

Digital Rights Management for Digital Broadcast

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Outline

- ① *DRM Concepts*
- ① *Current State of Digital Markets*
- ① *A DRM Model*
- ① *DRM in Digital Broadcasting*
- ① *Requirements for Broadcasting DRM*
- ① *Conclusions*

DRM Concepts

◎ *Digital Assets*

- *Any contents, resources and services in digital domain*
- *Examples: audio, video, text, image, software, service.*

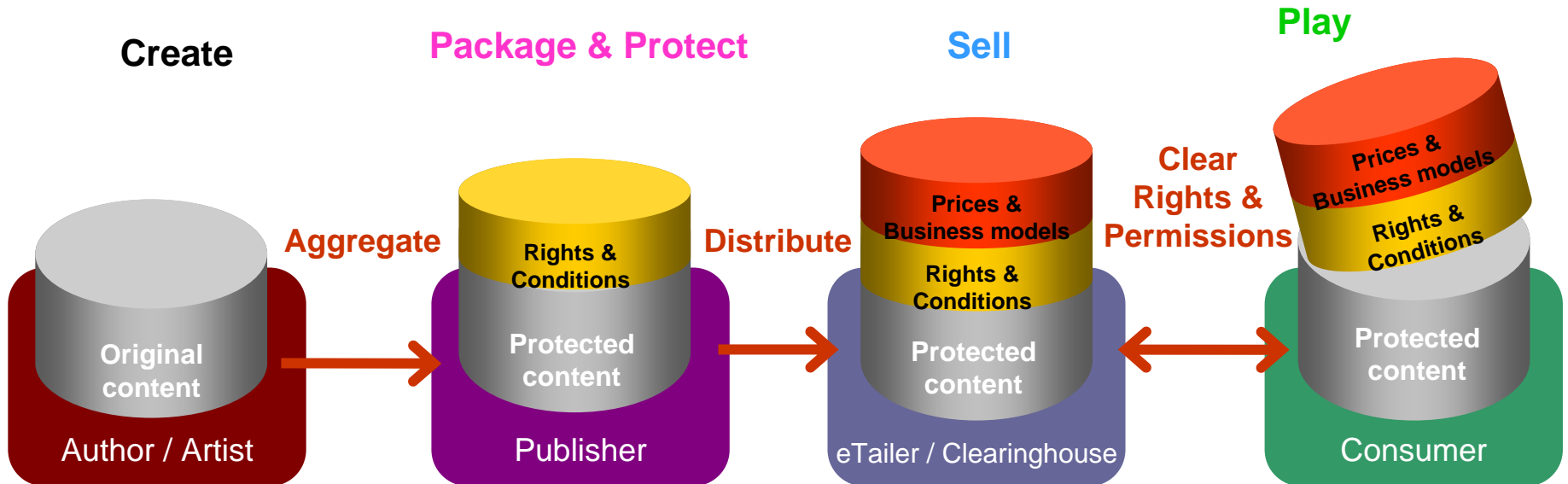
◎ *Digital Rights*

- *Privileges for creating, distributing, using and managing digital assets*
- *Examples of usage rights: play, print, copy, adapt, transfer*
- *Examples of meta rights: issue, obtain, revoke.*

◎ *Digital Rights Management (DRM)*

- *A unified approach to specifying, interpreting, enforcing and managing digital rights throughout the entire life cycle of the **assets*** 统筹方式来说明，解释，监督和管理在资源的整个生命周期中的数字权益

Digital Supply Chain



Technologies:



Purposes of DRM

- ⊙ *Not just to prevent illegal accessing and sharing digital assets on open and closed platforms*
- ⊙ *But, more importantly, enable to access more, high quality assets in more convenient fashions*
- ⊙ *And, at the same time, support more flexible business models to create more digital markets for creating, distributing and consuming digital assets*

