

CULTIVATING OPEN INFORMATION PLATFORMS: A LAND TRUST MODEL

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INTRODUCTION

James Boyle has led a recent call for intellectual property “environmentalism”—a movement to fend off perceived threats to the public interest posed by expansions in the scope and term of intellectual property protection.¹ Inspired in part by Boyle’s message, a number of organizations have sprung up that aspire to expand and cultivate the body of intellectual works that are not subject to proprietary control.²

The Internet’s original development as a non-proprietary information platform is another source of inspiration for this incipient movement.³ The Internet is built on a suite of protocols—

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1. See, e.g., James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net?*, 47 DUKE L.J. 87, 108-16 (1997); James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 39-43 (paper presented at the Duke conference on the Public Domain, Nov. 2001), *discussion draft available at* <http://www.law.duke.edu/pd/papers/boyle.pdf>; see also Seth Shulman, *Intellectual Property Ecology*, TECHNOLOGY REVIEW, Mar. 2002, at 87, *available at* <http://www.techreview.com/articles/shulman0302.asp>.

2. See, e.g., Center for the Public Domain, <http://www.centerpd.org.htm> (“Through grant making, original research, conferences, and collaborative programs, the Center seeks to call attention to the importance of the public domain and spur effective, practical solutions and responses.”); Public Knowledge, <http://www.bollier.org/public.htm> (“Public Knowledge is a new public-interest advocacy organization dedicated to fortifying and defending a vibrant information commons.”). I am a board member and former Executive Director of Creative Commons, a non-profit corporation founded by Boyle, among others, and committed to facilitating sharing of intellectual property. See Creative Commons, <http://www.creativecommons.org>; see also LAWRENCE LESSIG, *THE FUTURE OF IDEAS* 255 (2001) (describing Creative Commons, of which he is Chairman, as an “intellectual property conservancy”).

3. See Philip J. Weiser, *Law and Information Platforms*, 1 J. TELECOMMS. & HIGH TECH. L. 1 (2002) (explaining concept of “information platform”).

rules for communication between networked computers—over which no one claims ownership.⁴ Standardization around these protocols results in interoperability—everyone using the Internet can communicate with everyone else regardless of their hardware or operating system. The absence of proprietary claims on the protocols means that no one extracts monopoly rents from their use. Many commentators attribute the growth of the Internet to the free and universal availability of its public domain underpinnings.⁵

The first generation of public domain Internet protocols was developed primarily by academics and government researchers who may not have needed the incentives of intellectual property to motivate their innovations.⁶ Today, by contrast, much Internet innovation is done by the private sector.⁷ But some profit-motivated technologists still pursue a strategy of permitting free and unconditional access to the protocols they develop in order to promote interoperability, and thus to maximize the size of the network with which their products can communicate.⁸ These architects of open information platforms face two related challenges: “pollution” and “ambush.”

4. See, e.g., TIM BERNERS-LEE, *WEAVING THE WEB: THE ORIGINAL DESIGN AND ULTIMATE DESTINY OF THE WORLD WIDE WEB BY ITS INVENTOR* 74 (1999) (describing the decision to dedicate HTML, the basic language for web publishing, to the public domain); Mark A. Lemley, *Standardizing Government Standard-Setting Policy for Electronic Commerce*, 14 *BERKELEY TECH. L.J.* 745, 752 (1999) (“TCP/IP and HTML are good examples of public domain standards . . .”).

5. See, e.g., Lemley, *supra* note 4, at 752. Lemley contends:

The way to achieve a truly open, interoperable standard is to put the standard itself in the public domain. . . . One can imagine a world in which Microsoft owned the intellectual property rights in both TCP/IP and HTML, but it is hard to believe that the course of Internet development would have been the same.

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Id.; see also LESSIG, *supra* note 2, at 57 (“Not strong, perfect control by proprietary vendors, but open and free protocols, as well as open and free software that ran on top of those protocols, these produced the Net.”); ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, *THE ECONOMIC AND SOCIAL IMPACTS OF ELECTRONIC COMMERCE: PRELIMINARY FINDINGS AND RESEARCH AGENDA 1* (1999) (“The widespread adoption of the Internet as a platform for business is due to its non-proprietary standards and open nature . . .”).

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6. See Barry M. Leiner et al., *A Brief History of the Internet*, INTERNET SOCIETY, at <http://www.isoc.org/internet/history/brief.shtml> (last revised Aug. 4, 2000).

7. See *id.*

8. See, e.g., CARL SHAPIRO & HAL R. VARIAN, *INFORMATION RULES* 196-203 (1999); cf. Philip J. Weiser, *Internet Governance, Standard-Setting, and Self-Regulation*, 28 *N. KY. L. REV.* 822, 831 (2001) (chronicling this Internet history and predicting that “[a]s the stakeholders in the future of the Internet become more diverse and more concerned with the impact of the Internet’s development on their profits, stable, open, and end-to-end-based standards may well become the exception, not the norm”).

