

# EXHIBIT 2

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**Expert Report of Professor James Boyle**

1. I am currently the William Neal Reynolds Professor of Law at Duke University, and have been retained by Farella, Braun + Martel LLP on behalf of the Defendants in this action as an expert witness. I have personal knowledge of the following facts and, if called and sworn as a witness, could competently testify thereto.

**Background and Qualifications**

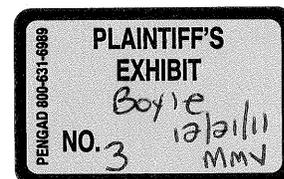
2. I received an LL.B. (Hons) from Glasgow University (1980), and an LL.M. (1981) and S.J.D. (1986) from Harvard Law School. I have been a law professor since 1982, teaching at American University, and at the Universities of Pennsylvania, Harvard and Yale as a Visiting Professor. In 2000 I joined the law faculty at Duke.

3. My academic research is mainly in the areas of intellectual property and communication policy, with a particular focus on the Internet. I have written and edited numerous articles and books on these subjects; a full list is available in the attached *curriculum vitae*. In 2003 I received the World Technology Network Award for law. My most recent book, *The Public Domain* (Yale University Press 2009), was the American Society for Information Science and Technology Book of the Year and the winner of the Donald McGannon Award for communications policy.

4. My scholarly work has dealt with three areas relevant to this testimony: a) "open source" software, such as Linux or Firefox, which is distributed under licenses that allow users freely to copy and make derivative works of the copyrighted code. I have extensively researched the structure of incentives and innovation in open source software and written about its features and its various licenses in my articles and books. b) cultural material that is made available under open licenses such as the Creative Commons set of licenses. There are millions of digital files covered by such licenses, ranging from photographs to scientific articles. The license is a way for the copyright owner to give permission in advance for various kinds of uses. I was one of the founding Board Members of Creative Commons and served on its board from 2002 until 2009, the last year as Chairman. c.) Public Domain material. I am one of the founders of the Center for the Study of the Public Domain at Duke Law School and the subject of my most recent book was the role of the public domain in innovation and culture.

**Scope of Expert Assignment**

5. My primary task was to explore some examples of the non-infringing uses of the Hotfile system. Defendants' counsel asked me to study the use of the Hotfile service to store and to distribute or download the types of material described above, that is to say, material which can be licitly copied and distributed. I did not research the many other types of content that could be licitly stored or transferred on Hotfile, including US government works, uncopyrightable material such as databases made up entirely of unoriginal compilations of facts, users' privately created content and so on.



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6. Defendant’s counsel also asked me to examine Hotfile’s Affiliate program, and specifically to look at how it can be used to compensate creators of content for distribution of their work on the Internet. I was asked to determine whether, for example, Hotfile’s Affiliate program compensates open source software developers for the software they write and freely distribute.

7. My examination of Hotfile was not an exhaustive review of the files on Hotfile, nor does it purport to be a representative statistical sample of the uses of Hotfile as a whole.

8. I am being compensated for my testimony at the rate of \$750 an hour.

**Summary of Opinions**

9. After examining the Hotfile system, I came to four conclusions that I believe may be helpful to the court’s analysis of both “substantial non-infringing uses” and of *Grokster*-style inducement liability.

i. First, there was a high volume of usage of the Hotfile system for activities that were either clearly non-infringing or highly likely to be non-infringing. Most notably, I determined that there is a high volume of usage of the Hotfile system for distribution of free and open source software. My non-comprehensive study found more than 1.7 million downloads of the six open source programs examined. Using the Hotfile system to share non-infringing software files was also a *popular* usage of the system in relative and absolute terms: the top two most downloaded files on Hotfile were open source programs. Open source and free software programs are a substantial (and growing) component of the software market today, so Hotfile’s proven suitability and compatibility with such licensing models is of significance.

ii. Second, Hotfile’s architecture is compatible with and is actually being used for a wide *range* of activities, beyond the open source software context. Examples of non-infringing uses that I identified ranged from distributing a public domain version of *Huckleberry Finn* to sharing Creative Commons-licensed “open source” animated movies. My methodology did not attempt to exhaustively identify such uses.

iii. Third, for reasons explained in the report, services such as Hotfile fill a gap in the Internet’s architecture by providing a convenient and generic method of distributing or storing files that are too large for e-mail. This is particularly important for small developers of open source software or non-profit distributors and collaborators in cultural projects under open licenses, like the “Blender Project” of open animation discussed in the report. This functionality is useful to anyone who wishes to store and transfer large files of their own creation for use in their daily professional and personal activities.

iv. Fourth, at least two of the open source developers featured in this study were

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active participants in Hotfile’s “Affiliate” program, thus being indirectly compensated for the programs they were freely providing to the public. This suggests that the Hotfile Affiliate program is capable of fulfilling the valuable function of compensating authors and distributors in proportion to the frequency with which their works are downloaded.

**Study Methodology**

10. In order to conduct my examination of the material stored on the Hotfile system, I worked with Elysium Digital, LL.C., a computer science consulting company retained by defendant’s counsel. Under my direction, Elysium searched the Hotfile database for examples of the three types of files I mentioned earlier:

- I. Open source software
- II. Creative Commons licensed content
- III. Public Domain material

Each of these types of material is more specifically described below.

11. The search method was a multi-step process that proceeded as follows.

First, Elysium searched by keywords likely to be associated with each type of content. For example, in searching for open source software, Elysium would use the official filenames of open source programs – such as Firefox or Ubuntu -- and would search for these terms both in Hotfile’s database and on Google.

