Interoperability, system design and the “DRM thicket”

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Digital Rights Management (DRM)
- (NIST) “a system of information technology (IT) components and services along with corresponding law, policies and business models which strive to distribute and control intellectual property (IP) and its rights”
  - RELs - Machine-readable metadata (ODRL, XrML)
  - Usage contracts (click-wrap)
  - IP licenses

Pervasiveness
- “DRM is not a piece of technology loaded onto an end-user device or a service offered through a server. It is a pervasive technology that has to extend across the entire value network if it is to perform its function.”
1. Maximizing the value of the Net
   - Preserving e2e architecture
   - Promoting open standards at remote layers
   - Promoting interactive services
   - Fight enduring bottlenecks

2. Maximizing the value of content made available on the Net
   - Incentives for content owners to make content available
   - Respect for architecture and system design
   - Enable access to specific valuable content

**DRM is the talk of the town. But the problem with DRM is not the technology, but the forces behind it. Does it have the potential to support the two main goals of cyberlaw?**
Only a few years ago...

In the early 1990s, the advent of the WWW elicited predictions of all sort. These predictions were apparently incompatible with each other...

- **In cyberspace: code, not law, defines what’s possible**
  
  *Lawrence Lessig (from 1996)*

- **The Internet will become like a “cestial juke-box”**
  
  *Paul Goldstein (1993)*

- **“Copyright is dead”**
  
  *John Perry Barlow (1994)*

- **“Almost every marketplace scheme in the information industry could be construed as illegal under our antiquated antitrust laws”**
  
  *Peter Huber (1993)*
Only a few years ago...

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"On the Internet, nobody knows you're a dog."

Cartoon by Peter Steiner. The New Yorker, July 5, 1993 issue (Vol.69 (LXIX) no. 20) page 61
“Code is an efficient means of regulation. But its perfection makes it something different. One obeys these laws as code not because one should; one obeys these laws as code because one can do nothing else. There is no choice about whether to yield to the demand for a password; one complies if one wants to enter the system. In the well implemented system, there is no civil disobedience. Law as code is a start to the perfect technology of justice.”

Lawrence Lessig (1996)
But then...

- Digitalization of information
  - Information goods = information
  - Imperfectly excludable, rival (in production), non-rival (in use), experience good

- High-speed bandwith
  - Advent of DSL, Cable, Mobile broadband
  - Convergence – info superhighway

- End-to-end architecture
  - Network externalities
  - Secondary information markets

- Economics of attention
  - Preference for flat pricing
  - Failure of micropayments
  - “clutter effect”
A few years later, all those commentators were wrong (but Huber). No celestial jukebox, reliance on copyright, constant circumvention of TPM...
The fight for control was violent

- **Lobbying for legal rules**
  - Lehman Commission, DMCA, Sonny Bono Act, Broadcast Flag, CBDTPA, IP Protection Act, Berman Bill, INDUCE Act...
  - EC Copyright directive, software patents directive, HLG on DRM issues...
  - WIPO, Canada, EU25, Korea, Japan...

- **Case-law**
  - Lawsuits against individual users
  - Mp3.com, Napster, Aimster, Kazaa, Grokster
  - Microsoft (US and EU)

- **Spoofing**
  - Media defender, Overpeer

- **Changing the architecture**
  - AOL/TW Roadrunner
  - AT&T @Home
Achilles and the turtle (I)

As p2p emerged as a new phenomenon, the protection offered by copyright law clashed with the new architectural forms studied for the purpose of escaping vicarious liability...

  - One-way downloads
  - No sharing
  - Space-shifting
  - Not fault-tolerant
  - Not extensible
  - Not lawsuit-proof

  - Centralized
  - Static
  - Manageable
  - Not extensible
  - Not fault-tolerant
  - Not lawsuit-proof
As p2p emerged as a new phenomenon, the protection offered by copyright law clashed with the new architectural forms studied for the purpose of escaping vicarious liability...

- **Morpheus (2003)**
  - Decentralized
  - Dynamic
  - Difficult to manage
  - Extensible
  - Fault-tolerant
  - Lawsuit-proof

- **Grokster (2003)**
  - Decentralized
  - Dynamic
  - Manageable
  - Extensible
  - Fault-tolerant
  - Lawsuit-proof
p2p boom!

