

20 December 2001: Editorial corrections made.

18 December 2001

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First posted to Cyberia-L, December 18, 2001: <http://www.lawlists.net/cyberia>

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December 18, 2001

# Coming Soon: Hollywood Versus the Internet

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If you have a fast computer and a fast connection to the Internet, you make Hollywood nervous. And Tinseltown is nervous not because of what you're doing now, but because of what you *might* do -- grab digital Hollywood content with your computer and broadcast it over the Internet.

Which is why Hollywood, along with other content companies, from book publishers to the music industry, has begun a campaign to stop you from ever being able to do such a thing -- even though you may have no intention of becoming a copyright "pirate." That campaign has pitted corporate giants like Disney and Fox against corporate giants like Microsoft and IBM, but the resulting war over the shape of future digital technology may end up with us computer users suffering the "collateral damage."

As music-software designer and entrepreneur Selene Makarios puts it, this campaign represents "little less than an attempt to outlaw general-purpose computers." Internet security and cryptography expert Bruce Schneier puts the matter a little differently: "If you think about it, the content industry does not want people to have computers; they're too powerful, too flexible, and too extensible. They want people to have Internet Entertainment Platforms: televisions, VCRs, game consoles, etc."

Let's get one thing straight -- when I say there's war looming in cyberspace over copyright, I'm not talking about the struggle between copyright holders and copyright "pirates" who distribute unlicensed copies of creative works for free over the Internet. Maybe you loved Napster or maybe you hated it, but the right to start a Napster, or to infringe copyright and get away with it, is not what's at issue here. And in a sense it's a distraction from what the real war is.

What I'm talking about instead is the war between the content industries (call them "the Content Faction") and the information-technology industries -- call the latter "the Tech Faction." That faction includes not only computer makers, software makers, and related digital-device manufacturers (think CD burners and MP3 players and Cisco routers). Allied with the Content Faction are the consumer-electronics makers -- the folks who build your VCRs and DVD players and boomboxes. The Tech Faction, which makes smarter, more programmable devices and technologies than the consumer-electronics guys do, may count among their allies many cable companies and even telephone companies.

But what's the "collateral damage," exactly? Perhaps the most likely scenario is this: at some near-future date -- perhaps as early as 2010 -- individuals may no longer be able to do the kinds of things they routinely do with their digital tools in 2001. They may no longer be able, for example, to move music or video files around easily from one of their computers to another (even if the other is just a few feet away in the same house), or to personal digital assistants. Their music collections, reduced to MP3s, may be moveable to a limited extent unless their digital hardware doesn't allow it. The digital videos they shot in 1999 may be unplayable on their desktop and laptop computers -- or even on other devices -- in 2009.

And if they're programmers, trying to come up with the next great version of the

Linux operating system, for example, they may find their development efforts put them at risk of criminal and civil penalties if the tools they develop are inadequately protective of copyright interests. Indeed, their sons and daughters in grade-school computer classes may face similar risks, if the broadest of the changes now being proposed becomes law.

Digital television is the thin entering wedge for the Content Faction's agenda. Here's why: unlike DVD movies, which are encrypted on the disc and decrypted every time they're played, digital broadcast television needs to be unencrypted, for a couple of reasons. First, the Federal Communications Commission requires that broadcast television be sent "in the clear" -- in unencrypted form -- as a matter of public policy. The argument here is that broadcasters are custodians of a public resource -- the part of the broadcasting spectrum used for television, and need to make whatever they pump into that spectrum available to everyone. Second, digital broadcast TV has to reach the existing (albeit relatively small) installed base of digital television sets, which wouldn't be able to decode encrypted broadcasts.

But digital broadcast television also poses a special problem -- it's just too darned high-quality. And if a home viewer can find a way to copy the content of a digital broadcast, he or she can reproduce it digitally over the Internet (or elsewhere), and everybody can get that high-quality digital content for free. This would have a particularly harsh effect on the movie and TV studios, which currently repackage old television shows for resale to individuals as DVDs or videotapes, and which also syndicate the rights (resell broadcast rights) to cable networks and to individual broadcasting stations. If everybody's trading high-quality digital copies of "Buffy the Vampire Slayer" or "Law & Order" over the Internet, who's going to view the reruns on, respectively, Fox's FX network or the Arts & Entertainment channel? What advertisers are going to pay to air those shows when their complete runs are available online to viewers, commercial-free, through some successor to Napster or Gnutella peer-to-peer file-sharing?