Current State of Digital Markets

- ◎ *Still forming, with early experimentation and confusion*
 - *DRM confused with content security*
 - *Narrow focus on combating piracy*
 - *Early limited applications & services*
 - *Music Industry moving into next stage: experiment with new but limited models*
 - *Mobile industry engaging*
- ◎ *Inability to support content across multiple platforms, formats or media types*
- ◎ *Interoperable standards not yet deployed*

Governance verse Protection

- ⊙ *All Rights ⇒ All Entities*
 - *No governance, no protection*

- ⊙ *All Rights ⇒ Some Entities*
 - *Protection for those entities (e.g., encryption with their keys)*

- ⊙ *Some Rights ⇒ All Entities*
 - *Governance with those rights*

- ⊙ *Some Rights ⇒ Some Entities*
 - *Protection for those entities*
 - *Governance with those rights*

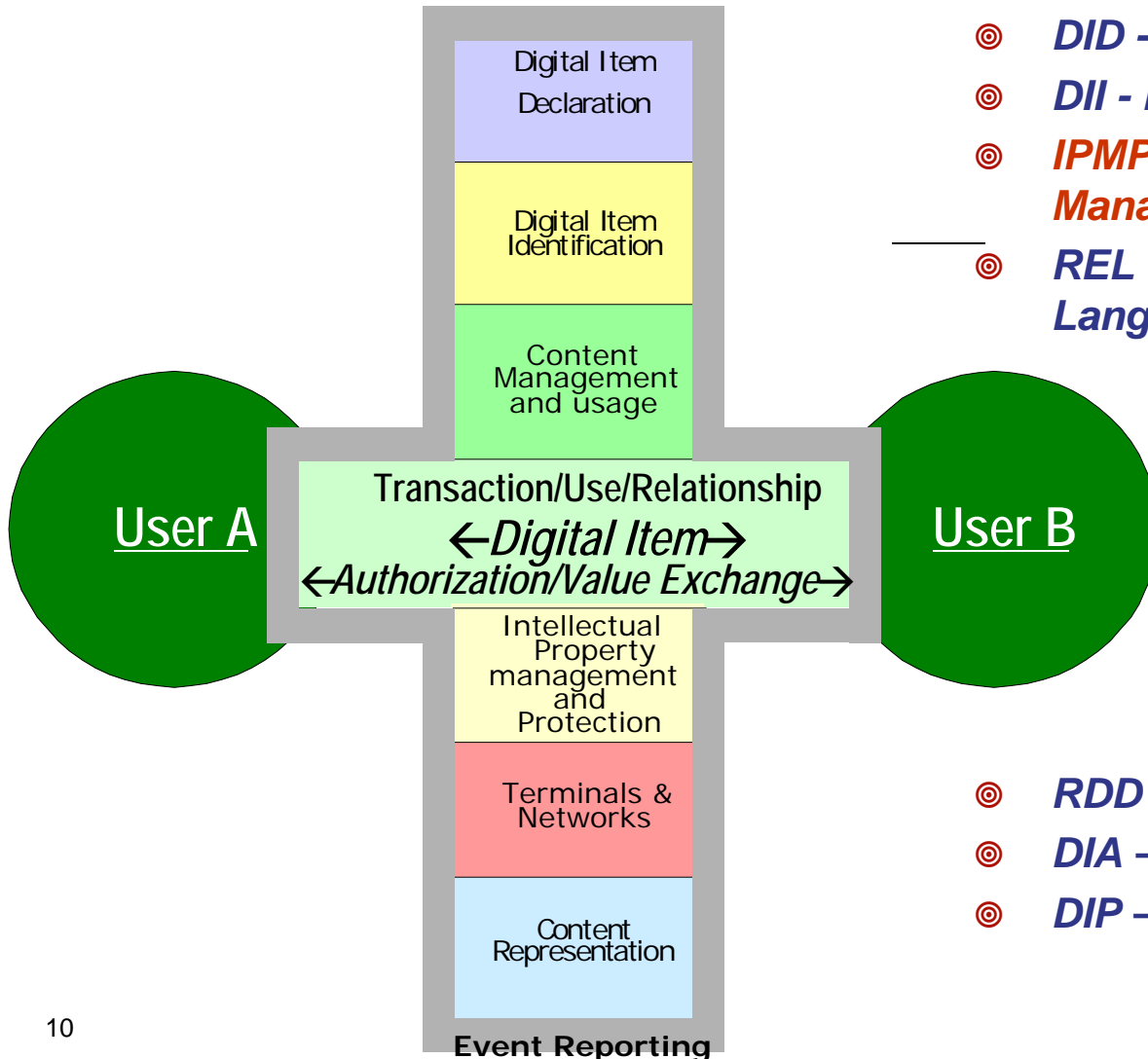
Chances and Challenges

- ◎ *Digital market is out there, when business models make sense*
 - *Apple's iTunes music store: >250M downloads since April, with 99¢ per song*
 - *Microsoft, Sony and Walmart will enter the market starting next year.*
