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DYNAMIC CONSTRAINTS FOR CONTENT RIGHTS**BACKGROUND OF THE INVENTION**

1. The Field of the Invention

The present invention relates to digital content and related devices. More particularly, embodiments of the invention relate to the management of digital rights in digital content.

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2. The Relevant Technology

Digital media is becoming ubiquitous in our society. Many people have access to digital content in one form or another. Not surprisingly, there are many different types of devices that can play the digital content. Personal audio players such as mp3 players, for example, can play digital audio content. Personal audio players enable media content to be loaded from a user's library as well as added to the library by purchasing audio content over the Internet.

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One of the concerns with devices that can play digital content such as personal audio players relates to copyright concerns. In fact, the rights of a user, the owner, and the provider of digital content are a major concern.

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One of the ways that these concerns are addressed is through the use of digital rights management ("DRM"), which generally refers to various schemes that are intended to control access to digital media such as digital audio or video. Digital rights management is not limited to copyright concerns however, and can be used by the provider of the content to impose restrictions in addition to normal copyright protections.

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In sum, digital rights is an issue that is difficult to manage because content can be received from different types of sources, in different formats, and over different types of networks. The ability to manage the rights associated with the content in various contexts is currently not manageable with conventional DRM schemes.

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BRIEF SUMMARY OF THE INVENTION

These and other limitations are overcome by embodiments of the present invention, which include a device that can play digital media. The device comprises a connection for receiving content over a network and a digital rights management ("DRM") data structure that identifies rights for the received content. The content can be received from one or more content providers, over one or more channels for at least one content provider, and over one or more networks (including a wired and/or a wireless network).

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5 The content received by the device can be protected according to the invention. In one embodiment, the content is protected by receiving the content from a provider, and identifying at least one of: an aspect of the device's state when the content is received; and a channel associated with the content. This information can be used to access a digital rights management data structure and identify rights for the content. Once the
10 rights have been identified, they are applied to the content to prevent and/or permit certain activities with respect to the content.

 According to another embodiment, content is accessed and identifiers associated with the content are identified. The identifiers can include a content provider of the content, a network type over which the content is accessed, and a device state of the
15 device when the content is accessed. The identifiers are transmitted to a remote server, which uses the identifiers to access a digital rights management data structure and thereby identify rights associated with the content, which are transmitted to the device. The device receives the rights and applies them to the content to prevent and/or permit certain activities with respect to the content.

20 These and other advantages and features of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

 To further clarify the advantages and features of the present invention, a more
25 particular description of the invention will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in
30 which:

 Figure 1 illustrates an example environment for implementing embodiments of the invention;

 Figures 2A and 2B illustrate embodiments of digital rights management that may be implemented at a device where consumption of digital content typically occurs;

35 Figure 3 illustrates one embodiment of a display that presents some of the options available to a user based on the rights associated with the content;

 Figure 4 illustrates another display that presents options available to the user based on rights associated with the content;

5 Figure 5 illustrates a system and method for performing digital rights management; and

 Figure 6 illustrates perspective front and rear views of one embodiment of a device that implements digital rights management.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 Embodiments of the invention relate to a personal electronic device and to the management of digital rights associated with the device's digital content. In particular, embodiments of the invention relate to digital rights management in a wired or wireless enabled personal audio/video device. One of skill in the art, with the benefit of the present disclosure, can appreciate that embodiments of the invention can be practiced in
15 conjunction with other devices that may include, but are not limited to, personal digital assistants, cellular telephones, personal audio devices, satellite radios, and the like or any combination thereof.

 Embodiments of the invention provide a platform for digital content. The platform includes digital rights management. Advantageously, the platform of digital
20 rights management provides, by way of example, variable granularity regarding the implementation of the digital rights, dynamic implementation of digital rights, and the ability to update the digital rights as needed. The rights associated with specific content or with specific groupings of content can be updated by the content provider at any time. By way of example only, media content or content refers to World Wide Web content,
25 digital or analog audio/video content in various formats, images in various formats, and the like or any combination thereof.

 In one example, an 802.11 enabled personal audio/video device can receive content over a wireless network. The content can be delivered by various content providers. Embodiments of the invention can also dock with another device such as a
30 computer for various reasons (e.g., altering stored content) and perform in a similar manner over the computer's connection.

