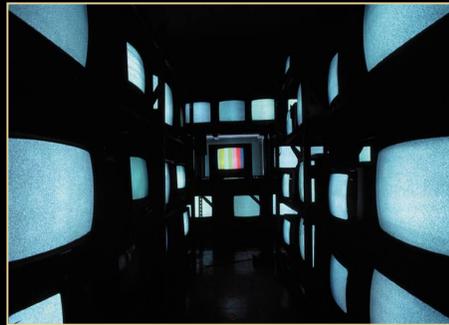

Blake White
Stanford University
June 5, 2003

Digital Rights Management

An Ethical Approach to Resolving Engineering Controversy

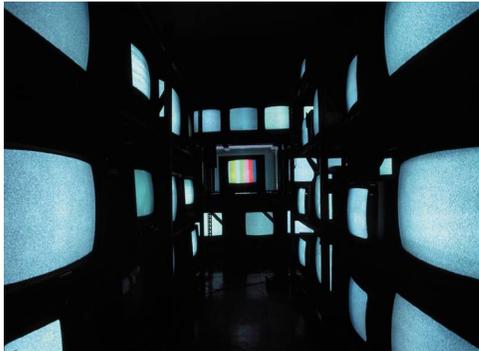


Digital Rights Management (DRM)



Managing Risk

Ensure privacy and security for digital assets



DRM technology addresses and enables:

- Content protection (encryption, key management)
- Content licensing rules, incl. complex new business models
- Enforcement of those rights and rules
- Automated tracking of distribution, usage patterns, license payments, royalties
 - Integration with Financial, ERP, Asset Management, License Management systems

DRM is part of a comprehensive security process

- Integral to industry workflow and tools
- Most effort needs to be put into business models and human issues

DRM – How it Works



Managing Risk

DRM Vendors

- Microsoft Windows Rights Manager 9
- InterTrust Rights|System
- IBM EMMS v2
- RealNetworks Helix DRM
- Macrovision MacroSafe
- Sealed Media License Server
- Adobe PDF Merchant
- Bertelsmann's DWS ADo2RA
- Apple's Fairplay