Observers have raised a cautionary flag about protocols that come with no proprietary strings attached.⁹ The fear is that public domain protocols are subject to “pollution” by entities that hope that their proprietary variations of the protocols will eventually trump the public domain originals.¹⁰ Some inventors who profess commitment to interoperability and open protocols point to the specter of this sort of pollution to justify retaining proprietary control over technologies (in the form of patent, copyright, or trademark protection) in order to forbid other developers’ proprietary variations.¹¹

This type of proprietary pollution control poses its own problem: potential adopters cannot be certain that a company that retains proprietary control over a protocol that is initially available on generous terms will not use that control to extract its own monopoly rents in the future. The intellectual property holder could commit an “intellectual property ambush” by changing the terms on which it makes the protocol available to adopters who have become dependent upon it.¹²

In this essay I describe the dual dilemma of pollution and ambush and propose a potential solution suggested by Boyle’s analogy to the environmental movement: A “land trust” for intellectual property could serve as a trusted party to whom an inventor could assign his rights for the purposes of pollution control and ambush prevention. I close by outlining my plan for future exploration and development of this proposal.

I. THE POLLUTION PROBLEM

Protocol “pollution” occurs when a technologist creates a variation on an existing protocol and makes a proprietary claim to

9. See, e.g., Michael J. Schallop, *The IPR Paradox: Leveraging Intellectual Property Rights to Encourage Interoperability in the Network Computing Age*, 28 AIPLA Q.J. 195 (2000); Mark A. Lemley, *The Law and Economics of Internet Norms*, 73 CHI.-KENT L. REV. 1257, 1288 (1998).

10. See, e.g., Lemley, *supra* note 9, at 1288. As Lemley explains: [A] number of the “open systems” on the Net are open only because a unified set of code is made available to everyone. There is some reason to think that this may change in the future. For example, Microsoft might benefit from splitting a standard like HTML or Java into incompatible, competing programs, because Microsoft would likely win the ensuing competition.

Id.

11. A Sun Microsystems attorney has spelled out this argument in detail. See Schallop, *supra* note 9.

12. Mark Lemley and David McGowan have raised the ambush possibility with regard to Sun Microsystems’ Java technology. Mark Lemley & David McGowan, *Could Java Change Everything? The Competitive Propriety of a Proprietary Standard*, 43 ANTITRUST BULL. 715, 760 (1998).

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the variation or otherwise uses the variation to undermine the original.¹³ One example is Microsoft's treatment of Kerberos. Kerberos is an authentication protocol developed at MIT and published by the Internet Engineering Task Force (IETF).¹⁴ Although "Kerberos" is a trademark of MIT, and MIT holds copyright in its implementation of the protocol (which it licenses without charge and with few conditions),¹⁵ no one has claimed a proprietary interest in the protocol itself. Microsoft (or anyone else) is therefore free to implement the protocol in its operating systems, or to modify the protocol as it sees fit. Microsoft in fact implemented a proprietary variation of the Kerberos protocol in its Windows 2000 operating systems. The variation allegedly made it difficult for non-Windows servers to interact with Windows PCs in the same way that Windows servers could.¹⁶

The developers of Kerberos were dismayed that a protocol they had developed and shared with the public for the purpose of promoting interoperability was being used to benefit a closed, incompatible system.¹⁷ As one of the original developers put it, "[t]his completely defeats the IETF's interoperability goals."¹⁸

The perceived threat posed by protocol pollution is that the polluter will extend the public domain protocol in a way that

13. Some observers refer to this phenomenon as "hijacking." See, e.g., SHAPIRO & VARIAN, *supra* note 8, at 257 ("Open standards can . . . be 'hijacked' by companies seeking to extend them in proprietary directions, and thus in time gain control over the installed base."). I instead use the term "pollution," which was used in internal Microsoft documents to describe the company's strategy with regard to Java, an instance of attempted pollution that I describe below. See Memorandum of the United States in Support of Motion for Preliminary Injunction at 63, *United States v. Microsoft*, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. 98-1232, 98-1233), available at <http://www.usdoj.gov/atr/cases/f1700/1762.htm> (last visited May 25, 2002) (quoting Microsoft documents describing the strategy to "[k]ill cross-platform Java by grow[ing] the polluted Java market.").

14. See Request for Comments 1510: The Kerberos Network Authentication Service (V5), at <http://www.ietf.org/rfc/rfc1510.txt> (Sept. 1993).

15. See Kerberos V5 Unix User's Guide, at <http://web.mit.edu/kerberos/www/krb5-1.2/krb5-1.2.4/doc/user-guide.html#SEC1> (Feb. 27, 2002).

