Title: METHOD OF OPERATING LOCAL CONTENTS PROVIDING SYSTEM FOR PROVIDING ENCRYPTED CONTENTS TO LOCAL SYSTEM AND LOCAL CONTENTS PROVIDING SYSTEM OF ENABLING THE METHOD

Abstract: The present invention includes: receiving a contents transmission request which transmits first contents encrypted in a first Digital Rights Management (DRM) method from a user to a second user terminal which supports a second DRM method; converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and transmitting the second contents and the second rights object to the second user terminal.

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METHOD OF OPERATING LOCAL CONTENTS PROVIDING SYSTEM FOR PROVIDING ENCRYPTED CONTENTS TO LOCAL SYSTEM AND LOCAL CONTENTS PROVIDING SYSTEM OF ENABLING THE METHOD

Technical Field
The present invention relates to a method of operating a local contents providing system with respect to encrypted contents, and a local contents providing system of performing the method, and more particularly, to a method of operating a local contents providing system with respect to encrypted contents, and a local contents providing system of performing the method, which can encrypt contents in a second Digital Rights Management (DRM) method according to a contents transmission request which transmits first contents encrypted in a first DRM method to a second user terminal which supports a second DRM method, and transmit the contents to the second user terminal.

Background Art
Due to present development in technologies, a multimedia contents providing service for providing a user terminal with multimedia contents has become popularized. Also, it is essentially required to apply Digital Rights Management (DRM) to multimedia contents to protect authors' copyrights of contents and diverse DRM methods are used due to a demand for applying DRM to multimedia contents.

DRM is a general concept of a technology for protecting interests and rights of parties concerned in copyrights to prevent unauthorized usage of digital contents. Since users may illegally use contents when contents are distributed without encryption, a contents providing server providing DRM generally transmits contents by encrypting contents, and enables an authorized user to replay and output contents by transmitting a rights object to the authorized user. The rights object includes a contents encryption key used for decrypting contents, information about contents usage, i.e. contents usage authority, and the like.

Also, according to a conventional art, a user terminal replays and outputs only contents in a predetermined DRM method. Also, a contents providing server similarly provides a user terminal with contents by applying one DRM method to contents.
FIG. 1 is a diagram illustrating an example of providing a user terminal with contents to which DRM is applied according to a conventional art.

Referring to FIG. 1, when a first user terminal 101 transmits a contents provision request to a first contents providing server 102, the first contents providing server 102 transmits contents encrypted according to a DRM 1 method, and a rights object to the first user terminal 101.

In this instance, the first contents providing server 102 corresponds to a server encrypting contents according to a DRM method which the first user terminal 101 supports, i.e. the DRM 1 method, and generating the rights object. Encrypted contents may be first transmitted to the first user terminal 101, and the rights object may be separately transmitted via a predetermined payment process and a predetermined authentication process. The first user terminal 101 decrypts encrypted contents by using a decryption key included in the rights object, and replays and outputs decrypted contents.

A second user terminal 103 similarly transmits a contents provision request to a second contents providing server 104. The second contents providing server 104 encrypts contents according to a DRM method which the second user terminal 103 supports, i.e. a DRM 2 method, and generates a rights object. The second contents providing server 104 transmits contents encrypted according to the DRM 2 method, and the rights object, to the second user terminal 103.

In this instance, encrypted contents may be first transmitted, and the rights object may be separately transmitted via a predetermined payment process and a predetermined authentication process. The second user terminal 103 decrypts encrypted contents by using a decryption key included in the rights object, and replays and outputs decrypted contents.

Similar to the description above, since a contents providing server of a conventional art simply provides contents encrypted according to a predetermined DRM method, there is a defect that contents encrypted in different DRM methods may not be provided.

Specifically, in FIG. 1, when a user desires to replay identical contents by using the second user terminal 103 after the user replays and outputs contents by using the first user terminal 101, the user may transmit contents from the first user terminal 101 to
the second user terminal 103, but when DRM methods which the first user terminal 101 and the second user terminal 103 support are different, there is a defect that contents transmitted from the first user terminal 101 to the second user terminal 103 may not be replayed.

Also, since a contents providing server according to a conventional art protects contents by simply using one DRM method, there is a defect that contents encrypted by using different DRM methods may not be provided.

When the user desires to download identical contents or different contents to another terminal of the user, i.e. the second user terminal 103, after the user downloads contents which the first contents providing server 102 provides by using the first user terminal 101, there is a defect that contents downloaded from the first contents providing server 102 may not be replayed when the DRM method which the second user terminal 103 supports is different from a method which the first contents providing server 102 provides.

Thus, according to a conventional art, there is restriction that a user may not freely use contents along with copyrights protection since a method of receiving and transmitting multimedia contents is generally used in a user terminal side, but conversion between DRMs is not provided.

Therefore, a device in which a first user terminal may also request contents transmission in a DRM method which a second user terminal supports, and provide the second user terminal with contents in the DRM method which the second user terminal supports in response to a contents transmission request, thereby solving the defect, is urgently required.

FIG. 2 is a diagram illustrating another example which a contents providing system provides contents to which DRM is applied according to a conventional art.

Referring to FIG. 2, when a local system 201 transmits a rights object provision request via a predetermined communication network to a rights object issuing server (RI) 202, the RI 202 transmits, via the communication network to a user terminal, a rights object with respect to contents encrypted according to a predetermined DRM method.

In this instance, the RI corresponds to a server generating a rights object according to a DRM method which a user terminal 201 supports. Encrypted contents
may be first transmitted to the user terminal 201 by a contents providing server, and the
rights object may be separately transmitted via a predetermined payment process and a
predetermined authentication process. The user terminal 201 decrypts encrypted
contents by using a decryption key included in the rights object, and replays and outputs
decrypted contents.

A contents providing system 202 according to a conventional art receives a
contents provision request and a rights object provision request with respect to the
contents from a plurality of user terminals. Accordingly, there is a problem that a load
is generated on the contents providing system 202.

Also, since the user terminal 201 transmits either the contents provision request
or the rights object provision request with respect to the contents from the contents
providing system 202 via the communication network, or receives either the contents or
the rights object, there is a payment pressure due to a communication network usage.

Also, since a user may not transmit, to a second user terminal of the user, the
contents including the rights object which the user terminal 201 receives from the
contents providing system 202 via a predetermined payment process and a
predetermined authentication process, and replay the contents, the user has an
inconvenience that the second user terminal is required to receive the contents including
the rights object from the contents providing system 202 via a predetermined payment
process and a predetermined authentication process.

Therefore, a method of operating a local contents providing system with respect
to encrypted contents, and a local contents providing system of performing the method,
which can encrypt contents in a second DRM method according to a contents
transmission request which transmits first contents encrypted in a first DRM method to
a second user terminal which supports a second DRM method, and transmit the contents
to the second user terminal, are required.