2 Find MP3
ABC
Acquisition
Adagio
Amini p2p Software
aMule Project
ANts p2p
Anywhere Explorer
Apollon
Applejuice
Ares
Ares p2p
Arhiweb Folders
AudioGalaxy Rhapsody
AudioGnome
Axbar
Azureus
BadBlue
BCDC++
BearShare
BitComet
BitComet Accelerator
BitLord
BitSpirit
BitTorrent
BitTorrent Absolute Downloader
BitTorrent Lite
Black Pirate FS
Blubster
BT2Net
BT2Net Jet-speed Downloader
BTGetit
Carracho
Connect Storm
Crazza
DC++
Deepnet Explorer
Diet K
Digital Media Server
DIYP2P / Paranoia
DriveHQ
Easy File Sharing Web Server
eDonkey 2000
eDonkey Accelerator
eFileGo
Einstein
Emule
eMule Plus
eXem
FilePipe
Filetopia
Freenet
Ganuerc
Grokster
Grouper
Haxial KDX
iMesh
iMesh Light
iMesh Revolution
InfoexSoft Photo Share
K-LiteGold
Kast
KaZaa
KaZaa All-in-One
KaZaa Lite Resurrection
KazaaHttp
Knutell
LimeWire
Lphant peer to peer
MagicVortex
MediaGrab!
Mercora IMRadio
Mixertractor
MLdonkey
Morpheus
MP3-Wolf
Myster
Network Sunshine
Nodescan
Noxx
P2P ShareSpy
Peer2Mail
PeerFolders
PeerFTP
Personal File Server
Piolet
PixVillage
PruneBaby!
PySoulSeek
Qnext
Searchius
SendLink
Shareaza
ShareDirect
ShareGear
ShareIt
Soulseek
StreamJack Music
The Circle
Torrent Searcher
Torrentopia
TribalWeb
TrustyFiles
Web file manager
HTTP Commander
WinMP3Locator
WWW File Share Pro
XBT
Xolox
YaCy
ZipTorrent
Zultrax
The Court is not blind to the possibility that Defendants may have intentionally structured their businesses to avoid secondary liability for copyright infringement... To justify a judicial remedy, however, Plaintiffs invite this Court to expand existing copyright law beyond its well-drawn boundaries.

MGM v. Grokster, 2003

Nothing in Sony requires courts to ignore evidence of intent to promote infringement if such evidence exists. In addition to intent... the inducement theory requires evidence of actual infringement... There is evidence of such infringement on a gigantic scale. Because substantial evidence supports MGM on all elements, summary judgment for respondents was error.

MGM v. Grokster, 2005
Today...

**DRM systems are currently promoted as the only viable solution for migrating towards legal use of content on the Internet.** Acceptability is the end, interoperability the means...

- **EU High Level Group**
  - “EU Institutions and Member States [must] reflect in their policy positions that copyright abuse will not be tolerated, and that protection of content delivered via DRM is the way forward.”

- **Interoperability is key to consumer acceptance:**
  - Stakeholders should continue work on open, cross-platform DRM systems and standards
  - The EU should foster open standards and discuss compliance mechanisms with stakeholders
  - Member States should foster open standards, ensure that DRM security will not be undermined and enforce anti-piracy measures
DRM: a reductionist view

From a reductionist perspective, DRM systems can create way more harm than good... but with convergence, a holistic view enables a better understanding.

**Pros**
- Effectively fight piracy
- More control for rights holders

**Cons**
- Still vulnerable
- May reduce ease of use and demand, especially if there is no interoperability
- Might (arbitrarily) restrict freedom to use content
- Might create consumer lock-in
- Might become a technology licensing control point and create competitive concerns
- Are potentially unlimited, and might go too far
- Might invade people’s privacy
- Might inhibit fair and transformative uses
The EU debate has not led to clear hints on how risks associated with DRM will be dealt with.

**Antitrust law**
- Should dominant players grant interoperability to competing content providers?
- Should DRM patent holders be forced to license their IP?

**Copyright/Contract interface**
- Should DRM usage terms comply with copyright law?
- Should copyright law prevail on shrink-wrap licenses?
- Should copyright law be used as a safety net?
- Should copyright become copy-duty?