16. See Declaration of Rebecca M. Henderson at paras. 38, 50-51, *United States v. Microsoft*, 97 F. Supp. 2d 59 (D.D.C. 2000) (Nos. 98-1232, 98-1233), available at <http://www.usdoj.gov/atr/cases/f4600/4644.htm> (last visited May 25, 2002); Andrew Leonard, *Embrace, Extend, Censor*, SALON.COM, at http://www.salon.com/tech/log/2000/05/11/slashdot_censor (May 11, 2000); Dominic Gates, *Microsoft's Kerberos Shuck and Jive*, THE INDUSTRY STANDARD, at <http://www.thestandard.com/article/0,1902,14996,00.html> (May 11, 2000).

17. Telephone Interview with Theodore Ts'o, former Kerberos Development Team Leader (June 3, 2002).

18. See *Kerberos, PACs, and Microsoft's Dirty Tricks*, at <http://slashdot.org/article.pl?sid=00/05/02/158204> (May 5, 2000) (quoting letter from Jeremy Allison and former Kerberos Development Team Leader Theodore Ts'o) (confirmed in telephone interview with Theodore Ts'o, *supra* note 17).

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reduces interoperability with products implementing the original protocol. If the polluter has sufficient market power, it may then be able to attract users away from those products that use the original; using the proprietary version maximizes interoperability with the polluter's installed base while it reduces overall interoperability. Pollution can thus discourage creation of public domain protocols by developers who are incentivized by the prospect of maximizing interoperability across the board.

The pollution of public domain protocols has been referred to as the "embrace, extend, and extinguish" strategy.¹⁹ During the Microsoft antitrust trial the Government claimed that Microsoft attempted to "embrace existing Internet standards, 'extend' them in incompatible ways, and thereby 'extinguish' competitors."²⁰ In addition to testimony about Kerberos, the Government introduced testimony that Microsoft intended to extend HTML (the basic public domain language for web pages) "to the point where it was incompatible with the Netscape browser and to encourage people to develop to their version of HTML so that pages couldn't be read with Netscape's browser."²¹ A public domain standard developed for the express purpose of interoperability could thus be leveraged to destroy interoperability (and the competitors who rely on it).

II. PROPRIETARY POLLUTION CONTROL

Faced with the pollution threat, some proponents of cross-platform interoperability are reluctant to put protocols and related technologies in the public domain with no strings attached. For example, Sun Microsystems developed Java, a programming language and associated technologies, as a "write once, run anywhere" solution for cross-platform application development.²² Concerned that incompatible Java implementations would threaten interoperability, Sun conditioned licenses for developing Java-based products and using Java logos on compliance with compatibility testing.²³

19. See, e.g., Plaintiffs' Joint Proposed Findings of Fact at para. 91.3.2, *United States v. Microsoft*, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. 98-1232, 98-1233), available at <http://www.usdoj.gov/atr/cases/f2600/2613-1.htm>.

20. *Id.*

21. *Id.*, at para. 91.3.2.ii; see also SHAPIRO & VARIAN, *supra* note 8, at 257.

22. See, e.g., Matt Curtin, *Write Once, Run Anywhere: Why it Matters*, at <http://java.sun.com/features/1998/01/wora.html> (last visited Mar. 27, 2002).

23. See, e.g., *Sun Microsystems, Inc. v. Microsoft Corp.*, 188 F.3d 1115, 1118 (9th Cir. 1999); see also SHAPIRO & VARIAN, *supra* note 8, at 257 ("Sun has been reluctant to give up control over the development of Java, fearful that without a champion,

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Microsoft claimed to support the Java technologies.²⁴ But, in fact, “developers who . . . used Microsoft’s tools to develop what Microsoft led them to believe were cross-platform [Java] applications ended up producing applications that would run only on the Windows operating system.”²⁵ When Microsoft developed these polluted Java tools, Sun (citing its license provisions) sued for copyright infringement and unfair competition.²⁶ The case was eventually settled for twenty million dollars.²⁷ A Sun lawyer has argued that Sun’s exercise of its proprietary claims to Java is an example of a successful strategy for promoting interoperability and avoiding pollution.²⁸ Several observers of the Kerberos controversy suggested that the developers of Kerberos should have taken this Sun approach—preventing (or at least responding to) proprietary pollution of the open protocol by asserting their own proprietary rights over Kerberos and imposing openness and/or compatibility requirements on subsequent developers.²⁹

Leveraging proprietary claims in order to promote open standards and interoperability is also promoted in the software context by proponents of the GNU³⁰ General Public License (GPL). The GPL gives licensees permission to copy, modify, and redistribute copyrighted software under certain conditions.³¹

Java could fragment.”); Tineke M. Egyedi, *Why Java Was – Not – Standardized Twice*, 23 *COMPUTER STANDARDS & INTERFACES* 253, 256 (2001).

