The Copyright Wars: Computer Scientists on the Front Lines

Barbara Simons

Copyright

Congress shall have the power ...

To promote the progress of science and the useful arts, by securing for <u>limited times</u> to authors and inventors the exclusive rights to their respective writings and discoveries.

"When Congress sits idly by in the face of these activities, we essentially sanction the Internet as a haven for thievery."   Sen Fritz Hollings

"Any attempt to inject a regulatory process into the design of our products will irreparably damage the high-tech industry: it will substantially retard innovation, investment in new technologies, and will reduce the usefulness of our products to consumers." Leslie Vadasz, Executive VP Intel Corp

Senate Commerce Comm. hearing, Feb. 28, 2002

History of Copyright

- Statute of Queen Ann (1710)
  - first recognized rights of creators
- US haven of copyright "piracy" in 19th century
  - Translations not covered until 1870
    - Harriet Beecher Stowe and German translation of *Uncle Tom's Cabin* - 1853
  - International protection not covered until 1891
    - Dickens *A Christmas Carol*
      - $2.50 in UK; $0.06 in US

Intellectual Property Issues

- Copyright laws
  - Digital Millenium Copyright Act (DMCA) *
  - Consumer Broadband & Digital Television Promotion Act (CBDTPA)
    - Security Systems Standards and Certification Act (SSSCA)
  - No Electronic Theft Act (NET Act) *
- Related legislation
  - Database bill
  - Mass contract (shrinkwrap) law: UCITA - formerly Uniform Commercial Code (UCC) - Article 2B

Length of Copyright

- Originally for 14 years
  - renewable for 14 years if author living
- Copyright Act of 1976:
  - retroactively extended to up to 75 years
- Sony Bono Copyright Term Extension Act 1998
  - extended yet another 20 years
  - currently author's life + 70 years
  - "works for hire": the shorter of 95 years from publication or 120 years from creation

Eldred v. Ashcroft

- Eric Eldred published public domain materials
- Did Congress overstep authority by adding 20 years to length of copyright?
  – Encourages "progress of science and useful arts"?
  – Dead creators?
  – Micky Mouse

Digital Millenium Copyright Act (DMCA) '98

- Implements World Intellectual Property Organization (WIPO) treaty and more
- Passed in '98 and signed into law
- Criminalizes technologies and technological devices
- Selected over alternative (Boucher/Campbell)

User rights under Copyright

- First sale: I can give you my copy
  – Early 20th century publishers attempted to kill used book market by "licensing" a minimum price
- Fair use
  – for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright.
  – A defense?

The DMCA

- Outlaws reverse engineering except for compatibility, encryption & security research (with notification of copyright holder), privacy protection, and to protect minors against porn
- Since makes technologies or devices that are primarily designed for circumvention illegal, could criminalize some computer security R&D

ACM's Fair Use Policy

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted with or without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and full citation on the first page . . . . To copy otherwise, to republish, to post on services, or to redistribute to lists, requires specific permission and/or a fee.

DMCA - definitions

- "Technological measure for protecting copyright"?
- "Effectively controls access to a work"?
  – Strong/weak encryption?
  – Data compression?
  – Obscure human language?
  – Compilation? Could decompilation become illegal?
- "Primarily designed" for circumvention?
  – VCRs? Breaking encryption?

DMCA: Criminal Penalties

- Circumvention of "copyright protection" or of "integrity of copyright management information" for commercial advantage or private financial gain:
  - first offense: <= $500K or <= 5 years prison, or both
  - subsequent offenses: <= $1M or <= 10 years prison, or both

Digital Era Copyright Enhancement (Boucher/Campbell)

- Prohibits altering or deleting copyright management information <u>for purposes of infringement</u>
- Prohibits enforcement of terms in "shrink-wrap" and "click-on" agreements when they reduce privileges recognized by copyright law
- Incorporates fair use and first sale rights

Who drafted the DMCA?

- "Also unresolved … on the policy side [is] the language of a draft for anti-circumvention legislation. That proposed law must be agreed upon by movie studios, computer and consumer companies".
  - "Intel weighs in on DVD encryption," *Electronic Engineering Times*, Oct 14, 1996, *923*: 1,142.

