding from. Select/type this and click “Next”. The next screen is asking for display information about the clip. You don’t have to fill out any of this screen, but it should be self-explanatory. Title, Author, Description and Copyright can be optionally displayed by Real Player when the clip is played. Keywords are not displayed, but may be used by certain search engines to enable people to search for the clip.

Real Producer will also need to know which type of clip to export. If you are planning to stream the video from a standard web server, use “Single-rate for web servers”. If you are planning to stream the video through a RealServer (such as stuweb.gre.ac.uk), you have the option of using single-rate streaming, but this is relatively inefficient. You should use “Multi-rate SureStream for RealServer G2”.

Now you will see the screen below:



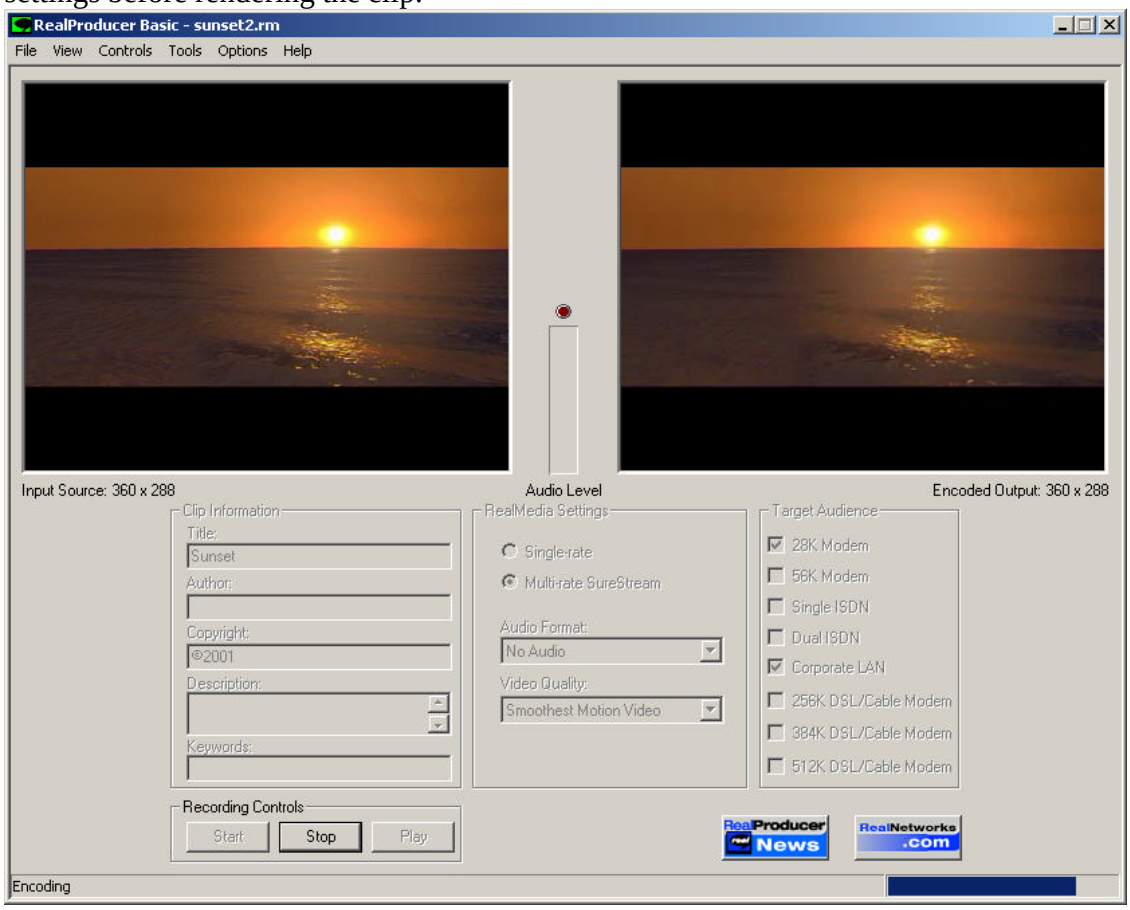
If you selected single-rate, you will be able to tick one of the target audience settings. On this version of RealProducer, if you selected multi-rate, you will be able to click two target audiences. On the version of RealProducer built into Premiere you can select more than two target audiences, but the version built into Premiere will not run outside Premiere.

If you are encoding a WAV file, you can skip this paragraph. The next page is asking what kind of video you have in the file. Basically, RealProducer will try to optimise the clip for whatever kind of video the clip has. If the video has a lot of movement, then it will blur the image a bit and try to smooth out the movement. If you have a video that has little movement, you may want a sharper image.