24. See, e.g., *United States v. Microsoft*, 253 F.3d 34, 74 (D.C. Cir. 2001).

25. *Id.* at 76.

26. *Sun Microsystems*, 188 F.3d at 1118.

27. See Stephen Shankland et al., *Sun, Microsoft Settle Java Suit*, CNET NEWS.COM, at <http://news.cnet.com/news/0-1003-200-4578025.html> (Jan. 23, 2001).

28. See Schallop, *supra* note 9, at 262-63. As Schallop notes:

Software patent protection, as well as software copyright protection and trademark (e.g., logo) protection, in combination with contractual means, typically through public licensing, is increasingly being used to ensure compliance over open or published standards. The compliance measures advantageously maintain interoperability and prevent fragmentation of the open standard. A license to a software standard that requires the passing of certain defined compliance testing measures can be an effective use of IPR as leverage to promote interoperability.

Id.

29. See, e.g., Tim O’Reilly, *Is Open Source Un-American?*, at <http://www.onlamp.com/pub/a/onlamp/2001/03/08/unamerican.html> (Mar. 8, 2001); Evan Leibovitch, *Fatal Flaw in BSD?*, ZDNET TECH UPDATE, at <http://techupdate.zdnet.com/techupdate/stories/main/0,14179,2582875.html> (June 6, 2000). *But see* James Howard, *Kerberos and the GPL*, ZDNET NEWS, at <http://zdnet.com.com/2100-11-521682.html> (June 20, 2000).

30. See GNU Project, at <http://www.gnu.org> (last modified April 25, 2002) (“The GNU Project was launched in 1984 to develop a complete Unix-like operating system which is free software: the GNU system. (GNU is a recursive acronym for ‘GNU’s not UNIX’; it is pronounced ‘guh-NEW’.)”).

31. See GNU General Public License Version 2, at <http://www.gnu.org/licenses/gpl.html> (June, 1991).

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One key condition is that redistributions of the software's object code (strings of machine-readable 0s and 1s) must be accompanied by corresponding source code (the language in which the software was originally programmed, which can be understood by human programmers).³² Derivative works must also be accompanied by source code and must be licensed under the GPL.³³ GPL proponents argue that the license's proprietary restrictions undermine attempts to "tak[e] the result of open projects and standards, and add[] incompatible . . . features in closed source."³⁴ A licensee that incorporates modified GPL-licensed software into its products cannot undermine interoperability by keeping the details of its modification secret (and, thus, difficult for others to build upon). Under the GPL, the licensee must release the source code along with any modifications.

It is not clear that the GPL or any other copyright-based license would have been an effective pollution control measure for Kerberos. Copyright does not generally protect the purely functional aspects of a work, which may be all that Microsoft copied from the Kerberos protocol.³⁵ But the GPL illustrates a specific implementation of the general concept of pollution control by means of intellectual property protection—which could be ap-

32. *Id.* para. 3.

33. *Id.* paras. 2-3. The GPL thus uses property rights to create a sort of "limited public commons," where certain uses of the resource are limited to insiders who are defined by their willingness to make contributions back to the group (here, via the requirement that distributions of derivative works be accompanied by source code and licensed under the GPL). See generally Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129, 156 (1998) (describing "limited common property—a regime that holds some resource as a commons among a group of 'insiders', but as an exclusive right against 'outsiders'").

34. Bruce Perens et al., *Free Software Leaders Stand Together*, at <http://perens.com/Articles/StandTogether.html> (last visited June 2, 2002); see also Nicholas Petreley, *Sun Should go for Broke on Open Source Java and Scare Microsoft Away in the Bargain*, INFOWORLD, at <http://www.infoworld.com/articles/op/xml/00/11/06/001106oppetreley.xml> (last visited Mar. 19, 2002) ("[T]he GPL prevents companies such as Micro-soft [sic] from modifying the source code without redistributing their modifications back to the community. This is anathema to Microsoft."); Eben Moglen, *Anarchism Triumphant: Free Software and the Death of Copyright*, 4 FIRST MONDAY 8 (Aug. 2, 1999), at http://www.firstmonday.dk/issues/issue4_8/moglen/. Moglen emphasizes the certainty that the GPL provides for users:

Users of GPL-licensed code, including those who purchase software and systems from a commercial reseller, know that future improvements and repairs will be accessible from the commons, and need not fear either the disappearance of their supplier or that someone will use a particularly attractive improvement or a desperately necessary repair as leverage for "taking the program private."

Id.

35. Telephone Interview with Theodore Ts'o, *supra* note 17.

plied to address protocol pollution more directly by conditioning patent and/or trademark licenses on promises of openness and interoperability.

