A media broker includes a communication interface communicatively coupling the media broker to one or more media storage devices and one or more renderers and a controller associated with the communication interface adapted to transmit a request for location information to one or more renderers, receive location information from each of the one or more renderers and determine, based upon the received location information, one or more viewing areas each comprising at least one of the one or more renderers. And then applying the media restrictions assigned to the renderers in those viewing areas, while still allowing media storage devices detected in any viewing area to record media of any rating.
FIG. 4

2000. DETECT VIEWER PROXIMITY TO VIEWING AREA

2010. TRANSMIT VIEWER IDENTIFY INFORMATION

2020. REQUEST VIEWER INFORMATION

2030. RECEIVE VIEWER INFORMATION COMPRISING ASSOCIATED MEDIA ITEM CONTENT RATING CLEARANCE

2040. ADJUST MEDIA ITEM ACCESS PARAMETER OF VIEWING AREA BASED UPON MEDIA ITEM CONTENT RATING CLEARANCE

2050. ALERT SYSTEM ADMINISTRATION
FIG. 9
METHOD AND SYSTEM FOR APPLYING CONTENT RESTRICTIONS TO RENDERERS IN IDENTIFIED NETWORK VIEWING AREAS

RELATED APPLICATIONS

[0001] This application claims the benefit of provisional patent application Ser. No. 61/173,628, filed Apr. 29, 2009, the disclosure of which is hereby incorporated by reference in its entirety.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to a system and method for applying content restrictions to viewing areas.

BACKGROUND DISCLOSURE

[0003] The V-Chip (i.e., violence chip or viewer control chip) is a technology that emerged in the mid 1990’s as the primary mechanism for parental control for restricting access to media items unsuitable for minors. Television receivers with the V-Chip block access to programs based on each program’s rating (as transmitted on line 21 of the vertical blanking interval). A four digit code is needed to unlock the content for viewing. These controls also work with time-shifted content. In other words, programs recorded on a Digital Video Recorder (DVR) similarly require the 4 digit code in order to permit viewing.

[0004] The current television rating system in the United States (US) recognizes several categories of ratings for media items: TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA. Many systems today (such as those from Verizon FIOS) also include the ability to offer parental controls based on the Motion Picture Association of America film rating system (e.g., G, PG, PG-13, R, NC-17).

[0005] The efficacy of the V-Chip as a parental control is questionable. Surveys show that only 15% of parents have ever used this feature. Despite the occasional multi-million dollar ad campaign to educate users, many parents are not even aware of the feature. V-Chip detractors cite studies that show that parental responsibility and involvement in the viewing habits of minors is the most effective parental control. Unfortunately, the V-Chip fails to provide true parental control in an environment where users (either visitors to a home or the members of the household) have devices with displays adequate for video viewing and network connectivity to access time-shifted content on a network of media storage repositories. There exists a need to improve upon drawbacks to the art described above.

SUMMARY

[0006] In accordance with an exemplary and non-limiting embodiment a media broker comprises a communication interface communicatively coupling the media broker to one or more media storage devices and one or more renderers and a controller associated with the communication interface adapted to transmit a request for location information to one or more renderers, receive location information from each of the one or more renderers and determine, based upon the received location information, one or more viewing areas each comprising at least one of the one or more renderers.

[0007] In accordance with another exemplary and non-limiting embodiment a method comprises transmitting a request for location information to one or more renderers, receiving location information from each of the one or more renderers and determining one or more viewing areas each comprising at least one of the one or more renderers.

[0008] In accordance with another exemplary and non-limiting embodiment a computer-readable medium embodied in an article of manufacture is encoded with instructions for directing a processor to transmit a request for location information to one or more renderers, receive location information from each of the one or more renderers and determine, based upon the received location information, one or more viewing areas each comprising at least one of the one or more renderers.

[0009] In accordance with another exemplary and non-limiting embodiment a renderer comprises a communication interface communicatively coupling the renderer to one or more media storage devices and a media broker; and a controller associated with the communication interface adapted to receive a request for location information from the media broker, determine a location of the renderer and transmit the location to the media broker.

