

Digital Rights Management (DRM) for Establishing and Increasing Trust and Privacy

Workshop on
Methods and Tools for Analyzing and
Securing Trust and Privacy
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Outline

- Definitions of
 - Intellectual Property Rights (IPR)
 - DRM
 - The term Rights
- Core Rights Model
- A DRM Reference Architecture
- DRM as a multi-faceted concept
- How DRM affects Privacy
- Comments
- Conclusions
- References

Definition of IPR

- **IPR** (<http://www.wipo.int>) refers to creations of the mind:
 - inventions, literary and artistic works, and
 - symbols, names, images, and designs used in commerce.
- **Intellectual property (IP)** is divided into two categories:
 - **Industrial property**, which includes
 - inventions (patents)
 - trademarks
 - industrial designs, and
 - geographic indications of source
 - **Copyright**, which includes literary and artistic works:
 - literary works: novels, poems and plays, films, musical works
 - artistic works: drawings, paintings, photographs and sculptures, and architectural designs.
 - **Rights** related to copyright include those of
 - performing artists in their performances
 - producers of phonograms in their recordings
 - broadcasters in their radio and television programs.

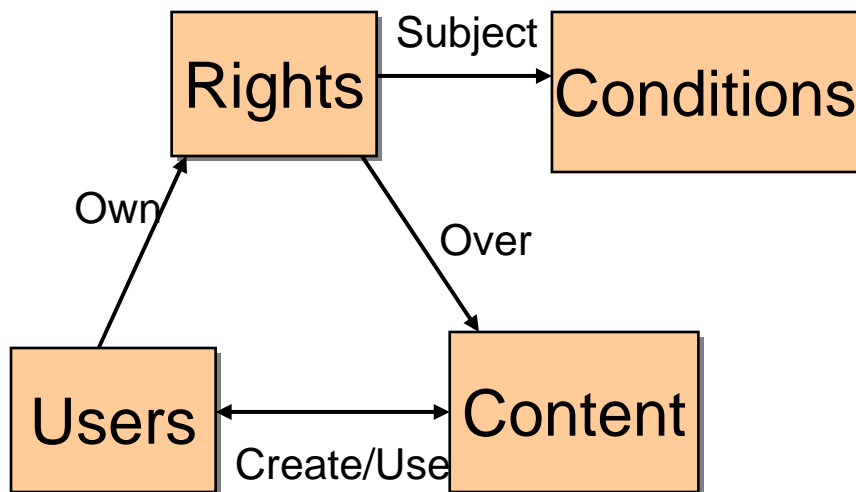
Definition of DRM

- DRM system refers to the use of technologies, which
 - unambiguously describe and identify digital information objects protected by Intellectual Property Rights (IPR)
 - enforce fine-grained rules of usage for, and rights of access to, them
 - monitor and track them, and
 - provide a secure infrastructure for their preparation, distribution, storage, manipulation, and communication, and finally
 - protect the privacy of users.
- To achieve these, DRM must include
 - persistent digital data protection against unauthorised interception and modification
 - unique identification of recipients and content to enable access control for the digital content
 - effective tamper-resistant mechanism to process protected digital data
- Thus, DRM
 - protects IPR over digital assets
 - Establishes and increases security, trust and privacy

Rights, Core Rights Model

The term Rights, according to Black's Law Dictionary, is "an interest or title in an object property; a just and legal claim to hold, use, and enjoy it or to convey it or donate it".

Rights: a user's privilege on an object



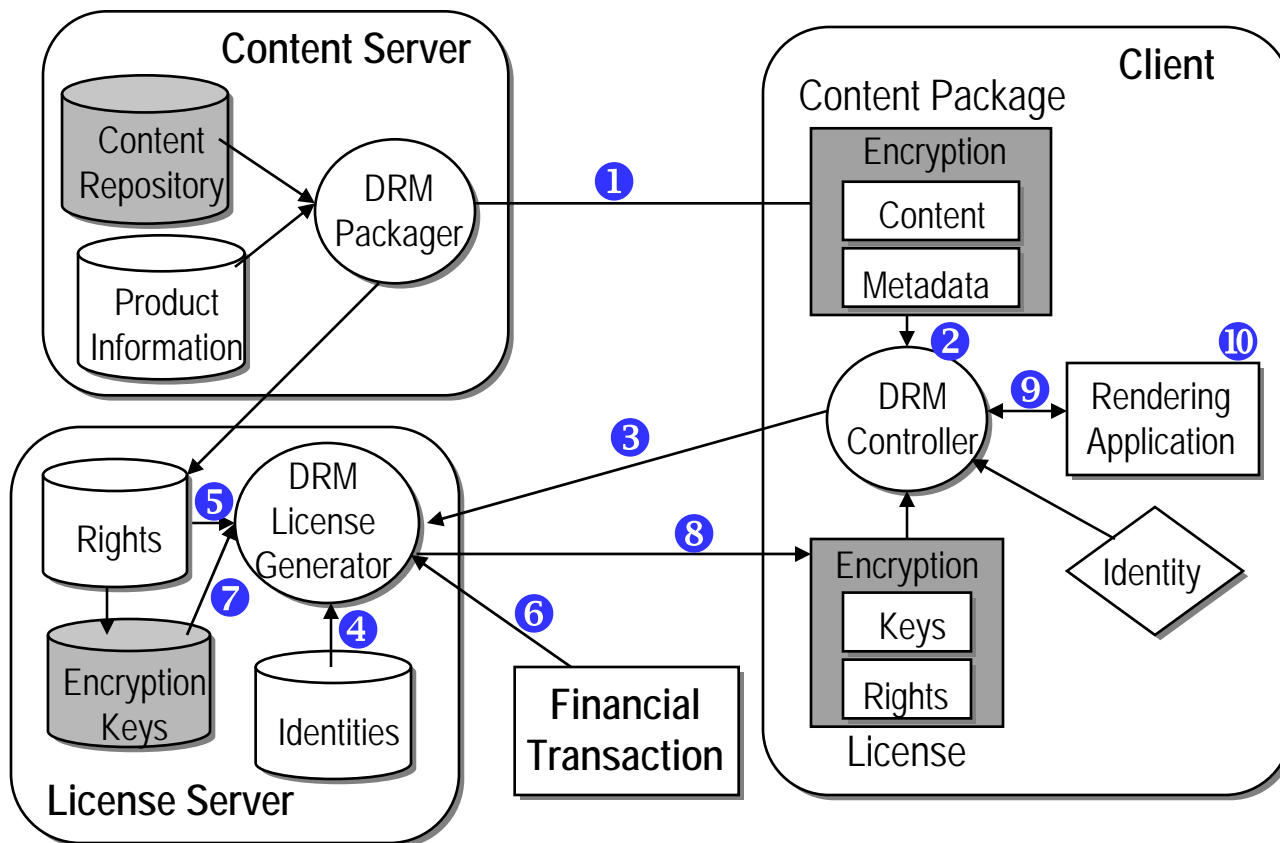
The four core entities:
Users, Content, Rights, and Conditions