Disclosure of Invention

Technical Goals

The present invention provides a method of operating a local contents providing
system with respect to encrypted contents, and a local contents providing system of
performing the method, which can perform conversion of a Digital Rights Management
(DRM) method from a user terminal to another user terminal when a user uses at least two user terminals, and when DRM methods which a first user terminal and a second user terminal support are different, thereby increasing availability of contents.

The present invention also provides a method of operating a local contents providing system with respect to encrypted contents, and a local contents providing system of performing the method, in which, according to a contents transmission request which transmits first contents encrypted in a first DRM method to a second user terminal which supports a second DRM method, the local contents providing system can convert the first contents and a first rights object with respect to the first contents into second contents encrypted in the second DRM method, and a second rights object, and transmit the second contents and the second rights object to the second user terminal, thereby replaying identical contents in different user terminals which supports different DRM methods.

The present invention also provides a local contents providing system, which can include a rights object with respect to contents according to a contents transmission request transmitted from a first user terminal, and convert using a DRM method which a second user terminal supports, thereby enabling the second user terminal to immediately use contents, and protecting contents copyrights.

The present invention also provides a local contents providing system, which can convert a rights object which corresponds to contents into a second rights object, and provide the local system with the contents including the converted second rights object when a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system is received with respect to encrypted contents, and a rights object with respect to the encrypted contents transmitted from a predetermined rights object issuing server (RI) using a predetermined DRM method transmitted from a predetermined contents providing server.

The present invention also provides a local contents providing system, which can generate a second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replatable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the
rights object when converting the rights object included in the contents into the second rights object transmitted to the local system, thereby splitting the rights object, and providing the local system with the rights object.

The present invention also provides a local contents providing system which can transmit, to the RI, a query which inquires about at least one piece of information from among whether the first rights object is permitted to be reissued to the RI, a number of times a reissue permission was performed, and whether a split of the rights object is possible, receive a response with respect to the query from the RI, and determine whether the second rights object is processed according to the response.

Technical solutions

According to an aspect of the present invention, there is provided a method of operating a local contents providing system which provides a local system with encrypted contents, the method including: receiving a contents transmission request which transmits first contents encrypted in a first Digital Rights Management (DRM) method from a user to a second user terminal which supports a second DRM method; converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and transmitting the second contents and the second rights object to the second user terminal. The local contents providing system is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module.

According to another aspect of the present invention, there is provided a method of operating a local contents providing system which provides a local system with encrypted contents, the method including: receiving a contents transmission request, which transmits first contents encrypted in a first DRM method, from a first user terminal connected via a wired/wireless communication network to a second user terminal which supports a second DRM method; converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according
to the contents transmission request; and controlling to transmit the second contents and the second rights object to the second user terminal.

According to still another aspect of the present invention, there is provided a method of operating a local contents providing system which provides a local system with encrypted contents, the method including: receiving, from a predetermined contents providing server, encrypted contents via a communication network, the encrypted contents using a predetermined DRM method; receiving, from a predetermined RI, a rights object with respect to the encrypted contents via a communication network; recording, in a contents information database, the encrypted contents and the rights object which corresponds to the contents; receiving a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system; reading and extracting a rights object which corresponds to the contents by referring to the contents information database; converting the read and extracted rights object into a second rights object transmitted to the local system; and transmitting the contents including the second rights object to the local system.

According to yet another aspect of the present invention, there is provided a local contents providing system which provides a local system with encrypted contents, the system including: a contents request receiver receiving a contents transmission request which transmits first contents encrypted in a first DRM method from a user to a second user terminal which supports a second DRM method; a contents/rights object converter converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and a contents transmitter transmitting the second contents and the second rights object to the second user terminal. The local contents providing system is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module.

According to a further aspect of the present invention, there is provided a local contents providing system which provides a local system with encrypted contents, the system including: a contents request receiver receiving a contents transmission request,
which transmits first contents encrypted in a first DRM method, from a first user terminal connected via a wired/wireless communication network to a second user terminal which supports a second DRM method; a contents/rights object converter converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and a contents transmission controller controlling to transmit the second contents and the second rights object to the second user terminal.

According to another aspect of the present invention, there is provided a local contents providing system which provides a local system with encrypted contents, the system including: a communication module receiving, from a predetermined contents providing server, encrypted contents via a communication network, the encrypted contents using a predetermined DRM method, and receiving, from a predetermined RI, a rights object which provides a local system with the encrypted contents via a communication network; a contents information database maintaining the encrypted contents and the rights object which corresponds to the contents; a database manager recording, in the contents information database, the encrypted contents and the rights object which corresponds to the contents; a user interface module receiving a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system; a rights object processor reading and extracting a rights object which corresponds to the contents by referring to the contents information database, and converting the read and extracted rights object into a second rights object transmitted to the local system; and a contents transmitter transmitting the contents including the second rights object to the local system.

Brief Description of Drawings

FIG. 1 is a diagram illustrating an example of providing a user terminal with contents to which DRM is applied according to a conventional art;

FIG. 2 is a diagram illustrating another example which a contents providing system provides contents to which DRM is applied according to a conventional art;

FIG. 3A and 3B are diagrams illustrating network connections of local contents providing systems according to an exemplary embodiment of the present invention;
FIG. 4 is a flowchart illustrating a method of operating a local contents providing system according to an exemplary embodiment of the present invention;

FIG. 5 is a flowchart illustrating a method of converting contents and a rights object with respect to the contents according to an exemplary embodiment of the present invention;

FIG. 6 is a flowchart illustrating a method of operating a local contents providing system according to another exemplary embodiment of the present invention;

FIG. 7 is a block diagram illustrating an internal configuration of a local contents providing system according to an exemplary embodiment of the present invention;

FIG. 8 is a block diagram illustrating an internal configuration of a local contents providing system according to another exemplary embodiment of the present invention;

FIG. 9 is a diagram illustrating a network connection of a local contents providing system according to another exemplary embodiment of the present invention;

FIG. 10 is a flowchart illustrating a method of operating a local contents providing system according to still another exemplary embodiment of the present invention;

FIG. 11 is a diagram illustrating a contents information database according to an exemplary embodiment of the present invention;

FIG. 12 is a block diagram illustrating an internal configuration of a local contents providing system according to still another exemplary embodiment of the present invention; and

FIG. 13 is an internal block diagram of a general-purpose computer which can be adopted in performing a method of operating a local contents providing system according to the present invention.

**Best Mode for Carrying Out the Invention**

Reference will now be made in detail to embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below in order to explain the present invention by referring to the figures.
FIGS. 3A and 3B are diagrams illustrating network connections of local contents providing systems according to an exemplary embodiment of the present invention.

As illustrated in FIG. 3A, a local contents providing system 302 is realized in either a software module executing in a first user terminal 301, or a hardware device performing in the first user terminal, and the first user terminal 301 and a second user terminal 303 are connected via a wired/wireless communication network. Also, as illustrated in FIG. 3B, a local contents providing system 302 is connected to a first user terminal 301 and a second user terminal 303 via a wired/wireless communication network.

