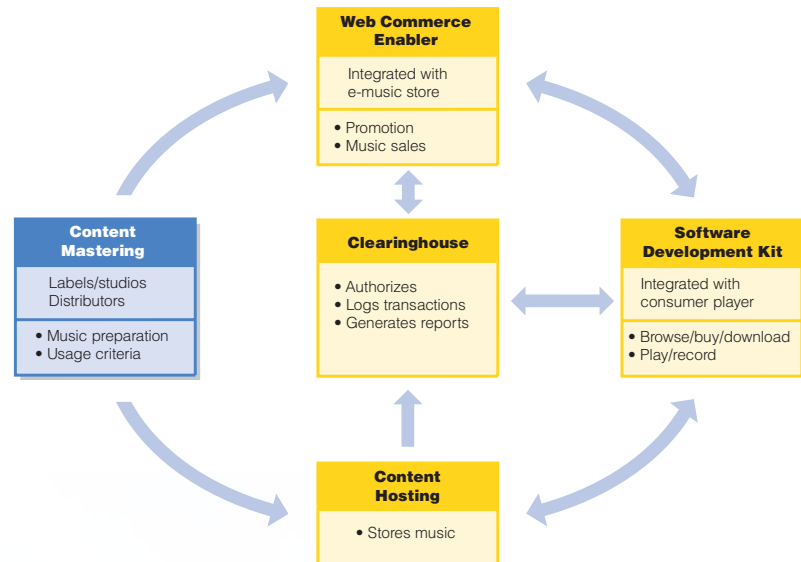**IBM**

EMMS Content Mastering Program

Highlights

- Enables content owners to implement advanced rights-management capabilities to enforce usage of their assets only by authorized users and processes

- Enables new electronic routes to market and new revenue sources by supporting a variety of content-usage and distribution models for content owners

- Allows importation of content and metadata from many different sources

- Supports watermarking to inhibit piracy and unauthorized use or copying

- Supports common digital compression/ decompression technologies and multiple compression rates

- Enables comparison of original and processed tracks to ensure high fidelity

- Provides enhanced security features and tamper detection for encrypted digital content and usage rights

- Creates customized streaming music clips in RealNetworks G2 format for promotional activities

- Enables unattended batch-processing operations

Content Mastering
Labels/studios
Distributors

- Music preparation
- Usage criteria

Web Commerce Enabler
Integrated with e-music store

- Promotion
- Music sales

Clearinghouse
- Authorizes
- Logs transactions
- Generates reports

Software Development Kit
Integrated with consumer player

- Browse/buy/download
- Play/record

Content Hosting
- Stores music

Overview

The Electronic Media Management System (EMMS) Content Mastering Program manages and controls the preparation of digital content that can be distributed over open networks and protected against unauthorized copying or use. With the EMMS Content Mastering Program, content owners or authorized third parties can prepare, package and distribute electronic content and associated promotional material for use by authorized and enabled EMMS aggregators, distributors, retailers and consumers. The architecture that supports the EMMS Content Mastering Program is comprehensive and flexible, allowing it to adapt to different distribution networks, distribution models, data types and industry applications.

The features of this program allow all operations to run in unattended batch mode with manual interaction required only to initiate the processing and, optionally, to perform quality assurance of the end product prior to dispersal of secure containers to the hosting services. The Workflow Manager is provided to coordinate all processing efficiently and to manage unattended batch operations.

This system was designed to allow for technology upgrades including enhanced watermarking or encoding techniques. Because the plug-in interfaces for the EMMS Content Mastering Program are externalized, technology upgrades can be added as they become available, or they can change to comply with developments in industry standards.

The EMMS Content Mastering Program contains the following tools:

Workflow Manager

This tool controls the sequence of processing steps, coordinates the flow of activities among the processing tools and dispatches jobs. It allows simultaneous batch encoding of several titles. Processing can be implemented to allocate work to individuals on different systems.

Music Director

The Music Director is responsible for coordinating the data-collection and job-submission process. It is used to import data and reference collateral files, and to provide a means for manual entry of all desired metadata and file references. The Music Director provides features to create audio files for processing by capturing audio tracks from an audio CD or parsing DDP streams from files or Exabyte tape to create audio files for processing. The Music Director controls the definition and assignment of content-usage conditions; defines the number of versions of the product to be created; and specifies what compression algorithm and bit rate should be used for each version. It also provides functions to create sample audio clips and to compress them to RealAudio G2 streaming format. Features exist in the Music Director to preview artwork, audio tracks, sample clips and lyrics files.

Watermarking tool

The watermarking tool is responsible for embedding selection identification information and copy control information into the audio streams of each track file of the selection based on SDMI-adopted data standards. This enables unauthorized copies to be tracked down to their originator. The watermark is imperceptible to the listener and cannot be removed without damaging the music.

Preprocessing tool

This tool utilizes the Sound Forge tool from Sonic Foundry, optimizing the music quality based on genre and the compression type being used. Preprocessing involves the use of digital signal processing operations to enhance characteristics of the audio signal to compensate for the effects of data compression. Preprocessing is not a requirement, but is provided to enable content masters to fine-tune the audio as desired.

Encoding tool

The encoding tool uses industry-standard encoding technologies to compress the audio data to a more manageable file size for data transmission and storage while maintaining the quality of the audio as close to the original signal as possible. A pluggable interface is provided to support encoding technologies as they evolve with little or no customization. Support is currently available for multiple encoding technologies. In each case, licensing requirements are the responsibility of the content owner. The tool supports multiple encoding formats and/or compression rates for each piece of music in a single processing step, thereby enabling music to be efficiently prepared for different connection rates and distribution methods.