 Figure 1 illustrates one embodiment of a device 100 that includes a platform for digital rights management. The device 100 has a user interface 102 that includes a display 104 and an input mechanism 106. The input mechanism 106 may include, but is
35 not limited to, a click wheel, buttons, soft keys, and the like or any combination thereof. Using the user interface 102, a user can navigate content stored on the device, configure device settings, select channels, select specific networks, and the like.

5 The device 100 is preferably a network connectable device. Thus, the device 100 may include a connection for accessing one or more networks. The device, for example, may include the ability to access multiple types of wireless networks, including 802.11 related networks (e.g., WiFi) and others using the antenna 118, which may be part of the connection. The device 100, in addition to 802.11 type networks, may have access to
10 other radio frequency networks such as a cellular network, a satellite network, and/or terrestrial RF networks (e.g., WiMAX, AM, FM, DAB (digital audio broadcasting)), etc.

 The device 100, for example, may be able to access the Internet through a hardwired connection or a wireless access point (e.g., a WiFi hotspot). Once connected to the Internet, the device 100 may interact with multiple content providers, represented by
15 the content providers 122 and 124. In one embodiment, the device 100 may access satellite broadcast content over the Internet rather than over a satellite network. The device 100 may also be able to access terrestrial radio broadcasts (digital radio, FM, AM, and the like). Further, the device 100 may also be able to receive and provide other media content, such as World Wide Web content, television content, video content and
20 the like or any combination thereof. The network 120 represents, in one example, a wireless access point, the Internet, a local or wide area network, a satellite network, an RF network, and the like or any combination thereof.

 In one example, the device 100 may be a wireless-enabled personal music device that can access media content through the Internet using wireless network connections
25 including WiFi wireless connections. The user of the device 100 can access media content whenever the device 100 is within range of a wireless access point or whenever access to a network is present.

 The device 100 also includes a processor 110, memory 112 and various modules 116. The modules 116 represent the software or computer executable instructions that,
30 when executed, cause the device to access networks, download content, manage content, provide and control the user interface including the display 104, record media content, and the like or any combination thereof. In one embodiment, the modules 116 include a digital rights management ("DRM") module 116 that implements digital rights management in the device 100, as will be discussed more fully below. The memory 112
35 may store media content from the user's library on another device or may store a library of media content that has been recorded or purchased over the wireless connection or that has been shared with the device 100 from another user.

5 The device 100 can also include a DRM data structure 114 stored in memory 112. While the DRM module 116 and the DRM data structure 114 are depicted as separate components, they can be integrated into a single component. In particular, the DRM module 116 can include the DRM data structure 114. Alternatively, the DRM module may access the data structure 114 locally or remotely. As indicated above, digital rights
10 management is typically intended to protect the copyright interests of the content providers or to implement policies of the content provider. Embodiments of the invention can integrate existing DRM schemes and provide additional rights management.

 In one embodiment, the DRM module 116/DRM data structure 114 augment traditional DRM implementations through the use of a multi-dimensional matrix or other
15 structure that enables rights to be protected. While the DRM data structure 114 can be implemented on the device 100 as illustrated, it can also be backed up on a remote server if desired. Alternately, the DRM data structure 114 can be implemented solely on a remote server or primarily on a remote server with a backup on the device 100. The backup copy of the DRM data structure 114 enables a device to be quickly restored with
20 the relevant rights if necessary.

 The DRM data structure 114 can be used by the DRM module 116 to identify the appropriate rights in a wide variety of different contexts and enable rights associated with media content to be described or implemented by the device 100. As described previously, the rights associated with specific content can depend on the content provider,
25 the way that the content is delivered, the format of the content, the network connection, and other factors. The DRM data structure 114 and DRM module 116 enable the device as well as content providers to set or identify those rights based on various factors.

 There are various ways or contexts in which the DRM data structure 114 may be used or accessed. In one example, the device 100 may use the DRM data structure 114
30 and DRM module 116 to contact a service or content provider in order to authorize the device. The device 100 can contact the service or content provider immediately when access to content is desired, or within some pre-determined period of time, and the like. The ability to authorize the device within some period of time may ensure device functionality, for example, in situations where a network connection may not be
35 available. In one embodiment, the rights identified in the DRM data structure 114 and accessible by the DRM module 116 can be temporally cached so that if the user does not have a network connection, the content may still be experienced. For example, each time that the content is accessed, an attempt is made to access the service or content provider.

