

GUIDE TO DIGITAL VIDEO DISTRO

The following aims to be an overview of the issues and procedures involved in distributing video produced by or for NGOs and non-profits using DVD/VCD and the web. This will hopefully also serve as a practical methodology for using free and open source software as part of a digital video distribution strategy.

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INTRODUCTION

The type of film you have made will be important in deciding how you choose to digitally distribute it. A shorter news piece may be suited to posting on a website that contains regular updates on a situation or topic and may contain links to other text or pictures relating to the event you are covering. A video with more in-depth background or analysis might be more suited to a themed compilation on a particular issue to sit alongside other videos exploring the same topic from different angles. A feature-length documentary may be better to distribute on DVD – as audiences may be more likely to watch a longer-format movie on their television than on a computer, and downloading large files off the Internet may be impractical.

Who the audience is will have the biggest impact on your methods of distribution – will your target audience have access to a DVD player or the Internet? Or will it be more important to screen your video – perhaps taking a tour of your film out to communities? You may choose to target specific audiences who are most likely to take action on the issues you are dealing with, in addition to reaching a broader audience by uploading your video to the Internet. Both can complement other aspects of your distribution strategy such as direct advocacy and campaign work, community TV and festivals.

All of these issues are important to think about in the planning stages of making your film. Pre-production is the time to define your audience and the best mediums to use to reach them.

Advocacy video can only be really useful when used strategically as part of your campaign – which means you should never be producing your film and then left wondering what to do with it. Other independently-produced material will not have a natural home in mainstream media channels so it is equally important to plan ahead.

Bigger is not necessarily better. When your distribution strategy is linked to grassroots campaigns and communities it may have a greater potential to make an impact than a program on television an audience has casually flicked over to.

DIGITAL VIDEO BASICS

Player Software

The operating system used by members of your audience will have a default media player installed – Windows Media Player for PC, Quicktime Player for Mac and for many Linux distributions it will be Mplayer. Other proprietary media players that will handle different types of video are RealPlayer and iTunes.

VLC (VideoLAN Client) is a cross-platform FLOSS media player that is designed to be a universal video player. VLC will play back most formats and codecs without the need to download additional software modules, and will also play back DVDs and VCDs. As VLC is GPL licensed it is possible to re-distribute the program along with your video. VLC offers many other features including streaming.

Compression

Most consumer NLE (non-linear editing) applications such as Premiere, Final Cut Pro or Cinelerra (for Linux) edit and render DV (Digital Video) files natively – either in SD (standard definition) or in the newer HD (high definition) formats. Even standard definition DV has a high fixed bit rate (the amount of data streamed over time). DV has a bit rate of 36 megabits per second or around 4 minutes of video per Gigabyte, resulting in files too large for transport on the web. It is necessary to compress these video files to make them smaller, in a format that will be compatible with your audience's player software.

Your options for compressing video include exporting directly from the timeline of your video editing application or by using a FLOSS or shareware encoding application such as Virtual Dub (Windows), MediaCoder (Windows), ffmpegX (Mac OSX), or gtranscode (Linux). Features to look for in an encoding application include batch encoding so you can line up many files to encode at once, settings you can save and re-use, and the more support for various codecs and formats the better. A great resource containing guides for encoding is <http://www.videohelp.com/>

Codecs

A codec (which stands for compression-decompression) is a software module that contains algorithms used by encoding or playback software to encode or decode video and/or audio information.

Popular proprietary codecs include Windows Media Video and Sorenson 3 for Quicktime. Depending on your audience's access to the Internet, operating systems and technical abilities it may be in some cases a good idea to offer your video in one of these codecs in addition to a FLOSS codec. A good resource for comparing codecs is the doom9 website.

One codec option that is becoming increasingly popular for playback within Internet browsers is Flash video. FLV or SWF files containing video are well suited to being embedded in a web page, as they only require the Flash browser plug-in for playback – which most Internet users already have without needing to download any additional software.

Open source video codec alternatives include Ogg Theora or the XviD codec. XviD is a high quality

codec and is the most widely supported open source option available. It is relatively simple for most people to watch as many players have native support for XviD. It is also easier than Ogg Theora to encode, as there are more applications available to encode it.