[0010] In accordance with another exemplary and non-limiting embodiment a computer-readable medium embodied in an article of manufacture comprising a renderer is encoded with instructions for directing a processor to receive a request for location information from a media broker, determine a location of the renderer and transmit the location to the media broker.

[0011] In accordance with another exemplary and non-limiting embodiment a media broker comprises a communication interface communicatively coupling the media broker to one or more media storage devices and one or more renderers and a controller associated with the communication interface adapted to transmit a request in response to an occurrence of a trigger for location information to one or more renderers, receive the location information and determine a need to notify a system administrator based upon the received location information.

[0012] In accordance with another exemplary and non-limiting embodiment a computer-readable medium is embodied in an article of manufacture and comprises a media broker encoded with instructions for directing a processor to transmit a request in response to an occurrence of a trigger for location information of one or more renderers, receive the location information and determine a need to notify a system administrator based upon the received location information.

[0013] Those skilled in the art will appreciate the scope of the present invention and realize additional aspects thereof after reading the following detailed description of the preferred embodiments in association with the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0014] The accompanying drawing figures incorporated in and forming a part of this specification illustrate several aspects of the invention, and together with the description serve to explain the principles of the invention.

[0015] FIG. 1 illustrates a system according to an exemplary embodiment;

[0016] FIG. 2 is a sequence diagram illustrating the operation of the system of FIG. 1 according to an exemplary embodiment;

[0017] FIGS. 3A-3C illustrate exemplary graphical user interfaces (GUIs) for practicing exemplary embodiments;
FIG. 4 is a flow chart illustrating the operation of the system of FIG. 1 according to an exemplary embodiment;

FIG. 5 is a sequence diagram illustrating the operation of the system of FIG. 1 according to an exemplary embodiment;

FIG. 6 illustrates an exemplary GUI for practicing exemplary embodiments;

FIG. 7 is an illustration of a media broker according to an exemplary embodiment;

FIG. 8 is an illustration of a renderer according to an exemplary embodiment; and

FIG. 9 is an illustration of a user server according to an exemplary embodiment.

**Detailed Description of the Preferred Embodiments**

The embodiments set forth below represent the necessary information to enable those skilled in the art to practice the invention and illustrate the best mode of practicing the invention. Upon reading the following description in light of the accompanying drawing figures, those skilled in the art will understand the concepts of the invention and will recognize applications of these concepts not particularly addressed herein. It should be understood that these concepts and applications fall within the scope of the disclosure and the accompanying claims.

In accordance with exemplary embodiments disclosed herein, a system restricts access to media items based on the viewing location of the media item. Specifically, an automated system allows a user of the system to establish a set of viewing areas on, for example, a home network, and then to apply and enforce a set of media item rating restrictions to those viewing areas. As a result, the system serves to implement a viewing area wide restriction on the content of media items that is configurable by the user of the system.

In accordance with an exemplary and non-limiting embodiment a media broker comprises a communication interface communicatively coupling the media broker to one or more media storage devices and a controller associated with the communication interface. The controller is adapted to receive a request for a media item from a requesting device, to determine a location of the requesting device and to determine a media item access parameter associated with the location. The controller further operates to determine a media item rating of the media item and enable transmission of the media item to the requesting device if the media item access parameter is greater than or equal to the media item rating.

FIG. 1 illustrates a system 10 incorporating a media broker 12 communicatively coupled to a plurality of renderers 14, one or more media storage devices 16, and at least one repository of user information, such as user server 18.

As used herein, a “viewer” of a display device or renderer 14 for whom associated user information is stored, for example, in user server 18, may be interchangeably referred to as a “user” of system 10.

As used herein, “renderer” refers to any device capable of receiving a media item and displaying, playing or otherwise rendering the media item. Examples of renderers 14 include, but are not limited to, laptop computers, desktop computers, personal digital assistants (PDAs), mobile telephones, televisions (TVs), portable game players, and the like.