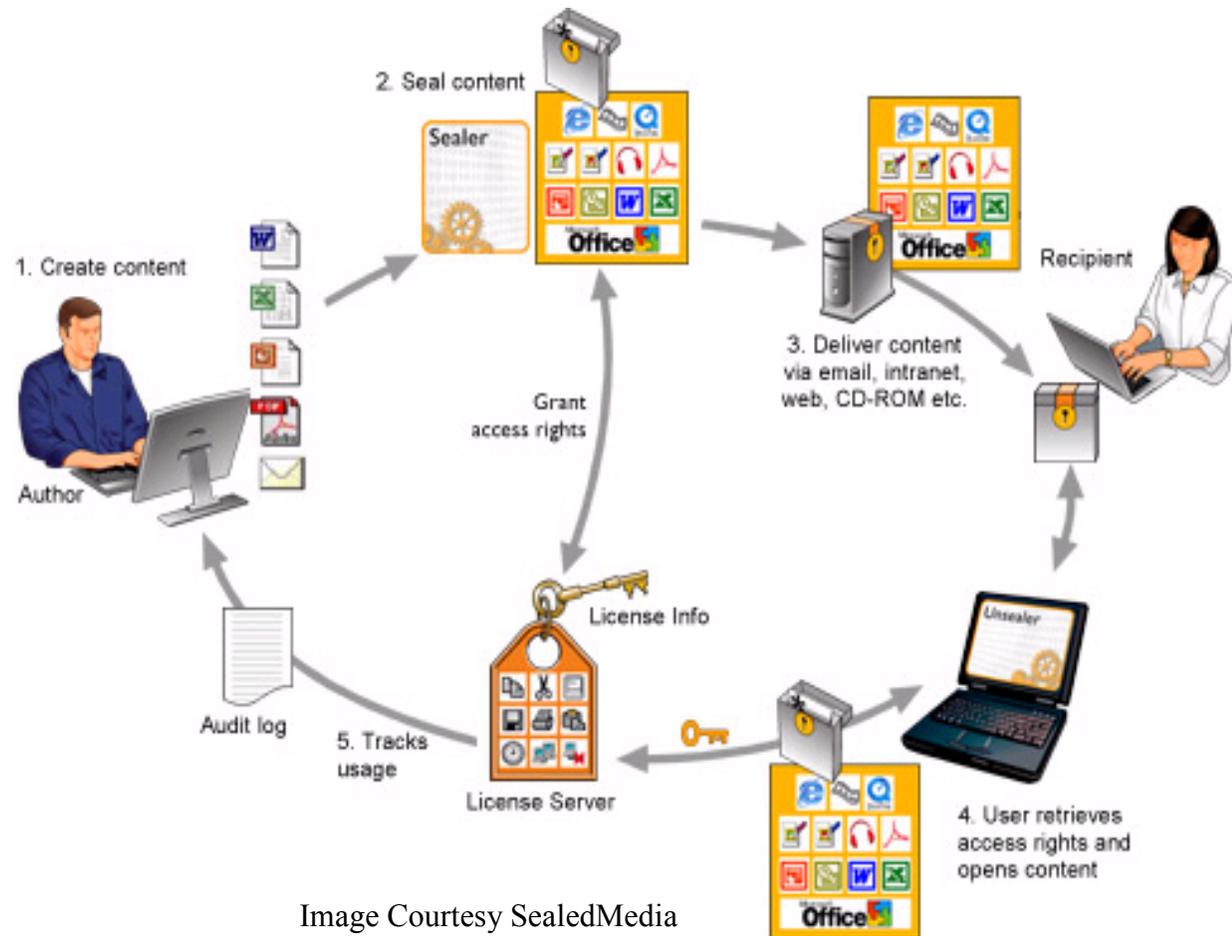


Image Courtesy SealedMedia

Stakeholder Arguments For DRM



Managing Risk

- **Property Rights**
 - Creative work should be owned and controlled by the creator. Stealing is still illegal, unethical, and all too frequent in today's digital age. (RIAA)
- **Aggregative Effect on Industry**
 - “There is no free lunch, no matter how free it seems (George Lucas)
- **Slowing Down Progress**
 - Broadband deployment is hindered by the threat of piracy
- **Protect Now, So We Can Enable the Future**
 - “Our goal is protecting content against theft and illegal redistribution, while protecting the thrilling advances and digital abilities to which we are accustomed.”
 - Peter Chernin, President & COO, News Corporation Chairman & CEO of Fox Group
 - Keynote address at 2003 COMDEX
- **DRM Standards Mandates**
 - Digital content won't be secure until DRMs are in all digital media systems
 - The computer/software industry has resisted voluntary standards on DRMs
- **Stronger Legal Protection is Needed**
 - Broadcast Flag
 - DRM Mandate
 - International crackdowns

Stakeholder Arguments Against DRM



Constraining Liberties

- **Property Rights**
 - “DRM systems impose restrictions on what individuals can do...with copies of works they’ve paid for.” (J. Cohen, Georgetown Univ. Law)
- **Being Driven by Narrow Property Interests** (L. Lessig, Stanford Law)
- **Fair Use**
 - DRM may be a way for content owners to override Fair Use, First Sales, and Public Domain Principles. (P. Samuelson, UC Berkeley Boalt Hall)
- **Abuse of Privacy**
 - “Information about intellectual activity has long been regarded as fundamentally private, both for reasons of individual dignity and because of the powerful chilling effect that disclosure of intellectual preferences would produce.” (Cohen, Georgetown)
- **Free Speech**
 - DeCSS (hacker code) is speech which he has a right to utter under the First Amendment (Corley defense against DMCA)
- **Constrains Open Public Debate**
 - “Bans on understanding technology cripple the public debate about these issues.” (E. Felton, Princeton)
- **Chilling Effect on Cryptographic Research**
 - “It will have a non-trivial impact on the conditions under which research takes place.” (J. Liu, Boston College Law)

The Great Middle Stakeholders



Make my Life Easy

- **Most consumers are not thieves, but cannot be inconvenienced to take a legal step when the illegal step is cheap and easy**
- **They want value for payment, impulse purchase, non-commercial rights to copy, and non-intrusive technology.**
- **Consumers demand a return to a singles-based sales model.**
- **Thirty years ago, the record industry:**
 - (a) gave a small amount of material away for free on the radio,
 - (b) did not care if copies were made for personal use compilations or passed on to friends,
 - (c) sold singles for under \$1,
 - (d) provided a better deal with albums for fans of artists than buying a dozen singles,
 - (e) made money on the live concert,
 - (f) made money on the T-shirts sold at concerts, and
 - (g) captured the loyalty of consumers with fan clubs.
- **Somewhere, the lure of the \$16 CD caused the industry to move away from singles and a model that worked for them for decades.**

