File-Sharing and Business Models*

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1. INTRODUCTION

File-sharing services provide to web users the ability to find and download files from other computer hard drives by typing an appropriate title, word, or phrase. For example, a student interested in the Civil War can find and download material from other user hard drives by entering the phrase "Abraham Lincoln". In addition to documents, software, and photographs, file-sharing can enable the unauthorized transfer and copying of copyrighted music, books, and movie files that can be "ripped" from CDs or otherwise loaded to hard drives on personal computers. The unauthorized reproduction of any copyrighted material can displace original sales and licensing opportunities and therefore presents concerns for copyright owners.

File-sharing can entail at least four topologies. In the first generation, Napster, Scour, Aimster/Madster, Audiogalaxy, and iMesh routed file requests through central directories that located and accessed donors with hard drive tracks that could be copied. The Recording Industry Association of America (RIAA) successfully pursued litigation against most of these services and led to their eventual demise or legitimacy. In a second generation, KaZaa and Grokster now use a network configuration that routes file requests through directories that are installed regionally on user computers. In a third layer of file-sharing services, smaller providers -- such

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as Morpheus, BearShare, and Limewire – use open source Gnutella programs to locate material without routing requests through any directory whatever. In a prospective fourth generation, Freenet will migrate encoded content across the web with perfect anonymity.

Facing a rapidly growing problem, record labels, music publishers, and movie studios filed copyright suits against Napster,[1] Audiogalaxy,[2] Madster,[3] and Kazaa/Grokster/Morpheus.[4] As a group, file-sharing cases present an intriguing plate of issues for lawyers, technologists, and economists who ponder the evolution of judicial policy in the digital era. *Ab initio*, these cases implicate the primary issue of indirect (i.e., contributory and vicarious) liability for copyright infringement; courts use indirect liability as a justification for shifting the responsibility for stopping infringement to the parties who can most efficiently deter it. As a second matter, content owners might come to control the next generation of music technology by merging, joint venturing, or licensing content to a peer-to-peer (P2P) platform. As an intriguing promotional vehicle, P2P services might attract a critical network mass useful to forming an incumbent base, establishing brand loyalty, and deterring migration to infringing technologies.[5]

2. ECONOMIC DISPUTE RESOLUTION

Courts may generally resolve disputes involving trespass or nuisance[6] in four general manners. First, the court could award an injunction or free use to either litigant based on a reading of statutory or common law, or some rational-comprehensive attempt to establish the costs and benefits associated with each outcome.[7] For example, courts may sympathize with victim rights, and rule against a cattleman whose herd grazes on a farm, a factory that pollutes the adjoining baker, or a prospective hospital whose ambulances endanger the lives of nearby pedestrians or drivers. Any of these decisions might actually impose greater social costs than the reverse if the property right is awarded to the less valuable use.

From a second perspective of Nobel Laureate R.H. Coase, the court's verdict is irrelevant if the property right can be easily transferred in the market to the more efficient outcome.[8] For if judgment were instituted inefficiently for the plaintiff, the defendant could pay the plaintiff to lift the injunction in a manner that would improve social welfare and leave both parties better off. By contrast, no such deal is possible if the starting position is efficient. However, the efficient application of the Coase Theorem generally depends on three general conditions — no excluded

"third parties", no market power, and no transaction costs in negotiations between the contending parties – that are frequently absent in a particular rights dispute [9]

As a weaker variation of the Coase Theorem, courts might invoke liability rules to permit use with established compensation for harmed parties.[10] Infringers can efficiently internalize damages if prospective or appointed dollar awards reflect true usage costs. If costs per unit of damage can be correctly estimated, liability rules would generally deter trespass or nuisance to the efficient point of deterrence.

Finally, courts can institute specific preventive responsibilities that would limit the harm from nuisances and infringements. Harold Demsetz makes the point; "it would be possible for the legal system to improve the allocation of resources by placing liability on that party who in the usual situation could be expected to avoid the costly interaction most cheaply."[11] The mandating of efficient restraints apparently found its way in 1997 to the Supreme Court, which examined statutory provisions of the Communications Decency Act of 1996 that prohibited commercial services from transmitting adult video communications via the Internet.[12]

However, there is no economic reason why courts should limit liability solely to the "low cost" provider.[13] A multilateral resolution would be particularly compelling if different preventive methods could resolve different aspects of the same problem.[14] Courts may then require complementary practices as a cooperative solution to Prisoner's Dilemma games.[15] Indeed, failure to impose symmetric restrictions invites the moral hazard of underprotection, which can encourage more wasteful litigation as a means of resolving future conflicts.[16]

Injunctions are sometimes granted in copyright cases based on statutory and common law considerations that are unrelated to economic efficiency.[17] The outcome, particularly in cases that implicate innovation and new technology, may close off information channels and otherwise reduce the ability of the market to reorganize more efficiently. If other preventive methods are not explicitly considered, an injunction might then render entirely inoperable a device or service that is otherwise capable of legal and beneficial activities.

While a frictionless licensing market could reassign initial rights to make both parties better off, general transaction difficulties can be often overwhelming for markets with new technologies where contestants may have widely divergent perspectives on future values of particular property rights. The same problem can affect liability rules, where estimate market damages necessarily implicate business models in the process of

development. Accordingly, the best practical strategy that a court can often follow is to institute specific deterrence -- "electronic fences" -- that impose balanced safeguards that obligate each side to act cooperatively for an indefinite period. In an open-ended knowledge system where novelty is perpetual and relevant information is slowly revealed, specific deterrence based on limited information and narrow policy goals presents a reasonable way of making key jurisprudential decisions.

3. ECONOMICS OF INDIRECT LIABILITY

A party can be held liable in common law for indirect infringement of copyright even if she has not directly reproduced or performed the work. This establishes a judicial platform which courts can activate for specific deterrents.