As used herein, “media storage device” refers to any and all devices capable of storing and outputting upon request one or more media items. Examples of media storage devices include, but are not limited to, data servers, digital video recorders (DVRs), computers, and the like.

As used herein, “media broker” refers to any device capable of (1) communicating with one or more media storage devices 16 to determine a set of media items stored on and accessible from one or more media storage devices 16, and media broker 12, (2) receiving requests from renderers 14 for media items stored on one or more media storage devices 16 and media broker 12, (3) and facilitating the streaming or transfer of a requested media item from a media storage device 16 or the media broker 12 to a renderer 14. As described more fully below, in an exemplary embodiment, media broker 12 operates as a centralized gatekeeper to receive requests from a renderer 14 at a known location to view media content, to determine if the requested media item is comprised of content that is appropriate for viewing at the location of the requesting renderer 14, and, if appropriate, enable the viewing of the media item at the renderer 14. While described herein as an entity separate and distinct from renderers 14, user server 18, and media storage devices 16, the present disclosure is drawn broadly to encompass devices which may combine the function of one or more renderers 14, user servers 18, and/or media storage devices 16 in a single device. As used herein, when referring to a device that incorporates, for example, both rendering and media content storage capabilities, such as a personal computer, references to a “renderer” and “media storage device” refer to those subsets of functionality of the device devoted to the performing the referenced functions.

As illustrated, the communicative coupling of media broker 12 to individual renderers 14, media storage devices 16 and user server 18 may be facilitated via network 20. Network 20 may be, but is not limited to, a hard wired local area network (LAN), a wireless network, or some combination thereof. As a result, media broker 12 can communicate with every renderer 14, media storage device 16 and user server 18 directly via the network 20. In addition to the network 20, various renderers 14, media storage devices 16 and user server 18 may engage in direct wireless communication with the media broker 12 according to, for example, one of the suite of IEEE 802.11 standards, the Bluetooth standard, or the like.

In general, as described more fully below, the media broker 12 operates to facilitate communication between renderers 14 and media storage devices 16 when it is determined that the media item stored in a media storage device 16 is appropriate for viewing at the renderer 14. In some exemplary embodiments, the media broker 12 facilitates communication between a media storage device 16 and a renderer 14, such as via network 20, whereby data flows between a media storage device 16 and a renderer 14 without passing through the media broker 12. In such embodiments, the media broker 12 supervises establishing the communication link between the media storage device 16 and the renderer 14, and may monitor the communication link. For example, the media broker 12 may enable a renderer 14 to receive and play a media item, such as a streaming music video, from media storage device 16 via network 20, comprising a Bluetooth connection, between the renderer 14 and the media storage device 16.

As noted above, a renderer 14 may also have media storage capabilities. For example, renderer 14 may be a desktop computer. Renderer 14 may incorporate a media storage device 16 for storing media items that may be viewed on a
screen also forming a part of renderer 14. In such an instance, the renderer 14 may still access the media via a request sent to media broker 12 acting as a proxy for a media item stored on the renderer's media storage device 16.

[0035] User server 18 may store information associated with a user of the system including, but not limited to, information uniquely identifying a user, user preferences, system attributes and the like. User server 18 may include a user information repository 22 for storing associated user information. Examples of information uniquely identifying a user include, but are not limited to, a unique numeric identifier, a voice print, facial recognition parameters, login and password information and the like. Examples of system attributes include, but are not limited to, designations of system administrator, media item content rating clearances and the like. As described more fully below, while viewing areas may be assigned an associated media item content rating restriction, individual users may have associated media item content rating clearances that may, in some exemplary embodiments, override the media item content rating restriction of a viewing area when the user enters into the viewing area.

