

DRM the saviour of digital media

... if only it were that simple

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Matchmakers

- In this world it is not always easy for two parties to find each other ☹
 - So, while there are people who like to create books, paintings, photos, music, movies, ...
 - And there are people who enjoy other people's creations
 - Creators are often not able to communicate to their clients that they have what is being looked for
- Fortunately there are people who are willing – for a reward – to make that happen ☺
- In the media world there are many intermediaries who work to make two sets of people – creators and end-users – achieve their goals

Un ménage à trois – Creators (and their proxies)

- Many creators (and their proxies) would like that end-users only enjoy their creations
- Creators (and their proxies) are conservative
 - Don't change a successful way to exploit works!
 - Technology is the enemy
 - It's hard to blame them, their goods are ethereal...
- Creators (and their proxies) tend to make recourse to law to defend their assets
 - Ludovico Ariosto (author of "Orlando Enraged") writes to the Duke of Ferrara: *you* fine those who pirate my works and *we* share the proceeds (1515)
 - Queen Anne's Act: "... some printers and publishers have of late frequently taken the liberty of printing, reprinting and republishing books without the consent of Authors or Proprietors of such Books" (1710)

Un ménage à trois – Intermediaries

- Intermediaries are in constant search of new technologies for distribution and consumption of
 - Old content in new forms
 - New content
- To better exploit their technology, intermediaries need plenty of content to take and distribute to consume with their technology
- But creators and their proxies object
- Eventually a compromise is reached, possibly brokered (so to speak) by law, e.g.
 - Player piano
 - Private copy
 - Single Copy Management System
 - WIPO Copyright Treaty

Un ménage à trois – End-users

- End-users enjoy content
 - But they feel the weight of the entire value-chain on their shoulders...
- End-users are ready to buy the hardware that is required to enjoy content
 - On condition that they can access all available content without discrimination
- End-users have one big weapon
 - Every little thing that is done by each of them that is emulated by the millions ends up having a big impact

The business of media is based on instability

- **Creators and their proxies**
 - Keep on offering content
- **Intermediaries**
 - Keep on supplying new means to distribute and consume
- **End-users**
 - By keeping on searching, accessing and consuming content using the tools supplied by the intermediaries end up creating a need that is satisfied by the new technology
- **Creators and their proxies**
 - Supply content for the new market so created once the need is firmly established

20th century – the past

- **Creators**
 - **Intermediaries** have constantly been given new technologies to create content – more of it, in newer and richer forms
- **End-users**
 - **Intermediaries** have constantly been given more and more tools to access and consume content
- Throughout the 20th century the distribution and consumption potential has always been above the capability of the system to absorb it
 - i.e. there have been less distribution and consumption means than there was supply (of content)

21st century – the future

- For the first time in history the capability of the system to absorb content is greater than the content creation and distribution potential
- The media business is no longer based on instability, it is unstable
- Creators and their proxies are right to see technology as the enemy
- The value of content can only decrease unless the media value-chain is turned upside down: distribution and consumption are not to be increased but decreased!
- But technology can provide the saviour...

Enter the saviour (?!)

- With Digital Rights Management (DRM) rights holders can manage the flow and use of their content the way they like
- Intermediaries and end-users have better to comply
 - If not the law is there to put transgressors in line
- The best monopoly market ever invented
- But it is for a good cause 😊
- Rights holders are happy
- Intermediaries are thrown into a turmoil
- No one cares of the end users

Many midwives - 1

1. 4C Entity
2. Advanced Access Content System Licensing Administrator
3. Audio Video Coding Standard Workgroup of China
4. Comité Européen des Normes
5. Content Management License Administrator
6. Content Protection Technical Working Group
7. Content Reference Forum
8. Coral Consortium
9. Digital Content Protection
10. Digital Living Network Alliance
11. Digital Media Project
12. Digital Transmission Licensing Administrator
13. Digital Video Broadcasting
14. DVD Copy Control Association

