Free Software

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My name is Brian Hodge, and I am here today to talk to you about Free Software.

Some of my presentation is paraphrased from a speech given by Richard Stallman[1], who founded the Free Software movement over twenty-five years ago. While I don't expect everyone to make all of the sacrifices he has made to uphold his ethical model, I hope that his monk-like dedication to Free Culture can be an inspiration to all of us.

Mr. Stallman defines Free Software as "software that respects the user's freedom and social solidarity of his community." Now, those words were transcribed[2] from his original speech which was in Spanish, and I think a bit of the meaning is lost in translation.

I define Free Software as software that contains an ethical contract which enforces and preserves the freedom of its developers and users to use, study, share, and modify their software however they see fit. These four tenants are expressed as the Four Essential Freedoms, which are:

Freedom Zero: The Freedom to run a program for any purpose. As a hyperbolic example, many Apple software licenses include a clause prohibiting the use of the software to design nuclear weapons[3]. This clause is even included in the iTunes license. While it may be a thought-provoking exercise wondering how iTunes could possibly be useful for designing nuclear weapons, this example sets a precedent for the exact type of licensing clause that Freedom Zero combats.

For a more realistic example, consider something like Microsoft Office. Without Freedom Zero, Microsoft could at any time add a clause to their software licenses that says "This software may not be used to open documents created with any Non-Microsoft Product." Or, like many software vendors already do, they could add code specifically to make their software not play well with other applications, simply to discourage users from exercising their freedom to choose. Freedom Zero prevents these practices. The Freedom to run a program for any purpose.

Freedom One is the freedom to study the source code of a program, and change it to make it do what you want.

"Proprietary" means that a software application is provided to you as a compiled binary. Binaries are notoriously difficult to reverse-engineer, so you can never be sure exactly what's going on behind the scenes. With open-source software, you can view the source code and compile it yourself and compare your compiled binaries to the ones provided by the software vendor to ensure they match. If they don't, then the binaries they're distributing may have been tampered with. If you are able to view and compile code yourself, it follows that you may modify it as you see fit and recompile it. The freedom to study the source code of a program, and change it to make it do what you want.

Freedom Two is the freedom to share; that is, the freedom make and distribute exact copies of the program whenever you want.

In essence, this makes all Free Software gratis, that is free of cost, as you can share the source code freely, and anyone you share it with can also compile it for themselves. Remember that Freedom One stipulates that any recipient of a compiled binary application is entitled to a copy of that application's source code. The freedom to study and modify code, Freedom One, and the freedom to make and distribute copies, Freedom Two.

Last is Freedom Three: The freedom to contribute, that is, the freedom to make and distribute copies of your own modifications to a program. It follows that if you are free to obtain code, share code, and modify code, then you are free to share your modified code as well. Furthermore, those to whom you give your code may then modify it and share it, and so on and so on. Freedom Three may be a bit logically redundant, but it describes the foundation of how Free and Open Source Software proliferates and evolves. Someone obtains the code to an application, they modify it to be more efficient or to have an improved feature, and others adopt those changes, still others contribute their own changes and additions, and as a project grows in popularity, eventually hundreds or even thousands of developers may be contributing to it. Each of them lend their particular expertise to make code more efficient, more secure, more reliable, more usable, etcetera.

To quote Richard Stallman, "Software must be Free because we all deserve Freedom – we all deserve to be allowed to participate in a free community."[2]

Many can't be bothered to care about Free Software, and that is their choice; however, some mistake that choice for Freedom itself. I'm reminded of a question asked by a reddit user (paraphrased): "Why do advocates of Free Software not support a user's **Freedom** to use proprietary software?"[4] On the face of it, it sounds like a valid question. But an astute redditor likened it to (again paraphrased): "Why doesn't the government support a citizen's 'freedom' to sell themselves into slavery?"[5] Proprietary software takes advantage of its users. While it may be perceived as benign, the largest software vendors masterfully manipulate entire industries for their own gains.

Proprietary software companies such as Microsoft, Apple, CISCO, Sun, and many more make "*charitable contributions*" to schools, from the smallest Elementary Schools to the most prestigious Universities. As an unspoken stipu-

lation for using these "free" or reduced-price tools, these companies encourage the schools to teach their students that they are the best, the only, tools for the job. Regardless of the product's quality, the students are exposed to these companies' technologies, and nothing else. Students graduate from college with a four-year degree in Information Technology, yet many don't know a lick of PHP or how to set up a Linux Server. But they have "certifications" on how to use proprietary (and extremely expensive) technologies. They're locked into either spending thousands of dollars of their own money to go into business themselves, or obligated to find employment at a firm that has already purchased licenses to the only software the graduates know how to use.

And the truth is, nearly all of the Free and Open Source alternatives are faster and more secure than their proprietary counterparts, while also being free of cost *and* supportive of users' freedoms. The majority of servers on the planet are Linux-based. But at far too many colleges and universities, students will be discouraged from learning how to use Linux, and instead indoctrinated with the Microsoft suite of applications. A student will graduate knowing how to configure Windows Server, Windows IIS webserver, Microsoft SQL, Microsoft Access, and ASP dot net, and find themselves in an extremely limited job market where employers want web developers that know PHP or Python, and server administrators that know Linux and Apache or nginx.

Now, I wish this was all just a conspiracy theory and that myself and Mr. Stallman were just tinfoil-hat-wearing kooks. But I've seen enough of this industry to know the truth. Proprietary software isn't the devil, it's not a scourge on the Earth. But when zero-cost alternatives that are almost universally superior are available which also staunchly protect the freedoms of their users and developers, it's a no-brainer which you should use.

If more establishments would adopt Free and Open Source Software, the

world would be a better place. It would put the big corporations in check, and force them to write better software which also respects its users freedoms just to remain competitive, and those companies would switch to a support-based profit model rather than license-based. This works very well in the open-source world: RHEL, that is Red-Hat Enterprise Linux, is a widely used operating system whose proprietors earn money via live support subscriptions. When something goes wrong with their server, or if they have a question or want to do something they don't know how to do, they can contact Red Hat at any time and their issue will be swiftly resolved. That is how a living can still be earned in the world of free software.

I am a scientist. A scientist-in-training, as it were, but that means that my mission in life is to improve humanity's collective access to knowledge and efficiency. Supporting Free Software is akin to that goal. I will strive to use Free Software whenever I am able, and write free and open source code whenever I am at liberty to do so. I encourage everyone to endeavor to do the same. Thank you.

References

[1] Richard M. Stallman. Free software and education. *GNU.org*, 2014. https://www.gnu.org/education/.

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[4] jadenPete. Why does gnu talk about freedom, but bash on distros who give users the freedom of using proprietary software. *reddit.com*, 2016. https://np.reddit.com/r/gnu/comments/4r000g/.

[5] VRMac. (top level comment). *reddit.com*, 2016. https://np.reddit.com/r/gnu/comments/4r000g//d4x9iq6.