

A dynamic splash of water with many bubbles and droplets, set against a dark background. The water is captured in mid-air, creating a sense of movement and energy.

Service and Content Protection in the field of digital video broadcast for handhelds (DVB-H)

Design decisions and external impacts of a
commercial product

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Intern. Virtual Goods and ODRL workshop , Koblenz, 11th October 2007

Who am I?

- Last 2,5 years: Technical Lead for o2-Music, Senior Specialist in the field of „Service and Content Protection / DRM “at o2 Germany
- Co-Leading (together with Renato Iannella) the open source initiative of the rights expression language ODRL (Open Digital Rights Language) which has been adopted by the Open Mobile Alliance (OMA).
- Promotion in the field of Digital Rights Management (DRM) in 2004.
- Various publications on DRM topics in books and conference proceedings.
- Published book „Interoperability of DRM systems“, 2006

Agenda

- Do we still need DRM?
- What is the best technology?
- Criteria for ,the right‘ DRM system.
- Dimensions of DRM technology.
- Choosing the ,right‘ technology for DVB-H?
- Conclusion
- Open Discussion / Questions



Do we still need DRM?



In many fields content owners require the protection or traceability of their digital goods.

There is no legal content platform without DRM... a lot of them use **service and content protection (SCP)** means!

– It's everywhere!



O₂ Games



O₂ Ring tones



O₂ Videos

What is the best Service and Content Protection technology?

OMA DRM, Marlin, Digital Media Platform, FairPlay, MediaFLO (to be continued)
or Windows Media DRM?

The right answer is:

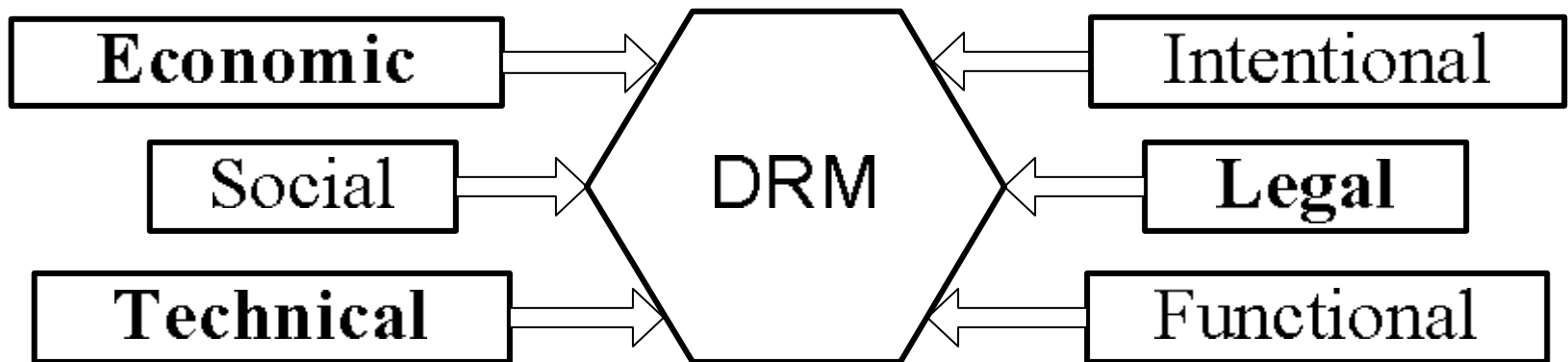
.... it depends!

Criteria for 'the right' SCP technology

- The planned business model (Subscription, Pay Per View).
- The target group that you want to reach.
- The content type that you want to distribute (games, music, tv).
- The consuming device you are delivering to (PC or mobile phone?).
- Legal directives and their requirements.
- Market availability of technology (SIMs, devices, network, etc.).
- Required level of security.
- Intellectual Property Rights/Liability risk.
- Desired control (→ customer retention)
- etc.

Dimensions of DRM

The DRM 6-Pack



Source: S. Guth, "Interoperability of DRM Systems", Peter Lang Verlag, 2006.

An example:

The 'right' Service and Content Protection technology for DVB-H

- *DVB-H is digital television via terrestrial broadcasting, optimized for mobile, low-power consuming handhelds.*
- *Commercial offer in Germany is planned for 2008*
- *In most countries consortia including MNOs, platform vendors, and investors are constituted to build service and network (in Germany: T-Mobile, Vodafone, o2)*



Relevant DRM Technology in the field of DVB-H



CBMS* – IP Datacast Specification:

- Open Security Framework (Conditional Access Systems like Nagra, Irdeto, etc.) mostly proprietary technology.
- 18 crypt (based on OMA DRM 2.0 with broadcast extensions)

OMA (Open Mobile Alliance) BCAST Standard:

- DRM Profile (based on OMA DRM 2.0)
- Smart Card Profile (based on Multimedia Broadcast Multicast Service (MBMS) and Generic Bootstrapping Architecture (GBA), 3GPP Release 6)

MediaFlow

- Proprietary solution by Qualcomm

*Convergence of Broadcast and Mobile Services

Economical impact



Costs:

- Can the costs of the technology be covered by the business case?
- What DRM technology is the cheapest (e.g. Smart Card profile requires MNO Core Network components and the development of new SIMs cause high costs).