Either the first user terminal 301 or the second user terminal 303 of the present invention may have a predetermined communication module such as a code division multiple access (CDMA) module, a Bluetooth module, an infrared data association (IrDA) module, and a wired/wireless local area network (LAN) card, such as those included in a personal computer (PC), a personal digital assistant (PDA), a smart phone, a handheld PC, a mobile phone, a Moving Picture Experts Group Audio Layer 3 (MP3) player, and the like. Also, either the first user terminal 301 or the second user terminal 303 is a general concept of a terminal having a predetermined operational capability by including a predetermined microprocessor implementing a function of replaying multimedia, and the first user terminal 301 and the second user terminal 302 may be terminals supporting DRM of different methods.

FIG. 4 is a flowchart illustrating a method of operating a local contents providing system according to an exemplary embodiment of the present invention.

First, a user inputs, in a local contents providing system, a contents transmission request which transmits first contents encrypted in a first DRM (DRM 1) method via a first user terminal to a second user terminal which supports a second DRM (DRM 2) method, in operation S401. For example, a user may input, in a local contents providing system, a contents transmission request which transmits music contents encrypted in a "DRM 1" method stored in a first user terminal, e.g. a song entitled "I probably loved you" is transmitted from a first user terminal which supports the "DRM 1 to a second user terminal which supports a "DRM 2" method.

In operation S402, the local contents providing system receives a contents
transmission request which transmits first contents encrypted in a first DRM method from a user to a second user terminal which supports a second DRM method. The local contents providing system is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module. According to an exemplary embodiment of the present invention, the hardware device may correspond to any one of either a chip or a bridge cable.

In operation S403, the local contents providing system converts the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request. The first rights object issued from a predetermined RI includes either a decryption key with respect to the first contents, or usage authority information with respect to the first contents.

Also, the second rights object is either generated by converting the first rights object, or is reissued from the RI by referring to the usage authority information included in the first rights object.

According to an exemplary embodiment of the present invention, the converting into the second contents encrypted in the second DRM method, and the second rights object may analyze the usage authority information included in the first rights object, determine whether the first rights object is converted into the second rights object, and generate the second rights object according to the usage authority information of the first rights object when the converting is possible, in the local contents providing system.

Also, according to another exemplary embodiment of the present invention, the local contents providing system which determines whether the first rights object is converted into the second rights object may transmit, to the RI, a query which inquires about at least one piece of information from among whether the first rights object is permitted to be reissued to the RI, a number of times a reissue permission was performed, and whether a split of the rights object is possible, receive a response with respect to the query from the RI, and determine whether the second rights object is converted according to the response.
Also, according to still another exemplary embodiment of the present invention, the local contents providing system may(240,246),(861,777)
in detail by referring to FIG. 5, as follows.

FIG. 5 is a flowchart illustrating a method of converting contents and a rights object with respect to the contents according to an exemplary embodiment of the present invention.

In operation S501, the local contents providing system allocates a memory area of a regular size to a predetermined memory device attached to the first user terminal.

In operation S502, the local contents providing system divides the first contents into at least two piece files.

In operation S503, the local contents providing system records the divided at least two piece files in the memory area, and performs decryption with respect to the corresponding piece file.

In operation S504, the local contents providing system encrypts the decrypted piece file into the second DRM method.

As an example of operations S503 through S504, when the local contents providing system divides the first contents into "a first piece file through a fourth piece file, records "the divided first piece file" in the memory area, performs decryption with respect to "the first piece file", encrypts "the decrypted first piece file" into the second DRM method, and completes encryption of "the first piece file", the local contents providing system may record "a second piece file" in the memory area, perform decryption with respect to "the second piece file", and encrypt "the decrypted second piece file" into the second DRM method. The local contents providing system may repeat the above process until all the divided at least two piece files are encrypted into the second DRM method (operation S505).

In the case when all the divided piece files are encrypted into the second DRM method (operation S505), the local contents providing system merges at least one piece file encrypted in the second DRM method, and generates the second contents, in operation S506.

Referring to FIG. 4 again, the local contents providing system transmits the second contents and the second rights object to the second user terminal, in operation S404.

FIG. 6 is a flowchart illustrating a method of operating a local contents providing system according to another exemplary embodiment of the present invention.
First, a first user terminal inputs, in a local contents providing system, a contents transmission request which transmits first contents encrypted in a first DRM method via a wired/wireless communication network to a second user terminal which supports a second DRM method, in operation S601. The contents transmission request includes the first rights object which corresponds to the first contents, and the first rights object issued from a predetermined RI includes either a decryption key with respect to the first contents, or usage authority information with respect to the first contents.

In operation S602, the local contents providing system receives the contents transmission request from a first user terminal connected via a wired/wireless communication network.

In operation S603, the local contents providing system converts the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request.

According to an exemplary embodiment of the present invention, the local contents providing system may request the second contents encrypted in the second DRM method, and the second rights object to be sent to a predetermined contents providing server and an RI via a communication network, and receive the second contents encrypted in the second DRM method, and the second rights object from the contents providing server and the RI.

In operation S604, the local contents providing system controls to transmit the second contents and the second rights object to the second user terminal. The second rights object is either generated by converting the first rights object transmitted with the first contents from the first user terminal, or is reissued from a predetermined RI by referring to the usage authority information included in the first rights object.

According to an exemplary embodiment of the present invention, the local contents providing system controls to transmit the second contents encrypted in the second DRM method, and the second rights object to the first user terminal, and transmit the second contents and the second rights object from the first user terminal to the second user terminal via a predetermined wired/wireless communication module. For example, the local contents providing system may control to transmit music contents, e.g. "I probably loved you" converted from a "DRM 1" method to a "DRM 2"
method, and a rights object with respect to the music contents, e.g. "I probably loved you" to the first user terminal, and transmit the music contents, e.g. "I probably loved you", and the rights object with respect to the music contents, e.g. "I probably loved you" from the first user terminal to the second user terminal which supports a "DRM 2" method via a wired/wireless communication module.

According to another exemplary embodiment of the present invention, the local contents providing system may control a communication network system to transmit the second contents and the second rights object to the second user terminal via a wired/wireless communication network. Specifically, according to the present exemplary embodiment, when the second user terminal includes a mobile communication module, the local contents providing system may control the communication network system to transmit the second rights object to the second user terminal.

FIG. 7 is a block diagram illustrating an internal configuration of a local contents providing system according to an exemplary embodiment of the present invention.

As illustrated in FIG. 7, a local contents providing system 700 includes a contents request receiver 710, a contents/rights object converter 720, a memory allocator 721, a DRM converter 722, a contents generator 723, a contents transmitter 730, and a contents/rights object transceiver 724.