If you are not encoding a WAV file (or video clip with audio), you can skip this paragraph. RealProducer will now ask you to describe the audio. This is so it can optimize the audio compression.

The final page asks you where to put the finished file. If you want, you can output it straight to your J:\public_html folder.

When you click "Finish", you will get the main Real Producer screen, and can edit any settings before rendering the clip.



You will see two "monitors" on the screen. The one on the left shows the "Input" file and the one on the right shows the output from RealPlayer. The controls below duplicate the controls in the wizard you just finished. The only extra controls are the Recording controls (bottom left). These enable you to create the Real file, and play back the created file in Real Player.

Windows Media Encoder

The main application we have for creating Windows Media files is called Windows Media Encoder. Like RealProducer, this can take either a pre-recorded file or live audio from a soundcard. Given a suitably equipped PC, you can also capture live video, but this cannot be done at University as the capture cards installed in the machines do not support it.

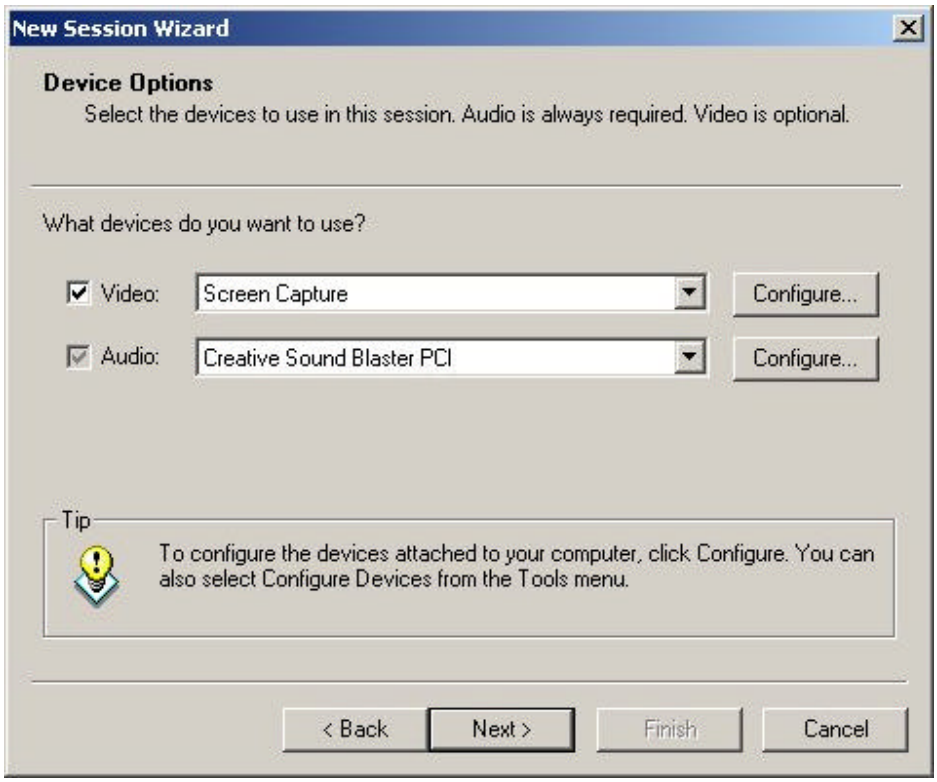
Starting encoder

When you start Windows Media Encoder, you will see a dialog appear that is asking you whether you want to use the wizard, open an existing encoding session or create new encoding session. Unless you have a session saved that you want to open, select "Broadcast, capture or convert a file using the New Session Wizard". Once you have experimented with the program a bit (it's not hard even not using the wizard), you can just create a new session without using the wizard. This also gives you access to things like scripting (which is beyond the scope of this text, so is not covered).

The next dialog enables you to select what type of thing you will be encoding (i.e. a live event or AVI file).

Live encoding

The first two options enable you capture and event and either stream it to a Windows Media Server (which for various technical reasons we are unable to support) or save it to a Windows Media file. This document shows how to capture from a device (in this case the computer's own screen) and the data to a WMV file.