 - *\$80M digital music market will hit \$1.6B in 2008.*
 - *What about video market?*
- ◎ *User experience and consumer device interoperability*
 - *Current digital music stores use different DRM methods to protect songs against unlimited copying. But consumers can then only play the music on devices (computers, CD and MP3 players) which support the same DRM system.*

Sample DRM Products/Services

	Media and Entertainment	Mobile	Enterprise
DRM Technology Providers	Microsoft [WMDRM] Apple [Fairplay] Real [Helix] Sony [Open MG] Macrovision IBM [Digital Media Factory]	Nokia NEC OpenWave SDC CoreMedia BeepScience DMDSecure UCP Morgen	Microsoft [RMS] Adobe [Policy Server] IBM Authentica Sealed Media Liquid Machines
Service Providers	LoudEye MusicNet Apple [iTunes] Real [Rhapsody] MovieLink	O2 Vodafone T-Mobile Orange Now3 StreamMan CMLA End2End UCP Morgen	OverDrive GigaTrust

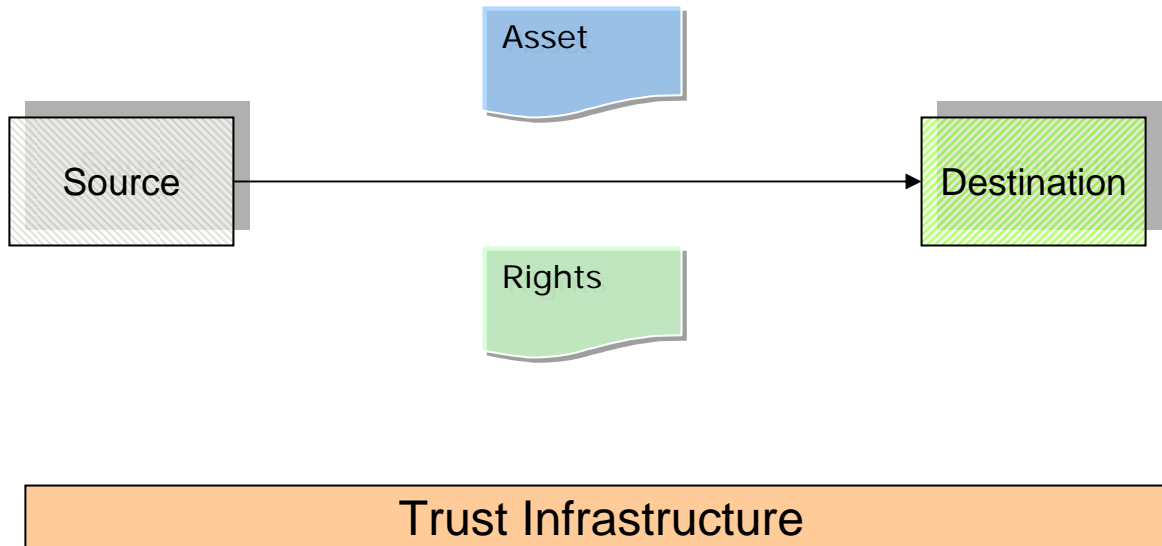
MPEG-21 Framework



- ⊙ **DID - Digital Item Declaration**
- ⊙ **DII - Digital Item Identification**
- ⊙ **IPMP - Intellectual Property Management and Protection**
- ⊙ **REL - Rights Expression Language**

