

Copyright, an Incentive or a Burden?

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A copyright provides protection for original artistic or literary work and is valid for the life of the owner plus 70 years. There is a growing tension between creative practices that require access to content that is often copyrighted, and increasingly restrictive intellectual property laws and policies governing access to copyrighted content. Very recently this has played out in the law suit between the media corporation Viacom and the Internet portal YouTube, which is owned by Google.

This is against the background of a steadily emerging open source and creative commons culture. Milestones in the open source movement are the OpenOffice office suite, Netscape's publication of the source code for its product as open software, Google's library project, various free archives for scientific dissemination, such as Cornell University's ArXiv.

Introuction

The gap between the cost of digital media and storage, and a copyrighted digital item (a CD or DVD) continually increases, as Internet is readily available, and the price of digitally duplicating anything capable of being transmitted via digital media dropped to near zero [1]. The use of a copyrighted material is less restrictive than other intellectual properties (patents, trademarks, service marks), even though the copyrighted material cannot be photocopied, scanned or copied in any way. But portions of it can be used for non-commercial purposes.

The First Sale Doctrine (Copyright Act, 1976) does allow you to resell or give away the copy of the copyrighted item you bought. But it does not allow you to distribute copies of that item. For example, it is OK to give to someone a DVD that you previously bought. But, the First Sale Doctrine doesn't allow you to give the DVD away and keep a copy for yourself, or to give away copies of your DVD. Whether or not you are being paid to commit an infringement to the copyright law is irrelevant under the copyright law. If you don't hold the copyright, you can't sell or even give away unauthorized copies of the sound recording without permission. In fact, in 1997 US Congress amended the copyright law to impose criminal liability on infringing activities for non-commercial purposes (under the No Electronic Theft ("NET") Act, passed in 1997). The Digital Millennium

Copyright Act (DMCA) of 1998 declares as criminal acts production and dissemination of technology whose primary purpose is to circumvent measures taken to protect copyright, not merely infringement of copyright itself, and heightens the penalties for copyright infringement on the Internet, while limiting the liability of online providers from copyright infringement by their users [2], since free online access to digital scholarly material is offered in educational institutions for the purpose of learning (school, universities, and public libraries). Similar to DMCA, EU Copyright Directive (EUCD) passed on 2001 by the European Union.

DMCA also requires built-in some form of copy prevention to non-digital recorders, commonly known as Macrovision. If a data stream is encoded with Macrovision most home recorders will fail to record it. For a VCR, the picture either is scrambled picture as if the tracking was incorrect, or fades between overly light and dark. For a DVD recorder, it causes a message saying the source is "copy-protected" to be displayed and the recording is stalled. Since the signal is created by the DVD player during the playback and it is not stored physically on the DVD itself, some DVD players give the user the option of ignoring such an instruction or disabling the Macrovision technology [3].

In 1984, in Sony versus Universal Studios (or

the Betamax case), the Supreme Court ruled that a company was not liable for creating a technology that some customers may use for copyright infringing purposes, so long as the technology is capable of substantial non-infringing uses. In other words, where a technology has many uses, the public cannot be denied the lawful uses just because some (or many or most) may use the product to infringe copyrights. A VCR can have legal usage (time-shifting, rentals, home movies) but also users to make a copy of a TV program (which she was invited to watch for free) so that it can be watch later. Thanks to the Betamax ruling, the makers of not just VCRs, but also every other technology capable of being used for infringement (e.g., photocopiers, personal computers, Cisco routers, CD burners, and Apple's iPod) can continue to sell their wares without fear of lawsuits from copyright owners. Home recording devices are covered under the Audio Home Recording Act (AHRA) of 1992 that offers some protection from contributory copyright infringement claims to devices (thus manufactures) designed or marketed for the primary purpose of making digital musical recordings. It thus allows the digital copying of music, but the devices are required to incorporate technology to prevent serial copying, and the manufacturers of covered devices also pay a royalty to copyright owners. DVD players do not fall in the same category. Jon Johansen developed and published the software called DeCSS that permits users to use owned DVD players not approved by the entertainment industry. The software stirred at that time a great public interest, especially in the Unix community. 2600 Magazine, The New York Times, the San Jose Mercury News, the Village Voice, and others had published an article containing the DeCSS computer software and gave a link to obtain it. In December 1999, eight major motion picture studios sued 2600 Magazine for publishing an article containing the DeCSS computer software and linking to DeCSS. The lawsuit result went on their favor.

II. Legitimate and Illegitimate file sharing Networks

Having a home device is not the same as a personal computer. As a mention, general purpose computers are not covered by the AHRA. Downloading music from the Internet is not the same as borrowing a musical CD from a friend. Napster, a file sharing service created by Shawn Fanning, was the first widely-used peer-to-peer (or P2P) network. It offered an online music service by allowing users who log onto Napster's servers to obtain MP3 music files that are stored on the computers of other users who are connected to the Napster system at the same time. Napster provided advanced search capabilities, as well as direct hyperlinks to the MP3 files housed on its users' computers. Recording Industry Association of America (RIAA), the trade group that represents the US recording industry, sued Napster on December 7, 1999, and later won the case on the grounds that Napster software enables and facilitates piracy of music on an unprecedented scale [4,5]. Companies Elektra Entertainment Group Inc., Virgin Records America Inc., UMG Recordings Inc., BMG Music and Sony BMG Music Entertainment, coordinated by the Recording Industry Association of America (RIAA) have sued more than 18,000 people, including many minors, accusing them of pirating music through file-sharing computer networks. They track downloads to a computer address and then contact the Internet service provider to find the name of the computer owner [6]. Just as a note, these five companies distribute more than 70 percent of the world's music. Just because Napster itself did not house the infringing recordings, it did not mean Napster was not guilty of copyright infringement. By NET Act, whoever materially contributes to infringing activity, with knowledge of that activity, is liable for copyright infringement as if that person did the copying him or herself. It is technically possible to create a file-sharing system that only index or allows searches for artists or songs that have been authorized. Before