[0036] Each renderer 14 may include an associated location identifier component 24 for identifying an absolute or relative location of a renderer 14 as well as the proximity and relative location of other renderers 14. Renderers 14 may also include a passive RFID tag 26 for returning a unique RFID identifier associated with the renderer 14 when queried by a RF signal. Location identification component 24 may be implemented in hardware, software or some combination thereof. For example, location identification component 24 may comprise a GPS device for determining a geographic location of a renderer 14. In another embodiment, location identification component 24 may utilize or otherwise interact with an RFID reader 28 capable of reading passive RFID tags 26 within a predetermined distance of RFID reader 28. In such an embodiment, RFID reader 28 is configured to transmit, such as in response to direction from location identification component 24, an RF signal and to monitor the received signal for both power level and reflected unique RFID identifiers. The RFID reader uses the reflected power level to determine if the responding one or more RFID tags 26 is within a given distance of the RFID reader 28. As described more fully below, a location identification component 24 may determine a location identifier associated with a renderer 14 and indicative of a location of the renderer 14 and/or the proximity of other renderers 14 to the renderer 14. This location identifier may be transmitted to media broker 12 and stored in media access parameter repository 32. As a result, media broker 12 is able to ascertain the absolute and/or relative location of one or more renderers 14 to establish one or more viewing areas each area comprising one or more renderers 14 and having associated media item access parameters, and to control the viewing of media items in the one or more viewing areas based upon the media item access controls parameters.

[0037] FIG. 2 is an illustration of a sequence diagram of an exemplary embodiment of the operation of system 10. First, a user associated with renderer 14(0) requests initialization of the system 10 by media broker 12 such as via user interface device 30 (step 1000). In response to receiving the request, media broker 12 broadcasts a request for location information from renderers 14(1), 14(2) having an associated location identifier, such as from an RFID tag 26 (step 1010). In this example, media broker 12 is aware of both renderer 14(0) and renderer 14(2) but has no location information from renderer 14(1). As illustrated, the requests for location information are transmitted to renderers 14(0), 14(2). In the present example, renderer 14(1) is a portable device, such as an iPhone, does not have a stored location identifier, but does include an RFID tag 26. In response to the request for location information, renderer 14(0) transmits an RF interrogation signal (step 1020). In this illustrated example, renderer 14(1) is within range of the RF interrogation signal sent from renderer 14(0). As a result, a return RF interrogation signal including a unique RFID is returned from renderer 14(1) to renderer 14(0) (step 1030).

[0038] Renderer 14(2), having not received any return RF interrogation signal, transmits location information to media broker 12 indicative of the location of only renderer 14(2). In an exemplary embodiment, a location identification component 24 of renderer 14(2) utilizes a GPS to ascertain a present location and forwards the location information to media broker 12 (step 1040). In addition, renderer 14(2) may also forward information to the media broker 12 indicating that renderer 14(2) is not proximate to any other renderers 14.

[0039] Similarly, renderer 14(0) transmits to media broker 12 location information indicative of the location of renderer 14(0) and renderer 14(1) (step 1050). For example, renderer 14(0) may transmit to media broker 12 location information of both renderers 14(0) and 14(1) as well as proximity information determined based upon a signal strength of the return RF interrogation signal received from renderer 14(1). For example, renderer 14(0) may transmit location information gathered from a GPS device associated with renderer 14(0) that spatially defines the location of renderer 14(0) in absolute terms while defining the location of renderer 14(1) in relative terms of proximity. Specifically, the location information associated with renderer 14(1) may indicate that renderer 14(1) is within an approximate distance of renderer 14(0) where the approximate distance is equal to the approximate range over which the RFID reader 28 can detect an RFID tag 26. In the instance where neither renderer 14(0), 14(1) is capable of determining an absolute location but wherein one or the other renderer 14(0), 14(1) is able to determine the relative proximity of the other renderer 14(0), 14(1), one or both of the renderers 14(0), 14(1) may transmit such location information to the media broker 12. As a result, the location of each renderer 14 may be defined in absolute terms, may be defined relatively in relationship to another renderer 14, or may be defined as some combination of the two.

