



eduSourceCanada

CANADIAN NETWORK
OF LEARNING OBJECT REPOSITORIES

Coping With Digital Rights Management June 12, 2003

Key Issues (1)

- How can content providers obtain a return for their investment?
 - Mechanism for search and retrieval
 - Which in turn must also be connected to some sort of payment (or credit, or co-op) system
 - And which must provide some safeguard against widespread file sharing (such as Napster...)

Key Issues (2)

- **Privacy**
 - In traditional commerce, there is little user identification, tracking
 - However, in digital rights management, this information can be collected and possibly misused
 - Legislation is beginning to come into force

Key Issues (3)

- Fair Use Rights

- Traditionally a right of fair use, for example, to quote or use excerpts
- DRM solutions, however, govern the use of all content equally
- This is a particular concern for educators, who widely employ fair use rights

Key Issues (4)

- **Freedom of Expression**
 - The Lessig argument – innovation builds on prior art
 - However, with increasing restrictions, the use of prior art is becoming prohibited
 - Special cases in the areas of parody, review

Key Issues (5)

- **Free and Open Software**
 - Many prefer to use free and open software
 - However, proposed DRM solutions frequently involve proprietary software
 - Examples: XrML, Microsoft RM Server
 - This issue includes the use of free and open educational content as well

Key Issues (6)

- **Network Neutrality**
 - A DRM solution should be network neutral
 - In other words, it should not matter whether you use Windows, OSX, Linux
 - Open standards are necessary to allow for development and innovation of new types of network, DRM solutions

Principles (1)

- **Open Marketplace**
 - There should be the least possible barriers to vendors who wish to offer content for sale
 - The network as a whole cannot entertain “exclusive distribution” of a certain provider’s work
 - Individual buyers (people or institutions) make their own choices

Principles (2)

- **Multiple Distribution Models**
 - Cash transactions are only *one* type of digital rights management
 - A proper DRM system must allow for alternatives such as co-op networks, free file exchanges, licensing and subscriptions
 - Alternative purchasing options are presented in the *same* environment

Principles (3)

- **Multiple Descriptions**
 - In some systems (eg., academic articles) there is no preview before you buy
 - Essential in an open marketplace to allow for independent reviews
 - The system must enable 3rd party descriptions of offerings for sale

Principles (4)

- **Simplicity**

- The best protection against unauthorized use is to make it easier to buy content than to steal it
- Simplicity also encourages the widest possible range of content providers to join and use the system
- Simplicity reduces vendor and purchaser costs

Principles (5)

- **Decentralization**
 - No single agent or company has sole ownership of any part of the system
 - Multiple options exist for each type of DRM service offered
 - Users (both buyers and sellers) have the freedom to exercise choice
 - Services operate in a decentralized network, like the World Wide Web

Elements (1)

- Encryption
 - Document-specific (travels with document)
 - Application-specific (and not open source?)
 - Cannot be applied across the entire network (because it involves a large overhead)
 - Probably no perfect system

Elements (2)

- **Authentication**
 - The idea: create a single login, users show their identity and are granted access rights to documents
 - Creates either bottlenecks or an untrustworthy system
 - Cannot scale globally
 - Major issues with privacy

Elements (3)

- **Credentials**
 - Like a password or a key
 - Credentials are issued when the payment is made and may be good under certain conditions, time
 - Issue of counterfeit credentials
 - Issue of credential management (how often do people forget passwords?)

Elements (4)

- **A multi-layered system:**
 - **Credentials – applied to whole network**
 - **Authentication – can be applied in subnets, but external to eduSource DRM**
 - **Encryption – embedded in documents, application-specific, but can be transported through eduSource DRM**

Elements (5)

- What we are bulding:
 - The management of digital rights *only*
 - That is, we are building a credentialing system
 - The best system for the widest range of content
 - This does not *preclude* authentication or encryption

Rights Expression (1)