Quality control tool

The quality control tool provides for quality-assurance testing for audio, data and metadata files, prior to encryption and packaging of the content into secure containers. Album information, referenced Web sites, artwork, lyrics (if provided), and the audio files can be reviewed. Quality assurance can be performed all at once or distributed across multiple groups, each validating

the type of data for which they are responsible. Playback of the compressed track file, the original track file, and optionally watermarked or preprocessed track files can be compared with an A/B player provided by the quality control tool. Individual or multiple tracks can be approved or rejected and queued for reprocessing.

Secure container tool

This tool creates unique keys and performs encryption so that only a licensed consumer can download and access the music. All referenced files, such as artwork, lyrics, audio clips and compressed song files are packaged into a series of secure containers. Promotional secure container files are created for electronic music stores or distributors, and content-secure container files are created for content host servers.

Content dispersal tool

The content dispersal tool transfers promotional secure containers to electronic retail Web sites for integration into their online store. It transfers the encrypted content-secure containers to content host servers for subsequent distribution to licensed consumers.

Price utility

The price utility is used to assign prices to each specific usage condition associated with each selection. Price specifications can reflect wholesale- or commission-based pricing models. Optional or supplemental price information, such as special discounts or geographic pricing, can also be specified. A series of price changes can be scheduled to take effect at defined dates or periods of time.

Key features

Security

- Utilizes secure containers to help prevent unauthorized use of content, usage rules, metadata and other high-value information during transmission and storage
- Provides rights-management capabilities to specify criteria for licensing and use of digitally prepared content
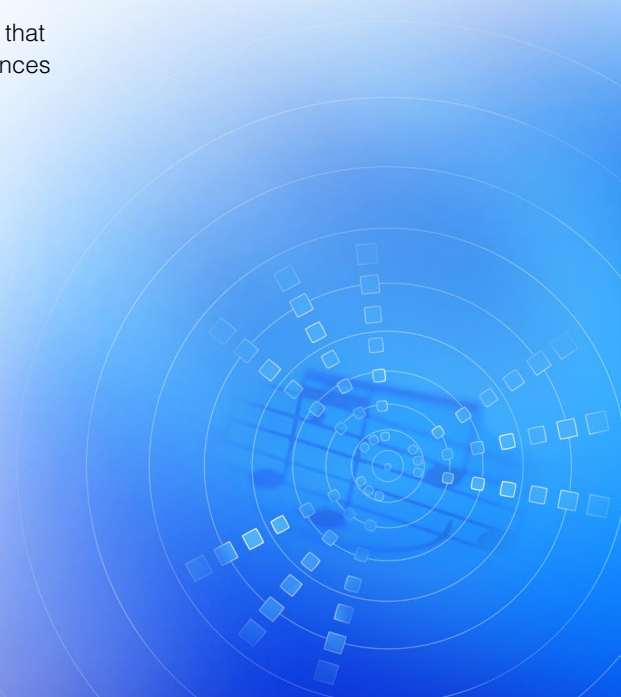
Flexibility

- Provides formatting and security for content in a way that supports a variety of content usage and distribution models, enabling dynamic management of the distribution chain
- Imports content and metadata from many different sources, including audio CDs, DDP files on tape or other media, WAV and AIFF files, and other sources
- Supports multiple standard compression technologies and rates
- Supports multiple pricing models
- Creates customized streaming clips in RealNetworks G2 format for promotional use
- Invokes preprocessing tool to optimize music quality based on genre and compression technology
- Promotes high fidelity through the ability to compare original and processed tracks
- Provides job queuing and dispatching for unattended operations and integration into studio mastering processes
- Automatically disperses content and metadata to specified content hosts and retailers
- Based on upgradable architecture that can support new technology advances in encoding, encryption and watermarking

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, execution of any customization or extensions to EMMS Content Mastering Program, integration with existing applications or systems, and management of the deployment. IBM Global Services also offers managed operations and outsourcing services. IBM Global Services is available to make EMMS an optimized solution for content distribution that meets each company's individual needs.

Minimum hardware requirements

- Dual 500-MHz Pentium® III processors
- 512 MB of memory
- 72-GB hard disk
- CD-ROM drive
- Plextor UltraPleX PX-32TS or PX-40TS CD-ROM drive (needed only if capturing content from audio CDs)
- 100BASE-T Ethernet adapter
- Any audio adapter supported by Microsoft® Windows NT® Workstation 4.0
- 19-inch display capable of at least 1280x1024 resolution with 24-bit color
- 8 mm tape drive compatible with Exabyte EXB-8505HE-0000 (needed only if processing DDP data streams from tape)

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Ordering information for the EMMS Content Mastering Program

Description	Part Number
EMMS Content Mastering Program	PRPQ # P91669; 5799-D69
Software Subscription For EMMS	PRPQ # P91673; 5799-D73

Software requirements

- Microsoft Windows NT Workstation 4.0 with Windows NT Service Pack 4 installed
- IBM DB2® Universal Database™ Workgroup Edition Version 6.1 (other versions not supported)
- Adobe Acrobat Reader 4.0
- Microsoft Internet Explorer 4.0
- Sonic Foundry SoundForge Version 4.5 and any supported plug-ins (required only if preprocessing functions are used)
- RealNetworks RealAudio G2 Player (needed only if using RealAudio files)
- Encoder licenses for all codes to be used

For more information

To learn more about the EMMS Content Mastering Program, please contact your local IBM sales representative, or visit our Web site at:
ibm.com/software/emms.

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