Contributory infringement results from a person "who, with knowledge of the infringing activity, induces, causes, or materially contributes to the infringing conduct of another" and who therefore is therefore "equally liable with the direct infringer."[18] Both knowledge and material contribution are implicated in a claim of contributory infringement. However, actual knowledge is not necessary; liability can also be incurred if the defendant had reason to know or was willfully blind to any form of infringing activity.[19] Indeed, merely "providing the site and facilities for known infringing activity is sufficient to establish contributory liability."[20]

A person may participate in vicarious infringement if he "has the right and ability to supervise the infringing activity and also has a direct financial interest in such activities."[21] Any party in a supervisory capacity may be guilty of vicarious infringement without any knowledge whatever of the infringing event. Moreover, it is not necessary to identify financial gain resulting from direct sale; the use of infringing material (e.g., music) to create interest and atmosphere may be sufficient.[22] However, some defendant ability to control or supervise the infringing parties is essential for a finding of vicarious infringement.[23]

Charges of contributory and vicarious infringement have often arisen in cases involving musical reproductions or performances. Courts ruled against dance halls with musical acts that made unauthorized performances,[24] a department store chain hosting a concessionaire that sold counterfeit records,[25] a store selling blank tapes for use with an on-the-premises "Make-A-Tape" machine,[26] a retail copy service operating a cassette copying machine to reproduce sound recordings,[27] an operator of a swap meet that rented space to bootleggers,[28] a trade show operator that

used music to cultivate interest and attendance,[29] bar owners who permitted unauthorized public performances of songs, [30] and a producer of specially timed audiotapes and taping equipment sold to known counterfeiters.[31]

Rules that establish indirect liability allow copyright owners to take action against, e.g., vendors of infringing technologies instead of their many users, or supervisors instead of subordinates. In so doing, indirect liability provides the incentive for superiors to heed their knowledge of, or contribution to, copyright infringements that may arise under their charge. In so doing, Richard Gilbert and Michael Katz argue that indirect liability shifts the necessary costs of monitoring to the party that can presumably can bear it most efficiently.[32]

Rights owners in cyberdomains may particularly value the tools of contributory and vicarious liability when they are often unable to prosecute infringing behavior in a widely distributed user base. By contrast, network intermediaries (such as employers, colleges, and internet service providers) may have some reasonable technical ability to monitor their constituents. Courts that enforce indirect liability may then establish a financial incentive for the creation of new monitoring technologies (e.g., Audible Magic,[33] Packeteer[34]) that can better deter copyright infringement. Rights owners then appreciate the incentives as catalysts that can induce changes in business practice, market organization, and enabling technology.

4. CONTRIBUTORY INFRINGEMENT AND *SONY*

A landmark decision involving contributory infringement was the 1984 Supreme Court decision, *Sony Corp. v. Universal City Studios* Inc.,[35] which considered the legality of Sony's videocassette recorder (VCR) that could videotape copyrighted television programs. As a reproduction technology, the VCR could be used for a wide category of purposes, ranging from time-shifting for single playback to unauthorized collection of a program library.

The District Court found the VCR to be a staple item of commerce and held for Sony;[36] the Ninth Circuit Court reversed,[37] and the Supreme Court reversed again. Writing for the majority, Justice Stevens found the VCR to be a "staple article of commerce" that could be used for significant noninfringing, i.e., noncommercial time-shifting of recorded programs for playback within the home.[38] Accordingly,

> the sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes. Indeed, it need merely be capable of substantial noninfringing uses.[39]

With additional testimony, the Court also found that many programmers (such as sports programmers and Mr. Rogers) actually supported the home recorder, suggesting that producer harms claimed by plaintiffs Universal and Disney were not pervasive.[40]

The Supreme Court here distinguished between commercial uses -- where the likelihood of harm may be presumed -- from noncommercial uses -- where harm must actually be demonstrated.[41] In the latter regard, plaintiff must prove "by a preponderance of evidence that some meaningful likelihood of future harm exists."[42] In this respect, movie industry experts virtually disproved their own case, admitting "at several points in the trial that the time-shifting without librarying would result in not a great deal of harm."[43]

In the 5-4 decision, a dissenting opinion suggested considering the proportion of infringing and noninfringing uses.[44] However, the dissenting opinion offered no immediate method to determine the value of each use, nor is one apparent. Alternatively, the Supreme Court might have considered the potential for economic "fence protection" by requiring manufacturers to redesign devices to protect against infringement. The District Court had earlier rejected this consideration, which Universal and Disney had suggested.[45]

The movie industry might not have liked the outcome of *Sony*,[46] although the VCR created the market for motion picture videos and greatly benefited Hollywood in the end. And the opinion derives its "significant noninfringing use" criterion from an unrelated area of patent law that involved the tying of secondary products to sale of the patented good.[47]. Nonetheless, Sony can be appreciated as a procedurally rational step in a policy-making process that withholds judgment until a new technology develops and more information can come to the table.

In *Sony*, the Supreme Court declined to make binding policy based on the little amount of information that it had. Rather, it left the game open to more information by deferring to Congress on matters of technology policy:[48]

> Congress has the constitutional authority and the institutional ability to accommodate fully the varied permutations of competing interests that are inevitably implicated by such new technology …It is not our job to apply laws that have not yet been written.".[49]

Congress would soon come to recognize some dangers and require the installation of protective technology on digital tape recorders[50] and

analog video cassette recorders[51] that disallowed users from making serial copies. The procedural process then is an exercise in policy incrementalism and economic fence building.

5 THE NAPSTER TECHNOLOGY

Napster Inc. was a start up company based in San Mateo, California that distributed free-of-charge software that enabled music fans to locate and download unprotected MP3s on donor hard drives.[52] Downloading through the network was possible without compensation to the record labels or music publishers who owned copyrights in the affected sound recording or underlying musical composition.

The distributed user software located donor songs by accessing directory data on a central server owned and controlled by Napster. Once downloaded, MP3 files could be "burned" on blank CDs or transferred to flash memory for use on mobile devices. As a directory service, Napster itself did not create nor copy any of the music files on its system, nor did files pass through its servers. Napster software could not detect the title, content, or performers of a music track, nor whether a transferred file was copyright-protected or not.[53]

New artists tended to view MP3 and Napster as favorable means of promoting their material on-line through sampling and on-line chat.[54] However, major labels and performers perceived Napster as an economic threat. Accordingly, on behalf of the eighteen label affiliates of Sony Music, Universal Music, Warner Music Group, EMI, and BMG (which together distribute 85 percent of sound recordings in the U.S.), the Recording Industry Association of America (RIAA) filed a complaint in December, 1999 for contributory and vicarious infringement against Napster. Plaintiffs were joined a month later by Jerry Lieber, Mike Stoller, and Frank Music, who acted on behalf of a class of music publishers.

On July 26, 2000, District Court Judge Marilyn Hall Patel issued a preliminary injunction against Napster,[55] which the U. S. Court of Appeals for the Ninth Circuit vacated one day later. On February 12, the Court of Appeals for the Ninth Circuit issued a decision that affirmed in part, reversed in part, and remanded the earlier injunction, which was found to be legally valid but overly broad.[56] On remand, the District Court issued a revised preliminary injunction that enjoined Napster from copying, downloading, uploading, transmitting, or distributing copyrighted sound recordings.[57]

The District Court found that Napster had both the requisite

knowledge and material contribution required for contributory infringement,[58] and the supervisory capacity and financial interest required for vicarious.[59] In reaching this conclusion, the Court found that each of the four "fair use" considerations of 17 U.S.C. § 107 held for the plaintiffs.