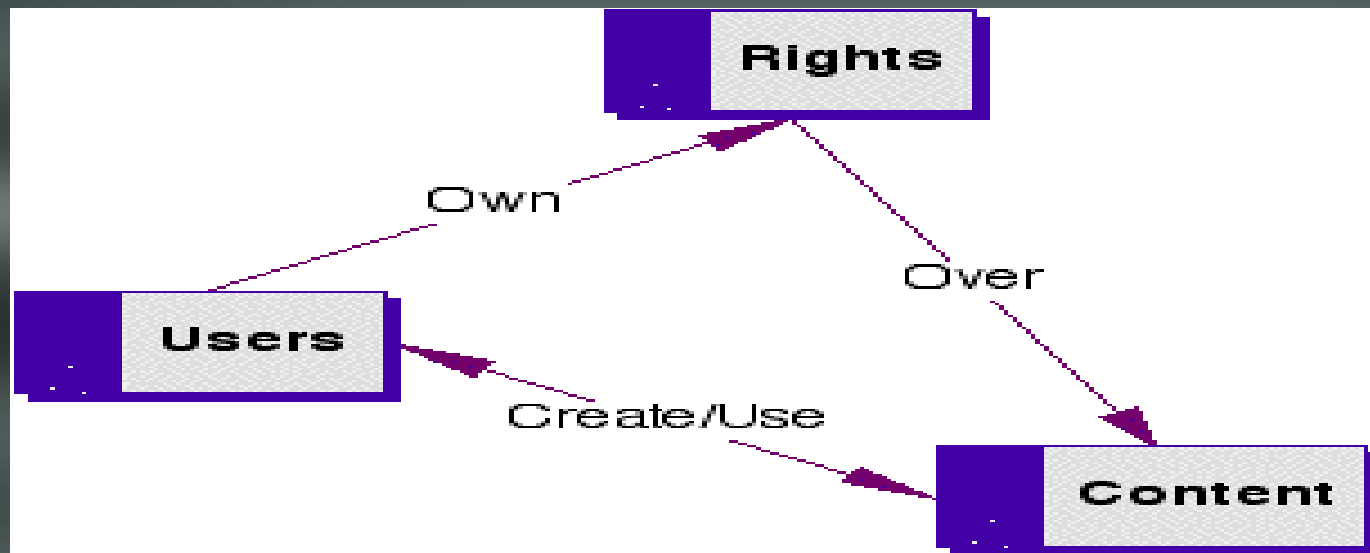
- **Credentials and Expression**
 - In a credentialing system, producers define the conditions of access (for example, payment, etc.)
 - These conditions are presented to the user, who accepts or rejects them
 - Upon satisfaction of the condition, the credential is passed to the user

Rights Expression (2)

- Rights are expressed in XML – naturally, there are two major schemes
 - XrML – owned by ContentGuard – the use of XrML may involve royalties or licensing
 - ODRL – royalty free – however – may still be a royalty issue
 - LTSC-DREL – project to select a language for education

Rights Expression (3)

