An Investigation of Voluntary Collective Licensing for Music File-Sharing at UC Berkeley

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Contents

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I. Introduction

This paper explores whether UC Berkeley, its students, and the recording industry would benefit from a collective licensing scheme allowing peer-to-peer file-sharing of digital music across the campus network. Our analysis builds on recent proposals for new business models for the music industry that would allow file-sharing in exchange for a monthly fee that Internet service providers (ISPs) would collect and make available to copyright holders based on individual artists' download rates. In light of the industry's declining sales, the proposals we examine seek to develop viable alternative compensation models for musicians, publishers, and producers that are based on current consumer practices and capitalize on the technological potential of peer-to-peer distribution. We believe these proposals are technically achievable and worthy of serious consideration, and that implementing a modified version on a limited scale at Berkeley will go a long way toward proving or disproving their viability.

This report takes as its starting point the system of voluntary collective licensing (VCL) as originally laid out by the Electronic Frontier Foundation (EFF) in 2004.[1] The EFF's proposal builds on academic proposals for alternative compensation systems by law professors Neil Netanel and William Fisher.[2] In general, the proposed schemes involve users paying a small fee in addition to their ISP charges in exchange for a license to share digital music. The fees would be pooled by a collecting society or government agency, the movement of files across the system would be tracked, and revenue would be distributed among licensors based on works' popularity. The general idea is not new; similar collective licensing systems have been put in place in the past in response to technological disruptions of established music distribution models. VCL represents a sensible way for the music industry to capitalize on the pervasive practice of file-sharing, rather than trying in vain to prevent its adoption by consumers.

Universities such as Berkeley are uniquely situated to test the concept of VCL. In one sense, they operate as small Internet service providers to their faculty, staff, and students, and thus can be a

[1] Electronic Frontier Foundation, "A Better Way Forward: Voluntary Collective Licensing of Music File Sharing," 2004 (rev. 2008). http://www.eff.org/wp/better-way-forward-voluntary-collective-licensing-music-file-sharing, accessed May 4, 2008.

[2] Neil Weinstock Netanel, "Impose A Noncommercial Use Levy To Allow Free Peer-To-Peer File Sharing," 17 Harv. J.L. & Tech. 1 (2003); William W. Fisher, *Promises to Keep*, Stanford, CA: Stanford University Press, 2004.

microcosm of how the system might be implemented on a wider scale. They also constitute a highly concentrated community of technically savvy young adults, who are among the most active consumers of music. Students are consistently courted by the recording industry, but at the same time the Recoding Industry Association of America (RIAA) has specifically targeted universities and their students, putting pressure on them to curb file-sharing through litigation and Congressional lobbying. These factors combine to make Berkeley an ideal site to implement a forward-thinking scheme that respects universities' reluctance to police and limit their students' activities online and also serves the industry's goal of converting file-sharers into legitimate consumers of copyrighted music.

The proposals are based on certain assumptions and leave some questions unresolved in relation to their actual implementation. In order to evaluate those assumptions and address those questions, we have explored the following theses regarding the real-world potential of these systems' implementation at Berkeley:

1. Licensed file-sharing is an attractive option for students, and many would opt to pay.
2. Voluntary collective licensing is technically achievable.
    a. Technology for accurately tracking and accounting for downloads exists.
    b. Berkeley's Residential Computing network can support this technology.
    c. Tracking for compensation and consumer privacy are not incompatible.
3. Implementing such a system is in Berkeley's best interest.
4. Navigating the rights at issue and negotiating licenses and payment with content providers present two major stumbling blocks to voluntary collective licensing's adoption, and developing a test implementation at Berkeley is the best way to begin those negotiations.

The next section of this paper reviews the current state of the recording industry and its relationship to digital technology, charting the industry's various attempts to maintain control over digital distribution. Section three discusses the proposals for alternative compensation systems and the history of licensing in the music industry. We evaluate these proposals, noting where certain conditions would have to be adapted for use in a university setting. Section four

presents our research methods as they relate to our theses, outlining our work with students and network administrators at Berkeley, as well as with music industry and music technology professionals. Section five is a detailed report of our findings as they address our theses about the adoption and technical requirements of such a system. Section six proposes a model for how a system for licensed file-sharing might be implemented on the Berkeley campus and discuss questions the model raises. We conclude by articulating our belief that pursuing collective licensing for music file-sharing is achievable and desirable, and that Berkeley should develop a test implementation to further its wider adoption.

II. Current State of the Industry

Since 1999, revenues for the major record labels have dropped 29%. Revenues for sales of physical media have fallen 49%.[3] Also in that time, peer-to-peer file-sharing has exploded. Estimates vary widely, but one recent study found that peer-to-peer traffic represented 37% of total internet traffic.[4] The EFF has estimated that over 60 million Americans downloaded a file from a file-sharing network in 2006.[5] The music industry attributes the vast majority of their declining revenues to digital piracy, likening file-sharing to shoplifting,[6] and have spent significant time, money and resources on largely ineffective education and enforcement campaigns.

Because of such attitudes and fear of the loss of control peer-to-peer represents, the recording industry has not fully embraced the potential of digital distribution. Instead, its constituents have engaged in an escalating fight to combat peer-to-peer file-sharing, using a broad range of tactics. These include insisting on and successfully lobbying for legislation mandating technical protection for digital music files in the form of digital rights management (DRM); developing licensed alternatives to file-sharing that implement such protections; suing the developers of file-sharing software; suing individuals, specifically targeting university students; and lobbying

[3] RIAA 2007 Year-End Shipment Statistics. http://76.74.24.142/81128FFD-028F-282E-1CE5-FDBF16A46388.pdf, accessed April 29, 2008
[4] Ryan Singel, "Internet Mysteries: How Much File Sharing Traffic Travels the Net?" *Wired* Blog Network, May 5, 2008. http://blog.wired.com/27bstroke6/2008/05/how-much-file-s.html, accessed May 6, 2008
[5] EFF, "A Better Way Forward."
[6] RIAA, FAQ "For Students Doing Reports," http://riaa.com/faq.php, accessed May 4, 2008.

Congress for stricter controls at the ISP and university level. All of these responses have met resistance, leading to new and more widely distributed networks that are increasingly difficult to police. File-sharing continues to increase and overall industry revenues continue to fall, the success of iTunes notwithstanding.[7]

In order to give context to the various proposals that are the impetus for our research, this section explores these five tactics, focusing on the history of the fight while pointing out how technological innovations in digital distribution consistently force control of content out of the hands of the major labels.

Response 1: Technical Controls

Recorded music has been commercially available since the beginning of the twentieth century. In its earliest forms, it was effectively protected from widespread copying because the technology necessary to make copies was expensive and not widely available. In the mid–twentieth century, analog cassette recording technology became available, for the first time giving ordinary consumers the ability to make copies. This caused some concern in the industry, but evidence of harm was limited; the copies were generally singular, made for personal use, and degraded in audio quality.[8] Because cassette recording did not pose a major disruption to the industry's business model, it was allowed to continue, effectively signaling to consumers that limited copying was acceptable.[9]

The emergence of read/write digital audio tapes (DATs) in the late 1980s caused the industry more concern. While labels were experiencing success with read-only CDs, digital *copying* posed more of a threat to the industry because it resulted in exact copies that could themselves be

[7] See supra note 3. Additionally, the latest NPD Group study shows file-sharing up from 14% of music acquisitions in the United States in 2006 to 19% in 2007. http://bits.blogs.nytimes.com/2008/04/17/amazon-gains-share-of-shrinking-paid-music-market/index.html?ref=technology, accessed May 4, 2008.

[8] U.S. Congress, Office of Technology Assessment, "Copyright and Home Copying: Technology Challenges the Law," OTA-CIT-422, Washington, DC: U.S. Government Printing Office, October 1989, 3. http://www.princeton.edu/~ota/disk1/1989/8910/8910.PDF, accessed May 4, 2008.

[9] Stephen Hetcher, "The Music Industry's Failed Attempt to Influence File Sharing Norms" 7 Vanderbilt Journal of Entertainment and Technology Law, Date Unknown, 11-16. http://law.vanderbilt.edu/publications/journal-entertainment-technology-law/archive/download.aspx?id=1760, accessed May 4, 2008.

copied without degradation. This prompted the Congressional Office of Technology Assessment (OTA) to conduct a study of home taping, its impact on the recording industry, and its implications for copyright law.[10] The OTA report presented several options for Congressional consideration, including the record and electronics industries' favored approach, legislation mandating the serial copy management system, which would prevent unlimited copying.[11] The industry successfully lobbied for this legislation, and in 1992, the Audio Home Recording Act (ARHA) required that devices "designed specifically to communicate digital audio information and related interface data to a digital audio recording device" conform to standards limiting the number of copies of any recording that could be produced by the device.[12] AHRA enacted a compulsory royalty on such devices, payable to the recording industry. Unfortunately for the industry, DATs did not take hold in the marketplace, and technologies that did, such as CD-R drives included in general purpose computers, were not covered under the Act. Thus, the overly specific AHRA amounted to a losing gamble.

In a major blow to AHRA and the industry's efforts to maintain control over digital music, the Ninth Circuit Court of Appeals ruled in *RIAA v. Diamond* that the Act did not apply to MP3 players.[13] Compressed formats for digital music such as MP3, which lowered the costs of transmission and storage, posed a new threat to labels' control over digital music. Consequently, as that case was moving through the courts, the major labels expressed interest in more comprehensive technological solutions to the particular control problems digital music poses. In 1998, the RIAA created the Secure Digital Music Initiative (SDMI), calling together over 100 music and technology companies to research DRM and audio watermarking technologies. SDMI's seemingly benevolent objective was to "enable consumers to access and enjoy music in new ways, while ensuring interoperability among digital products and services so as to enhance the consumers listening experience."[14] The practical outcomes of this were meant to be both a

[10] Office of Technology Assessment, "Copyright and Home Copying."
[11] Ibid, 26.
[12] Enacted as 17 U.S.C. § 1001-1010. http://www.copyright.gov/title17/92chap10.html, accessed May 4, 2008.
[13] *Recording Industry Association of America v. Diamond Multimedia Sys.*, 180 F.3d 1072 (9th Cir. 1999). http://www.law.cornell.edu/copyright/cases/180_F3d_1072.htm, accessed April 29, 2008.
[14] SDMI Press Release, "Worldwide Recording Industry and Technology Companies Kick Off Work of Secure Digital Music Initiative," February 26, 1999. SDMI's site and the text of the announcement is no longer available, but can be accessed through The Internet Archive at http://web.archive.org/web/*/http://www.sdmi.org/pr/LA_Feb_26_1999_PR.htm, accessed May 4, 2008.

secure digital music format that would replace the MP3 and complementary players that would be able to read that format, not unlike the Content Scramble System for DVDs.[15]

The initiative faced major hurdles from the outset. First, the new format would have had to compete with the MP3 format that already dominated the market. Second, SDMI aimed to create a set of voluntary standards for copy protection, but competition among technologists regarding what those standards should be led to interoperability problems.[16] Third, content owners sought "perfect" copyright protection, over objections from technologists who insisted that such a goal was impractical if not impossible.[17] The group's one partial success in creating a watermarking scheme was broken by Princeton computer science professor Ed Felten and his team, and soon after SDMI was disbanded without meaningful results.[18]

Frustrated in its attempts at universal control, the industry has turned to DRM methods of more limited scope. Techniques include limiting the number of devices or applications a file can be played on, and for much of the first part of this decade, incorporating DRM into digital music applications was the price technology companies like Apple paid in order to obtain licensing deals with major record labels. DRM has other negative consequences associated with it as well. It can come into conflict with copyright law and unnecessarily chill some fair uses of music.[19] It has led to public embarrassments like the Sony rootkit scandal, in which audio CDs installed malicious spyware on user's computers.[20] Because of the rootkit scandal and a number of similar consumer inconveniences,[21] DRM has met widespread disapproval by the public. Within the last

[15] *See* http://www.dvdcca.org/css/

[16] Nichelle Nichols Levy, "Method to Their Madness: The Secure Digital Music Initiative, a Law and Economics Perspective," 5 VA. J.L. & TECH. 12 (2000), para. 20. http://www.vjolt.net/vol5/issue3/v5i3a12-Levy.html, accessed May 4, 2008.

[17] Ibid., para 25.

[18] It is fitting to point out that the RIAA tried to stop Felten from publishing his findings, and even threatened legal action under DMCA anti-circumvention charges to prevent him from doing so. The Justice Department eventually interceded on Felten's behalf, showing that once again the RIAA had pursued a failed attempt at control.

[19] *See* Pamela Samuelson, "DRM {and, or, vs.} The Law," *Communications of the ACM* 46, no. 4 (April 2003), 41-45. http://people.ischool.berkeley.edu/~pam/papers/acm_v46_p41.pdf, accessed April 30, 2008.

[20] *See* J. Alex Halderman and Edward W. Felten, "Lessons from the Sony CD DRM Episode." http://www.copyright.gov/1201/2006/hearings/sonydrm-ext.pdf, accessed May 4, 2008.

[21] As a recent example of DRM's interference with users' ability to freely enjoy music, Microsoft has announced that customers who purchased music through the now defunct MSN Music store must commit the music to five machines by August 31, 2008. After that time the service will be discontinued and customers will lose the ability to listen to the music they purchased if they don't access it from one of those five machines. See Jacqui Cheng, "DRM Sucks Redux: Microsoft to Nuke MSN Music DRM Keys," *Ars Technica*, April 22, 2008.

eighteen months, there have been some signs that the major labels may be rejecting DRM as a method for controlling digital content, which are discussed below.

Response 2: Licensed Alternatives

As alternatives to peer-to-peer file-sharing, the music industry has worked with businesses to provide a carrot to DRM's technological stick in the form of licensed outlets for digital music. Chief among these has been Apple's iTunes, which sells music on a per-song or per album basis. It has obtained licensing deals with all the majors and many independent record labels, creating the largest legal digital music catalog in the world. In doing so, it has been the number one digital music site in sales revenue since it launched in 2003, and as of April 2008, it is the number one music store in America with 19% of the market share.[22]

However, Apple's Fairplay DRM codec and its low bit-rate encoding has drawn criticism and invited market competition, and in September of 2007 Amazon.com announced it would sell MP3s unencumbered by DRM at a much higher bit-rate.[23] Alternative pay-per-song business models exist as well,[24] and there is no doubt that this part of the digital music market is growing. As a percentage of total music acquired by American Internet users, digital music sales jumped from 7% in 2006 to 10% in 2007. However, it should be noted that this growth has not kept pace with the decline of the physical music market.[25]

Numerous other digital acquisition models in combination with some forms of DRM exist. Some, such as Rhapsody and Napster 2.0, try to mimic the "all you can eat" nature of file-sharing networks. [26] Rhapsody charges a per-month fee for access to its entire catalog of 4 million songs, but uses its Helix DRM codec to restrict listeners to a streaming or tethered

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http://arstechnica.com/news.ars/post/20080422-drm-sucks-redux-microsoft-to-nuke-msn-music-drm-keys.html, accessed April 30, 2008.

[22] Apple press release, April 2008. http://www.apple.com/pr/library/2008/04/03itunes.html, accessed May 4, 2008.

[23] Jeff Leeds, "Amazon to Sell Warner Music Minus Copy Protection," *New York Times*, December 28, 2007. http://www.nytimes.com/2007/12/28/technology/28music.html?_r=1&adxnnl=1&oref=slogin&adxnnlx=1210271447-wpHJkEED0zIUNkztjSfraw, accessed May 4, 2008.

[24] EMusic (http://www.emusic.com), for example, charges a flat per-month fee for around 60 downloads, effectively pricing individual, DRM-free songs at $.25 a song.

[25] NPD Group report, supra note 7.

[26] http://www.rhapsody.com; http://www.napster.com

download model, and revokes listening rights if the user stops paying.[27] Others, such as iMeem, a social networking site for music lovers, have secured licensing deals with all four major labels to allow content on the site in return for preventing listeners from downloading music, and for a share of ad revenues.[28] Still others, like Pandora, qualify as small webcasters and act as digital radio stations, presenting streaming music without allowing users to pick individual songs to listen to.[29]

There is evidence that the industry's insistence on DRM is waning, with all four major labels recently announcing that they will offer DRM-free music.[30] There have also been calls from within the industry for collective licensing systems like those proposed by Netanel, Fisher, and the EFF. Songwriter organizations from Canada[31] and Sweden[32] have released major statements calling for VCL. The Play Louder company in the UK plans to partner with labels and ISPs to provide a VCL-like system as a "Music Service Provider."[33] The Noank Project, based in Canada and China, lays out a detailed plan on their website for how they will create "limitless legal content flow" by forming an "intermediary content licensing system."[34] And most recently, Warner Music has hired digital music industry veteran Jim Griffin to explore schemes for licensed file-sharing. Griffin, the first label executive to experiment with digital music content

[27] In the streaming format, music lives on Rhapsody's servers and can only be accessed by logging in. In the tethered download format, music can additionally be accessed from a number of Rhapsody-licensed proprietary devices, but not Apple's iPod or certain other MP3 players.

[28] http://www.imeem.com. The majors have reached a similar deal with YouTube (http://www.youtube.com).

