# A Fault-tolerant and Open Platform for Social Music

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For anyone who loves music.
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## 1. Abstract

This paper describes a platform that if implemented will provide pervasive free access to music across the internet. It allows music to be available to a larger group of people in a similar fashion to torrents. Improvements over existing systems include:

- Reduced cost of management.
- No central network for music distribution.
- Increased access to music across the internet.
- Improved flexibility of technology.

There is also potential for this system to be used to facilitate open research and innovation into the music listening experience. Improved technology also presents new possibilities for web developers.

The system's reliability is not guaranteed, nor is its efficiency; however, the intention is that the efficiency and reliability will be sufficient to make the system useful, and demonstrate that such a system is feasible.

This report also describes several prototypes designed to highlight the practicality of such a system. These are performed upon real-world targets using mostly Java and Javascript. Improvements over similar systems are also highlighted in this report. The system is considered a prototype, and areas for further improvements are highlighted throughout this report.

## 2. Introduction

Up until this point, the Anontune project has been purposely vague and we have avoided defining it. Since it is no longer practical to do so we would like to present a white paper on the Anontune project. This white paper should outline our goals, opinions, philosophy, progress, and more regarding the project. We hope it helps explain things a little better.

## 2.1. A Discussion of Music Piracy

> *"One of the most effective weapons for defeating online piracy is providing legal, easy-to-use alternatives."* - Kevin Tsujihara

In an attempt to recover lost revenues, the music industry has made progress in allowing legal alternatives to flourish in the hope they may compete with "illegal" alternatives like P2P and file sharing. It is reasoned that if the legal alternatives are as easy to use as the illegal alternatives people will start using them. Unfortunately in our opinion, by the very nature and design of commercial music, this is impossible.

Commercial music is about money, so users of these legal alternatives are always going to be controlled compared to alternatives. This is because in order to protect revenue streams restrictions on access need to be imposed. By design, users can expect to provide rigorous registration information including credit card information just to use the service. There may also be restrictions on how the music can be used – So called Digital Rights Management or "DRM."

Here's a wake up call: Illegal alternatives don't have these restrictions therefore they will ALWAYS be easier to use – If a user wants to download music from a P2P network they don't have to enter their birth certificate just to consume chained-up music.

Thus we conclude from a user's perspective legal alternatives are horrendous. That is . . . unless the music industry truly sets music free.

> *"Online piracy is a huge problem, one which costs the U.S. economy between $200 and $250 billion per year, and is responsible for the loss of 750,000 American jobs."* - You.

When we talk about piracy normally, the knee jerk reaction is to conclude piracy is bad because it robs the producers of intellectual property of their entitled income.

Those figures about losses are grossly exaggerated and can be safely ignored. It also needs to be mentioned that there is no production cost when music is pirated. Digital piracy is not the same as stealing a physical item. With digital piracy, a copy is created and the original is left untouched. With physical stealing, the original is taken and that counts as an actual loss. It

costs nothing to pirate music so you can't call piracy “stealing.”

You can say there is a loss, but in reality if the only alternative was to pay, you can't say that this implies the intellectual property thief would have otherwise made the purchase. That's the whole point; If you think of it like that, a person who pirates potentially receives value he or she might otherwise have never had. You can't argue that isn't good for promotional purposes. It may even lead to legitimate sales of merchandise and music related products.

> “*Music may be as effective as food, drug, and facial expressions in eliciting subcortically mediated affective responses.*” - Some researcher.

When you consider the properties of music it seems strange to uphold the notion that music should or can have a price. Where in the music is the price exactly? Answer that.

By the very nature of music it seeks to be free. It is auditory waves of emotional expression. It seeks to be heard and by setting a price, its distribution is inhibited. The result may even be that this action actually causes more losses for the artists in question.