The Facts



Managing Risk

- **Piracy is a Serious Problem for the Content Industry**
 - **20M** pirated optical discs seized and **4.5M** pirated videos seized in 2000 (MPAA)
 - MPAA estimates **\$3B** in annual revenues were lost by the US motion picture industry
 - Piracy upsets release schedules. For example, *Star Wars: Episode 1 – The Phantom Menace* had much lower Asian attendance because of earlier US piracy.
 - Music industry loses **\$4.2B** to piracy worldwide and **\$300M** a year domestically (RIAA)
 - UMG held 28% share of 2002 WW music distribution, but it experienced a **decline of 20%** in CD units over the past three years, due to in part to free downloads and burns.
 - **200 millionth download** of Kazaa Media Desktop (KMD) on 3/11/2003
 - Cost of fighting back, according to RIAA, 2001 stats:
 - 230 distribution operations raids
 - 145 manufacturing operations raids
 - 2.8 million unauthorized CD-Rs seized
 - 21 million labels seized
 - 74% increase in search warrants
 - 113% increase in arrests and indictments
 - 170% increase in “sight seizures”
 - 203% increase in guilty pleas/convictions

The Facts, cont.



Managing Risk

- **Poor and/or Outdated Business Models Contribute to the Problem**
 - Content owners
 - Fiduciary responsibility to today's stockholders
 - Hit business. Less than 10% profitable to cover costs of all artists
 - No longer investing to develop artists with longevity and a valuable body of work
 - Content owners have been naïve, arrogant, and focused on short-term business
 - Content owners rely on criminal law vs. civil law to shift the true costs of piracy to public
 - Consumers
 - Consumers want choice, value, and a model similar to the physical world
- **US Copyright Law is the Basis for Owners' Claims**
 - Rights for owner to perform, display, distribute, reproduce, derive works
 - Digital Millennium Copyright Act (DMCA) 1998
 - Anti-circumvention rules (sec.1201)
 - Protection for copyright management (sec 1202)
 - NET Act
 - Copyright infringement – 5yrs in prison, \$250,000 fine, up to \$150,000 statutory damages per work infringed.

The Facts, cont.



Managing Risk

- **US Copyright Law's Exceptions are the Basis for Consumer Claims**
 - Educational use
 - Critical analysis
 - Non-profit “shopping” privilege
 - Backup copies
 - Interoperability
 - Broken access control
 - Parental control
 - Law enforcement and national security
 - Protection against surveillance without notice
 - Computer security testing
- **DRM Technologies Can Prevent Much, But Not All Piracy**
 - Cryptography will ultimately be broken, if the pirate is dedicated, has time and resources.
 - DRM can keep honest people honest
 - DRM gives content owners a “comfort level” rather than a guarantee (ex: lock on door at home)

The Facts, cont.



Managing Risk

- DRM Has Limitations as an Implementation of Social Policy
 - “Policies that are subject to many exemptions or based on conditions that may be indeterminant or external are difficult or impossible to automate with DRM.” (J. Erickson, HP Labs)
- DRM Can Enable Intentional and Unintentional Privacy Abuses
 - Tracking purchases and preferences
 - But, protections can be built in. Ex: Macrovision

Ethical Concepts Involved



Balancing Rights with Reality

- **Aggregative Impact of Maximalist Technology**
- **Contextualized Theory of Human Rights (CTHR)**
 - Replication of same rights of the physical world in the digital realm ?
- **Conflicts between Engineers' Loyalties**
 - Content owners
 - Shareholders
 - Fair Use Claimants
 - Consumer Demand for Quality Product
 - Employer and/or client
- **Fundamental Moral Responsibilities (McGinn)**
 - FMRE1 – Do no harm nor risk harm to the public interest (property and fair use rights)
 - FMRE3 – Adequately inform parties likely to be impacted by engineering work (consumer labelling, security flaws, privacy issues)
 - FMRE4 – Work for the legitimate best interests of employers or clients (property rights management alone will not solve the problem)
- **Derived Moral Responsibilities of the Engineer (McGinn)**
 - DMR to help employer clarify definition of “the real problem”
 - DMR to disclose unrecognized options to employer

Basis for Recommendation



Balancing Risk & Rewards

- **ACM and Joint ACM-IEEE/CS Codes of Ethics**
- **DRM Cannot Enforce Context-Sensitive Copyright Law**
- **Copyright Law Should Not be the Basis of DRM Implementation**
- **Peer-to-Peer File Sharing is Not Illegal, and can be Combined with DRM to Become an Enabler of New Business Models**
 - Hypothetical Scenarios (see spreadsheet)
 - 1A -- Email Pass-Along Superdistribution without DRM – 0% increase in sales + 0 new contacts
 - 1B -- Email Pass-Along Superdistribution with DRM – 1.8% increase in sales + 176K new contacts
 - 2A -- Superdistribution without DRM – 200% decrease in sales + 0 new contacts
 - 2B -- Superdistribution with DRM – 115% increase in sales + 1.5M new contacts