- 5 If successful, it resets the timer on the temporal cache. If unsuccessful, it uses the cached copy so long as the cached copy is not stale (that is, it has not exceeded the time threshold for checking in with the service).

In another example, the DRM data structure 114 can be accessed by the content provider 122. The ability of a content provider 122 to access the DRM data structure 114 therefore provides the content provider 122 with a way to update rights as needed or
10 whenever the content provider 122 desires to change the rights. The device 100 can then immediately implement those rights. There are various situations, for example, when the rights associated with content can change. Content rights often change over time, for example. The use of the DRM data structure 114 and DRM module 116 enables those
15 changes to be made effective at a device level and enables the rights of different users with different devices to easily account for differences between devices, differences between user subscriptions, differences between content providers, differences between networks, and the like or any combination thereof.

In one embodiment, the DRM data structure 114 comprises a multi-dimensional
20 DRM matrix that includes axes and/or entries that are related to: 1) channels or songs; 2) states of local device (e.g., channels, device capabilities, subscription, content of provider, content delivery); and 3) actions permitted and rights protected. In one embodiment, each entry in the DRM matrix corresponds to specific rights for a given situation that can be described in terms of the axes of the DRM matrix.

25 As indicated above, one of the axes of the DRM matrix may be the device state. In some instances, the state of the local device is determined in part by the results of previous interactions with a service or content provider to set the device's capabilities, channels, subscription level, and the like or any combination thereof. Other aspects of the device state include the type of device, its capabilities, the media usage behavior of the
30 device since the device last communicated with the service, and the like or any combination thereof.

When decisions relating to rights are based on a matrix of criteria, such as may be included in the DRM data structure 114, the device state may also include state that is established by a service or content provider during prior communications or during a
35 current communication. For example, a service or other content provider may participate and/or manage the coordination of multiple DRM schemes, rights sets, subscription levels, and the like or any combination thereof. For example, a service can coordinate the management of DRM schemes for multiple content providers and/or multiple content

5 owners. The device and the service can cooperate over the network to enforce the specific rights set in the DRM, even in situations where network communication is lost or currently not present.

As previously described, the DRM matrix can have one or more axes. Note that, while described as comprising a DRM matrix, the DRM data structure 114 can be
10 represented in other manners and may be resident on the device and/or on a remote server. Thus, the device may simply transmit the various identifiers (e.g., content provider, network type, device state) to the remote server and the remote server can access a DRM data structure (such as a DRM matrix) and return the relevant rights for the configuration identified by the device.

15 A matrix configuration for the DRM data structure 114 is useful because different types of content have different types of permitted activities according to the preferences of the content owners or of the content providers and/or the associated copyrights. Some content, for example, can be recorded whereas other content cannot be recorded. The DRM data structure 114 enables the permitted actions with regard to content to be
20 expansive, scalable, and customizable. Further, the permitted actions can be arbitrary. For example, sharing permissions, ability to play back the content a specified number of times, volume limits, and the like are examples of rights that may be applied to the content.

For example, the rights identified in the DRM data structure and enforced by the
25 DRM module for content received from a first content provider such as a satellite radio content provider may prevent the content from being recorded while the rights for the same content received over a terrestrial network may allow the content to be recorded. In this case, the content provided by the satellite radio content provider can be received over the satellite network or over the Internet through a wireless access point or a hardwired
30 connection. The rights identified in the DRM data structure 114 and enforced by the DRM module 116 may depend on whether the content is received over the Internet or over a satellite network.

Beneficially, the content provider may have the ability to access the DRM data structure 114 and change the rights stored therein. This is particularly true when the
35 device 100 is accessing the content via a wireless access point. The protocol of this type of connection enables easily established bi-directional communication with the content provider. Alternatively, a user may be able to access updates to the DRM data structure 114 manually or automatically. In this case, content providers may post their rights to a

5 website and the device 100 may be able to update its DRM data structure 114 by accessing the website.