1. Napster was a commercial service with the intent of building a positive base to enable subscription fees or attract a corporate buyer. Napster technology enabled duplicative reproductions and was not therefore transformative.[60]
2. The act of creating a musical composition or sound recording entails creative abilities and is not rote.[61]
3. Napster's copying of music files entailed a reproduction of the entire work.[62]
4. Napster harmed the potential market for the copyrighted work by reducing CD sales among college students and raising barriers to the label's entry into the market for digital downloading.[63]

The lower court ruled against Napster on points of law concerning sampling,[64] "space-shifting",[65] and the authorized use of reproductions made available by particular artists.[66] The Courts also rejected the defendant's attempt to apply an exemption for space-shifting based on the Audio Home Recording Act of 1992.[67]

With respect to market harm, defendant experts contended that file-sharing may have actually stimulated the sales of CDs andconcerts by enabling prospective customers to sample individual tracks, exchange information, and develop a base of users and network infrastructure.[68] However, Judge Patel pointed out that the appropriate market harm test must also consider how the activity affected licensing opportunities and derivative works.[69] In this respect, plaintiffs presented credible evidence of disrupted business models and licensing plans.[70] By appropriating copyrighted material without authorization, Napster had hindered the potential for this licensing market to congeal.

The District Court found Napster to provide an ongoing network service that could be controlled over its server, and not a staple article of commerce to which *Sony* might apply.[71] In contrast, the Sony Court saw the VCR as an appliance with a one-time purchase.[72] As Napster had purported knowledge of infringing behavior, the Sony decision was then of limited assistance.[73]

The direct knowledge of copyright infringement had been provided directly by the RIAA, which provided to Napster the names of more than

12,000 infringing files that were still available on the Napster system.[74] Citing *Religious Technology Center v. Netcom*,[75] "the record supports the District Court's finding that Napster has actual knowledge that specific infringing material is available using its system, that it could block access to the system by suppliers of the infringing material, and that it failed to remove the material."[76] With regard to *Fonovisa*,[77] Napster provides the "site and facilities" for direct infringement and therefore materially contributes to direct infringement; "without the support services defendant provides, Napster users could not find and download the music they want with the ease of which defendant boasts."[78]

6. SPECIFIC DETERRENCE AND COPYRIGHT MISUSE

In each of the above matters, the judges of the Circuit Court came to uphold the reasoning and points of law of the lower court.[79] The Courts nonetheless would differ in the way that information was to be handled and the respective role that each player must take in response to it; i.e., specific deterrence. The U.S. District Court enjoined Napster from "copying, downloading, uploading, transmitting, or distributing plaintiff's copyrighted compositions and recordings without express permission":[80] The informational burden is made explicit:

> This injunction applies to all such works that plaintiffs own; it is not limited to those [identified by plaintiffs] . . . [B]ecause defendant has contributed to illegal copying on a scale that is without precedent, it bears the burden of developing a means to comply with the injunction. Defendant must ensure that no work owned by plaintiffs which neither defendant nor Napster users have permission to use or distribute is uploaded or downloaded on Napster.[81] (emphasis mine)

Labels were obliged only "to cooperate with defendant in identifying the works to which they own copyrights."[82]

Napster would contend that the imposed informational was unbalanced. Defendant attorneys claimed in Circuit Court that Napster could not discern copyrighted material because neither CD music nor MP3 files contained notices and because plaintiffs refused to identify copyrighted works,[83] claiming that it would be burdensome to do so.[84] Rather, "without attempting to determine the actual practicability of any potential modification of the Napster system, the Court ordered that Napster simply had to figure out a way to prevent any and all alleged infringing uses."[85]

The Circuit Court here concurred with the defendants, finding the resulting informational burden to be inefficient and the injunction wording

to be overly broad.[86] Judge Patel failed to consider how the underlying technology could be used to protect copyrighted works and left many questions unanswered.[87] In line with its finding, the Circuit ordered the labels therefore to provide the names of copyrighted files that must be blocked from access.[88] Consistent with the idea of specific deterrence, the Court here built an efficient fence by placing liabilities upon the respective providers who were in a best position to deter damage.

On remand, the District Court ruled that Napster was preliminarily enjoined from copying, downloading, uploading, transmitting, or distributing copyrighted sound recordings.[89] However, labels bore the responsibility to provide notice of the title of the copyrighted work, the name of the featured recording artist, the names of one or more files on the Napster system containing the work, and a certification that plaintiffs own the claimed copyright.[90] All parties were compelled to use reasonable measures to identifying variations in the title name, including misspellings.[91] The deal left the game open for more information.

On March 27, 2001, the RIAA filed a brief that contended that Napster's system failed to filter effectively the compositions that had been identified.[92] Indeed, the plaintiff group claimed that every song in an original notice of 675,000 copyrighted works remained available in the Napster system. Name-based filters were porous because certain files were misspelled or identified by idiosyncratic user mnemonics (such as pig Latin), purportedly with the assistance of Napster-provided bulletin boards that transmitted information about strategic coding.[93] The District Court ordered Napster to strengthen its protection but did not close it down.[94]

In an effort to improve monitoring, Napster purchased from Gracenote access to a vast database of song titles with common misspellings, and designed its own automated filter to look for likely misspellings.[95] Napster also licensed from Relatable audio recognition software that can take from any song a "digital fingerprint" bearing 34 distinct audio characteristics that were measurable in the first seconds of use.[96] Fingerprinted works can be compared to data that are now available from Loudeye Technologies to check for owner permission. Napster also worked with Bertelsmann's Digital World Services to add protection layers to music files to prevent songs from being burned to CDs or transferred to portable devices.[97] Finally, Napster began distributing from its web site file-swapping software that severely restricted allowable trading.[98]

As a result of the increased security of the Napster system, the number of songs shared by the average Napster user declined from 220 in February, 2001 to 1.5 in July.[99] Napster also claimed that 99.4 percent of

copyrighted works were successfully filtered.[100] As the user base dwindled from 18.7 million to 150,000 people, this additional protection was not enough to satisfy plaintiffs ("The law does not tolerate any infringement") nor Judge Patel ("The standard is to get it down to zero, do you understand that?")[101] To eliminate the remaining infringement, Napster implemented a technical shutdown in July, 2001 that culminated in its bankruptcy in the following year.[102]

Prior to the bankruptcy, the parties entered into a trial in October, 2001 when the labels sought to extend the preliminary injunction into a summary judgment for a permanent one.[103] In its defense, Napster argued that summary judgment should be denied and discovery proceed because the plaintiffs were engaged in copyright misuse. Sourcing *Lasercomb Am. Inc. v. Reynolds*[104] and *Practice Mgmt. Info. Corp. v. American Med. Assoc.*,[105] the Court found copyright misuse to be an equitable defense against summary judgment.[106] With regard to the matter at hand, the court found that one label music service, MusicNet, licensed material in a contract that disallowed Napster from transacting directly with any other individual plaintiff (including Sony and Universal, which were not part of MusicNet).[107] With the possible effect of closing off competition and raising licensing fees, this exclusive deal sufficiently concerned the court that summary judgment was not permitted; "the evidence now shows that plaintiffs have licensed their catalogs of works for digital distribution in what could be an overreaching manner [and what could also] run afoul of the antitrust laws."[108]

The defense of copyright or patent misuse, which may include antitrust violations, is a defense in equity that prevents plaintiffs from enforcing copyright while the misuse is taking place.[109] It does not generally suspend or invalidate IP rights, nor does it award monetary damages to the parties harmfully affected. As a matter of reasonable procedure, economic fence-building would compel what courts now do; no judgment can be granted until the misuse stops. Markets and negotiations cannot then move forward efficiently if one party uses copyright or patents in an abusive or anti-competitive manner. Courts then implement efficient practice by delaying action until the misuse is resolved.