Second, they engaged in a human review of the contents of a small sample of the files retrieved by that search in order to discover what material was actually in the files since those terms alone could not identify the content precisely. For example, Ubuntu might refer to an African humanist philosophy of the same name, and there is a copyrighted film called “Firefox” which cannot be licitly shared. They verified, for example, that example files labeled “JDownloader” were actually the JDownloader software and that the movies that turned up from these searches were actually the Creative Commons licensed movies as indicated on Google. Based on the attached spreadsheet, this analysis should be reproducible. I assessed the copyright status of the human-verified materials they discovered, and instructed them to discard material that was not clearly in the relevant licitly sharable category.

Third, when they identified an example of a particular file type – for example a file that contained a verified distribution of Firefox – they produced a “hash” or digital signature that uniquely identified the file. I asked Elysium to use two different mathematical methods of producing hashes – MD5 and SHA1 – on each file in order to preclude false positives. Additionally, developers of open source software often list the hashes of the files on their web site so that users can verify that there were no errors during the download of the software. When possible,

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Elysium compared the hashes of a file from Hotfile with the hashes listed on the developer's web site to further confirm that the file is identical to what can be downloaded from the developer's web site.

Fourth, Elysium searched the Hotfile database for those unique hashes – thus identifying other examples of exactly the same file which might or might not have been stored under the same name. This allowed me to have confidence that if we identified one copy of a file and confirmed that it was indeed within the specific category (open source, public domain, etc.) I could establish that all of the other “hits” with the identical hash in the Hotfile database were perfect duplicates, and thus were also within the specific licitly shared category. This method was deliberately conservative. For example, an open source program that had become garbled in uploading, or an earlier release of a freeware program – version 1.0 rather than 1.1– would produce a different hash and thus would not be counted in the analysis, though it would still be legal to up- and download. In addition, different compression software, or simply a decision to “break” the various portion of a Creative Commons film at a different point in a .rar file, would also result in a different hash signature.

12. This process was extremely labor-intensive and, in the time allowed, we could not classify, verify and conclusively assess a majority of the files identified by the preliminary keyword search. Thus, for example, there were 36 sets of files that used the name of an open source program which may be legally copied that we did not have time to assess at all: Apache, Chrome, ChromeOS, Debian, Django, Drupal, Emacs, FreeBSD, FreeSpire, Gimp, GNU programs, KDE, Knoppix, LibreOffice, Linspire, Mediawiki, MongoDB, Moodle, Mozilla, MySQL, Mythbuntu, OpenSolaris, PHP, Python, RenovatioCMS, Solaris, Squiz, StarOffice, SugarCRM, Suse, Symbian, Thunderbird, Wiki, Wordpress, Xandros, and Xebian. Due to the constraints, none of these were included in the final assessment. Thus, the listing in this report is best viewed as exemplary of particular non-infringing uses, not exhaustive. In addition, any material that we could not identify with a high degree of certainty as non-infringing—for example due to insufficient licensing information--was omitted from this report. For example, we omitted pre-1923 movie files that might or might not have had new copyrighted material added to them, and Creative Commons licensed material that might or might not have been distributed in accordance with the terms of the license.

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**I**

**Free and Open Source software**

13. “Free and open source software” is the term used to describe software that is produced under a number of public licenses that grant to users the rights freely to copy the software and to make derivative works – new versions of the program, customized for some particular purpose. Commonly known examples of such software include the Firefox and Chrome web browsers, the Linux operating system, the Apache web server software and the Android operating system for mobile devices.

14. The most common free and open source licenses include the General Public License (GPL) produced by the Free Software Foundation and the BSD, or Berkeley Software Distribution license. These licenses differ in their particular terms. For example the GPL requires that, if a user receives software governed by the GPL, modifies it and then publicly redistributes the resulting derivative work, he must place the modified code under the same license that granted him the freedom to modify it in the first place. The BSD license, by contrast, imposes no such requirement on makers of derivative works. All of the licenses classified as free or open source, however, allow users freely to copy and distribute the software placed under the license. They also place no limits on commercial exploitation of the code by users and developers. Thus, uploading this type of software to or downloading it from a site such as Hotfile is entirely legal, as is receiving compensation from the “Affiliates” program for the volume of such downloads.

15. Unlike proprietary software developed by a single company, open source software relies on a decentralized network of developers, commercial and non-commercial, large and small. Both developers and users of open source software must use a variety of file storage and transfer methods to distribute or get access to the code produced under the license. Open source software is now a significant piece of the global software market.

16. The networks that produce open source are diverse. A single software project such as Mozilla/Firefox or a particular distribution of Linux might include paid programmers working for a large company such as IBM, Google or Red Hat and individuals who are donating their time to the project and who work in loosely organized collaborative arrays.<sup>1</sup> They are also heterogeneous in size, ranging from huge projects such as the two just mentioned, to small groups or individuals working on a single program. These features of open source projects have been of considerable interest to scholars studying the structure of innovation in this apparently anomalous economic system.<sup>2</sup> Two salient characteristics emerge from

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<sup>1</sup> Yochai Benkler, *Coase’s Penguin, or, Linux and the Nature of the Firm*, 112 *Yale Law Journal* 369 (2002.);

<sup>2</sup> Steven Weber, *THE SUCCESS OF OPEN SOURCE* (2004); *PERSPECTIVES ON FREE AND OPEN SOURCE SOFTWARE* (Feller, Fitzgerald et al. eds 2005); Josh Lerner and Jean

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that scholarship: a.) these networks rely on the ease of communication and file transfer and storage facilitated by the Internet; the reduction of the transaction costs of collaboration is the single most important precipitating factor for forms of creativity such as open source. b.) participants who are not working for commercial entities are nevertheless able to profit from their contributions to open source projects, whether by demonstrating their skills to future employers or by being paid indirectly, for example through “tip jars” or per download fees from file storage systems such as Hotfile. These methods of indirect compensation are thus important to the future of distributed creativity.

