Freeing the Mind : Free Software and the Death of Proprietary Culture

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The subject matter we're going to talk about is variously named, and the words have some resonances of importance. I'm going to use the phrase "Free Software" to describe this material and I'm going to suggest to you that the choice of words is relevant. We are talking not merely about a form of production or a system of industrial relations, but also about the beginning of a social movement with specific political goals which will characterize not only the production of software in the twenty-first century, but the production and distribution of culture generally. My purpose this morning is to put that process in large enough context so that the significance of free software can be seen beyond the changes in the software industry alone.

BUSINESS WEEK, we can assume, as Rita Heimes suggested in her very gracious introduction, needs to hype its material in order to make people want to read below the first paragraph. But I think BUSINESS WEEK here is probably guilty of low blood pressure. Earlier this week in Brazil, the chief technology officer of the Microsoft Corporation, Craig Mundie, made a public speech, in which he said that my client the Free Software Foundation (the Free Software Foundation, and only the Free Software Foundation) was destroying the global software industry. Now, The Free Software Foundation, which I have represented for ten years and on whose board I have the honor to sit, has an annual budget in the neighborhood of $750,000, and total assets slightly under two million dollars; it is supported entirely by donative contributions, mostly from individuals. The Microsoft

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Corporation, as some of you know, has a market capitalization of several hundred billion dollars, and possesses fifty billion dollars in cash at the moment. It is the single most profitable monopoly in the history of the world. I am deeply grateful to Mr. Mundie for his accurate assessment of the current state of affairs between his organization and mine.

So why does he think that we're doing something important to him? There is naturally a certain degree of partisan chagrin in what he's saying. We're not destroying the global software industry, we're destroying the monopoly, which has been exercised for quite some while now by his employer, despite the best efforts (the temporary best efforts) of the United States government, the European Union, and a number of well-funded commercial competitors who have uniformly failed. I would disagree with BUSINESS WEEK because I think the Netscape Browser is a pretty greasy, unimportant little tool, of no fundamental significance, whose challenge to Microsoft in the early 1990's in the so-called "middleware" market, was a comparatively unimportant run even before AOL bought Netscape and began its ambivalent relation to competition with Microsoft, an ambivalence about which you have all been reading recently.

We are doing something else. We are changing what software is, not just how its made, but how it works in relation to all the other aspects of human intellectual production. Software, by which I here mean executable bitstreams that instruct computers in what to do (there are lots of other types of software and we will be discussing them in the course of this hour: they include music, and movies, and train schedules, and all other useful forms of information in the twenty-first century) is becoming in the twenty-first century a public utility, not a product. We are doing that for a reason. The reason, which was sketched out by my colleague, friend, and client Richard Stallman in the early nineteen eighties, is to protect the ethical right to share information. This is properly understood as the intellectual context of Western science and literature–not as an invention of the nineteen eighties, not as a consequence of our particular personal, intellectual or moral idiosyncrasies. It is the received understanding of our common culture with regard to the production of knowledge by collaborative effort. The free sharing of scientific information is the essence of Western science. And without the concept of the free sharing of information—Western scientists have been pointing out since Galileo pointed it out to the church in the mid 16th century—the advance of knowledge would be either impossible or impossibly burdened.

The context of the transformation of society from analog to digital means of information transmission posed a threat to the free exchange of information, a threat which you all see becoming tangible around you in every area of life from day to day. Information distribution, from the adoption of movable type printing in the west at the end of the fifteenth century until the end of the twentieth, was an industrial process. Information was turned into physical artifacts that it cost money to make, move and sell. Accordingly, an economy of information distribution arose, which required payment streams to recoup the cost of making, moving and selling physical artifacts containing information. That process came to center around the creation of property rights—through a logic of the raising of streams of payment to recoup the costs of production familiar to everybody—in every branch of Western economic thought. The morality of that process, however, depended on the fact that there was no alternative. Because this form of distribution inevitably resulted in the exclusion of some people from information. Societies, as their wealth increased, tended to attempt to offset that exclusionary effect—the undesired, exclusionary effect—of property rights in information production by socialized measures to ensure access: the public library, the public university, and so on. Thus, by the middle of the twentieth century it had become the dogma of the West that information costs money to make move and sell, that information costs must be recouped by exclusionary property rights ("you may not have this information unless you pay for it") and that the harshness of coercive distribution of information goods could be ameliorated in the familiar way—by semi-socialized institutions that offset the distributive unfairness of coercive models of information production and distribution. That, in a nutshell, is how to we got to the point at which things threatened to become terrible, because the advance of technology removed the barrier to universal access. But our minds did not change with respect to the paradigms of information production and distribution.

