An Application for Multimedia Content Management and On-line Distribution

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Abstract

The Wedelmusic Server Database System (WESDAsys) is a powerful application intended for music publishers, labels, conservatories and any other organisation that can be interested in storing, managing and finally distributing music and multimedia content on the Internet. It is the result of the R&D work carried out in the Wedelmusic project, financed by European Union IST programme.

1. System Description

WESDAsys manages all the aspects related to storage, maintenance, e-selling and Internet delivery of Wedel objects, which are digital objects containing music sheets, audio files, image files, symbolic notation and more. It is possible to store and easily manage millions of music scores, high quality audio and video recordings, images and documents on a single DBMS with multiple disks support (CDROM or DVD jukebox, Hard Disks arrays).

WESDAsys provides a set of tools for storage, management and secure delivery of multimedia content in digital format. Wedel Objects are composed of multimedia content and metadata containing information about content identification and classification. WESDAsys also provides protection mechanisms to manage and deliver Wedel Objects ensuring that the content cannot be accessed by others than the intended recipients. Wedel Objects and all related components stored in the database maintain their original structure as prepared using the Wedelmusic Editor. WESDAsys provides automatic uploads and updates of Wedel Objects’ multimedia content and related metadata, such as, for instance, identification and classification information in several languages.

Local music distributors can connect to WESDAsys via the Internet, browse music catalogue, select Wedel Objects to purchase, buy them and finally download them, all strongly protected with security mechanisms.

The Server Database automatically publishes on the Web music and multimedia catalogues for the stored Wedel Objects. Authorisation Management allows users to select and purchase (and pay) only the desired Wedel Objects’ components and to use them only for the desired operations, and ensures that for each component of a Wedel Object only authorised (and hence purchased) operations are performed. Before delivering Wedel Objects to a Local Distributor, the Server Database checks all the necessary authorisations and embeds into the object the list of all the allowed operation for each component (permissions configuration). The permissions configuration allows Local Distributors to use exclusively the purchased components according to the acquired authorisation. Permissions are valid only for the specific Local Distributor who bought the related object.

2. Protection Mechanisms

An extremely high level of security avoids unauthorised use of Wedel Objects. advanced watermarking and encryption mechanisms. Wedel Objects are encrypted during the Internet delivery and remains encrypted on the Local Distributor side. Only the Wedelmusic Editor, using the proper decryption key can open these objects to perform only the authorised (purchased) operations. For each delivered object, watermarking allows the retrieval of the copyright owner name and the identification of the responsible Local distributor. Log files are produced to trace the whole server activity, with special attention to communication and transactions; accesses to the web site are also monitored and logged.

Key management controls encryption key generation and storage, manages Local Distributors’ public keys and solves key requests issued by Wedel Editors, serving decryption keys to open Wedel Objects.

Accounting of performed operations allows to keep track of all the transactions successfully completed by all the Local Distributors connected, along with details about date, time, permissions acquired for a specific component, prices and payment systems.