GSoC 2025 Final Report

VideoLAN – DVD-Audio Deciphering Module in VLC

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General Information

Organization: VideoLAN
Project: DVD-Audio Deciphering Module in VLC
Mentors: Jean-Baptiste Kempf, Steve Lhomme
Proposal Link: available here

Abstract

This project's initial aim was to add CPPM decryption support into VLC, however, more was required to support the DVD-Audio format, so the initial aims were expanded upon. The final deliverables were updates to the libdvdread, to support the DVD-Audio format and libdvdcss for the decryption support as well as a submodule for simple playback into vlc. All of this is documented through comments, and this page: Link

1 Goals

- Goal 1 – provide a public API to read CPPM encrypted DVD-Audio blocks to libdvdcss
- Goal 2 – provide a public API to change libdvdread's behavior to read DVD-Audio discs
- Goal 3 – provide a way for the user to encrypted play DVD-Audio discs inside of the vlc media player

2 Work Completed and Results

VLC now supports simple audio title based playback on encrypted DVD-Audio discs in intuitively, No need to extract the Audio Data. This now makes VLC one of the only ways to play this type of disc as is. and both Libdvdread and Libdvdcss have been extended to support DVD-Audio features (IFO files, path structures, etc) in an OS Agnostic way (previous implementations of DVD-Audio software across the web is only built for windows). These additions were tested and validated on the following discs:

1. Deep Purple - Machine Head (encrypted)
2. Brain Salad Surgery (unencrypted)
3. Say You Will - FleetWood Mac (encrypted)
4. Eagles - Hotel California (encrypted)

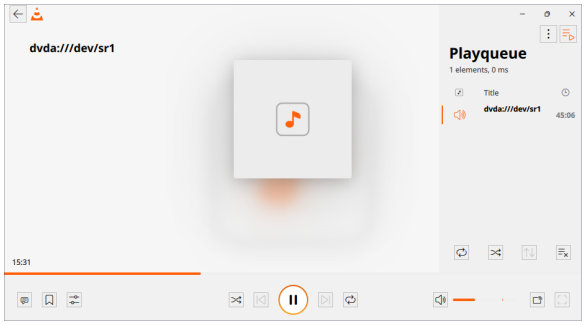

Figure 1: DVD-Audio Disc Playback

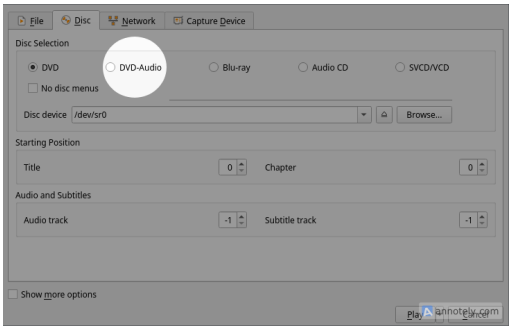

Figure 2: Addition to Disc Menu

3 Merge Requests

Project	+	-	Description	Link
	1205	133	Initial DVD-Audio additions	link
libdvdread	20	7	Follow-up adjustments/fixes	link
	95	73	Follow-up adjustments/fixes	link
	199	-81	Follow-up adjustments/fixes	link
libdvdcss	1492	9	Initial CPPM support integration	link
vlc	y	x	DVD-Audio disc menu addition and submodule	link

4 Challenges

This topic is heavily undocumented, and the available resources are often poorly explained or contain errors. Much of the effort was spent manually analyzing the format in order to try to replicate the wanted behaviors. There was also initially trouble acquiring material to work on, though discs were generously provided by the foundation.

The DVD libraries are also not as well documented as many of the other pieces of software in VLC, so there was initial friction when it came to understanding how they worked and how I'd extend their functionality without breaking API.

Once the initial research and discovery phase were completed, the remainder of the project ran more smoothly, though reorganizing my commits to fit with VLC code standards was very time consuming as well.

Additionally, the VLC demuxer had some issues working with MLP DVD-Audio streams that were difficult to resolve; This issue was dealt with by my mentor, Steve Lhomme, in a seperate merge request.

5 Future Work

Support for hybrid disc behavior with video linking titles is not supported, as well as DVD-Audio menu integration similar to that in Libdvdnav since the information required to implement these features is currently unavailable, and undocumented in the available unofficial specifications. Exposing still images to the API should be added as well, according to the unofficial specifications these are included in the Audio Still Video Set (ASVS)

Acknowledgements

I would like to thank both of my mentors, Jean-Baptiste Kempf and Steve Lhomme, for their patience and time. I would also like to thank the foundation for providing me with difficult-to-access material for my work. This wouldn't have been possible without their guidance and support

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