The conversion to digital technology means that every work of utility or beauty, every computer program, every piece of music, every piece of visual or literary art, every piece of video, every useful piece of information—train schedule, university curriculum, map, chart—every piece of useful or beautiful information can be distributed to everybody at the same cost that it can be distributed to anybody. For the first time in human history, we face an economy in which the most important goods have zero marginal cost. And the transformation to digital methods of production and distribution therefore poses to the twenty-first century a fundamental moral problem. If I can provide to everyone all goods of intellectual value or beauty, for the same price that I can provide the first copy of those works to anyone, why is it ever moral to exclude anyone from anything? If you could feed everyone on earth at the cost of baking one loaf and pressing a button, what would be the moral case for charging more for bread than some people could afford to pay? This represents the difficulty at which we find ourselves straining at the opening of the twenty-first century.

Vast institutions are committed to the social philosophy that only exclusionary practices inevitably involving the large-scale continuance of unnecessary ignorance are essential to the production of useful information. Vast economic rents are being extracted from the world, and enormous numbers of people are going unfulfilled in intellectual and aesthetic needs that we can provide for. One inevitable consequence of the continuance of that approach is that people are forbidden to share.

In 1993, the National Information Infrastructure Working Group on Intellectual Property, led by the chair of the PTO, Bruce Lehman, produced a green paper on intellectual property in the evolving Internet, which became eventually a White House policy document in the first Clinton administration. The IP Working Group report stated that, although it would indeed be necessary to increase copyright infringement penalties drastically, that measure would be inadequate to change social behavior sufficiently to protect intellectual property in the net. Accordingly, the IPWG suggested, every school receiving federal funds should have a curriculum in grades K-12, teaching children that it is wrong to share information. They suggested—I am not fooling you—a slogan in the aftermath of Mrs. Reagan's extraordinary success at ending drug abuse in America. The slogan was: "Just say 'yes' to licensing." What they did not explain was what you called the institution in which you explained to children that it is wrong to share information; it seemed improbable that one would continue to call such a place a school. Nonetheless, I thought that their intellectual honesty was extremely commendable. They had come to the heart of the problem. Their goal was the maintenance of existing social and economic relationships at the expense of incurring the fundamental intellectual inconsistency of their position: that we must teach people that they must not teach others, or else.

Now, it is in that context that we have made a social network committed to the proposition that the central executable elements of human technology can be produced by sharing—without exclusionary property relations. And that if the central executable elements of technology can be *made* by sharing, without exclusionary property relations, then the non-executable elements of culture—art, useful information, and so on—can be *distributed* without exclusionary property relations. It is this process that you are presently witnessing.

When I began working as a computer programmer for pay, in the early

1970s, there was a goal. Software developers had a purpose. The purpose was embodied in a four-word phrase: "Write once, run everywhere." It meant, develop software which can be made to run on all of the hardware that even then rather heterogeneously populated society. It was, from the point of view of venture-capital funded, profit-making, investor-owned industries, an impossible goal, never achieved. We did it. GNU, Linux, and all the other thousands of programs in the free software world, run, as Rita correctly said, on everything. From the palmtop, the cell phone, and the single-purpose appliance—like the digital camera and the personal video recorder—to the mainframe. There was one purpose to software engineering overall throughout my lifetime, and we did it. The best-funded monopoly in the history of the world does not even try.

There are reasons, which I have explored in my writing, including in the piece "Anarchism Triumphant," that production of executable software without property relations inherently develops superior software—not immediately, but over the long term. The analysis of that proposition I leave in detail for further discussion. It's essence is this: software (executable software) is an inherently incremental intellectual product. This is an argument, by the way, against the application of the patent system to it, not a philosophical one, but a technical one. The appropriate invocation of the principal of novelty and non-obviousness to software results in zero software patents. All persons reasonably skilled in the art are capable of achieving each result incrementally, from where the art is at any given moment. But more importantly, for our purposes, the process of making software is massively parallelizable, when the costs of communication and coordination are reduced near zero.