17. Elysium Digital’s search focused on six open source programs: Firefox, iREB and sn0wbreeze, JDownloader, OpenOffice.org and Ubuntu. As mentioned in paragraph 12, 36 other possible open source programs were identified by keyword searches, but it was impossible in the time available to explore and verify them all, and they are not included in this count. Under my direction, Elysium human-verified a source file and then used two different methods of generating “hashes” or digital fingerprints of the file so that they could identify perfect copies of that file elsewhere on the system, even if they were named differently. A complete table of all the results, with download counts of the individual source file and comprehensive download counts that include both the source file and hash-verified identical instances of the file is provided at the end of the open source software section of this report. The “Verified ID” column provides the ID or locator of the source file on the Hotfile system. The “Hash Match ID” column gives the ID’s of all of the files that were an exact hash match with that original source file.

18. Focusing only on the six programs in the current study, we found a significant level of downloading. There were more than 1.7 million downloads of these files from Hotfile. Elysium Digital reported to me that two of the programs, iREB and sn0wbreeze, were the top 2 most downloaded files from Hotfile. That is to say, out of all the content on Hotfile, these files were the most often downloaded. The examples of open source software were as follows:

19. **Firefox:** Firefox is an open source web browser distributed by Mozilla, a non-profit organization<sup>3</sup> It is distributed under the Mozilla Public License<sup>4</sup> which

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Tirole, *The Simple Economics of Open Source* NBER Research Paper 7600 (2000).

<sup>3</sup> <http://www.mozilla.org/about/> (last visited Nov 12, 2011.)

<sup>4</sup> *Firefox: About* tab, “Mozilla Firefox is free and open source software, built by a community of thousands from all over the world. There are a few things you should know:

Firefox is made available to you under the terms of the Mozilla Public License. This means you may use, copy and distribute Firefox to others. You are also welcome to modify the source code of Firefox as you want to meet your needs. The Mozilla Public License also gives you the right to distribute your modified versions.” The Mozilla Public License can be found here <http://www.mozilla.org/MPL/> (Last visited Nov 12, 2011.)

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specifically gives users the freedom to copy, distribute and modify its code.<sup>5</sup>

Legal Status: Clearly Non-infringing

Downloads: There were 460 verified downloads of the human-verified instance of Firefox that we identified.

**20. JDownloader:** JDownloader is an open source download assistant that simplifies the process of downloading. JDownloader’s developers describe it as completely open source,<sup>6</sup> and licensed<sup>7</sup> under the General Public License.<sup>8</sup> The developers allow free copying and redistribution. JDownloader advertises itself as useful on one-click hosting sites, and can also be used on sites such as Google Books or social networking sites such as Taringa.<sup>9</sup> Like a web browser, JDownloader makes no distinction between infringing or non-infringing content and thus could be used for both licit and illicit downloading. The potential for illicit use, however, is not sufficient to enjoin a product. JDownloader would seem easily to pass the standard laid down in *Sony v Universal*<sup>10</sup>: a product’s distribution may not be enjoined on the grounds that it could be used to violate copyright if the product has or is capable of substantial non-infringing uses.

Legal Status: Very likely non-infringing.

Downloads: There were 203,389 downloads of the identified JDownloader files and 228,814 total downloads, including hash-match copies of the human-verified instances of JDownloader. Under my direction, Elysium Digital determined that JDownloader’s developers appear to be members of the Hotfile Affiliates program

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<sup>5</sup> “2.1. The Initial Developer Grant. The Initial Developer hereby grants You a world-wide, royalty-free, non-exclusive license, subject to third party intellectual property claims: under intellectual property rights (other than patent or trademark) Licensable by Initial Developer to use, reproduce, modify, display, perform, sublicense and distribute the Original Code (or portions thereof) with or without Modifications, and/or as part of a Larger Work.” Mozilla Public License 1.1 <http://www.mozilla.org/MPL/MPL-1.1.html> (last visited Nov 12, 2011.)

<sup>6</sup> “JDownloader is open source, platform independent, and written completely in Java.” <http://jdownloader.org/> (last visited Nov 12, 2011.)

<sup>7</sup> <http://jdownloader.org/home/features> (last visited Nov 12, 2011.)

<sup>8</sup> My preliminary investigations indicate the source code for some portions of the program may not be publicly available (a requirement of the license.) While this may be legally significant for those who wish to *modify* the code, and are unable to find all of it, it has no effect on whether it is legal simply to copy or redistribute the program as is, and thus has no apparent bearing on this case.

<sup>9</sup> “JDownloader Review” Software Explorer <http://www.softwareexplorer.com/jdownloader-96540.html> (last visited Nov 12, 2011.)

<sup>10</sup> *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984).

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and thus are being indirectly compensated for their popular free software in proportion to the number of downloads.<sup>11</sup> The number of downloads was substantial and, in all probability, considerably higher than the figures given here. Elysium Digital examined the Hotfile database and discovered that authors of JDownloader had 17 of the top 100 most downloaded files. Since the software distributed by the authors of JDownloader is open source, these files would presumably be entirely licit to copy and share. However, most of those files were no longer available on Hotfile, so this count is limited to a subset of those versions of the JDownloader software that we able to conclusively verify.

