

**Using ffmpeg for, well, everything**

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# Presenter data

- Doran L. Barton
  - Using, teaching, abusing, etc. Unix/Linux since 1991
  - Amateur videographer
  - Consultant
    - Systems administrator
    - Systems Architect
    - Developer (Perl, C, PHP, bash, awk)
  - Dad & husband
  - Tired

# What's FFMPEG? (short version)

- Created by Fabrice Bellard
- “Fast-Forward MPEG”
- Original intention was a live MPEG1 streaming server (ffserver)
- Later, intention was MSMPEG4v3 (AKA DivX) encoder/decoder
- Mplayer project picked up *libavcodec*
- Now does more than anyone every imagined

# Who is Fabrice Bellard?

- Bellard's formula
  - Fastest method to find  $n$ th digit of pi
- QEMU
- TinyCC



# What's FFMPEG? (longer version)

- Collection of command-line tools
  - ffmpeg, ffserver, ffplay
- Libraries
  - libavcodec, libavformat, libavutil, libavdevice, libswscale

# ffmpeg

- “a command line tool to convert multimedia files between formats.”
- Also good for...
  - Identifying formats, codecs, etc.
  - Many *editing* functions
    - Filters (e.g., crop, clip, resize, etc.)

# ffserver

- “a multimedia streaming server for live broadcasts.”

# ffplay

- “a simple media player based on SDL and the FFmpeg libraries.”

# Libraries

- libavutils - “a library containing functions for simplifying programming, including random number generators, data structures, mathematics routines and much more.”
- libavcodec - “a library containing decoders and encoders for audio/video codecs.”
- libavformat - “a library containing demuxers and muxers for multimedia container formats.”

## Libraries (continued)

- libavdevice - “a library containing input and output devices for grabbing from and rendering to many common multimedia input/output software frameworks, including Video4Linux, Video4Linux2, Vfw, and ALSA.”
- libswscale - “a library performing highly optimized image scaling and color space/pixel format conversion operations.”

# Identify a media file

- Identify a file
  - `ffmpeg -i filename`

*Input #0, avi, from 'video.avi':*

*Duration: 00:21:39.26, start: 0.000000, bitrate: 1122 kb/s*

*Stream #0.0: Video: mpeg4, yuv420p, 624x352 [PAR 1:1 DAR 39:22],  
23.98 tbr, 23.98 tbn, 23.98 tbc*

*Stream #0.1: Audio: mp3, 48000 Hz, stereo, s16, 32 kb/s*

# Identifying a media file

Input #0, avi, from 'aoc\_video.avi':

Duration: 00:02:13.00, start: 0.000000, bitrate: 16013 kb/s

Stream #0.0: Video: mjpeg, yuvj422p, 704x480, 30 tbr, 30 tbn, 30 tbc

Stream #0.1: Audio: pcm\_s16le, 44100 Hz, stereo, s16, 1411 kb/s

# Convert MPEG2 to Xvid

- `ffmpeg -i input.mpg \`  
  `-vcodec libxvid -vb 300k`  
  `-acodec libmp3lame -ar 44100 -ab 128k \`  
  `-s 640x480 -aspect 4:3 \`  
  `-deinterlace \`  
  `-y output.avi`

# DVD to iPod

```
ffmpeg -i VTS_0_1.VOB -acodec libfaac -ab 128k -s 320x240 \  
-vcodec libx264 -vpre hq -vpre ipod320 -b 350k -bt 320k \  
-aspect 4:3 -threads 0 -f ipod output.mp4
```

# DVD to iPod (letterbox)

```
ffmpeg -i VTS_0_1.VOB -acodec libfaac -ab 128k \  
-vcodec libx264 -vpre hq -vpre ipod320 -b 350k -bt 350k \  
-aspect 4:3 -threads 0 -f ipod \  
-padtop 30 -padbottom 30 -s 320x180 \  
-padcolor 000000 \  
output.mp4
```

# Big DVDs

```
cat VTS_6_{1,2,3}.VOB | ffmpeg -i - -acodec libfaac \  
-ab 128k -vcodec libx264 -vpre hq -vpre ipod320 \  
-b 350k -bt 350k \  
-aspect 4:3 -threads 0 -f ipod \  
-padtop 30 -padbottom 30 -s 320x180 \  
-padcolor 000000 \  
output.mp4
```

# Getting images from video

- Use container format image2
  - `ffmpeg -i somevid.avi -f image2 \`  
`-ss 01:40 -an -r 1 -vframes 1 file.jpg`

# Audio conversion

- Ogg Vorbis to MP3
  - `ffmpeg -i file.ogg -f mp3 -ab 128k \`  
`file.mp3`

# Image conversion

- PNG to JPEG
  - `ffmpeg -i file.png file.jpg`
- Do some fancy stuff
  - `ffmpeg -i file.png -s 800x600 \`  
`-croptop 50 -cropbottom 50 file.jpg`

# Screencast capture!

- Use the x11grab format
  - `ffmpeg -f x11grab -s 1920x1200 \`  
`-r 30 -i :0.0 -vcodec mpeg2video out.mpg`

# Make video from webcam

- Use the video4linux format
  - `ffmpeg -r 15 -s 352x288 -f video4linux -i /dev/video0 -vcodec mpeg1video \ out.mpg`

# Scripting & automating

- Lends itself well to shell scripting by itself
- FFMPEG::Command Perl module
- FFMPEG-PHP
- PyMedia
- FFMPEG-Java