The net is a superconductive medium for the creation of software. So, as I wrote in 1999 when it was a little less obvious than it is today, we are witnessing a phenomenon first noticed by Michael Faraday at the beginning of the nineteenth century. Wrap a coil around a magnet; spin the magnet. Electrical current flows in the wire. One does not ask, "what is the incentive for the electrons to leave home?" It's an inherent, emergent property of the system, we have a name for it: we call it induction. The question we ask is, "what is the resistance of the wire?" Moglen's corollary to Faraday's Law says, wrap the Internet around every brain on the planet; spin the planet. Software flows in the network. It is wrong to ask, "What is the incentive for people to create?" It's an emergent property of connected human minds that they do create. The forms in which they create, like the evolution of spoken and written language, like the disposition of memes, cultural forms, patterns of pottery, shapes of musical endeavor, and so on, are structural characteristics of the human mind. We are a social species, and we create together; that's our nature. The question to ask is, "What is the resistance of the network?" Moglen's Corollary to Ohlm's Law states that the resistance of the network is directly proportional to the field strength of the intellectual property system. The conclusion is: Resist the resistance. Which is what we do. We have been doing it in an exponential growth curve for slightly over twenty years. Now we have forty percent of the server market. We're going to have a hundred percent of the appliance market within five years. That's a trivial economic deduction from the following simple fact: when you sell a four-hundred dollar palm top, you can afford to pay a license fee for its operating system, of $24.95, or $49.95, or incur expensive in-house development activity and make a Palm OS. When the box costs fifty bucks, there's no room left for paying $12.95 to Mister Gates: we win. We win.

We all do it together, the software's a public utility; "Write once, run everywhere"; we're done. This is a noticeable proposition, not just to us–though we understand why it is socially and politically desirable that the world work this way. It is a noticeable proposition for the International Business Machines Corporation, too. You now have, after a mere twenty years of work on our part, the largest, best-funded technology company on earth fundamentally on our side with respect to how the information technology system will work in the twenty-first century. San Palmisano, Irving Wladawski-Berger, you read them all the time, there's a simple proposition: software's a public utility, computing is an on-demand service provided by service providers who handle the internalized cost of making computing possible, and so on.

Thus we observe the new political economy of software. If you have a network and you share, you can achieve the ethical goal of allowing everybody to understand, to improve, to find and fix bugs, to create better software, and to share information in a way that allows them to improve their technical skills. Free software is the single greatest technical library on earth. I say that because free software is the only field where a person can go from naiveté, to the state of the art, in everything that a particular field contains, solely by reading material that is universally available at no cost everywhere the network exists. That is the single, greatest intellectual capital development program in the world. The legal system that makes that possible, the GNU General Public License, with which I have some intimate experience, achieves the creation of a greater and more extensive knowledge exchange program than any other in the world, at no cost. When my colleagues at the Massachusetts Institute of Technology decided to put their entire curriculum on the web—every course, every teaching material, every problem set, every examination—they were adopting the recognition that the principle of Western science, the principle of free software, and the principle of non-exclusion are the path of development for the twenty-first century, a proposition which has its capitalist echo in the behavior of IBM. But for a moment, I just want to concentrate your attention on the moral and political dimension of that activity.

In the twenty-first century, power is the ability to change the behavior of computers. If you can't change the behavior of computers, you live within a Skinner box created by the people who can change the behavior of computers. Every artifact around you responds by either handing you a banana pellet or a shock, depending upon which button you push and whether you are "right," from the designer's point of view. In the world in which I grew up, twelve-year-olds became programmers because they could read other people's code. Mr. Mundie, speaking in Brazil earlier this week in a speech I already referred to, said—and I agree with him—"The health of the software industry," (by which he means his software industry, not mine) "depends upon one simple proposition: never show anybody the source code to anything." Right. More elegantly it cannot be put. And a system which depends for its continuation upon the universalization of ignorance for private profit is an immoral system. Destroying it is merely one more step in the long history of struggling for freedom.

