

Video editing using Linux

- Introducing video file formats and codecs
- Understanding aspect ratio
- Preparing material
- Editing and compositing
- Titling, graphics and animation
- Working with Audio tracks
- Screen capture
- Format conversion using Handbrake
- Creating DVDs for use in a DVD player

Video editing using Linux

Commonly used open source applications

OpenShot

Kdenlive

Blender

RecordMyDesktop

The Gimp

Inkscape

Audacity

Handbrake

DeVeDe



Codecs and Container Files

Video containers

Video files may contain

- Multiple video tracks (camera angles)
- Multiple audio tracks (various languages)
- Captions (subtitles)
- Attachments (eg fonts for subtitles)
- Metadata
- Support for navigation (menus, chapters)

Video file containers

Different container files vary in the features they support.

Most containers support a variety of video and audio encoding methods

Common container files include

- AVI (Microsoft)
- FLV (Adobe Flash Video)
- MPG and MP4 (Motion Picture Experts Group, MPEG)
- OGG (Xiph)
- Quicktime (Apple)
- WebM (WebM Project)

Video Codecs

- A codec is software for encoding/decoding media
- Many different video compression formats
- Most use data compression, which may be lossless or lossy
- “Quality” settings affect the balance between smaller file size and perceived image quality
- Newer codecs usually achieve better file compression with less loss in perceived quality
- Newer codecs rely on more powerful processors to handle the decompression

Video compression formats

- Many available, most with loads of compression options
- Commonly used:
 - MPEG-1: designed for “VHS quality” video
 - H.262 / MPEG-2: commonly used on DVDs, digital TV and digital cameras and non-HD camcorders
 - H.264 / MPEG-4 AVC: used on Blu Ray discs and higher definition camcorders
 - VC-1 (WMV 9): Windows Media Video used on Blu Ray discs

Audio codecs

- Many more compression formats for audio than video!
- Channel support
 - Some support a single channel (mono) only
 - Most support stereo
 - Some support multiple channels
- As with video, “Quality” settings affect the balance between smaller file size and perceived sound quality
- Newer codecs usually achieve better file compression with less loss in perceived quality but require more processing power

Audio codecs

Commonly used

- PCM: “Pulse Code Modulation”, a non-compressed format used in .wav and .aiff files and CDs
- MP2: “MPEG-1 Audio Layer II” - commonly used on DVDs
- AC3: “Dolby Digital audio” - used on some DVDs to provide multi-channel sound
- MP3: “MPEG-2 Audio Layer III” - the de facto standard for digital audio
- AAC: “Advanced Audio Coding”, designed as the successor to MP3

Container and codec choices

If in doubt, I suggest ...

For maximum compatibility with older systems

- MPEG container with MPEG-2 video and MP2 audio

For best quality on newer systems

- MP4 container with H.264 video and AAC audio



Aspect Ratio

4:3 (1.33:1) Aspect Ratio



16:9 (1.78:1) Aspect Ratio



16:10 ratio monitors are also common

Movie ratios

MOVIE THEATER ASPECT RATIOS

1.37:1

Academy Standard

1.85:1

Academy Flat

2.39:1 (2.35:1 prior to 1970)

Anamorphic Scope

(Panavision/Cinemascope)