III. INTELLECTUAL PROPERTY AMBUSH

The problem with protecting interoperability via proprietary control is that a developer committed to maximizing interoperability may change its tack if its technologies succeed in the marketplace. The result has been referred to as an “intellectual property ambush”—users who have come to depend on a protocol that has been shared on generous terms to promote interoperability are faced with new, restrictive terms imposed by the original developer.³⁶

There are plenty of examples and variations of the intellectual property ambush problem that give potential adopters of proprietary protocols and related technologies something to worry about.³⁷ For instance, after the university and research communities spent years improving the Unix operating system, AT&T asserted its right to demand royalties for it.³⁸ As Robert Young recalls:

All the universities and research groups who had helped build Unix suddenly found themselves having to pay for licenses for an [operating system] that they had helped build. They were not happy, but could not do much about it—after all, AT&T owned the copyright to Unix. The other development teams had been helping AT&T at AT&T’s discretion.³⁹

36. See Lemley & McGowan, *supra* note 12, at 760.

37. See, e.g., David A. Balto, Standard Setting in a Network Economy, Speech at Cutting Edge Antitrust Law Seminars International (Feb. 17, 2000), *transcript available at* <http://www.ftc.gov/speeches/other/standardsetting.htm>. Balto notes:

A dominant firm, or a group of firms that sponsors an interface standardization project, might initially sponsor an open standard. They would encourage competitors to make their products interoperable in order to enhance the value of their standard. In particular, they would encourage manufacturers of complementary products to design products for their standard, in hopes that network effects might tip the market in their favor. However, competitive concerns could arise if, once the standard became successful, the sponsor closed the standard.

Id.; see also SHAPIRO & VARIAN, *supra* note 8, at 200 (“[B]eware vague promises of openness.”).

38. See, e.g., Robert Young, *Giving It Away: How Red Hat Software Stumbled Across a New Economic Model and Helped Improve an Industry*, in OPEN SOURCES: VOICES FROM THE OPEN SOURCE REVOLUTION 113, 121 (Chris DiBona et al. eds., 1999).

39. *Id.*; see also Tim O’Reilly, *Open Source and OpenGL*, ASK TIM, at http://www.oreilly.com/ask_tim/opengl_1200.html (Dec. 2000) (“As the early history of Unix shows, a company that has long practiced an open and inclusive style of software development can change its mind and turn on the community that helped

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Fear of this sort of intellectual property ambush may discourage developers from adopting a protocol that is subject to proprietary pollution control.

Proponents of the GPL argue that the terms of that license prevent ambush in the software realm. The basic argument is that even if the holder of copyright to GPL-licensed software decides to change the terms on which the latest version of the software is distributed (perhaps distributing only object code or charging royalties for the use of source code), developers who depend on the software can avoid any restrictive licensing terms by ignoring the copyright holder and improving the original code (which they have been licensed to copy and modify under the GPL) themselves. As Tim O'Reilly puts it, "if an open source project leader fails to keep the trust of his users and developer community, those other developers can take his or her work and build on it independently."⁴⁰

Some observers are less sanguine about the security of the GPL model. David McGowan suggests that in many jurisdictions the permission granted by the GPL could be terminated at any time, leaving licensees with no rights (apart from fair use) to copy or distribute the original copyrighted software.⁴¹

In any event, it is surely the case that the requirements imposed by the GPL (including the requirement to make the source code of derivative works available and to license them under the GPL) do not apply to the copyright holder himself, who of course needs no license to copy, distribute, or make derivative works of software to which he holds the copyright. So copyright holders cannot honestly say, on the basis of the GPL alone, that they are "subject to the same rules as the rest of the community, including giving back modifications."⁴²

The specter of ambush may seem overblown with regard to typical GPL projects, in which the current version of the software

to build and popularize its software."); LESSIG, *supra* note 2, at 50-53 (describing the history of Unix).

40. O'Reilly, *supra* note 39.

41. See David McGowan, *The Legal Implications of Open Source Software*, 2001 U. ILL. L. REV. 241, 299 (2001); see also Declan McCullagh, *Mattel Ruling Confuses Hackers*, WIRED NEWS, Mar. 29, 2000, at <http://www.wired.com/news/business/0,1367,35258-2,00.html> (quoting Professor Eugene Volokh for the proposition that "[n]onexclusive licenses given for free are generally revocable, even if they purport to be irrevocable."). *But see* Declan McCullagh, *Mattel Suit Takes GNU Twist*, WIRED NEWS, at <http://www.wired.com/news/politics/0,1283,35226,00.html> (Mar. 28, 2000) (quoting Professor Eben Moglen for the proposition that "GPL is software that cannot be revoked").

42. *Frequently Asked Questions*, OPENOFFICE.ORG, at <http://www.openoffice.org/FAQs/mostfaqs.html#3> (last updated Aug. 31, 2002).