This is the free software movement. I want to be very clear about that. The idea of "Open Source Software" is software that people can read, and I am for that. But it is important to understand that that inadequately describes what we were trying to do, or why. Dylan Thomas refers in "The Child's Christmas in Wales" to the ideal Christmas present of the book that told everything about the wasp, except why. This is, from my point of view, the problem with the discussion about Open Source: it tells you everything, except why. I have now told you why.

Free software is an invocation for particular social purposes of the ability to develop resources in commons. This is not, as I have pointed out, an economic novelty. It is the single way in which we have produced the most important works of Western intellectual achievement since the Renaissance. It is also the way in which we have managed for all time fisheries, surface water resources, and large numbers of other forms of resource beyond human production. Free software presents an attempt to construct a commons in cyberspace with respect to executable computer code. It works. It works, with one interesting subdivision of structural decision-making on how to construct the commons. When we come to the technicalities of licensing, we will observe that there are two philosophies in the construction of the commons, one of which is characterized, oddly enough, by a license with the three-letter name BSD, the Berkeley Systems Division license, which originally covered the distribution of a Unix-like operating system, written on free-sharing principles, primarily at the University of California. The BSD license says: "Here is a commons. It is not defended by copyright against appropriation. Everything in the commons may be taken and put into proprietary, non-commons production as easily as it may be incorporated into commons production. We encourage people to put material into commons, and we are indifferent as to whether the appropriative use made of commons resources is proprietary, or commons-reinforcing."

The second philosophy for the production of software in commons is embodied in the GNU General Public License of the Free Software Foundation, known universally throughout the world by another three-letter abbreviation, GPL. The GPL says: We construct a protected commons, in which by a trick, an irony, the phenomena of commons are adduced through the phenomena of copyright, restricted ownership is employed to create non-restricted, self-protected commons. The GPL, whose language you've been referred to, is not quite as elegant a license as I would like but it is pretty short; yet I can put it more simply for you. It says: "Take this software; do what you want with it—copy, modify, redistribute. But if you distribute, modified or unmodified, do not attempt to give anybody to whom you distribute fewer rights than you had in the material with which you began. Have a nice day." That's all. It requires no acceptance, it requires no contractual obligation. It says, you are permitted to do, just don't try to reduce anybody else's rights. The result is a commons that protects itself: Appropriation may be made in an unlimited way, providing that each modification of goods in commons are returned to commons. Anyone making non-commons use of the material is infringing. One says, simply, "You're distributing. Where's your license?" The defendant has two choices: "I have no license," which is not a good answer, or "I have a license. It's the GPL," which is not a good answer unless you are giving everyone else the rights you had in what you started with.

I hear quite often that my license has not been tested in court. This puzzles me. It is, because of the structure of my license, the defendant's obligation affirmatively to plead it, if she wants to. After all, if she is distributing, it is either without license, in which case my license doesn't get tested—there's an unlicensed distribution going on and it's enjoinable—or the license is pled by the other side .... how interesting. There, if I may put it to you briefly, is the trick. That's how it was done. That's how an enormous commons came into existence throughout the world, not just with zero cost of goods and movement and sales, but with near zero cost of enforcement.

For ten years, I did all of the GPL enforcement work around the world by myself, while teaching full time at a law school. It wasn't hard, really; the defendant in court would have had no license, or had to choose affirmatively to plead my license: they didn't choose that route. Indeed, they didn't choose to go to court; they cooperated, that was the better way. My client didn't want damages, my client wanted compliance. My client didn't want publicity, my client wanted compliance. We settled for compliance all the time. We got compliance all the time.

The legal arrangements which defend these commons are elegant and simple. They respond to the proposition that when the marginal cost of goods is zero, any non-zero cost of barbed wire is too high. That's a fact about the twenty-first century, and everybody had better get used to it. Yet, as you know, there are enormous cultural enterprises profoundly committed to the proposition that more and more barbed wire is necessary. And their basic strategy is to get that barbed wire paid for by the public everywhere. Not just through higher cost of goods, of course, not just through oligopoly pricing, but through direct government subsidies to the production of barbed wire and the occasional removal of juvenile human beings who are impaled upon it. Government should conduct a war on twelve-year-olds all over the globe, for the benefit of Jack Valenti's employers. This is their solution to the problem of the morality of distribution in the twenty-first century. It's stupid, and it will fail.