We can see that it is human nature to try and avoid paying for music. Even if it weren't, it doesn't make logical sense to pay for something when you don't have to. In the instances where this does not occur, we suspect it is the result of not having the skill or patience to pirate and or wanting to actually support the artist . . . not that the artist actually gets that much when their music is legally purchased; Not that the consumer really receives comparably better quality music from paying for it . . . We guarantee you a comparable quality bootleg exists in the wild.

It is also human nature to want to share their music. Music may reflect or compensate for aspects of the personality. It may represent aspects of culture, providing the social cohesion of a group or movement. These are good reasons to share and display your taste in music.

It is these aspects that lead us to conclude the current commercial model for music is wrong.

First - the truth needs to be accepted: That piracy is superior and you can't stop it.
Second - music needs to be set free. Free enough in the primary medium of its consumption, the internet, for innovation to prosper.

By discussing Anontune, we are also proposing an alternative model of revenue be used by the music industry.

The idea is that if all songs were easily accessible and centralized on one user-friendly platform that it would be possible to hijack all current users of music piracy solutions. For the first time in history, the legal alternative would actually be better. There would no longer be any reason for music piracy. It would become redundant. Not to necessarily suggest such a service need provide for download of its music. Making music accessible for online listening would be enough. Internal mechanisms of sharing and embedding could further make the

platform popular, and around the platform new innovations in musical listening could take place.

Onec such a platform exists, it would become insanely popular. More popular than perhaps YouTube or even Facebook (if done right), and musical consumption would become centralized. Then it will be possible to monetize this consumption. There are multiple avenues available regarding this, but they must not impinge upon musical listening: Affiliate marketing of music related products and services, advertisements, donations, anything really. There is huge potential to be creative here and we really think it could be profitable.

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## 3. Aims

A fault-tolerant and open platform for social music as described in this report, allows anyone connected to the internet to easily retrieve music. The methods and limitations upon how music can be added to the system, and limitations upon how the music is accessed are specific to individual systems. The aims of this project are to devise a platform with the following properties:

1. Open access to the platform and its information for developers, researchers, and users.
2. Legal indemnity and anonymity from prosecution.
3. Flexible, dynamic, redundant, and fault-tolerant organization of music networks.
4. Improved musical listening experiences.
5. Social environment and model for sharing and discovering music.
6. A platform for experimentation and innovation.
7. Alternative revenue streams for entitled parties where appropriate [and if possible].

And also to evaluate the practicality of such a system by means of experimentation.

## 4. Related Works

In this section we examine related services for musical consumption online and use these to justify the aims of this project.

**Streaming Websites**

> "*If it's not broken, fix it until it is.*" - You.

Our biggest fault about these services is that they don't take their ideas far enough. Where is the Facebook of social music? There is none.

The web is currently ripe for innovation of music and I'm sure we will see more improvements show up over time; however, as things stand it is very disappointing. Compared to what we know about music and the state of innovation in the online world, there is a huge gap.

Where are the music services experimenting with biofeedback to enhance musical listening? Where are the experiments and innovation? None of these platforms are open enough to nurture innovation thanks in large part to totalitarian restrictions and bullying imposed by the music industry. We need to overcome these restrictions to create the music environment of the future.

If we look at services like Muziic, Pandora, and Facebook there is definite innovation, and it's a start.

Muziic introduced the concept of YouTube as a music player. Incidentally, others (including Anontune) already had the idea, but it's the right direction: Pervasive and open access to music by anyone.

Pandora introduced the Music Genome Project which seeks to understand the essence of music at a fundamental level. This is hugely important. It marks a turning point in popular understanding: If we can understand the properties of music we might be able to enhance the musical listening experience.

Imagine if, for example, we were able to analyze the rhythmic properties of any song or piece using intelligent software. Further imagine, that these rhythmic qualities were correlated to changes in attention or alertness. It would be possible to scientifically determine music in degrees of wakefulness promotion. Then, let's say that a listener was hooked up to a device which monitored their heart rate. We could select music which promotes the listener's alertness thereby keeping them awake and alert. Here's the cool part: We can! The research supports this and consumer biofeedback devices are readily available.