Digital Era Copyright Enhancement

- Ensures right of librarians & archivists to preserve copies of copyrighted works using latest technology
- Protects author's work under traditional legal understandings while allowing incidental copies for otherwise lawful use of a device.
- Civil rather than criminal penalties

Opposition and Concerns

- ALA (American Library Association)
  - Copyright, fair use, distribution rights
- US Public Policy Comm. of ACM (USACM)
  - Technology not taken into account
  - Outlaws technologies instead of behaviors

DMCA could require permission of copyright owner to:

- Test a computer system before purchasing to ensure that it is trustworthy and secure
- Reverse engineer to eliminate viruses or other undesired code
- Reverse engineer to see if software infringes on another copyright

The DVD Controversy

- DVD movies encrypted using Content Scrambling System (CSS)
  - Weak encryption
    - 40 bit key
    - proprietary algorithm
- Uses authentication to verify that player or operating system has been licensed
- Who can license open/free software systems?

Proposals to mandate copyright protection

- the Security Systems Standards and Certification Act (SSSCA)
  - circulated, but never introduced by Sen. Hollings
- Consumer Broadband & Digital Television Promotion Act (CBDTPA)
  - introduced March 22, 2002 by Hollings, Feinstein, Stevens, Inouye, Breaux, Nelson
    - 5 Democrats and 1 Republican

Michael Eisner, Ceo of Disney

"[D]igital technologies can enable a level of piracy - theft - that would undermine our capacity to produce films and entertainment, underline the deployment of Broadband networks, undermine the digital television transition and ultimately result in fewer choices & options for American consumers."

SSSCA

- Would have required computer & electronics manufacturers to include copyright-protection technologies in the production of certain products and multi-use devices
  - Sen. Hollings
  - Pushed by Hollywood; opposed by scientific societies, academia, and industry (BSA, etc.)

Michael Eisner, Ceo of Disney

"[O]nce standards [for digital rights management] are set, they must be mandated for inclusion in all digital media devices that handle creative content. This is necessary to ensure a reasonably secure environment and to prevent unfair competition by non-compliant device manufacturers."
-2/28/02

CBDTPA

- A manufacturer, importer, or seller of digital media devices may not
  - (1) sell, or offer for sale, in interstate commerce, or
  - (2) cause to be transported in, or in a manner affecting, interstate commerce, a digital media device unless the device includes and utilizes standard security technologies that adhere to the security system standards adopted under section 3.

Compliance with Encoding Rules (CBDTPA)

- (b) NO person may knowingly apply to a copyrighted work, that has been distributed to the public, a security measure that uses a standard security technology in violation of the encoding rules adopted under section 3.

Problems with CBDTPA

- No way to reliably distinguish protected content from everything else.
- Overly broad approach seeks to criminalize activities rather than narrowly focusing on infringement with criminal intent.

Removal or Alteration of Security Technology (CBDTPA)

- (a) NO person may
  - (1) knowingly remove or alter any standard security technology in a digital media device lawfully transported in interstate commerce; or
  - (2) knowingly transmit or make available to the public any copyrighted material where the security measure associated with a standard security technology has been removed or altered, without the authority of the copyright owner.

CBDTPA could make illegal

- distribution of open source software for use in education and research
- creation of a student project to learn about operating systems
- distribution of an urgent software patch to fix a serious security flaw
- transmission of security alerts to law enforcement agencies

Digital Media Device (CBDTPA)

- any hardware or software that
  - (A) reproduces copyrighted works in digital form;
  - (B) converts copyrighted works in digital form into a form whereby the images and sounds are visible or audible; or
  - (C) retrieves or accesses copyrighted works in digital form and transfers or makes available for transfer such works to hardware or software described in subparagraph (B) .

CBDTPA could make illegal

- dissemination of anti-cancer drug research results funded by the US government
- personal speech by individuals using Internet telephony to communicate
- legitimate and legal speech, as in the posting of mail in support of a political candidate
- free on-line performances of music or poetry by the legitimate copyright holder.
  - USACM letter to Hollings 3/29/02

Safety issues

- Inclusion of anti-copying technology in general purpose equipment-- real-time computing devices used in traffic control, air flight control, medical equipment, & manufacturing -- adds complexity & potential for failure.
  - Unexpected interactions with other code
  - Accidental activation of protection protocols
    (SSSCA letter)

Legal Cases against Posters of DeCSS

- Norway: Jon Johansen
  - Indicted Jan 9, 2002
- New York & Connecticut lawsuits brought by 8 largest movie studios
  - Based on reverse engineering being circumvention of copyright protection
- Ca case brought by DVD licensing group
  - Trade secret misappropriation - shrink wrap license

Court cases

DeCSS legally available

- DeCSS available in Ca case at cryptome.org/dvd-hoy-reply.htm#ExhibitB
- T-shirt with code available at copyleft.net/cgi-bin/copyleft/t039.pl?s1&back
- Dave Touretzky's webpage: http://www-2.cs.cmu.edu/~dst/DeCSS/Gallery/
  - haiku, song, steganography, English description, a programming language that has no compiler, ...