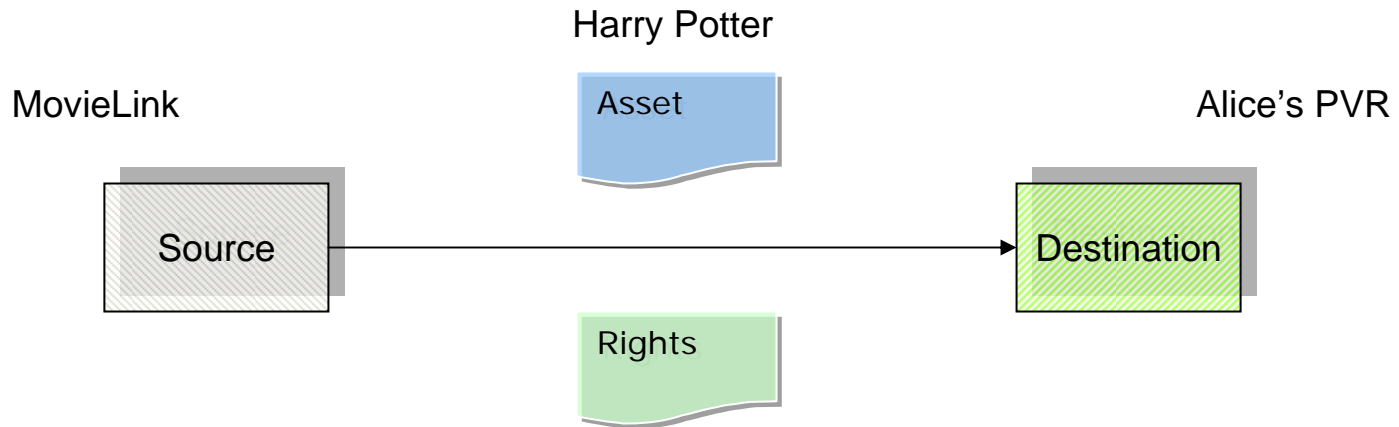
- ⊙ **RDD - Rights Data Dictionary**
- ⊙ **DIA – Digital Item Adaptation**
- ⊙ **DIP – Digital Item Processing**

A Primitive DRM Model



The primitive model can be used as building blocks to compose compound ones.