7. THE SECOND GENERATION

The RIAA's victory over Napster -- and related services Audiogalaxy[110] and Madster[111] -- may yet have been Pyrrhic. As a result of the Napster shutdown, an installed base of 64 million users was released for other

sharing services that came to perform more functions (i.e., videos) than had Napster. Webnoize estimated that over three billion files were downloaded in the month after Napster first shut down (August, 2001), exceeding Napster's highest previous monthly level of 2.79 billion (February, 2001).[112]

Versions of the present leading P2P service, Kazaa, have now (May, 2003) been downloaded over 230 million times, exceeding Napster's 64 million by more than threefold.[113] Kazaa now claims to have ten million unique users, in contrast to the 300,000 people who have signed up with a legitimate music service.[114] Shipments of CDs from the major labels fell by 10 percent over the past two years, which the recording industry contends is the result of unauthorized file-sharing.[115]

Three service providers -- KaZaa BV (aka Consumer Empowerment), Grokster, and Music City (nka Streamcast) – came to provide the new market leader, Fast Track, that Kazaa BV licensed. Without use of centralized directory, Kazaa users first access a controlled network server, which assigns to a unique name/password and provides desktop software that enables data transfer.. New customers are then assigned to a regional cluster of personal computers that are oriented around a supernode, which is a selected user computer with appropriate technical characteristics that can store directory information.

Not owned or operated by the service, the supernode computer enables any party to find and download material on other hard drives in the neighborhood. Because communications between computers are encoded and anonymous, the original service provider has no way of knowing what information a user searches, downloads, or shares. Service providers now give away desktop software and monetize their investments through the sales of onscreen advertising, personal data tracking, and processor and storage services made possible through distributed computing.

Twenty-nine companies in the recording and movie industries filed suit against KaZaa, Grokster, and Music City on October 2, 2001 for contributory and vicarious infringement.[116] The National Music Publishers Association joined the suit on November 19. In January, 2002, Kazaa BV sold the desktop technology, Kazaa Media Desktop, to Sharman Networks of the island Vanuatu.[117] The plaintiffs settled with Kazaa BV in May, 2002.[118]

The matter against Streamcast and Grokster reached an unexpected moment in April, 2003, when District Court Judge Stephen Wilson granted summary judgment to the defense. Invoking *Sony,*[119]

> Defendants distribute and support software, the users of which can and do choose to employ it for both lawful and unlawful ends. Grokster and StreamCast are not significantly different from companies that sell home video recorders or copy machines, both of which can be and are used to infringe copyrights."[120]

While Napster played an active role in facilitating each unauthorized transaction, Streamcast and Grokster had no control over the software that they might have previously distributed; "if either defendant closed their doors and deactivated all computers within their control, users of their products could continue sharing files with little or no interruption."[121] The record industry is expected to appeal the matter to the Circuit Court.

Sharman Networks

Yet outstanding is the matter of Sharman Networks, which is the market-leader of the three services.

Immediately after settling with the RIAA, Kazaa BV formed a new company, called Blastoise, which continues to license Fast Track software.[122] In May, 2002, Sharman Networks and Brilliant Digital Entertainment licensed from Blastoise usage rights for Fast Track.technology that uses available storage capacity from Kazaa users to compose an edge services network to accommodate a variety of distributed computing needs.[123] This layer of distributed computing is made possible through an additional piece of software, Altnet Secureinstall, which is produced in a joint venture between BDE and software provider Blastoise. Physically connected to (but logically separate from) the Kazaa network, the size of the Altnet system greatly exceeds the base of P2P rivals, Kontiki, Centerspan, and Red Swoosh.[124]

While Sharman gives away free desktop software, it monetizes its service by distributing pop-up advertising and personalization files on user computers, and providing machine capacity as computing nodes to the Altnet system[125]. Personalization files gather information on user choices and favorite words that advertising clients may subsequently access. Indeed, advertising can be made to pop up instantaneously when certain key words are typed.[126] Sharman's stealth program has led to considerable criticism by privacy groups; Altnet is now the second most complained about ad software company on the web (behind Gator).[127]

The record industry initiated a lawsuit against Sharman in January, 2003.[128] Sharman countersued on antitrust grounds, contending that the labels had cooperatively and anticompetitively refused to license material to the file-sharing service. While Sharman might alternatively have alleged

that its distributed software could no longer be centrally controlled, labels and studios would apparently have disputed this. [129] The Sharman matter is now undecided.

A conceivable closure of Sharman notwithstanding, a sobering technological lesson may then be about to repeat itself. In eliminating Napster, the industry created the opportunity for more sophisticated and less controllable software to follow. While StreamCast and Grokster may now be less efficient than Sharman and their systems do not easily accommodate scaling or growth,[130] programming will not cease and entry will not stop. Also on the horizon is Freenet, an open source project that makes possible file encoding and migration to promise a wholly anonymous and untraceable way of distributing any form of content.[131]

With neither central directories nor the ability to retrieve or control distributed software, it may then be impossible to re-engineer peer-to-peer systems to retrieve old software, accommodate new software, or reject particular searches for copyrighted material. Courts furthermore might not be in a position to outlaw entirely new distributors of software. The present parties in the Sharman dispute may then consider reaching a reasonable licensing arrangement before technological realities again prevail over law.

8. STRATEGY BY MARKET

An welfare-maximizing economist might affirm with Carl Shapiro and Hal Varian, "When managing intellectual property, your goal should be to choose the terms and conditions that maximize the value of your intellectual property, not the terms and conditions that maximize [or optimize] the protection."[132] One hopes generally that licensing transactions maximize value, not prevention. In this respect, a fair settlement to a licensed solution could be a very attractive combination of content and delivery technology.