[0040] Next, after receiving location information from one or more renderers 14, media broker 12 proceeds to establish default viewer areas based, at least in part, upon the received location information. As defined herein, a “viewer area” refers to logical grouping of renderers 14 that are related by their spatial proximity to one another. In the present example, media broker 12 may establish two viewing areas, specifically, a first viewing area including renderer 14(0) and renderer 14(1) (being close enough to return an RF interrogation signal to renderer 14(0)) and a second viewing area including renderer 14(2) (step 1060). In an exemplary embodiment, media broker 12 may confirm the inclusion of multiple renderers 14 in the same default viewing area by pinging one or more renderers 14 assigned to the same default viewing area and measuring the latency of the responses from each renderer 14.

[0041] Having established one or more default viewing areas, media broker 12 transmits the default viewer areas to renderer 14(0) (step 1070) whereupon receipt of the default
viewing area information associated therewith is displayed to the user, such as on renderer 14(0) via interface component 34 (step 1080).

[0042] Once displayed, a user may proceed, such as via a GUI displayed on renderer 14(0), to customize the displayed default viewing areas (step 1090) and assign one or more media item access parameters to each viewing area (step 1100). With reference to FIGS. 3A-3C, there is illustrated an exemplary GUI 36 such as might be displayed on renderer 14(0) as part of a setup wizard or the like to guide a user of the system 10. In FIG. 3A, GUI 36 includes one or more viewing area entry fields 38. Note that in the example, default designations “viewing area 1” and “viewing area 2” are displayed in viewing area entry fields 38. Associated with each viewing area there is displayed one or more renderer identifiers 40 associated with a renderer 14 of the system 10. As illustrated, a first viewing area includes renderers 14(0), 14(1) identified as “device 0001” and “device 0002” and a second viewing area includes renderer 14(2) identified as “device 0003”. In addition, each viewing area has been assigned a default media item access parameter 42 of “G” indicating that only media items having a rating of “G” may be played on renderers 14 located in the established viewing areas.

[0043] In FIG. 3B, a user has customized the names of the viewing areas of FIG. 3A by entering into the one or more viewing area entry fields 38 the designations of “living room” and “bed room”. The user has further assigned a media item access parameter 42 of “PG” to the living room and a media item access parameter 42 of “R” to the bedroom. It is understood that in practice, GUI 36 may offer greater or fewer options to customize information associated with a viewing area. For example, media item access parameters 42 may be defined for a single viewing area to be different at different times of the day, may be defined to be variable based on the identity of users in proximity to a viewing area, etc. In addition, a user may reallocate renderers 14 amongst the defined viewing areas, create new viewing areas, etc.

[0044] FIG. 3C is an illustration of a GUI 44 for defining a system administrator. In an exemplary embodiment, a user of system 10 may define a system administrator and associated information including, but not limited to, a login identifier, a password and a contact number. In an exemplary embodiment, each GUI 36, 44 of FIGS. 3A-3C may be outputted by media broker 12 to a renderer 14 for display to a user. In such an instance, information entered by a user via any one of the GUIs 36, 44 of FIGS. 3A-3C may be transmitted to media broker 12 for storage in, for example, media item access parameter repository 32, or user information repository 22.

[0045] Returning to FIG. 2, the customized viewer areas and associated media item access parameters 42 are transmitted to media broker 12 (step 1110). Once received, media broker 12 stores the customized viewer areas and associated media item access parameter information such as in media item access parameters repository 32 (step 1120).

