



Software Copyrights Software Patents and Free Software

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Rourke's Speech

- **From the movie “The Fountainhead”, from Ayn Rand’s novel. Gary Cooper as Rourke, who is accused of dynamiting Courtland, a building he designed, but which was not built to his specifications.**

Rourke

I am an architect. I know what is to come by the principle on which it is built. We are approaching a world in which I cannot permit myself to live. My ideas are my property. They were taken from me by force, by breach of contract. No appeal was left to me.

Rourke (continued)

It was believed that my work belonged to others, to do with as they pleased. They had a claim upon me without my consent -- that it was my duty to serve them without choice or reward.

Now you know why a dynamited Courtland. I designed Courtland. I made it possible. I destroyed it.

Rourke (continued)

I agreed to design it for the purpose of it seeing built as I wished. That was the price I set for my work. I was not paid. My building was disfigured at the whim of others who took all the benefits of my work and gave me nothing in return.

I came here to say that I do not recognize anyone's right to one minute of my life, nor to any part of my energy, nor to any achievement of mine -- no matter who makes the claim!

My terms are: A man's RIGHT to exist for his own sake.

What do you think?

- **DO AUTHORS HAVE THE RIGHT TO BENEFIT FROM THEIR CREATIONS AND INVENTIONS?**
- **DOES BRAZILIAN LAW RECOGNIZE THESE RIGHTS?**
- **DOES THE UNITED STATES CONSTITUTION RECOGNIZE OR PROTECT THIS RIGHT?**

What Thomas Jefferson Thought



What Jefferson Thought

He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature,

Jefferson (continued)

***when she made them, like fire,
expansible over all space, without
lessening their density in any point,
and like the air in which we breathe,
move, and have our physical being,
incapable of confinement or
exclusive appropriation.***

Jefferson (continued)

Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done, according to the will and convenience of the society, without claim or complaint from anybody...”

(letter to Isaac McPherson 1813)

What British Common Law Has to Say

- **Common Law has recognized the moral rights of an author to control their creations and profit from their distribution.**
- **The “right” in copyright really is a right in England which probably could not be removed by statute.**
- **England is a signatory to the Berne convention which recognizes this moral right as the basis of international copyright law.**
- **The same notions largely apply to patents. Though what can be patented is a hot issue.**
- **The EU (unlike the US) does not permit software to be patented, though in practice many software patents are in fact granted.**

What the US Constitution Says

- **Section 8 (The Powers Clauses)**
congress shall have the power to
- **Clause 8: To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries;**

What the US Constitution Says

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What the US Constitution Says

- **Note however that the US is a signatory to the Berne convention which recognizes moral rights.**
- **In practice the US position is not so different from the British position.**
- **Statutes specifically mention moral rights**
- **Would be interesting to see what would happen if congress suddenly eliminated copyrights or patents.**

Copyright in Brazil

- **Brazil has enacted new copyright and software laws which came into effect on June 19, 1998 and February 20, 1998, respectively.**
- **The copyright law establishes that computer software and databases are copyrightable subject matter but copyright protection for computer software is subject to the new software law.**
- **The specific software law establishes that the term of protection is 50 years from the first of January next following publication or, if there is no publication, from the first of January next following creation.**

Copyrights in Brazil (continued)

- **Moral rights in computer software are limited to a right to claim authorship and a right to oppose modifications detrimental to the author.**
- **Registration of copyright with the Patent Office is possible and provides evidence of ownership but is not required.**
- **Infringement of copyright in software can give rise to criminal penalties.**
- **More details to be found in:**

**[www.ladas.com/BULLETTINS/1999/0399Bulletin/
Brazil_NewCopyrightLaw.html](http://www.ladas.com/BULLETTINS/1999/0399Bulletin/Brazil_NewCopyrightLaw.html)**

Who is Ada Core Technologies?

