



Electronic Media Management System

A Digital Media Wireless Solution

Highlights

- Provides an end-to-end system for enabling the electronic distribution of digital assets with comprehensive security and rights protection features.
- Enables content owners to manage their distribution value chain dynamically in areas such as business relationships and content packaging, pricing, and usage.
- Allows a variety of consumer and business-to-business services while supporting different networks, data types, consumer devices, portable media, and applications.
- Utilizes clearinghouse technologies to enforce licensing authorization and control; to authenticate authorized participants in the distribution chain; and to track status of content transactions end-to-end from dispersal to consumer receipt.
- Allows a distribution system based on EMMS components to grow exponentially as the demand for digital content and the number of participating e-businesses increases worldwide.

The IBM Electronic Media Management System (EMMS) delivers a complete, end-to-end solution for digital media distribution and rights-management needs. It provides a foundation for the digital delivery of assets that creates new business models, enables flexible usage rights, and helps protect the assets through the entire delivery process. The system is used today for the electronic distribution of music and can be adapted to distribute other digital media such as e-books and video. IBM is also currently working with several customers to provide extended capabilities in EMMS, including the integration of technologies for the delivery of content via private and wireless networks and for the support of pervasive devices.

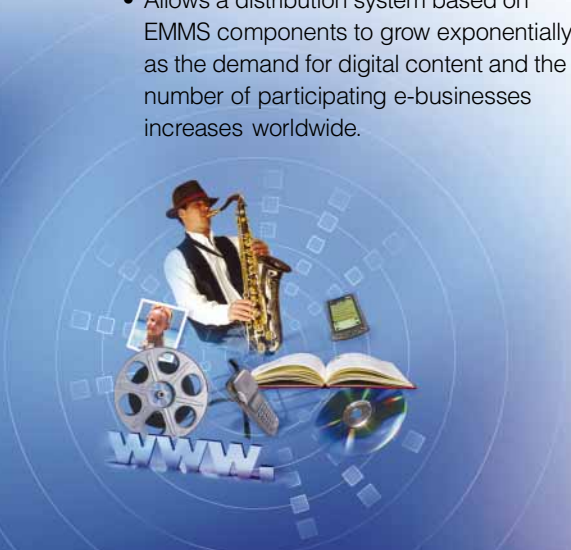
Overview

EMMS consists of five major components that interact to provide content owners, e-businesses, and consumers with the solutions for their digital distribution needs. A brief description of each component follows.

The **EMMS Content Mastering Program** allows content owners to specify rules of permitted use and to selectively perform automated preprocessing, encoding, watermarking, and encryption of their content and promotional material. Creative works are then packaged into secure containers for electronic distribution to storage facilities and retailers.

The **EMMS Content Hosting Program** is the storage facility for EMMS-formatted content that will subsequently be distributed to consumers. Multiple content hosts can be supported and distributed geographically with automatic replication of content across the sites.

The **EMMS Web Commerce Enabler** allows retailers and distributors to integrate EMMS-formatted promotional material into tailored retail offerings and to facilitate consumer downloads of desired content. A variety of business models and distribution methods can be deployed, such as wholesale or retail, pay-per-use, subscription, promotions, and super-distribution.



The **EMMS Clearinghouse Program** provides digital rights management functions and acts as a central control point for managing, authorizing and reporting transactions. It verifies licensing requests, issues licenses that enable consumers to access content downloaded in EMMS-supported formats and provides information to facilitate royalty payments.

The **EMMS Player Software Development Kit (SDK)** enables business partners to develop consumer applications that download, use, and manage content in a tamper-resistant environment according to usage conditions specified by content owners. It also allows control over permitted interaction with external devices, such as CD-R drives, portable players, and mobile devices, through a Trusted Device Interface. The Trusted Device Interface provides a low-level programming interface that controls transfer of content, metadata, and usage conditions in formats specific to the receiving devices. The SDK is targeted for widespread deployment in software applications and for use with consumer electronic devices. It has been integrated in players by RealNetworks, MusicMatch, Sony Music Japan, and Toshiba iVC and used to download music to Sony Memory Stick, Toshiba SD Memory, and other SD devices. The EMMS Player SDK currently supports a Windows PC client environment. A technology prototype has been developed by IBM that provides basic digital rights management functions in a tamper-resistant environment on an ARM/EPOC processor.