Conventional DRM schemes rely on static interpretations of rights in that the rights are created at the time the content is loaded and cannot typically be changed after creation. The DRM data structure 114 described herein provides dynamic rights that can
10 be changed and are not static. In some instances, the rights are related to the transport method, dynamic rights checking, state variables in addition to time, and the like. In other words, the accessing of the DRM data structure 114 extends the traditional capabilities of DRM by allowing for these rights to change based on input from at least one of the content holder, content owner, or content provider.

15 Figures 2A and 2B illustrate embodiments of a DRM matrix which may be implemented in the DRM data structure 114 of Figure 1. For simplicity and ease of illustration, Figure 2A illustrates a two-dimensional DRM matrix 200 and Figure 2B illustrates a three-dimensional matrix 250. In Figure 2A, the DRM matrix 200 has axes that include a source 202 and a device state 204. Each entry in the DRM matrix 200
20 includes the rights for the various permutations or configurations that are possible based on the axes.

The source 202 can typically be determined by the device 100. Alternatively, the source information may be included in the stream of content delivered to the device 100. A content provider is one example of a source 202. The DRM data structure 200 allows
25 rights to be set for content from each source. Furthermore, the rights for each source may depend on the device state 204.

The device state 204 may refer to how the device is operating and can also be identified by the device. The device state may include a subscription level of the device. For instance, the rights available to a device at a first subscription level may exceed the
30 rights available to the device at a second subscription level. In addition to the specific examples already given, the device state 204 may refer to the network over which content is being received (e.g., Internet, satellite, terrestrial radio). Device state may also include such items as number of times some particular content has been accessed.

Once the source 202 and the device state 204 are determined, the corresponding
35 entry in the DRM matrix 200, such as the entry 206, then identifies the rights that are applicable to the content being received or played. Once the rights are identified, those rights can be implemented for relevant content by the DRM module 116 on the device

5 100. As previously indicated, the device may also access a content provider based on the entry 206 to authorize the device 100 according to those specific rights in one example.

This enables the rights associated with various content sources and/or providers to be implemented dynamically. As previously indicated, the DRM matrix 200 can also be updated by a particular source or for a particular device state without impacting other
10 rights associated with other device states. In some instances, the service or content provider may be able to push rights to the device as changes are made. The device may also be able to pull updated rights from the DRM matrix 200 automatically.

Figure 2B illustrates one embodiment of a three-dimensional DRM matrix 250. The DRM matrix 250 may have similar functionality as compared to the DRM matrix 200
15 of Figure 2A. However, the DRM matrix 250 has a third axis which enables finer granularity in providing digital rights management. In the present case, the DRM matrix 250 has axes that include content provider 252, device state 254, and channel 256. As previously indicated, the device 100 may be configured to identify the content provider 252 and the device state 254. Additionally, the device 100 may be configured to identify
20 the channel 256. Alternately, the content provider 252, device state 254 and channel 256 information may be included in the stream of content delivered to the device 100.

The channel may be a particular stream of content and may refer to one of the channels of content offered by a satellite radio provider or to a channel of content from a terrestrial radio, online radio, or online provider of media content. In each case, the DRM
25 matrix 250 enables the various content providers 252 of the channels 256 to set rights according to specific channels of content. Further, the rights may additionally depend on the device state 254. For example, a satellite radio content provider that delivers content to a device over the Internet may provide multiple channels of content (e.g., a rock channel, a country channel, a sports channel). The DRM matrix 200 may include one or
30 more rights entries for each of these channels and for different device states. Thus, the content provider can specify rights based on a per channel basis as well as using other factors, such as device state, if desired.

As with the DRM matrix 200 of Figure 2A, once the content provider 252, device state 254 and channel 256 are identified, a corresponding entry, such as the entry 260,
35 then identifies the rights that are applicable to the content being received or played. Those rights can be implemented for relevant content by the DRM module 116 and/or a content provider can be accessed based on the entry 260 to authorize the device 100 according to those specific rights.

5 One advantage of the DRM matrices 200 and 250 is that they can be related to and/or used to control a dynamic interface that may reflect the specific rights in the DRM matrices 200, 250. For example, a device may have the ability to save content, record content, share content, and the like or any combination thereof. Often these abilities are dependent on the rights associated with the content as identified in the DRM matrices 200
10 and 250.