The Content Faction has a plan to prevent that world from coming about -- a plan they hope will work for music and every other kind of content. One guide to a different future is the "watermarking" solution proposed for digital broadcast television.

Essentially, there are two parts to the scheme. The first part is this: the digital broadcast TV signal will include a digital "watermark" containing information that

tells a TV watcher's home-entertainment system whether to allow copying at all, or to allow limited copying, or to allow unlimited copying. The so-called digital watermark is not like a normal watermark in stationery -- instead, it's "steganographic." That is, it's contained in the content itself but the normal viewer isn't able to see it without special tools. Not all of the bits in a digital bitstream have to be used to communicate images or sound -- the remaining bits can be structured in a way that adds up to a "watermark."

But the first part of the fix -- adding a watermark -- doesn't work without the second part, which is that the components of the home entertainment system have to be designed to receive those watermarks and flags and limit copying accordingly.

If the digital TV guys put together a working watermarking scheme for television, then at least in theory they've come up with a solution that will apply to all other digital media. After all, bits is bits.

There are some problems with this scheme -- perhaps intractable ones. If Princeton computer scientist Edward Felten is right, when you design your watermarking system so that it is invisible to normal viewers or listeners yet easily detectable by machines, it's probably going to be relatively easy to strip it out. To put it simply, if you can't see it, you won't miss it when it's gone.

Which is why, when you think through how the watermarking system will work, you realize the components of new home entertainment systems will also likely have to be designed not to play unwatermarked content - otherwise, all you've done is develop an incentive for both inquisitive hackers and copyright "pirates" to learn how to strip out the watermarks. So much for your legacy digital videos. So much for your MP3 collection.

What will the components of a new home-entertainment system be, exactly? Mostly standard consumer electronics: a VCR, a DVD player, maybe, a CD player, speakers, a TV receiver. Yet what tech-industry pundits call "convergence" means that one other component is increasingly likely to be part of home-entertainment setups -- the personal computer. Says Business Software Alliance special counsel Emery Simon: "That's the multipurpose device that has them terrified, that will result in leaking [copyrighted content] all over the world."

This is precisely what Disney CEO Michael Eisner, in a speech to Congress in summer of 2000, was referring to when he warned of "the perilous irony of the digital age." Eisner's statement of the problem is shared by virtually everybody in the movie industry: "Just as computers make it possible to create remarkably pristine images, they also make it possible to make remarkably pristine copies."

Because computers are potentially very efficient and capable copying machines, and because the Internet is potentially a very efficient and capable distribution mechanism, even in the hands of ordinary individuals, the Content Faction has set out to restructure the entire digital world we have today. They want to rearchitect not just the Internet, but every computer and digital tool on or off the Net that might be used to make unauthorized copies.

Ask them about their goals, though, and they'll tell you they don't quite want to turn back the clock. If you use your VCR to record a favorite program so you can watch it later, why, then, the Content Faction says, we'll let you do something similar in the future -- but we're also going to make sure, with our watermarking scheme or something similar, that it won't be possible to do more than that.

The Content Faction is proceeding on many fronts: legislative, of course, but also in standards groups, in industrial consortia, and in global business policy forums. A recent legislative proposal floated (but not formally introduced) by Sen. Fritz Hollings, D-SC, which would require that all new digital-transmission technologies have built-in copyright protection -- built-in watermark-scheme compliance, in other words -- generated a significant public backlash after being leaked to the press. But that proposal caused a backlash because it was itself public -- in reality, it's only one small part of a mostly unpublicized global effort to include digital-rights-management in every digital technology. "Digital rights management," also known to both factions as "DRM," is the generic term used to characterize any technology -- software, hardware, or both -- that prevents unauthorized copying of, or that controls access to, copyrighted materials.

At stake in this war, says Eisner, who's the acknowledged leader of the Content Faction, is "the future of the American entertainment industry, the future of American consumers, the future of America's balance of international trade." The lobbyists at News Corporation and Vivendi Universal S.A. -- and pretty much any other company whose chief product is content -- agree with Disney's Eisner about the magnitude of the issue (although the foreign-based ones, like Bertelsmann AG,

are understandably less concerned about the U.S. balance of trade). All of them tend to talk about the problems posed by computers, digital technology, and the Internet, in apocalyptic terms.