21. **iREB & sn0wbreeze:** iREB and sn0wbreeze are open source programs developed (predominantly) by a programmer whose screen name is iH8sn0w.<sup>12</sup> They are used to “jailbreak” iPhones. In the words of the Librarian of Congress, “jailbreaking” is the colloquial term for “circumvention of the technological measures contained on certain wireless phone handsets (known as ‘smartphones’) that prevent third-party software applications from being installed and run on such phones.”<sup>13</sup> To put it differently, to “jailbreak” a phone is to allow the phone’s operating system to run applications of the user’s choice. On July 27<sup>th</sup>, 2010, in a Digital Millennium Copyright Act (DMCA) triennial rulemaking, the Librarian of Congress determined that jailbreaking a smartphone such as an iPhone was legal under the DMCA. That is, it does not constitute a violation of DMCA section 1201’s prohibition against circumventing a technological protection measure that controls access to a copyrighted work (the software in the smartphone). More specifically, one of the six exempt classes of works that the rulemaking announced was:

Computer programs that enable wireless communication handsets to execute software applications, where circumvention is accomplished for the sole purpose of enabling interoperability of such applications, when they have been lawfully obtained, with computer programs on the telephone handset.<sup>14</sup>

iREB and sn0wbreeze are used to do exactly this. Without access to such programs consumers (at least those consumers who are not software engineers) would be unable to make the use identified in the Librarian’s rulemaking. Both programs are licensed under the General Public License<sup>15</sup> and are thus legal to copy and to

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<sup>11</sup> The Affiliate account has an associated e-mail address which uses the JDownloader domain and has the user-name JDownloader. The software uploaded by that account is software produced by the JDownloader developers.

<sup>12</sup> See <http://ih8sn0w.com/> (last visited Nov 12, 2011.)

<sup>13</sup> <http://www.copyright.gov/fedreg/2010/75fr43825.pdf>

<sup>14</sup> Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, Final Rule, 75 Fed. Reg. 43,825 (July 27, 2010) (codified at 37 C.F.R. §201.40).

<sup>15</sup> See <https://github.com/iH8sn0w/iREB-2.0/blob/master/LICENSE> and <https://github.com/iH8sn0w/sn0wbreeze/blob/master/LICENSE> (last visited Nov 12, 2011.)

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redistribute, commercially and non-commercially. The developer of these programs, iH8sn0w, uses Hotfile to distribute them to the public. If one goes to his homepage, one will find download links directly to Hotfile.<sup>16</sup> For example, the most recent version of iREB can be found at

<http://hotfile.com/dl/125818297/0d55168/iREB-r4.zip.html> and of sn0wbreeze can be found at <http://hotfile.com/dl/134691967/4171147/sn0wbreeze-v2.8b11.zip.html>

Under my direction, Elysium Digital determined that iH8sn0w is a member of the Hotfile Affiliates program and is thus being indirectly compensated for his popular free software in proportion to the number of downloads.

Legal Status: Very likely non-infringing

Downloads: For iREB, there were 691,625 downloads of the source file identified by Elysium and a total of 885,583 downloads including hash-match verified copies of that file. For sn0wbreeze, there were 108,985 downloads of the source file identified by Elysium and 629,783 total downloads including hash-match verified copies of that file. As mentioned before, Elysium Digital reported to me that iREB and sn0wbreeze were the two most frequently downloaded files on Hotfile.

22. **OpenOffice.org:** OpenOffice.org is an open source suite of office productivity tools similar to Microsoft Office in its functions. The software is distributed under the Lesser General Public License.<sup>17</sup> Copying is expressly permitted.

Legal Status: Clearly non-infringing.

Downloads: There were 9581 downloads of the identified OpenOffice.org source files and 30,265 total downloads including identical hash-verified instances of those OpenOffice.org files.

23. **Ubuntu:** Ubuntu is an open source desktop software system built on the Linux platform. The Ubuntu distribution is designed to supply open source versions of all the software a user will require – from operating system to browser to word processing – either included in the bundle or downloadable from within the operating system. While various add on components of Ubuntu may have differing licenses, the standard distribution of the “Main” and “Restricted” sections of Ubuntu is licensed under open source terms and all parts of the standard distribution are

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<sup>16</sup> See <http://ih8sn0w.com/> (last visited Nov 12, 2011.)

<sup>17</sup> “OpenOffice.org uses a single open-source license for the source code and a separate documentation license for most documents published on the website without the intention of being included in the product. The source-code license is the GNU Lesser General Public License. Effective OpenOffice.org 3.0 Beta, OpenOffice.org uses the LGPL v3. The document license is the Public Document License (PDL).” <http://www.openoffice.org/license.html> (last visited Nov 11, 2011.)

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under licenses that guarantee the right freely to copy the software.<sup>18</sup>

Legal Status: Clearly non-infringing.

Downloads: There were 113 downloads of Ubuntu, source and hash-verified.

**TABLE ONE – EXAMPLES OF FREE AND OPEN SOURCE SOFTWARE ON HOTFILE**

<b>Name</b>	<b>Keywords/Query</b>	<b>Verified IDs</b>	<b>Hash Match IDs</b>	<b>Verified Downloads</b>	<b>Verified &amp; Hash Downloads</b>
Firefox	Searched on "firefox" from file_names on hotfile database.	111035126		460	460
JDownloader	JDownloader	4051026, 14052520, 81315168, 23418241, 27342313	45471394, 14090647, 29015390, 13934079, 106024395, 124158886, 106346182, 98911239, 124395721, 85729258, 105581035, 106344622, 92329459, 105548820, 102599094, 114067993, 106462457, 97900827, 81607389, 94567934, 24440741, 127148368, 99280977, 125775956, 93040444, 18894080, 25576195, 106438662, 73552519, 117806124, 113552377, 126354675, 109171920, 116443534, 22398479, 18270992, 82381329, 103151762, 94548371, 91699126, 110450072, 23823513, 113545910, 101418523, 117047836, 27326109, 29522078, 106593311, 121139744, 119304336, 112377525, 102973863, 20506410, 110701227, 21782444, 109229943, 99494703, 95191217, 109932082, 35106867,	203389	228814

<sup>18</sup> “All application software in both main and restricted must meet the following requirements:

Must allow redistribution. Your right to sell or give away the software alone, or as part of an aggregate software distribution, is important because:

You, the user, must be able to pass on any software you have received from Ubuntu in either source code or compiled form.