 One of skill in the art, with the benefit of this disclosure, can envision other methods for implementing DRM as described herein, including using a database in place of the multi-dimensional matrix. Further, one of skill in the art can also appreciate that a DRM matrix can have four or more dimensions. These dimensions can be used to further
15 specify rights to content in any manner desired. For example, the DRM matrix may have an artist axis, a song axis, a subscription axis, a network axis, and the like or any combination thereof. Thus, a DRM matrix provides fine granularity as well as scalability to content providers and/or to artists.

 Embodiments of the invention can update the user interface dynamically. Figure
20 3, for example, illustrates a display 300 that presents the permitted activities available to the user for a particular channel as identified in the DRM matrix 200 or 250. A user may be allowed, based on the rights 206 or 260 from the DRM matrix 200 or 250, for example, to save 302, share 304, or record 306 the content delivered to the device 100. The rights 208 or 262 for another channel of content, on the other hand may be different.
25 Figure 4 illustrates a display 400 that presents the permitted activities available to the user for this channel. More particularly, the user is allowed to share 402 the content.

 The display can therefore be updated dynamically as the user changes channels or switches sources or changes the device state, or any combination thereof. Thus, as a user browses the content that is accessible to a device or experiences content that is available
30 to the device, the user interface can dynamically reflect the rights afforded the user.

 Figure 5 illustrates a method for dynamically updating rights and/or for setting rights for content. In this example, a DRM module 502 operating on a device receives content 504 from a content provider. The DRM module 502 may be one embodiment of the DRM module 116 of Figure 1. The content can be received, as discussed herein, over
35 a wired network, over a wireless network including an 802.11 network, or over another wireless network such as a satellite network or a terrestrial radio network.

 The DRM module 502 receives or has access to the content 504 and to a DRM data structure 506, which may be one embodiment of the DRM matrix 200 or 250 of

5 Figure 2A or 2B, respectively. While illustrated separately, the DRM data structure 506 may be included within the DRM module 502. In this example, the DRM module 502 can determine the device state and/or the channel of the content from the device itself or from the content 504. Additionally, if the DRM data structure 506 includes three or more axes rather than two as in the present example, the DRM module 502 may determine
10 values for all of the axes.

With this information, the DRM module 502 can access the DRM data structure 506 to identify the rights 508 to be applied to the content 504. Additionally, the DRM module 502 can enforce the identified rights 508 by enabling certain activities specified in the rights 508 and/or can also provide the rights to a user interface of the device for
15 display to a user of the device.

Figure 5 further illustrates that a content provider 510 may have access to the DRM data structure 506, enabling the content provider 510 to change or update the rights stored in or accessible to the DRM data structure 506. For example, a particular content provider that previously prevented content from being recorded may make a change that
20 enables the content to be recorded. Advantageously, this will automatically be reflected to the display as previously described in one embodiment or this right will be enabled in the device 100. Alternatively, a content provider may open a window of time during which content can be freely shared or recorded. A content provider may also disable or delete one or more rights. More generally, the content provider or other authorized entity
25 can set the rights for the provided content or for a portion of the provided content.

Because the DRM data structure 506 has multiple dimensions, a content provider can also provide updates according to the various dimensions of the DRM data structure 506. A content provider, for example, can change rights for a particular channel, for a particular transport method for the content, for a particular artist, for a particular song,
30 album, video, and the like or any combination thereof that are supported by the DRM data structure 506.

The DRM data structure 506 can also be used by the DRM module to determine whether there is a permissible way to obtain content in a manner desired by the user. For example, the user may desire to record content, but currently be prevented from doing so.
35 The DRM module may query the DRM data structure to determine if there is a combination that enables the content to be recorded. Some solutions identified by the DRM module may include, but are not limited to, switching to a channel with different

5 rights on the content, purchasing the content, changing a user's service subscription, and the like.

In another embodiment, the content provider can include certain tags in the content 504 that can impact the rights in a dynamic fashion. For example, a tag may be included that enables content to be recorded for a certain time period. This could enable a
10 user to record a preview of a song and then share that preview with others for example. The tag that is included in this manner can be used to control any aspect of the content (e.g., volume control, number of times recorded media can be played/shared, quality of recording, and the like or any combination thereof).