This is what we're talking about regarding innovation. A new way of thinking about music and understanding it not just as entertainment but in terms of changes that take place around its exposure. Music is really powerful like that, we can and do use it for practical purposes: The regulation of mood, alertness, induction of emotion, relaxation, exercise, social promotion, consumer promotion, even in the treatment of mental illness.

That is why we say, these services are boring and behind current advances. We can do so much more with music, and there is so much more to know about it. but currently these possibilities are left scarcely elaborated and explored. Our team seeks to change that.

Then there are the social aspects of music: Music is inherently social and provides a bonding experience. If music reflects aspects of personality, then it may be that people who share similar interests in music have more in common than those who don't.

Further expanding on this thesis, what if we were to test this by creating a new kind of dating website: You go to the website, sign-up/fill in your bio, and start listening to music. Crude algorithms are then used and refined to determine matches. The algorithm is then improved based on the success of relationship outcomes. The end result would be a mathematical model of music and personality. Expanding from there, we now have the means to match music to personality. So then all we need to do to determine highly compatible music for an individual is assess their personality.

These propositions aren't just science fiction. They are actually testable and researchers are testing them right now. Facebook, you're boring, go away. Facebook is way too overrated as is all modern artists. The only innovative thing Facebook has done with social music is real-time listening to what your friend's are listening to (I think this was in a Twitter leak.) Interestingly enough, Anontune also had this idea before Facebook ever mentioned it, but we were focusing on more important things and the platform was still very much in its infancy.

This is all a little disappointing . . . These streaming websites – places where people actually go to listen to music, focus so little on trying to improve the musical experience. Anontune isn't going to make the same mistake. We have numerous theories, ideas, and research directions to try out. We're not going to ignore current research in music and emotion. Academia is light years ahead and we acknowledge that with vigorous interest and respect.

**Limewire**

Limewire is (or rather, was) a very cool program. Almost everyone knows about Limewire but for those who don't – it was a file sharing client. The technical details aren't significant but the result is as they got sued to hell and are no more. The same thing happened to Napster.

The music industry executives decided that downloading one song was worth millions of dollars to them and started suing children and single mothers for downloading their auditory vomit. One could argue, it served them right for having such poor taste, but it's evident the

legal consequences of music piracy, if pursued, are outright ridiculous.

The actual mechanics of the situation are easy to understand: Downloading and saving copyrighted data in an obvious way that is easy to track, leads to potential prosecution. Thus, we are forced to propose a solution:

Anontune as a platform has to exist in such a way that it technically and practically distances itself from all copyrighted material and legal consequences. It has to have plausible deniability regarding providing access to copyrighted material. Users of the platform also need to be physically distanced from the possibility of committing a crime and getting caught for it. The legal responsibility needs to reasonably exist and not on Anontune or on a user's behalf, but on third parties providing the music (knowingly or not.)

Anontune cannot and will not host any infringing content at any point in time. Therefore, for the platform to meet its design goals, it must integrate systems that DO potentially provide such infringing content but not overtly so. An example of such systems are YouTube and Soundcloud. Copyrighted music is often uploaded to these services. The legal responsibility for ensuring its removal is in the hands of these services, not Anontune. Anontune will include the means to interact with multiple music networks on one platform.

These networks can be added and removed as needed to expand access to music. If a particular network blocks Anontune then music can be retrieved from the other networks. From a technical perspective, Anontune is at the intersection of meta-information about music and its distribution. It does not provide any music in and of itself, which makes it unusually resilient. Its design is similar to that of the internet which had in its design goals “the ability to withstand nuclear attack.”

That is our vision for Anontune. We will give developers the technology and ability to add new networks directly to the platform. It won't just be about one network for everything like Limewire or Napster was. The only fault in this system will be Anontune itself. Thus, Anontune will need stand-alone distributions and multiple avenues to host it. We believe this goal is attainable when considering the web as a publishing platform.

More on how this will be possible later.