While Ubuntu will not charge licence fees for this distribution, you might want to charge to print Ubuntu CDs, or create your own customised versions of Ubuntu which you sell, and should have the freedom to do so.”

<http://www.ubuntu.com/project/about-ubuntu/licensing>

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Name	Keywords/Query	Verified IDs	Hash Match IDs	Verified Downloads	Verified & Hash Downloads
			106450996, 78606238, 19013686, 63918903, 18709817, 116444730, 65760059, 51676988, 129274557, 19771966, 19142975, 120815723, 61837635, 31650884, 69522757, 96581338, 104790647, 106458189, 100567888, 86529234, 106450005, 128863574, 22128215, 102844760, 61812186, 119437199, 60841308, 109804729, 96118201, 80631266, 106448483, 73963108, 119445733, 105134182, 109748074, 116444651, 64639357, 123847152, 119434994, 109813103, 106451700, 20000631, 57853816, 21419769, 97386618, 19608315, 63227946, 18574719		
OpenOffice	OpenOffice% ;OOo%	61682386, 63993443, 106906538	101748046, 98264344, 97312315, 106374379, 100448967, 108379358, 85581586, 103002761, 107602983, 93365244, 53570616, 128924696, 95551033, 116362996, 100190542, 114295685, 112135971, 106128722, 101747896, 108983774, 112144612	9581	30265
Ubuntu	Google: "Ubuntu on hotfile"	81087050, 81087051		113	113
iREB	iREB	108923557	118055012, 108969652, 125969054, 124080917, 116963265, 111015314, 108944058, 113950902, 127338293, 111134233, 111102945, 109432291, 117509749, 118236145, 113493651, 111044524, 113300326, 111225402, 129285191, 123426938, 121844508, 129137393, 123549421, 117009434, 128306751, 113216075, 108928623, 128926633, 117509141, 115224338, 128513796, 113062967, 120433044, 121484483, 127268020, 125818297, 122450789, 124740681, 110330855, 110910580, 122605094, 118434968, 123529015, 122692366, 117258783, 109050411, 126842839, 124958429, 121793717, 120075176, 128188567, 118654221, 119874964, 116596749, 119193810, 124958467, 119380105, 129237270, 126667967, 118062795,	691625	885583

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Name	Keywords/Query	Verified IDs	Hash Match IDs	Verified Downloads	Verified & Hash Downloads
			110387124, 111657566, 116941345, 124958585, 128653559, 127267996, 116829785, 118624030, 128111985, 125027246, 115932793, 111866952, 112285263, 114633459, 124661491, 116309824, 113299943, 116047221, 122776323, 126562919, 109043298, 123686433		
sn0wbreeze	sn0wbreeze%	125818066	128419283, 117674441, 118702210, 122423360, 121460959, 121201922, 118222269, 128814851, 127449487, 118533619, 128733652, 128421432, 128652641, 119299826, 118937654, 121473429, 124771672, 118043851, 117674872, 124476756, 120737623, 124138569, 124476894, 118263379, 117726226, 124561020, 128457680, 125123833, 128202577, 126383120, 123897164, 118576938, 125214726, 119067724, 125396398, 118942400, 117722117, 126110757, 117635913, 122806897, 124329140, 125454952, 119483092, 120027357, 125145002, 117662024, 118048976, 125088395	108985	629783

**II**

**Creative Commons Licensed Content**

24. Creative Commons licenses are standardized licenses that allow copyright holders to share their content under a variety of possible terms they choose.<sup>19</sup> Users select from a list of options, for example to allow commercial uses or not, to allow derivative works or not. The resulting license has three layers; a simplified ‘human readable’ page that summarizes the terms of the license,<sup>20</sup> the actual license itself,<sup>21</sup> known as the ‘lawyer-readable’ portion, and a machine-readable set of metatags that identify the terms of the license to search engines, so that those seeking open material can search by the license terms as well as the content. (For example, physics textbooks that are available for non-commercial reproduction and distribution.) Creative Commons licenses have been used by a wide array of copyright holders, ranging from successful commercial artists such as Trent Reznor and David Bowie, to scholarly publications such as the Public Library of Science journals, to universities such as MIT that wish to make their course materials available on the web for reproduction and distribution.

25. Searching for Creative Commons materials on Hotfile was challenging because the compression of files necessary to save space means the license information, too, is compressed and hidden. This means that one cannot simply search for the license terms as one can when the files are not compressed. Instead, I directed Elysium Digital to search for the names of three popular animated films, Big Buck Bunny, Elephants Dream, and Sintel on Google and in Hotfile’s data. These films were chosen because they were all produced by the Blender Project and released under the least restrictive Creative Commons license, CC BY, which requires only attribution. Other Creative Commons content that we discovered, including MIT Open Courseware, or author Cory Doctorow’s novels and stories, were not included in this count because that material is released under a Creative Commons license that precludes commercial use and we could not be certain the uploader was receiving no revenue as a result of sharing the material. This survey also does not

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<sup>19</sup> *About Creative Commons*, “Our tools give everyone from individual creators to large companies and institutions a simple, standardized way to keep their copyright while allowing certain uses of their work – a “some rights reserved” approach to copyright – which makes their creative, educational, and scientific content instantly more compatible with the full potential of the Internet. The combination of our tools and our users is a vast and growing digital commons, a pool of content that can be copied, distributed, edited, remixed, and built upon, all within the boundaries of copyright law.” <http://creativecommons.org/about> (last visited Nov 12, 2011.)

<sup>20</sup> Here, for example, is the human readable summary of the CC 3.0 Attribution license. <http://creativecommons.org/licenses/by/3.0/us/>

<sup>21</sup> Here for example is the full text of the CC 3.0 Attribution License <http://creativecommons.org/licenses/by/3.0/us/legalcode>

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include counts of the material discovered during the search that appears to be freely shared by the author and copyright holder but which is not under a formal Creative Commons license. For example, this Chinese PowerPoint on “Hepatitis C Treatment: Current and Future Trends”<sup>22</sup> seems unlikely to be infringing, but it is not formally licensed under a Creative Commons license.