Those skilled in the art will appreciate that various of the foregoing features of the
15 invention may be practiced alone or in network environments with many types of computer system configurations, including media players, satellite radio receivers, AM/FM transmitters or receivers, DAB transmitters or receivers, personal computers, hand-held devices, multi-processor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like.
20 Aspects of the invention may also be practiced in distributed computing environments where tasks are performed by local and remote processing devices that are linked (either by hardwired links, wireless links, or by a combination of hardwired or wireless links) through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

25 Figure 6 illustrates perspective views of one embodiment of a personal audio and/or video device with display and navigation mechanisms that can be used in conjunction with the features of the present invention. Figure 6 illustrates one view of the rear portion 602 of the device and two views of the front portion 604 and 606. In this example, the device is a hand-held device, although larger devices can also be used. The
30 device includes a display 608 having various display methods. A user can interact with the device using a touchpad 610, electro-mechanical keys on a keypad, such as arrow keys and alphanumeric keys, soft keys 614 on display 608, a navigation wheel, other device buttons 618, a remote control device (not shown) associated with the device, voice commands, or by moving the communication device in a particular way. The device may
35 also include port 616 for connecting audio headgear and port 612 for connecting the device to a docking station or connector for charging the device. Of course, the device can include any of a variety of configurations and designs that are contemplated within the scope of the present invention.

5 Embodiments of the device may include computer-readable media for carrying or having computer-executable instructions or data structures stored thereon. Such computer-readable media can be any available media that can be accessed by a portable device or general purpose or special purpose computer. By way of example, and not limitation, such computer-readable media can comprise RAM, ROM, EEPROM, CD-
10 ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a portable device or general purpose or special purpose computer. When information is transferred or provided over a network or another communications
15 connection (either hardwired, wireless, or a combination of hardwired and wireless) to a computer, the computer properly views the connection as a computer-readable medium. Thus, any such connection is properly termed a computer-readable medium. Combinations of the above should also be included within the scope of computer-readable media. Computer-executable instructions comprise, for example, instructions and data
20 which cause a general purpose computer, special purpose computer, or special purpose processing device to perform a certain function or group of functions.

 Although not required, the invention may be described in the general context of computer-executable instructions, such as program modules, being executed by computers in network environments. Generally, program modules include acts, routines,
25 programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Computer-executable instructions, associated data structures, and program modules represent examples of the program code means for executing acts of the methods disclosed herein. The particular sequence of such executable instructions or associated data structures represents examples of corresponding
30 acts for implementing the functions described in such acts.

 The devices may also include a magnetic hard disk drive for reading from and writing to a magnetic hard disk, a magnetic disk drive for reading from or writing to a removable magnetic disk, or an optical disk drive for reading from or writing to removable optical disk such as a CD-ROM or other optical media. The device may also
35 include non-volatile memory including flash memory. The drives and their associated computer-readable media provide nonvolatile storage of computer-executable instructions, data structures, program modules and other data. Although the example environment described herein may employ a magnetic hard disk, a removable magnetic

- 5 disk and/or a removable optical disk, other types of computer readable media for storing data can be used, including magnetic cassettes, flash memory cards, digital versatile disks, Bernoulli cartridges, RAMs, ROMs, and the like.

Program code means comprising one or more program modules may be stored on the hard disk, magnetic disk, optical disk, ROM or RAM, including an operating system,
10 one or more application programs, other program modules, and program data. A user may enter commands and information through a keyboard, pointing device, or other input devices (not shown), such as a microphone, joy stick, touch pad, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit through a universal serial bus (USB) or serial port interface coupled to system bus.
15 Alternatively, the input devices may be connected by other interfaces, such as a parallel port, or a game port. A display device is also connected to system bus via an interface, such as video adapter.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be
20 considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

CLAIMS

What is claimed is:

