

Digital Rights Management

More and more digital information comes with restrictions on what the user can do with it.

Proponents say that otherwise this information will not be distributed in digital form at all.

Opponents say that this is a way of increasing the revenues of the vendors at the expense of the public.

My problem is that it prevents innovative methods of re-use.

What is DRM?

Technology to enforce rules content suppliers wish to impose on their uses. These may include:

listen/view a limited number of times or at specific locations

listen/view only for a limited time period

restrict content to specific computers

prohibit copying of whole or parts

suppress choices like fast-forward or pause

prevent searching

stop resale or lending

keep track of who is using the material and how

interfere with the creation of derivative works

There are whole projects to define computer languages in which you can express these restrictions formally.

Contradictory requirements

If “previews” are allowed as sales tools, how draw the line between that and what you want to charge for?

If customers are encouraged to buy your product as a Christmas present, they won't know computer-IDs for the person they are giving it to. And should they be allowed to listen to the music, say, before they give it as a gift?

Are you controlling individual users or computers?

What happens when the user buys a new computer?

Can a user make a backup copy for safety?

How does one do DRM?

It sounds simple. You encrypt the content, and provide a limited set of software that decrypts it.

For example, iTunes music is in a format called Advanced Audio Coding (AAC) encrypted in a system called FairPlay. As you buy a song from iTunes, the iTunes store encrypts it, and sends your iTunes software the key. The key is re-encrypted for storage on your machine. The software that fetches it and plays the music understands rules about how many copies you can make under what circumstances.

In particular, it doesn't let you download the software to any portable music player except an iPod.

But other people write software too

Other people write software to get around encryption. So you get Congress to make that illegal and prosecute them. Problem: they are in Norway or Russia.

DeCSS: DVD-decoder for Linux, distributed by Jon Lech Johansen, who dropped out of high school to become a programmer. He was prosecuted in Norway after a complaint from MPAA, but acquitted since he personally had done nothing wrong: making copies of DVDs for personal use is legal in Norway. PS. He denies writing the DeCSS code.

AEBR: (Advanced E-Book Processor), breaks protection in Adobe PDF. Dmitri Sklyarov was arrested when he came to the US but charges were dropped in exchange for testimony against Elcomsoft, which was then acquitted.

Move into the operating system

OK, the next step is to put the control into the operating system so that it's harder to get around. Specifically, Microsoft's NGSCB (previously known as Palladium and SDCA) enables a second control thread inside your computer; you can't program it, or turn it off. It permits a program running on Windows Vista to have exclusive use of some data areas. Sounds good. But the history of bugs in Microsoft code make one fear that this too, will be hacked (witness recent fuss over FairUse4WM, a program that broke the DRM in Windows Media).

Note that although Microsoft only distributes security patches that help you once a month, security patches that affect their DRM software go out immediately.

So DRM has to have hardware

Once upon a time some software came with “dongles,” small gadgets that had to be attached to your computer for the software to work. Customers hated these, and they often cost more than the software (and obviously prevent selling by downloading).

The current push is to get the manufacturers of devices that can play music or video, or create CDs or DVDs, implement the restrictions. For example, the “broadcast flag” dispute which we'll hear about in class: can the makers of high-def DVD recorders be required to build them so that if a TV program contains a specific digital code, it can not be recorded?

This lost procedurally, but may re-appear in Congress.

Is DRM a good idea?

Enough on technology. Would working DRM mean that more content or less content would be available?

MPAA and RIAA say: given the amount of piracy, either we have workable DRM, or we won't let anything be available in electronic form.

EFF says (well, Cory Doctorow says): that DRM won't work, and it is bad for society, business, and creative artists; and it's even bad for Microsoft.

And another question is whether it discourages competition.

Are there any analogies?

VCRs: everything said about why DRM is needed was said to argue that VCRs should not be allowed. Videos (and now DVDs) now represent far more revenue for movies than theater admissions.

“Carterfone”: until 1968 you could not connect to your telephone line anything not approved by AT&T. In 1968 the FCC approved the Carterfone acoustic coupler as “customer premises equipment” and the result was, over the years, a flood of fax machines, answering machines and the like.

Monopolies

Should vendors of a particular kind of equipment be allowed to control related equipment? In anti-trust law, this is known as a “tie-in” sale: to buy A you also have to buy B from the same vendor.

Sometimes it's OK: nobody says Boeing should let you attach some unknown engine to their jets instead of what it's designed to work with.

In general, it's not allowed, however.

Often this isn't even good for the manufacturers: until General Electric standardized light bulb sockets, you had to buy bulbs that matched the lamps you owned.

iTunes

At the moment, the fight is about iTunes; music you buy from iTunes works on Apple's portable players, but not directly on anyone else's. Microsoft is following suit with a format specially for their player.

Thus, people who have spent a lot of money buying music are now tied to one particular player. Apple has 88% of the single-song online sales market (ZDnet).

Strangely, the pricing seems to be selling the songs cheap relative to the player; the reverse of what is normally sensible (John D. Rockefeller gave away kerosene lamps, and Gillette always made their money on the blades, not the razors).

France is considering making Apple's Fairplay illegal.

How compare DRM mechanisms?

CDT (Center for Democracy and Technology) suggests four “metrics”:

- transparency: are users told how the technology will work
- effects on use: does it permit time-shifting, sharing, etc.
- collateral impact: does it risk user privacy or reliability?
- purpose and consumer benefit: does it expand or shrink what you can do?

Many existing systems don't score well. For example, most DRM vendors claim a right to update your software and change the rules for using the music (failure of transparency).

Apple, for example, changed the number of times you could burn a playlist to disk and the number of computers you could move your music between (in opposite directions).

The worst story: Sony rootkits

In 2005 Sony started selling CDs with a DRM mechanism bought from “First4Internet” which installed a secret program on your machine that captured the CD drive and which hid itself from the usual utilities to list programs. (Windows only)

It also opened a hole that let others install hidden software.

Among the problems: the EULA (end-user license agreement) did not disclose what was happening, the process for removing the code was botched, people started writing viruses to exploit the hole, Sony made some silly public statements (such as that most people didn't know what rootkits were and therefore wouldn't care); and Sony was very slow to admit the problem publicly (they did nothing until an outsider announced the problem).

Creeping protection

A big question is whether, should DRM become straightforward, it will become a default, and all sorts of sites that are now free (for example many daily newspapers) will start to charge.

In this context, note that the new Microsoft DRM is such that if you copy any sound file onto their player, even one that is not restricted by the owner (it might have a Creative Commons license, or it might be you singing your own song or a folk song), Microsoft puts DRM protection on it.

Derivative works

DRM interferes with some new versions of old works, for example “sampling” in music, or the new craze for posting (on youtube) videos of amateurs singing hit songs badly. Note that today (Sept. 2006) Warner has just announced a way to the latter legally (split the ad revenue).

It wouldn't affect something like Beethoven's variations on Rule Britannia, since that's an entirely new composition not based on any specific old recording (the copyright law would however have stopped it today, since Thomas Arne had only been dead for 25 years when Beethoven wrote his piece).

Likely futures

Would DRM:

Increase or decrease the amount of music in the world?

Transfer money from consumers to record labels? Or artists?

Stifle innovation or encourage it?

And what might happen?

We're seeing it already: iTunes.

There will be some economic bargain that results in a somewhat reasonable split of money. At the moment the record companies are angry because Apple won't let them charge differential prices; consumers may be angry because they are being locked-in; but the artists are probably better off in the long run because independent labels will have more access to ITMS (iTunes Music Store) than to a real record store.

I almost wrote "Tower Records" but they're bankrupt: that's who the losers are going to be.