The most highly regarded and widely supported open source audio codec is the LAME mp3 codec, which can be incorporated within many different container formats (see below).

The future of video codecs lies with those built to the new H.264 or AVC standard that forms part of the MPEG-4 specification (see “Standards” below). There is a GPL-licensed application of H.264 called x264. This is a codec to watch – many people are using it already but it is still in early development and uptake is still limited as compared to XviD. It is also a much more highly CPU-intensive codec, both when compressing files and decompressing them in player software – which means it uses more computer processing power. It is therefore not recommended for use on older less powerful computers – which must be considered when thinking about your audience.

Container Formats

A container format is the wrapper code around the audio and video streams in a file to synchronise the two for playback. It can also contain other information such as chapters, sub-titles and metadata. Examples of container formats are ASF (the Windows streaming format), Quicktime (Apple’s .mov format), 3gp (a type of MPEG4 format for mobile phones) and AVI (an early Windows format still widely in use). Each of these formats can only support certain codecs for each audio or video stream. The open .ogg format can contain codecs such as Vorbis (audio) and Theora (video). The XviD codec is used within the AVI format.

Standards

Video compression standards, such as the MPEG1, MPEG2 and MPEG4 standards set by the Motion Picture Experts Group, are a set of rules that video codecs and formats must be designed to adhere to. This standardisation, as in any other area of engineering, allows manufacturers and software designers to anticipate the kind of video, audio and other information that their software or hardware will have to process.

The MPEG4 standard contains several parts including Advanced Simple Profile (MPEG4 Part 2) that contains elements implemented in codecs such as XviD, 3ivX and DivX. A new more advanced part of the MPEG4 standard, known as H.264 (MPEG4 Part 10), is set to become the major standard used by the next generation of High Definition DVD and Television, as well being used for video conferencing and other online video delivery.

Mobile Devices

Encoding to certain specifications will allow users to watch video on their mobile devices such as a mobile phone, PSP or video iPod. Conversely it is possible to record video with many mobile phones or digital cameras these days, often in the 3gp format. Users can then transfer these video files to a computer and upload them onto the Internet. These files are already highly compressed and therefore do not require further encoding and are most useful when uploaded along with supporting material such as text and images as the video and audio quality is quite low.

ONLINE DISTRIBUTION

Distributing video on the Internet can give you access to a potentially global audience – fast and at relatively low cost. It is true that the initial investment in computers to process and encode your video, plus a reasonably fast Internet connection, can be high – and will be impossible for many groups and individuals to afford themselves. However, this may be overcome in some cases by sharing existing community resources, or by installing free open source software on computers that are already used for other purposes.

Once this investment is made or these resources have been found, by using new distribution technologies and making use of free services already available on the web, the cost of distributing to a very large audience can be no more than the cost of sharing your video with only one other user. This means that this form of distribution is much more scalable than using tape or disc where the cost of distribution increases for every physical item that must be replicated and delivered to the end user.

It is no longer necessary to worry about the costs of increased traffic from your web hosting company when you can choose to use one of the many free services that are now proliferating on the Internet. There are various freely accessible online video distribution projects that are committed to principles of open content, participatory culture and the sharing of knowledge without commercial constraints – having similar aims and objectives to the free software movement.

It is important that you distribute your video in formats that your audience will be able to play back easily, and that you use your networks online and offline to let people know that it is there. There is an ocean of content on the web, and your video may otherwise get lost amongst it.

Once your video is in digital format on the web it is easy for others to make copies of it and re-distribute it in their own networks. Content has the potential to reproduce itself “virally” on the Internet and take itself much further than you could anticipate if you happen to interest people enough that they will forward it on to their friends and associates.

It is therefore theoretically possible for video-makers to access mass audiences in a way that was only possible previously through traditional broadcast media channels – but this depends on how linked your material is both online and offline to social networks or to matters of popular interest.

There is also the potential for others to make use of parts of your film in their own videos by re-editing or remixing the content that you have produced. By attaching a Copyleft notice such as a Creative Commons license that permits others to re-use parts of your production you are contributing to a cultural resource pool that may be used by others and which you in turn have access to.