The local contents providing system 700 is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module. According to the present exemplary embodiment, the hardware device may correspond to any one of either a chip or a bridge cable.

The contents request receiver 710 receives a contents transmission request which transmits first contents encrypted in a first DRM method from a user to a second user terminal which supports a second DRM method.

The contents/rights object converter 720 converts the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according
to the contents transmission request which the contents request receiver 710 receives. The first rights object issued from a predetermined RI includes either a decryption key with respect to the first contents, or usage authority information with respect to the first contents, and the second rights object is either generated by converting the first rights object, or is reissued from the RI by referring to the usage authority information included in the first rights object.

According to an exemplary embodiment of the present invention, the contents/rights object converter 720 converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object may be converted by using a memory allocator 721, a DRM converter 722, and a contents generator 723.

The memory allocator 721 of the contents/rights object converter 720 allocates a memory area of a regular size to a predetermined memory device attached to the first user terminal.

The DRM converter 722 divides the first contents into at least two piece files, records the divided at least two piece files in the memory area, performs decryption with respect to the corresponding piece file, and encrypts the decrypted piece file into the second DRM method.

The contents generator 723 merges at least one piece file encrypted in the second DRM method, and generates the second contents.

Also, according to another exemplary embodiment of the present invention, the contents/rights object converter 720 includes a contents/rights object transceiver 724, and the contents/rights object transceiver 724 may request the second contents encrypted in the second DRM method, and the second rights object to be sent to a predetermined contents providing server and an RI via a communication network, and receive the second contents encrypted in the second DRM method, and the second rights object from the contents providing server and the RI.

The contents transmitter 730 transmits the second contents and the second rights object to the second user terminal.

FIG. 8 is a block diagram illustrating an internal configuration of a local contents providing system according to another exemplary embodiment of the present invention.
As illustrated in FIG. 8, a local contents providing system 800 includes a
contents request receiver 810, a contents/rights object converter 820, a contents
transmission controller 830, and a contents/rights object transceiver 821.

The contents request receiver 810 receives a contents transmission request
which transmits first contents encrypted in a first DRM method from a first user
terminal connected via a wired/wireless communication network to a second user
terminal which supports a second DRM method. The contents transmission request
includes the first rights object which corresponds to the first contents, and the first rights
object issued from a predetermined RI includes either a decryption key with respect to
the first contents, or usage authority information with respect to the first contents.

The contents/rights object converter 820 converts the first contents and a first
rights object which corresponds to the first contents into second contents encrypted in
the second DRM method, and a second rights object in a converting module according
to the contents transmission request.

Also, according to another exemplary embodiment of the present invention, the
contents/rights object converter 820 includes a contents/rights object transceiver 821,
and the contents/rights object transceiver 821 may request the second contents
encrypted in the second DRM method, and the second rights object to be sent to a
predetermined contents providing server and an RI via a communication network, and
receive the second contents encrypted in the second DRM method, and the second
rights object from the contents providing server and the RI.

The contents transmission controller 830 controls to transmit the second
contents and the second rights object to the second user terminal. The second rights
object is either generated by converting the first rights object transmitted with the first
contents from the first user terminal, or is reissued from a predetermined RI by referring
to the usage authority information included in the first rights object.

According to an exemplary embodiment of the present invention, the contents
transmission controller 830 may control to transmit the second contents and the second
rights object to the first user terminal, and transmit the second contents and the second
rights object from the first user terminal to the second user terminal via a predetermined
wired/wireless communication module.

According to an exemplary embodiment of the present invention, the contents
transmission controller 830 may control a communication network system to transmit
the second contents and the second rights object to the second user terminal via a
wired/wireless communication network.

FIG. 9 is a diagram illustrating a network connection of a local contents
providing system according to another exemplary embodiment of the present invention.

A local contents providing system 910 is connected to a local system 940 via a
wired/wireless communication network. Also, the local contents providing system 910
is connected to either a contents providing server 920 providing encrypted contents via
a wired/wireless communication network, or an RI 930 issuing a rights object which
provides the local system with encrypted contents.

The local system 940 of the present invention may have a predetermined
communication module such as a CDMA module, a Bluetooth module, an IrDA module,
and a wired/wireless LAN card, such as those included in a PC, a PDA, a smart phone, a
handheld PC, a mobile phone, an MP3 player, and the like. Also, the local system 940
is a general concept of a terminal having a predetermined operation capability by
including a predetermined microprocessor implementing a function of replaying
multimedia.

FIG. 10 is a flowchart illustrating a method of operating a local contents
providing system according to still another exemplary embodiment of the present
invention.

First, the local contents providing system receives, from a predetermined
contents providing server, encrypted contents via a communication network, the
encrypted contents using a predetermined DRM method, in operation S1001. For
example, the local contents providing system may receive, from a predetermined
contents providing server, encrypted music contents, e.g. "I probably loved you" via a
communication network, the encrypted music contents using a predetermined DRM
method.

In operation S1002, the local contents providing system receives, from a
predetermined RI, a rights object with respect to the encrypted contents via a
communication network. For example, the local contents providing system may
receive, from a predetermined RI, usage authority information, e.g. "a number of
replayable times: five times" included in a rights object with respect to the encrypted
music contents, e.g. "I probably loved you" via a communication network.

According to the present invention, the rights object includes a decryption key which enables the contents to be replayed in the local contents providing system, and usage authority information which corresponds to information with respect to contents usage. Specifically, the local contents providing system requires the decryption key included in the rights object for replaying the encrypted contents in order to protect contents copyrights, and may use the contents according to the usage authority information included in the rights object.

According to another exemplary embodiment of the present invention, the rights object which corresponds to the contents transmitted from the RI may be issued from the RI according to meta information of the contents. For example, when meta information of the contents transmitted from the contents providing server corresponds to "aa", the rights object which corresponds to the meta information "aa" of the contents transmitted from the RI may be issued in the local contents providing system.

Dividing servers into the contents providing server, i.e. a configuration providing the local contents providing system with the contents, and the RI, i.e. a configuration providing the rights object with respect to the contents, is described. However, this is merely divided according to a function which each server device performs. It is obvious to those of ordinary skill in the art that the RI and the contents providing server which provides the local contents providing system with the contents may be realized by being unified physically and functionally when realized in actuality.

In operation S1003, the local contents providing system records, in a contents information database, the encrypted contents and the rights object which corresponds to the contents.

FIG. 11 is a diagram illustrating a contents information database according to an exemplary embodiment of the present invention.

As illustrated in FIG. 11, a contents information database 1100 includes a contents 1101 field and a rights object 1102 field. The rights object 1102 may record usage authority information corresponding to the contents 1101. The usage authority information may include a usage period, a number of replayable times, a number of transmissible times, target local system information, target user information of the contents, and the like.
In operation S1004, the local contents providing system receives a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system.

In operation S1005, the local contents providing system reads and extracts a rights object which corresponds to the contents by referring to the contents information database.