Economical Power:

- What power does the operator have in a joint consortium with two „big“ competitors to chose his desired technology?
- Do the handset and SIM vendors develop products for the desired DRM technology of the operator?

Contractual requirements

- Labels/Broadcast channels request certain security levels in the contracts.

Economical impact (cont.)

IPR indemnity

- Proposed technology may not cause large IPR risk (e.g. proprietary solutions often offer IPR indemnity, open standards and their implementers don't)
- Due to unclear patent claims the market is still unsettled (18crypt and DRM profile base on OMA DRM 2.0, IPR situation of smart card profile is totally open!)

Liability

- Companies need the possibility to hedge against liability costs, i.e. against the liability if the security system gets hacked. (proprietary solutions often offer 100% liability, open standards and their implementers don't)

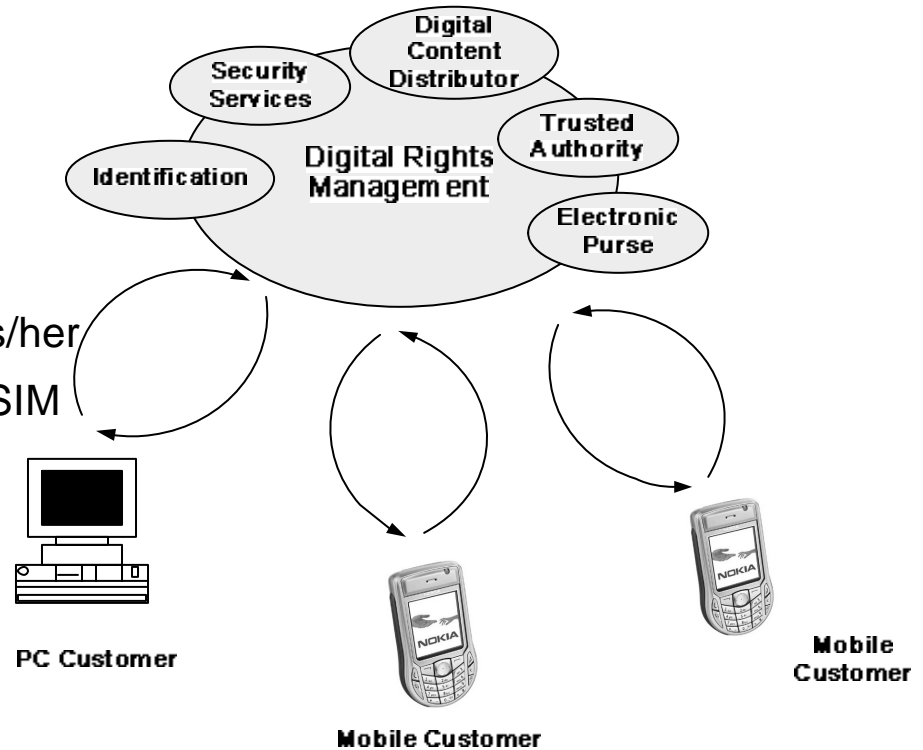
Time To Market

- ***When is the DRM solution available?*** Very critical if the launch date is fixed, e.g. European Soccer Cup 2008. However, according to SIM and device vendors first BCAST implementations are available in Q3 2008.

Economical impact (cont.)

Customer Retention:

- DRM technologies offer a new form of „customer retention“. The customer is bound to the partner that manages his/her content rights → rights are stored on SIM → lowers „churn risk“.
- Who owns the „root of trust“?



Legal / regulatory impact

Competition Law:

3 MNOs in Germany are planning to found a consortium for building the DVB-H network: This has been granted by the German's antitrust division with certain rules, e.g.:

- „The service must support TV devices, that do not require a mobile phone contract“

Media regulation:

Only one applicant receives the Media Licence of the „Landesmedienanstalten“ (LMA) to broadcast media on the DVB-H frequencies. The licensee is bound to the LMA' regulations, e.g. :

- „Implemented technology has to be based on open standards“.
- „The service must be launched by Mid 2008 ...“

Frequency regulation:

Only one applicant receives the DVB-H frequency licences of the German „Bundesnetzagentur“. The licensee is again bound to regulations.

Broadcasting law: Public channels (ARD, ZDF) require to be broadcasted „clear to air“!