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may include the contributions of hundreds of copyright holders—each of whom could object if anyone (even a co-contributor) distributed the software on non-GPL terms.⁴³ But the Free Software Foundation,⁴⁴ the non-profit organization that promotes the GPL,⁴⁵ encourages people who make improvements to GPL-licensed software to assign copyrights in their improvements to the holder of copyright in the original software in order to streamline enforcement.⁴⁶ Once the initial developer holds copyright to contributions, he is free to take the whole project private—profiting from the contributions without releasing the source code or licensing the work under the GPL.⁴⁷ Because the GPL imposes no obligations on the copyright holder, it does not prevent this type of ambush.⁴⁸

To bolster the GPL model, developers who want to retain proprietary control over protocols in order to prevent pollution could simply promise adopters that the relevant patent, copyright, and trademark licenses will always be available under the original (or similar) terms. Ambush would trigger liability for breach of contract. The disadvantages of this simple contractual approach are familiar ones. First, privity: the protocol developer might assign the protocol to a third party who is not clearly

43. See McGowan, *supra* note 41, at 259 (“This web of blocking copyrights suggests that, as a practical matter, each contributing programmer would have to agree to privatize the code if it was to be taken private in its most current and complete form.”). I assume for the sake of argument that the project is not a “joint work,” see 17 U.S.C. § 101 (2000).

44. FREE SOFTWARE FOUNDATION, at <http://www.fsf.org/fsf/fsf.html> (last updated July 31, 2001).

45. *Id.*

46. See *Frequently Asked Questions About the GNU GPL*, GNU PROJECT, at <http://www.gnu.org/copyleft/gpl-faq.html#AssignCopyright> (last visited Mar. 7, 2002). This statement on the GNU Project’s website addresses the question of why contributors to Free Software Foundation licensed programs are encouraged to assign their copyright to the Free Software Foundation by explaining:

Our lawyers have told us that to be in the best position to enforce the GPL in court against violators, we should keep the copyright status of the program as simple as possible. We do this by asking each contributor to either assign the copyright on his contribution to the FSF, or disclaim copyright on it and thus put it in the public domain. . . . If you want to make an effort to enforce the GPL on your program, it is probably a good idea for you to follow a similar policy.

Id.

47. See, e.g., Loic Dachary, *SourceForge Drifting*, FSF EUROPE, at <http://fsfeurope.org/news/article2001-10-20-01.en.html> (last updated Feb. 7, 2002); Stephen Shankland, *Open-Source Approach Fades in Tough Times*, ZDNET UK NEWS.COM, at <http://news.zdnet.co.uk/story/0,,t289-s2099534,00.html> (Nov. 20, 2001).

48. See GNU PROJECT, *supra* note 46, at <http://www.gnu.org/copyleft/gpl-faq.html#DeveloperViolate> (last visited Mar. 7, 2002).

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bound by the terms of the contract; or the licensee might sublicense to a subsequent adopter who will not be able to rely on the developer's promises.⁴⁹ Second, reality: the promise of an eventual lawsuit may be cold comfort to those potential adopters who are out-matched by the developer in terms of size and legal wherewithal.

IV. A TRUSTED THIRD-PARTY MODEL FROM THE ENVIRONMENTAL MOVEMENT

Landowners dedicated to conserving open space or wildlife habitats, like interoperability-minded technologists, are faced with the dual dilemma of pollution and ambush. A landowner who wants to ensure that her land is not developed cannot simply abandon it to the "public domain." Without limitations on its use the land may be, literally, polluted. But a landowner who retains ownership of her land may fear ambush—that is, she or her heirs may be tempted in the future to develop the land themselves and to abandon the original conservation goal. Common law privity requirements and related limitations on real covenants, easements, and equitable servitudes limit the extent to which the landowner can make a binding promise that neither she nor her successors will exploit the land.⁵⁰ But state statutes now permit "land trusts"⁵¹—non-profit organizations that pursue conservation goals through acquisition of land and perpetual easements—to help landowners out of the pollution/ambush bind.⁵²

49. Cf. Margaret Jane Radin, *Humans, Computers, and Binding Commitment*, 75 IND. L.J. 1125, 1139-40 (2000) (arguing against validity of "[c]ontracts that run with digital objects and attempt to bind recipients to obligations to all other recipients"); Robert P. Merges, *The End of Friction? Property Rights and Contracts in the "Newtonian World" of On-Line Commerce*, 12 BERKELEY TECH. L.J. 115, 129 (1997) (arguing that the GPL is unenforceable, for lack of privity, against someone who receives software from a licensee). Mark Lemley describes other potential difficulties with enforcing anti-ambush promises that protocol developers and other technologists make to standard setting organizations. See Mark Lemley, *Intellectual Property Rights and Standard Setting Organizations*, CAL. L. REV. (forthcoming 2002) (manuscript at 41-46, on file with author).