[0046] Subsequently, renderer 14(0) may transmit a request including a unique identifier of the renderer 14(0) for a media item to media broker 12 (step 1130). Upon receipt of the media item request, media broker 12 may verify an identity and/or a location of the requesting renderer 14(0) (step 1140). In an exemplary embodiment, media broker 12 may compare the unique identifier to information retrieved from media item access parameters repository 32 to verify that the requesting renderer 14(0) belongs to a previously established viewer area. In one exemplary embodiment, media broker 12 may optionally send a request for location information as described above with reference to step 1010. If the location information received by media broker 12 in response to the request does not include the location of the requesting renderer 14, media broker 12 may determine that the requesting renderer 14 has moved outside of an established viewing area and may decline to provide access to the requested media item. In another embodiment, media broker 12 may query renderers 14 to return a GPS determined location of each renderer’s 14 whereabouts. In another exemplary embodiment, media broker 12 may ping one or more renderers 14 associated with the requesting renderer 14 and measure the latency of the responses. If any one of the renderers 14 has been moved so as to be in a location not corresponding to a viewing area or corresponding to a viewing area not previously associated with the requesting renderer 14, media broker 12 may proceed to delay providing the requested media item until a media item access parameter 42 for the requesting renderer’s location can be established.

[0047] If it is determined that the requesting renderer 14 belongs to a previously established viewing area, media broker 12 compares the stored media item access parameter 42 corresponding to the requesting renderer 14 to a media item rating comprising, for example, the Motion Picture Association of America (MPAA) film rating of the media item (step 1140). In an exemplary embodiment, media broker 12 queries a media storage device 16 having a copy of the requested media item stored on it, such as in media item repository 47. Media storage device 16 may access metadata associated with the requested media item to determine a media item rating and return the rating to the media broker 12. In an exemplary embodiment, if there is no available media item rating available, media broker 12 may attempt to ascertain an appropriate rating for the media item. In accordance with an exemplary embodiment, either the media broker 12 or the media storage device 16 may perform audio or image analysis of a media item. For example, audio analysis for gunshot sounds may be performed to ascertain violent content. Image analysis for pixel values approximating the color of blood may likewise indicate violent content associated with a relatively high rating. Likewise, speech to text analysis of a media item may indicate a prevalence of profanity associated with a high rating. In an alternative embodiment, the media broker 12 may query an external third party service such as, for example, IMDB, to retrieve a media item rating. In such an instance, network 20 may include an Internet capabilities enabling media broker 12 to communicate via the Internet.