- **Ada Core Technologies is a software company that remains 100% committed to the principles of Free Software and Open Source (FLOSS - Freely Licensed Open Source Software)**
- **Why?**
 - It's invaluable to our users
 - It's profitable for our company

Overview

- **Copyright Considerations**
- **Public Domain**
- **Free Software**
- **Open Source Software**
- **Licensing Considerations**
- **The GPL and modified GPL**
- **Commercial considerations**

Copyright Considerations

- **Copyright**
 - In England, a fundamental moral right belonging to authors
 - In the USA, a temporary property interest granted by congress in the public interest.
 - In practice little difference
 - Details of laws do differ. This presentation basically presents the US practice, but the differences are not great, and the US pressures other countries to conform to its notions in this area.
 - Brazilian law seems close to British/European laws

Who Owns the Copyright

- **The author automatically owns the copyright unless one of these holds**
 - Work-made-for-hire implied by employment
 - Specific work-made-for-hire agreement
 - Specific contractual assignment occurs
 - Similar rules in Brazil
- **No specific notice is required**
- **No official registration required**
- **Up to user to check copyright status**

Copyright Registration

- **In the US, copyrights are registered by depositing a copy with the Library of Congress.**
- **For software, only need to deposit first and last section (can be just comments!)**
- **Helps to establish a presumption of originality if done within five years.**
- **Copyrights last life + 75 or 90 years (corp)**
- **But only 50 years for software in Brazil**
- **What a relief to know that the copyright on your version of windows will expire in only 50 years here instead of 90 years 😊**

What can be Copyrighted

- **Both Source and Object of Programs can be copyrighted**
- **Subject to exceptions**
 - Lack of originality
 - Dictated by external considerations
 - Dictated by efficiency
- **No uniform law in this area**
- **Law is mostly established by precedent and actual court decisions, and there is not much to go on.**

What Copyright Controls

- **It allows the author to control copying**
- **Loading a program is a copy**
 - True for sure in Europe
 - True according to some courts in the US
 - Don't know in Brazil
- **But certain copying is allowed**
 - Fair use
 - Creating backup copies
- **User owns a copy of the software, not the software itself.**

Derived Works

- **If a copyrighted work is modified by a new party, a derived work is created.**
- **Creation of derived works is controlled**
 - Fair use provisions apply
- **A derived work can only be copied with permission of both parties**

De Minimus Copying

- **De minimus refers to copying that is**
 - Small in extent
 - Non-critical functionality
- **Case law very vague**
- **Basically a jury decides**
- **Is a one line patch de minimus?**
 - No clear case law
- **The FSF has decided that any patch of 10 lines or less is de minimus.**
 - But not tested in court

Fair Use

- **Notwithstanding the provisions of sections 106 and 106A, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include -**

Fair Use (continued)

- **(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;**
- **(2) the nature of the copyrighted work;**
- **(3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and**
- **(4) the effect of the use upon the potential market for or value of the copyrighted work.**

Public Domain

- **Software is in the public domain if**
 - Enough time has elapsed (75 years!!)
 - But this can be extended by modification
 - It is explicitly placed in the public domain by the holder of the copyright (and author?)
 - But in some countries (certainly including France), an author cannot disclaim copyright entirely. That seems to be true wrt moral rights in Brazil as well.
- **It is up to the user to properly determine if something is in the public domain.**
- **PD software is owned by no one.**

More on Public Domain

- **If a PD work is modified by an author, then a derived work is created.**
- **That derived work is wholly owned by the new author.**
- **Not much is required to claim total ownership.**
- **Example: Beethoven Sonatas**

Copyright and Licensing

- **A copyrighted work may not be copied**
- **The copyright holder can grant a license permitting copies under specified circumstances.**
- **Licenses are pretty free to say anything they like (but not quite!)**
- **Virtually all software is sold this way**
- **Note that copyright/license statements in source files have no legal significance.**

The DMCA

- **Digital Millenium Copyright Act**
- **For the first time extends copyright beyond just copying**
- **Recognizes the use of encryption (and other methods) to protect copyright “rights”.**
- **Criminalizes any attempt for any purpose to get around any such device or method**

The DMCA in Action

- **Lexmark puts a chip in their printer cartridges**
- **Contains trivial code (but encrypted)**
- **Printer checks this code is there as expected**
- **Won't work with cartridge if chip is not there**
- **Any attempt to get around encryption is a potential DMCA violation**
- **Not resolved yet!**