Conditions specify terms, conditions, and obligations under which rights can be exercised

Rights expressions should consist of:

- **Permissions** (i.e., usages) - what we are allowed to do
- **Constraints** - restrictions on the permissions
- **Obligations** - what we have to do/provide/accept
- **Rights Holders** - who is entitled to what

A DRM Reference Architecture



Based on Rosenblatt et al., Digital Rights Management: Business and Technology (2002)

DRM as a Multi-faceted Concept

- Ubiquity of digital content
 - DRM concerns everyone
 - All stakeholders must be winners
- Factors that affect the uptake of DRM
 - Legal, regulatory, private and public policies
 - Societal questions, ethics
 - Business processes and models
 - Technology
- Laws and policies pertaining to IPR protection
 - vary widely between countries and are likely to remain different, regardless of efforts to harmonise them
 - must interoperate and be reconciled

DRM as a Multi-faceted Concept

- Societal questions
 - privacy, information access, digital divide
 - fair-use, private-use, community-use
 - cultural issues, freedom of speech
 - general use acceptance or customer's benefits from DRM
- Business processes and models
 - fine-grained usage control: fair use, private use, super-distribution, payment
 - IPR negotiation, contracting, licensing
 - usage tracking and monitoring
- Technology
 - Trust
 - providers need to establish trust and confidence in their products and services
 - consumers need to trust providers, and protect their privacy and information
 - Privacy (individuals, groups, organisations)

All Stakeholders are Winners

- Content creators/owners
 - (artists, authors) win by getting fairly paid for their efforts
- Content distributors
 - (publishers, retailers) win by getting paid to distribute content.
- Technology Providers
 - (Telecos, ISPs, DRM providers: IBM, Sony, Microsoft, InterTrust, ContentGuard, Adobe) win by getting paid for enabling distribution of content
- Manufactures
 - (soft + hardware) win by getting paid for producing end-devices (Computers, PDA, CD-Player, Mobile phones)
- Users/Consumers
 - (businesses, schools, libraries) win by getting good and authentic service at a reasonable price.
- Education and learning sector
 - **double** winner for being the major creator and consumer of IPR

How DRM Affects User Privacy

- Potential threats to user privacy occur
 - monitoring of content and rights acquisition
 - the need to update rights
 - the collection of usage data
- Provision of web services,
 - monitoring user's activity (e.g., through client side cookies, server-side logs) for post-download control.
- Distributing persistent, complete DRM metadata with digital content,
 - rights metadata is added to the collectible, information about the user
 - No effect on user privacy in the actual use of content
- Tying content to a particular device or set of devices,
 - Tracking for the purpose of tying content to a set of devices
- Tying the content to the user
 - User tracking can be much greater
 - Collectible and minable information about a user includes his complete usage pattern (e.g., listening, reading, viewing history)

Comments

- **The ability of DRM to track and monitor will lead to a need for**
 - more efficient mechanisms for the protection of personal privacy, protection that the DRM system itself must ensure
- **Although there are those who claim that this is a red herring on the basis that such privacy is protected and guaranteed by law,**
 - it should be pointed out that unscrupulous manufacturers and individuals may be technically capable of violating privacy undetected and therefore unpunished.
- **Solved by technology, legal contracts, or combination of them**
 - In DRM trust model,
 - it is not possible to separate honest and dishonest users
- **If properly designed, implemented, and used, DRM can**
 - provide user-privacy protection
 - increase trust

Conclusions: DRM Business Mascot

- DRM is Key to Offering Secure Multimedia Services

With data traffic and premium content revenues over the mobile channel forecast to rise from \$9 billion in 2003 to almost \$40 billion by 2007, DRM plays an essential role in protecting these revenues and facilitating the means to boost them through super-distribution. Players just cannot afford not to implement DRM.

[Source: Ovum, “Digital Rights Management: How to Sell and Protect Content”, 7/2003]

Does DRM help rights-holders’ gold rush into a new market?

References

- **Books**

- Digital Rights Management: Business and Technology, John Wiley & Sons, 2002, by Bill Rosenblatt et al.
- Digital Rights Management: Technological, Economic, Legal and Political aspects, LNCS 2770, Springer, 2003, by Becker et al.

- **General resources**

- Cover Pages: <http://xml.coverpages.org/drm.html>
- DRM Watch: <http://www.giantstepsmts.com/drmwatch.htm>