50. See generally Andrew Dana & Michael Ramsey, *Conservation Easements and the Common Law*, 8 STAN. ENVTL. L.J. 2, 12-21 (1989) (describing common law limitations).

51. Despite this common name, land trusts are not typically "trusts" in the legal sense. Some organizations that serve the same role call themselves "conservancies" or something else. See THE LAND TRUST ALLIANCE, STARTING A LAND TRUST 1 (1990). "[T]he term *land trust* has no specific legal meaning. . . . [N]ot many [land trusts] are structured as true trusts or even operate under any semblance of trust principles." SALLY K. FAIRFAX & DARLA GUENZLER, CONSERVATION TRUSTS 21 (2001).

52. THE LAND TRUST ALLIANCE, *supra* note 51, at 85.

In many states, land trusts may acquire special “conservation easements” that are exempt from the common law limits on servitudes that run with the land.⁵³ The landowner continues to own title to the land, but the easement binds him and all subsequent landowners to restrictions limiting the land’s uses.⁵⁴ The land trust takes on the responsibility of enforcing the limitations against the landowner and any other would-be developers.⁵⁵

For my purposes here, the key features of the land trust model are these: the property owner assigns at least a partial property interest to a third party; the third party is committed to preventing certain types of exploitation of the property; and the third party can be trusted to forego such exploitation itself. The arrangement is designed to maintain control over the property and to impose restrictions on its use (pollution prevention) without the uncertainty posed by the continued exercise of proprietary control by a potentially profit-motivated owner (ambush prevention).

Like landowners who donate conservation easements to land trusts, interoperability-minded protocol developers could similarly prevent both pollution and ambush by assigning some or all of their rights to a third party that is committed to preserving access to the protocols.⁵⁶ The Free Software Foundation already serves a land-trust-like role by receiving assignments of software copyrights.⁵⁷ The Free Software Foundation encourages contributors to the Foundation’s own projects to assign their copyrights to the Foundation.⁵⁸ The Foundation apparently also welcomes assignments of rights to other GPL-licensed software.⁵⁹ The Free Software Foundation, with its long history of zealous support and advocacy for the GPL, backs up its reputation as a trusted steward of GPL-licensed software with explicit promises to assignors that its distributions of their software will always be

53. See generally Dana & Ramsey, *supra* note 50, at 3 (describing statutory conservation easements and contrasting them with common law rules). R

54. See THE LAND TRUST ALLIANCE, *supra* note 51, at 85. R

55. See THE LAND TRUST ALLIANCE, CONSERVATION OPTIONS 10-11 (1993).

56. David McGowan makes a similar suggestion with regard to open source software. See McGowan, *supra* note 41, at 300. R

57. Although McGowan does not develop the land trust analogy, he does identify the Free Software Foundation as the most obvious trusted third party for purposes of GPL-licensed software. *Id.*

58. See Eben Moglen, *Why the FSF Gets Copyright Assignments from Contributors*, GNU PROJECT, at <http://www.gnu.org/licenses/why-assign.html> (last updated Nov. 4, 2001).

59. See McCullagh, *Mattel Ruling Confuses Hackers*, *supra* note 41 (quoting Free Software Foundation General Counsel Eben Moglen, “[T]he Free Software Foundation strongly urges authors of free software to assign their rights to FSF.”). R

accompanied by the source code, and that it will permit recipients to distribute the source code as well.⁶⁰

The Free Software Foundation's approach mirrors the conservation easement concept. Under the assignment terms the Free Software Foundation agrees to grant to the assigner a non-exclusive right "to use the work as [he] see[s] fit,"⁶¹ analogous to the landowner's continued right under a conservation easement to live on and sell his land. But because the copyright assigner no longer holds copyright to the software (or any "changes and/or enhancements to the software," copyright in which is also assigned to the Free Software Foundation⁶²) he cannot commercially exploit the software by enforcing restrictive terms on anyone else's use of it—just as a landowner may not develop his land in ways prohibited by the conservation easement. In both cases, the donor is relieved of the burden of enforcing his rights against infringers, and the donee is required to enforce those rights per its agreement with the donor. Because the donee, in the case of the Free Software Foundation, is a non-profit organization with a long track record of commitment to free software, its promises will likely inspire more confidence than a commercial software developer's might.

V. EXPANDING THE LAND TRUST MODEL

The Free Software Foundation appears to serve a role analogous to a land trust, and thus helps software developers avoid pollution and credibly renounce ambush. But the Free Software Foundation is devoted to enforcement of only one type of license, the GPL, which applies only to one form of intellectual property, copyright.⁶³ Avoiding protocol pollution may also require reliance on patents (which can protect the functional aspects of protocols, not merely specific copyrighted implementations) or

60. See, e.g., Richard Stallman, *Would Like to Relinquish Copyright to FSF*, at <http://mail.gnu.org/pipermail/web-hurd/2001-May/000281.html> (posted May 31, 2001) (example of assignment agreement between software author and the Free Software Foundation).