Many applications of distributed computing complement the technology needs of content owners. By concentrating and utilizing available storage and process space on local PCs, distributed computing can enable cell phones, handheld devices, and ordinary computers to have the same power as massive Web servers.[133] Product sold through Altnet generally can be made secure, protectable by digital rights management, and monetizable through micropayments.[134] Entire playlists on Kazaa can be presented and downloaded with one mouseclick[135] Altnet now makes possible the delivery of secure entertainment product, including music-based video games from Infrogames and sound recordings from

independent label 2Ksounds.[136] Cornerband.com uses P2P technology to sell music push services to bands that can be activated when users type certain words or phrases, such as "Chicago Blues".[137] Microsoft used Altnet to distribute two promotional videos that were bundled with the company's new Windows Media 9 (Jon Healey,) and plans to add P2P applications programming interfaces to its new operating system, Windows XP, which is designed to accommodate greater applications for entertainment.[138] Sony Music now distributes content over Scour's P2P network.[139] edge services provider Kontiki attracted investments from AOL Time Warner,[140] and Blastoise is now negotiating distribution deals with European telecom companies.[141]

There are eight compelling reasons why an integrated service between MusicNet, Pressplay, and a P2P service would be attractive.

1. *Promotional Instruments*: Growth in digital music subscriptions is disappointing. Music listeners, particularly those on campuses with broadband connections, prefer free downloads with unlimited burning to paid services with limits on burning and downloading. Peer to peer services have broad consumer appeal in a developing market and can be used as promotional devices to "jump start" the customer base.

As a promotion strategy, the digital services can offer a free P2P connection to new service subscribers for a limited period of time, say a few months. During that time, service upgrades can also be made available to any user for an additional fee. As a primary upgrade, the new service can offer P2P service without advertisements, a key source of concern for many present users of Kazaa. The file-sharing service would no longer be free after the trial period.

2. *Installed Base*: As more new subscribers join the digital services, the installed base of shared recordings would increase, enhancing commercial appeal of the service. This creates a "virtuous cycle" built around positive externalities and system feedback. In a classic example of "network tipping", the label system would gain popularity at the expense of the nonintegrated services and may culminate – "winner take all" -- in a virtual industry standard.

3. *Lock In*: After an period of introductory free service ends, a customer may wish to drop her subscription and attempt to find an alternative. However, migrants will lose contact with a considerable base of recordings, including those contributed by later subscribers who may yet come on the system for free. As a consequence, the relative advantage of the labels' service would increase as the subscriber base increases; music

fans would increasingly be discouraged from shopping for other services and might actually be willing to pay a premium to stay with the P2P system that is now established as part of digital service.[142]

4. *Ancillary Products*: Besides free introductory offers, labels may also use complementary P2P to reward loyal customers, large buyers, "upgraders", or listeners willing to commit to multiperiod contracts that span a designated period. A larger customer base will facilitate the sale of more advertising, personalization data, videos, concert tickets, books, new releases, samples, and high quality recordings that can be protected by digital rights management.

5. *Distributed Computing*: The distributed computing capabilities of P2P networks offer additional supply considerations that should promote scale economies and system growth. Distributed computing can accommodate caching and network storage without the buildout of additional servers. The capacity to do this actually increases as more subscribers join the system. For entertainment platforms, distributed computing can be useful to distribute recorded videos, movies, or video games without scaling up the server base. This is particularly relevant for the presentation of live concerts, where demand may surge for short intervals. . Particular acts may establish a secure virtual network with firewalls that accommodate greater security.

6. *Public Relations*: If complemented with P2P file-sharing and distributed computing, the new music services may present a "killer application" to reach a younger generation that is attracted more by video games, DVDs, and the Internet instead of traditional CDs. Record labels will earn a reprieve from an increasingly hostile group of fans and artists that perceives them (rightly or wrongly) to be overreaching litigants.[143] Finally, an aggressive strategy in the digital space will counter political cynics who contend that performers and copyright owners interfere with the spread of new technology.[144]

7. *Preserving Option Value*: By reducing the potential market for future unfriendly software, labels also maintain more control and the option to modify or terminate the service at appropriate moments. Indeed, it may be possible to leave free subscriptions in place for a longer period if evidence shows that people eventually graduate up to deluxe choices of their own free will.

8.*Piracy*: If P2P is regarded as a temporary platform, record labels might continue other efforts to deter unauthorized takings. In this respect, labels might continue efforts to release new CDs with "second session" protection that tethers uploaded tracks to the receiving.[145] With digital rights

management, they also might find it profitable to sell digital tracks that allow no or limited copying to other hard drives.[146] Finally, trusted systems allow protected tracks to be used on a limited number of peripheral devices.[147] However, it is quite conceivable that a number of other uses should go unprotected or free, for permanent or temporary amounts of time, if they can be elsewhere monetized.

The integrated entity of P2P technology can be operated as a joint venture. The five labels must apportion among one another the l buyout costs necessary to obtain the software, as well as payments due for musical compositions and sound recordings. It will also be necessary to add a module to the software to filter user requests through a centralized directory. The software should be usable by Pressplay and MusicNet. It may also be necessary to establish a licensing agreement with other digital service providers to accommodate antitrust concerns at the Justice Department.

The largest incumbent provider of P2P technology is the Fast Track system of Sharman and Grokster. With larger network size, Fast Track has considerable first-mover advantages and is the evident choice to start building a legitimate base for P2P file sharing. It is the most user-friendly P2P system, scaling more easily and avoiding congestion more readily than decentralized systems (i.e., Gnutella and Freenet). Both directory size and user ease were major attractions for the central directory services, such as Napster, and should continue to present an attractive advantage over more decentralized rivals

9. CONCLUSION

The case of file-sharing and peer-to-peer technology exemplifies one of the most interesting legal issues involving internet technology. These technologies will continue to reappear and will not fall to a string of court injunctions. Indeed, peer-to-peer methods may only become more extreme and less controllable.

The record labels may continue their litigation, and may have every apparent legal precedent and may win every judgment. Nonetheless, they are finding an obstinate opponent that springs heads like hydrae. The best that labels can realistically hope for may be buyout or a negotiated settlements with the most attractive, for the purpose of attracting fans from the more remote and preempting other entrants. While courts cannot necessarily force this outcome, they can constrain any negotiations within

proper procedure to move the process along in an efficient manner.

As a second option, the labels may back off from litigation against ambiguous technologies, and instead pursue action against individual infringers who might yet be their best "fans". In April, 2003, the recording industry sued four college students for operating peer-to-peer systems on their campuses' internal computer networks that allowed classmates to obtain unauthorized copies of copyrighted music for free; the students settled the suits for amounts up to $17,500 each.[148] With assistance from the U.S. Department of Justice, the company also won power to subpoena information from Verizon regarding the identity of a file-trader.[149] Individual infringement is now punishable by civil penalties under the Copyright Act and the No Electronic Theft Act, but may be less efficient to pursue.

NOTES

[1]Infra note 55-57 and surrounding text.

[2]Infra note 110 and surrounding text.

[3] Infra note 111 and surrounding text.

[4] Infra note 116 and surrounding text.

