

# YourTunes File System

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## 1 Introduction

The **YourTunes File System** is a FUSE-based implementation of a filesystem tailored towards music files. It is built on top of a remote backend server, which stores file data and metadata on a database server with a RESTful web server frontend. The client is responsible for transparently querying the remote server for resident files and constructing a metadata-based abstraction based on the parsed server response.

### 1.1 Directory structure

The directory structure on the local filesystem is based on audio metadata - specifically, the **Album**, **Title**, **Track**, and **Year** ID3 fields.



Each song is placed as a leaf in two separate directory trees: one based on albums directly, and one based on albums categorized by the decade that they were released in (parsed from the **Year** field). In the case of missing metadata, a song is placed in a "Unknown" folder for both cases (`/albums/Unknown/file`, `/decades/Unknown/Unknown/file`). Files with no metadata are also put into these buckets.

Given the same metadata, the file pointers through both directory hierarchies are pointers to the same file data.

## 1.2 Example

Given an audio file with the following metadata:

<b>Track</b>	4
<b>Title</b>	Jesus, Take the Wheel
<b>Artist</b>	Carrie Underwood
<b>Album</b>	<i>Some Hearts</i>
<b>Year</b>	2005

The filesystem will present the following abstraction:

```
/
├── albums/
│   └── Some Hearts/
│       └── 4-Jesus, Take the Wheel
└── decades/
    └── 2000s/
        └── Some Hearts/
            └── 4-Jesus, Take the Wheel
```

## 2 Client

### 2.1 Setup

The following packages are required: `libfuse-dev` `pkg-config`, `mp3info`, `curl`, `jq`. Assuming a Debian-based system, these can be installed by running `./install-deps.sh` or running the following command manually:

```
1 sudo apt-get install -y libfuse-dev pkg-config mp3info curl jq
```

Once the dependencies are installed, run `make` from the project root to build the client. Finally, run `./yourtuneslib <mountpoint>` to mount the filesystem to a local directory, with `<mountpoint>` being the path to an existing directory.

## 3 Server

### 3.1 Setup

Run `./install.sh` in the `server` directory. You will need `sudo` privileges as well as a root MySQL database password, and will be prompted for these when required. If MySQL is not installed, it will be installed for you, with the root password being set to `team14`.

Once the script completes, start the server by running `python3 server.py`.