Many midwives - 2

15. High-Definition Multimedia Interface
16. International DOI Foundation
17. Internet Streaming Media Alliance
18. Moving Picture Experts Group
19. MPEG Licensing Authority
20. Open eBook Forum
21. Open Mobile Alliance
22. Open Platform Initiative for Multimedia Access
23. Organization for the Advancement of Structured Information Standards
24. SD Card Association
25. Secure Digital Music Initiative
26. Trusted Computing Group
27. TV-Anytime Forum

The situation today

- Initiatives are established around groupings of interest targeting
 - Points in the value chain
 - Specific industries
- Different corporate agendas
 - Protect traditional roles
 - Expand traditional roles
 - Create new roles
- Common tool to further corporate agendas
 - Protect/expand/create value-chains using proprietary technologies
- Most end-users don't buy it because they lose on two fronts
 - The possibility of accessing all content (aka interoperability)
 - The many little liberties they used to take with content

And Public Authorities?

- With the approval of the Copyright Directive the European Commission asked CEN/ISSS to look into the issues brought about by DRM
- A group representing the major stakeholders was set up
- The group issued a report (October 2003)
- A sample from the report
 - “The solution suggested is regular and informal discussions between all the stakeholders in order to hear the concerns of each party and progress in the debate, whilst examining the market evolution.”

Samples of views on interoperability 1 (from CEN/ISSS DRM report)

- The ability for content and rights usage rules to be supported, unambiguously interpreted and enforced across multiple proprietary DRM systems and end user devices
- The ability to use datasets from different origins as though they were built to a common standard (e.g. for using metadata from different communities)
- It should be possible to use the same software or hardware for content from different suppliers

Samples of views on interoperability 2 (from CEN/ISSS DRM report)

- It should be possible to purchase content that is not tied to a specific device, i.e. content that can be used across devices, such as to enjoy a song purchased via a cell phone on a PC's car stereo etc.
- If the end-user cannot access/use/shift the content he has bought with the same usage rights then he will either prefer to get it through other more traditional or less legitimate distribution channels
- The portability decisions should rest with the content provider who should have the right to determine the range of devices and domains on which the content can be accessed. As the content provider makes choices in terms of his licensing models, then the marketplace (through the end-user) will reward or penalise accordingly

Samples of views on interoperability 3 (from CEN/ISSS DRM report)

- It should be possible to have a consistent and predictable interface when accessing content from different suppliers in the same sector
- There is a need to listen to what the end-user is saying and to study how the market is reacting to what it is being told because the future of the industry lies with its ability to reach its end-users. So far the lack of interoperability has been a major obstacle encountered by those who have used DRM in their solutions offered to end-users because of the confusion created by multiple choices, system complexity, novelty of dealing with possibly radically different systems and impossibility to move content and enjoy it on multiple platforms

Samples of views on interoperability 4 (from CEN/ISSS DRM report)

- At present interoperability is not the primary barrier to the uptake of DRM. Interoperability must be guaranteed but market forces should resolve this issue at a later point via global, open, voluntary technologies. The development and proof of different business models is more of an issue.

The Digital Media Project

- Launched as **Digital Media Manifesto** in Jul 2003
- Manifesto published in Sep 2003
 - <http://manifesto.chiariglione.org/>
- **Digital Media Project** established in Dec 2003
 - <http://www.digital-media-project.org/>
- The basic DMP position
 - Digital technologies are an **asset** of mankind
 - Creators and their proxies, intermediaries and end-users should all **benefit** from them
 - This goal can be achieved by **standardising**
 - Appropriate *protocols* between value-chain users supporting the functions they execute
 - At suitably identified *interfaces*

About interoperability

- **DMP definition of interoperability**
The possibility for Users (including End-Users) to technically execute value-chain Functions through Interfaces and Protocols of open specification
- According to this definition DMP develops an **Interoperable DRM standard**

Vision is good but we need a strategy

- DMP specifications should enable **innovation**
- DMP **cannot** standardise protocols for
 - Functions performed in **existing** value-chains
 - We do not know if today's value-chains will continue to exist
 - Functions performed in **future** value-chains
 - We do not know what future value-chains will be
- DMP **can only** standardise protocols for *Primitive Functions* performed by value-chain users because
 - **Existing** Primitive Functions
 - Can be combined to implement Functions
 - Are "re-used" in different Functions
 - The Functions performed by **future** value-chain users will still be combinations of
 - Today's Primitive Functions and
 - New Primitive Functions (possibly)