[29] http://www.pandora.com. Even this arrangement is in jeopardy, as Pandora spent most of 2007 battling legislation that would have created prohibitively expensive web-casting royalty rates. *See* Tim Westergren, "Emergency for Internet Radio." Pandora Blog, July 2007. http://blog.pandora.com/pandora/archives/2007/07/emergency_for_i.html, accessed May 4, 2008.

[30] Catherine Holahan, "Sony BMG Plans to Drop DRM," *Business Week*, January 4, 2008. http://businessweek.com/technology/content/jan2008/tc2008013_398775.htm, accessed May 5, 2008.

[31] Songwriters Association of Canada, "A Proposal for the Monetization of the File Sharing of Music from The Songwriters and Recording Artists of Canada." http://www.songwriters.ca/studio/proposal.php, accessed May 4, 2008.

[32] Swedish Performing Rights Society, "How Downloading Could Be Made Legal." http://www.stim.se/stim/prod/stimv4eng.nsf/alldocuments/1D66451CBE1B0F81C12573F4002E1CCC, accessed May 4, 2008.

[33] http://playlouder.com

[34] http://www.noankmedia.com

when he was at Geffen in 1994,[35] has stated that Warner is actively engaged in find a way to create "a pool of money and a way to split it up."[36]

While such collective systems potentially hold promise, none have been fully implemented, and the existence of legitimate options has not ended file-sharing. The 2008 annual report of the International Federation of the Phonographic Industry claims that while legitimate digital sales are growing steadily, the number of files downloaded from peer-to-peer networks still outstrips digital music sales by twenty to one.[37] It is with this in mind that we turn to an examination of file-sharing systems themselves and the major labels' battle against them.

Response 3: Lawsuits Against File-Sharing Providers

The meteoric rise of Napster took the industry by surprise. At its peak in 2001, Napster had been downloaded 90 million times, registered 375 million files, and had up to 10 million users online at any given time.[38] Napster's growth and popularity stemmed from its architecture, which took advantage of the decentralized, multi-client structure of peer-to-peer networks, allowing users to search for music files across the network of all users and not just on one central server. Napster was efficient and robust, and because ripping and uploading MP3s was easy, it had an unrivaled music selection even by today's standards. Consequently, beginning with Napster, peer-to-peer networks have represented a loss of control over distribution on which the market for recorded music was based.

A&M Records v. Napster, initiated while Napster was actively pursuing licensing agreements with the major record labels, marked the beginning of the industry's efforts to eliminate file-sharing as a threat rather than embrace it as an opportunity. Because Napster maintained an index of materials being shared on users' computers, used its servers to facilitate file transfers, and did not act to terminate the accounts of users transferring copyrighted material, it was ultimately

[35] Griffin used Aerosmith's "Head First" in WAV format as a promotional tool. *See* John Alderman, *Sonic Boom: Napster, MP3, and the new Pioneers of Music*. Cambridge, MA: Perseus Publishing, 2001.
[36] Sam Gustin, "Fee for All," *Portfolio*, March 27, 2008. http://www.portfolio.com/news-markets/top-5/2008/03/27/Warners-New-Web-Guru, accessed May 4, 2008.
[37] IFPI Digital Music Report 2008. http://www.ifpi.org/content/library/DMR2008.pdf, accessed May 4, 2008.
[38] Research Interview, February 20, 2008.

enjoined from continuing to operate, under claims for contributory and vicarious copyright infringement.[39] Thus the major labels failed to embrace this potential new revenue stream at what turned out to be its most controllable point.

As a result of the Napster ruling, new and less centralized networks became popular. The next generation of peer-to-peer clients such as KaZaa, Morpheus, and Limewire distributed indexing and search functionality among clients on the system, an effort on the part of software designers to avoid the central point of control that felled Napster. This, however, did not prevent the labels from suing again. In March of 2005, *MGM Studios, Inc. v. Grokster, Ltd.* reached the Supreme Court, and Grokster ultimately lost the case in a unanimous decision.[40] The Court ruled that because certain promotional materials Grokster had produced seemed to encourage the sharing of copyrighted music files, the company could be held liable for the infringing actions of its users on grounds of inducement, a ruling never before applied to peer-to-peer software.[41]

This decision only spurred development of a new round of peer-to-peer clients. Some use encrypted protocols to obscure content.[42] Others are even more decentralized than Grokster. For example, the BitTorrent protocol finds and downloads parts of the same files from multiple clients in the network, so that no one client can be said to have supplied another with a full file. File locations are stored in torrent hubs (trackers) that can often live overseas, outside the RIAA's purview. When one tracker is shut down, another pops up in its place.[43] Perhaps because of this, the labels have turned their attention on a new target, individual file-sharers.

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[39] *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004 (9th Cir. 2001). http://www.law.cornell.edu/copyright/cases/239_F3d_1004.htm, accessed May 4, 2008.

[40] 545 U.S. 913 (2005)

[41] The court did not rule on the issue of vicarious or contributory infringement in the *Grokster* case. Furthermore, despite calls from across the legal and computer professions, it sidestepped the chance to update or provide clarity on the *Sony v. Universal* doctrine of "substantial non-infringing use," which is often used to defend new and disruptive technologies. *See* http://www.copyright.gov/docs/mgm/index.html for a list of *Amicus* briefs.

[42] The MUTE, WASTE, and Freenet networks now encrypt files that move across them. If file-sharing through encrypted networks becomes widespread, there may be little to nothing filtering systems could do about infringing traffic. *See* Chris Palmer and Seth Schoen, "Debunking Audible Magic — Again," July 20, 2004. http://w2.eff.org/share/audible_magic.php?f=audible_magic2.html, accessed May 4, 2008.

[43] The popular BitTorrent hub at http://oink.cd was shut down by a high-profile raid by the IFPI in October of 2007, but was replaced within days. *See* "When Pigs Fly: The Death of Oink, the Birth of Dissent, and a Brief History of Record Industry Suicide," October 24, 2007. http://www.demonbaby.com/blog/2007/10/when-pigs-fly-death-of-oink-birth-of.html, accessed May 4, 2008.

Response 4: Lawsuits against Individuals and Pre-Litigation Settlement Letters

In the fall of 2003, the RIAA began suing individuals they were able to identify by name using Digital Millennium Copyright Act (DMCA) subpoenas sent to ISPs.[44] After more than 3,000 subpoenas had been sent and 400 lawsuits had been brought against file-sharers,[45] the practice was enjoined by the court and the RIAA had to switch tactics.[46] In January 2004 the organization began issuing waves of "John Doe" lawsuits, which cite solely infringing IP addresses. Once these suits are approved by the court, they carry the force of law and compel ISPs to reveal the names of customers or students associated with those IP addresses. At a debate in Colorado, Richard Gabriel, head of the RIAA file sharing litigation against individuals, confirmed that more than 30,000 individuals have been targeted for legal action as of mid-April 2008.[47]

Many of these suits are settled out of court for between $3,000 and $11,000.[48] In one case that did reach a jury verdict, Jammie Thomas of Duluth, Minnesota, was ordered to pay $222,000 in statutory damages—$9,250 dollars for each of 24 songs she had shared on the KaZaa network.[49] While a discussion of the appropriateness of such statutory damage awards for file-sharing offenses is outside the scope of this paper, this ruling is evidence that there is a wide gulf between consumers' attitudes and behavior surrounding file-sharing and the rights currently afforded copyright holders. Furthermore, to the extent that the lawsuits have not deterred the practice to a significant degree,[50] such lawsuits are unreasonable.

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[44] John Borland, "RIAA sues 261 file swappers," *CNET News.com*, September 8, 2003. http://news.com.com/2100-1023_3-5072564.html, accessed March 30, 2008.

[45] Roy Mark, "High Court Bounces Latest RIAA Effort," InternetNews.com, Oct. 12, 2004, http://www.internetnews.com/bus-news/article.php/3420681, accessed May 4, 2008.

[46] *RIAA, Inc. v. Verizon Internet Services, Inc.*, 351 F.3d 1229 (D.C. Cir. 2003). http://www.eff.org/files/filenode/RIAA_v_Verizon/opinion-20031219.pdf, accessed May 4, 2008. *See also* Roy Mark, "High Court Bounces Latest RIAA Effort."

[47] EFF, "A Better Way Forward," 5; Fred von Lohmann, personal e-mail communication.

[48] Fred von Lohmann, "Is Suing Your Customers a Good Idea?" *Law.com*, September 29, 2004. http://www.law.com/jsp/article.jsp?id=1095434496352, accessed May 6, 2008.

[49] *Capitol v. Thomas*, 06-cv-1497 (Minn. 207), Special Verdict Form. http://www.muddlawoffices.com/RIAA/Virgin%20Thomas/100%20Special%20Verdict%20Form.pdf, accessed May 4, 2008.

[50] *See* NPD Group report, supra note 7.

In *RIAA v. The People: 4 years Later*, the EFF has collected some salient examples of individuals that have been sued.[51] These included grandmothers who did not own computers at the time of the suit, people sued for infringement in states where they did not live, a daughter who was sued upon settlement of a suit against her mother, and instances of people sued for downloading songs they already owned on CD (which they thought was legal).[52] In response to the bad press around these particular lawsuits, an RIAA spokesman claimed, "When you fish with a net, you sometimes are going to catch a few dolphins."[53]

The RIAA has also pursued university students even more directly with a "deterrence and education initiative."[54] For the last year, it has been sending "pre-settlement" letters to universities to be forwarded to students at allegedly infringing campus IP addresses. These letters offer the student a choice between paying a "reduced" settlement amount of $3,000 within 20 days or facing a subpoena and risking paying $750 per infringing song.[55] Such a process has no judicial oversight and puts universities in the position of deciding whether to identify and forward on these letters to the students. Most universities forward them, fearing reprisal for non-compliance.[56] The RIAA has sent out approximately 5,404 "pre-settlement" letters since it began the practice in early 2007.[57]

Matthew Sag has offered an economic rationale for this approach, arguing that suing average individual sharers is likely to have a larger effect on widespread consumer practice than

[51] EFF, "RIAA v. The People: Four Years Later," August 2007. http://w2.eff.org/IP/P2P/riaa_at_four.pdf, accessed May 4, 2008.
[52] Ibid.
[53] RIAA spokeswoman Amy Weiss, quoted in Dennis Roddy, "The Song Remains the Same" *Pittsburgh Post-Gazette*, Sept. 16, 2003. http://www.post-gazette.com/columnists/20030914edroddy0914p1.asp, accessed May 4, 2008.
[54] See Eliot Van Buskirk, "A Poison Pen From the RIAA," *Wired*, Feb. 28, 2007, http://www.wired.com/politics/onlinerights/news/2007/02/72834, accessed April 30, 2008.
[55] An example of such a letter can be found at http://w2.eff.org/IP/P2P/sample_riaa_letter.pdf, accessed May 4, 2008.
[56] One exception is the University of Maine, where law students named in a John Doe suit have recently filed for an injunction against the RIAA, claiming its campaign against "John Does" violates rules 11(b)(1) and 11(b)(3) of the Federal Rules of Civil Procedure. The motion is available at http://www.ilrweb.com/viewILRPDFfull.asp?filename=arista_does1-27_080401Rule11Motion, accessed May 4, 2008.
[57] RIAA press release, "RIAA Sends More Pre-Lawsuit Letters to Colleges One Year Into Campaign." http://www.riaa.com/newsitem.php?id=B0FAEEC1-A56A-0F04-D999-94A807ADAA6E, accessed May 4, 2008.

attacking the networks or high-volume pirates.[58] According to Sag, implicit in these suits is a recognition that file-sharing cannot be completely eradicated, but that fence-sitters can be scared straight, and the practice stigmatized: "Rather than focusing on the infringing acts of high-volume uploaders, the recording industry's resources are better spent targeting the comparably innocent file-sharers because they are more likely to be deterred from file-sharing and also more likely to switch to buying music."[59]

Those favoring this approach and looking for evidence of its success might point to 2004 record sales, which actually increased slightly,[60] but more recent evidence shows that the decline has continued.[61] Last year, a survey by the NPD Group indicated that 57% of music acquired in the United States is obtained without paying for it.[62] This indicates that lawsuits are an ineffective strategy to correct the perceived problem.

Response 5: Pressure through Legislation

Litigation has not been the RIAA's only tool in their fight against file-sharing, especially at the university level. Representatives from the RIAA have testified before Congress that universities need to be doing more to curb their students' file-sharing habits, demanding that universities install monitoring and filtering solutions, institute "three strikes and you're out"[63] policies with regard to student file-sharing, and increase their education of students concerning copyright law and online citizenship.[64] Congress, in turn, has put pressure on universities, sending a survey on file-sharing deterrence measures to the RIAA's top-25 list of "worst offenders" threatening

[58] Matthew Sag, "Twelve Year-Olds, Grandmothers, And Other Good Targets For The Recording Industry's File Sharing Litigation," 4 Nw. J. Tech. & Intell. Prop. 133 (2006).
[59] Ibid., 149.
[60] See supra note 3.
[61] Brian Hiatt and Evan Serpic, "The Record Industry's Decline," *Rolling Stone*, June 28, 2007. http://www.rollingstone.com/news/story/15137581/the_record_industrys_decline, accessed May 4, 2008.
[62] supra note 7.
[63] "Stanford Starts Three Strikes Policy," http://www.p2p-weblog.com/50226711/stanford_starts_three_strikes_rule.php, accessed May 4, 2008. *See also* Bill Clebsch, "P2P @ SU: Policies & Technologies for Filesharing © Material in a Litigious World." Powerpoint presentation to the Common Solutions Group discussing DMCA takedown procedures, January 2008. http://www.stonesoup.org/Meetings/0801/work1.pres/clebsch.htm, accessed May 4, 2008.
[64] *See* U.S. House, Committee on Science and Technology, *The Role of Technology in Reducing Illegal Filesharing: A University Perspective*, June 5, 2007. http://science.house.gov/publications/hearings_markups_details.aspx?NewsID=1846, accessed May 7, 2008.

"unspecified repercussions" if the universities did not provide "acceptable answers" to the survey, which included questions such as: "Does your institution expel violating students?"[65]

Additionally, Congress has inserted language into education bills concerning deterrence of file-sharing at universities. Most recently, such language has been included in HR 4137, The College Opportunity and Affordability Act of 2007, which has passed the House and now waits to be reconciled with the Senate's version. It calls for universities to "develop a plan for offering alternatives to illegal downloading or peer-to-peer distribution of intellectual property as well as a plan to explore technology-based deterrents to prevent such illegal activity."[66]

Some have read the bill as unjustly jeopardizing a school's federal funding for non-compliance and as an unnecessary handout to traffic blocking companies.[67] Others see it as infringing on student privacy and academic freedom.[68] Although some representatives have stated they are against this federal mandate condoning technological deterrents, it is an open question whether the language will remain in the bill.

This section has discussed the threats that digital music and file-sharing pose to established record-industry practice, and the RIAA's attempts to eradicate file-sharing. Despite these efforts, file-sharing continues. The next section shifts in focus from these attempts at maintaining control to possible mechanisms for compensation, examining proposals for new business models that would more effectively serve both the industry and those who continue to share music on peer-to-peer networks.

[65] The survey is available at http://www.eff.org/IP/P2P/RIAA_v_ThePeople/example_letter_sent_to_universities.pdf, accessed April 30, 2008.
[66] 110th U.S. Congress, H.R. 4137. http://thomas.loc.gov/cgi-bin/query/z?c110:h4137:, accessed May 4, 2008.
[67] Larisa Mann, "Download a Song, Lose your Loan," *The Nation*, November 27, 2007. http://www.thenation.com/doc/20071217/download, accessed May 4, 2008.
[68] Eugene H. Spafford and Edward Felten, Letter to Sen. Edward Kennedy and Rep. George Miller on behalf of the ACM, April 15, 2008. http://usacm.acm.org/usacm/weblog/wp-content/USACM_Filtering_Final.pdf, accessed May 4, 2008.

III. Review of the Proposals for Collective Licensing

The current state of file-sharing constitutes a market failure, in that the efforts of the music industry to meet or reshape consumer demand have been unsuccessful. Millions of people are using efficient systems to distribute music, but this distribution falls outside the bounds of traditional models for compensating creators. In 2000, the authors of the National Research Councils report *The Digital Dilemma* identified two possible responses to the rapidly changing environment for digital music: technical protection mechanisms such as DRM and the development of new business models.[69] Recognizing the inadequacy of the former, scholars and advocates have since advanced the idea of collective licensing as a potential correction for the market failure.

Alternative compensation systems have been proposed by William Fisher, Neil Netanel, and the EFF, among others.[70] All the proposals accept that the lost control over circulation is irrecoverable and instead advocate systems to compensate artists for the music that is already circulating. The proposed systems share some basic features. Each calls for music to enter the system through licensing with rights holders, either compulsorily or voluntarily. Money would then be collected from system users, either through a tax on some good or service or else by voluntary payment to a collective rights organization. Users would be free to acquire, copy, and make available digital content as they saw fit, using whatever software suited them. Files' movement through the systems would be accounted for in some manner, and the pooled money would be distributed to rights holders based on download or use rates.

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[69] *See* chapter 2, "Music: Intellectual Property's Canary in the Digital Coal Mine," in *The Digital Dilemma: Intellectual Property in the Information Age*, Washington, DC: National Academy Press, 2000.