[5]*See* Jean Gabszewicz, Lynne Pepall, and Jacques-Francoise Thisse, "Sequential Entry with Brand Loyalty Caused by Consumer Learning by Using", 40 J. INDUSTRIAL ECON. 397 (1992); *see also* Gideon Parchomovsky and Peter Siegelman, "Towards and Integrated Theory of Intellectual Property". 88 VA. L. REV. 1455 (2002).

[4]T. W. Merrill, "Trespass, Nuisance, and the Costs of Determining Property Rights", 14 J.LEGAL STUD., 13, 18 (1985). Trespass applies to invasions of space by unauthorized persons and tangible objects, while nuisance applies more to indirect interferences that affect the enjoyment of that space (e.g., noise, odor, pollution). The principal distinction between trespass and nuisance is the standard of care applied to determine whether the interference is actionable; i.e., whether Marshall may enjoin and/or received damages from the action of Taney, or Taney may practice his intrusion without exclusion from Marshall. To establish an actionable trespass, Marshall must show that Taney has invaded his space.

[7]Charles E. Lindblom, *The Science of Muddling Through*, 19 PUB. ADMIN. REV. 79 (1959). Lindblom defines a *rational comprehensive* policy as one that tries to consider and weigh all factors, gather all relevant information, measure all relevant quantities, and willingly jump to extreme positions as logically justified.

[8]R. H. Coase, "The Problem of Social Cost", 3 J. LAW ECON. 1 (1960).

[9]See Chapter 1 for a fuller overview.

[10]Guido Calabresi and Douglas Melamed, "Property Rules, Liability Rules, and Inalienability: One View of the Cathedral", 85 HARV. L. REV. 1089, 1106-1110 (1972).

[11]Harold Demsetz, When Does the Rule of Liability Matter?, 1 J. LEGAL STUD. 13, 27-28 (1972). For application to torts, see Guido Calabresi & John T. Hirschoff, Toward a Test for Strict Liability in Torts, 81 YALE L. J. 1055, 1060 (1972); WILLIAM E. LANDES & RICHARD A. POSNER, ECONOMIC STRUCTURE OF TORT LAW, ch. 1 (1987)

[12]Reno v. ACLU, 521 U.S. 844 (1997). The Court ruled that users could more efficiently prevent exposure and disallowed the provisions. The Court efficiently reassigned the responsibility of policing for adult transmissions to the party capable of providing the prevention technology at the lowest cost.

[13] See Demsetz, supra note 11 Calabresi & Hirschoff, supra note 11; *see also* Stephen G. Gilles, Negligence, Strict Liability, and the Cheapest Cost-Avoider, 78 VA. L. REV. 1291 (1992).

[14]Bilateral care rules applied to property disputes were suggested first by Michelle J. White & Donald Wittman, Long Run versus Short Run Remedies for Spatial Externalities: Liability Rules, Pollution Rules, and Zoning, in ESSAYS ON THE LAW AND ECONOMICS OF LOCAL GOVERNMENTS 33 (Daniel L. Rubinfeld ed., 1979).

[15]On the other hand, if a specialized labor solution is mandated where the resources of only one player are to be mobilized, courts may reasonably prescribe compensations that could make both parties better off. See ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES 162 (1991).

[16]Steven Shavell, The Fundamental Divergence between the Private and the Social Motive to Use the Legal System, 26 J. LEGAL STUD. 575 (1997).

[17]This is particularly common in infringement cases that involve "transformative works", where innovative presentations that add new meaning to copyrighted material may be enjoined for a variety of reasons; *see also* Chapter 2.

[18]Gershwin Publ'g Corp. v. Columbia Artists Mgmt., Inc., 443 F. 2d 1159, 1162 (2d Cir. 1971); Fonovisa, Inc. v. Cherry Auction, Inc., 76 F.3d 259, 264 (9th Cir. 1996).

[19]Cable/ Home Communication Corp. v. Network Productions., 902 F.2d 829, 846 (11th Cir. 1990); Sega Enter., Ltd. v. MAPHIA, 948 F. Supp. 923, 933 (N.D.Cal 1996).

[20]Fonovisa, supra note 18, at 264, citing Columbia Pictures Industries, Inc. v. Aveco, Inc., 800 F. 2d 59 (3rd Cir. 1986).

[21]Gershwin, supra note 18, at 1162; Fonovisa, supra note 18, at 264.

[22]Polygram Int'l Pub'g, Inc. v. Nevada/TIG, Inc., 855 F. Supp. 1314, 1332 (D. Mass. 1994); *see also* Famous Music Corp. v. Bay State Harness Horse Racing and Breeding Ass'n, 54 F. 2d 1213, 1214 (1st Cir. 1977).

[23]Demitriades v. Kaufmann, 690 F. Supp. 289, 292 (S.D.N.Y. 1988).

[24]Buck v. Jewell-LaSalle Realty Co., 283 U.S. 191 (1931); Dreamland Ball Room, Inc. v. Shapiro, Bernstein & Co., 36 F.2d 354 (7th Cir. 1929); M. Witmark & Sons v. Tremont Society & Athletic Club, 188 F. Supp. 787 (D. Mass. 1960); Renmick Music Corp. v. Interstate Hotel Co., 58 F. Supp. 523 (D. Neb. 1944), aff'd, 157 F.2d 744 (8th Cir. 1946).

[25]Shapiro, Bernstein, and Co. v. H.L. Green Co. 316 G. 2d 304 (2d Cir. 1963)

[26]Elektra Records Co. v. Gem Elec. Distribs., Inc., 360 F. Supp. 821 (E.D.N.Y. 1973).

[27]RCA Records v. All-Fast Sys., Inc., 594 F. Supp. 335 (S.D.N.Y. 1984).

[28]Fonovisa, supra note 18, at 259.

[29]Polygram, supra note 25.

[30]Major Bob Music v. Stubbs, 851 F. Supp. 475 (S.D. Ga. 1994); Walden Music, Inc. v. C.H.W., Inc., 1996 WL 254654, at *5 (D. Kan. Apr. 19, 1996); Broadcast Music, Inc. v. Hobi, Inc. 1993 WL 404152, at *3 (M.D. La. Jun. 24, 1993).

[31]A&M Records, Inc. v. General Audio Video Cassettes, Inc., 948 F. Supp. 1449 (C.D. Cal 1996); A& M Records, Inc. v. Abdallah 948 F Supp. 1449 (1996). .

[32]Richard J. Gilbert and Michael L. Katz, "When Good Value Chains Go Bad: The Economics of Indirect Liability for Copyright Infringement", 52 HASTINGS L.J. 961 (2001).