The DMCA in Action

- **Russian company breaks encryption on Adobe electronic books.**
- **Allows disabled people to view larger versions**
- **Not criminal in Russia**
- **Programmer for company visits USA**
- **Gets arrested for violating the DMCA**

Patents

- **Quite different from copyright**
- **Much more limited period of time (20 years)**
- **Patent a process (but not a recipe)**
- **Patent an invention (but not an idea)**
- **Must disclose invention and best embodiment**

More on Patents

- **Must not have any prior art**
- **Must not be obvious**
- **Can copyright non-obvious combination of obvious ideas**

Example of Combination

- **Intermittent wind shield wipers, well known**
- **Electric timers providing regular signals well known.**
- **Put them together, voila, electronically timed intermittent wind shield wipers**
- **Non obvious??**
- **Worth at least 17 million dollars 😊**
- **See the movie “Flash of Genius” for another viewpoint!**

Software Patents

- **Does a program express an invention or an idea?**
- **If an invention, then can be patented**
- **In practice, software algorithms and programs can be copyrighted**

Some examples

- **If on last line and press return, screen scrolls**
- **Progress bar (patented in France)**
- **Graph coloring for register allocation**
- **Font smoothing algorithms**
- **To exchange little-endian/big-endian data, use canonical (e.g. LE) encoding for transfer, swap bytes if you need the other encoding**

How Patents Strike

- **Apply for patent**
- **Patent granted**
- **You find out about it**
- **You are infringing from point of patent being granted to when you find out about it.**
- **Patent is secret until it is granted**

Patents in Action

- **No good font smoothing in Linux**
- **New palm pilots don't have grafitti**
- **Mozilla may have to eliminate plugins**
- **Blackberry nearly closed down, paid \$57 million**
- **Does this contribute to progress?**

Copyright and Licensing

- **Free Software and Open Source Software are typically:**
 - Copyrighted
 - With a license allowing copying
- **Just like Microsoft!**
- **The only difference is the license**
- **The license allows some copying**

Software “Piracy”

- **Clever use of term**
 - Piracy implies extreme violence and horrible behavior
- **But software “piracy” is nothing of the sort**
 - When something is copied, the original is still there!
- **It’s more like videotaping the other ships chests of gold than stealing them.**
- **Software makers claim huge losses**
- **But these calculations are based on total number of “stolen” copies multiplied by retail price**
- **Totally bogus!**

Free Software

- **License allows**
 - Copying for personal use with no restrictions of any kind at all
 - Redistribution of original software with sources
 - Redistribution of derived works with full sources
- **Derived works must be Free Software**

The Idea of Free Software

- **Encourage secondary distribution**
- **Encourage derived works**
- **Encourage general use**
- **Create notion of public ownership**
 - Unlike PD, no one can claim proprietary ownership of free software.
- **Free Software tries to approximate what people assume public domain means.**

Free Software Licenses

- **The GPL**
 - Quite restrictive for redistribution
- **Modified GPL**
 - Allows redistribution more generally
- **BSD**
 - No restrictions on redistribution at all
- **Public Domain**

Free Software Ownership

- **Free software license allows authors to own their own work**
- **If you modify a Free Software program, you own the copyright**
- **It is up to you to decide about distribution and allowing others to copy your work.**

Open Source Software

- **Software distributed with sources**
- **Modifications encouraged, but may create distribution and ownership restrictions**
- **The emphasis is on quality**
 - Peer review of open code
 - Cooperative work to improve code

Open Source Software Licenses

- **Are approved by OSI (Open Source Initiative)**
- **All Free Software is Open Source**
- **But other licenses are allowed, for example:**
 - Original APL (Apple Community License)
 - Specified that Apple owns modifications
 - APL was not considered Free Software

The General Public License

- **A Free Software License**
- **If you create a derived work, you can freely distribute it provided that**
 - You provide sources (at reasonable cost)
 - The resulting derived work does not have any additional restrictions.