[70] *See* Jessica Litman, "Sharing and Stealing," note 124, citing Daniel Gervais, "Copyright, Money and the Internet," (March 3, 2004). http://www.commonlaw.uottawa.ca/faculty/prof/dgervais/CopyrightMoneyAndTheInternet.pdf; Raymond Shih Ray Ku, "The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology," 69 U. CHI. L. REV. 263, 305 (2002); and Glynn S. Lunney, "The Death of Copyright: Digital Technology, Private Copying, and the Digital Millennium Copyright Act," 87 VA. L. REV. 813, 852-69, 886-920 (2001).

Collective licensing[71] for digital music file-sharing is attractive for a number of reasons. It capitalizes on current sharing habits that have become acceptable to consumers through home-taping and through immersion in an information economy.[72] It works with, instead of against, the technological possibilities of peer-to-peer file-sharing. It creates a revenue source for content creators where currently none exists. It acknowledges the creative production possibilities that peer to peer file-sharing affords in the form of "online collecting, swapping, reworking, and remixing."[73] In potentially legitimizing file-sharing itself, it ends the practice of the industry suing its biggest fans and most active consumers, a strategy the EFF has called "absurd."[74] Finally, it is rooted in historic precedent; collective licensing of copyrights has been used for over a century to remedy market disruptions caused by new technology.[75]

This section analyzes the proposals of Netanel, Fisher, and the EFF, focusing on two important aspects where they diverge: how and from whom the money should be collected and how music in the system should be accounted for. We also touch on other points concerning the management of the system, concluding that the voluntary approach favored by the EFF is preferable. This is followed by a discussion of the performing rights organizations' (PROs) fight for royalties on radio performances, the outcome of which may serve as a precedent for voluntary collective licensing of file-sharing. The section closes with a discussion of how VCL could fit into copyright law, as well as theoretical arguments surrounding music as a form of digital information and complex systems theory that favor its adoption.

Collecting the Money

One point on which the three proposals we focus on differ is how payment would be collected. Netanel and Fisher propose systems of taxation managed by the Copyright Office. The EFF

[71] Throughout this paper, we use "collective licensing" to refer to all three proposals, despite the fact the Netanel's and Fisher's systems are base on taxation and compulsory royalties and potentially involve major revisions to copyright law. We use the EFF's "voluntary collective licensing" to designate their proposed system, where creators license their reproduction and distribution copyrights under current law.
[72] Lawrence Lessig, *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*, New York: Penguin Press: 2003, 207.
[73] Netanel, 3.
[74] EFF, "A Better Way Forward."
[75] See discussion of radio performance licensing, this section.

proposes that copyright owners voluntarily collectively license their material for file-sharing, offering consumers the choice to buy into the license via their ISPs or other methods. Our proposal is informed by aspects of each, but favors the licensing approach of the EFF.

Netanel proposes instituting a tax on products whose value is substantially increased by peer-to-peer file-sharing, including CD burners, MP3 players, and ISPs.[76] He terms this a "non-commercial use levy" because the levied funds would compensate creators for the non-commercial copying and sharing that file-sharing entails. He defends this proposal by comparing it favorably to existing government interventions in copyright markets. He envisions the levy as more broadly focused and therefore more successful than AHRA, which also placed a levy on equipment and media, and sees precedent in compulsory licensing for recordings and public performances.[77] On a higher level, Netanel argues that a strict property rights approach to copyright, whereby such uses are prohibited, can result in over-protected and under-exploited creative works.[78] By contrast, for content creators file-sharing embodies the uncompensated exploitation of works. Recognizing that neither under-exploitation nor uncompensated use serves the public interest in creative works, Netanel would impose the non-commercial use levy to reconcile these extremes, distributing the resulting money to artists and their assignees according to the popularity of their works.

Fisher also envisions a taxation-based system. He characterizes music and movies as public goods, and argues in favor of a system in which the government fairly compensates creators, rather than granting them exclusive rights, which grow ever more difficult to enforce in the networked environment.[79] To determine a starting point for what that compensation should be, Fisher provides a rough estimate of the music and film industries' losses attributable to file-sharing. He bases his numbers on figures from 2000, the year the music industry's revenues began declining, and adds music publishers' mechanical license revenues[80] and movie studios'

[76] Netanel, 43-44.
[77] Netanel, 5, 31-34.
[78] Netanel, 36.
[79] Fisher, ch. 6, 3: "The rapidly increasing popularity of digital recording and storage systems, the improvement of compression technologies, and the communicative power of the Internet made it ever harder for artists and their assignees to enforce their rights under copyright law."
[80] Under the Copyright Act, musical compositions are subject to compulsory "mechanical license" allowing others to embody the work in sound recordings. Such uses are subject to a statutory license fee. *See* 17 U.S.C. § 115.

revenues for that year, since both are affected by file-sharing. Then he conservatively estimates the losses to these industries attributable to file-sharing.[81] To recoup these losses, Fisher proposes taxes on CD burners, digital video recorders, blank media, digital music players, and, most importantly, a $5.36 per month tax on broadband Internet access providers.[82] Since ISPs represent 81% of the tax revenue under Fisher's system and the music industry represents 72% of the costs, [83] $5 per month (the approximate ISP figure without considering the tax on other goods and services) is a useful figure around which to begin negotiations for licensed file-sharing of recorded music, keeping in mind that the pricing of any such system will require periodic renegotiation.

In contrast to the taxation-based proposals, the EFF has suggested that any collective licensing scheme must be voluntary on the part of consumers in order to succeed.[84] Their proposal avoids the potential political unpopularity of tax-supported systems, and instead envisions a blanket license folded into any number of existing services, including Internet access, also for around $5 per month. Those who do not file-share need not pay the license fee. While this would require significantly less government intervention, it creates the possibility that people might file-share even thought they haven't bought into a service that bundles the fee.[85] In such a case, rights holders or the collectives they might form would be free to combat unlicensed sharing, much like how the performing rights collectives such as ASCAP police their member publishers' rights through litigation against unlicensed broadcasters and performance spaces. At the same time, individuals or collectives would collect license fees from fans willing to pay. Considering the revisions to copyright law that would be required to implement Netanel's and Fisher's proposals, a system of negotiated licenses working under current law such as that proposed by the EFF is more achievable in the near term.

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http://www.copyright.gov/title17/92chap1.html#115.

[81] Fisher's figures are based on Netanel's estimate 20% of the recording industry's falling revenues are attributable to file-sharing. This estimate is in turn based on Stan J. Liebowitz, "Will MP3 Downloads Annihilate the Music Industry? The Evidence So Far," (June 2003). http://ssrn.com/abstract=414162.

[82] Fisher, ch. 6, 17-21.

[83] Ibid. Fisher estimates music losses to recoup of $1.262 billion and movie studio losses to recoup of $.479 billion; he estimate ISPs' revenue at $16.456 billion, and other taxed sources' revenue at $3.792 billion.

[84] EFF, "A Better Way Forward."

[85] In a coda to his proposal, Fisher too considers the merits of a voluntary system he calls "The Entertainment Co-op." He raises this issue of "leakage" of licensed content onto unlicensed networks as a potential problem. Ch.6, 51. *See also* Discussion section, below.

Accounting for Traffic

The question of how to account for the movement of files through the system is composed of two smaller questions. The first is whether to monitor all transactions or to sample traffic. The second is whether to track downloads or individual plays. When considering the first, monitoring all transactions is known variously as full-scale metering or the Census model because it aims for total inclusion. This is contrasted with a sampling model, in which limited information representative of the whole system is collected in order to generate a projection of relative popularity. If a fair, accurate, and representative sample can be constructed, this method may be a more feasible way to account for downloads in the aggregate, although sampling itself introduces separate statistical concerns. Some of these are addressed in more detail in the Discussion section.

Netanel advocates the metering approach to determine the proportions by which the levied funds would be distributed. Such tracking, he argues, would create the best market-like environment for determining the relative value of copyrighted content, providing a fuller picture to producers of consumers' valuation of their content.[86] Indeed, monitoring usage would most closely resemble the level of accounting afforded by sales of physical media and centralized digital sales such as those from iTunes. Netanel cites both client-side and passive network monitoring devices that can perform such metering.[87] In the event that 100% accounting is impossible or too costly, Netanel concedes that sampling could be used to a much greater degree of precision in the digital environment than in established markets like radio and television.[88]

Fisher dismisses metering as problematic and unnecessary, citing the potential for users to download songs they end up never listening to and the possibility of IP address spoofing being used to game the system.[89] He stresses that the goal should be to determine works' relative value,

[86] Netanel, 53-55.
[87] Some of these technologies are discussed in detail in the Findings section.
[88] Netanel, 54-55.
[89] Fisher, ch. 6, 24-25.

not to collect a fee per download.[90] Thus, he describes a system based purely on sampling to determine compensation rates:

> Using techniques pioneered by American and European performing rights organizations and television rating services, a government agency would estimate the frequency with which each song and film was heard or watched by consumers.[91]

The EFF similarly proposes sampling, seeing the utility of a broad, mixed-methods approach:

> Figuring out what is popular can be accomplished through a mix of anonymously monitoring what people are sharing . . . and recruiting volunteers to serve as the digital music equivalent of Nielsen families. . . . In a digital environment, a mix of these approaches should strike the right balance between preserving privacy and accurately estimating popularity.[92]

The system we envision in Berkeley's test implementation would rely primarily on the first of these approaches enumerated by the EFF, using a limited number of technical monitors, which could be easily deployed on a limited scale, to sample actual network traffic. Developing robust sampling techniques will be difficult given the large number of artists represented on peer-to-peer networks, and testing various techniques will need to be a part of Berkeley's pilot implementation.

The question of whether to track downloads or individual plays is potentially more wide-ranging, and raises significant questions about the nature of copyright law as it would be applied to digital music. Both Netanel and Fisher propose tracking plays.[93] The EFF's proposal does not distinguish between the two, but contains general language about sampling to determine works' relative popularity.[94] Netanel and Fisher argue that tracking plays would provide a better measure of consumer value of entertainment goods. While this is a laudable goal, and not out of step with their larger proposals to reform copyright law, it implies a sort of private performance right in musical compositions, at odds with current copyright law.[95]

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[90] Fisher, ch. 6, 22.
[91] Fisher, 3-4.
[92] EFF, "A Better Way Forward," 3.
[93] Netanel, 54; Fisher, ch. 6, 23-25.
[94] EFF, "A Better Way Forward," 4.
[95] 17 U.S.C. § 106, granting exclusive rights under copyright, does not grant any rights in the private performance of

The EFF's proposal is rooted in the organization's belief that "We could get there without the need for changes to copyright law and with minimal government intervention."[96] Since our goal is to investigate the feasibility such a comparably lightweight licensing system that could be implemented as soon as possible, we favor a downloads-based accounting metric. Accounting for download instead of plays more closely resembles current compensation systems and is therefore more realistic and achievable without broader revision of the ways in which copyright law allows for artists to be compensated for their creations.

Managing the System

The plans all consider what organization is best suited to oversee the system. Netanel and Fisher propose government oversight, with Fisher advocating major copyright reforms, while the EFF proposes that the system be managed by one or more private rights collectives. Netanel's proposal addresses this question only a very high level, proposing that a Copyright Tribunal would establish rates and procedures for determining what products and services to tax, and that levied funds should be distributed to current copyright holders.[97]

Fisher proposes a detailed accounting system to be managed by the Copyright Office. Creators would register their works, which the Office would assign a unique identifier for the purposes of tracking both distribution and chains of derivation in remixed and sample-based works.[98] While the Copyright Office would be well situated to manage these transactions, imposing such bureaucracy would place an unnecessary burden on copyright-holders to license their works into the system. Some copyright reformers would tout the potential benefits of reinstating copyright registration requirements that were abandoned in the Copyright Act of 1976,[99] but simply to get artists paid for the distribution of their works, government registration seems overkill. The goal of creating a master database of works for tracking and accounting purposes is also attractive, but

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copyrighted works. http://www.copyright.gov/title17/92chap1.html#106, accessed May 8, 2008.

[96] EFF, "A Better Way Forward," 2.

[97] Netanel 43-44, 58.

[98] Fisher Ch. 6, 4-7.

[99] *See* Christopher Sprigman, "Reform(aliz)ing Copyright Law," 57 Stan. L. Rev. 485 (2004), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=578502, accessed April 29, 2008.

in the case of sound recordings, private companies already construct such databases that can account for these concerns.[100] Additionally, in considering the practicality of implementing a collective licensing system, the question of derivative works is best left to more comprehensive copyright reform efforts.

The voluntary system proposed by the EFF, while less detailed, again presents a more lightweight solution. Viewing collective licensing as a powerful tool to work within existing copyright law, they envision collecting societies that would manage licenses and establish rates without the administrative burden of government registration.[101] As the next section demonstrates, such solutions have worked in the past to bring disruptive technologies in line with copyright law.

Learning from ASCAP: Collective Licensing in History

Whatever differences may exist between the three proposals discussed above, they are all rooted in the idea that the music industry has faced these challenges before, and that collective licensing is an established method to facilitate the creation of markets for uses of copyrighted works afforded by disruptive technology. The performing rights organizations (PROs), which include the American Society of Composers and Publishers (ASCAP), the Broadcast Music Industry (BMI), and SESAC, create a functioning market for licensing radio broadcasts that would be impossible without them. Initial conflicts between rights holders demanding royalties and broadcasters unable to individually license every song they played were eventually resolved when radio broadcasts were ruled to be under the purview of the PROs' blanket licensing authority. ASCAP and BMI have survived antitrust challenges since their founding because they facilitate the creation of a market for licensing that could not otherwise exist. Similarly, collective licensing for music file-sharing can create a market where currently no legitimate one exists.

[100] See discussion of Audible Magic and Gracenote in the Findings section, below.
[101] EFF, "A Better Way Forward," 1.

ASCAP was originally founded in 1914 to collectively license musical works for non-dramatic live performances in restaurants, bars, and hotels, but as radio took hold, publishers engaged in a protracted fight with broadcasters to bring radio transmissions under the scope of the society's blanket performance licenses.[102] ASCAP's reaction to radio resembled the RIAA's tactics today, with ASCAP suing individual radio stations for infringing its members' exclusive rights to perform works publicly.[103] In describing the fight, Timothy Wu chronicles the failed litigious and legislative attempts of broadcasters to resist paying ASCAP licenses.[104] Broadcasters' strategies included lobbying for state legislation declaring collectivizing copyrights illegal and alleging antitrust violations on the part of the ASCAP.[105] Wu uses the term "copyright settlement" to characterize the fight's ultimate resolution in the form of a judicial consent decree that allowed ASCAP to continue its licensing practices, under government supervision.[106]

The consent decree provides the basic framework under which ASCAP and BMI can operate. Glynn Lunney explains that the decree's basic purpose is to prevent monopolistic exploitation of the collectives' members' copyrights at the expense of licensees like radio stations.[107] Appropriately, periodic changes to the consent decree have been precipitated by changing technology. Such changes include the clarification of the collective management organizations' role in theatrical synchronization licenses, the establishment of royalty rates, and the establishment of the District Court for the Southern District of New York as a rate court for resolving disputes over licensing fees.[108]

Despite these adjustments and occasional challenges, the PROs continue to serve an important role in the licensing market. In one important antitrust challenge, the Supreme Court held in *BMI*

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[102] Timothy Wu, "Copyright's Communication Policy," 103 Mich. L. Rev. 278-366, 305; Daniel Gervais, "The Changing Role of Copyright Collectives," in Gervais, Daniel, ed. *Collective Management of Copyright and Related Rights*, Netherlands: Kluwer Law International, 2006, 3-36.

[103] See *Jerome H. Remick & Co. v. American Automobile Accessories Co.*, 5 F.2d 411 (6th Cir. 1925), cited by Wu, 307.

[104] Wu, 301-311.

[105] Wu, 308, citing *Pennsylvania Broadcasting Co. v. Buck*, (S.D.N.Y., filed Sept. 7, 1933).

[106] The consent decree is the result of Justice Department antitrust challenges to ASCAP's existence, and was first established in 1941. *United States of America v. ASCAP*, Civil Action No. 41-1395 (Second Amended Final Judgment, 2001).

[107] Glynn Lunney, "Copyright Collectives and Collecting Societies: The United States Experience," in Gervais, Daniel, ed., *Collective Management of Copyright and Related Rights*, Netherlands: Kluwer Law International, 2006, 323-335.

[108] Ibid.

v. CBS that the collective management organizations did not violate antitrust laws *per se,* finding them necessary to create a market where individual songwriters and publishers could not.[109] If collective management organizations are necessary to create a market to adequately compensate artists in the distributed technological environment of cover bands and radio broadcasts, the same argument can be made for the creation of similar organizations to oversee collective licensing for monetizing file-sharing.

Licensing is an established mechanism for correcting market failures, in that it can align social norms and the uses enabled by new technologies with the rights afforded creators under copyright law. Daniel Gervais has pointed out the incompatibilities between current copyright law and file-sharing practice, concluding that "the solution . . . is to license massive Internet uses, in a way that respects all those involved in the creation, performance, publication, production, and use of copyright content."[110] Without a statutory public performance right in sound recordings,[111] the historical fight for performance royalties only implicated copyright in musical works. Record companies did not have to face the loss of control of their rights along with music publishers. With file-sharing the other shoe has dropped, implicating reproduction and distribution rights in sound recordings. The major labels' model has been disrupted. They should take a cue from the fight between publishers and ASCAP and license their content for file-sharing in order to create more sustainable support for the artists they represent, rather than attempting in vain to sue the problem out of existence.