In operation S1006, the local contents providing system converts the read and extracted rights object into a second rights object transmitted to the local system. According to the present invention, the local contents providing system may process the second rights object transmitted to the local system by referring to the usage authority information included in the rights object.

Also, according to another exemplary embodiment of the present invention, the usage authority information of the rights object may include reissue permission information of the rights object. Specifically, the reissue permission information may correspond to information permitting to conversion into the second rights object by referring to the usage authority information included in the rights object.

Also, according to still another exemplary embodiment of the present invention, the usage authority information included in the second rights object processed from the rights object may exclude reissue permission information of the rights object. Specifically, it means that a second local contents providing system which receives the second rights object excluding the reissue permission information may not process the second rights object, and may not generate the second rights object by converting the first rights object excluding the reissue permission information.

Also, according to yet another exemplary embodiment of the present invention, the local contents providing system may generate the second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the rights object. For example, when a number of replayable times included in the usage authority information of the rights object corresponds to "five times", the local contents providing system may control a number of replayable times to "twice", and generate the second rights object including
second usage authority information in which a number of replayable times corresponds
to "twice".

Also, according to a further exemplary embodiment of the present invention,
the local contents providing system may generate the second rights object including
second usage authority information which controls at least one piece of information
from among a usage period, a number of replayable times, a number of transmissible
times, target local system information, and target user information of the contents
included in the usage authority information of the rights object, update the usage
authority information of the rights object according to the second usage authority
information included in the generated second rights object, and record the updated
usage authority information in the contents information database (a split of a rights
object).

Also, according to another exemplary embodiment of the present invention, the
local contents providing system may transmit, to the RI, a query which inquires about at
least one piece of information from among whether the first rights object is permitted to
be reissued to the RI, a number of times a reissue permission was performed, and
whether a split of the rights object is possible, receive a response with respect to the
query from the RI, and determine whether the second rights object is processed
according to the response.

Also, according to another exemplary embodiment of the present invention, the
local contents providing system may record, in a predetermined log information
recording device, log information according to the processing of the rights object, read
and extract the log information recorded in the log information recording device, and
transmit the log information to the RI when a log information request is received from
the RI.

Also, according to another exemplary embodiment of the present invention, the
local contents providing system may record, in a predetermined log information
recording device, log information according to the processing of the rights object, and
transmit the log information recorded in the log information recording device to the RI
at predetermined intervals.

In operation S1007, the local contents providing system transmits the contents
including the second rights object to the local system.
According to the present invention, the local contents providing system may transmit, to the RI, report data according to the transmitting of the contents including the second rights object. Specifically, when a system error is generated, or the rights object is deleted in the local system, the local contents providing system may transmit, to the RI, report data according to the transmitting of the contents in order to enable the rights object to be reissued from the RI.

FIG. 12 is a block diagram illustrating an internal configuration of a local contents providing system according to still another exemplary embodiment of the present invention.

As illustrated in FIG. 12, a local contents providing system 1200 includes a communication module 1210, a contents information database 1220, a database manager 1230, a user interface module 1240, a rights object processor 1250, a rights object generator 1251, and a contents transmitter 1260.

The communication module 1210 receives, from a predetermined contents providing server, encrypted contents via a communication network, the encrypted contents using a predetermined DRM method, and receiving, from a predetermined RI, a rights object with respect to the encrypted contents via a communication network. The rights object includes a decryption key which enables the contents to be replayed in the local contents providing system, and usage authority information which corresponds to information with respect to contents usage.

According to an exemplary embodiment of the present invention, the rights object which corresponds to the contents transmitted to the local contents providing system may be issued from the RI according to meta information of the contents.

The contents information database 1220 maintains the encrypted contents and the rights object which corresponds to the contents.

The database manager 1230 records, in the contents information database 1220, the encrypted contents and the rights object which corresponds to the contents.

The user interface module 1240 receives a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system.

The rights object processor 1250 reads and extracts a rights object which corresponds to the contents by referring to the contents information database 1220, and
converts the read and extracted rights object into a second rights object transmitted to the local system. According to the present invention, the local contents providing system may process the second rights object transmitted to the local system by referring to the usage authority information included in the rights object.

Also, according to another exemplary embodiment of the present invention, the usage authority information of the rights object stored in the contents information database 1220 may include reissue permission information of the rights object.

Also, according to still another exemplary embodiment of the present invention, the usage authority information included in the second rights object processed from the rights object may exclude reissue permission information of the rights object.

Also, according to yet another exemplary embodiment of the present invention, the rights object generator 1251 generates the second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the rights object.

Also, according to a further exemplary embodiment of the present invention, the rights object processor 1250 may record, in a predetermined log information recording device, log information according to the processing of the rights object. Also, the rights object processor 1250 may read and extract the log information recorded in the log information recording device, and transmit the log information to the RI when a log information request is received from the RI.

Also, according to another exemplary embodiment of the present invention, the rights object processor 1250 may record, in a predetermined log information recording device, log information according to the processing of the rights object, and transmit the log information recorded in the log information recording device to the RI at predetermined intervals.

The database manager 1230 updates the usage authority information of the rights object according to the second usage authority information included in the second rights object, and records the updated usage authority information in the contents information database.

The contents transmitter 1260 transmits the contents including the second rights
object to the local system.

According to an exemplary embodiment of the present invention, the contents transmitter 1260 may transmit, to the RI, report data according to the transmitting of the contents including the second rights object. Specifically, when a system error is generated, or the rights object is deleted in the local system, the contents transmitter 1260 may transmit, to the RI, report data according to the transmitting of the contents in order to enable the rights object to be reissued from the RI.

A method of operating a local contents providing system according to the above-described embodiment of the present invention may be recorded in computer-readable media including program instructions to implement various operations embodied by a computer. The media may also include, alone or in combination with the program instructions, data files, data structures, and the like. The media and program instructions may be those specially designed and constructed for the purposes of the present invention, or they may be of the kind well-known and available to those having skill in the computer software arts. Examples of computer-readable media include magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD ROM disks and DVD; magneto-optical media such as optical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory (ROM), random access memory (RAM), flash memory, and the like. The media may also be a transmission medium such as optical or metallic lines, wave guides, and the like, including a carrier wave transmitting signals specifying the program instructions, data structures, and the like. Examples of program instructions include both machine code, such as produced by a compiler, and files containing higher level code that may be executed by the computer using an interpreter. The described hardware devices may be configured to act as one or more software modules in order to perform the operations of the above-described embodiments of the present invention.

FIG. 13 is an internal block diagram of a general-purpose computer which can be adopted in performing a method of operating a local contents providing system according to the present invention.