[33]Audible Magic allows operators to install technology to read files transmitted over the system. With a directory of musical fingerprints, Audible Magic can be used to detect illegal transmissions of copyrighted sound recordings, which now may consume over 50 percent of a university's available bandwidth. John Borland, "Fingerprinting P2P pirates", CNET NEWS.com, February 20, 2003

[34]Packeteer prioritizes data flows in a manner that can detect and slow traffic that moves through a P2P network. Ib.

[35]464 U.S. 417 (1984).

[36]480 F. Supp. 429 (C.D. Cal. 1979)

[37]659 F. 2d 963 (9th Cir. 1981).

[38]Supra note 35, at 451, 453.

[39]Id., at 442.

[40]Id., at 444, 456.

[41]Id., at 450.

[42]Regarding empirical evidence, the Court concurred with the District Court opinion that found that plaintiff evidence that demonstrated market harm was speculative, inaccurate, and worthy of dismissal. Id. at 452-3.

[43]Id., at 451.

[44]Id., at 491 (Dissent).

[45]480 F. Supp. at 462. Plaintiffs Universal and Disney suggested that the infringing uses of the VCR could be addressed by removal of the tuner or introduction of a jamming signal that would stop copying of protected programs.

[46]Jack Valenti, president of the Motion Picture Association of America, testified before a Congressional Committee: ""I say to you that the VCR is to the American film producer and the American public as the Boston strangler is to the woman home alone." Valenti called the VCR an "avalanche" and a "tidal wave", and said it would make the film industry "bleed and bleed and hemorrhage". Testimony, Committee on the Judiciary House of Representative, 97th Cong., Home Recording of Copyrighted Works. April 12, 1982.

[47]Id., at 440 ("The Court has always recognized the critical importance of not allowing the patentee to extend his monopoly beyond the limits of his specific grant. These cases deny the patentee any right to control the distribution of unpatented articles unless they are 'unsuited for any commercial noninfringing use.' Dawson Chemical Co. v. Rohm and Haas Co., 448 U.S. 176, 198 (1980)"; also citing Henry v. A.B. Dick Co., 224 U.S. 1,48 (1912); Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502, 517 (1917)).

[48]Id., at 456. "The direction of Article 1 is that Congress shall have the power to promote the progress of science and the useful arts. When, as here, the Constitution is permissive, the sign of how far Congress has chosen to go can come only from Congress [citing Deepsouth Packing Co. v. Laitram Corp., 406 U.S. 518, 530 (1972)]."

[49]Id., at 431, 456.

[50]17 U.S.C. § 1002

[51]17 U.S.C. § 1201(k).

[52]With peripheral devices known as "rippers", music users already had the ability to upload and compress tracks from store bought CDs for storage on hard drives using a data compression format called MP3 that reduced considerably the amount of disk space needed to contain a file. As the MP3 format lacked appropriate "flag" bits, users could freely exchange music files in emails between friends and chat groups.

[53]See Russell Frackman, Napster Legal Documents; *See also* Plaintiff's Brief on 512(a) Issue; Complaint for Copyright Infringement Against Napster.

[54]See Reply Brief of Appellant Napster at 15

[55]A&M Records, Inc. v. Napster, Inc., 114 F. Supp. 2d 896 (N. D. Cal. 2000).

[56]A&M Records, Inc. v. Napster, Inc., 239 F. 3d 1004 (9th Cir. 2000).

[57]A&M Records, Inc. v. Napster, Inc., No. C 99-05183 MHP, 2001 U.S. Dist. LEXIS 2186 (N.D. Cal. March 5, 2001).

[58]Supra note 55, at 918-920.

[59]Id., at 920-922.

[60]Id., at 912

[61]Id., at 913

[62]Id.

[63]Id.

[64]Id., at 913-914.

[65]Id., at 914-916.

[66]Id., at 917.

[67]Id., at 916.

[68]Id., at 910.

[69]Id., at 910-911.

[70]Id., at 911.

[71]Id., at 916.

[72]RCA Records v. All-Fast Sys., Inc., 594 F. Supp. 335, 339 (S.D.N.Y. 1984). (The Supreme Court "recognized that contributory infringer status had traditionally been given to those who were 'in a position to control the use of copyrighted works by others and had authorized the use without permission from the copyright owner.'… The manufacturer of the machine does not fit this definition since it has no such control once the machine is sold ")

[73]Supra note 55, at 917.

[74]Id., at 918

[75]"If a computer system operator learns of specific infringing material available on his system and fails to purge such material from the system, the operator knows of and contributes to direct infringement." 907 F. Supp. at 1374.

[76]Supra note 53, at 918, 920-21, n. 6

[77]Supra note 18, at 264

[78]Supra note 55, at 919-20.

[79]Supra note 56.

[80]Id., at 927.

[81]Id., at 926

[82]Id.

[83]Napster's Motion for Stay Pending Appeal, at 8, 13–14, 51–52.

[84]Appellant Napster Inc. Opening Brief, at 12.

[85]Napster's Motion for Stay Pending Appeal, at 15.

[86]Supra note 56. "The district court, however, failed to recognize that the boundaries of the premises that Napster 'controls and patrols' are limited. Put differently, Napster's reserved 'right and ability' to police is cabined by the system's current architecture. … The preliminary injunction . . . is overbroad because it placed on Napster the entire burden of ensuring that no 'copying, downloading, uploading, transmitting, or distributing' or plaintiff's works occur on the system. As stated, we place the burden on plaintiffs to provide notice to Napster of copyrighted works and files containing such works available on the Napster system before Napster has the duty to disable access to the offending content." (citations omitted)

[87]Id.

[88]Id.

[89]Supra note 57.

[90]Id at part 2.

[91]Id at part 3.

[92]Id. at 1.

[93]Id. at 11-12.

[94]John Borland, "Judge: Napster Filtering Efforts 'Disgraceful'", CNET NEWS.COM, (Apr. 10, 2001)

[95]"The Gracenote technology inserts into the beginning of an MP3 file that was ripped with a Gracenote-enabled encoder a Track Unique Identifier (TUID). The TUID is a unique identifier that may be used to identify music tracks. Further, applications exist, and in the future could be put into the Napster client software, that would retroactively insert a TUID into MP3 files that had been ripped with a Gracenote-enabled ripper that had not previously inserted a TUID. Using this TUID, Napster could filter files based on their content rather than their name." Plaintiffs' Report on Napster's Non-Compliance with Modified Preliminary Injunctions, at 14-5

[96]"A recording can be analyzed for traces of unique digital characteristics, usually through the use of a proprietary or patented algorithm. As a result, a 'fingerprint' of these characteristics is derived. This 'fingerprint' can be used to identify specific recordings, regardless of the name placed on the file by the Napster user, the source of the recording or technical difficulties such as frequency or sampling rate." Id., at 14.

[97]"Napster, Bertelsmann's Digital World Services Working on Service", DIGITAL MEDIA WIRE

(February 16, 2001).

[98]Lisa M. Bowman, "Napster Orders Strict Service Upgrade", CNET NEWS.com, (June 28, 2001).