Source Distribution Requirements

- **To redistribute a GPL'ed program you must either**
 - Distribute the sources with the program
 - Or make a written offer to provide the sources at a reasonable cost.
 - Does not apply to original author
 - The original author doesn't even have to distribute the sources, though the GPL is pretty meaningless in this case.
- **Reminder: you do not have to distribute anything to anyone.**

The “Virus” Effect

- **If you have a proprietary product and you incorporate GPL components, then you can only redistribute if the result is also covered by the GPL.**
- **This is simply the condition for allowing you to use the GPL component (which no one is forcing you to do)**
- **If you “violate” the license, it is simply a copyright infringement.**
- **Microsoft would not allow redistribution at all, so this is really not onerous.**

Can you Sell GPL'ed Software

- **Yes of course**
- **No one ever suggested otherwise**
- **No restriction on price you can charge**
- **No special considerations at all**
 - Of course someone can redistribute and charge whatever they want to charge.

Redistribution Requirements

- **If you modify GPL'ed software are you required to redistribute your modifications?**
 - Of course not!
 - No one ever implied this
 - Such a requirement would be contrary to the entire spirit of the GPL
- **The GPL never ever forces distribution**

How does the GPL affect Author

- **If you issue a GPL to someone how does it restrict you, the author?**
 - Not at all
 - A license you grant to others cannot affect you in anyway at all.
- **You are free to do anything you want**
 - For example, distribute to someone else with a different license.

Modified Versions of GPL

- **If runtime of compiler was GPL'ed then a program using runtime would be too.**
- **Nothing wrong with that**
- **But it may not be what you want**
- **Modified versions of GPL allow more freedom.**

The Library GPL

- **LGPL permits more general use**
- **Can distribute object only, even modified versions**
- **Must distribute objects to allow relinking**

The Run-Time GPL

- **Allows completely general incorporation of object code into executables**
- **No requirement for source or object distribution**
- **Used for the C run-time.**
- **Ideology note: pragmatically better to have people using FS even for non-FS than using non-FS for this purpose.**

The GNAT Modified GPL

- **Similar to run-time GPL**
- **Important difference specifically allows for generic instantiation**
 - Probably this is needed for C++ as well
- **Practical effect is to completely remove restrictions on derived use in programs**
- **But could not distribute modified library containing GMGPL components.**

Example of Multiple Licensing

- **Cygwin is a library from Cygnus providing Unix-like features for NT**
- **Distributed under the GPL**
- **Cannot be used in proprietary programs**
- **But you can also license a proprietary version from Cygnus that can be used in proprietary programs.**

Example of Multiple Licensing

- **Company S has backend for compiler**
- **Wants to put it together with g++ front end to create new C++ compiler**
 - Backend must be under GPL for this case
- **Wants to put it together with some proprietary front end from company Q**
 - Result here can be fully proprietary

Open Source vs Commercial

- **At the NYU forum last year, an NYU student asked Bill Gates if he would adopt the Open Source Model for any Microsoft Software.**
- **He answered saying that the commercial model worked better, since by charging a modest (!) fee for such products as Office, resources were available to improve the product.**

Open Source vs Commercial

- **This is a nonsense contrast**
- **Open Source software can be commercial**
- **And non-open software can be non-commercial**
- **They are unrelated concepts**
- **And Bill Gates knows it!**

Commercial Considerations

- **How FS and OSS fit into a commercial picture where goal is to maximize revenue.**
- **Use GNAT and GNAT Professional as examples**

Open Source

- **Open Source**
 - Emphasis is on quality and commercial use
 - Quality achieved by universal review
 - Quality achieved by publication
 - Users have access to source
 - Risk reduction
 - Special requirements

GNAT Professional

- **Is a product sold with support**
- **Support is the primary product**
 - But we do not break out cost of product
- **No large up front payment**
 - Support cost is constant year to year
 - Over period of time total cost is often higher than proprietary software.