A computer apparatus 1300 includes at least one processor 1310 connected to a main memory device including a RAM 1320 and a ROM 1330. The processor 1310 is
also known as a central processing unit CPU. As well-known in the field of the art, the ROM 1330 unidirectionally transmits data and instructions to the CPU, and the RAM 1320 is generally used for bidirectionally transmitting data and instructions. The RAM 1320 and the ROM 1330 may include a certain proper form of a computer-readable recording medium. A mass storage device 1340 is bidirectionally connected to the processor 1310 to provide additional data storage capacity and may be one of a number of computer-readable recording mediums. The mass storage device 1340 is used for storing programs, data, and the like, and is generally an auxiliary memory such as a hard disk which is slower than the main memory device. A particular mass storage device such as a CD ROM 1360 may be used. The processor 1310 is connected to at least one input/output interface 1350 such as a video monitor, a track ball, a mouse, a keyboard, a microphone, a touch-screen type display, a card reader, a magnetic or paper tape reader, a voice or hand-writing recognizer, a joystick, or other known computer input/output units. The processor 1310 may be connected to a wired or wireless communication network via a network interface 1370. The procedure of the described method can be performed via the network connection. The described devices and tools are well-known to those skilled in the art of computer hardware and software. The described hardware devices may be configured to act as one or more software modules in order to perform the operations of the present invention.

Although a few embodiments of the present invention have been shown and described, the present invention is not limited to the described embodiments. Instead, it would be appreciated by those skilled in the art that changes may be made to these embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.

Industrial Applicability

According to the present invention, there is provided a method of operating a local contents providing system with respect to encrypted contents, and a local contents providing system of performing the method, which can perform conversion of a DRM method from a user terminal to another user terminal when a user uses at least two user terminals, and when DRM methods which a first user terminal and a second user terminal support are different, thereby increasing availability of contents.
Also, according to the present invention, there is provided a method of operating a local contents providing system with respect to encrypted contents, and a local contents providing system of performing the method, in which, according to a contents transmission request which transmits first contents encrypted in a first DRM method to a second user terminal which supports a second DRM method, the local contents providing system can convert the first contents and a first rights object with respect to the first contents into second contents encrypted in the second DRM method, and a second rights object, and transmit the second contents and the second rights object to the second user terminal, thereby replaying identical contents in different user terminals which supports different DRM methods.

Also, according to the present invention, there is provided a local contents providing system, which can include a rights object with respect to contents according to a contents transmission request transmitted from a first user terminal, and convert using a DRM method which a second user terminal supports, thereby enabling the second user terminal to immediately use contents, and protecting contents copyrights.

Also, according to the present invention, there is provided a local contents providing system, which can convert a rights object which corresponds to contents into a second rights object, and provide the local system with the contents including the converted second rights object when a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system is received with respect to encrypted contents, and a rights object with respect to the encrypted contents transmitted from a predetermined RI using a predetermined DRM method transmitted from a predetermined contents providing server.

Also, according to the present invention, there is provided a local contents providing system, which can generate a second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the rights object when converting the rights object included in the contents into the second rights object transmitted to the local system, thereby splitting the rights object, and providing the local system with the rights object.

Also, according to the present invention, there is provided a local contents
providing system which can transmit, to the RI, a query which inquires about at least one piece of information from among whether the first rights object is permitted to be reissued to the RI, a number of times a reissue permission was performed, and whether a split of the rights object is possible, receive a response with respect to the query from the RI, and determine whether the second rights object is processed according to the response.
CLAIMS

1. A method of operating a local contents providing system which provides a local system with encrypted contents, the method comprising:
   - receiving a contents transmission request which transmits first contents encrypted in a first Digital Rights Management (DRM) method from a user to a second user terminal which supports a second DRM method;
   - converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and
   - transmitting the second contents and the second rights object to the second user terminal.

2. The method of claim 1, wherein the local contents providing system is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module.

3. The method of claim 1, wherein the first rights object issued from a predetermined rights object issuing server (RI) comprises either a decryption key with respect to the first contents, or usage authority information with respect to the first contents, and
   - the second rights object is either generated by converting the first rights object, or is reissued from the RI by referring to the usage authority information included in the first rights object.

4. The method of claim 3, wherein the converting into the second contents and the second rights object comprises:
   - analyzing the usage authority information included in the first rights object, and determining whether the first rights object is converted into the second rights object; and
   - generating the second rights object according to the usage authority information of the first rights object when the converting is possible.
5. The method of claim 4, wherein the generating of the second rights object generates the second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the first rights object.

6. The method of claim 4, wherein the analyzing and determining comprises:
transmitting, to the RI, a query which inquires about at least one piece of information from among whether the first rights object is permitted to be reissued to the RI, a number of times a reissue permission was performed, and whether a split of the rights object is possible; and
receiving a response with respect to the query from the RI, and determining whether the second rights object is converted according to the response.

7. The method of claim 4, wherein the usage authority information of the first rights object comprises reissue permission information of the first rights object.

8. The method of claim 4, wherein the usage authority information included in the second rights object generated from the first rights object excludes reissue permission information of the rights object.

9. The method of claim 1, wherein the converting into the second contents and the second rights object comprises:
allocating a memory area of a regular size to a predetermined memory device attached to the first user terminal;
dividing the first contents into at least two piece files, recording the divided at least two piece files in the memory area, and performing decryption with respect to the corresponding piece file;
encrypting the decrypted piece file into the second DRM method; and
merging at least one piece file encrypted in the second DRM method, and
generating the second contents.

10. The method of claim 1, wherein the hardware device corresponds to any one of either a chip or a bridge cable.

11. The method of claim 1, wherein the converting into the second contents and the second rights object comprises:
   requesting the second contents encrypted in the second DRM method, and the second rights object to be sent to a predetermined contents providing server and an RI via a communication network; and
   receiving the second contents encrypted in the second DRM method, and the second rights object from the contents providing server and the RI.

12. A method of operating a local contents providing system which provides a local system with encrypted contents, the method comprising:
   receiving a contents transmission request, which transmits first contents encrypted in a first DRM method, from a first user terminal connected via a wired/wireless communication network to a second user terminal which supports a second DRM method;
   converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and
   controlling to transmit the second contents and the second rights object to the second user terminal.

13. The method of claim 12, wherein the contents transmission request comprises the first rights object which corresponds to the first contents, and the first rights object issued from a predetermined RI comprises either a decryption key with respect to the first contents, or usage authority information with respect to the first contents.

14. The method of claim 12, wherein the second rights object is either generated by converting the first rights object transmitted with the first contents from the first user
terminal, or is reissued from a predetermined RI by referring to the usage authority information included in the first rights object.

15. The method of claim 12, wherein the controlling controls to transmit the second contents and the second rights object to the first user terminal, and transmit the second contents and the second rights object from the first user terminal to the second user terminal via a predetermined wired/wireless communication module.

16. The method of claim 12, wherein the controlling controls a communication network system to transmit the second contents and the second rights object to the second user terminal via a wired/wireless communication network.

