

The Landscape of Content Protection Technology: Implications for Digital Publishing

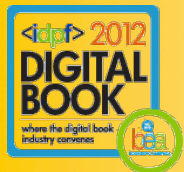
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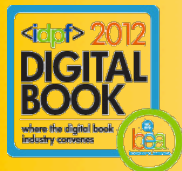
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Ways to Fight Copyright Infringement

- Legal
- Economic
- Behavioral
- Technical

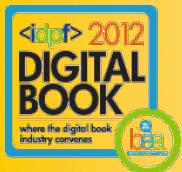
(Courtesy Larry Lessig, *Code and Other Laws of Cyberspace*)



Ways to Fight Copyright Infringement

- Legal: Strengthen copyright law
- Economic: Make content cheaper & easier to access
- Behavioral: Educate public about copyright
- Technical: Use technology to enforce copyright

(Courtesy Larry Lessig, *Code and Other Laws of Cyberspace*)



Technical Methods

Proactive

- Limit what consumer can do with content
- Encrypt content, require special s/w or h/w to decrypt
- Tie access to user or device identity
- Expiry date & time
- Limits on print, copy to clipboard, etc.

Reactive

- Don't limit what consumer can do with content
- Search for infringing copies of content
- Identify their source by context or examination
- Create evidence for legal infringement complaint

Technical Methods

DRM

- Limit what consumer can do with content
- Encrypt content, require special s/w or h/w to decrypt
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Content Identification

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Pros and Cons of DRM

Constituency	Attribute	DRM
Publishers	Piracy	Maybe
Retailers	Lock-in	Yes
Libraries	E-lending	Some
Distributors, E-reader vendors	Cost to implement	Yes
Users	Portability	Restricted
Users	Sharing	Restricted
Users	Borrowing	Some
eReading Market	Growth	Fragmentation

Fragmentation: Current DRMs for eBooks

DRM	Platforms
AZW DRM	Amazon Kindle devices/apps
Adobe Content Server 4 (ACS4)	B&N Nook, Sony Reader, Kobo Reader, various others
Apple FairPlay	iOS (iPhone, iPad)
“Screen shot DRM”	Google Books
Fictionwise DRM	B&N Nook
Microsoft PlayReady	Blio Reader
Kobo Vox DRM	Kobo Vox tablet

DRM in Music

- Paid downloads DRM-free
- iTunes post-DRM functionality restrictions
- Streams (Spotify, Pandora) encrypted
- “Offline listening mode” in mobile subscription services (Spotify, Rhapsody, MOG) use DRM

DRM in Movies & TV

- Protection getting stronger, not weaker
- “Software hardening” to deter hacking
- Impact of hacks limited
- Forensic antipiracy services to catch hacks
- UltraViolet standard for downloads: family accounts, rights locker, 5 DRMs, stream encryption
- Watermarking + encryption for early window high def

DRM for Corporate Documents

- Protect confidential information
- Adjunct to corporate content management systems
- Complements firewalls, DLP, SSO, etc.
- Strong protection
- Integrated into Word, Excel, Acrobat, etc.
- Integrated with identity management

Content Identification in Publishing

Watermarking (Safari, Booxstream)

- Adding user identity into to downloaded eBook
- User ID, real name, cc# in obfuscated or plaintext form
- Once, in every chapter, or on every page
- Legal one-click hacks possible
- Web crawling optional

Fingerprinting (Attributor, Irdeto)

- Examining files to determine their identity
- Fancy form of pattern matching
- Requires web crawling to find unauthorized copies online
- Cannot identify user who copied content
- Hacks not relevant

Content Identification in Publishing

Watermarking

- Safari Books Online PDF downloads: user's name on every page
- Harry Potter EPUB downloads: obfuscated user ID on copyright page

Fingerprinting

- At least 4 of Big 6 trade
- Majority of major K-12 and higher ed
- Many major STM and university presses

Publishers Going DRM-Free?

- Genres: SF/fantasy, IT
- Demographics: young/techie
- ...otherwise most publishers do and will use DRM
- ...and publishers either use it for e-lending or don't allow e-lending at all
- Particularly hard to imagine higher ed & professional going DRM-free

Non-Optimal Choices

Status quo	Go DRM-free
Standardize strong DRM	Standardize w' marking

Non-Optimal Choices

<p>Status quo</p> <ul style="list-style-type: none">• Market fragmentation and slower e-readership growth• Or monopoly	<p>Go DRM-free</p>
<p>Standardize strong DRM</p>	<p>Standardize w' marking</p>

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Go DRM-free

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- Not practical for some models
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Standardize strong DRM

- Expensive and complex
- Resistance from retailers and device makers
- Privacy issues

Standardize w' marking

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Standardize w' marking

- Privacy vs. efficacy tradeoff
- Hacks are legal

IDPF Is Exploring a New Choice: EPUB LCP

- Lightweight Content Protection for EPUB 3
- Open pro-competitive standard
- Use personal information (e.g. name, email, cc#) as password, stored in obfuscated form
- Complementary to watermarking
- Library lending (expiry period) support