BROADBAND DISTRIBUTION STRATEGY

Methods that may form part of your online video distribution strategy include:

1. Uploading a copy of your video encoded at high enough quality to be screened.
2. Uploading smaller more compressed versions of your video for viewing within the browser or for faster download for people without broadband Internet connections.
3. Creating a Torrent of your video and sharing your video on peer-to-peer networks.
4. Creating a vodcast of your videos or adding your video to an existing vodcast channel that allows viewers to download video automatically to their computers.

1. Screening quality video

It is possible to encode your video using XviD at a reasonable file-size (around 350 to 500 megabytes per hour of video) to be downloaded by a user and screened on a television or video projector – either directly from a computer’s video output or after being transferred to another medium such as tape or DVD.

Once your video is encoded you can upload it along with related metadata to a free service such as the Internet Archive or Ourmedia. Uploading files of this size requires a decent broadband connection and some patience. The Internet Archive offers two ways to upload – either by using an FTP client or by

using an uploading application called the CC Publisher.

The Internet Archive will generate a page about your video with metadata you have entered such as a description and the Creative Commons license you have attached to it. Visitors to this page have the option to download your video by clicking on a link in their browser or by using an FTP client, and may also review the video by filling out an online form. You can link to this page from your own website, and include the link in your emails during promotion.

If you choose to allow it, your Creative Commons license may grant others permission to use excerpts of your production in their own – if your video has been encoded at high enough quality to make this viable.

2. Video for viewing on computer or within the browser

It is a good idea, where possible, to offer your video in a format that has been highly compressed, in order that viewers with narrow Internet connections will be able to download your video in a reasonable amount of time. It may be best to encode this version of your video in a popular proprietary format such as Quicktime (.mov) or Flash Video (.flv) that many users will be able to play back easily. There are many FLOSS encoders that will allow you to compress to these formats (see “Digital Video Basics” above).

The Quicktime format allows the viewer to watch the video as it is being downloaded onto their machine without waiting for the whole file to download first. This is called progressive download or pseudo-streaming and makes it a good web-preview format. Flash also has this ability, and is a good option to choose as most Internet users already have the Flash plug-in. There is a list of open source tools available for Flash at <http://osflash.org/>.

Commercial services such as Google Video or YouTube offer free hosting of video that is automatically transcoded to the Flash Video format. You can then link to your video on any of these websites from your own. However, it will often be more desirable to upload your campaign or advocacy video to a project such as OneWorld or video.indymedia.org that is hosting similar content and is not directed by commercial interests. You can also upload your smaller video files to Ourmedia or the Internet Archive along with your larger files you have encoded for screening.

VideoBomb – is a useful place to promote your videos and other content you are interested in. It lists videos that have been recommended by its community, allowing users to tag them and create a collaborative categorisation system that makes content easier to find. It also provides an easy way for you to create a vodcast of your videos (see below).

3. Peer-to-Peer file sharing

Peer-to-peer (p2p) networks allow the sharing of bandwidth and data-transfer load across a community. Users downloading your video from a peer-to-peer network may be downloading from many other individuals' computers instead of from a central server. This has several advantages including faster download times as you can share the bandwidth of many Internet connections at once. This depends on how many people already have the file to share, which means the more popular your video is the faster it will be to download.

BitTorrent is a peer-to-peer application that allows users to download segments of a file from other users who may not have already downloaded the complete file. This means you can be sharing the video with other users before you have even finished downloading it. You can generate your own Torrent file using an application such as BitTorrent itself, or by using a website that will automatically generate a Torrent file from your video file – such as EngageMedia. You can also install the FLOSS Broadcast Machine on your website and allow users to automatically create Torrent files and list them in vodcast channels (see below).

You can list your Torrent in a tracker such as IndyTorrents that allows users to see how many people have copies of your video as a Torrent and therefore gauge how fast it will download. Other popular ways to find Torrents include The Pirate Bay and the BitTorrent search engine.

4. Vodcasting

A vodcast (video podcast) is an RSS feed containing media enclosures (pointers to media files within the RSS feed). These feeds enable users to subscribe to a “channel” which will automatically download new video content as it is added to the channel. You can install a vodcasting client such as Democracy Player to access video-on-demand that downloads or streams into the player, a bit like watching a TV channel. The popular iTunes application from Apple also has vodcasting functionality.