Current Distribution Case

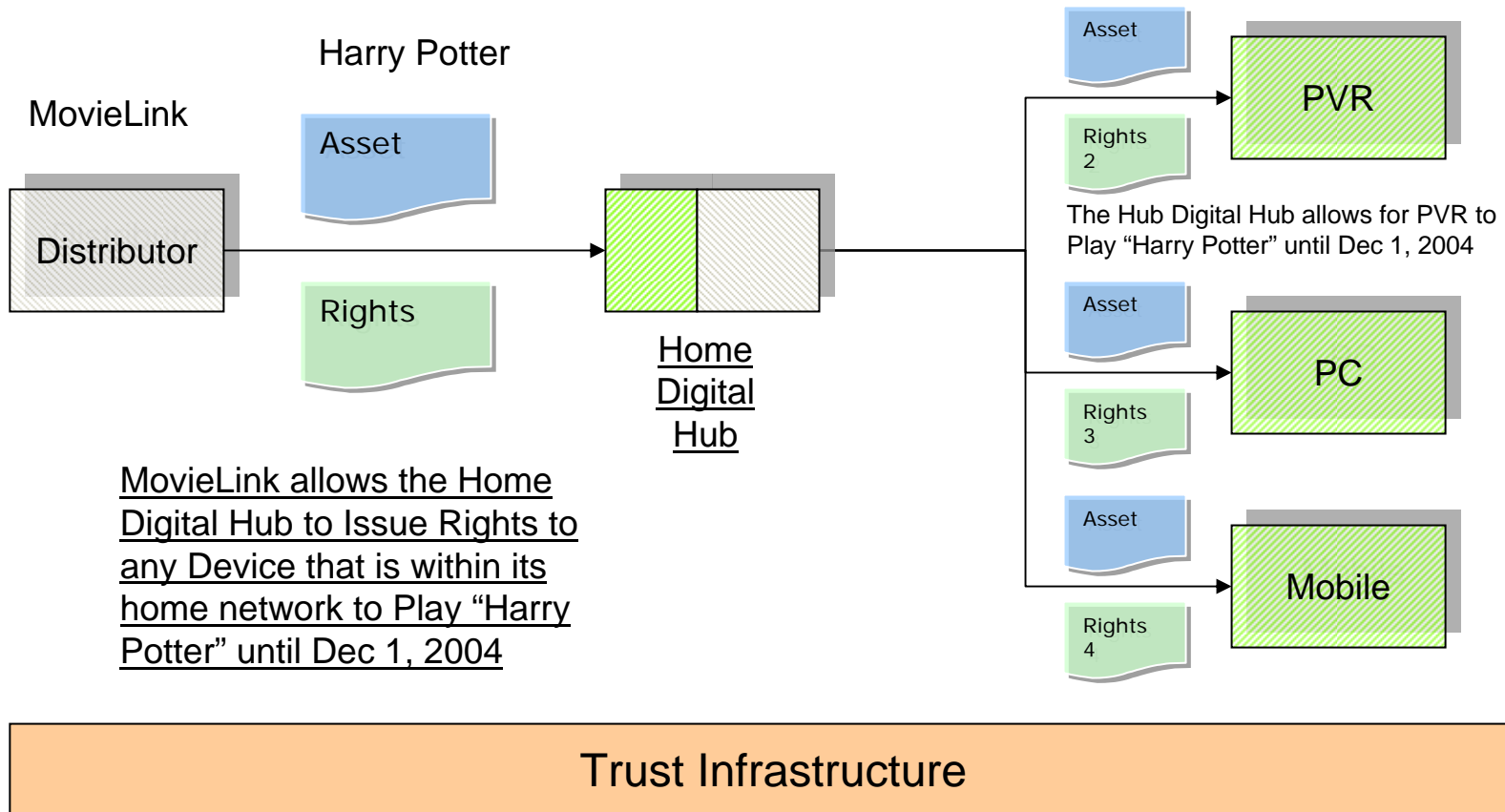


MovieLink allows for Alice's PVR to play "Harry Potter" until Dec 1, 2004.