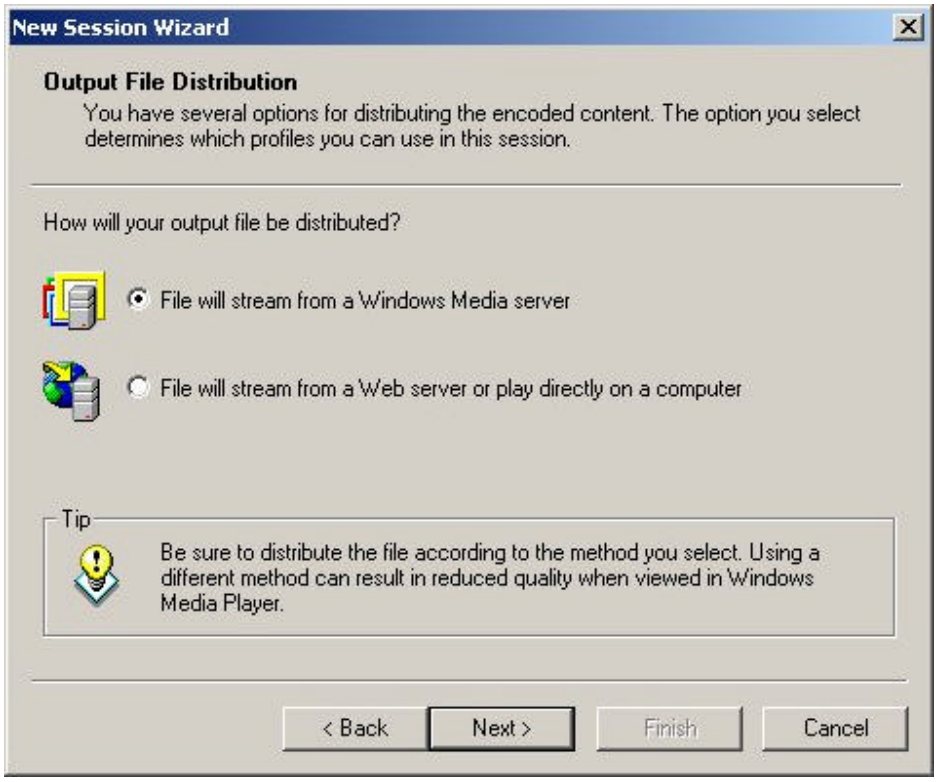
Now, on this dialog you can control whether or not you capture video and the devices used for capture (useful if you have more than one video or audio capture device in the machine). You can also reconfigure various settings for each device. One thing you cannot do is stop Windows Media Encoder capturing audio. This is because Windows Media stores necessary information in the audio track of the video. The listener will not hear this information as Windows Media Player filters it out.

The next dialog simply asks for a filename and where to put that file. Type or select the file here. It may be a good idea to put the encoded file straight in the I: folder (saves you having to copy it there later).

Streaming from an AVI or WAV file.

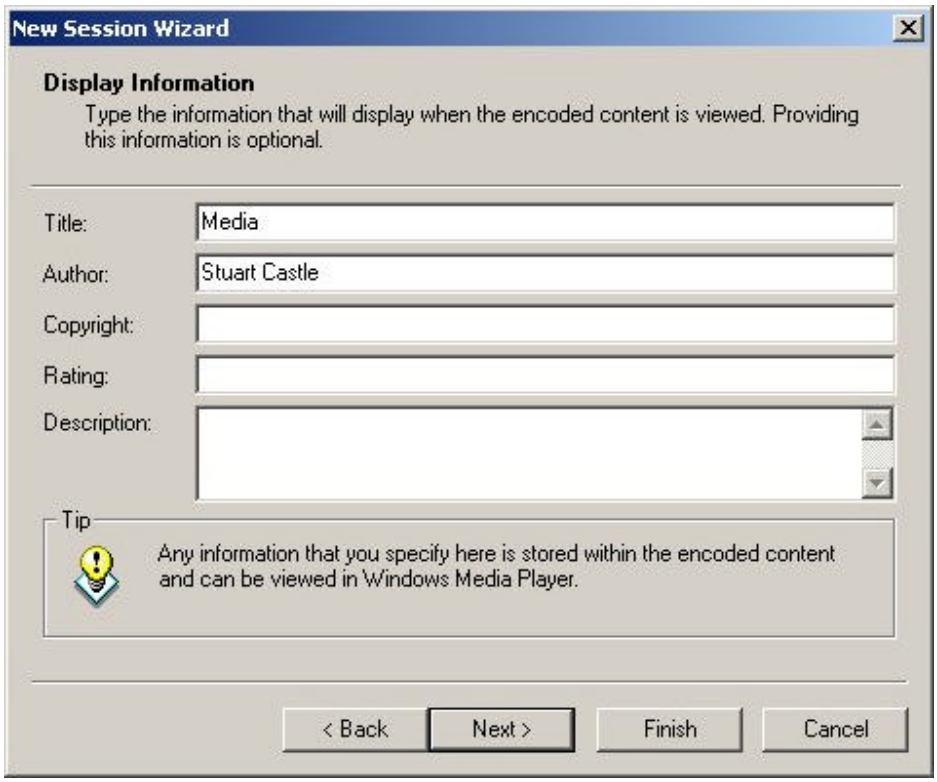
Starting this is slightly different to starting a stream from a live source. The only real difference is that a dialog asking for both the input and output filenames is displayed first.