The companies whose bailiwick *just is* computers, digital technology, and the Internet -- whose focus is more technology than content -- take a different view. These members of the Tech Faction, which include Microsoft, IBM, Hewlett-Packard, Cisco Systems, and Adobe, also value copyright. (Adobe, for example, just this year instigated the prosecution of a Russian computer programmer who cracked the company's encryption-based e-book security scheme.) And many of them -- particularly those who have been developing their own digital-rights-management technologies -- want to see a world in which copyrighted works are reasonably well-protected. Yet if you ask a Tech Faction member what it thinks of the Content Faction's agenda for the digital world, you invariably get something similar to Emery Simon's judgment of the scheme: "We are strongly anti-piracy, but we think mandating these protections is an abysmally stupid idea." (BSA is an anti-piracy trade group whose members include the major players of the Tech Faction, from Adobe to Microsoft to Intel to IBM.)

You can't overestimate the extent to which the two factions are both pro-copyright -- their shared view of the importance of protecting copyrighted works online makes them awfully uncomfortable to be on opposite sides now. One thing the Tech Faction and the Content Faction have in common is that they both supported the passage of the Digital Millennium Copyright Act in 1998 -- both sides like the DMCA pretty much as it is. That act, which was framed as the implementation legislation for the World Intellectual Property Organization's Internet treaties, prohibited the creation, dissemination, and use of tools that circumvent digital-rights-management technologies.

Where the two sides differ is on the issue of whether the DMCA is enough. BSA's Simon views the DMCA as a well-crafted piece of legislation, but thinks that efforts that would build DRM into every digital device are overreaching, at best. And in taped remarks presented at a Dec. 4 business-technology conference in Washington, DC, Intel CEO Craig Barrett spoke out against legislation like the Hollings bill, which would have the government mandating a copyright-protection standard to adopted by the entire IT [information-technology] industry. Yet the Content Faction, as represented by their lawyers and lobbyists in Washington, as well as by their West Coast technologists, say that failure to standardize on a

universally built-in digital-rights-management technology will, in effect, lead to the destruction of the digital-content industries.

A few companies are so big and so diverse that they don't fall easily into either the Tech or the Content faction. Take AOL Time Warner, for example. The movie companies and other content producers under the AOL Time Warner umbrella tend to favor efforts that lock down cyberspace, but AOL itself, as well as some of the company's cable subsidiaries, opposes any effort to mandate DRM in all digital technologies. "We like the DMCA," says Jill Lesser, AOL Time Warner's senior vice president for domestic public policy. "There isn't from our perspective a need for additional remedies of copyright violations," Lesser says. AOL's reluctance to embrace the Hollings bill explains why the Motion Picture Association of America, of whom AOL Time Warner is a prominent member, remains officially neutral on the bill.

But Lesser needs only to take a breath before she adds that something like the Hollings bill -- at least with regard to digital broadcast television standards -- may be a good idea, since industry progress towards an agreement for copyright protection in digital television hasn't proceeded as quickly as the content companies would like. "Maybe a mandate is the way to get there more quickly," she says.

The specter that's haunting the Content Faction is Napster. Although the free version of Napster has been essentially wiped out by the music-company litigation against it (a new version of the file-sharing system is being developed by Bertelsmann AG), the Napster phenomenon still casts a long shadow. One technologist for News Corporation who's working on a watermark-based DRM scheme told me he thinks Napster already signals the end of the music industry. Since most record companies have most of their catalogues available on unprotected CDs, which can be "ripped" and duplicated with CD burners or distributed over the Internet as MP3 files, music lovers have already gotten out of the habit of paying for records, which means an end to big profits and thus an end to big record companies. "Within five years," the technologist says, "the music industry will be a cottage industry."

Matthew Gerson, the vice president for public policy at Vivendi Universal S.A., which produces and sells both music (Universal Music Group) and movies (Universal Studios, Inc.), is quick to dispute the prediction that the music

companies face cottage-industry status. "We know that if we build a safe, consumer friendly site that has all the 'bells and whistles' and features that music fans want, it will flourish. My hunch is that fans will have no trouble paying for the music that they love, and compensating the artists who bring it to them -- established stars as well as the new voices the labels introduce year after year."

But maintaining that model -- the model of the big music company that plays an important filtering role for music audiences -- depends both on large streams of revenue and on control of copyrighted works. The Internet and digital technology could change all that, cutting off the revenue stream by moving music consumers to a world in which trading music online for free is a norm. At the same time, a technical/legal scheme that perfects control of content in the digital world creates new revenue opportunities -- the music companies, for example, could "rent" or "license" music to us in a protected format rather than sell copies outright to us in unprotected forms.