[0048] Once the viewer area associated with the requesting renderer 14(0) has been determined and it has been further determined that the media item rating of the media item is equal to or lower than the media item access parameter 42 associated with the viewing area, media broker 12 commences to transmit the requested media item to the requesting renderer 14(0) (step 1150). As used herein, a media item rating is “lower” than a media item access parameter 42 if the media item rating indicates permissible viewing by a more general audience than does the media item access parameter 42. For example, MPAA ratings trend from G (General Audience) to PG (Parental Guidance Suggested) to PG-13 (Parents Strongly Cautioned) to R (Restricted). Therefore, for example, if a viewing area has an associated media item access parameter 42 of “PG”, the media broker 12 will direct
the transmission of a media item to a renderer 14 in the viewing area if the media item rating is either “PG” or “G”. [0049] The following example illustrates an exemplary embodiment of the system. A controlling user wants to set up his home media network so that he has control over what kind of programming can be watched throughout his home. Ideally, the controlling user wants to configure four Viewing Areas throughout his home and assign rating levels to those areas so that no content having an associated rating above a predefined rating for a Viewing Area can be viewed in the Viewing Area. [0050] Specifically, the user wants to make and enforce the following media item content restrictions: Living Room (PG), Den (PG), Family Room (G), Master Bedroom (R). With these assignments, the user may be reasonably sure that nothing above the assigned rating will be accessible in those rooms. The user is aided in establishing the Viewing Areas of this networked system by an automated setup wizard that he can access by clicking on “Setup” at the bottom of a GUI, such as might be displayed on a television screen, and then entering the appropriate administrative password. [0051] When the user employs this setup interface, the system automatically polls all of the components, including, but not limited to, renderers of media items that have been identified via a unique identifier and registered with the user’s home media network. In one embodiment, each of the devices in the user’s network (e.g., DVRs, displays, game consoles, set top boxes, Apple TV®s, etc.) came equipped with an RFID chip. These chips are designed to communicate with one another or with an RFID reader to establish a default for the viewing areas. [0052] The user interacts with a setup wizard comprising one or more GUIs displayed on a television configured for access to his home network in order to refine his viewing areas. The system reports four Viewing Areas in the home network and has accounted for all the components (DVRs, Apple TV®s, etc.) that are in each of the Areas. Instead of simply accepting the default names for these Areas (Viewing Area 1, Viewing Area 2, Viewing Area 3, Viewing Area 4), the user assigns more accurate descriptors, for example, “Living Room”, “Den”, “Family Room”, and “Master Bedroom”. The user then uses the setup wizard to assign media item content rating restrictions to each of the four rooms or Viewing Areas. [0053] The user’s configuration of the viewing areas does not affect his ability to access all of the devices in the home network to record media items of any rating. Rather, only playback of a media item in a particular viewing area is restricted according to the user’s content rating restrictions for the Viewing Area. Additionally, the user employs the system to set up automatic alerts for him to conditionally override these global settings when users make requests for him to do so. [0054] After the system has been configured in this way, a second user moves a renderer (comprising a television) that was in the den to the second user’s Bedroom. As a result, the renderer (the television) is now in a different Viewing Area than it was when the system was originally configured. In the present example, the moved renderer is a master device within the home network—having an RFID reader—and is used to periodically interrogate its surroundings and report nearby devices to the system. The system maintains a device footprint comprised of all rendering devices in all of the established viewing areas. In the present example, the system requests the television, now moved to the second user’s bedroom (another Viewing Area), to interrogate its surroundings and report the results. For example, the system is aware that when the television is in the den it is near “DVR A123” and “Receiver B123”. If the system determines that the television does not, in its current location, detect devices “DVR A123” and “Receiver B123”, or if the system detects a large number of different devices, the system may notify a system administrator (e.g., the controlling user) that the television may have been moved, and could even potentially prevent any media item content being streamed or otherwise provided to the second user’s television until the controlling user, acting as system administrator, enters a code or otherwise verifies that the television and all associated media item content restrictions apply to the new location. [0055] While the exemplary embodiments disclosed describe the manner in which the transmission of media items from a media storage device 16 to a renderer 14 may be restricted, system 10 does not impose such limitations when recording or otherwise storing media items on a media storage device 16. [0056] FIG. 4 is an illustration of an exemplary embodiment of the manner in which system 10 may dynamically adjust media item content restrictions for viewing areas based upon parameters associated with a user. First, renderer 14 detects the proximity of a user to a viewing area (step 2000). In an exemplary embodiment, a renderer 14 may incorporate an input device such as a camera, microphone, or the like to sense audio or video of a user entering into or near a viewing area. In other exemplary embodiments, renderer 14(0) may sense a Bluetooth communication from a portable device associated with a user. Regardless of the method by which renderer 14(0) operates to detect the arrival of a user to a viewing area, the viewer identity information gathered is transmitted by user identification component 46 operating on renderer 14(0), to media broker 12 (step 2010). [0057] Once received, media broker 12 operates to request additional information associated with the user from user server 18 including, but not limited to, a unique user identifier and associated media item content rating clearance (step 2020). For example, media broker 12 may transmit gathered viewer identity information, such as a voice print or facial recognition metrics gathered at a viewing area. The viewer identity information may then be used, such as by user server 18, to perform a search or query of user information repository 22 to identify the user and to access or otherwise retrieve a media item content rating clearance associated with the user. Media item content rating clearance identifies the highest rating for a media item appropriate for viewing by a user. In an exemplary embodiment, a user’s media item content clearance is entered by or approved by a system administrator when adding a user to the system 10. If the user can be identified and an associated media item content rating clearance determined, user/viewer information, at least including the user’s media item content rating clearance, is transmitted to and received by media broker 12 (step 2030). [0058] In response to receiving the user information, media broker 12 may adjust a media item access parameter of the viewing area into which the user entered based upon the media item content rating clearance associated with the user (step 2040). For example, if media broker 12 accesses a media item access parameter of the viewing area of “PG” from the media access parameter repository 32 and compares the media item access parameter to a media item content rating clearance
associated with the user of “R”, media broker 12 may adjust, either temporarily or permanently, the media item access parameter of the viewing area to be “R”. As a result, a user of the system 10 with a relatively high associated media item content rating clearance can view media items appropriate to the user regardless of the viewing area in which the user is located. Such may be the case, for example, when a parent who rarely views media items in the family room and who has configured the media item content restriction associated with the family room to be child friendly “PG”, enters the family room. In addition, this functionality allows the family room to remain “PG” in the absence of a parent, but, when a parent is present, automatically adjusts the media item access parameter associated with the viewing area to be more permissive in the presence of adult supervision.