You can create your own vodcast using Broadcast Machine an application which you can install on your website. This allows you to either generate Torrents of your videos to share over peer-to-peer networks, or enter the URL of a video you have already uploaded to the Internet Archive or Ourmedia – and then add these videos to different channels on your site. You can also use videobomb.com to create a vodcast of videos you have published elsewhere by simply entering their url and some information about them.

DVD AND VCD DISTRIBUTION

There are a few different options for distributing your video on DVD or VCD. One is to submit your video to existing compilations. The producers of the compilation will look after distribution for you, though you can arrange to be responsible for distributing copies in your own area. Another simple approach if you have a CD or DVD burner in your computer is to duplicate DVDs or VCDs on a small scale yourself.

If you anticipate distributing larger numbers of discs then you can author a master disc and have it professionally duplicated. Prices are continually dropping for blank media, duplication and digital printing – but should be budgeted for as they can still be substantial. You can then choose to either set up an ordering system yourself online or through the post, or pass the discs on to a mail-order company that may have their own online credit-card ordering facility to take the trouble of filling orders and delivering them out of your hands.

DVD

DVD stands for Digital Versatile Disc and can be burned in many different formats and used to store any kind of data. DVD-Video discs contain video encoded in the MPEG2 format. DVD discs can have a single layer of information burned on one side (single-layer), two layers of information on one side (dual-layer) or have information on both sides (double-sided). Each layer or side can contain up to 4.7 Gigabytes of video or other data.

DVD-Video discs are designed to play back in hardware DVD players or using DVD playback software on computers with DVD drives installed. The MPEG2 video on a DVD must be encoded within the DVD specification (for example it must be encoded with a bit rate of between 1 and 10 megabits per second and must have video designed for playback on either NTSC or PAL television systems). The video is compiled along with graphics and sound for interactive menus into the DVD-Video format during the DVD authoring process.

The advantages of distributing your video on DVD over VCD are:

- quality – DVD uses a more sophisticated and better compression standard and can also hold a lot more data than VCD
- interactivity – the ability to create complex menu structures, subtitles and simultaneous video streams for additional camera-angles etc.

- familiarity – audiences in some parts of the world are much more at ease with DVD technology.

Steps involved in authoring a DVD

- Decide what content you wish to include on the DVD – video segments may include the program itself and additional video such as a trailer or extra footage, text info about the video and the issues concerned with links to further information, production stills, logos and some audio loops for background music in the menus.
- One of the advantages of the DVD format is that you can include sub-titles for different languages, or original language subtitles can be activated for the hearing-impaired, so prepare translations if you have the time and resources.
- Work with a graphic designer to create images for menu backgrounds and buttons or create them yourself, using free software such as GIMP.
- If you have the time and the inclination, prepare custom transitions that will play when a user selects a button that takes them to another menu level.
- Import your video into your DVD authoring application – some applications will let you import the DV file you have exported from an editing program as it will be transcoded within the application itself, while others will expect you to have encoded the video as MPEG2 that conforms to DVD specifications.
- Arrange your content within intuitively designed menus that will be easy for users to navigate.
- Choose a bit rate to encode your video at, depending on how long the program lasts and whether or not you will be printing on single-layer, dual-layer or double-sided discs. The rule is to encode your video at the highest bit rate possible while still enabling it to fit onto the medium you have chosen.
- Create the DVD master using your authoring application and test on a DVD player to make sure it works correctly including all menu buttons.
- Make sure you author your DVD as region-free (known as Region 0), enabling the disc to be played on DVD players sold in different regions of the world. You will still have to choose to author the DVD as either PAL or NTSC depending on where in the world you are going to distribute the discs.
- Copy this master using a DVD burner and a DVD burning application or take it along with graphics for the disc and jacket to a professional duplication company for bulk copies to be made.

VCD

VCD stands for Video Compact Disc and is basically a CD containing up to 74 minutes of video, in a format both hardware VCD players and most DVD players can play back. The video on a VCD is encoded as a standardised form of MPEG1 - an old video compression standard that requires less computing power to play back than many of the newer and more sophisticated codecs that are available. MPEG1-VCD is comparable to viewing a VHS in terms of perceptible image quality.

The advantages of distributing your video on VCD over DVD are:

- cost – the price of blank CD media is lower than blank DVD media