26. **Big Buck Bunny:** Despite its rather alarming name, Big Buck Bunny is an animated film<sup>23</sup> about the eponymous rabbit of the title, created by the Blender Project. The Blender Project is an organization that was formed to explore the use of the open source program Blender to produce films which are also freely licensed.<sup>24</sup> The film is licensed<sup>25</sup> under the Creative Commons Attribution 3.0 license<sup>26</sup> which permits commercial and non-commercial reproduction and distribution and the creation of derivative works. Because it is a movie, the file is very large (885 megabytes in its .avi format) and cannot be easily shared without some kind of file-transfer service. It is stored on Hotfile in the highly compressed, multi-part, .rar format. A trailer for the movie can be found here. <http://www.youtube.com/watch?v=YE7VzLLtp-4>

Legal Status: Clearly non-infringing

Downloads: The instances of Big Buck Bunny that we found and human verified had 103 downloads.

27. **Elephants Dream:** Elephants Dream was the first movie produced by the Blender Project. It was part of a demonstration of the possibilities of open source film-making in which source files and graphics files are made available to the audience as well as the film itself. “Elephants Dream is the world’s first open movie, made entirely with open source graphics software such as Blender, and with all production files freely available to use however you please, under a Creative Commons license.”<sup>27</sup> It, too, is produced under the Creative Commons Attribution 3.0 License and as such may be copied and redistributed freely.

Legal Status: Clearly non-infringing

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<sup>22</sup> “Hepatitis C Treatment: Current and Future Trends”

<http://hotfile.com/dl/126573095/0852787/1000616.ppt.html>

<sup>23</sup> <http://www.bigbuckbunny.org/index.php/about/> (last visited Nov 13, 2011.)

<sup>24</sup> <http://www.blender.org/features-gallery/blender-open-projects/> (last visited Nov 13, 2011.)

<sup>25</sup> “The results of the Peach open movie project has been licensed under the Creative Commons Attribution 3.0 license.”

<http://www.bigbuckbunny.org/index.php/about/> (last visited Nov 13, 2011.)

<sup>26</sup> <http://creativecommons.org/licenses/by/3.0/> (last visited Nov 13, 2011.)

<sup>27</sup> <http://orange.blender.org/> (last visited Nov 13, 2011.)

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Downloads: The instance of Elephants Dream we identified had 18 hash-verified downloads.

28. **Sintel:** Sintel is the third film in the Blender Project Series. “Sintel is an independently produced short film, initiated by the Blender Foundation as a means to further improve and validate the free/open source 3D creation suite Blender. With initial funding provided by 1000s of donations via the Internet community, it has again proven to be a viable development model for both open 3D technology as for independent animation film.”<sup>28</sup> It, too, is released under the Creative Commons Attribution 3.0 license.

Legal Status: Clearly non-infringing

Downloads: Though this file was stored on Hotfile, we did not find any downloads of Sintel.

**TABLE TWO – EXAMPLES OF CREATIVE COMMONS CONTENT ON HOTFILE**

<b>Name</b>	<b>Keywords/Query</b>	<b>Verified IDs</b>	<b>Hash Match IDs</b>	<b>Verified Downloads</b>	<b>Verified &amp; Hash Downloads</b>
Big_Buck_Bunny	Google:"Big Buck Bunny on hotfile"; searched bunny and buck on hotfile database	108538977, 108549505, 108557338		103	103
Elephants_Dream	google "Elephants Dream on hotfile"	25133372		18	18
Sintel	Google: "Sintel on hotfile"; searched "Sintel" on hotfile database	97697238, 97697035, 97697403		0	0

<sup>28</sup> <http://www.sintel.org/about/> (last visited November 13, 2011.)

**III  
Public Domain Material**

29. Material may be in the public domain in the United States for many reasons. For example, its public domain status may be because it is uncopyrightable, such as an unoriginal compilation of fact, or that it is a work of the Federal Government and thus is put into the public domain by section 105 of the Copyright Act. In my assessment of Hotfile, I asked Elysium to search for examples of works that are in the public domain either because the work had never been under copyright to begin with, such as Shakespeare’s plays, or because the copyright had expired, such as *Huckleberry Finn*. (Works published before 1923 can be presumed to be in the public domain in the United States.<sup>29</sup>)

I applied very conservative standards even to works such as these, however. A Google Books scan of Hamlet, while clearly in the public domain, was omitted from this analysis because the Google books cover page, listing the terms of use, was included in the download. We also found a number of pre-1923 films, including *Birth of A Nation*, and the Charlie Chaplin films *The Adventurer*, *On Easy Street* and *The Fireman*. However, in the time available I could not examine the films fully enough to be sure that copyrighted material had not been added to the version stored on Hotfile. They are not included in these counts.

30. **Huckleberry Finn:** Mark Twain’s classic tale is available on Hotfile in the form of an attractive illustrated 1885 edition, which appears to be the very first book ever published by the Charles L. Webster publishing company.<sup>30</sup>

Legal Status: Clearly non-infringing. Works published before 1923 are in the public domain in the United States. This book was published 38 years before that cut-off. The book has an imprint on the title page declaring “Prepared and Published by E-Books Directory” but neither mechanically scanning a book, nor adding the name of your firm to it, suffices to confer a new copyright in it. For that to happen there would need to be additional original expressive material. I examined the book and it is otherwise unchanged.

Downloads: There were 17 instances of the human-verified file of Huckleberry Finn and 45 hash-verified downloads.

