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Comment to section 1201(a)(1) of the Copyright Act

Thank you for extending the opportunity to comment on the forthcoming rulemaking, regarding exceptions in connection with the Digital Millenium Copyright Act.

I am writing as an embedded systems software developer in a biotech company. In my daily work, I greatly benefit from the public availability of development tools, pertinent source code libraries, and open/published standards. For instance, our company has developed the DNA sequencer that is currently used to map the human genome, for a large part using GNU development tools, the TCP/IP protocol, and other such openly available products.

Specifically we would not have been able to complete this task with the same efficiency had we used proprietary code libraries, without the ability to reverse engineer their operation.

I view it as critical to the health of a competitive business environment that important standards, upon which entire industries depend (such as network protocols, operating system platforms and Application Programming Interfaces, document formats, media formats) remain public. This is to:

- ensure that no one entity gains a stranglehold on the industry, giving access to specifications only to those it deem "harmless" to its own operations.
- create a "level playing field", where companies do not depend on standing on good foot (for instance, through favours) with the entity that holds the standard.

Let me bring up a couple of examples. The first example is in the area of networking protocols. The Transmission Control Protocol (TCP) on top of the Internet Protocol (IP) was published over 30 years ago, and has given birth to the Internet as we know it. On top of these layers, we have specific application protocols, such as the Simple Mail Transfer Protocol (SMTP), the HyperText Transfer Protocol (HTTP), and Sun's Network File System (NFS). All of these have been public all along.

In contrast, an example of a proprietary application protocol layer is the SMB (Server Message Block) protocol, developed by Microsoft to share network volumes and printers on a Windows network. While running on top of TCP/IP, this protocol is a fundamental piece of networks where Windows machines take part. Yet, Microsoft never published any specifications for this protocol. This, naturally, has a bit to do with business strategy - they were interested in advancing Windows on the server side as well as the client side - and were not interested in companies running non-Windows servers.

Yet, in spite of this, there does exist an implementation of the SMB protocol for other operating systems. A team of developers in Australia created the "samba" suite, enabling a variety of UNIX-like machines to act as file and print servers also for Windows machines. This fact alone has prevented a monopoly, and preserved a healthy and competitive business climate in the area of Network servers.

The "samba" suite was made possible by reverse engineering Microsoft's "SMB" protocol, something which according to my understanding would be deemed illegal under the DMCA.

The second example I am going to bring up is an emerging standard, currently under a bit of

controversy: The Content Scrambling System (CSS) that exists on DVD disks.

A critical portion of the information needed to read DVD disks is a digital key, issued by the DVD Copyright Control Association. Valid keys are given to DVD-ROM manufacturers in return for a significant license fee.

One such key, issued to Xing Technology Corp, was reverse engineered by a German and a Norwegian teenager. A piece of source code, suitable for incorporation into a software DVD player, was then published on the Internet.

I want to emphasize that obtaining such a key makes it possible to develop a DVD player, but does not in any way facilitate or aid the illegal copying or redistribution of DVD media. A disk can be copied regardless of what it contains, as long as you have a DVD recorder. [However, this business would not be very lucurative, as empty DVD media is more expensive than media with content].

While the Motion Picture Association of America (MPAA), Time Warner, and others are trying to stop the spread of the code snipped described above, the irony is that they are probably better served with its spread. There are currently no "open source" DVD players, and also no players for any UNIX platform, the Macintosh, or even for Windows NT. (Only Windows 95/98). This being the case, not only is the long-term viability of DVD as a standard in jeopardy, but these companies are actually missing out on a piece of their potential market *today*.

The preceeding paragraphs were intended to illuminate some of the arguments these companies might have *against* providing excemptions to the Copyright Act. Now I want to explain why I think it is in the public's best interest that the reverse engineering that took place in Germany and Norway is deemed legal (albeit in the USA), and be allowed to continue.

First, reverse engineering has so far been an accepted and much-used way of obtaining standards in the case where a "wannabe monopolist" does not publish it. AMD and Cyrix have prevented price hikes from Intel in their processor line, by creating compatible processors (capable of running, for instance, Microsoft Windows).

Second, DVD still has a good chance of becoming the de-facto physical medium for publishing movies, music, and other content. If one organization (The DVD CCA) is allowed the unprecedented rights associated with guaranteed monopoly on this standard, they are also given a license to basically "tax" the DVD market - akin an elected government of a country.

Lastly, deeming reverse engineering illegal will have much the same effect that restrictions on the spread of strong cryptography have: Forcing such development out of the USA's borders. Basically, exporting the mindshare.

I thank you for your kind consideration to these points.

Sincerely,

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