Redistribution Issues

- **GNAT Professional is distributed under the GPL (and GMGPL as appropriate)**
- **This allows redistribution**
- **But we have never seen it happen**
- **Redistribution is NOT a focus of OSI software, though it is permitted**
- **Boeing is not interested in providing software to Lockheed!**

GNAT Professional Sales Approach

- **We regard the OS nature of GNAT as a big selling point**
- **This has nothing to do with the Free Software goal of universal access and redistribution.**

Why FLOSS Is Essential For You!

- **Cannot afford to rely on a single vendor for support. There must be alternatives.**
- **Cannot afford to have black box components in mission-critical software.**
- **No fiddling around with aggravating license controls (note huge Microsoft screwup with Vista licensing for example).**
- **You can evaluate the quality for yourself**
- **No source escrow considerations**
- **You can self-maintain if necessary**

What You See is What You Get

- **No Easter Eggs in Open Source Software**
 - By definition
 - By custom and practice
- **Early versions of Excel had a built in full featured flight simulator.**
 - What else is there?
 - What does this say about quality control

“Why Open Source Works for You”

- **ACT makes money if you renew support**
- **ACT has an interest in providing really good support, since otherwise you will not renew.**
- **Our commercial interests are aligned with your project interests.**
- **We provide “Project support”**

But What About Ritchie?

- **Ritchie's Open Source Trojan Horse**
 - Very complex theoretical model
 - Has never been seen in practice
- **Does not apply to GNAT in any case**
 - Full development history available
 - Each version compiled with previous version
 - Original version compiled with proprietary Ada compiler
- **But in proprietary software, trivial**

Upsides to Open Source Approach

- **Many people familiar with technology**
 - We often hire people who have already worked for us as volunteers.
- **OS appeals to technical folks**
 - Pride in work that is published
 - “Good guys”
- **Support orientation extends to staff**
 - All ACT staff are involved in support

Downsides to OS Approach

- **Competition is much easier, since sources and people are available.**
- **No captive market for support**
- **Restriction on what can be charged**
- **Long term concerns (next slide)**

Is Model Long-Term Viable?

- **What if GNAT gets so good that no support is required?**
- **Won't people simply use the freely available public version?**
- **In practice most of our support is not fixing problems**
- **We constantly upgrade and improve**

Free Software

- **Emphasis is on user rights**
 - Right of modification
 - Right of redistribution
 - A view of a free exchange of versions
- **This view is exactly right for the public version of GNAT**
 - Redistribution and modification encouraged
- **Use for proprietary commercial software is discouraged**
 - GNAT GPL Version distributed under the pure GPL
 - Fine for academic (GAP) usage
 - Fine for Free Software development

The Public Version of GNAT (GNAT GPL)

- **Familiarizes Students with GNAT**
 - We provide no-cost university support
- **Allows Development of Free Software**
- **Allows people to evaluate GNAT easily**
 - But this is a double-edged sword
 - Since they do not evaluate our support
 - And tend to evaluate an old version
 - Free evaluations of GNAT/Pro with support
- **Makes GNAT universally known**

Public Version Concerns

- **This is an unsupported product**
 - We emphasize lack of support
 - But this can create concerns
 - We use to include a “nag-ware” message about availability of commercial support, but no longer
- **People want to spend money, they are suspicious of “freeware”.**
 - We do not discourage this viewpoint 😊
 - Big companies need to worry about “free” software

Public Version Releases

- **We do not have to distribute the public version**
- **We do not have to distribute GNAT sources**
- **We do not have to make public binary versions of GNAT**
- **We do anyway!**

How is FS/OSS Working for ACT

- **We do see some “cheating”**
 - But then proprietary software is not free of that problem either
- **Our pricing structure seems to be reasonable for this kind of market**
 - Not clear it would work in other markets, e.g. it seems unlikely this could work for computer games.
- **A path to success, but not wild success!**

Can This Model Work Elsewhere

- **The ingredients for success**
 - High level support required
 - Specialized consulting required
 - Complex software requiring full time team
 - Long term projects requiring long term support.

Conclusion

- **An interesting new world of software development**
- **Anyone can get involved**
- **Barrier to entry in many FLOSS projects is low**
- **Think about how you could contribute!**