## 5. Technical Proposal

For music to be free a web-player is needed. The web is chosen because of its reach and accessibility. The player will be entirely web-based and live on a profile. Every user has their own profile which is accessible at their own URL. From the URL users can view another user's music. This promotes one form of social interaction and sharing. Users can add their friends, send private messages, chat to one another – exchanging music in real time if needed, and more.

For this to work a highly flexible and powerful engine needs to be created to locate and play music. This requires the engine have access to networking features. Client-side, this is currently impossible. To overcome these limitations a bridge will be constructed providing a BSD-style Socket API to Javascript applications. The bridge will link up with a specialized Java application which will service API requests.

Once constructed, it will be possible to talk to arbitrary services on the internet from the music engine. This allows developers to create standalone enhancements called “routes.” Each route describes a way to find, filter, and play music in a particular way. A route for YouTube would search YouTube for music, filter out invalid results, and play the most accurate result when required. In this way the music engine can be dynamically extended to tap pervasive music across the internet.

Once complete, developers will be able to submit routes targeting particular music niches. Thus overtime, more and more music will be available for listening. This architecture requires simplifying and understanding the process for developers and users. Users will be able to control the routes they use and customize their experience. It will also be possible to easily create many other networked applications with this networking technology thereby drastically expanding what can be done with the web.

Once complete, pervasive access to music will be centralized on one platform, in which case the core platform will need to be built to provide programmatic access to all aspects of Anontune. It is at this point new research and innovation will be possible. All of this, from a legally respectable stand-point.

Anontune is really about information regarding music and the unique usage there of. This is the meta-paradigm. It operates on a higher level to consider abstractly just how musical listening occurs online.

That is the strength of Anontune.

## 6. Prototypes

> *“Talk is cheap! Where's the action?”* - Zhang Fei from Dynasty Warriors.

Much of the core technology required to make this proposal a reality has already been constructed; It's just very crude. We've already built the networking technology for the music engine. Details are available at www.anontune.com/netjs/. Presently, this technology is quite stable (considering.) We've observed the obvious trade-offs with such an approach such as the speed issues, crashes, and the requirement of Java being installed.

Even with the issues of such a technology, it appears we're going to be able to use it for the music engine. Already, a library to talk to web servers has been written and tested using netjs. We've successfully created three prototype routes from the library which allow the music engine to include music from 4shared, Soundcloud, and YouTube with many more potential routes planned for the future.

Our prototype proves our proposals are feasible, at least for the moment. We don't know how the internet community are going to react if things start to get big. Are all the routes going to cut us off before we can find an alternative? Is performance and stability going to be adequate? We're technically not breaking terms of services at this point. The obvious exception is our use of the Bing search engine to find artist images but that's quite innocuous in these early stages.

We've also completed a crude web-based player (www.anontune.com/demo) and the surrounding API calls required to make it work. Obviously, neither of these creations are up to our standards yet but we don't yet see any challenges that can't be overcome in their improvement. With most of the difficult problems solved already, development can proceed at full force.

The other prototype we are proud of is the ability to add all the music from an Apple iPod.

Usability of all systems at this point are poor, and this will need to be overcome for Anontune to be a success. As will presentation, stability, and performance problems.

## 7. Conclusion

In this paper we introduced the Anontune project, what our aims are, where we're heading, and where we are. At this point in time, our most difficult technical aims have been reached but many of our long term aims remain unfilled. It will be the focus of future research and development to ensure these aims are met. In reality, specifications may be changed or improved but for now the future of the project looks bright and stable.

Thanks for your interest in Anontune.

Anonymous.

## 8. Outro

If you're an investor, with the press, or just want to get in contact. Get in touch at *anontune [et at at at] gmail [dawt] com*.

If you want to get involved with the project join us on IRC. The channel is #anontune and the server is irc.cryto.net (see http://irc.lc/cryto/anontune if you're a noob.) We're open to collaboration. You might even get a spot on the core team.