using other people's copyrighted works, the user is then responsible for getting permission to use them. Some legitimate distributed file-sharing networks still left are: Gnutella, Gnutella2, WASTE, GUNet, Freenet, MUTE. Afraid that the labels (the nickname for the big music producers company as EMI, Sony, Universal, Zomba, TVT) will see the idea of file sharing as a threat to their industry and ban it, two of the employees Justin Frankel and Tom Pepper created a distributed file-sharing program called Gnutella [7]. As of December 2005, Gnutella is the third most popular file sharing network on the Internet, following eDonkey 2000 and FastTrack. When you run Gnutella software and connect to the Gnutella Network, you choose what information to share (nothing, a file, a directory, or your entire hard drive) [8]. The development of the Gnutella protocol is currently led by the GDF (Gnutella Developer Forum). Freenet is a free (open source) software implementation of the system described by Ian Clarke in [9]. It is a decentralized censorship-resistant peer-to-peer distributed data store that allows users to anonymously publish or retrieve various kinds of information. Nowadays it is used for the distribution of censored information all over the world including countries such as China (www.freenet-china.org) and the Middle East [10]. One group, Freenet-China, has translated the Freenet software to Chinese and distributed it within China on CD and floppy disk. Freenet uses a kind of key based routing similar to a distributed hash table to locate peers' data. It can be thought of as a large storage device. When you store a file in it, you receive a key which can be used to retrieve the file. When you supply Freenet with a key, it returns the appropriate file (if it is located). If the document is not found in the local data store, the node finds the node in its routing table that it thinks will be able to locate the key the fastest, and forwards the request to that node, remembering that it has done so [10]. Ideas and concepts pioneered in Freenet have had a significant impact in the academic world. The 2000 paper "Freenet: A

Distributed Anonymous Information Storage and Retrieval System" was the most cited computer science paper of 2000 (citeseer.nj.nec.com/articles2000.html).

Freenet has also inspired papers in the worlds of law and philosophy. Ian Clarke, Freenet's creator and project coordinator, was selected as one of the top 100 innovators of 2003 by MIT's Technology Review magazine. In summer of 2006, Google paid four students to work full-time for Freenet.

III. Open source

The term *open source* describes any kind of creative work published in a format that explicitly allows the copying and the modifying of the data by anyone. Open source software refers to any computer software whose source code is available under a license that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified form. Open source licenses define the privileges and restrictions a licensor must follow in order to use, modify or redistribute the open-source software. Open source software includes software with source code in the public domain and software distributed under an open-source license. Examples of open source licenses include Apache License, BSD license, GNU General Public License, and Mozilla Public License [19]. A much less-restrictive concept, *free software* is different from open source software. Free software is mostly created under no license, thus it can be used, copied, studied, modified and redistributed with little or no restriction beyond the requirement that source code must be made available free of charge (charging for selling the software is against the definition of free software). A software licenses must have the following four freedoms to qualify as being *free*: (0) run the program for any purpose, (1) study and modify the program, (2) copy the program so you can help your neighbor, and (3) improve the program, and release your improvements to the public [11]. Richard Stallman, founder of the free software movement and Free Software Foundation, launched in 1983 the GNU. In 1992, Linux, the Unix-based

operating system developed by Linus Torwalds, was release as free software, and over the years became the major opponent to Microsoft's Windows operating system. Linus was inspired by Minix (an operating system developed by Andrew S. Tanenbaum). FreeBSD is another Unix-based free operating system descended from AT&T UNIX via the Berkeley Software Distribution (BSD) branch. Unlike Linux where the kernel is developed by one set of developers, the device drivers, utilities and applications by others, FreeBSD is developed as a complete operating system. Kerberos, X.org, and Apache software licenses originated in academic institutions (University of California, MIT, and University of Illinois at Urbana-Champaign), are substantially similar in intent and implementation [11]. Some example of free software follow (the list is taken from [11]):

1. Operating systems: GNU/Linux, BSD, OpenSolaris, ReactOS
2. GCC compilers, GDB debugger and C libraries.
3. Servers: BIND name server, Sendmail mail transport, Apache web server, Samba file server.
4. Relational database systems: MySQL and PostgreSQL.
5. Programming languages: Perl, PHP, Python, Ruby and Tcl.
6. Graphical User Interface (GUI)-related: X Window System, GNOME, KDE.
7. OpenOffice.org office suite, Mozilla and Firefox web browsers, GIMP graphics editor.
8. Typesetting and document preparation systems TeX and LaTeX.

Acknowledging the impact on the market of free software, in November of 2006, Microsoft and Novell announced their partnership in order to improve interoperability between Microsoft Windows and SUSE Linux [11]. Another term closely

related to open source and free software is *freeware*, that is software made available free of charge, but generally proprietary (users are not allowed to copy, study, modify or redistribute it).

IV. Conclusion

With free software, businesses have the freedom to fit the software to their specific needs by changing the software themselves or by hiring programmers to modify it for them. The Free Software Foundation maintains a service directory of people offering their free software services for hire. It shows free software developers offer their services ranging from \$35/hour to \$250/hour, a fraction of the cost for proprietary software [11].

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