- 5 1. A device that can play digital media, the device comprising:
 a connection that receives content over a network; and
 a digital rights management module that identifies and enforces rights for the
 content by accessing a data structure that stores the rights for the content, wherein the
 data structure comprises a multi-dimensional matrix, the matrix including a plurality of
10 axes and a plurality of entries, each entry in the matrix corresponding to specific rights
 for a given situation described in terms of the axes of the matrix, and wherein the
 content is one or more of:
 received from one or more content providers;
 received over one or more channels for at least one content provider; and
15 received over one or more networks.
2. The device of claim 1, further comprising a user interface, wherein the user
 interface is configured to display to a user of the device one or more activities that are
 permitted for the content, the one or more permitted activities based on the rights
20 identified for the content.
3. The device of claim 1, wherein rights applicable to specific content are
 identified by accessing the data structure using one or more of a channel, a content
 provider, and a device state identified by the digital rights management module.
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4. The device of claim 3, wherein the one or more content providers can access the
 data structure to update the rights applicable to specific content.
5. The device of claim 1, wherein the data structure comprises a temporal cache
30 stored on the device, such that the digital rights management module can identify and
 enforce the rights by accessing the temporal cache as long as the temporal cache is not
 stale.

6. The device of claim 1, wherein the device accesses a service to enforce rights in the data structure.
- 5 7. The device of claim 1, wherein the data structure is updated periodically either by the device or by a remote service.
8. The device of claim 1, wherein the axes comprise a channel or source of content and a device state.
- 10 9. The device of claim 8, wherein the device state comprises one or more of:
a type of the device;
one or more capabilities of the device;
media usage behavior of the device since the device last communicated with a
15 service, wherein the service cooperates with the digital rights management module to set and/or enforce rights for the content;
subscription level; and
network type.
- 20 10. The device of claim 1, wherein the one or more networks over which content can be received include at least one wireless network.
11. A method for protecting content using digital rights management, the method comprising:
25 receiving content from a content provider;
identifying at least one of a device state and a channel associated with the content received from the content provider;
accessing a digital rights management data structure to identify rights for the content, wherein the data structure comprises a multi-dimensional matrix, the matrix
30 including a plurality of axes and a plurality of entries, each entry in the matrix corresponding to specific rights for a given situation described in terms of the axes of the matrix,; and

applying the rights to the content.

12. The method of claim 11, further comprising updating a user interface based on the rights associated with the content.

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13. The method of claim 12, wherein the updated user interface displays to a user of the device one or more activities that are permitted for the content, the one or more permitted activities based on the rights associated with the content.

10 14. The method of claim 13, wherein the one or more permitted activities include one or more of: recording the content, saving the content, sharing the content, playing the content a specified number of times, and playing the content above or below one or more specified volume levels.

15 15. The method of claim 13, wherein the one or more permitted activities do not include an activity desired by a user, the method further comprising querying the digital rights management data structure to determine whether the activity desired by the user can be obtained by receiving the content in a different manner.

20 16. The method of claim 15, wherein receiving the content in a different manner comprises one or more of: receiving the content while the device is in a device state different than the identified device state; and receiving the content from a channel different than the channel associated with the content, the different channel also being associated with the content.

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17. The method of claim 11, further comprising receiving an update to the digital rights management data structure from a content provider, the update changing one or more rights associated with a particular content.

30 18. In a device for accessing content, a method for protecting content using digital rights management, the method comprising:

accessing content using a device;

identifying one or more identifiers associated with the content, the device, or both, wherein the identifiers are selected from the group including: content provider, network type, and device state;

transmitting the one or more identifiers to a remote server;

- 5 receiving one or more rights from the remote server, the one or more rights associated with the content and identified by the remote server, wherein the remote server identifies the one or more rights by accessing a digital rights management data structure using the one or more identifiers, and wherein the data structure comprises a multi-dimensional matrix, the matrix including a plurality of axes and a plurality of
10 entries, each entry in the matrix corresponding to specific rights for a given situation described in terms of the axes of the matrix,; and
applying the rights to the content.

19. The method of claim 18, wherein applying the rights to the content includes
15 displaying, in a user interface of the device, one or more permissible activities for the content, the one or more permissible activities determined by the one or more received rights.

20. The method of claim 19, wherein the one or more permissible activities include
20 one or more of: recording the content, saving the content, sharing the content, playing the content a specified number of times, and playing the content above or below one or more specified volume levels.

21. The method of claim 19, further comprising, in response to accessing second
25 content and receiving one or more rights associated with the second content, updating the user interface to display one or more permissible activities for the second content, the one or more permissible activities for the second content determined by the one or more received rights associated with the second content.

- 30 22. The method of claim 18, further comprising storing the one or more rights associated with the content in a temporal cache on the device.