Now, this brings us to the other part of the significance of free software, which is proposed in my title. For it is not merely the global software industry which is being altered, or—as Mr. Mundie would have us believe—destroyed. What is happening is a more complicated process, more favorable to human freedom and much more amusing. The distribution of other cultural goods is changing because the production of software is changing.

From my point of view, there are two classes of goods with zero marginal cost in the twenty-first century. One class of goods is functional; it performs either better or worse than another class of goods at the same job. Executable computer software is a good, central, but not the only, example of such functional information. Maps, genome information and other examples could be equally invoked. My proposition, as I have already put it before you, is that for functional goods with zero marginal cost, production without property relations produces superior goods. And this is true the more that collaboration is necessary in order to produce. Hence, free software and soon–as a result of the work that I and hundreds of other people are doing around the world—free genetic information and machines, represent the demonstration that this form of production, without exclusion from the right to understand and produce oneself, produces better goods. So everybody who wants to be a producer is, and produces at the margin of the ever-expanding compact mass of existing production, because nothing requires reinvention. What you have is a system of Lamarckian evolution of functional goods, in which the acquired characteristics of any one good can be inherited by all the others. The result, as Lamarck and Darwin and other nineteenth century evolutionary theorists noted, is the rapidest and most positive kind of evolutionary change.

But there is no such thing with respect to non-functional goods. One cannot say that anarchist music is inherently superior to proprietary music. What one can say is that in the world of zero-marginal cost, anarchist distribution—that is, distribution without exclusion from the act of distributing—produces inherently superior distribution. This is even easier to perceive than the first proposition. When the right to distribute goods with zero marginal cost has to be bought and sold, there are inefficiencies introduced in the social network of distribution. When no such buying and selling, no such exclusion from the power of distribution exists, distribution occurs at the native speed of the social network itself.

The famous experiments of Stanley Milgram, now somewhat blown upon, which gave us the amusing sociological result known as "Six Degrees of Separation" was a demonstration of the inherent speed of social distribution in the network. Let us concede six to be a number predicated on only networks of privileged people with a certain degree of wealth, and so on. As recent research has tended to show, it is still true that the social distribution network is much deeper and much richer than anybody previously understood in human history, and that it is inherently superior to systems of distribution networking constructed by the exclusion of most distributors. The result, as everyone in this room is aware, is that twelve-year-olds do a better job of distributing music than the music companies. The music company continues to take ninety-four percent of the gross for promoting and distributing music, and the twelve-year-olds who take zero off the top do a better job. When bandwidth constraints are removed, the same happens to video; without removal of bandwidth constraints the same happens to publishable text, to poetry, to all forms of useful knowledge and information. The model is: "Here; I think you need this: take it." The result is, let us say, that when music under the present system leaves the production studio and passes through six hands, it isn't in the store yet. Whereas, in

Stanley Milgram's United States, after six jumps, everybody who wants the music has it. The systems for the proprietary distribution of culture—the systems in which the right to distribute is bought and sold—are the Trabant factories of the twenty-first century. They are hopelessly inefficient, they are the outcome of a social philosophy that is utterly defunct, they fail to respond to the existing presence of a robust and superior competitor: they are through.

Of course, the coercive power of the state will be summoned in endless quantity, to reassert the right of Trabant to make inferior automobiles and force them on helpless consumers. And even then, their days are numbered. Because you cannot put all the twelve-year-olds in jail, and because you cannot teach them in school that sharing information is wrong. That's it. End of game.

So, we now find ourselves, if you will permit me, projected approximately twenty-five to thirty years into the future. Software is a service, a public utility, being produced primarily by people we presently call "students," doing something we presently call "learning." The primary services being sold in the Capitalist economy with respect to software are project management, indemnification, distributional customization, and tailoring, piece by piece, to the individual needs of consumers. That work is being done on a basis which is commons-reinforcing, so it has a tendency, as such work should, to put itself out of business. And it is therefore a much lighter and simpler industry than the present one. Governments do not buy software at exclusionary prices. This is what is giving Mr. Mundie the heart attack he is having, and why he is saying the absurd things he is saying in Brazil.