CSS Broken - DeCSS

- Code broken
  - (Then) 15 year old Jon Johansen or Norwegian group called Masters of Reverse Engineering (MoRE)?
- Subsequently learned that offset provides key with no decryption necessary
- Claim: Need to break CSS in order to run legally purchased DVDs on Linux

MPAA v. Eric Corley A/K/A "Emmanuel Goldstein" and 2600 ENTERPRISES, INC

or
the 2600 DVD Case

Legal Case against Corley

- Lawsuit brought by Motion Picture Association of America (MPAA)
- Corley accused of posting DeCSS
  - Not accused of deriving DeCSS from CSS
  - Not accused of making illegal copies
- Corley subsequently deleted DeCSS from his web site, and instead posted links to other sites containing DeCSS

DVDCCA v. Bunner (CA case)

- Nov 1, 2001 CA appeals court overturned an earlier order that barred hundreds of people from publishing the code for DeCSS online. Posting the code is just like publishing other types of controversial speech - protected by Constitution
- programmers could still be prosecuted for posting illegal software but could not be prevented from doing so in the first place.

Arguments used by Defense

- Reverse engineering for compatibility allowed under DMCA
- Fair use guaranteed by copyright
  - Should not be able to eliminate indirectly via legislation
  - If DMCA holds, techies who can break encryption will have fair use right, but no one else will … including most judges

DVDCCA v. Bunner (CA case)

"Like the CSS decryption software, DeCSS is a writing composed of computer source code which describes an alternative method of decrypting CSS-encrypted DVDs. Regardless of who authored the program, DeCSS is a written expression of the author's ideas and information about decryption of DVDs without CSS. If the source code were 'compiled' to create object code, we would agree that the resulting composition of zeroes and ones would not convey ideas."

Trial results

- Judge ruled against Corley
  - Enjoined from posting DeCSS
  - Enjoined from **linking** to other sites with DeCSS
  - 2nd U.S. Circuit Court of Appeals upheld lower court ruling
    - Case for defense argued by Kathleen Sullivan, Dean of Stanford Law School

Ed Felten

- Felten and co-authors entered SDMI sponsored contest to defeat watermarking technologies
  - confidentiality agreement prohibiting public discussions of research a precondition for receiving the prize
  - Felten et al did not sign; instead submitted paper to 4th International Information Hiding Workshop

Ed Felten

- Section 1201 of DMCA: "no person shall ... offer to the public, provide, or otherwise traffic in any technology, product, service, device, component, or part thereof, that ..." can be used to circumvent "a technological measure that effectively controls access to a [copyrighted] work."
- Does not address issues such as the robustness of a technological measure or fair use.

Dmitry Skylarov

- Arrested for criminal violation of DMCA after presenting paper at DefCon in Las Vegas
  - Russian computer science grad student
  - Talk focused on weaknesses in Adobe copy protection system
  - His company sold software that allowed people who purchased e-books to make copies
    - now available free on the web
  - Allowed to leave US in Dec; agreed to testify later

Ed Felten

- Two weeks before presentation all authors, all their employers, all program committee members, and all their employers threatened with civil suit by RIAA and SDMI.
  - Withdrew paper
  - resubmitted to USENIX Conference
    - Brought suit against RIAA, SDMI, Verance, John Ashcroft, and mystery company
  - RIAA, SDMI, Verance promised not to sue

US vs Elcom Ltd, aka Elcomsoft Co., Ltd, and Dmitry Sklyarov

- EFF amicus signed by USACM, the ACM Law Comm., the American Assoc. of Law Libraries, Music Library Assoc., CPSR, EPIC, CPT, 35 law professors
  - http://www.eff.org/IP/DMCA/US_v_Elcomsoft/

ACM and Felten

- ACM submitted declaration in Felten case
  - Concerned about ACM November '01 Workshop on Security and Privacy in Digital Rights Management
- www.acm.org www.acm.org/usacm/
- Nov 28, 2001 case dismissed by Judge Garrett Brown
  - SDMI, RIAA, and DoJ said they will not sue
  - Felten will not appeal

Technological protection for IP

- Technology will solve the problems created by technology => no need for draconian legislation?
  - What if technological "fixes" create as many problems as bad legislation?
    - Will fair use be defined by technology?
    - How will documents be archived?
  - Could device manufacturers be sued for copyright violation?

Why Does Copyright Matter?

- Trade-off: limited time monopoly to encourage creativity and availability of information
- What if information becomes privatized?
  - Education
  - Democracy
  - Science

No Electronic Theft ACT (NET)

Where are we going?