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<sup>29</sup> 17 U.S.C. § 304

<sup>30</sup> I am grateful to the Cornell University Library’s exhibition “The Business of Being Mark Twain” for this fact. Both the cover and the dates match exactly. <http://rmc.library.cornell.edu/twain/exhibition/webster/index.html> (last visited Nov 16, 2011.)

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31. **Othello:** Dating from approximately 1603, a time that preceded the coming into effect of the first true copyright act by 107 years, Shakespeare’s Othello is clearly in the public domain.

Legal Status: Clearly non-infringing

Downloads: Othello was uploaded to the Hotfile system but, as yet, the Moor of Venice has found no admirers among Hotfile users. We found zero downloads.

32. **Macbeth:** Shakespeare’s Macbeth was written in the early 1600’s and is therefore in the public domain in the United States. The particular version on Hotfile is an unchanged pdf of the text of the play.

Legal Status: Clearly non-infringing

Downloads: Macbeth was uploaded to the Hotfile system but we found no downloads.

33. **A Tale of Two Cities:** Charles Dickens’ A Tale of Two Cities was published in 1859 and is in the public domain in the United States. The version uploaded to Hotfile bore markings of an organization called “Planet PDF” but no original expression had been added to the book and thus its copyright status is unchanged.

Legal Status: Clearly non-infringing

Downloads: A Tale of Two Cities had been downloaded 4 times.

**TABLE THREE – EXAMPLES OF PUBLIC DOMAIN CONTENT ON HOTFILE**

<b>Name</b>	<b>Keywords/Query</b>	<b>Verified IDs</b>	<b>Hash Match IDs</b>	<b>Verified Downloads</b>	<b>Verified &amp; Hash Downloads</b>
A_Tale_of_Two_Cities	google: "A Tale of Two Cities on hotfile"	94112268		4	4
Huckleberry_Finn	google: "Huckleberry Finn on hotfile"; search Huckleberry and Finn on hotfile database	65463776	76947371, 59344815, 120866286, 95907818	17	45
Macbeth	Searched on Macbeth.pdf from Hotfile database, Googled "Macbeth.pdf on hotfile"	99000556, 118496987		0	0
Othello	Googled: "Othello.pdf on hotfile"	118398280		0	0

**IV  
Conclusion**

33. The court will make its own assessment of whether Hotfile has substantial non-infringing uses and whether Hotfile “induces” infringement. This expert report focused only on specific instances of three types of non-infringing content, and did not survey all, or even a majority of the examples of that content. Nevertheless, in my opinion, it reveals four facts that are relevant to the court’s decision.

34. First, non-infringing content is frequently uploaded and downloaded on Hotfile and those uses are substantial both in terms of raw numbers, and in terms of the most common uses of the Hotfile system. This report does not attempt to present a statistically representative sample of the usage of Hotfile and I have no personal knowledge about what percentage of Hotfile’s uploaded content, or of user downloads, is non-infringing. Nevertheless, even within the limits suggested by the previous sentence, my investigation of the system provided some striking facts about the usage of Hotfile. There were more than 1.7 million downloads of the six open source programs described here. OpenOffice.org alone was downloaded more than 30,000 times. From the records we have, it appears likely, though not certain, that JDownloader supplied 17 of the top 100 most shared files on Hotfile. Elysium Digital informs me that sn0wbreeze and iREB are the two most downloaded programs on Hotfile, iREB being the #1 most downloaded and sn0wbreeze being the #2. The fact that it is highly likely that the two most commonly downloaded files on Hotfile are open source programs that seem to be licitly shared appears relevant to any assessment the court might make about the *current* usage of the system. In terms of the *potential* uses of the system, it is worth noting that open source software is an important, and growing, component of the software market today. Hotfile appears suited for, compatible with, and widely used for independent open source distribution. In my opinion, therefore, this shows both current, and potential future, substantial non-infringing uses.

35. Second, Hotfile is also being used for a wide *range* of non-infringing activity, even when the number of downloads in the category is relatively lower than for open source software. In this study, other uses ranged from sharing Shakespearean plays to open source movies. The courts have made clear that it is not merely current non-infringing use, but capability for future non-infringing use, that is relevant to any legal assessment of a service such as Hotfile.<sup>31</sup>

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<sup>31</sup> “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.” *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417, at 442 (emphasis added); “We depart from the reasoning of the district court that Napster failed to demonstrate that its system is capable of commercially significant noninfringing uses. *The district court improperly confined the use analysis*

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36. Third, Hotfile provides a type of service that is very important in the architecture of the Internet. Transferring large files over the Internet is difficult. Gmail’s maximum file attachment size is 25MB, for example, and most e-mail systems set lower limits.<sup>32</sup> For an 885 MB movie such as *Elephants Dream*, or an entire distribution of Ubuntu or OpenOffice.org, some kind of file hosting or transfer service is required. Independent open source developers or filmmakers collaborating on an open source film do not necessarily have their own servers from which material can be shared. The growth of distributed creative activity on the Internet suggests that the already important role for services such as Hotfile is likely to grow in the future.

37. Fourth, some of those producing and sharing content licitly and freely on Hotfile are using the Affiliate Program as a way of being indirectly compensated for their efforts. This is true of the open source developers of iREB, sn0wbreeze, and JDownloader, for example. Since we know that iREB and sn0wbreeze are the two most commonly downloaded files on the system and since Elysium Digital found that the developers of JDownloader appear to have provided 17 of the top 100 most downloaded files,<sup>33</sup> the Affiliate Program may offer each of them a source of revenue. Methods of indirect compensation such as this are important to the future of the types of distributed creativity described in the open source and Creative Commons sections of this report. Any assessment of the Affiliate Program, particularly one that indirectly casts doubt on the legal acceptability of such programs elsewhere on the Internet, should take this into account.