VCL and Copyright, Digital Information, and Complex Systems

Even if the major labels decide to actively pursue a licensing scheme for file-sharing downloads, complex issues remain. Licensing analog broadcasts involved only artists' public performance rights in musical works. Digital distributions complicate matters because they can involve the transmission of perfect copies of sound recordings. Pay-per-track downloads, such as those available from iTunes, are referred to in copyright law as digital phonorecord deliveries (DPDs),

[109] *Broadcast Music, Inc. v. Columbia Broadcasting System, Inc.*, 441 U.S. 1. Quoted in Lunney, "Copyright Collectives."
[110] Gervais, "Changing Role."
[111] 17 U.S.C. § 114. http://www.copyright.gov/title17/92chap1.html#114, accessed May 4, 2008.

and until recently it was not clear whether their purchase and subsequent play implicated the public performance right. The rate court considered the status of DPDs in *United States v. ASCAP (AOL Application for Reasonable Fees)*. The court ruled that while streaming webcasts fall within the scope of the PROs' licensing authority, DPDs, even if played immediately upon downloading, do not constitute a public performance.[112] By this ruling, songwriters and music publishers do not have a right to a performance royalty on direct DPDs. They implicate different rights: the reproduction and distribution rights in both the musical work and the embodied sound recording. We believe that file-sharing transactions largely resemble DPDs, in that they are both private transactions resulting in a permanent recording being download to a user's hard drive.

Under traditional models, such as CD sales or pay-per-track downloads, the holder of the copyright in the sound recording receives a wholesale rate for the recording, and the writer or publisher of the song receives a statutory royalty per copy.[113] A licensing attorney at Rhapsody called licensing for DPDs "the easiest and the most streamlined and elegant licensing scheme for digital distribution of music right now."[114] However, applying this model to a blanket license for file-sharing will not be as clear-cut. In the VCL plan envisioned by the EFF, users would not pay per copy, but per month or per semester. In the digital environment where copying is not controlled and the marginal cost of any copy is next to nothing, basing costs on copies does not make sense. Thus, new deals will have to be struck to establish the rates at which producers and artists are compensated for their work.

Turning from technical details of the implementation of VCL to broader theories that support it, we find the ideas of Jessica Litman and Deborah Tussey useful in framing the merits of collective licensing for file-sharing. Litman has championed new approaches to musical copyright by placing music within the larger context of digital information. She argues that copyright law has fostered creativity on the Web due to its reluctance to copyright facts, and posits that "we should be trying to achieve . . . an online musical smorgasbord of comparable

[112] *United States of America v. ASCAP*, Civil Action No. 41-1395 (AOL Application For Reasonable Fees) (S.D.N.Y April 25, 2007).

[113] According to one interviewee, iTunes's dominance has established 70 cents per track as the default wholesale rate paid to recording companies. Currently, the mechanical rate is 9.1 cents for songs 5 minutes or less or 1.75 cents per minute or fraction thereof over 5 minutes. *See* http://www.harryfox.com/public/licenseeRateCurrent.jsp, accessed April 30, 2008.

[114] Research Interview, March 6, 2008.

breadth and variety."[115] From this perspective, Litman endorses calls for voluntary collective licensing, hoping that the resulting incentives to share will cause a flourishing in music similar to that which she finds in the Web's information.[116] Providing efficient access to information is among the most positive features of peer-to-peer networks, and encouraging that access in a way that compensates creators for providing that information may well foster further creativity.

At a higher level, privately negotiated licenses represent an efficient way for the digital music market to reach equilibrium. In "Music at The Edge of Chaos: A Complex Systems Perspective on File Sharing," Deborah Tussey applies complex systems theory to the music industry's operations, advocating a "wait and see" approach to the current conflict over business models, copyright, and social norms.[117] Cautioning against legislative intervention, she argues that the music business demonstrates characteristics of a complex system, and that complex systems are most efficient when allowed a certain degree of freedom to balance control and chaos. Voluntary collective licensing is one way that the music industry has achieved such a balance in the past, and it is no less appropriate in the context of file-sharing.

In making her argument, Tussey notes that "while sound recordings were in common use by the early twentieth century, they were not copyright-protected until 1972, with no apparent ill effects on the growth of the recording industry."[118] She uses this point to illustrate that flexibility on the part of all players, including the government, can be productive. Delaying regulation is beneficial, in that it allows the complex system to develop new equilibria in a process resembling Wu's "copyright settlement." Tussey therefore sees potential in the EFF's voluntary collective licensing proposal because it "add[s] new options to the mix of emerging business models and will stand or fall on their own merits."[119]

[115] Litman, 3.
[116] Litman, 39-44.
[117] Deborah Tussey, "Music at the Edge of Chaos: A Complex Systems Perspective on File Sharing," 37 Loy. U. Chi. L.J. 147-212 (2005).
[118] Ibid., 204.
[119] Ibid., 156.

Control versus Compensation

This section began by pointing out two potential approaches to the challenges digital music brings to a music industry based on analog distribution: technical control and new business models. One of our interviewees for this project similarly argued that copyright holders' interests boil down to control (e.g. record distribution) or compensation, (e.g. performance and mechanical royalty collection).[120] Such a view aligns with Tussey's complex systems perspective and the positive aspects of allowing systems to self-govern. She cites DRM as an emergent force of control, arguing that newer, more flexible DRM technologies represent a move toward balance, recognizing the importance of personal use and relaxing control over recordings.[121] With the major labels now offering DRM-free music, the role of technical control in recorded music has potentially lessened further. New mechanisms for compensation such as VCL stand as a viable alternative to perfect control that allows rights-holders to monetize existing transactions.

IV. Methods

To address our theses and develop a model for how licensed file-sharing might look at Berkeley, we undertook a mixed-methods approach to determine the needs and practices of three groups of stakeholders: consumers of digital music, in our case Berkeley undergraduates; ISPs, in our case Berkeley technology administrators; and digital music providers and music technology professionals. Investigating the needs of these stakeholders with respect to our theses was an effort in triangulation. After reviewing literature surrounding the state of the music industry and music licensing, we conducted a series of semi-structured interviews with experts in music licensing, network accounting technologies, and the technical infrastructure at Berkeley. In addition, we surveyed Berkeley students to understand their practices relating to file-sharing and digital music, as well as their receptivity to a blanket licensing scheme. All of these methods combined to inform our assessment of our theses. In this section we address each thesis in turn, describing how the relevant methods informed its development.

[120] Research Interview, March 29, 2008.

[121] Tussey, 183: "For example, successful imposition of draconian DRM schemes several years ago might have precluded Apple from developing its more liberal DRM regime and from negotiating licenses that allow considerably more freedom to consumers than proponents of the pay-per-use world advocate."

1. Licensed file-sharing is an attractive option for students, and many would opt to pay.

To address this and otherwise explore student's general attitudes and practices towards digital music, we developed and a questionnaire administered it to Berkeley undergraduates living on campus. After reviewing related surveys of INDICARE[122] and EDUCAUSE,[123] we designed our survey to better understand how Berkeley students are sharing music on peer-to-peer networks, and how such sharing might be related to their willingness to opt into a VCL-type system. Key questions included whether or not they were currently file-sharing, how aware they were of the University's "Be Smart" digital copyright education campaign and the RIAA's lawsuits, whether or not they would opt in to a licensed file-sharing system, what they thought a fair price per semester would be for access, and what price per semester they would be willing to pay for access. The development of the survey is described in more in the Appendices, which include a copy of our questionnaire.

Aware of the possibilities of low response rate and poor self-reporting in our survey, we also interviewed a number of Berkeley technology administrators about other licensed music initiatives at Berkeley and their experience with students file-sharing. This helped to give additional context to current student attitudes.

2. Voluntary collective licensing is technically achievable.

Addressing this broad question necessitated both an understanding of how files moving across the system might be accounted for, and how well those tracking mechanisms would fit in with the systems file-sharers are already using. As discussed above, the literature contains some debate over the merits of full-scale tracking versus a sampling approach. Because of the relatively small scale of Berkeley's implementation as well as our underlying concern for the compensation of all artists whose content might move across the system, we initially favored the former, and thus explored its technical feasibility. In order to assess the various tracking systems'

[122] Nicole Dufft et. al. (INDICARE), "Digital Video Usage and DRM," February 2006. http://www.indicare.org/tiki-download_file.php?fileId=170, accessed May 6, 2008.

[123] EDUCAUSE, "Student Campus Technology Trends: 2001 Versus 2006." http://connect.educause.edu/Library/EDUCAUSE+Quarterly/StudentCampusTechnologyTr/45537, accessed May 6, 2008. Some questions in these surveys served as models for our questions.

compatibility with current file-sharing practices, we included questions in the student questionnaire to determine the variety of networks in use by students.

Ensuring accurate accounting requires robust tracking across available networks. We therefore conducted interviews with executives from three leading music informatics and tracking firms: Audible Magic, Big Champagne, and Gracenote. These semi-structured interviews centered on understanding how each of the products and services offered by the companies works and in what situations they were currently deployed. Our goal was to evaluate the possibility of system-agnostic accounting. In addition, we reviewed reports and testimony concerning and effectiveness of these companies' products and services.

To understand if and how these technologies would interact with Berkeley's existing network infrastructure, we also addressed these issues in our interviews with administrators of the campus Residential Computing network. These interviews provided insight into the physical structure of the network, as well as to Berkeley's current practices relating to student use of the network in general and file-sharing in particular.

3. Implementing such a system is in Berkeley's best interest.

Any new technical system installed at a state university faces significant policy and financial questions. In order to place VCL within the context of the current environment, we also interviewed policy administrators at Berkeley. The interviews were designed to elicit staff's reactions to the current state of affairs surrounding file-sharing on campus, especially as they related to social and legal issues like privacy and copyright compliance, and also to gauge their willingness and desire to explore new solutions. Specific questions focused on the details of compliance with RIAA requests, in terms of the number of requests received, percentage of staff time devoted to compliance, and general reaction to the process.

In addition to the data gathered by these interviews, the University's designated copyright agent provided us with an accounting of the communication received from the RIAA in 2007-2008.

This information, along with the interviews and survey results provided a rich picture of the current approach to file-sharing, its efficacy, its shortcomings, and its frustrations.

4. Navigating the rights at issue and negotiating licenses and payment with content providers present two major stumbling blocks to voluntary collective licensing's adoption, and developing a test implementation at Berkeley is the best way to begin those negotiations.

Given the music industry's historical reluctance to adopt new models and the RIAA's aggressive pursuit of unlicensed file-sharing, we understood early on that—adequate technology and eager consumers notwithstanding—getting record labels to license their content for file-sharing would be the largest obstacle to the system's implementation. In order to assess the industry's collective willingness to embrace licensed file-sharing, we conducted interviews with professionals with experience in digital music licensing. While we were not able to interview record label executives directly, our interviews did include a former executive at the original Napster, members of a leading performance rights administration firm, an attorney working in content licensing for Real Networks's Rhapsody service, and a digital music specialist recently hired by a major record label.[124]

These interviews were largely unstructured and tailored to the individual informants in order to learn from their unique experience in developing our proposal. Our goal in these interviews was to better understand the history of digital licensing, current challenges in licensing digital music content, the terms record labels are likely to look for in entering a licensing deal, and what kinds of resistance we might encounter in establishing collectively licensed file-sharing.

[124] Additional insight into major copyright holders' perspectives came from a panel discussion between NBC Universal's Vice President for Technology Policy, a lawyer from the Electronic Frontier Foundation familiar with VCL, and the chair of the Campus Computing project. Audio available at http://connect.educause.edu/blog/gbayne/podcastdontdownloadthispa/46658, accessed May 7, 2008.

V. Findings

The EFF's call for VCL is based on the assumptions that consumers would buy in and that the resulting revenue would be a more attractive and sustainable option to the record companies than suing their customers. The goal of our research has therefore been to examine these assumptions in developing a proposal for a system at Berkeley to test the concept's viability. This section will present findings that address these assumptions, expressed above in our four major theses, as they relate to VCL's potential acceptance at Berkeley. The first three theses serve to set up the fourth: after demonstrating that it is logistically possible, we show that the most significant obstacle will be negotiating the terms of compensation with a heretofore resistant industry. Given the unique position of universities in relationship to file-sharing, implementing a test of a modified voluntary collective licensing system at Berkeley is a good way to begin those negotiations.

1. Licensed file-sharing is an attractive option for students, and many would opt to pay.

There are strong arguments for consumers' participation in any collective licensing scheme for music file-sharing to be voluntary. The EFF has argued that a voluntary system avoids the price-fixing concerns that compulsory systems raise.[125] Allowing consumers to opt in or out will create a more fluid pricing system, and avoid the political problems of levying taxes to pay for a service that some members of the population in question might not use or even want.[126] At the same time, current licensed alternatives to music file-sharing such as Rhapsody can be viewed as voluntary, yet they have failed to stop file-sharing. Thus, measuring the extent to which users of file-sharing networks would opt in to a system that takes into account their current practices is critical to determining the viability of the licensing proposals.

Our first step in assessing whether or not students would accept voluntary collective licensing was to determine how much file-sharing occurs at Berkeley and to confirm that efforts to curb it have had limited success. In order do this, we distributed a questionnaire to students currently

[125] EFF, "A Better Way Forward."
[126] Fisher also notes this hurdle to his proposal. *See* ch. 6, p. 17.

living in Berkeley residence halls, and received 103 responses (n=103). Of those, 39% responded that they currently use peer-to-peer networks to download music. 75% have used peer-to-peer networks in the past to download music. A high percentage of students are aware of the deterrence and education campaigns around file-sharing, but the effects of those campaigns are mixed. 79% said they have heard that the RIAA was suing individual file-sharers, and 69% said that they were aware of Berkeley's "Be Smart" campaign aimed at educating students about file-sharing and copyright. However, of those who were aware of the RIAA's legal campaign, 67% (n=81) said that it had had no effect on their file-sharing or that their habits had remained the same. Similarly, 70% (n=71) reported that the "Be Smart" campaign had had no effect. Students' free-text responses as to why they stopped file-sharing are illuminating in their lack of uniformity. Some framed it as matter of Berkeley policy: "We are not allowed to use them in the dorms here at Berkeley"; "Because of the dorms." Some addressed legal concerns, or the possibility of penalty: "Illegal and it's better to support the artist"; "Understood the legal ramifications"; "Too dangerous." Other responses were more pragmatic: "My computer is too slow"; "Spyware and internet radio"; "I like owning physical CDs"; One respondent simply "lost interest."

Furthermore, subscription services have seen little use in comparison to peer-to-peer downloading. One Berkeley technology administrator noted Rhapsody's, iTunes's, and Ruckus's failure to take hold on campus, despite heavy promotion by Residential Computing. A 2004 Rhapsody deal offered an 80% discount for students at $2 a month, and saw a slow but steady increase of users until the service was mysteriously discontinued in 2005 due to forces beyond the university's control. [127] An iTunes promotion never did well because it required students to sign in to a separate site to receive a 5% discount, and was not accessible from the iTunes music player. While the ad-supported Ruckus service is currently running on campus free of cost to Berkeley, he believes Ruckus is "not very successful because I think they would have made a lot of noise about it if it were."[128] In our survey, only 8% of students reported having used a

[127] *See* Benny Evangelista, "Online music at UC: Berkeley students offered low fees for Rhapsody list," *San Francisco Chronicle*, August 24, 2004. http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2004/08/24/BUGBU8D4681.DTL&type=tech, accessed May 7, 2008.
[128] Research Interview, February 13, 2008.

subscription service like Rhapsody in the last six months, compared with 75% for peer-to-peer networks in the same period.

When asked about the possibility of paying into a blanket license for file-sharing, 64% of students reported that they would be willing to pay. The 75% of respondents who have ever file-shared were 2.2 times more likely (p=.07*) to be willing to pay than those who never have. 60% of all respondents indicated that a fair price per semester would be $10 or more, with most of these responses falling in the $10-$20 range. Of those willing to pay, 29% (n=66) would pay between $10 and $20 per semester, 15% would pay between $20 and $30 per semester, and 21% would pay over $30 per semester. Overall, 42% of all survey respondents indicated that they would pay $10 or more per semester for a license to file-share. This range roughly aligns with the $5 per month charge calculated by Fisher and advocated by the EFF, which works out to between $15 and $20 per semester.

2. Voluntary collective licensing is technically achievable.

Our survey indicates that students use a wide variety of networks and protocols to file-share and are largely reluctant to switch to new systems. Thus, the ability to account for files traveling across the multiple networks currently in use is the first criterion any system must meet. Additionally, survey results indicate that to be effective, any system must monitor intranet traffic and not solely traffic between Berkeley and the wider Internet. 80% (n=40) of students who file-share reported using a DC++ or other Direct Connect client, with 30% reporting using only a Direct Connect client. In Direct Connect networks, users connect to central hubs, which index the shared content of the users currently connected. In contrast to Napster's server, however, hubs are disaggregated, and sharing is largely self-contained within the intranets on which the hub sits. A website with instructions for connecting to the Berkeley (Cal) hub states:

> The Cal hub is special because all the users are on the Berkeley network, and as a result, the data transferred does *not* count against a user's weekly bandwidth allowance. . . . [S]haring files on DC++ is pretty safe. Unlike BitTorrent [or] Kazaa, . . . traffic on the Cal hub does not get routed outside our network. That means that you cannot be passively monitored for file sharing.[129]

[129] Instructions for setting up a client to connect to the Cal Direct Connect hub, accessed April 25, 2008.