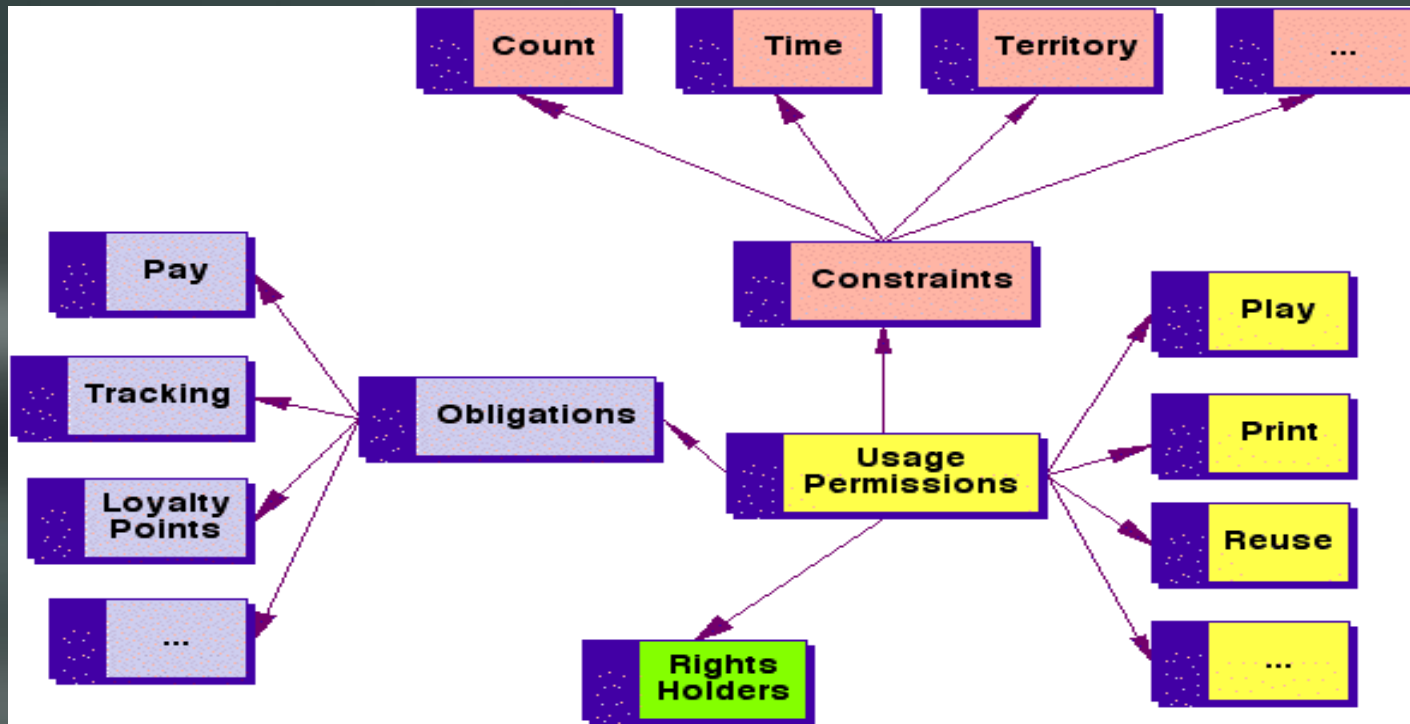
- Rights Expression a description of relations between entities...



<http://www.dlib.org/dlib/june01/iannella/06iannella.html>

Rights Expression (4)

- Dimensions of Rights Expression



<http://www.dlib.org/dlib/june01/iannella/06iannella.html>

Transactions (1)

- **Key Considerations**
 - Control over the presentation of options – the use of rights expression as a search criterion
 - Trust in the payment mechanism
 - Ease of making payment – single point of transaction, aggregated payments or licensing

Transactions (2)

- **Mechanisms – The Purchaser Broker – a “one stop” for purchasers, but choice and control**
 - Determine whether a payment or other condition is required
 - Accepts user decision as to whether to approve the payment or condition
 - Makes the payment via payment agency
 - Obtains credential to access the resource

