

## Initiatives, Forums, And Associations

In this section, we describe some of the initiatives, forums, and working groups developing standard solutions for DRM for audio and video content. This section can be considered as background information for DRM.

### SDMI

Secure Digital Music Initiative (SDMI), founded in February 1999, is a forum of worldwide record industry, consumer electronics and information technology to discuss and develop specifications for DRM solutions. It was not founded to produce a single format or solution for the secure distribution of digital content, but as a forum for discussing and developing voluntary, open specifications for secure music and other secured online content. For example, the SDMI forum has specified the following criteria for secure online content:

- Must be encrypted
- Must be authorized for distribution by the content owner or usage rules
- Must have rules embedded, associated or attached
- May be watermarked and traceable back to a unique distributor
- May be accompanied by a non-encrypted header

SDMI published a specification for portable devices and in SDMI's roadmap screening technologies were divided in two phases in order to expedite the time to market of SDMI compliant components. Phase 1 compatible portable devices and PC software to transfer files to these. Phase 1 compatible software installed on a user's PC, would be capable to auto-update to new Phase 2 technology. SDMI continued to work on the selection of Phase 2 technologies.

DRM technology providers like IBM, Microsoft, InterTrust, Macrovision and Real Networks are all members of the SDMI forum and support its specifications.

### Associations for Secure Memory Cards

There are several types of memory cards available with different security features. Currently, there are five major technologies in the market: CompactFlash, SmartMedia, MultiMediaCard, MemoryStick, and SecureDigital.

Usually the usage rules allow the transfer of songs to the memory card of a portable music player. Special copyright technologies must be used in order to prevent illegal copying of the content from a memory card to another. When content is transferred from a PC with an SDMI compliant player such as RealJukebox, Windows Media Player or MusicMatch, the content license key is encrypted with the unique key of the media card. The content can only be played with that unique card. More sophisticated encryption schemes compared to a simple unique key have also been introduced.

SmartMedia and CompactFlash have established a large market share for themselves as early starters. SmartMedia was the first memory card with unique ID support. CompactFlash Association (the consortium that controls the technology) announced the adoption of 4C Entity's Content Protection for Recordable Media (CPRM) encryption method. The 4C entity consists of Intel, Toshiba, IBM and Matsushita and it has established standards for Content Protection for Pre-recorded Media (CPPM) like the encryption used in DVD's. The new standard, called Secure CompactFlash, is entirely backward compatible and transparent to the user. A drawback for CompactFlash is that it is considered to be too large in size for mobile phones and portable music players.

Sony was first to market their solution called MagicGate. It is an enhancement to the MemoryStick format and makes no changes to the external design. However, each MagicGate MemoryStick has a unique ID and encrypted recognition technology to determine if the host device is MagicGate compliant. MagicGate also relies on Sony's OpenMG copy protection software platform to prevent unlicensed file duplication. OpenMG is free to developers, but MagicGate technology is not. Some of Sony audio products, featuring the OpenMG and MagicGate copyright management technologies play music content secured with IBM EMMS.

SmartMedia and MultiMediaCard have a rudimentary ID function, but no advanced security features, which is a setback as security is becoming paramount. SanDisk, the company behind it, teamed up with Matsushita and Toshiba and created the SecureDigital card. SD is compliant with both SDMI and CPRM and is license-free. The complete specification is available to any developer who pays entrance fee to join the SD Card Association. The CPRM format creates encryption using a series of keys spread over three categories: device, media, and content. Device keys are issued by the 4C Entity to a specific manufacturer for inclusion in each of the vendor's devices, which is a similar technique to the MagicGate approach.

## **MPEG**

MPEG (Moving Picture Experts Group) addressed a markup-based machine-readable rights expression language to govern intellectual property and digital rights. MPEG has produced three important standards (MPEG-1, MPEG-2 and MPEG-4) and is working on MPEG-7 and MPEG-21. Extension work is ongoing on the Intellectual Property Management and Protection (IPMP) specification for MPEG-4, with the goal to enhance interoperability in the consumption of protected content. The multimedia framework MPEG-21 standard is in the initial development phase. MPEG has identified the need for a rights expression language and a rights data dictionary in the context of three of its standards:

- MPEG-4, for the IPMP extension
- MPEG-7, to describe, as a part of content descriptions, the conditions to access content
- MPEG-21, to achieve the goal of expressing rights for all creators, producers, distributors and rights holders of MPEG-21's so-called digital items

### **eXtensive Media Commerce Language (XMCL) initiative**

eXtensible Media Commerce Language (XMCL) is an open XML-based language designed to establish industry-wide standards for Internet media commerce. XMCL aims at establishing interoperability between proprietary DRM systems by standardizing the rules for how content can be played in a way that's independent of codecs, digital DRM systems, and e-commerce systems.

Companies like RealNetworks, America Online, MusicNet, InterTrust, IBM and EMI support the XMCL Initiative.

### **eXtensive rights Markup Language (XrML)**

XrML is an XML based language that assigns usage rights terms and conditions to content. ContentGuard Inc. a Xerox spin-off company formed by Xerox and Microsoft, licenses the XrML specifications to the industry royalty free in order to drive the adoption of electronic content and DRM standards by ensuring interoperability of digital rights management solutions.

XrML is intended to support the commerce of digital content, such as the publishing and selling of e-books, movies, music, games, and computer software. In addition, XrML is intended to support the specification of access and usage control for secure digital objects and services. Some of the companies supporting XrML include Adobe, HP, Xerox, and Microsoft.