Two years ago we began a campaign to point out to governments that they ought not to subsidize monopolists by buying unfree software. I was invited to speak at the Business Software Alliance last November, and to Emery Simon I owe my continuing thanks for that experience. I felt a little like Fidel in Miami, but in fact I was treated with a warmth that belied the comparison. I said there, and I think it represents a simple truth, that the government market is one in which there should be free and open and unrestricted competition. Our position is that every government employee, everywhere on earth, should have a desktop fully compatible with all the data now in existence, with which everything can be done that that government official needs to do, that the price of acquisition to that government should be zero, and that government should be free to make as many copies of that software as it has public employees and to distribute that software in any way it wants. Those are the terms on which we propose to supply software to government, and we assume that anybody intending to compete in that market will offer terms at least as favorable to the public and to the public fisc, as our terms.

Oddly enough, that does not represent the terms on which the monopoly proposes to offer software to the public, and therefore there is a continuing assumption that governments around the world will continue to pour billions of dollars of subsidy into the continuance of the proprietary production of software. Emery will explain in due course why that is good. I will only point out that so long as that is good, the system of distribution of culture by means that are efficient for the distribution of all cultural goods will be to some extent inhibited, because the software which performs distribution will be regarded as illegal or unavailable. The building of networks means building the systems for sharing data. Industries that own data on exclusionary terms then turn around and attempt to prevent networks from working, because networks share data and the goal is not to share. The result is that the owners of the technology are put under pressure to facilitate a network which does not share data efficiently. The attempt is to move the inefficiency of the distribution system into the technology itself, and that of course requires technology that the users cannot change. For if the users can understand and change the technology, they will remove the inefficiencies and resume using the networks for their intended purpose, which is the sharing of information.

Accordingly, we now face a fundamental choice: whether we plan to employ free software, with the inevitable corollaries that it presents with respect to the replacement of a dead system of inefficient distribution by a live, vital and important system of efficient distribution, or to attempt to control every computer and appliance in the network in the interest of a few small distributors of bitstreams, who regard their bitstreams as their property.

For this reason, again I want to point out that the phrase "Open Source" does not capture what is really happening. What we are actually deciding is whether to free the network to be a network, or to control the network as a form of broadcasting—a form of proprietary distribution by a few favored individuals in which the remaining individuals are regarded as—the phrase is so familiar it rolls off the tongue without a second look—consumers. Meaning, non-producers, non-creators. We have become so accustomed to that model of that understanding of the human mind—that a few people create and the others consume—that we do not even recognize when we say it what it implies about the people in general. How anti-democratic our basic assumption is: there are some creators, and there are consumers. This is the moral question of the age. We mean to solve it. By freeing the technology that runs the network, we change the way the network operates as a connector of human minds. That's the goal.

Eventually, we reach the question of the network infrastructure itself. So, let us go back to that Motorola cellphone. Like every other appliance, it will contain free software—it can't afford not to. And as things are at present, I get calls from the manufacturers of such radio communication appliances relatively frequently. "We are making an Open Source/Linux/free software architecture board inside our enterprise." "I'm surprised to hear it," I say. "We would like you to affiliate yourself with us, etc." "I'm very interested in the discussion," I say. "By the way, you do have two chips in that phone, don't you?" "Oh yes, of course we do, we must, one chip that runs free software, that does the keypad, and the screen, and all the user interface operations, and one chip which doesn't run free software, which controls the radio. We have to do it that way. If we don't, the regulators all over the world will beat us up and they won't let us sell the appliance." "Yes," I say. "I know." And then, as if by magic, the same phrase pops out of them each time: "But it is so expensive." "Yes," I say. "And that's why, ten years from now, you are going to be helping me destroy spectrum regulation all over the world—because the logic of Capitalism compels you to save that other fifteen dollars for that second chip." But of course, once you have general software-controlled radio, under the general control of free software, users make decisions about the spectrum, not regulators. How odd! It's our spectrum—how strange that we should be making decisions about it. How peculiar that democracy might actually say, "We decide how to use channel seven. It doesn't belong to Mr. Murdoch, it belongs to us!"