And that, says Simon, is why the Hollings legislation is so broadly drafted -- it's designed to close up all the leaks that digital technology might pose. In the drafts made available in fall of 2001, the Hollings bill, titled the [Security Systems Standards and Certification Act](#), would create a civil offense for anyone who developed (for example) a new computer that did not include a federally approved security standard preventing the unlicensed copying of copyrighted works. The SSSCA also would set up a scheme under which private industry met and approved the security standard. It would require that the standard be adopted within 18 months of passage; if that deadline passed without an agreement on a standard, the government would step in and impose one itself. In at least one version, the law would also felonize the act of removing the watermark or flag from copyrighted content, as well as the act of attaching a computer to the Internet that removes or sidesteps the copy-protection technology.

It doesn't take a close look at the provisions of the SSSCA to see that its scope extends far beyond digital television. And you can see why the crafters of the proposal want it to reach so far: If the watermark scheme works for digital TV, and results in an established standard both for labeling copyrighted works and for designing consumer electronics not to allow unlicensed copying of those watermarked works, it ought to be adaptable to the rest of the digital world -- especially that most troubling sphere of the digital world, the Internet. This explains why the draft of the SSSCA, under its own terms applies to any digital

technology, and not just television -- the big music companies like the SSSCA too because they have been laboring for years through a group called the Secure Digital Music Initiative to agree on a digital-music watermarking standard.

The many fronts of the DRM-standards push include DRM-proponent groups like 4C Entity (promoting a standard for building DRM into mass-storage devices, such as hard drives), the 5C Consortium (developing a copy-protection standard for digital television), inter-industry forums like the Content Protection Technology Working Group (CPTWG) and a growing number of conventional standards-setting groups. And as we've seen, they also include legislation like the Hollings bill, whose genesis, according to sources on the Hill close to the legislative process, was Eisner's speech to Congress in the summer of 2000.

Those close to the process that drafted the Hollings proposal don't couch the legislation in terms of protecting embattled copyright interests - instead they frame it as a proactive measure designed to *promote* both digital content and increased use of broadband, high-speed Internet services. The theory here is this: consumer adoption of broadband services (like cable modems and DSL) has been slower than predicted. This means the cable companies and the phone companies have too small a consumer base to justify building out their broadband capacity very quickly or very far. But (the theory goes) if Hollywood could be assured that its content would be protected on the broadband Internet, they'd develop more compelling content and make it available on the Internet, which would spur greater consumer demand for broadband.

There are problems with this theory -- it assumes that what people really want from the Internet is more TV and movies -- but it's the theory with the most currency in Washington policymaker circles. And as the debate over the Tauzin-Dingell broadband deregulation bill shows, Congress wants to find a way to take credit for a quicker rollout of faster Internet service.

It's the Hollings legislation, the SSSCA, that has brought the existence of the war between the Content Faction and the Tech Faction out into the open. Before the draft legislation was circulated, "we didn't know how broad this was," says one lawyer for cable-company interests. (Some cable companies have aligned themselves with the Tech Faction partly because they see themselves as technology companies too, and partly because they see DRM, which might define the conditions under which subscribers could use and copy content, as interfering with

their own ability to package content for their subscriber base. Other cable companies, however, are owned by Content Faction players - officially, they favor measures like the Hollings bill.) And in the near term it's the Hollings legislation that is likely to be the flash point for the debate about widespread copyright-protection standards in the near future. Sources involved in the drafting process say there are likely to be hearings on the bill as early as February 2002; hearings that had been set for fall of 2001 were postponed while the government cleared Senate offices of anthrax spores.

Although the Hollings legislation is controversial, some folks in the Content Faction remain bullish on its passage. Preston Padden, the executive vice president for government relations for The Walt Disney Company, traces the impulse behind the Hollings bill to recommendations from the Global Business Dialog on e-Commerce, a CEO-led public policy group that tries to shape global business policy. Since the GBDeC includes members of both the Tech Faction and the Content Faction, the argument is that there is, at some very high level, a global business consensus on the need to protect content.

Padden says the group approached the issue of content protection with an attitude of "let's get together and identify the daunting, unprecedented global issues that are represented by the Internet and see if we can come to a common view as to how these issues should be resolved." The group's intellectual property subcommittee is chaired by Michael Eisner, who shepherded through language favoring government "facilitation" of standards for copyright protection, after much give and take with Tech Faction members. With the group's recommendations in hand, Eisner could go to Congress and say there was a general business consensus favoring the passage of new laws to protect content on the Internet.