Technical impact

(Mobile) Devices and SIM cards:

- Is the solution on the roadmap of handset/SIM vendors? (→ **time to market** impact)
- Is there (secure) enough ROM / RAM available to support the solution? The smart card solution requires approx. 64 KB of memory on the SIM card to store keys, but o2s SIMs only have 64 KB in total.
- The mobile world is strongly relying on standards because of the required interoperability with various different devices and their software / OS.

Synergies:

- Which technologies can be used as a basis for other / future services? E.g. MBMS, authentication in WLANs, etc.

Dependencies:

- How dependent is the operator of a single vendor with regard to:
 - technology „lock in“? (high risk with proprietary solution provider)
 - bug fixing? (high risk with implementing standard solutions).

Functional

Business requirements

- Does the technology meet all business requirements, i.e. can all use cases and pricing models be implemented, e.g. subscription, Pay Per View, Pay per time, etc.
- Are all content types supported of the technology (games, music, video, DVB-H broadcast, MBMS, maps, ring tones, images, etc.)
- Can I reach the right customer? E.g. Windows Mobile -, Symbian -, Linux -, Mac users, etc.
- How flexible is the operator to develop the technology further (standard dependencies) and diversify its product?

Mobile operator specific requirements

- Will „Multicard“ be supported?
- Does the technology require high battery power?
- Is the customer service able to react on user problems?

Social impact

Customer impact:

- Customers expect public TV to be clear to air!
- Customers expect public TV to be free of charge.
- Customers do not understand the difference between streaming and DVB-H („It's ALL moving image!“)

Operator impact:

- Public information (e.g. press releases) from large companies (Nokia, Microsoft, etc.) or organisations such as the Global System for Mobile Communications Association (GSMA) can give an impulse PRO or AGAINST certain technologies.

Intentional impact


Overall goal

- Image win, service improvement, etc.
- Market leader or „me too“ service?

Conclusion

- The **right technology** depends on the product specific DRM dimensions and requirements (DRM 6-pack), here: OMA BCAST Smart Card Profile!
- In general, service and content protection means can only be successful if they are accepted by the customer, born with the digital product, and offer all desired convenience to the customer (e.g. device interoperability).
- The right SCP solution for a commercial service is the one that satisfies the most important business needs of the investor. In the case of DVB-H in Germany, that is the interests of the operators:
 1. Operator control (SIM involvement)
 2. Total costs
 3. Time to market
- Due to the above reasons a SCP solution might be preferred, although it's not the best, interoperable, future proof, scalable, flexible,.... technical solution.





Thank you for your attention.

Questions?

References:

<http://www.dvb-h.org/>

<http://www.openmobilealliance.org/>

<http://odrl.net/>

<http://www.o2online.de/>

BACKUP



Excursion: Pricing Models for DVB-H and their implementation

Pricing Models:

- Monthly, daily, etc. subscription
- Pay per view (i.e. the customer consumes one program (German: Sendung))
- Pay per time (the customer pays for the time s/he actually consumed, e.g. 3 hours)
- Pay per episode (the customer pays for one season, e.g. „Sex in the city“)
- Previews (trial periods)
- Content may be viewed and recorded, etc.

Implementation: With the OMA BCAST Smart Card Profile the purchased product is separated from the actually delivered access rights:

- ***All pricing models have to be mapped to keys that have a certain validity period for a certain channel.***
- Access keys can only be calculated one week in advance.
- Drawbacks of this mechanism: rights expression is complex, causes high GPRS traffic, expressiveness is poor, no other restrictions than time available (no count, purpose, etc. restrictions), causes all enforcement logic to be on the platform.

About ODRL

- ODRL is an open and free to use rights expression language developed by the international ODRL Initiative in the spirit of the „open source“ community
- Standards adoption:
 - Formal Open Mobile Alliance (OMA) DRM spec
 - Published as W3C Note
 - Submitted to NISO (US)
- Latest version is 1.1 – The development of 2.0 is ongoing.
- ODRL is available @ <http://www.odrl.net>

Market today

- DRM market is highly competitive.
- Different trends can be seen depending on content and rendering device.
- Proprietary solutions are very important in the commercial world, as they can provide liability, IPR indemnification, and sometimes a short time to market.
- Proprietary technology is currently preferred in the „PC world“ (WM DRM, FairPlay) and is getting stronger in the „mobile world“. However, the mobile world is strongly relying on standards (interoperability).

Market forces

The business needs lead the DRM technology development (handset and SIM manufacturers follow).

Due to costs/time to market, a DRM system might be preferred, although it's not the best technical solution (the benefits of open standards are often not seen by business owners.)

Public information (e.g. press releases) from large companies (Nokia, Microsoft, etc.) or organisations (GSMA) can give an impulse pro or against certain technologies.

Regulation can make a predecision.

Content Providers require a certain technology.

Lessons Learned from the Music Market

- Standardised, interoperable solutions were not available, when the market needed them!
- People expect to use the content in the known manner and for similar costs!

Open Discussion:

Music Market ←vs.→ Mobile TV Market