Process to identify Primitive Functions

- First set of contributions helped identify Primitive Functions in DMP0146 (Jul 2004)
- More contributions received from
 - Public service broadcasters
 - Collective management societies
 - Sheet music publishershave been integrated in DMP0176 (Sep 2004)
- Further contributions received from
 - End-users (people with disabilities)
 - Telecommunication companies
 - CE manufacturers
 - Individualshave been integrated in DMP0239 (Oct 2004)
- Additional contributions have been received and integrated in DMP0277 (Dec. 2004)

Basic Primitive Functions (DMP0146 – July 2004)

- **Identify** (Data, User, Device, Content Format, Device Capability)
- **Represent** (Content, Rights Expression, Use Data)
- **Authenticate** (User, Device)
- **Verify** (Data Integrity, Device Integrity)
- **Certify** (User, Device)
- **Manage** (Key, Domain, Device Capability, Use Data Confidentiality)
- **Process** (Encrypt, Copy, Move, Backup, Restore, Export, Import, Render)
- **Pay**

More Primitive Functions (DMP0277 – December 2004)

- **Identify** (License, Use Context, Domain)
- **Assign** (Identifier, Description)
- **Revoke** (Domain ID)
- **Authenticate** (Domain)
- **Certify** (Author, Work)
- **Access** (Content, License)
- **Process** (Store, Play, Bind)
- **Test Conformance** (Rights Expressions, Enforcement of Rights Expressions, Tamper Resistance)

An example Primitive Function

"Assign Descriptors"

Definition	The function performed by an Authority to assign a Descriptor to a Work, a Resource or a piece of Content	AHG3
Objective	To facilitate search and find Works, Resources or pieces of Content	AHG3
Requirements	<ul style="list-style-type: none"> • To include the following mandatory fields <ul style="list-style-type: none"> ○ Author ○ Title ○ Genre of Authorship ○ Date of Creation of Work ... 	CMS
	<ul style="list-style-type: none"> • Assign Descriptors that facilitate cataloguing Content for B2B distribution 	SMP
Benefits	Easy and accurate retrieval of Works, Resources or pieces of Content	AHG3

CMS: Collective Management Societies

SMP: Sheet Music Publishers

NB: Words beginning with capital letter are defined by DMP0178

The DMP Interoperable DRM Platform (IDP)

- DMP develops a **Technical Specification** called “Interoperable DRM Platform” (IDP)
- The IDP Specification is developed in **Phases**
 - Phase I (IDP-1)
 - To specify technologies for **Portable Audio & Video Devices** (PAV) as per Call for Proposals issued in July 2004
 - To be approved in April 2005
 - Phase II (IDP-2)
 - To specify technologies for **stationary devices**
 - To be approved in October 2005
 - Phase III (IDP-3)
 - TBD

The IDP is a toolkit specification + use cases

- The IDP specification is based on a “**tool-kit**” approach
 - I.e. it contains normative specification of elementary technologies (“tools”)
- IDP is complemented by an “**IDP Use Cases**” document
 - To describe how the technologies in IDP can be assembled to build DMP DRM Systems
- The **Portable Audio and Video Device** Use Case describes how to make interoperable PAV Devices using the “tools” in IDP
 - Other Use Cases, e.g. **Import/Export Architecture** are being considered

The IDP-1 Working Draft 1.0

- Technologies for Primitive Functions in WD 1.0
 - Identify (Content, License, Device, Domain)
 - Identify Content is based on MPEG-21 Digital Item Identification
 - Represent (Content, Rights Expression)
 - Uses MPEG-21 File Format, Digital Item Declaration, Rights Expression Language
 - Authenticate (Device)
 - Manage (Key, Domain)
 - Process (Encrypt)
 - Access (License)
- Note that
 - Technologies are derived from a simple PAV Use Case
 - More technologies will be needed for the general PAV Use Case
 - Proposals have already been received but not put to use yet in WD
 - Suitability of IDP-1 tools for other Use Cases still to be done