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*to current uses, ignoring the system’s capabilities.* Consequently, the district court placed undue weight on the proportion of current infringing use as compared to current and future noninfringing use.” *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004,1021 (9th Cir. 2001) (emphasis added.); “Importantly, Sony also used the word “capable,” asking whether the product is “capable of” substantial noninfringing uses... its language also indicates the appropriateness of looking to potential future uses of the product to determine its “capability.” *Metro-Goldwyn-Mayer Studios, Inc. v. Grokster, Ltd.*, 545 U.S. 913, 953-954 (2005) (Breyer, J., concurring).

<sup>32</sup> <http://mail.google.com/support/bin/answer.py?answer=8770> (last visited Nov 13, 2011.)

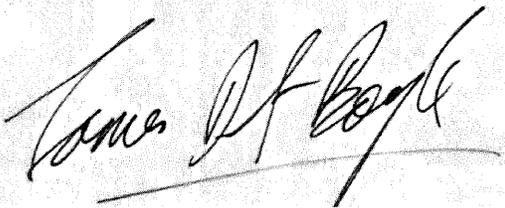
<sup>33</sup> See *infra* at paragraph 20.

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**SUPPLEMENTATION OF OPINIONS**

38. I expect to testify regarding the matters set forth in this expert report, if asked about these matters by the court or the parties' attorneys. I understand that discovery is ongoing in this case. I therefore reserve the right to adjust or supplement my opinions after I have had the opportunity to review deposition testimony or in light of additional documents or arguments that may be brought to my attention, including any additional orders from the court.

Signed,

A handwritten signature in black ink, appearing to read "James Boyle", is written over a light gray rectangular background. The signature is cursive and fluid.

James Boyle

Curriculum Vitae of  
**JAMES D.A. BOYLE**

**Office:**

Duke Law School  
Box 90360 / 210 Science Drive  
Durham, North Carolina 27708-0360  
919 613-7287  
e-mail: boyle@law.duke.edu

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**EMPLOYMENT**

- 2002–present    **William Neal Reynolds Professor of Law**, Duke Law School. Founder and Faculty Co-Director, Duke Center for the Study of the Public Domain.
- 2000–2002    **Professor**, Duke Law School
- 1998–99      **Visiting Professor**, Yale Law School
- 1993–94      **Visiting Professor**, Duke Law School
- Spring 1992    **Visiting Professor**, Harvard Law School
- Fall 1991      **Visiting Professor**, Boston University Law School
- Spring 1986    **Visiting Associate Professor**, University of Pennsylvania Law School
- 1986–2000    **Professor**, Washington College of Law, American University
- 1985–1986    **Associate Professor**, Washington College of Law, American University
- 1982–1984    **Assistant Professor**, Washington College of Law, American University
- 1981–1982 &  
1980–1981    **Teaching Fellow**, Harvard University  
Harvard-Danforth Certificate for Excellence in Teaching
- 1981–1982    **Research Assistant**, Harvard Law School

**EDUCATION**

- 1986          Harvard Law School  
**S.J.D.**

1981–82 Harvard Law School  
Coursework for S.J.D.: Frank Knox Fellow

1980–1981 Harvard Law School  
**LL.M.:** Frank Knox Fellow

1975–1980 Glasgow University  
**LL.B. (Hons.):** Double First in International Law and Politics. Viscount Stair Prize for best graduate in international law.

## PUBLICATIONS

### Books & Collections

THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND (Yale University Press 2009)

CULTURAL ENVIRONMENTALISM @ 10, 70 LAW & CONTEMPORARY PROBLEMS 1–210 (2007) (Larry Lessig and James Boyle eds.)

PAPERS ON THE PUBLIC DOMAIN (edited with an introduction by James Boyle, Law & Contemporary Problems 2003)

SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY (Harvard University Press 1996)

CRITICAL LEGAL STUDIES: SELECTED READINGS (edited with an introduction by James Boyle, Dartmouth/N.Y.U. Press 1994), part of the INTERNATIONAL LIBRARY ON LAW & LEGAL THEORY SERIES

### Educational Comic Book

TALES FROM THE PUBLIC DOMAIN: BOUND BY LAW? (with Keith Aoki and Jennifer Jenkins 2006) (expanded edition, Duke University Press 2008) (also translated into French, Portuguese, and Italian)

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### **Translated**

### **Essays**

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*Las Ideas Cercadas: El Confinamiento Y La Desaparición Del Dominio Público* (Spanish translation of *Fencing off Ideas*), in *¿UN MUNDO PATENTADO? LA PRIVATIZACIÓN DE LA VIDA Y DEL CONOCIMIENTO*, at 39 (Jorge Villarreal, Silke Helfrich & Alejandro Calvillo eds., Heinrich Boell Press 2007)

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## POSITIONS & HONORS:

Expert Advisor to the Hargreaves Review of Intellectual Property Law for the Government of the United Kingdom (2010/2011)

Melville B. Nimmer Memorial Lecturer, UCLA School of Law (2011)

Arcadia Lecturer, University of Cambridge (2009)

Duke Law School Distinguished Teaching Award (2006)

Columnist, *Financial Times* “New Economy Policy Forum”

Winner, World Technology Award for Law, 2003

Co-Founder, Science Commons, ccLearn

Founder and Faculty Co-Director, Duke Center for the Study of the Public Domain ([www.law.duke.edu/cspd](http://www.law.duke.edu/cspd))

Board Member, Creative Commons ([www.creativecommons.org](http://www.creativecommons.org))

Academic Advisory Board, EPIC (Electronic Privacy and Information Center [www.epic.org](http://www.epic.org))

Academic Advisory Board, Public Knowledge ([www.publicknowledge.org](http://www.publicknowledge.org))

Advisory Board, Connexions Open Source Learning Tools

American University Faculty Award for Outstanding Scholarship 1996