We quote this not to endorse or deny its claims, but simply to point out the amount of file-sharing traffic that is internal to the University's network, and that savvy users are aware of monitoring systems and have taken steps to avoid them. In fact, the RIAA is well aware of Direct Connect, although as of yet there have been no direct suits against it. There has, though, been pressure on universities to eliminate it, as was the case at Tufts in early 2008.[130]

With regard to other file-sharing networks, 40% reported using a BitTorrent client to acquire music, 23% Limewire, and 18% reported using eMule or some other client. Therefore, we conclude that any fair accounting system must be able to monitor traffic on both the Internet and the intranet, and must be able to do so in a system-agnostic way.

2a. Technology for accurately tracking and accounting for downloads exists.

We interviewed representatives from three firms involved in tracking and accounting for music use. Big Champagne is an aggregator of digital music data that generates reports of the rates at which specific songs are downloaded from a wide variety of sources, including peer-to-peer networks.[131] Audible Magic sells a network appliance that employs both metadata matching and digital fingerprinting to identify files moving across a network.[132] Gracenote, formerly CDDB, maintains a large database of music metadata, including digital fingerprints, and sells its music recognition services to a wide range of customers including software manufacturers, hardware manufacturers, and mobile phone companies.[133] While Gracenote maintains the largest database for recognition and is the most widely used, Big Champagne and Audible Magic are in a better position to provide traffic accounting services to Berkeley.

Big Champagne bills itself as "a nexus for intelligence about media consumption," and its primary business is creating and selling reports on the movement of entertainment media

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[130] *See* Giovanni Russonello, "Student Terminates Direct Connect as RIAA Turns Up Heat On Colleges," *Tufts Daily*, March 3, 2008. http://media.www.tuftsdaily.com/media/storage/paper856/news/2008/03/03/News/Student.Terminates.Direct.Connect.As.Riaa.Turns.Up.Heat.On.Colleges-3247462.shtml, accessed May 7, 2008.
[131] http://www.bigchampagne.com
[132] http://www.audiblemagic.com
[133] http://www.gracenote.com

online.[134] Its music tracking services are in general more broadly focused than what is required on a contained network like Berkeley's, combining data from licensed digital music sellers like iTunes and peer-to-peer networks globally. While the company has not engaged with universities on a localized scale in the past, representatives of Big Champagne did express interest in the project.[135] If contracted to work with the University on an accounting system, the company would take a consulting approach, meeting with the designers of Berkeley's implementation to determine appropriate strategy. While our interviewees did not offer specifics regarding monitoring techniques, they favored gathering information about downloads from multiple sources. These included passive network monitoring, selecting some students to report downloads in the same manner as Nielsen families, and examining larger market trends as a proxy for Berkeley traffic patters. They suggested that among the methods Big Champagne uses were technologies similar to and including Audible Magic, which they mentioned as a possible subcontractor.

Audible Magic currently markets a network appliance called CopySense to universities for filtering copyrighted peer-to-peer content.[136] The appliance is attached to a network switch or router, and works at the application layer to monitor passing files. CopySense compares both metadata and a digital fingerprint of audio files to a database of over six million registered works, and "applies business rules."[137] At the 65-plus universities using CopySense currently, these rules most often involve blocking infringing files, but the system could be changed to simply account for music as it flows through the system. In fact, the press release announcing Audible Magic's purchase of its patented fingerprinting technology celebrated the "digital media . . . monetization opportunities it enables."[138] An Audible Magic representative reported that CopySense could "easily just turn into a logging device."[139] Furthermore, this interviewee expressed interest in entering into discussion about such a modified system with Berkeley.

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[134] Big Champagne, "What is Big Champagne?" http://www.bigchampagne.com/about.html, accessed May 1, 2008.
[135] Research Interview, April 03, 2008.
[136] *See* http://www.audiblemagic.com/products-services/copysense/
[137] Research Interview, March 12, 2008.
[138] "Audible Magic Applies Patented Technology to Provide Audio Identification for Streaming Media," October 16, 2000. http://www.prosoundweb.com/news/industrynews/industnews00/audiable.shtml, accessed April 30, 2008.
[139] Research Interview, March 12, 2008

Gracenote maintains a much larger database of 14-17 million digital fingerprints of copyrighted music and has a long history of identifying music based on imprecise, conflicting, or missing metadata.[140] However, identifying songs using Gracenote's audio fingerprint database requires a client-side application to send audio to Gracenote's servers. Introducing a client-side component is impractical in a system meant to be technology-agnostic and respectful student choice of networks and applications. For the purposes of testing available accounting systems at Berkeley, Audible Magic presents a more feasible and less invasive solution.

In evaluating these technical options, it has been helpful to consider a January 2008 report of The Common Solutions Group (CSG), a committee of chief information officers and lead technologists from 28 major research universities and other technology experts. The CSG evaluated three "infringement suppression" technologies, one of which was Audible Magic.[141] While all three were found lacking to some degree, the concerns about Audible Magic's CopySense technology were the most solvable. The CSG's first concern was that encrypted traffic would easily bypass filtration technologies, a concern echoed by the EFF,[142] by the ACM,[143] and in our interviews. The concern that filtering content would simply drive file-sharers to encrypt their transactions is legitimate in light of the arms-race characterization of the past decade of file-sharing. However, in a case such as the proposed system where the consequence of monitoring traffic is not that a user does not get a certain song, but that the copyright holder of that song gets paid, file-sharers will have little incentive to work around the system, especially if they have already paid into the license.

Secondly, the CSG was concerned that CopySense would only block those songs that it could match in its database. While this too is legitimate, a situation where traffic is merely being accounted for mitigates this to a certain extent. With the success rates claimed by Audible Magic,[144] a six-million song database that includes content from all the major labels and many of

[140] Research Interview, April 4, 2008.
[141] Common Solutions Group. "Infringement-Suppression Technologies Summary Observations from a Common Solutions Group Workshop," January 22, 2008. http://www.stonesoup.org/docs/copyright-technology.pdf, accessed April 30, 2008.
[142] Chris Palmer and Seth Schoen, "Debunking Audible Magic — Again," supra note 42.
[143] Spafford and Felten, Letter to Sen. Kennedy and Rep. Miller, supra note 58.
[144] Our interviewee noted that CopySense provided 99.99% true positives and "very small false negative rates." Research Interview, March 12, 2008.

the larger independents will likely recognize a large majority of the traffic it sees. Additionally, the CopySense appliance records metadata for *all* music files it recognizes regardless of whether the song was found in the reference database.[145] Should the combination of its database recognition and supplemental metadata be found lacking, contracting for access to Gracenote's larger digital fingerprint database might present an even more robust solution, though potentially a more costly one.

2b: Berkeley's Residential Computing network can support this technology.

Berkeley's residential computing network presents a suitable site for a test implementation of licensed file-sharing. Berkeley has a long history of network innovation, with its computer science department creating the TCP/IP protocol that underlies much of the transactions on the Internet, including peer-to-peer file-sharing.[146] Above all, in comparison to commercial ISPs, Berkeley's systems are small, localized, and relatively controlled, and therefore demonstrate characteristics appropriate for any experiment. Our research indicates that implementing such a test using the technologies described above would not overburden the network infrastructure.

A common argument given by the major labels for why universities ought to combat music file-sharing is that peer-to-peer traffic consumes bandwidth and causes congestion. Mitch Glazier, one of the RIAA's executive vice-presidents, told the California assembly that file-sharing is the universities' problem because "it's their bandwidth that's being abused."[147] Our research at Berkeley has shown this not to be the case. Commercial ISPs, with client-server technologies in mind, build out their residential broadband connections as asymmetric connections, with limited upload bandwidth.[148] This can cause network congestion when peer-to-peer activities increase users' uploading. The Berkeley network, however, is symmetric (equal up/down bandwidth). An

[145] Ibid.
[146] UC Berkeley Dept. of Electrical Engineering and Computer Science, *EECS History.* http://www.eecs.berkeley.edu/department/history.shtml, accessed May 1, 2008.
[147] RIAA, "CA Assembly Committee Looks into High Number of Music Piracy Complaints at State Schools," March 4, 2008. http://www.riaa.com/newsitem.php?news_month_filter=&news_year_filter=&resultpage=2&id=9E39B88A-8F87-C04E-9EA9-4E7551AC99E1, accessed May 4, 2008.
[148] Nelson Minar and Marc Hedlund, "Chapter 1: A Network of Peers, Peer-to-Peer: Harnessing the Power of Disruptive Technologies," in Oram, Andy, ed., *Peer-to-Peer*, O'Reilly, 2001. http://www.oreilly.com/catalog/peertopeer/chapter/ch01.html, accessed May 4, 2008.

interviewee reports that the Berkeley network runs "with plenty of headroom,"[149] and that he has not seen evidence of the detrimental congestion that is raised by Glaizer and others.

Berkeley network administrators do limit students' Internet usage to 8GB per week, but their primary concern is keeping down the cost of the connection to commodity Internet, and not regulating student uploads and downloads.[150] As such, there is no bandwidth-limitation argument against allowing sanctioned peer-to-peer traffic. The financial argument that any resulting spike in traffic could increase Berkeley's costs for commodity Internet access is also undercut by the evidence that much file-sharing goes on within the campus network and thus does not incur additional Internet costs. While removing the threat of legal action for file-sharing might increase Internet traffic, thereby increasing the frequency with which students encounter the limit, the cap itself will still serve its function to keep Internet costs down.

Interviewees further indicated that Information Services and Technology (IS&T) would be able to examine network traffic and even to identify individual files with appropriate technology tools, but has policies not to do so without cause or notice. Network management does occur in the form of packet-shaping for performance optimization, a practice common among universities.[151] From a policy perspective, interviewees indicated more comfort with the concept of anonymous accounting for traffic in the service of compensation than in the service of blocking, but added that policies on student privacy would be a significant hurdle to implementation. One interviewee further expressed that he had been impressed with the CopySense appliance on a technical level, and that it could be feasibly integrated into Berkeley's infrastructure.[152]

Despite the CopySense appliance's compatibility with Berkeley's infrastructure, the (not atypical) decentralized physical structure of the Residential Computing network makes full-scale

[149] Research Interview, February 14, 2008.
[150] Ibid. Berkeley purchases commodity Internet access on a cost per bit basis, which it limits to 200-300 Mbps to keep costs down.
[151] Packeteer (http://www.packeteer.com) is currently in use at over 800 colleges and universities. *See* Joint Committee of the Higher Education and Entertainment Communities, *Workshop on Requirements for Technological Control of Illegal File Sharing on College and University Networks*, April 2007, 50. http://www.educause.edu/ir/library/pdf/CSD5170.pdf, accessed May 7, 2008.
[152] Research Interview, February 14, 2008.

metering impractical. Audible Magic can monitor all the networks Berkeley students appear to be using,[153] but to capture all intranet traffic would require too many network appliances. Berkeley's residential computing network consists of 61 subnets, and hundreds of network switches through which intranet traffic might pass.[154] Capturing data for all transfers would be unfeasible and prohibitively expensive. Thus, in our model we suggest sampling traffic in such a way as to be representative of the network as a whole.

2c. Tracking for compensation and student privacy are not incompatible.

Installing any mechanism to track the downloads of online users raises significant privacy concerns. In interviews, two Berkeley policy administrators noted that the University of California maintains a clear policy on the privacy of electronic communications, framed in the context of "academic freedom" and "freedom of speech," that generally prohibits examination of electronic communications without consent or probable cause. [155] The technicalities of tracking to account for downloads are different than those that might govern electronic communications, but the same principles should underlie the university's policies regarding them.

Additionally, data security continues to be a serious problem in networked environments, with Berkeley itself being subject to a security breach that compromised 98,000 graduate applicants' personal information.[156] In their critique of HR 4137, the House bill that calls for universities to develop policies regarding peer-to-peer filtering technologies, the ACM raised the possibility that hackers might be able to compromise any accounting system and gain access to far more than just a list of songs a student had downloaded.[157] Berkeley administrators echoed this concern.

Privacy-sensitive data collection and retention policies could mitigate the potential threat posed by the chosen information collection technology. Our interviewee likened the CopySense system

[153] Ibid.; personal e-mail communication, April 29, 2008; and survey results.
[154] Personal e-mail communication, April 27, 2008.
[155] University of California Office of the President, *Electronic Communications Policy*, August 18, 2005. http://www.ucop.edu/ucophome/coordrev/policy/PP081805ECP.pdf, accessed May 7, 2008.
[156] "UC Berkeley police investigating theft of laptop containing grad student ID data," March 28, 2005. http://berkeley.edu/news/media/releases/2005/03/28_security.shtml, accessed May 7, 2008.
[157] Spafford and Felten, Letter to Sen. Kennedy and Rep. Miller, supra note 58.

to a "virus-scan" that does not need to record personal information in order to do its job. Furthermore, he claims the system has been installed in many universities without having to put new privacy policies in place.[158] The accounting system should record only that metadata that directly pertains to the music being transferred, and not the addresses involved in the transfer. If all users on the network are part of the system, 'white-list' IP addresses or user names are not needed for the system to count download rates accurately. To protect anonymity, the CopySense appliance includes a "restricted reporting" feature that prevents campus administrators from identifying IP addresses.

Moreover, an accounting system based on sampling would further reduce privacy concerns. Using a limited number of CopySense appliances, Berkeley administrators could construct a sampling system to minimize the amount of information collected on any group of students. For example, sampling intermittently on a rotating schedule would minimize student exposure to data monitoring. Sampling is discussed in greater detail in the Discussion section.

We believe that with strict collection and retention rules in place, the benefits of the system—namely protection from infringement lawsuits, which themselves prove users' lack of anonymity on popular file-sharing networks—would outweigh the privacy concerns. When asked directly, 32% of all survey respondents reported that they would accept Berkeley's having knowledge of what songs they had downloaded as a provision of the system. This was significantly higher than the percentage that would accept other types of restrictions, such as limitations on the devices that could play the music downloaded through the licensed system. Only 4% would accept restrictions that would prevent the downloaded music from being played on MP3 players; 14% would accept restrictions preventing CD burning; and 29% would accept limitations on the number of computers a file could be played.

Privacy is an important concern and should be considered at each step of building a workable accounting system for the University, but our research leads us to believe that accounting for the purposes of compensation and student privacy are not incompatible. Collecting only relevant

[158] Research Interview, March 12, 2008.

information and minimizing students' exposure to the traffic sampling would make the system less likely to violate privacy and more acceptable to students in light of the benefits it provides.

3. Implementing such a system is in Berkeley's best interest.

The RIAA has stopped sending infringement allegations to Berkeley under DMCA procedures and is instead now regularly sending three types of legal action notices concerning file-sharing. The University carefully vets each notice before taking appropriate action in light of the Family Educational Rights and Privacy Act (FERPA) and policies not to disclose student information. The first type is called a "preservation notice" and requests that the University retain information about who was using a particular connection at a specific time, and states that the notice is in advance of a pre-litigation settlement offer or a subpoena. The University complies with these requests. The second notice is a request to forward a pre-litigation settlement offer to the user of an identified IP address. For these, the University forwards the offer letter to all known student addresses, but neither reveals the student's identity to the RIAA nor follows up regarding the student's response. The third type of notice is a subpoena for the student's identity in cases where offers to settle go ignored. Berkeley complies with these subpoenas after following appropriate notification procedures under FERPA. Since March 2007, Berkeley has received 28 RIAA demands to preserve evidence, 64 settlement offers, and 7 subpoenas.[159]

Berkeley administrators expressed exasperation when describing the process of complying with RIAA settlement letters and subpoenas. One Residential and Student Services administrator described the arms race between the RIAA and file-sharers: "[T]he scrutiny and the desire to keep up with that is—it's like a nuclear war."[160] A policy administrator described the frustrating process that her office and campus student activities administrators, in coordination with counsel for the Regents of the University of California, have had to go through to determine what types of action are required to respond to these notices.

[159] Data provided Berkeley's IT Policy office.
[160] Research Interview, February 14, 2008.

The policy administrator characterized the amount of time she spends on copyright issues as "really ridiculous," elaborating, "the rub of all this is that we are taking on the work of the RIAA… A whole lot of work."[161] Her many responsibilities include processing DMCA takedown notices,[162] decisions concerning e-mail and privacy, managing electronic evidence pertaining to civil suits against the University, managing communications involving electronic privacy with external entities, and the development and enforcement of standards for network connectivity. She estimates that copyright issues take up 10% of her time, and 20% of her assistant's.

She further described her impression from professional communications at conferences and through mailing lists, that contrary to the RIAA's assertions that some universities are not taking appropriate action, most of her colleagues are taking similar steps and have extensive education programs in place,[163] but are also not seeing a drop in file-sharing.[164] Indeed, a survey from the Campus Computing Project showed that 82.9% of universities have "campus policies to address inappropriate P2P downloading."[165] As discussed above, Berkeley also has such programs in place, yet our survey results confirm the litigation and education campaigns' ineffectiveness, with 70% of respondents reporting the education campaign has had no effect on their file-sharing behavior.