Trust Infrastructure

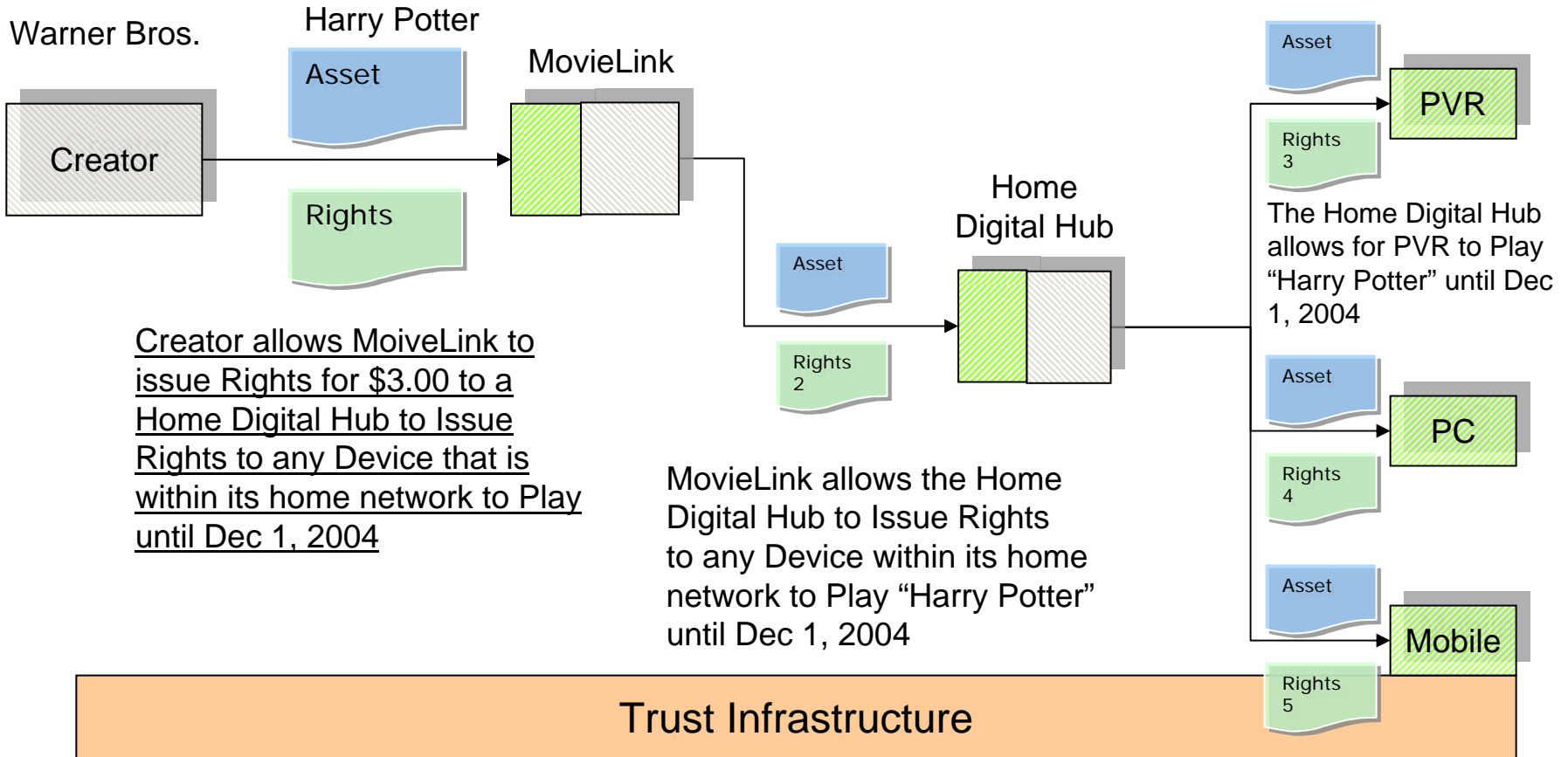
- MovieLink is an authorized distributor for "Harry Potter", and
- PVR is a compliant device.

Home Digital Hub Case



- MovieLink is an authorized distributor for "Harry Potter",
- PVR is a compliant device, and
- Home Digital Hub is a compliant media center.

Digital Supply Chain Case



Creator allows MovieLink to issue Rights for \$3.00 to a Home Digital Hub to Issue Rights to any Device that is within its home network to Play until Dec 1, 2004

MovieLink allows the Home Digital Hub to Issue Rights to any Device within its home network to Play "Harry Potter" until Dec 1, 2004

- Creator is a well-known movie studio,
- MovieLink is an authorized distributor for "Harry Potter",
- PVR is a compliant device, and
- Home Digital Hub is a compliant media center.