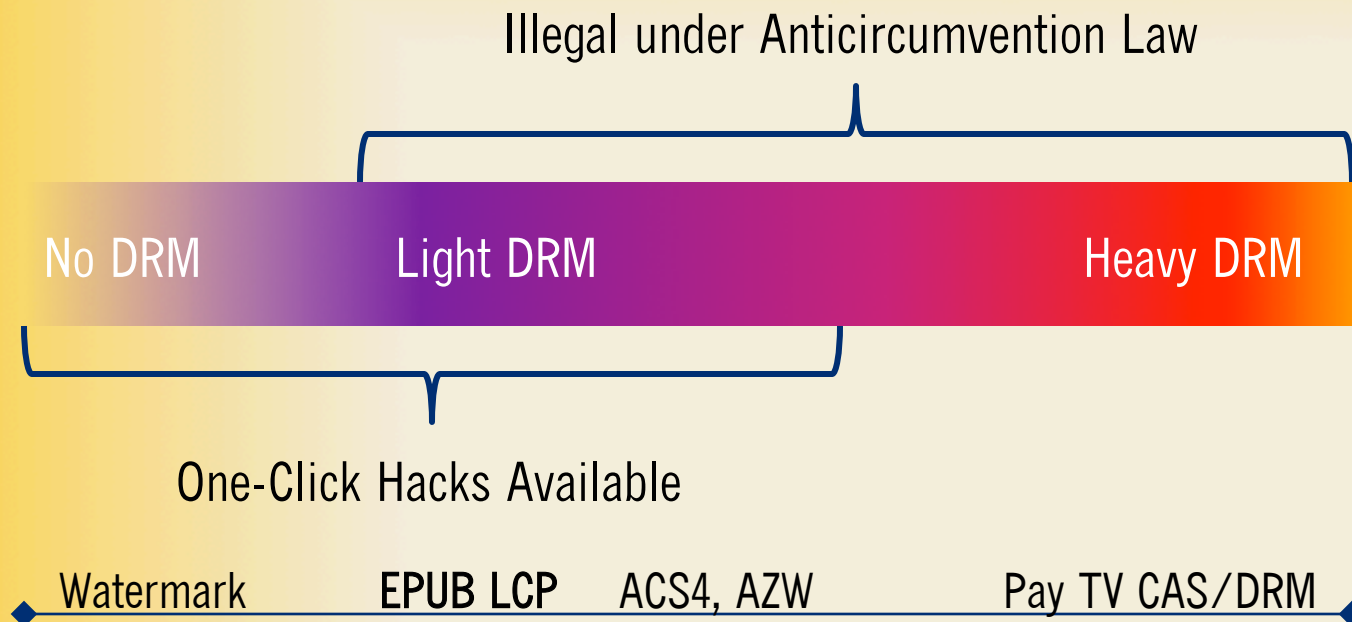
EPUB LCP is “Lightweight”

- Give away password to others, they can read content
 - “Social DRM” concept
 - Who do you trust with your personal information?
- No “phoning home”
 - Heavyweight DRM depends on it
 - Can be used offline (or if retailer goes out of business)
- Designed to be extended for certain markets
 - More security
 - More business models

Heavyweight vs. Lightweight

	Heavyweight	Lightweight
File sharing	Restricted	“Social”
Net cnxn required	Yes	No
One-click hacks	No	Yes
Recovery from hacks	Possible	Not possible
Legality of hacks	Illegal	Illegal
Cost/complexity	Expensive/complex	Cheaper/simpler
Bus model flexibility	More	Less

Security Strength of DRMs and Anticircumvention Law



Models Not Possible with EPUB LCP

- Separate license delivery
 - One file, multiple sets of rights
- Domain authentication
 - “Family accounts”: multiple users and/or devices
- License chaining
 - Subscription services
- Master-slave
 - Secure transfer from PC to portable device
- Forward-and-delete
 - Support for “Digital First Sale”

Window of Opportunity

- Fragmentation increasing
 - E.g. Kobo replacing ACS4 with proprietary DRM
- Amazon at ~60% market share
 - Tipping point between monopoly and fragmentation
- E-reading going global
 - Moving into higher-piracy markets
- EUPB 2 – EPUB 3 transition
 - Opportunity to rectify IDPF' s historical inaction on DRM

What IDPF Is Doing

- Engaged GiantSteps to help with EPUB LCP design
- Draft requirements
- Soliciting comments from knowledgeable constituents... like you!
 - Visit idpf.org to read requirements
 - Email bmccoy@idpf.org

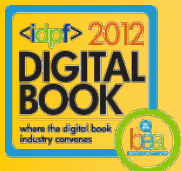
More Information



www.giantstepsmts.com



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Thank You!

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