Scenario #1 – 1M songs sold, email pass-along, 3 generations

<i>Pass Along Rate</i>	<i>30%</i>
<i>Preview Rate w/o Condition</i>	<i>80%</i>
<i>Preview Rate w/ Condition</i>	<i>50%</i>
<i>Take Up Rate</i>	<i>10%</i>
<i>Unprotected Piracy Rate</i>	<i>100%</i>
<i>DRM Protected Piracy Rate</i>	<i>1%</i>

Scenario #2 – 1M songs sold, P2P file sharing

<i>Upload Rate</i>	<i>30%</i>
<i>Download Multiple</i>	<i>10</i>
<i>Preview Rate w/o Condition</i>	<i>100%</i>
<i>Preview Rate w/ Condition</i>	<i>50%</i>
<i>Take Up Rate</i>	<i>10%</i>
<i>Unprotected Piracy Rate</i>	<i>100%</i>
<i>DRM Protected Piracy Rate</i>	<i>1%</i>

Give Consumers What They Want, but Balance Business Benefits with Reasonable Risk – The Apple Example



Managing Risk

- Invisible DRM
- Painless, purchase process
- Impulse purchase without subscription
- Reasonable copies for personal use
- Integration with portable devices
- High-value music content integrated with videos
- Low price -- \$0.99 singles
- Sold over 1M units in first week, \$2M units in 16 days.

Free 30-second, full-quality previews of any song

Download songs directly to your music library

Exclusive artists and tracks

Scroll through the latest releases and staff favorites



Browse entire store library by genre, artist and album

Search for any artist, song or album plus power search

Top song downloads

Top album downloads

Shop

Exclusive Content

Browse

Search

Image Courtesy Apple Computer

The Ethical Way Forward



Managing Risk, while Enabling Value

- **Maximize the most just distribution of benefits**

- Give consumers more and better choices
- Enable new creative business models for owners

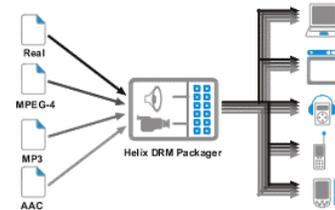


Image
Courtesy
RealNetworks

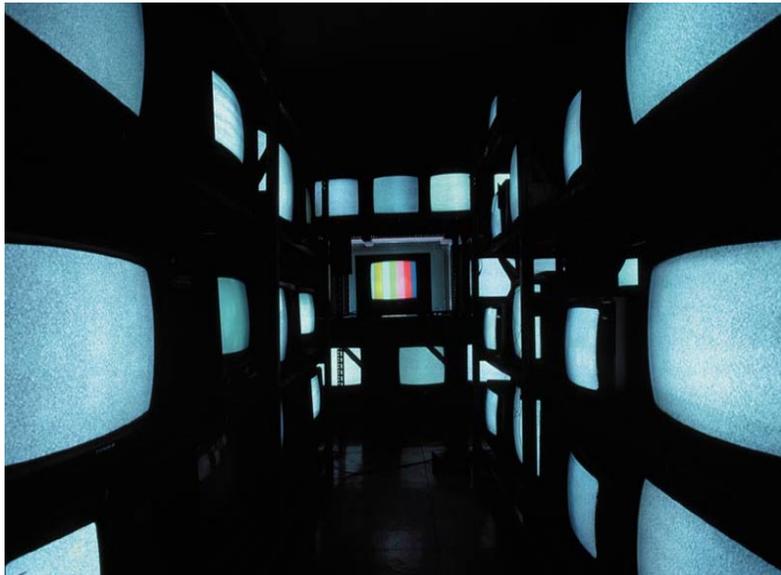
- **Context-sensitive, bottom-up framework inverts ‘sacred’ rights**

- Physical world analogies of ownership rights and copyright exclusions cannot be unbounded in a maximalist digital world
- Content should be explicitly licensed based on explicit terms of use
- Achieve Fair Use by applying previews, sub-sections, lower-resolution, samples, and time limits
- Cryptographic research enabled, but constrained by severe penalties for NDA and IP violations

- **Build the ethics into the product design process**

- Use civil law, rather than criminal law, to enable explicit permissions
- Build invisible security to accommodate to 90%+ legal users
- Default Opt-Out for non-explicit consumer information sharing
- Prevent collection of personally identifiable information
- Enable anonymizing techniques
- Informed consent (proper labeling in simple opt-in/opt-out, yes/no terms)

Humans, the Weakest Links in Security



Wall Street Journal
March 3, 2003 --

Hollywood Gives Pirates a Hand

The big Hollywood studios' decision to send out so-called screeners in DVD format to the people who vote on the Academy Awards was a case of the lust for Oscars winning out over the desire to stamp out piracy, resulting in a field day for bootleggers.