DRM in Broadcasting

- ◎ *Currently dominated by conditional access systems (CAS)*
 - *Customer is given a “designated” box by the service provider, and that box works with only that provider’s network*
 - *Customer buys an “open” box, and gets a smart card access from the service provider*
- ◎ *Most CAS for broadcast applications are proprietary*
- ◎ *Very simple business model*
 - *Once granted with access, you have all rights provided by the CAS*
- ◎ *Some broadcast standardization bodies (e.g., DVB) are working towards DRM systems beyond the capabilities of CAS.*

Trends in TV Broadcasting

- ◎ *Customers want to watch what they want when they want from a virtually unlimited and interactive content selection*
 - *Watching time shift by recording content*
 - *at either a central portal or local terminal*
 - *More delivery channels*
 - *wire, wireless*
 - *ground (cable) and air (satellite)*
 - *Receiving terminals*
 - *Static TV, set-top-box, PVR and PC*
 - *Mobile phones, PDAs*
 - *Record and share*
 - *With devices within a home domain*
 - *With friends across different domains*
 - *Understand what rights available*
 - *Knowing what are and are not allowed to do*
 - *Make right choice*

Requirements for Broadcasting DRM

- ⊙ *Provide persistent protection and governance throughout content life-cycle, especially post-broadcasting*
 - *Protection with security*
 - *Governance with rights*
- ⊙ *Support flexible business models*
 - *Super-distribution, rental, lending, transfer, etc.*
- ⊙ *Provide friendly user experience*
- ⊙ *Ensure interoperability of rights and trust management*
 - *across different platforms, formats and media types*
- ⊙ *Renewability*

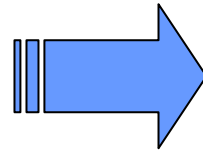
The Need for Interoperability

- ⊙ ***Rightsholders want their content rendered on all platforms***
 - *But the digital distribution market is fragmented with varying needs for security and protection*
 - *Many distributors, many geographies*
- ⊙ ***Tech vendors want all content to run on their platforms***
 - *But vendors rely on rendering environment lock-in to build/retain market shares*
- ⊙ ***Service providers want to serve users with content and platform of their choice***
 - *But providers distribute content and adopt DRM platforms based on business relationship with rightsholders and tech vendors*
- ⊙ ***Users want the content of their choice to be rendered on the platform of their choice***
 - *But users do own different types of devices*

Evolution of DRM Marketplace

Past

- ⊙ *Proprietary DRM*
- ⊙ *Combat piracy (defensive)*



Future

- ⊙ *Interoperable DRM*
- ⊙ *New business models (offensive)*

Future of DRM-Enabled Digital Media

- ① *Content owners decide what, when, where and how their contents to be released*
- ② *Consumers decide what, when and where to watch*
- ③ *CE vendors manufacture devices with good user interface and features*
- ④ *Service providers provide digital media infrastructure services like telephone, water and electricity*



Conclusions

- ⊙ *Content of value will move to many connected and disconnected devices*
- ⊙ *Still “Early Days” for DRM; new business models just emerging*
- ⊙ *Persistent protection with security and governance with rights throughout content life-cycle are critical*
- ⊙ *Rights and trust management to enable flexible business models*
- ⊙ *Standards and Interoperability are necessary to fulfill the vision of Digital Content Distribution*
 - *within domains (e.g. mobile)*
 - *across domains (e.g. within the home)*

Thank You 谢谢大家

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Backup Slides

About ContentGuard, Inc.

ContentGuard

- ◎ *Launched in April 2000*
- ◎ *Time Warner, Microsoft, and Xerox investors*
- ◎ *A decade of patented Xerox PARC research*
- ◎ *Developer of XrML - the basis for ISO MPEG-REL and other standards*
- ◎ *Headquartered in Bethesda, MD; Engineering Operations in El Segundo, CA*
- ◎ *Business Areas*
 - *Digital Rights Management Standards*
 - *IP Licensing*
 - *Software tools*

ContentGuard Key Partners & Customers



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