17. A method of operating a local contents providing system which provides a local system with encrypted contents, the method comprising:

   receiving, from a predetermined contents providing server, encrypted contents via a communication network, the encrypted contents using a predetermined DRM method;

   receiving, from a predetermined RI, a rights object with respect to the encrypted contents via a communication network;

   recording, in a contents information database, the encrypted contents and the rights object which corresponds to the contents;

   receiving a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system;

   reading and extracting a rights object which corresponds to the contents by referring to the contents information database;

   converting the read and extracted rights object into a second rights object transmitted to the local system; and

   transmitting the contents including the second rights object to the local system.

18. The method of claim 17, wherein the rights object comprises either a decryption key with respect to the contents or usage authority information with respect to the contents, and
the processing processes the second rights object transmitted to the local system by referring to the usage authority information included in the read and extracted rights object.

19. The method of claim 17, wherein the rights object which corresponds to the contents transmitted to the local contents providing system is issued from the RI according to meta information of the contents.

20. The method of claim 18, wherein the usage authority information of the rights object stored in the contents information database comprises reissue permission information of the rights object.

21. The method of claim 20, wherein the usage authority information included in the second rights object processed from the rights object excludes reissue permission information of the rights object.

22. The method of claim 18, wherein the processing generates the second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the rights object.

23. The method of claim 18, wherein the processing comprises:

   generating the second rights object including second usage authority information which controls at least one piece of information from among a usage period, a number of replayable times, a number of transmissible times, target local system information, and target user information of the contents included in the usage authority information of the rights object; and

   updating the usage authority information of the rights object according to the second usage authority information included in the second rights object, and recording the updated usage authority information in the contents information database.
24. The method of claim 17, wherein the processing comprises:
recording, in a predetermined log information recording device, log information according to the processing of the rights object; and
reading and extracting the log information recorded in the log information recording device, and transmitting the log information to the RI when a log information request is received from the RI.

25. The method of claim 17, wherein the processing comprises:
recording, in a predetermined log information recording device, log information according to the processing of the rights object; and
transmitting the log information recorded in the log information recording device to the RI at predetermined intervals.

26. The method of claim 17, wherein the transmitting comprises transmitting, to the RI, report data according to the transmitting of the contents including the second rights object.

27. The method of claim 17, wherein the processing comprises:
transmitting, to the RI, a query which inquires about at least one piece of information from among whether the first rights object is permitted to be reissued to the RI, a number of times a reissue permission was performed, and whether a split of the rights object is possible; and
receiving a response with respect to the query from the RI, and determining whether the second rights object is processed according to the response.

28. The method of claim 27, wherein the response corresponds to a repurchase request response in the receiving and determining, and
the receiving and determining further comprises providing the manager with a user interface for repurchasing the rights object according to the repurchase request response.

29. A computer-readable recording medium storing a program for implementing the
method according to any one of claims 1 through 28.

30. A local contents providing system which provides a local system with encrypted contents, the system comprising:

a contents request receiver receiving a contents transmission request which transmits first contents encrypted in a first DRM method from a user to a second user terminal which supports a second DRM method;

a contents/rights object converter converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and

a contents transmitter transmitting the second contents and the second rights object to the second user terminal.

31. The system of claim 30, wherein the local contents providing system is realized in either a software module executing in a first user terminal of the user, or a hardware device performing in the first user terminal, and the first user terminal and the second user terminal are connected via a wired/wireless communication module.

32. The system of claim 30, wherein the first rights object issued from a predetermined RI comprises either a decryption key with respect to the first contents, or usage authority information with respect to the first contents, and the second rights object is either generated by converting the first rights object, or is reissued from the RI by referring to the usage authority information included in the first rights object.

33. The system of claim 30, wherein the contents/rights object converter comprises:

a memory allocator allocating a memory area of a regular size to a predetermined memory device attached to the first user terminal;

a DRM converter dividing the first contents into at least two piece files, recording the divided at least two piece files in the memory area, performing decryption with respect to the corresponding piece file, and encrypting the decrypted piece file into
the second DRM method; and

a contents generator merging at least one piece file encrypted in the second DRM method, and generating the second contents.

34. The system of claim 30, wherein the hardware device corresponds to any one of either a chip or a bridge cable.

35. The system of claim 30, wherein the contents/rights object converter comprises a contents/rights object transceiver requesting the second contents encrypted in the second DRM method, and the second rights object to be sent to a predetermined contents providing server and an RI via a communication network, and receiving the second contents encrypted in the second DRM method, and the second rights object from the contents providing server and the RI.

36. A local contents providing system which provides a local system with encrypted contents, the system comprising:

a contents request receiver receiving a contents transmission request, which transmits first contents encrypted in a first DRM method, from a first user terminal connected via a wired/wireless communication network to a second user terminal which supports a second DRM method;

a contents/rights object converter converting the first contents and a first rights object which corresponds to the first contents into second contents encrypted in the second DRM method, and a second rights object in a converting module according to the contents transmission request; and

a contents transmission controller controlling to transmit the second contents and the second rights object to the second user terminal.

37. The system of claim 36, wherein the contents transmission request comprises the first rights object which corresponds to the first contents, and the first rights object issued from a predetermined RI comprises either a decryption key with respect to the first contents, or usage authority information with respect to the first contents.
38. The system of claim 36, wherein the second rights object is either generated by converting the first rights object transmitted with the first contents from the first user terminal, or is reissued from a predetermined RI by referring to the usage authority information included in the first rights object.

39. The system of claim 36, wherein the contents transmission controller controls to transmit the second contents and the second rights object to the first user terminal, and transmit the second contents and the second rights object from the first user terminal to the second user terminal via a predetermined wired/wireless communication module.

40. The system of claim 36, wherein the contents transmission controller controls a communication network system to transmit the second contents and the second rights object to the second user terminal via a wired/wireless communication network.

41. A local contents providing system which provides a local system with encrypted contents, the system comprising:

- a communication module receiving, from a predetermined contents providing server, encrypted contents via a communication network, the encrypted contents using a predetermined DRM method, and receiving, from a predetermined RI, a rights object which provides a local system with the encrypted contents via a communication network;

- a contents information database maintaining the encrypted contents and the rights object which corresponds to the contents;

- a database manager recording, in the contents information database, the encrypted contents and the rights object which corresponds to the contents;

- a user interface module receiving a contents transmission request which transmits the contents from a manager of the local contents providing system to the local system;

- a rights object processor reading and extracting a rights object which corresponds to the contents by referring to the contents information database, and converting the read and extracted rights object into a second rights object transmitted to
the local system; and

a contents transmitter transmitting the contents including the second rights
object to the local system.

42. The system of claim 41, wherein the rights object comprises either a decryption
key with respect to the contents or usage authority information with respect to the
contents, and

the rights object processor processes the second rights object transmitted to the
local system by referring to the usage authority information included in the read and
extracted rights object.