Why should the university (and the RIAA) continue investing in a response to file-sharing that is not effective? A licensing system could represent a more effective use of resources, and policy administrators were interested in exploring the idea. When discussing the possibility of Berkeley serving as a pilot program for the wider implementation of voluntary collective licensing, one

[161] Research Interview, March 4, 2008.
[162] From March 2007 through February 2008, Berkeley received 795 DMCA takedown notices. *See* supra note 159.
[163] Casey Green of the Campus Computing Project, mentioned during a panel discussion (surpa note 124) that he was especially impressed with Cornell's copyright education program for all students that have been forwarded a DMCA notice. *See* http://www.ecornell.com/copyrightdemo/, accessed May 4, 2008. Brigham Young University has created an education module on copyright that includes videos and multiple quizzes. *See* http://www.lib.byu.edu/departs/copyright/tutorial/intro/page1.htm, accessed May 4, 2008.
[164] For example, our interviewee cited a presentation at a recent conference where a school presented the results of a study of a $40,000 educational campaign. The results indicated that the messages were received and overwhelmingly ignored by students. Research Interview, March 04, 2008.
[165] Campus Computing Project, "IT Security and Crisis Management Pose Continuing Challenges." http://www.campuscomputing.net/sites/www.campuscomputing.net/files/2007-CCP_0.pdf, accessed May 06, 2008.

interviewee declared, "I like the idea of testing the technology. . . . [T]he only way to get a good feel for it is to test it."

4. Navigating the rights at issue and negotiating licenses and payment with content providers present two major stumbling blocks to voluntary collective licensing's adoption, and developing a test implementation at Berkeley is the best way to begin that conversation.

Efforts to create blanket licenses for file-sharing, such as Napster's negotiations with major labels, have failed in the past, and record company resistance likely remains a significant obstacle. Jim Griffin's hire by Warner music shows a new willingness on the part of the industry to explore new distribution models. Universal Music has recently reached a deal with Qtrax, an ad-supported peer-to-peer network for music.[166] Even so, rights holders' exclusive rights under copyright law to make and distribute copies do not map well onto decentralized peer-to-peer distribution. Developing a system for collective licensing will therefore require extensive negotiation. Because of the industry's characterization of universities as the seat of the file-sharing problem,[167] Berkeley is well-situated to approach copyright holders and begin the negotiation that will lead to a real solution.

As noted above, file-sharing became a problem when the record labels failed to license Napster, instead believing they could hold fast to their established models and eliminate unlicensed distribution. The negotiations around that deal, however, are illustrative and show how current negotiations could take place. In an interview, a former executive at the original Napster recounted the failure of the company's negotiations to secure such licenses from the major labels for the recordings its users shared.[168] Even after it had secured an investment from Bertelsmann

[166] Owen Gibson, "Universal to allow free music downloads," *The Guardian*, May 8, 2008. http://www.guardian.co.uk/media/2008/may/08/digitalmedia.digitalmusic, accessed May 7, 2008.

[167] Howard Berman, Chairman of the House Judiciary Subcommittee on Courts, the Internet, and Intellectual Property: "I am concerned that current law isn't giving universities enough incentives to stop piracy . . . Indeed, the statistics demonstrate that students engage in rampant piracy, and while Congress has given universities many exemptions from copyright liability it might be time to condition some of those exemptions on action taken by universities to address the piracy problem." Quoted in Ken Fisher, "Congressman Hollywood: Universities a Wretched Hive of Scum and Villainy," *Ars Technica*, March 9, 2007. http://arstechnica.com/news.ars/post/20070309-senator-hollywood-universities-a-wretched-hive-of-scum-and-villainy.html. Accessed May 06, 2008.

[168] Research Interview, February 20, 2008.

AG to pursue licenses to create a subscription file-sharing service,[169] Napster was enjoined and eventually declared bankruptcy after failing to secure those deals.[170] The interviewee described a division among the leadership of the major record companies with regard to licensing their content for file-sharing, with the CEOs of the labels' parent companies, major media conglomerates like Sony, interested in exploring the new possibilities for revenue that Napster represented, and the record label executives remaining resistant.

According to the interviewee, this resistance was driven by a desire to hold on to the physical sales model that had been in place for decades, which involved bundling hit songs into albums. He paraphrased, "If you like this song, you [have to] buy the record, and if you buy the record, that's eighteen dollars." He described an adversarial industry intent on maintaining its established business, characterized by bundling and "moving tonnage" through record stores. Even as the CEOs signaled their interest, the deals were prevented by powerful record executives who would rather have quit than see Napster licensed.[171] Faced with a unique opportunity to license Napster and capture a new revenue stream, the industry balked and has struggled to sustain its former models in the networked environment.

As a result of the major labels' insistence on old models, digital music providers must navigate a complex system of rights and royalties that is poorly adapted to their business. For example, the application of the statutory mechanical license, first developed in the era of player pianos, to new modes of distribution has been contested among publishers and digital music providers. A licensing attorney for Rhapsody described how the company has been putting money aside for mechanical royalties due to music publishers since 2001, awaiting the Copyright Royalty Board's decision on what the rate will be, simply hoping that they allocated the right amount.[172] At issue is whether the full statutory mechanical rate is due publishers for tethered downloads

[169] Bertelsmann was at that time the parent of BMG Music, and is now half-owner with Sony of Sony-BMG, one of the four major record labels. For more on the investment, *see* Jim Hu and Evan Hansen, "Record label signs deal with Napster,"*CNET News.com*, October 31, 2000. http://www.news.com/2100-1023-247859.html, accessed May 4, 2008.
[170] *A&M v. Napster*, supra note 39.
[171] The interviewee specifically pointed out former Sony CEO Nobuyuki Idei's interest in making a deal similar to Bertelsmann's. Research Interview, February 20, 2008.
[172] Research Interview, April 6, 2008.

and interactive on-demand streams, which users cannot keep without an active subscription.[173] According to our interviewee, the reason Rhapsody has been able to develop its services at all is due to the private collective negotiation of the National Music Publishers Association, the Harry Fox Agency, which administers publishing rights and mechanical royalties, and the RIAA:

> [T]he National Music Publishers Association, the Harry Fox Agency, and the RIAA all got together, and they entered into a contract together that said, 'We're going to cooperate, and we're just not going to sue each other over this issue.' . . . The language of that agreement was used to model contracts that Harry Fox entered into with the Napsters and the Rhapsodys of the world that said, 'We're going to license you for on-demand streaming and conditional or tethered downloads. We don't know what the rate is, and when the rate is set, sometime in the next couple years, you can just pay us.'[174]

The arrangement among the representatives of rights holders and service providers illustrates the power of private negotiations in dealing with new technology and copyright law. Berkeley, in its role both as a research institution and Internet access provider to its students, can help begin similar negotiations surrounding file-sharing. As noted above, the industry is interested in seeing universities take positive steps to combat the phenomenon that, in their view, is most dramatically affecting their sales. At the same time, there is strong evidence that the measures the industry have proposed up to now are not sufficient to stop the problem, and that it is appropriate to explore new methods for compensation.

This section has laid out our findings regarding the feasibility of VCL at Berkeley. We have demonstrated that necessary technology exists and that constituents are interested in and could benefit from the proposed system. We have also highlighted examples of the business and licensing challenges that VCL will face. We believe that VCL can correct the problem of file-sharing and that a working test of the system at Berkeley will be useful in convincing a recalcitrant industry of VCL's merits. We now turn to a discussion of what that test system could look like.

[173] Ibid.
[174] Ibid.

VI. Discussion: Testing Voluntary Collective Licensing at Berkeley

In light of the above findings and our interviewees apparent interest, this section describes what a test implementation of VCL at Berkeley might look like. We briefly discuss our results and recommendations with respect to beginning negotiations with record labels, collecting fees from students, accounting for traffic, distributing payments to rights holders, and funding the system.

While our research suggests that the proposals of Netanel, Fisher, and the EFF are possible in the university setting, additional in-depth study will be required to fully implement a test. Our contribution is meant as a positive first step, but generates as many questions as it answers. We will point out those questions where they arise, and suggest further directions for research to answer these questions. Our proposal should be used to guide that research and the development of the test implementation.

Before the test begins, a committee should be formed to oversee its development. The details and composition of the group should be worked out to fit Berkeley's needs, but ideally it should include representatives from Student Affairs, Residential Computing, Infrastructure Services, IT Policy, and the Office of Legal Affairs. Representatives from Audible Magic and Big Champagne should be included as consultants to the project because of their technical expertise in accounting for file-sharing traffic and their knowledge of and connections to the industry. A further member might include a representative of the students to understand how they view the system test and report concerns from the end-user point of view. Additionally, research could be supported by faculty from the School of Information and the Samuelson Law, Technology, and Public Policy Clinic.

Covenants Not to Sue and a Framework for Running a Test

Implementing the system must begin with contracts constituting covenants not to sue for copyright infringement, entered into by the University with the record labels and a representative of music publishers. The best starting point for the University would be to approach the RIAA, the four major labels, and an independent label aggregator such as the Independent Online

Distribution Alliance. Depending on whether these contracts will cover appropriate publishing rights, a contract with the Harry Fox Agency to cover mechanical royalties might also be necessary. Because no contract will cover all potential rights holders, the committee should develop a mechanism for adding stakeholders into the system in the case of copyright complaints.

Since the University will be collecting sensitive data that would, under the present system, be valuable evidence in infringement suits, it must have assurances that the labels will not use its data to sue students. Thus, critical terms for these agreements should include blanket protection for students from liability with respect to file-sharing activity; strict protection of student privacy; and assurances that tracking data generated not be used for any purposes other than the disbursal of agreed funds to copyright holders. For their part copyright holders would receive promises of accurate accounting of music downloaded; payment based on download rates; and assurances that the University put technical measures in place to prevent content from Berkeley being shared outside the network. As the system is set up and evaluated, this contract should be reviewed at regular intervals, but the broad terms outlined above should remain consistent throughout the implementation.

Collecting the Money

While our findings indicate a potential market for voluntary systems on a larger scale, for the purposes of Berkeley's test implementation the fee should be compulsory for students living in campus housing. In our model case, the University would serve as the 'volunteer'—which would still allow for price negotiation—extending the resulting protection from suit to all students. In our interviews, Berkeley administrators expressed great interest in being removed from the battle between the RIAA and file-sharers, a sentiment echoed elsewhere in the California education system.[175] If the system implemented is voluntary, it would leave some students uncovered by the license and vulnerable to RIAA litigation, thus not fully removing the administrative burden

[175] Kent Wada, "Get Me out of the Middle!" *EDUCAUSE Review*, March-April 2008. http://www.educause.edu/ir/library/pdf/ERM0829.pdf Accessed May 7, 2008.

of compliance with pre-litigation letters and subpoenas and would thereby compromise the effectiveness of the test.

Furthermore, universities are not in the business of creating a fluid market for Internet access. Students attending Berkeley are a special population and do not always have a choice in paying for the services the University provides. For example, not all students will make full use of their free access to the Alameda County Transit system; nonetheless, the University has included that charge in campus fees for all students.[176] Additionally, the current fee structure for campus residences does not allow for adding or removing options such as Internet access or cable television, and the University is reluctant to create and manage different pricing plans.[177]

If licensing systems are implemented on a wider scale, allowing for user choice should be a priority. However, before the University can reach that point, the system needs to be proven effective. To facilitate deployment at Berkeley, the best solution is to enter into an agreement whereby students are protected en masse from litigation, even if that means including students who might otherwise opt out. Given the particulars of deploying the system at a university, we are confident that proponents of voluntary collective licensing like the EFF would understand the necessity of requiring student payment for the purpose of testing the system at Berkeley.[178]

Given this, we return to the $5 per month figure arrived at by Fisher, which we recast as $20 per semester.[179] This fee would be added to current housing fees, which includes broadband Internet access. Applied to the approximately 6,200 students living in single-student residence halls, this would yield $124,000 per semester.

Evaluation and renegotiation of the price for access to the blanket license will be critical to the success of VCL on a larger scale. Fisher cautions that his proposed figures are based on rough estimates and meant primarily to indicate the type of calculations necessary to determine

[176] UC Berkeley Office of the Registrar, 2007-2008 Registration Fees. http://registrar.berkeley.edu/Registration/feesched.html, accessed May 6, 2008.
[177] Research Interview, April 18, 2008.
[178] Fred von Lohmann, the EFF's major advocate of the voluntary collective licensing proposal, understands this position and has expressed flexibility with regard to the consumer-level voluntary aspect of the proposal as it would be implemented at universities. Research Interview, April 4, 2008.
[179] Berkeley semesters are roughly 4 months long.

appropriate rates.[180] While our survey results reinforce that $20 per semester is a useful starting point, a more detailed analysis of costs and downloading rates will need to be a major part of initial research and the licensing negotiations.

Accounting for Traffic

We propose that Berkeley place ten CopySense appliances on the Residential Computing network to sample file-sharing traffic. Full metering, while desirable in some ways, is not practical given the decentralized network and the evidence from our findings that capturing intranet traffic is essential to the creation of a fair accounting system. By placing the appliances at an aggregating network switch or router for each dorm in addition to the Internet gateway, administrators can capture enough traffic to generate a representative sample on which to base rights holders' remuneration.

We began our research intent on creating a system that could fully meter downloads. There is much rhetoric surrounding the power of peer-to-peer networks to promote lesser-known artists and to provide a closer link between artists and fans.[181] We were excited by the prospect of a system that could capture each and every download, thus providing some compensation for all artists, no matter how small their fan base. Even on the limited scale of the Berkeley network, however, this proved impractical. To catch every possible transaction that could be monetized would require a prohibitively expensive number of monitoring points. Additionally, a system designed to catch all traffic would create a standard that may be unreasonably high. We became convinced in the course of our research that the appropriate measures would be "actuarial accounting, not actual counting."[182] Since payment into a VCL system is not tied to individual downloads, the distribution of download rates is what counts, not the actual numbers.

Absent full metering, it is imperative that any sample be as representative as possible of Berkeley's traffic. One accounting approach might simply be to purchase reports from a music

[180] Fisher, "Promises to Keep," ch. 6, 17.
[181] *See MGM. v. Grokster*, 545 U.S. 913 (2005), Brief of *Amici Curiae:* Sovereign Artists . . . In Support Of Respondents. http://www2.sims.berkeley.edu/academics/courses/is296a-2/s05/grokster/20050301_artists.pdf , accessed May 6, 2008.
[182] Research Interview, March 28, 2008.

informatics aggregator such as Big Champagne, assuming that Berkeley's traffic patterns mirrored all file-sharing traffic. However, Big Champagne monitors peer-to-peer traffic at the global level and while we believe such information may be one piece of the puzzle, a better solution can be found. A closer fit would involve one CopySense appliance at the Residential Computing network's Internet gateway, but this too would not accurately capture actual sharing patterns, missing the large amount of intranet file-sharing activity. The closest fit to actual traffic would be to place one CopySense appliance at the Internet gateway to capture inbound traffic, and another at each of the nine single-student dormitories' gateways to the larger residential computing intranet. This, too, requires assuming that uncaptured traffic patterns within any dorm would largely resemble those occurring between dorms. We believe this to be a fairer assumption, and this type of Internet/intranet sample strikes the right balance between accuracy and the cost of accounting for traffic. This sampling system could be supplemented by recruiting student volunteers to have their file-sharing activity anonymously monitored in greater detail, and by comparing the data with the more broadly focused reports of Big Champagne.

Once the data is collected, a statistical model will be needed to map download rates recorded in the sample to the broader activity the sample is meant to represent. Creating such a model is also beyond the scope of our current project, but is a vital step in VCL's full implementation, and one where a company like Big Champagne may be able to offer insight. At this time we simply note that the major labels have a history of attempting to game accounting systems for their benefit, as they did with radio Payola in the 1960s or the use of "independent promoters" in the 1980s.[183] The statistical model could be influenced at its creation point, and designers should actively check that the system they create does not disadvantage artists with few resources and little power. After all, the original proposals for collective licensing systems sought to lay out a system that would provide the current music industry with a revenue source for file-sharing, but that would also be fair to all rights holders, perhaps even more so than accounting systems that currently exist.

[183] Fredric Dannen, *Hit Men: Power Brokers and Fast Money Inside the Music Business*, New York: Random House, 1991, ch. 1.

A further design concern is the question of leakage. In proposing such a system, there is legitimate concern that Berkeley, in licensing file-sharing for a test of VCL, could become a feeder from which the rest of the world could download music. This concern can be addressed by the CopySense appliance at the Internet gateway, which can be set to block outgoing file-sharing traffic even as it accounts for incoming traffic.[184] Blocking does present its own problems, but we believe, as discussed above in reaction to the ACM's paper on monitoring file-sharing at universities, that because students in our model would not be enjoined from downloading music, or even from uploading that music to their university peers, they would have little reason to circumvent the outgoing blocking system.

A final concern is perhaps the most important. We are aware that arguing for the placement of Audible Magic's CopySense network monitoring raises serious privacy concerns, and while using CopySense boxes is the best choice for a test implementation at Berkeley, we do not necessarily advocate their use on a wider scale. Julie Cohen has strongly cautioned against what she calls "pervasively distributed copyright enforcement," in which enforcement mechanisms are built into trusted systems without leaving the freedom for personal use that has become associated with less precise enforcement of exclusive rights.[185] While sampling traffic to account for downloads in a compensation scheme is less troubling than content filtering, such mechanisms constitute a slippery slope for privacy, the "freedom to tinker", and would be undesirable on a larger scale.