Now, of course, there was a time when we regarded it as absolutely necessary for government coercively to decide who used channel seven. The problem was interference, which was a real problem as severe as recouping the cost of the industrial production and distribution of information. Then, we went digital. Cellphones learned to share spectrum. The problem of interference, as real and serious as it was, like the problem of recouping the non-zero marginal cost of the book, went away. But the underlying system of social relations did not change. And we are not merely talking about Mr. Murdoch's interest in the ability to reach one hundred and eighty million people, as opposed to my ability to reach fifteen—we are also talking about Verizon's view that the spectrum should be sold to us, by the sip, for personal communications. What should we do instead? We should share the spectrum. This is what the Wi-Fi revolution is beginning to suggest to civil society. We should just build mesh networks and interconnect them. And we should send our voice and data communications over those networks, and we should do so in a decentralized way which does not require us to rent our switching capacity from the telecommunications oligopoly. We don't need them anymore, people are beginning to recognize—and this is true. Free software will assist in the next twenty years with both of those most extraordinary changes. Because as the devices that use radio inevitably come to include software that users can modify, and as the barbed wire civil war moves inside the box (tamperproof chips, laws against removing one chip and replacing it with another, laws against reprogramming cellphones, etc.) it turns out that you can't put every fifteen-year-old on earth in jail. And when people realize that they are paying two hundred dollars a month—this for the wired phone, that for the wireless, that for the cable—or, they could put a fifteen dollar box in their pockets and talk all the time, and have fast data communication everywhere for the rest of their lives, it becomes a civil society issue. It becomes a political issue. That means in the United States, it becomes an issue of money. Of the twenty-five largest contributors to political campaigns in the 2002 election cycle, eight were telecommunications oligopolists. That's where we're heading.

Free software is, at the moment, about giving Mr. Mundie a headache. We're going to spend the next two days at this conference talking about that restricted part of what's going on: the transformation of the software industry from commodity to service. The transformation of the system of production from one which assumes exclusionary production is superior, to one which discovers that non-exclusionary production is superior. We're going to discuss how enterprises adjust to that change, how individual researchers and programmers adjust to that change, how the nuances of legal relationships affect the ways in which that change works. This is a fascinating conversation, I've been thinking about it for fifteen years, I have a lot of fun doing it. I just want you to understand that such talk is the beginning of something way more important, and that in order to understand why it is important you have to understand why it is at all. It won't do to say it's Open Source—you'll get a good idea about the software business but you won't understand any of the rest of this because it won't be clear why what is happening is happening, or why the newspaper headlines read the way they do. What we are going through is a fundamental alteration in the areas of intellectual infrastructure and production all over the world. We're now talking about just one little piece. You have got to understand that the struggle is bigger than that. That it is more serious. That it commits us to fundamental moral questions that we have to take a side about. That the work we do as lawyers, and programmers and engineers now is about the future of freedom of ideas all over everywhere. That it means confrontations just as improbable in scale as the confrontation between the Microsoft Corporation and the Free Software Foundation, which I didn't name but which Mr. Mundie did. David and Goliath? Hell no. Goliath was just a big human being, basically the same as David but larger.

I was in Redmond recently, having a nice, pleasant conversation in a little conference room with nine guys surrounding me on every side. I said, "Okay, it's time for another one of our recurrent talks between the movement and the firm." We're not talking about things that are parallel in scale, or size, or feature, or nature, or composition. We're talking about a confrontation between two fundamentally different forms of social organization. It doesn't behave the way inter-firm competition behaves in a competitive market, it doesn't have anything to do with what it looks like in Microeconomics 101. There are features that can be put up on the two axes that way: you can draw supply and demand curves, and you can get real answers, I don't say otherwise, there are features of this well studied that way. But it's important to get out past that in order to understand what's happening. Two different philosophies about the nature of human intellectual production are in confrontation. One of them has all the chips; the other has all the right answers. This is part of the long struggle in the history of human beings for the creation of freedom. This time, we win.

Thank you very much.