

TECHNISCHE UNIVERSITEIT DELFT

TI3800 BACHELORPROJECT

A NON-CENTRALIZED APPROACH TO VIDEO ON DEMAND ON MOBILE
DEVICES

Orientation Report

Authors:

Martijn BREET
(1265458)

Jaap VAN TOUW
(1380753)

Supervisor:

Cor-Paul BEZEMER



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Abstract

Preface

Chapter 1

Tribler

1.1 Introduction

Tribler is an application that enables its users to find, enjoy and share content through a P2P network. The application is currently available for Windows, Mac and Linux¹. This section will provide an overview of Tribler and describe related software.

1.2 An overview of Tribler

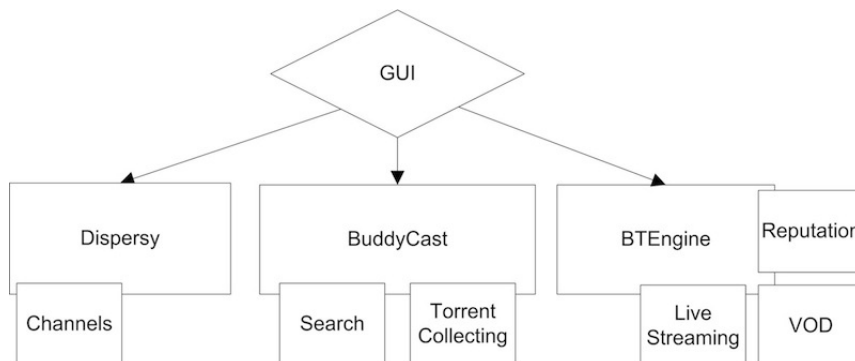


Figure 1.1: The architecture of Tribler

Tribler consists out of four major components as can also be seen in figure 1.1²:

- GUI: the graphical user interface.
- BTEngine: the bittorrent engine.
- BuddyCast: a protocol used to find peers with the same taste as the user³.

¹www.tribler.org

²<http://sigmm.org/records/records1201/featured03.html>

³<http://iptps06.cs.ucsb.edu/papers/Pouw-Tribler06.pdf>

- Dispersy: a fully decentralized system for data bundle synchronization⁴.

1.2.1 GUI

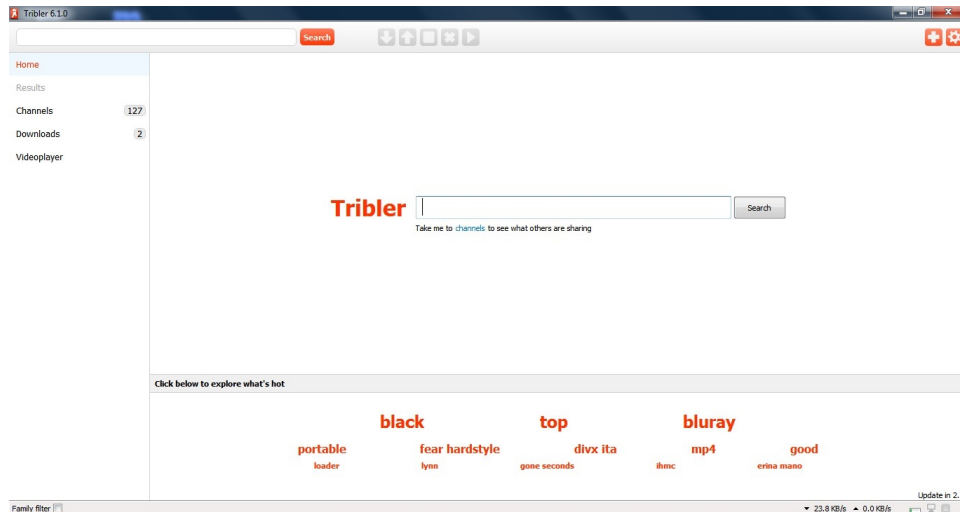


Figure 1.2: Tribler's GUI

The GUI has a number of elements to it, resembling Tribler's main features:

- **Top bar**
This includes a search bar, a number of controls, and buttons to go into the settings and download external torrents. The controls include a button to start streaming the video instead of having to wait for it to be completely downloaded.
- **Left pane**
The left pane gives an overview of the different pages to visit. Channels is a page where collections of content are bundled so the user can browse through them. The page below, the downloads page, shows which torrents have been downloaded and what the status is of the current download. The next page is the videoplayer where videos can be watched and streamed.
- **Bottom bar**
At the bottom, information can be found how fast the download is going, as well as the upload and more information about how much peers the user is connected to.

1.2.2 BitTorrent

BitTorrent is a protocol which allows for P2P file sharing, section 2 will describe more about other P2P file sharing protocols that might be used in the Mobile VoD project. The protocol allows users to join a swarm of hosts to download and upload files. For a user to share a file it can create a torrent descriptor file

⁴<http://www.pds.ewi.tudelft.nl/fileadmin/pds/reports/2013/PDS-2013-002.pdf>

which contains information about the file. The torrent can then be distributed over the internet via e-mail, a link on a website, etc. Other users with the torrent can connect to this host, called a seeder, and ask for pieces of this file. After all pieces are collected, the leecher becomes a seeder and other leechers can download from the new seeder. This way the files is distributed over the Internet and no central server is needed.

The BTengine in Tribler uses the BitTorrent protocol and also includes a reputation system, where the user is rated for their upload to download ratio. This helps to minimize the effects of free riding, where users only download, because the user with a low ratio will be given lower speed peers to connect to.

1.2.3 P2P communication

The BuddyCast protocol is used to find peers with similar taste so Tribler can give recommendations to what the user might like and thus discover new content. Dispersy is used to spread data bundles over the Internet in a fully decentralized way. This could potentially remove the need for central servers for services as Facebook or Wikipedia. In Tribler it is used for creating the channels.

1.3 Related Software

A lot of BitTorrent clients exist, such as uTorrent, MLDonkey, Miro, LimeWire, etc. The team needs to implement such a client to make VoD available for mobile devices. Not all clients support VoD, and the ones that do still need to be modified to be able to operate on Android, so they have to be open source in order to use and modify them. Because the aim of the project is to create VoD for Android powered devices, not all functionality of the open source BitTorrent clients that support VoD is needed. Because the team works at the department that created Tribler, the team can get a lot of information about how Tribler operates, which subsystems are useful for VoD and more. Tribler is therefore currently the best choice to implement as client.

Chapter 2

P2P Streaming Protocol

2.1 Introduction

2.2 Protocols

2.2.1 Libtorrent

2.2.2 Bittorrent

2.2.3 Libswift

2.3 Trade-off

2.4 Conclusion

Chapter 3

Video Decoding

3.1 Introduction

Appendices

Appendix A

Appendices