**e-communications regulation**
- “ladder of investment” or “enduring bottlenecks?”
Consumer-centric models and DRM

- Consumer
  - "Pro-sumer"
  - content to peer consumers
  - attention and money to network operators
- Rights Owners
  - content to advertising
  - attention and money to content aggregators
- Content aggregators
  - content to consumer
  - attention and money to rights owners
- Network operators
  - content to advertising
  - attention and money to content aggregators
- Advertising
  - content to consumer
  - attention and money to rights owners
- Regulators
  - regulation for advertising and rights owners
- Peer consumers
  - content from consumer
  - attention and money from content aggregators

"Pro-sumer"
Consumer-centric models and DRM
The platform operator’s Decalogue

“Three Cs”: Content, Customers, Capacity
- Gather data on customers
- Create the product accordingly
- Choose system architecture
- Create a co-opetition model
- Manage customers’ expectations
- Create the “customer experience”
- Formulate a pricing/bundling strategy
- Versioning strategy
- Choose the revenue-mix

Competitive capacity

Business model

Chicken or egg?
Depending on the architectural choice, competition in or for the market will emerge.

No architecture is better than others in all respects. However, with convergence, semi-open models have more chances to prevail.
How about market forces?

- **iTunes is dominant and closed**
  - System design is the key: losses from songs, profits from devices
  - It refused interoperability with VirginMega and with RealNetworks
  - Users start to complain

- **New players are succeeding**
  - MusicMatch/Yahoo!
  - Napster
  - Rhapsody
  - Sony connect
  - Microsoft
  - Virgin Digital

- **The creation of community is increasingly key, and is a major threat to Apple’s closed system**

Most commentators agree that market forces will drive interoperability between devices and more open architectures in the content industry…
Emerging business models

Legal downloads are increasing – 35% v. 40% illegal downloads. iTunes sold over 400 million songs and earned a 80% market share… is there a market failure?

- **Digital Media Store**
  - iTunes, Napster, Movielink

- **P2P Store/Superdistribution**
  - Wippit, Weedshare, Altnet

- **Downloads with alternative compensation**
  - Qtrax

- **Universal meets Snocap**
  - All repertoire

- **Sony meets Snocap and Grokster**
  - Mashboxx

- **Collective licensing**
  - Requires tracking

- **“Trojan Horse” strategies**
  - Requires fidelization
Refusal to grant interoperability?

The four-pronged Magill/IMS test

1. Did the dominant firm refuse to supply IP-protected information which was indispensable/essential for competitors to effectively compete in a secondary market?

2. Assuming it was indispensable, was it indispensable to produce new products/services for which there was an unsatisfied consumer demand?

3. Was the allegedly abusive conduct capable of posing a credible threat of eliminating all competition from the secondary market?

4. Was the “great refusal” objectively justified?

IP protection in network industries has long relied on the existing Magill rule, which challenges exercise of IP as abusive ex article 82 under “exceptional circumstances”
Refusal to grant interoperability?

**US:** “narrow and deferential approach”
  - “A court’s evaluation of a claim of integration must be narrow and deferential.”

**EU:** Microsoft Case (2004)
- Did not fit the Magill/IMS test
- CFI mandated further analysis on
  - Value of underlying R&D investments
  - Value of the interface information withheld
  - Actual indispensability of the information
  - Merit of protecting Windows’ “design concept”

**France:** VirginMega v. Apple (November 2004)
- Lack of interoperability functional to the product’s design (system design defense)
Where patents count

Apple → FairPlay → iPod, Motorola ROKR

Microsoft

ContentGuard

Settlement

XrML

DRM 10

Very similar, and now interoperable (COREMEDIA)

OMA ODRL

Most wireless devices

Vodafone

InterTrust

XrML

MPEG LA

Audiovox, Creative, Samsung, Nokia, Philips, Sony, TW, Yahoo, Thomson

PC-to-Mobile interoperability
Recommendations

- **Antitrust should focus only on enduring bottlenecks**
  - Do not change the Magill/IMS rule
  - Do not impose open architectures
  - Deferential approach to system design
  - Focus on enduring bottlenecks in the value chain
  - Focus on more remote layers of the Internet:
    - DRM patents that prevent the creation of new markets
    - Disruption of previous levels of supply
    - Patent tying not functional to system design
    - Unfair practices in patent pools

No easy solution exists: only a combination of policies can help facing a combination of TPM, consumer contracts and IP licenses.
Recommendations

- Public policy can create virtuous competition
  - Promote fair licensing systems, but do not impose interoperability
  - Fight exclusive agreements between rights owners and platform operators
  - Promote infrastructure-based competition in the review of e-communications regulation
  - Promote the standardization of usage terms by embedding consumer rights in shrink-wrap contracts
  - Leave platform operators free to choose their own system architecture
  - Use copyright as a safety net
All prophets were right!

Code is being promoted, civil disobedience is decreasing, copyright has become an exception, antitrust is confused...