Continuing the setup



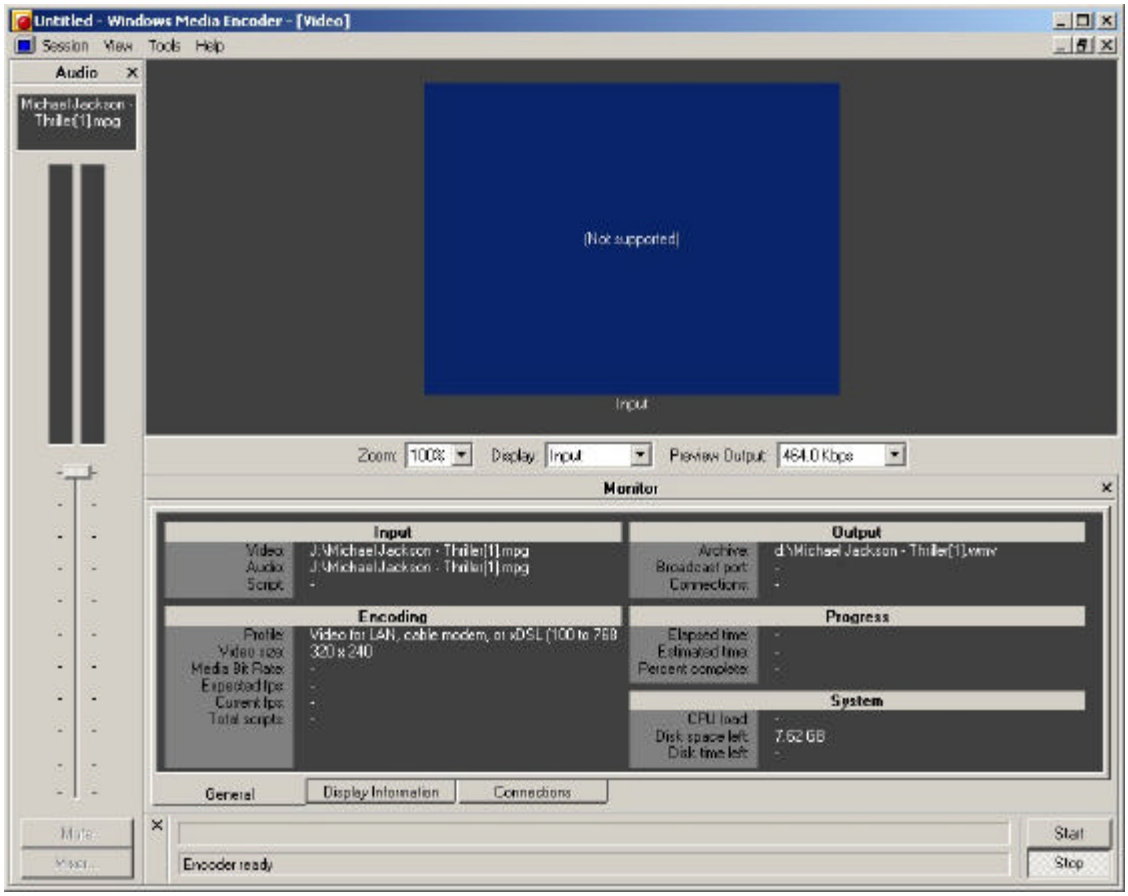
Now, you need to select how the file will be distributed. Basically if you tell the encoder that the file will stream from a Windows Media Server, then you can select multiple output bit rates, which the server will then switch to as and when needed. If you select to stream from a web server, you will only be able to use one output bit rate.

The next dialog is asking which profile you want to use. These work in the same way as the Profiles/Presets in Windows Media Encoder (the version built into Premiere) and can also be edited. Select the profile that most closely matches your target audience (i.e. don't select "Video for broadband film content (1500 KBps total)" if you expect your target audience to be using modems, it will not be a pleasant experience for them).



This dialog allows you to enter the information that is stored with a clip. This information can be displayed within Media Player, and can also be used in a web page (via JavaScript/J Script).

The main work area looks like this:



This screen actually looks worse than it is. If you need to reduce the audio level, just adjust the volume control on the left. If you need to look at the information (such as Title, Author etc), click the "Display Information" tab. When you want to start/stop encoding, click "Start" or "Stop".

If you click Stop, or the encoding finishes, a small dialog appears that gives you information on the file you just encoded. You also have the option to view the finished file. You can do this but bear in mind that it will be "streaming" the file off disk, which is not a very accurate indicator of how it will stream over a network (or the Internet), so you should still try and view the clip using an Internet connection if possible. If you do view the clip, you should try and view it using a similar type of connection as your expected target audience.