- What is a library?
- Is copyright being replaced by shrink-wrap licenses?
- Will copyright be replaced by contract law?
- Will we have pay-per-view?
- Do scientists and engineers have any ethical responsibility for how their work is used?

NET Act

- MIT student David LaMacchia posted copyrighted software
  - Financial gain required for criminal violation
  - Civil violation involves paying fines, but LaMacchia had no money
  - Gov't prosecuted under Wire Fraud statute
  - Federal court dismissed case, creating ...
- LaMacchia Loophole

What can you do?

- Support professional societies (ACM)
- Interact with policy makers, journalists, other decision makers

NET Act ('97)

- Distributing copyrighted material for no financial gain criminal if:
  - Total retail value > $1000 over 180 days is federal misdemeanor
    - Up to 1 year in prison and fine up to $100,000
  - Total retail value > $2500 over 180 days federal felony
    - Up to 3 years in prison and fine up to $250,000
    - Doubled for second offense

Determining Monetary Value of ip

- Craig Neidorf publisher of online Phrack
- published Bell South manual on "911" system
  – Obtained by someone else who broke into system
- Neidorf charged with interstate transportation of ip obtained through fraud
- Bell South claimed the value of manual $80K
  – Statute required loss >= $5,000

Database treaties and bills

Monetary Value of IP

- $80,000: $70K for word processor, salaries, pro-rated, of typists, supervisors of typists, paper on which hard copy of manual printed & edited, etc.
- But … Bell South's pr dept routinely sold edited (but for prosecution's purposes equivalent) version of manual for $13
- Indictment dismissed mid-trial

European Law impacting US

- EU Database Directive (1996)
  – Stated that protection for databases would not extend to countries that didn't pass similar legislation
- Database proposal defeated at WIPO
  – Academy Presidents' letter

NET Act

Jeffrey Gerard Levy, 22, a senior at the University of Oregon, Eugene, became the first person convicted of a felony under US law punishing Internet copyright piracy.

He gave away music, movies and software on the Web.

Pled guilty to felony charge

Academy Presidents' Letter
(the WIPO database proposal)

"We believe that these changes to the intellectual property law, if enacted in their present form, would seriously undermine the ability of researchers and educators to access and use scientific data, and would have a deleterious long-term impact on our nations research capabilities. Moreover, the proposed changes are broadly antithetical to the principle of full and open exchange of scientific data espoused by the U.S. government and academic science communities, and promoted internationally."

"Current" US Database Bills

- HR 354 The Collections of Information Antipiracy Act (Coble R-NC) - 1/19/99 Reintroduction of HR 2652
- HR 1858 The Consumer and Investors Access to Information Act (Bliley R-VA) 5/19/99

HR 1858

- Aims to prevent harmful, parasitic copying while enabling researchers' access to information and continual development of value-added databases.
- Imposes narrow restrictions on the transformative use of information
- prohibits outright duplication of databases to compete against the original one.

Comparison of database bills

- Both ban wholesale misappropriation of databases
- Differ on creation of new databases using material from existing ones (transformative use)

Penalties - HR 354

- Criminal penalties: <= $250k and/or <= 5 years; second conviction both can be doubled
  - Doesn't apply if material in database > 15 years
- Civil action can be brought "without regard to the amount in controversy"
- Injunctions, impoundment of equipment, and monetary relief

HR 354

- Prohibits the use of a "substantial part" of a database in many instances
- "...harm to the actual or potential market"
- Provides exemption for scientific and academic research that "does not harm directly the actual market"
- Other factors for exemption, eg "good faith"

Penalties: HR 1858

- FTC has authority to enforce
- violation of HR 1858 treated as violation of rule respecting unfair or deceptive acts or practices under Federal Trade Commission Act
  - Cease and desist order
  - <=$10K for each violation of order
- Civil remedies

Problems with Coble Database Proposal

- Good for 15 years - updating resets clock
- Fair use: only extractions that do "not harm directly the actual market for the product or service"
- Protects "facts"
- Irreproducible databases e.g. astronomical observations

Problems with Coble Database Proposal

- Aggregate loss of $10K in one year to owner combined with financial gain for offender:
  - fine of up to $250K; prison of up to 5 years
  - second offense double
  - computers can be impounded while action pending

The Players

- Supporters: Reed-Elsevier (world's largest publisher of scientific journals), Thomson (owns West Publishing, legal publisher), AMA (Physician's Desktop Reference), stock exchanges, esp NYSE
- Opposed: Dun & Bradstreet, Bloomberg, AT&T, MCI, ALA, AAAS, USACM, Bell Atlantic, Academy Presidents, CSSP, ...