Conformance

- Value-chains are the result of business agreements made by value-chain users that are supported by a set of technologies
- As the IDP is an open specification value-chain users can get solutions from multiple sources
- To be in business each party in an agreement must have the means to make sure that the other parties employ conforming products
- DMP will develop **Recommended Practices** for End-to-End Conformance to be published in July 2006
- Value-chain users can reference the document in their business agreements

Benefits of DMP specifications

- IDP is not application-specific, but a “tool-kit”
- Use Cases are application specific, but implemented with the same “tools”
- IDP enables interoperable products made by an ecosystem of competing providers
- By properly assembling the IDP “tools” value-chains implementing a variety of business models can be established
- The functionalities of an existing IDP-enabled value-chain can be augmented in a scalable way by adding more “tools”
- Interoperability between value-chains is enhanced by the use of common “tools”

Interoperability is important but more is needed

- For DMP interoperability of DRM is a must but...
- *Any* DRM has the potential to substantially alter the analogue-world balance between Users, in particular when one of them is the End-User
 - The set of Rights acquired by a given Value-Chain User is subject to the set of Rights that was available to the Value-Chain User granting the Rights
- If the imbalance is not remedied the scope of Traditional Rights and Usages (TRU) of users of media will be reduced
- This may lead to the outright rejection of DRM by some Users, in particular End-Users

Disclaimer

- DMP does not claim that an established TRU necessarily implies a *right* of a User to a particular Use of digital media
- DMP only claims that, if Users have found a particular Use advantageous in the analogue domain they are probably interested to continue exercising that Use in the digital domain as well
 - Not necessarily for free 😊
- Leveraging on this interest may offer opportunities for new “Digital Media Business Models” that are
 - Attractive to Users
 - Respectful of the rights of those who have created Works and invested in making Content

Overcoming the TRU obstacle

- During 2004 a large number of Traditional Rights and Usages have been collected/analysed
 - See <http://www.dmpf.org/open/dmp0270.zip>
- A Call for Contributions will be published in Jan 2005
 - See current draft <http://www.dmpf.org/open/dmp0280.zip>
- The intention is to publish “Recommended Action on Mapping of Traditional Rights and Usages (TRU) to the Digital Space” in Oct 2005
- The “TRU Recommended Action” will contain scenarios of TRU support made possible by specific technical and legal choices
- Individual jurisdictions may wish to use the “TRU Recommended Action” to determine
 - TRUs mandatorily supported by the IDPs operating under their purview
 - TRUs that can be left to private negotiations between Users

Some TRUs

TRU 01 to quote

TRU 02 to make personal copy

TRU 03 to space shift content

TRU 04 to time shift content

TRU 07 to use content whose copyright has expired

TRU 10 to use content anonymously

TRU 13 to annotate for personal use

TRU 19 of continued access

TRU 55 to access content in libraries

TRU 69 to access content of one's choice

TRU 72 to access information about content

TRU #55 to access content in libraries

- Description
 - The ability to access content in libraries when it is available. In the digital space libraries are called Repositories.
- Scenario #1
 - Type of support: Repositories supply
 - Basic Content search services
 - Pointers to Content offered by other sources are provided
 - Content as Governed Content when no other source is available
 - Content for which Repositories hold the copyright
 - Content as Ungoverned Content when copyright has expired

TRU #55 – Value-Chain Users' Roles-Advantages-Disadvantages

- Repositories
 - Role: Offer End-Users means to Access “all” Content
- Retailers
 - Advantages: Content is promoted by Repositories
- End-Users
 - Advantages
 - Can Access “all” Content, not necessarily for free
 - Can Access for free
 - Certain types of Content
 - If he is a certain type of User
- Public Authorities
 - Role: Offer Access to Content in the Repositories to particular classes of Users
 - Advantages: Achieve social ends

Read more at

<http://digital-media-project.org>