Wireless Implementation

While the initial implementations of EMMS supported point-to-point Internet connections to a PC client, IBM has modified the EMMS architecture to accommodate wireless delivery to mobile handsets. An implementation of this architecture is currently being deployed in Japan with NTT-DoCoMo and its business partners, Sony and MEI.

The primary modification for wireless implementations has been the development of a multi-session version of the PC client code. This server component, the **EMMS Proxy Server**, is designed to receive downloads from an upstream EMMS system and to forward those downloads to another type of device on a private network. An example could be a mobile handset connected to the Internet via a WAP, GPRS, UMTS, or i-Mode network. The EMMS Proxy Server contains all the digital rights management features that are contained in the EMMS Player SDK and uses the Trusted Device Interface to communicate with native secure client applications in the downstream devices (which may also support alternative DRM applications). Using the Trusted Device Interface, the EMMS Proxy Server can perform protocol or format conversion and further encryption of the media content before sending the downloads to the devices. The EMMS Proxy Server requires other server software, such as WebSphere Everyplace Suite, to manage the network connection.

The advantage of this implementation is that EMMS can support a wide variety of devices with varied connectivity options. This approach also takes advantage of unique attributes in the devices that can be used for content protection and transfer; allows the reuse of existing processing software modules in the devices; and allows the devices to use content prepared for general distribution and residing in existing repositories. It offers device manufacturers the flexibility to implement rights management functions in a manner that best exploits and differentiates their devices while taking advantage of the distribution capabilities of EMMS.

For device manufacturers who do not want to develop their own rights management functionality in their devices, IBM can work with them to provide a customized version of the EMMS Player SDK, referred to as an embedded Secured Module (eSM). The eSM can provide tamper-resistant digital rights management and content handling services for Internet appliances such as mobile handsets. The eSM framework is based on object-oriented software technology that allows for code reusability and data encapsulation to meet requirements of devices with a small memory footprint. A prototype of the eSM currently runs on EPOC32 Version 5.x and 6.x. Each implementation of the eSM requires customization in order for the eSM to support and take advantage of device-specific attributes. An application would also need to be developed to provide a consumer interface specific to the device and media type.

Comprehensive digital rights management

EMMS is an extensive and broad-based digital rights management system that can be deployed in a wide variety of consumer and business-to-business services across a distribution value chain. Commerce models such as wholesale or retail purchase, protected transfer to portable devices and portable media, promotions, and super-distribution can all be implemented.

The rights-management functions of EMMS offer dynamic copyright protection and control for content owners over how content is licensed and used. They can enforce content-usage conditions, such as permitted number of copies, availability dates, and usage periods. They can provide pricing and packaging information to their authorized retailers. These functions are provided through the EMMS Content Mastering Program and can be integrated directly into the mastering process.

The rights-management functions in EMMS rely upon encryption, secure container technology, Clearinghouse software, and a tamper-resistant client environment to provide an end-to-end solution. EMMS uses strong encryption algorithms throughout the system and has obtained U.S. Government approvals for export. In addition to encryption, secure container technology further protects digital assets, such as content, usage rules, metadata, and other high-value information, against unauthorized interception or modification. The EMMS Clearinghouse Program acts as a trusted custodian that enforces and meters licensing authorization for individual receipt of content. A tamper-resistant client environment enables control for permitted copying, storage, and use of licensed content. Together, these technologies provide a high level of security and rights protection as content is hosted, distributed over open networks and used on PCs or other devices. They enable a separation of trust where the content owners are not dependent on their business partners to provide a secure environment to protect their digital assets.

EMMS draws on IBM's proven expertise and technology in the areas of electronic commerce systems, secure commercial transactions, digital rights management, online distribution, system security, databases, and tamper-resistant software. IBM is committed to developing new applications for the digital music marketplace and supports the goals of the Secure Digital Music Initiative (SDMI).

e-business services

IBM Global Services is ready to assist companies at every stage in the content life cycle. IBM Global Services offers: assessment of requirements, development of a functional specification for the work, execution of any customization or extensions to EMMS, network configuration and optimization, and management of the deployment. IBM Global Services is prepared to make EMMS an optimized solution for content distribution that meets each company's individual needs.



© Copyright International Business Machines Corporation 2001

Printed in the United States of America

4-01

All Rights Reserved

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.

IBM and the IBM logo are trademarks of International Business Machines Corporation in the United States and/or other countries.

Other company, product and service names may be trademarks or service marks of other companies.