On a contained university network and for the purposes of testing the feasibility of VCL, the benefits of passive network monitoring outweigh these costs. More accurate data will be useful in evaluating the system, and in developing potential sampling techniques. Moreover, the size and homogeneity of the population does not lend itself to other methods of accounting, such as self-reporting volunteers (could we get enough?) or comparison to larger market trends (do Berkeley's tastes really mirror the country's? the world's?). On a wider scale, however, such information would more accurately represent the system's patterns, thus obviating the need for focused localized tracking. We therefore stress that the use of monitoring appliances should be

[184] See Appendix C for screen shots of Audible Magic's control interface.
[185] Julie E. Cohen, "Pervasively Distributed Copyright Enforcement," 95 Geo. L.J. 1. (2006). http://papers.ssrn.com/sol3/papers.cfm?abstract_id=892623, accessed May 1, 2008.

undertaken cautiously, and that on a wider scale, less potentially invasive sampling techniques be used.

Distributing the Money

Once traffic is accounted for, that information must be used fairly to determine the distribution of payments to rights holders. Royalty distribution is already a complex matter for music businesses, and the university cannot and should not enter into this space. If the contracts with record labels include terms on publishing rights, it is possible that simple bulk payments to labels could be sufficient, mirroring the recently announced Universal/Qtrax deal.[186] However, if distributing to a diverse array of publishing rights holders is necessary, Berkeley should contract with a third-party rights administrator such as the Harry Fox Agency or Music Reports, Inc (MRI).

Representatives from MRI, a company that claims one of the largest databases of musical copyright information in the world, have expressed interest in our model.[187] Furthermore, they claim they have argued that new systems call for new business arrangements when considering royalty rates, since existing rates are still based on a physical content distribution model. One interviewee stated that instead of trying to find an existing royalty model to impose on a digital distribution system, "you should be thinking about the economic model that works for you, and you should propose it . . . the question is what's the [best] economic model for the University."

System Costs

We close by mentioning system costs. Our position as student researchers did not allow us to gain a full picture of the costs of all parts of the system we propose, and generating a full budget was beyond the scope of this project. We did learn that Audible Magic typically sells its monitoring services with no initial hardware costs and a range of $.25 - $.50 per month per student. This works out to around $12,400 per semester, or ten percent of the money raised by a

[186] The arrangement between Universal and Qtrax covers both rights in the sound recordings and associated publishing right. Owen Gibson, "Universal to allow free music downloads," supra note 166.
[187] Research Interview, April 23, 2008.

$20 fee per student. But further costs exist. Some would be in the initial phase of the project, including Berkeley administrators' time to oversee the project and the cost of consultation with Big Champagne. Others might be reflected in ongoing costs, such as contracting with MRI to disburse money to rights holders and ongoing research into the effectiveness of accounting measures. These and other costs could quickly mount.

In the long term we envision a system that is to some degree self-sustaining, with the fees charged to students covering consultant costs as well as payments to licensors. However, in the short term the committee should pursue University funds or outside grants to fund initial research and set-up. Furthermore, the committee may deem that it does not make sense to have students foot the bill for a test and could propose in the covenants that no actual money be collected during an initial phase. We are not unaware that we are suggesting this model in the face of a possible 7% per department budget cut at Berkeley.[188] Nevertheless, we believe the benefits of a working test of a VCL system outweigh the costs.

VII. Conclusion

In this paper, we have argued that voluntary collective licensing is an appropriate and achievable solution to the problems posed by peer-to-peer file-sharing. In a recent decision, the ASCAP/BMI rate court echoed some of our arguments in ruling on appropriate fees for licensing streaming media on the Internet. In addressing the question of the applicability of blanket licensing, the court wrote that "a blanket license offers the flexibility of immediate and unlimited access to a vast and ever-growing repertory of compositions, without the cost and delay of consummating individual agreements, and without the concern of exposure to liability for copyright infringement."[189] The court found blanket licenses particularly well-suited to the Internet, where the "unprecedented capability to make millions of songs available to the entire nation all at once far outstrips the music distribution capabilities of all other passive media such

[188] Barry Bergman, "Bottom Line on the Berkeley Budget," UC Berkeley Public Affairs, April 23, 2008. http://berkeley.edu/news/berkeleyan/2008/04/23_budget.shtml Accessed May 08, 2008.

[189] *United States of America v. ASCAP*, Civil Action No. 41-1395 (AOL Application For Reasonable Fees) (S.D.N.Y May 2008), 119-120.

as radio or television."[190] We are heartened by the court's decision and believe that the reasoning it uses to support blanket licensing in this case is no less applicable to peer-to-peer file-sharing. Just as the blanket license is an effective, useful, and sensible tool for licensing public performance rights in streaming media, it can be as effective and useful in licensing the reproduction and distribution rights in file-sharing downloads. The belief that a court would similarly interpret this type of situation with respect to file-sharing, and would take into account the success of blanket licensing in the past, is one of the basic premises of our project.

In proposing Berkeley as a test site for the voluntary collective licensing proposal of the EFF, we sought to discover if the idea was palatable to the students who would use the system, if the technology exists to make the system possible, and if installing the system makes sense from the University's perspective. We have demonstrated through our findings that the answer to the first three questions is yes in general, although, as noted in our discussion, additional research is required to implement a working system at Berkeley. We also set out to show that the complex peculiarities of an industry that is sometimes slow to embrace technological change might continue to pose a problem for effective implementation of the system, even if that system is shown to be desirable, achievable, and necessary given the changing distributing models that peer-to-peer file-sharing affords. We continue to believe that a working test of the system at Berkeley would not only relieve students of the threat of litigation, but also help convince the industry of VCL's viability.

The last nine years, from the birth of Napster to the announcement of the launch of Qtrax, show that file-sharing of copyrighted music is not going away, despite the RIAA's continued efforts to stamp it out. The proposals for alternative compensation systems we have reviewed seek to take a practice that is considered by some in the music industry as "piracy"[191] and others in Congress as an issue of "morality"[192] and recast it as a business opportunity. Because we believe that the technology exists and can be used fairly, we advocate the creation and implementation of a working model of VCL to test the concept. We believe that the same qualities that make

[190] Ibid., 125
[191] RIAA, "How to Report Piracy." http://riaa.com/reportpiracy.php, accessed May 8, 2008.
[192] Kristen Green, "Downloading Music Affects Children's Morality, Senator Say," *Kansas City Infozine*, August 4, 2005. http://www.infozine.com/news/stories/op/storiesView/sid/9389/, accessed May 08, 2008.

universities and their students the primary targets of the RIAA's campaign of "education and deterrence" also make them ideally suited to test the merits of the system.

Appendix A: Survey Methods

Overview and Sample Frame

In order to understand student file-sharing practices and to gauge their response to voluntary collective licensing, we created a survey and electronically distributed a questionnaire to students currently living in residence halls who received their internet access through Berkeley's Office of Residential Computing. We chose this group because they are the ones who would be affected by and receive the benefits of Berkeley's institution of our model. Around 6,200 students live in single occupancy dorms spread out across 9 units.

Survey Design and Testing

Our questionnaire was designed to gather information about student's current attitudes towards a range of topics related to digital music. These included: 1) A section on their general use of technology (Background Information); 2) A section on their current sources for music and their attitudes towards it (Music Acquisition and Listening); 3) A section on how they acquire digital music and what they do with it once they have acquired it (Digital Music); 4) A section on whether they file-share, why the stopped if they once did but no longer do, and, if they currently file-share, questions about their current habits (File-Sharing and File-Sharing Continued); 5) A section on their knowledge of copyright, their awareness of the RIAA and Berkeley education campaigns, and the effects of those campaigns on their behavior (Music and Copyright); 6) A section on their receptivity to the idea of VCL and some specific proposed implementations of it (Licensed Music File-Sharing); and 7) A section on respondent's age, year, and gender (Demographics). The questionnaire was built using Lime Survey and hosted by a colleague on his web server.

The questionnaire itself is present in Appendix B. Some questions were conditional on response, and for the purposes of reproduction here we have checked the response that showed further response-dependent question. These responses were not selected when a respondent took the survey.

We pilot tested the survey with six Berkeley students, ranging from 21 to 26 years old, all of whom were familiar with current file-sharing trends and two of whom lived on the Berkeley campus. Testing the survey in this way helped us clarify confusing questions and ensured that the options presented in questions related to file-sharing reflected current practice.

Survey Implementation and Response Rate

With the help of Residential Computing staff, we obtained 500 random e-mail addresses of students living in the dorms and distributed the survey link to them directly via e-mail. As an incentive to participate, we raffled off a 1 GB iPod Shuffle to respondents, using a separate database unconnected to the survey to store respondents voluntarily given names and e-mail addresses. The survey was active from April 1 through April 23, 2008.

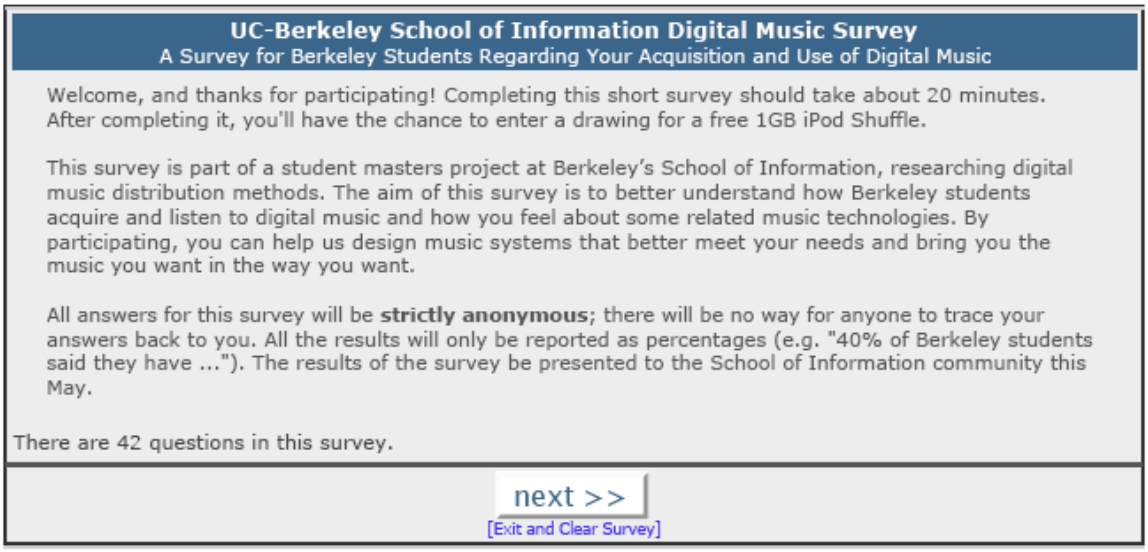
A low response rate caused us to seek additional respondents, and Vanessa DeGuzman of Residential Computing allowed us to put a link to the survey on ResComp's internal website. This survey was identical except for a single extra question that asked students whether they lived in the dorms and were undergraduates. This strategy was less than optimal for us, and opens the possibility that a single student could have taken the survey multiple times. However, since a registration process was required to take this version of the survey, we were able to see the e-mail addresses of those that had completed it. Because we saw no entries duplicated in the list of e-mails to whom we sent the first survey, we believe there were no repeat entries. This registration process was managed by the software separately from survey responses, which were anonymous.

In total, we received 78 complete responses from the e-mail survey and 25 usable responses from the ResComp Website survey, for a total of 103 responses (n=103), a response rate of 16% from the e-mail survey, and an unknown response rate from the ResComp version. In total, a large majority of respondents were either 18-19 years old (73%) or 20-21 years old (19%), the response was weighted towards Freshmen (63% Freshmen, 21% Sophomores, 15% Juniors, 1% Seniors), and the genders split was 39% Male and 57% Female (4% Decline to State). The data was exported from Lime Survey to SPSS, then recoded and processed in Stata Version 10.

Further Research

We began the survey hoping to use our response data to answer complex questions about the nature of file-sharing at Berkeley. This included questions such as: What types of students file-share? What factors are good indicators of a willingness to pay for VCL? What is the correlation between students perception of copyright law and the way in which they acquire digital music? Unfortunately, time constraints prevented us from fully exploring these questions using statistical analysis. Although we cannot make the dataset public because of the constraints placed on its gathering, it is our hope that others will follow our lines of questioning. We believe that a key aspect of implementing a working VCL system is understanding the social reasons behind file-sharing, and also understanding why students continue to file-share given the current legal alternatives and the existence of the RIAA's litigation campaign.

Appendix B: CalShares Survey Instrument



UC-Berkeley School of Information Digital Music Survey

A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

Welcome, and thanks for participating! Completing this short survey should take about 20 minutes. After completing it, you'll have the chance to enter a drawing for a free 1GB iPod Shuffle.

This survey is part of a student masters project at Berkeley's School of Information, researching digital music distribution methods. The aim of this survey is to better understand how Berkeley students acquire and listen to digital music and how you feel about some related music technologies. By participating, you can help us design music systems that better meet your needs and bring you the music you want in the way you want.

All answers for this survey will be **strictly anonymous**; there will be no way for anyone to trace your answers back to you. All the results will only be reported as percentages (e.g. "40% of Berkeley students said they have ..."). The results of the survey be presented to the School of Information community this May.

There are 42 questions in this survey.

next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Background Information

01: Which of the following do you own?
Check any that apply

- ☐ Desktop computer
- ☐ Laptop or tablet computer
- ☐ Portable digital music player, such as an iPod or Zune
- ☐ Music-enabled mobile phone
- ☐ None of the above

02: How often do you connect to the Internet...

	Never	Less than once per week	About once per week	Several times per week, but not once per day	About once per day	Several times per day
...using a wired Ethernet connection in the dorms?	○	○	○	○	○	○
...using wireless in the dorms?	○	○	○	○	○	○
...using other Berkeley wireless networks (e.g. AirBears or individual department networks)?	○	○	○	○	○	○
...using public computers in computer labs?	○	○	○	○	○	○
...using off-campus wireless networks (e.g in coffee shops)?	○	○	○	○	○	○

03: How often do you...

	Never	Less than once per week	About once per week	Several times per week, but not once per day	About once per day	Several times per day
...check e-mail?	○	○	○	○	○	○
...visit websites for classes or research?	○	○	○	○	○	○
...visit websites for personal use?	○	○	○	○	○	○
...use instant messaging software such as AIM or Google chat?	○	○	○	○	○	○
...use social networking sites such as MySpace or Facebook?	○	○	○	○	○	○

04: Are you aware of Residential Computing's upload/download limit on Internet traffic?

- Yes
- No

05: Have you ever exceeded the limit in a given week?

- Yes
- No
- Not sure

06: If you have exceeded the limit in a given week, what were the circumstances?

<< prev | next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Music Acquisition and Listening

07: How much do you spend on CDs or other physical forms of recorded music in an average month?

- Less than $30
- Between $30 and $60
- Between $60 and $90
- Between $90 and $120
- More than $120

08: How much do you spend on digital music in an average month (e.g. downloads or subscription services)?

- Less than $30
- Between $30 and $60
- Between $60 and $90
- Between $90 and $120
- More than $120

09: In the last 6 months, how often did you...

	Never	Less than once per month	About once per month	About once per week	Several times per week, but not once per day	About once per day	Several times per day
...listen to broadcast radio (including satellite radio, but not including Internet radio)?							
...listen to Internet radio (for example, Pandora, SomaFM, or kalx.berkeley.edu)?							
...see live music (for example, concerts, DJs, or bars/parties with live bands)?							

10: Please indicate the degree to which you agree or disagree with the following statements:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
I often talk to my friends about music.						
Music is an important part of my social life.						
When people know what music I listen to, they have a good sense of who I am.						
I would rather spend my money for entertainment on music than on other things.						

<< prev next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Digital Music

11: In the last six months, how often have you...

	Never	Less than once per month	About once per month	About once per week	Several times per week, but not once per day	About once per day	Several times per day
...used your computer to play digital music files such as mp3 files?	○	○	○	○	○	○	○
...used your computer to rip CDs (copy the audio files to your computer)?	○	○	○	○	○	○	○
...used a portable digital music player to download, store, or play digital music files?	○	○	○	○	○	○	○
...used your mobile phone to download, store, or play music files other than ringtones?	○	○	○	○	○	○	○

12: If you have a computer and/or digital music player, approximately how large is your digital music collection? (If you don't know, take your best guess.)

- ○ I do not store digital music on my computer.
- ○ Less than 1/2GB
- ○ Between 1/2GB and 5GB
- ○ Between 5GB and 25GB
- ○ Between 25GB and 50GB
- ○ Between 50GB and 75GB
- ○ Between 75GB and 100GB
- ○ More than 100GB
- ◉ No answer

13: If you have a computer and/or digital music player, approximately how many music files do you have in your collection? (If you don't know, take your best guess.)

- ○ None
- ○ Fewer than 100
- ○ Between 101 and 1,000
- ○ Between 1,001 and 5,000
- ○ Between 5,001 and 10,000
- ○ Between 10,001 and 15,000
- ○ Between 15,001 and 20,000
- ○ More than 20,000
- ◉ No answer

14: In the past six months, approximately how often have you used the following sources to obtain digital music files?