But although companies like IBM and Disney officially agree on the need to protect content on the Internet (and it's really the Internet that is the focus of DRM efforts, not digital broadcasting), the devil is in the details. IBM, Microsoft, and other Tech Faction members each want their own DRM technologies to be adopted, they don't want design mandates, and they want technology-based copyright protection to be the special case rather than the rule.

Both Padden and News Corporation vice president for governmental affairs Rick Lane say the reason for the Tech companies' recalcitrance represents a "philosophical problem" those companies have with design mandates. Lane says

the Tech companies oppose technological mandates because "they've never been subject to them before, except for export controls [on encryption]." Lane and the other Content Faction lawyers think the computer companies need to grow up and get over it. After all, they say, technology mandates have been a fact of life for the consumer-electronics industry -- particularly radio and television equipment -- for many, many decades. (The consumer-electronics companies generally don't like government regulation either, but they sometimes see value in it. As Electronic Frontier Foundation technologist Seth David Schoen points out, the Content Faction often can get the major consumer-electronics companies to adopt new standards without resorting to lawmaking. But if the new standards limit what their devices can do, that makes the established consumer-electronics companies vulnerable to competition from an upstart company that produces a more capable machine. Better to have a law in place that prevents that from happening.)

But the philosophical war really runs deeper than mere resistance to government control. One way to understand this is to look at how the content industries talk about individuals as compared to how the Tech industries do. The content industries refer to "consumers." The Tech industries refer to "users."

In general, if you see the world as one of "consumers," you think: nobody gets things to consume for free, but price it appropriately and consumers will come. You control access to what you offer, and do everything you can to prevent theft, for the same reason that supermarkets have cameras by the door and bookstores have electronic theft detectors. Allowing people to take stuff for free is inconsistent with your business model.

But if you think of the world as one of "users," you see the market as one in which you give people more features and powers at cheaper prices. The impulse to empower users was at the heart of the microcomputer revolution -- Steve Jobs and Steve Wozniak, for example, wanted to put computing power into ordinary people's hands, and that's why they founded Apple Computer Inc. If this is your philosophy -- one of empowering users to do new things -- it's hard to wrap your mind around building in limitations. Plus, at some basic level, moving bits around from hard drives to RAM to screen and back again, with 100-percent accuracy in copying, is simply what computers do. Building DRM into all of this -- limiting how computers perform their basic functions -- seems to the Tech Faction almost to be an effort to make a computer something other than a computer -- a digital appliance, maybe, or something special-purpose like a toaster. It's an approach that

would have the effect of undoing the user-empowerment philosophy that drove the PC revolution in the first place.

It's important at this point not to overstate the differences between the Tech Faction and the Content Faction. The Tech companies are arguably just as adamant about protecting intellectual property as the Content Faction is. And, as Schoen remarks, "some of the IT folks can occasionally ally themselves with particular parts of the content faction, often in order to try to deflect something they see as worse."

But because the Tech Faction's approach to their customer base is different, they find the universal-DRM approach anathema. To them, the digital world is one in which users are generally empowered to do whatever they want with digital tools, except to the extent that copyrighted works are walled off by DRM. But to the Content Faction, the digital world isn't safe unless every digital tool also functions as a kind of copyright policeman.

Still, the Content Faction's approach to the issue shouldn't be easily dismissed. They may be right to say that what individual citizens really want is compelling content over broadband, and it may even be the case that a majority of citizens would trade away the open, robust, relatively simple digital tools they now have for a more constrained digital world in which they have more content choices. But the important thing to note is that, at least for now, few ordinary citizens have any voice in this particular debate about the digital future -- few are even aware the debate is going on. (It doesn't help, for example, that the Hollings proposal is pitched as a "security standard" rather than as a new copyright law.)

The consequences of the outcome of the struggle between the Content Faction and the Tech Faction fight are huge. At the heart of the fight are two questions: whether computer users can continue to be allowed to have the abilities that computers have had since their invention, and whether the content companies can survive in a world in which users have that power. What's been missing from the debate so far has been the users themselves. It seems safe to say that most computer and Internet users like to have choices -- choices both of the content they consume and of the kinds of tools they should get to use. Still, maybe citizens would say they're willing to give up "general-purpose" computers and willing to use, instead, systems designed to prevent them from engaging in willy-nilly copying, if that is the price you have to pay for compelling music and movies and television over the Internet.. That is, maybe they'd say so if you asked them. But right now, nobody's asking.