[99]Id.

[100]Evan Hansen & Lisa M. Bowman, "Court: Napster filters must be foolproof", CNET NEWS.COM (July 12, 2001)

[101]Id.

[102]Jim Hu, "Napster: Gimme shelter in Chapter 11", CNET NEWS.COM, June 3, 2002

[103]In Re Napster, Inc. Copyright Litigation. No. MDL 00-1369 MHP.

[104]911 F. 2d 970, 976 (4th Cir. 1990)

[105]121 F. 3d 516 (9th Cir. 1997)

[106]Section II.A., supra note 100.

[107]Id., Section II.B.1; *see also* Noll. Decl.

[108]Id., Section II.

[109]Supra note 105, at 520, n. 9 ("Copyright misuse does not invalidate a copyright, but precludes its enforcement during a period of misuse.")

[110]Gwendolyn Mariano, "Audiogalaxy to ask first, trade later", CNET NEWS.COM, June 18, 2002.

[111]John Borland, "Madster told to pull the plug", CNET NEWS.COM, December 3, 2002

[112]John Borland, "Suit Hits Popular Post-Napster Network", CNET NEWS.COM, October 3, 2001.

[113]Reuters, "Kazaa nears download record", CNET NEWS.COM, May 22, 2003.

[114]Jane Weaver, "Compact disc sales slid in 2002", MSNBC.NEWS.COM, February 29, 2003.

[115]Id. Other experts blame high CD prices, radio consolidation, and an industry focus on hit-oriented artists of limited or nonexistent talent.

[116]Plaintiff's Complaint for Damages and Injunctive Relief for Copyright Infringement, Metro Goldwyn Mayer et al. v. Grokster et al., C. D. Ca, No. 01-CV-8541 SVW, 2001; Class Action Complaint for Copyright Infringement, C.D. Ca, No. 01-09923 GAF, 2001

[117]Jim Hu, Kazaa picks up the speed with update, CNET NEWS.com, February 11, 2002

[118]Declan McCullagh, "Judge: Kazaa can be sued in U.S.", CNET NEWS.com, January 10, 2003.

[119]Supra notes 35-51.
[120]quoted in John Borland, "File-swapping tools are legal", CNET NEWS.com, April 25, 2003.

[121]Id.

[122]John Borland, "Kazaa, Morpheus legal case collapsing", CNET NEWS.com, May 22, 2002.

[123]John Borland, "Stealth P2P Network Hides Inside Kazaa", CNET NEWS.com, April 1, 2002

[124]Id.

[125]John Borland, "The brains behind Kazaa", CNET NEWS.com, December 29, 2002

[126]John Borland, "New Kazaa likely to raise labels' ire", CNET NEWS.com, September 22, 2002

[127]John Borland, "Spike in 'Spyware' accelerates arms race", CNET NEWS.com, February 24, 2003

[128]Id.

[129]re Grokster and StreamCast, supra notes 119-21 and surrounding text.

[130]Gwendolyn Mariano, "Rival Services Prepare for Napster Onslaught", Tech News, News.com, March 1, 2001.

[131]"This is the first [release] where we can confidently encourage people to go download the software and comfortably expect to work for them." John Borland, "Freenet keeps file-trading flame burning" CNET NEWS.com, October 28, 2002. See "Protecting Free Expression Online with Freenet", IEEE Internet Computing 6(1), 40-49 (2002). (Currently the most up-to-date explanation of Freenet, including details of innovations in Freenet's security architecture since Ian Clarke's original design0. The original unpublished paper upon which the Freenet architecture is based in Ian Clarke, "A distributed decentralized information storage and retrieval system" (1999). For the first publication, see Ian Clarke, Oskar Sandberg, Brandon Wiley, and Theodore W. Hong, "Freenet: A Distributed Anonymous Information Storage and Retrieval System" ADAISARS in Designing Privacy Enhancing Technologies: International Workshop on Design Issues in Anonymity and Unobservability, LNCS 2009, ed. by Hannes Federrath. Springer: New York (2001). *see also* John Borland, "Networks promise unfettered file swapping", CNET NEWS.com, June 19, 2001.

[132]Carl Shapiro and Hal R. Varian, INFORMATION RULES 5 (1999).

[133]John Borland, "Sun's Joy rapturous over Jxta", CNET NEWS.com, June 6, 2001.

[134]Jeanne-Vida Douglas, "Altnet tops 2 million downloads", CNET NEWS.com, July 2, 2002

[135]John Healey, "Microsoft using Kazaa as a Marketing Portal", September 22, 2002, L.A. Times.

[136]John Borland, "Paid content comes to Kazaa", CNET NEWS.com, May 19, 2002

[137]John Borland, "Bands to buy Kazaa search results", CNET NEWS.com, August 22, 2002

[138]Martin La Monica, "Microsoft makes P2P play", CNET NEWS.com, February 26, 2003. The company also has purchased Xdegrees and invested in Groove Networks as part of an integrative P2P strategy designed to promote application software. Sandeep Junnarkar, "P2P boost for Microsoft's .Net?", CNET NEWS.com, September 16, 2002..

[139]John Borland, "Paid Content comes to Kazaa", CNET NEWS.com, May 19, 2002

[140]John Borland, "Freenet founder launches P2P product " CNET NEWS.com, April 30, 2002

[141]John Borland, "The brains behind Kazaa", CNET News.com, December 29, 2002

[142] From an economic perspective, customers who forego the digital services for any of these alternatives actually suffer switching costs resulting from an interior P2P selection.

[143] The RIAA is the first trade association to have attracted organized boycotts of its members, replete with appropriate apparel, housewares, auto goods, cards, prints, and tote bags. See http://www.boycott-riaa.com

[144] Giovanna Fessenden identifies six. Musicians in 1877 boycotted the phonograph that would displace live music, music publishers in 1909 sought to prevent the distribution of the piano roll that would displace sheet music, songwriters in 1920 opposed broadcast music for fear that it would reduce performance royalties, the music industry in 1982 lobbied Congress to require manufacturers of tape recorders to pay royalties, the movie industry in 1983 opposed the VCR and brought action against Sony, and the RIAA in 1997 sought to enjoin the Rio portable music player. G. Fessenden, "Peer-to-Peer Technlogy: Analysis of Contributory Infringement and Fair Use", 42 IDEA 391 (2002).

[145]Joe Wilcox, "Microsoft protecting rights--or Windows?", CNET News.com, February 3, 2003

[146]Joe Wilcox, "Microsoft expands rights management tool", CNET News.com, February 21, 2003

[147]Id.

[148] Lisa M. Bowman, "Are file traders next?", CNET NEWS.COM, April 25, 2003.

[149] John Borland, "Verizon gets 14 days to ID file-swapper", CNET NEWS.COM, April 24, 2003.