43. The system of claim 42, wherein the rights object processor comprises a rights
object generator generating the second rights object including second usage authority
information which controls at least one piece of information from among a usage period,
a number of replayable times, a number of transmissible times, target local system
information, and target user information of the contents included in the usage authority
information of the rights object, and

the database manager updates the usage authority information of the rights
object according to the second usage authority information included in the second rights
object, and records the updated usage authority information in the contents information
database.

44. The system of claim 41, wherein the rights object processor comprises:

a log information provider recording, in a predetermined log information
recording device, log information according to the processing of the rights object, and
reading and extracting the log information recorded in the log information
recording device, and transmitting the log information to the RI when a log information
request is received from the RI.

45. The system of claim 41, wherein the rights object processor comprises a log
information provider recording, in a predetermined log information recording device,
log information according to the processing of the rights object, and transmitting the log
information recorded in the log information recording device to the RI at predetermined
intervals.

46. The system of claim 41, wherein the contents transmitter comprises a report
message transmitter transmitting, to the RI, report data according to the transmitting of
the contents including the second rights object.

47. The system of claim 41, wherein the rights object which corresponds to the
contents transmitted to the local contents providing system is issued from the RI
according to meta information of the contents.

48. The system of claim 41, wherein the usage authority information of the rights
object stored in the contents information database comprises reissue permission
information of the rights object.

49. The system of claim 41, wherein the usage authority information included in
the second rights object processed from the rights object excludes reissue permission
information of the rights object.
FIG. 1

101

FIRST CONTENTS PROVIDING SERVER (DRM 1)

102

103

SECOND CONTENTS PROVIDING SERVER (DRM 2)

104
FIG. 4

<<USER>>

INPUT CONTENTS TRANSMISSION REQUEST WHICH TRANSMITS FIRST CONTENTS ENCRYPTED IN FIRST DRM METHOD TO SECOND USER TERMINAL

<<DRM CONVERSION SYSTEM>>

S401

RECEIVE CONTENTS TRANSMISSION REQUEST

S402

CONVERT FIRST CONTENTS AND FIRST RIGHTS OBJECT INTO SECOND CONTENTS ENCRYPTED IN SECOND DRM METHOD, AND SECOND RIGHTS OBJECT

S403

TRANSMIT SECOND CONTENTS AND SECOND RIGHTS OBJECT TO SECOND USER TERMINAL

S404
FIG. 5

1. ALLOCATE MEMORY AREA OF REGULAR SIZE TO MEMORY DEVICE (S501)
2. DIVIDE FIRST CONTENTS INTO AT LEAST TWO PIECE FILES (S502)
3. PERFORM DECRYPTION WITH RESPECT TO CORRESPONDING PIECE FILE (S503)
4. ENCRYPT DECRYPTED PIECE FILE INTO SECOND DRM METHOD (S504)
5. ARE ALL PIECE FILES ENCRYPTED INTO SECOND DRM METHOD? (S505)
   - NO
6. YES
   - MERGE AT LEAST ONE PIECE FILE, AND GENERATE SECOND CONTENTS (S506)
**FIG. 6**

**<<USER>>**

INPUT CONTENTS TRANSMISSION REQUEST WHICH TRANSMITS FIRST CONTENTS ENCRYPTED IN FIRST DRM METHOD TO SECOND USER TERMINAL

**<<DRM CONVERSION SYSTEM>>**

S601

RECEIVE CONTENTS TRANSMISSION REQUEST

S602

CONVERT FIRST CONTENTS AND FIRST RIGHTS OBJECT INTO SECOND CONTENTS ENCRYPTED IN SECOND DRM METHOD, AND SECOND RIGHTS OBJECT

S603

CONTROL TO TRANSMIT SECOND CONTENTS AND SECOND RIGHTS OBJECT TO SECOND USER TERMINAL

S604
FIG. 7

700

710

CONTENTS REQUEST RECEIVER

CONTENTS TRANSMITTER

730

720

CONTENTS/RIGHTS OBJECT CONVERTER

721

MEMORY ALLOCATOR

722

DRM CONVERTER

723

CONTENTS GENERATOR

724

CONTENTS/RIGHTS OBJECT TRANSCEIVER
FIG. 8

800

810
CONTENTS REQUEST RECEIVER

820
CONTENTS/RIGHTS OBJECT CONVERTER

821
CONTENTS/RIGHTS OBJECT TRANSCEIVER

830
CONTENTS TRANSMISSION CONTROLLER
**FIG. 10**

1. **S1001**
   - RECEIVE, FROM PREDETERMINED CONTENTS PROVIDING SERVER, ENCRYPTED CONTENTS

2. **S1002**
   - RECEIVE, FROM PREDETERMINED RI, RIGHTS OBJECT WITH RESPECT TO CONTENTS

3. **S1003**
   - RECORD, IN CONTENTS INFORMATION DATABASE, CONTENTS AND THE RIGHTS OBJECT WHICH CORRESPONDS TO CONTENTS

4. **S1004**
   - RECEIVE CONTENTS TRANSMISSION REQUEST WHICH TRANSMITS CONTENTS FROM MANAGER OF LOCAL CONTENTS PROVIDING SYSTEM TO LOCAL SYSTEM

5. **S1005**
   - READ AND EXTRACT RIGHTS OBJECT WHICH CORRESPONDS TO CONTENTS

6. **S1006**
   - PROCESS SECOND RIGHTS OBJECT TRANSMITTED TO LOCAL SYSTEM BY REFERRING TO USAGE AUTHORITY INFORMATION INCLUDED IN RIGHTS OBJECT

7. **S1007**
   - TRANSMIT CONTENTS INCLUDING SECOND RIGHTS OBJECT TO LOCAL SYSTEM
## FIG. 11

<table>
<thead>
<tr>
<th>CONTENTS 1101</th>
<th>RIGHTS OBJECT 1102</th>
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FIG. 12

1200

1210  COMMUNICATION MODULE

1220  CONTENTS INFORMATION DATABASE

1230

1240  USER INTERFACE MODULE

1250  RIGHTS OBJECT PROCESSOR

1251

1260  CONTENTS TRANSMITTER

RIGHTS OBJECT GENERATOR
A. CLASSIFICATION OF SUBJECT MATTER

G06F 15/00(2006.01)i, G06F 17/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC8 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS(KIPO internal) "DRM content encrypt"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Relevant to claim No</th>
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<td>EP 1486850 A2 (SONY ERICSSON MOBILE COMMUNICATIONS AB) 15 November 2004</td>
<td>1, 2, 10, 12, 29-31, 36, 39, 40</td>
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* Special categories of cited documents
  "X" document defining the general state of the art which is not considered to be of particular relevance
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"&" document member of the same patent family

Date of the actual completion of the international search
13 APRIL 2007 (13 04 2007)

Date of mailing of the international search report
13 APRIL 2007 (13.04.2007)

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea
Facsimile No 82-42-472-7140

Authorized officer
YEON, Won Hyeon
Telephone No 82-42-481-5696

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