Video display not in native format



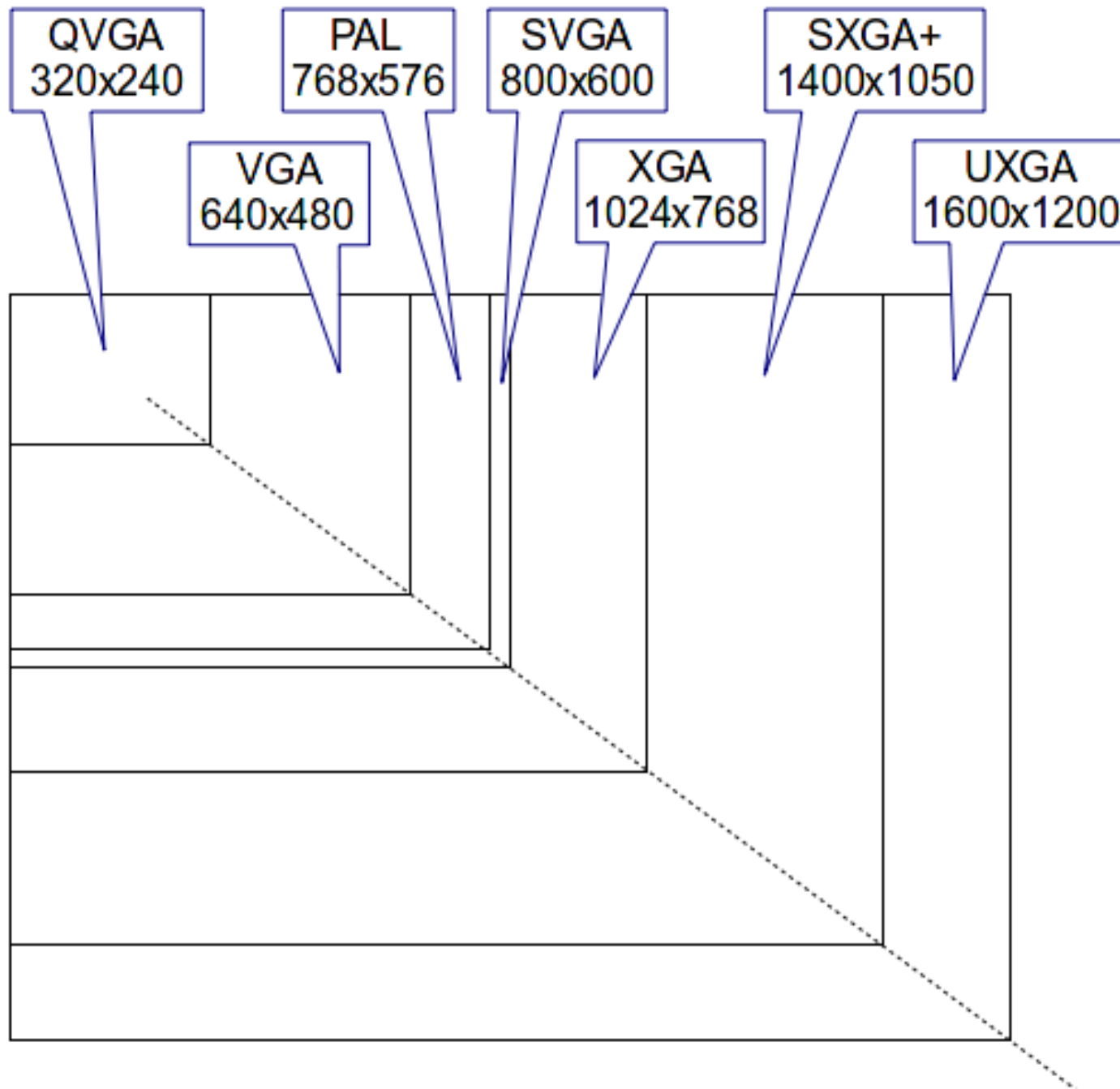
Video display not in native format



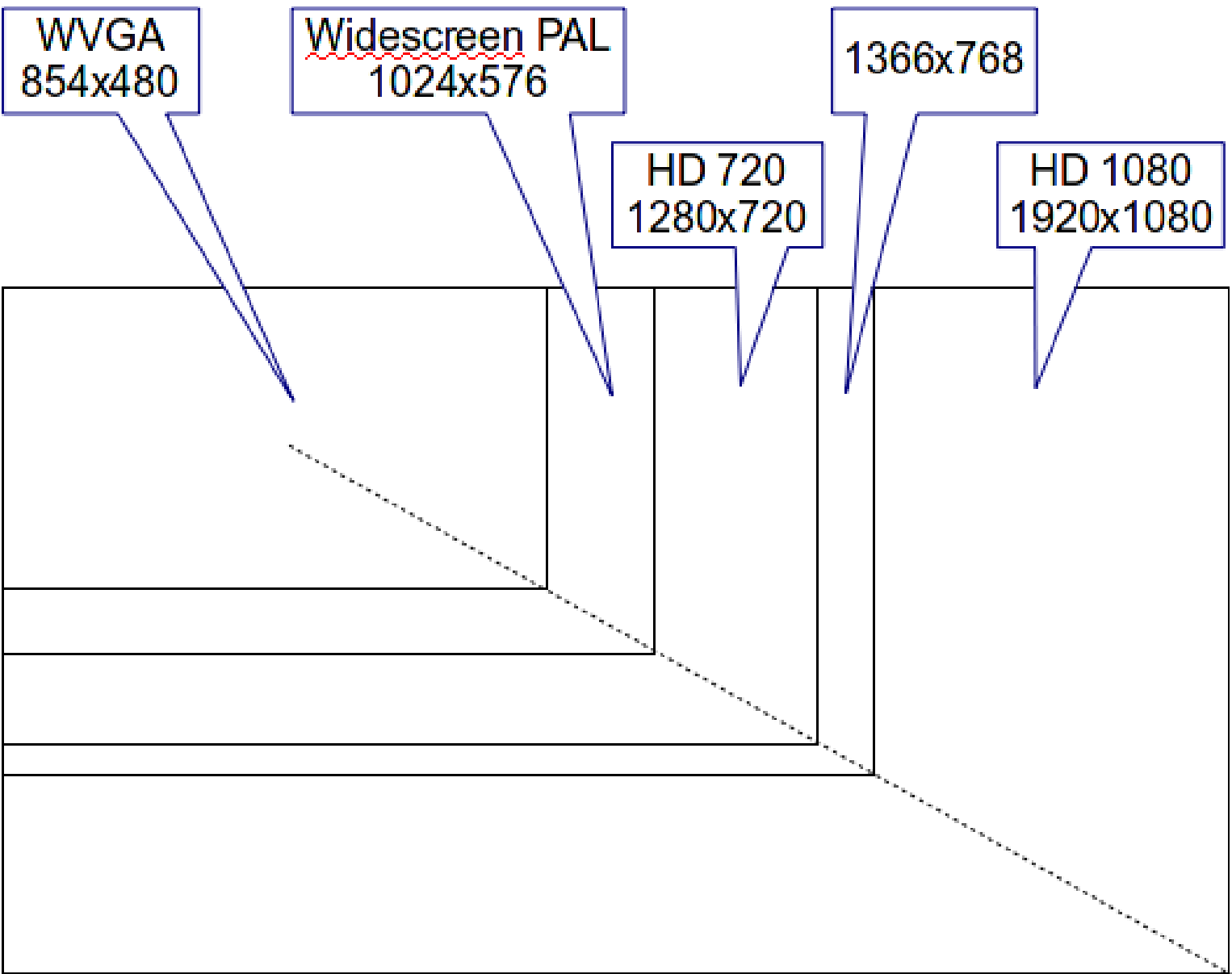


Aspect Ratio and Image Size

The 4:3 family of display sizes



The 16:9 family of display sizes





Preparing Source Material

Recommendations for video and images

- Decide on the aspect ratio and pixel size of the video you want to produce
- As a general guide, prepare source material to this size
- If not practical to use same size, keep to the same aspect ratio at a larger pixel size
- ... or be prepared to crop material to fit

Exceptions

- Image material for “pan and zoom” use may need to be considerably larger pixel size
- Image material for “picture in picture” use needs to be appropriate for the pixel dimensions it will take up on screen

Recommendations for audio

- Use recordings that are at least as good a quality as the requirement for the final video
- “Clean up” and normalise recordings using Audacity beforehand



“Post Production”

Using Handbrake to optimise files

- Create versions optimised for different devices (cropping where necessary)
- Choose degree of compression and other optimisations to get the balance you want between file size and image quality

Using DeVeDe to create DVDs

- Use to create DVD menus
- Create DVDs containing multiple videos
- Break longer videos into chapters to make seeking easier
- Create ISO image which can be burned using any DVD writing software