	Never	Less than once per month	About once per month	About once per week	Several times per week, but not once per day	About once per day	Several times per day
Your own CDs, by copying or ripping them (copying the files to your computer)							
Friends' or family members' CDs, by copying or ripping them							
Peer-to-peer file-sharing networks such as LimeWire, KaZaa, eDonkey/eMule, DC++, or BitTorrent							
Online music stores such as iTunes or Amazon							
Monthly music subscription services such as Napster 2.0, Rhapsody, or eMusic							
Other music-related web sites like musician's homepages, MySpace, or mp3 blogs							
E-mail or instant messages you received with music files attached							
Podcasts							

15: In the past six months, which of the following have you done after discovering a new artist on the Internet?
Check any that apply

- ☐ Downloaded music by this artist
- ☐ Purchased digital music by this artist
- ☐ Purchased a CD by this artist
- ☐ Attended a concert by this artist
- ☐ Followed this artist in the media (e.g., news or blogs)

Other: ☐

16: How much do you agree or disagree with the following statements regarding digital music?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
It is important to me that my files can be transferred easily between different devices, e.g. PC, MP3 player, mobile phone.						

I want to share music files with my friends or family members.						
Listening to music is more important to me (e.g. via streaming) than storing songs on any of my devices.						
I am afraid that my files will not be usable on devices I buy in the future.						
I want to sell my purchased music files that I don't like anymore to others.						

<< prev next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

File-Sharing

This section asks about your use of peer-to-peer networks to obtain digital music. Rest assured your answers are completely anonymous. There is no way for the survey administrators to know who has given which answer.

17: Do you currently use peer-to-peer file-sharing networks to download digital music files?

- ○ **Yes**
- ◉ **No**

18: Do you currently use peer-to-peer file-sharing networks to upload (share) digital music files?

- ○ **Yes**
- ◉ **No**

19: Regardless of your current use, have you ever used peer-to-peer file-sharing networks to upload or download digital music files?

- ◉ **Yes**
- ○ **No**

20: If you used to use peer-to-peer file-sharing networks, but do not anymore, why did you stop?

<< prev | next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

File-Sharing, continued

21: If you currently use peer-to-peer networks to search for music, which networks/software do you use?
Check any that apply

- [ ] KaZaa
- [ ] LimeWire
- [ ] Direct Connect / DC++
- [ ] a BitTorrent client
- [ ] eDonkey or eMule
- [ ] WinMX

Other: _____

22: How often do you search for music using peer-to-peer networks?

- ( ) Never
- ( ) Less than once per month
- ( ) About once per month
- ( ) About once per week
- ( ) Several times per week, but not once per day
- ( ) About once per day
- ( ) Several times per day

23: How often are file-sharing clients or shared folders open and accessible on your computer?

- ( ) Never
- ( ) Less than once per month
- ( ) About once a month
- ( ) About once a week
- ( ) Several times per week, but not once per day
- ( ) About once per day
- ( ) Several times per day
- ( ) Whenever my computer is on
- ( ) Don't know

24: When did you start using file-sharing software?

- ( ) Within the last year
- ( ) 1 to 2 years ago
- ( ) 3 to 4 years ago
- ( ) More than 4 years ago
- ( ) Don't know

25: How did you learn about peer-to-peer file-sharing networks?

- ( ) From a friend
- ( ) From a family member
- ( ) From someone in my dorm
- ( ) Read about it online
- ( ) Don't know / can't remember
- ( ) I choose not to answer.
- ( ) Other _____

26: Has your use of file-sharing software increased or decreased since coming to UC-Berkeley?

- ○ Increased
- ○ Decreased
- ○ Hasn't changed

27: Please rank the following reasons for using file-sharing to obtain digital music files, with 1 being the most important:

Click on an item in the list on the left, starting with your highest ranking item, moving through to your lowest ranking item.

Your Choices:	Your Ranking:
Music selection	1:
Lack of restrictions on using the files	2:
Convenience	3:
Cost	4:
Speed	5:
Popularity of the services	6:

Click on the scissors next to each item on the right to remove the last entry in your ranked list

<< prev | next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Music and Copyright

28: Do you care whether the music you download onto your computer (from any source) is copyrighted?

- I care if the music is copyrighted.
- This isn't something I care much about.
- I am familiar with copyright, but am not sure how I feel.
- I don't know exactly what copyright means.

29: There are many issues surrounding copyright law and digital music. To the best of your knowledge, would you consider the following activities legal or illegal?

	Legal	Illegal	Depends on the individual case	Not sure
Making yourself a copy of a CD or file that you have purchased				
Making your friends or family members a copy of a CD or file that you have purchased				
Playing a file, which you have purchased, on multiple devices				
Downloading music files from peer-to-peer networks				
Offering music files, which you have purchased, on peer-to-peer networks				

30: Have you ever heard of Digital Rights Management (DRM)?

- Yes
- Yes, but I don't know what it is
- No

31: If you have heard of DRM, how much do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
DRM helps to compensate musicians for their creative work.						
DRM helps the music industry to increase its revenues.						
DRM prevents me from enjoying the music I buy.						
I prefer to buy music without DRM.						
DRM makes online music sales possible.						

32: Are you aware that the Recording Industry Association of America (RIAA) has sued users of peer-to-peer file-sharing networks for copyright infringement?

- (•) Yes
- ( ) No

33: How has your awareness of these lawsuits affected your file-sharing activities with respect to music files?

- ( ) My file-sharing activity has increased.
- ( ) My file-sharing activity has stayed about the same.
- ( ) My file-sharing activity has decreased.
- ( ) This has had no effect on my file-sharing activity.

34: Are you aware of Berkeley's copyright and file-sharing education programs, such as the "Be Smart" campaign?

- (•) Yes
- ( ) No

35: How has your awareness of these education programs affected your file-sharing activities with respect to music files?

- ( ) My file-sharing activity has increased.
- ( ) My file-sharing activity has stayed about the same.
- ( ) My file-sharing activity has decreased.
- ( ) This has had no effect on my file-sharing activity.

<< prev | next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Licensed Music File-Sharing

36: If UC-Berkeley made a licensing arrangement with record labels to allow students to engage in unlimited peer-to-peer music file-sharing on campus, would you be willing to pay a fee to enroll in this service?

- (•) Yes
- ( ) No

37: What do you think would be a fair price to pay *per semester* for the service described in question 36?

- ( ) Less than $10 per semester
- ( ) Between $10 and $20 per semester
- ( ) Between $20 and $30 per semester
- ( ) Between $30 and $40 per semester
- ( ) Between $40 and $50 per semester
- ( ) More than $50 per semester

38: How much would you be *willing to pay* per semester for the service described in question 36?

- ( ) Less than $10 per semester
- ( ) Between $10 and $20 per semester
- ( ) Between $20 and $30 per semester
- ( ) Between $30 and $40 per semester
- ( ) Between $40 and $50 per semester
- ( ) More than $50 per semester

39: Which of the following restrictions or provisions would you accept on your use of the music you downloaded using the service described in question 36?
Check any that apply

- [ ] Restrictions preventing the files from being burned onto CDs
- [ ] Limitations on the number of computers the files could be copied onto
- [ ] Restrictions preventing the files from being copied onto a portable digital music player
- [ ] UC-Berkeley having knowledge of what songs you download
- [ ] Would not accept restrictions

<< prev | next >>

[Exit and Clear Survey]

UC-Berkeley School of Information Digital Music Survey
A Survey for Berkeley Students Regarding Your Acquisition and Use of Digital Music

0% 100%

Demographics

40: How old are you?

- 17 years old or younger
- 18-19 years old
- 20-21 years old
- 22-23 years old
- 24 years old or older

41: What year at UC Berkeley are you in? (If you are a visiting student or are not sure, please choose the answer that corresponds most closely.)

- Freshman
- Sophomore
- Junior
- Senior
- Other

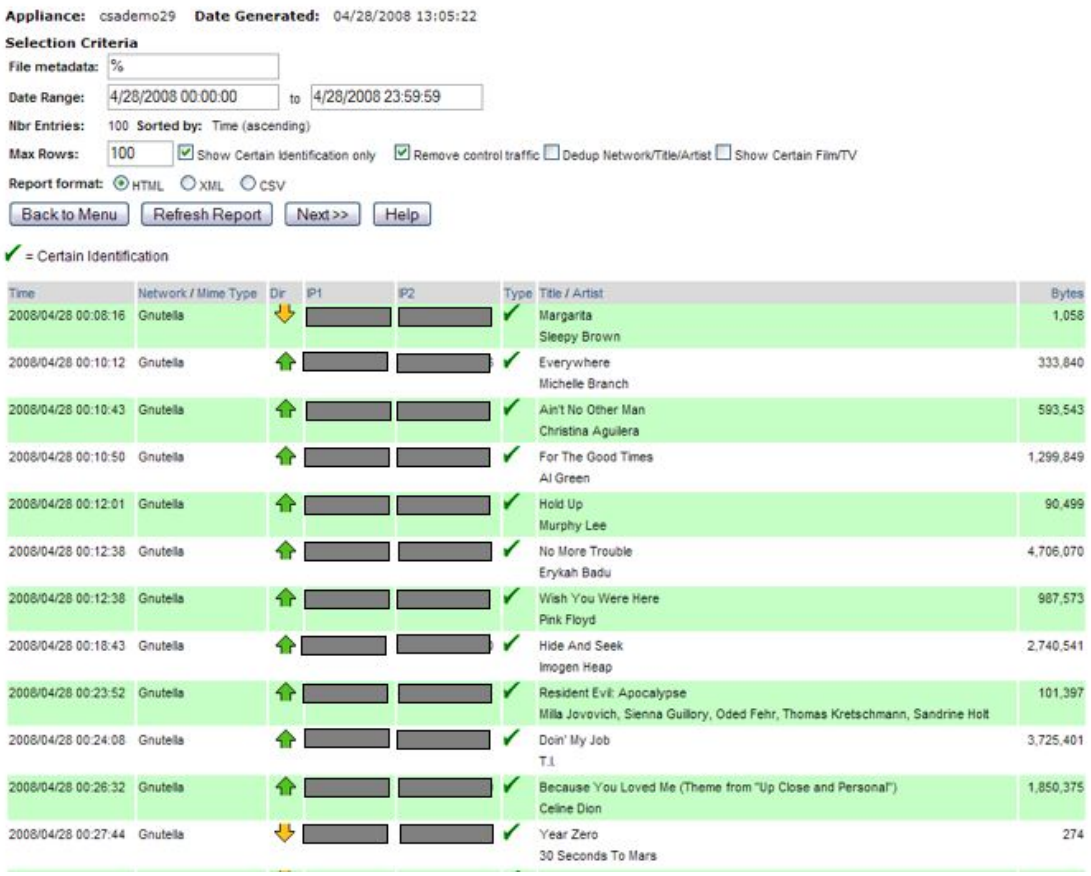
42: Are you...

- Male
- Female
- Decline to state

<< prev | last

[Exit and Clear Survey]

Appendix C: Audible Magic Screen Shots



Appliance: csademo29 **Date Generated:** 04/28/2008 13:05:22

Selection Criteria

File metadata: %

Date Range: 4/28/2008 00:00:00 to 4/28/2008 23:59:59

Nbr Entries: 100 **Sorted by:** Time (ascending)

Max Rows: 100 Show Certain Identification only Remove control traffic Dedup Network/Title/Artist Show Certain Film/TV

Report format: HTML XML CSV

Back to Menu | Refresh Report | Next >> | Help

✓ = Certain Identification

Time	Network / Mime Type	Dir	IP1	IP2	Type	Title / Artist	Bytes
2008/04/28 00:08:16	Gnutella	↓	[redacted]	[redacted]	✓	Margarita Sleepy Brown	1,058
2008/04/28 00:10:12	Gnutella	↑	[redacted]	[redacted]	✓	Everywhere Michelle Branch	333,840
2008/04/28 00:10:43	Gnutella	↑	[redacted]	[redacted]	✓	Ain't No Other Man Christina Aguilera	593,543
2008/04/28 00:10:50	Gnutella	↑	[redacted]	[redacted]	✓	For The Good Times Al Green	1,299,849
2008/04/28 00:12:01	Gnutella	↑	[redacted]	[redacted]	✓	Hold Up Murphy Lee	90,499
2008/04/28 00:12:38	Gnutella	↑	[redacted]	[redacted]	✓	No More Trouble Erykah Badu	4,706,070
2008/04/28 00:12:38	Gnutella	↑	[redacted]	[redacted]	✓	Wish You Were Here Pink Floyd	987,573
2008/04/28 00:18:43	Gnutella	↑	[redacted]	[redacted]	✓	Hide And Seek Imogen Heap	2,740,541
2008/04/28 00:23:52	Gnutella	↑	[redacted]	[redacted]	✓	Resident Evil: Apocalypse Milla Jovovich, Sienna Guillory, Oded Fehr, Thomas Kretschmann, Sandrine Holt	101,397
2008/04/28 00:24:08	Gnutella	↑	[redacted]	[redacted]	✓	Doin' My Job T.I.	3,725,401
2008/04/28 00:26:32	Gnutella	↑	[redacted]	[redacted]	✓	Because You Loved Me (Theme from "Up Close and Personal") Celine Dion	1,850,375
2008/04/28 00:27:44	Gnutella	↓	[redacted]	[redacted]	✓	Year Zero 30 Seconds To Mars	274

Figure 1: CopySense screenshot showing network, artist, and track identification capabilities.

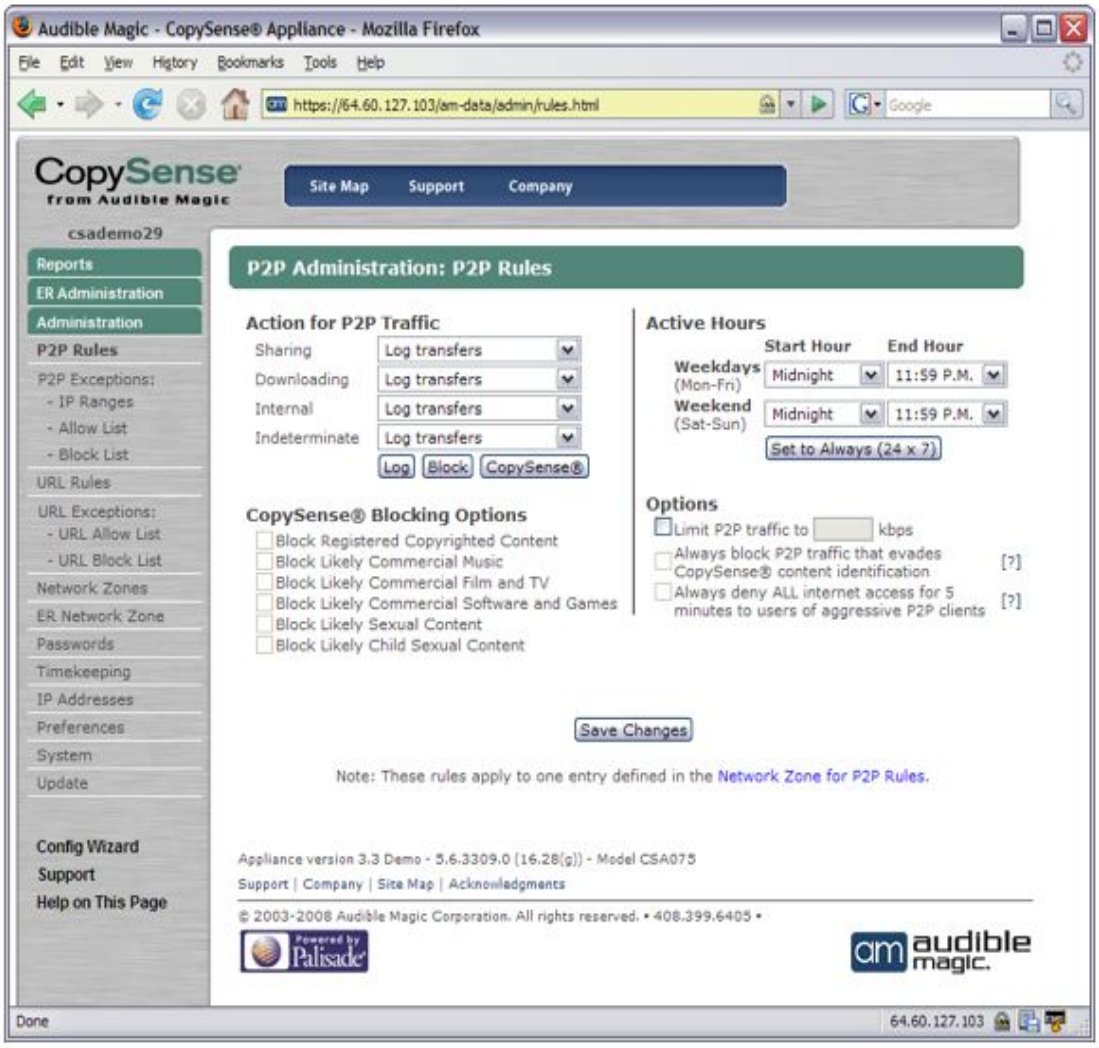


Figure 2: CopySense screenshot showing accounting options.