FFmpeg - the universal multimedia toolkit

Stefano Sabatini

`mailto:stefasab@gmail.com`

Video Vortex #9

Video Vortex #9 - 1 March, 2013

Description

Introduction

Resume

Resources

Appendix

- **multiplatform** software project (Linux, Mac, Windows, Android, etc...)
- Comprises several **command line tools**: `ffmpeg`, `ffplay`, `ffprobe`, `ffserver`
- Comprises **C libraries** to handle multimedia at several levels
- **Free Software** / **FLOSS**: LGPL/GPL

2 / 13

Provide **universal and complete support** to multimedia content access and processing.

- decoding/encoding
- muxing/demuxing
- streaming
- filtering
- metadata handling

History

- **2000**: **Fabrice Bellard** starts the project with the initial aim to implement an MPEG encoding/decoding library. The resulting project is integrated as multimedia engine in MPlayer, which also hosts the project.
- **2003**: Fabrice Bellard leaves the project, **Michael Niedermayer** acts as project maintainer since then.
- **March 2009**: release version 0.5, first official release
- **January 2011**: a group of discontented developers takes control over the FFmpeg web server and creates an alternative Git repo, a few months later a proper fork is created (**Libav**).

Development model

- Source code is handled through **Git**, tickets (feature requests, bugs) handled by **Trac**
- Patches are discussed and approved on mailing-list, and directly pushed or merged from external repos, trivial patches or hot fixes can be pushed directly with no review.
- Every contributor/maintainer reviews patches in his/her own area of expertise/interest, review is done on a best effort basis by a (hopefully) competent developer.
- **Formal releases** are delivered every 6 months or so.
- Custom testing environment (FATE) and samples archive used for automated testing
- around 10 core developers, 200/300 per-year total contributors

What is used for

- audio / video low level conversions (libswscale, libswresample - rescaling, image format conversion, audio conversion)
- decoding / encoding (libavcodec - more than 300 codecs)
- muxing / demuxing (libavformat)
- grabbing input devices (libavdevice)
- streaming (libavformat, RTSP, RTP, RTMP, ...)
- filtering (libavfilter)

High level Features

- written mostly in C/assembly
- provides an extensible framework
- modular/configurable
- relies on external libraries (e.g. libmp3lame, libx264, libvorbis, libspeex, frei0r, ...) **when it makes sense**

Libavfilter

- Audio / Video filters
- timestamps manipulation
- more than 100 filters, some wrapped libraries (opencv, frei0r filters)
- transmedia filtering (e.g. audio to video)
- subtitles video hardcoding through ass/subtitles filter
- command API (allow to send commands to various filters)
- future development: lua scripting, subtitles filtering

FFmpeg-based projects

- Used by most (all?) web transcoding multimedia back-ends: (e.g. used by Youtube according to this post: `http://multimedia.cx/eggs/googles-youtube-uses-ffmpeg/`)
- MPlayer (libavcodec, libavformat)
- VLC (libavcodec, libavformat)
- GStreamer (libav/ffmpeg plugin)
- Chromium
- more: `http://ffmpeg.org/projects.html`

Organization

- No official organization backing the project. Donations are collected through SPI (Software in the Public Interest) since June 2012.
- Partecipated to several editions of Google Summer of Code (2006, 2007, 2008, 2009, 2010, 2011) and ESA Summer of Code in Space (2011, 2012)
- Crowd funding would be nice at some point

- free universal multimedia engine
- integrated into large number of FLOSS multimedia projects
- huge community of developers / users

- FFmpeg project web site: `http://www.ffmpeg.org`
- FFmpeg wiki:
  `https://ffmpeg.org/trac/ffmpeg/wiki`
- Mike Melanson multimedia wiki
  `http://wiki.multimedia.cx/`

License of this document