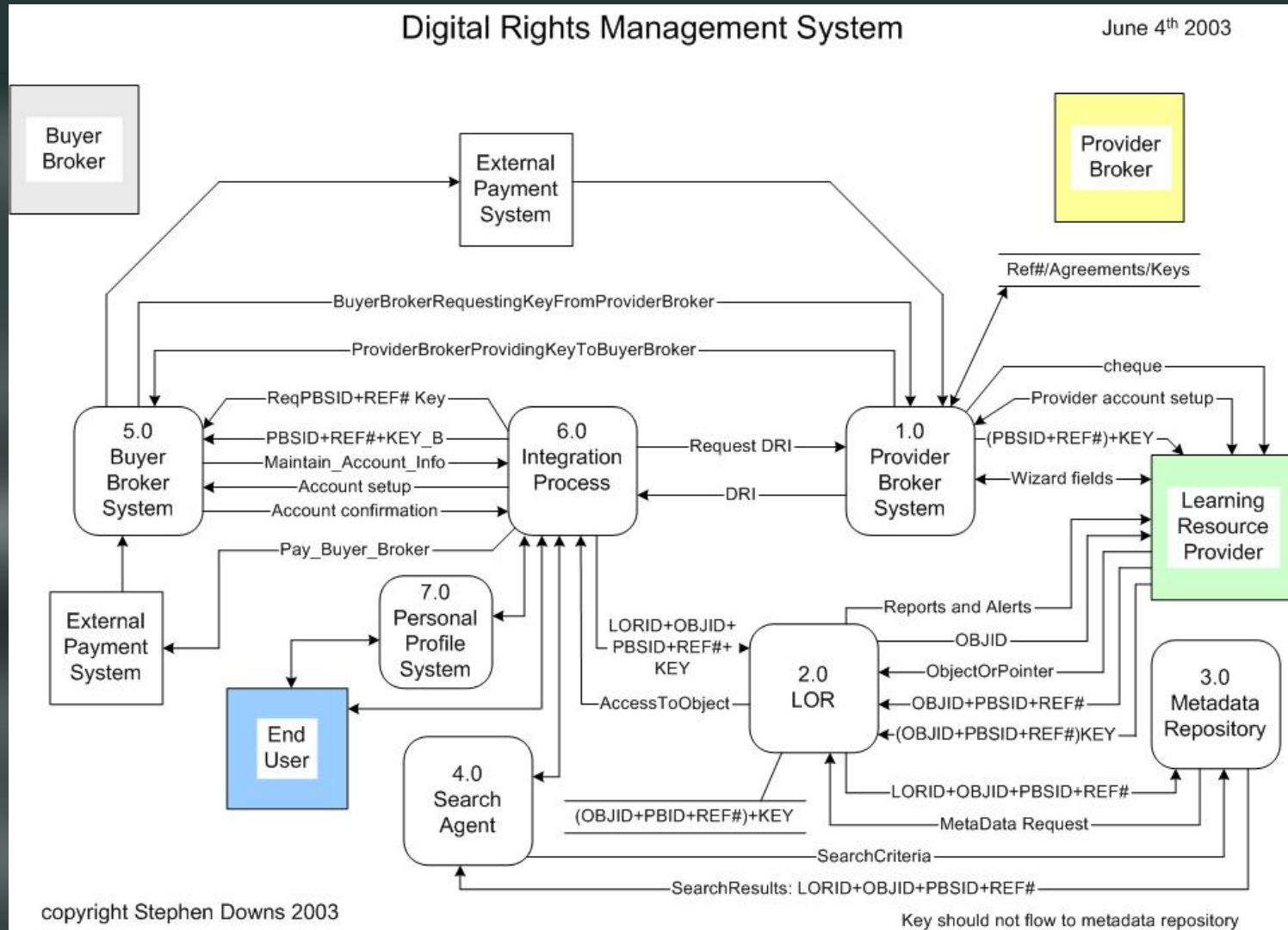
Transactions (3)

- **Mechanisms – The Vendor Broker**
 - **Helps vendor describe conditions**
 - **Tells user whether payment, other conditions, are required**
 - **Receives payment from the Purchaser Broker**
 - **Sends credentials to access the Resource**

eduSource DRM Model (1)

- **The Four Major Entities:**
 - The vendor or publisher, who owns the content
 - The Vendor Broker, who sells the content
 - The purchaser broker, who makes purchases on behalf of the user
 - The user, who obtains and uses the content

eduSource DRM Model (2)



Other Issues (1)

- **Search and Retrieval**
 - Will use the eduSource Network to locate objects
 - DRM information included in the LO metadata
 - Two parts: Broker / Rights Model
 - DRM metadata can be used to filter search

Other Issues (2)

- **Digital Object Identification**
 - Required to enable caching, tracking of objects
 - Specifications available, e.g., DOI
 - DOI network similar to the DNS network for domain names
 - Two parts: registrar / unique identifier

Other Issues (3)

- Personal Profiles

- Submission of name, email (with permission) often a condition of access
- Personal information managed by the Purchaser Broker
- All transactions in personal profile are explicit and with consumer participation
- See <http://crypto.stanford.edu/DRM2002/KorbaKennyDRM20021.pdf>

Thank You

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