61. *Id.*

62. *Id.*

63. In addition to the Free Software Foundation, the newly-formed Software Conservancy has announced that it will serve as an "independent, neutral organization to hold copyright to open source or free software source code." *CollabNet Announces Creation of "The Software Conservancy"*, COLLABNET, at <http://www.collab.net/news/press/2002/softwareconservancy.html> (Feb. 2, 2002); see also THE SOFTWARE CONSERVANCY, at <http://www.tsc.org> (last visited June 2, 2002). Like the Free Software Foundation, the Software Conservancy appears to focus on software copyrights.

trademarks (which can be used to prohibit false claims of compliance with protocol specifications).

The new breed of intellectual property environmentalists could create additional mechanisms for solving the developer's dual dilemma of pollution and ambush, and thus promote the preservation of open information platforms (that is, information platforms safe from proprietary ambush despite their developers' pollution fears). The land trust model could be expanded beyond the limits of the Free Software Foundation to create new avenues for assigning rights to trusted third parties. This essay begins to sketch the justification for such "intellectual property conservancies"⁶⁴ and suggests several questions that I am investigating in ongoing research.

1. What is the best mechanism for ensuring that the trusted third party will enforce pollution controls? Possibilities include: statutorily imposed obligations; contractual commitments to the donor that the intellectual property will be licensed only on certain terms; and trust agreements that impose fiduciary obligations on the conservancy.
2. Should the conservancy have flexibility to change (or discard) pollution control measures if, for example, a donated protocol falls into disuse because of inadequate incentives to update and improve it?
3. How would an intellectual property conservancy accumulate resources adequate to the costly task of enforcing pollution control measures?
4. How can an intellectual property conservancy establish that it can be trusted not to commit its own intellectual property ambush? Structuring the conservancy as a non-profit might remove the direct incentive to ambush, but non-profit structure alone hardly ensures that a conservancy will not be captured by, for example, self-interested donors.
5. Is the incentive of promoting protocol adoption and interoperability sufficient to entice donations of intellectual property to a conservancy? If not, is there a public policy justification for encouraging donations through special tax incentives like those that apply to donations of conservation easements in the land trust context?

64. This terminology has been used elsewhere. See David Bearman, *Intellectual Property Conservancies*, D-LIB MAGAZINE, Dec. 2000, available at <http://www.dlib.org/dlib/december00/bearman/12bearman.html>; Brewster Kahle et al., *Public Access to Digital Material*, available at <http://www.archive.org/news/colloquia/2001/whitepaper.html> (Mar. 5, 2001).

6. Would some developers who might otherwise have incentives to donate intellectual property to a conservancy be discouraged by federal policies that promote proprietary exploitation of government-sponsored research results?⁶⁵
7. Would some developers who might otherwise have incentives to donate intellectual property to a conservancy be dissuaded by the prospect that they could no longer use the donated intellectual property for defensive purposes in an infringement suit against them?⁶⁶
8. Could (or should) an intellectual property conservancy overcome the provision in the Copyright Act that permits authors to terminate transfers of their copyrights after thirty-five years?⁶⁷
9. What type of antitrust scrutiny would be applied to transfers of intellectual property to an intellectual property conservancy?⁶⁸
10. To what extent do standard setting organizations, patent pools, and other entities already follow the land trust model described here?

CONCLUSION

Protocol developers who want to replicate the benefits of the initial suite of open Internet protocols may be discouraged by the threat of protocol pollution; would-be adopters of their protocols may be discouraged by the threat of ambush. Intellectual property conservancies built on the land trust model could help address both of these challenges by enforcing protocol developers' pollution-control preferences while binding them to their promises to forgo ambush. My ongoing research will explore how intellectual property conservancies should be structured to ensure their own viability and trustworthiness and to overcome potential obstacles to donation.

65. See generally Arti K. Rai & Rebecca Eisenberg, *The Public and the Private in Biopharmaceutical Research*, Paper presented at the Duke conference on the Public Domain (Nov. 2001), *discussion draft available at* <http://www.law.duke.edu/pd/papers/raieisen.pdf> (last visited June 25, 2002) (describing the "explicit policy of the U.S. government to promote patenting of government-sponsored research results by universities, government agencies, and other recipients of federal research funds").

66. Cf. McGowan, *supra* note 41, at 301-02 (raising this possibility with regard to the "trusted third-party" solution he discusses in the open source software context).

67. 17 U.S.C. §203 (Supp. V 1999).

68. Cf. Lemley, *supra* note 49 (manuscript at n.375) (raising the possibility of Clayton Act scrutiny for transfers of intellectual property to standard setting organizations).

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