[0059] Media broker 12 may optionally transmit an alert, such as to, for example, a system administrator, based upon a comparison of the media item access parameter and a media item content rating clearance associated with a user (step 2050). For example, media broker 12 may text a system administrator at a provided contact number to inform the system administrator that a child having associated media item content rating clearance of “G” has entered into a viewing area having media item access parameter of “R” that is currently playing a media item having a rating of “PG”.

[0060] In accordance with another exemplary embodiment, attempts to introduce a media item not previously known to media broker 12 into the system 10 to be viewed or otherwise displayed on a renderer 14 requires registering the media item with media broker 12. For example, suppose a child has a friend over to Robert’s house who has brought a movie on their smartphone that they want to play in the child’s bedroom viewing area. The smart phone may be registered as a media storage device 16 with the media broker 12 such as by a system administrator. When an attempt is made to play the movie, media broker 12 intercepts the attempt as a request to view the media item from the media storage device 16 comprising the smartphone to a known renderer 14. As described above, media broker 12 determines a media item content rating for the media item to determine whether or not to allow the media item to be rendered in the viewing area of the child’s bedroom. In an exemplary embodiment, media broker 12 checks for rating information embedded in metadata associated with the media item. If a media item content rating can be determined and is appropriate for the bedroom viewing area, media broker 12 enables the playing of the media item in the viewing area. In an exemplary embodiment, this authentication of the media item’s rating occurs locally at renderer 14 or via cloud computing, such as when interacting with a third party service as described above.

[0061] FIG. 5 is a sequence diagram illustrating the manner in which system 10 operates to detect changes to an existing configuration of renderers 14. First, there is determined at media broker 12 the occurrence of a trigger indicating the need to verify a renderer 14 configuration (step 3000). In an exemplary embodiment, such a trigger may be the passage of a predetermined amount of time. In such an embodiment, media broker 12 operates to regularly and continuously monitor the configuration of renderers 14. In other embodiments, the trigger may arise from any and all changes to an existing renderer 14 configuration. For example, a previously unknown or unrecognized renderer 14 may seek to be incorporated into an established Viewing Area. In another example, a renderer 14 associated with a first Viewing Area may be detected as residing in a second Viewing Area, as might happen when a television is carried from one room to another. In yet other examples, a trigger may be generated when a renderer 14 is unplugged or otherwise rendered inoperable.

[0062] Regardless of the manner in which a trigger arises, media broker 12 responds by issuing a request for location information to known renderers 14 in previously established Viewing Areas and, in the case of a new renderer 14 being added, to the new renderer 14 (step 3010). As described above, in response to receiving the request for location information, each renderer 14 proceeds to determine its location and that of other proximate renderers (steps 3020 and 3030). Once determined, each renderer 14 transmits the determined location information to the media broker 12 (steps 3040 and 3050).

[0063] Upon receipt of the location information from the renderers 14, media broker 12 proceeds to determine the need for system administrator notification (step 3060). For example, if a previously known renderer 14 from a Viewing Area having a media item access parameter of “G” is moved to a Viewing Area having a media item access parameter of “R”, the media broker 12 may determine that a user is attempting to view an otherwise restricted media item. In another example, a user may be attempting to add a new renderer 14 to system 10 and requires the system administrator to allow the renderer 14 to be added to a Viewing Area. When the media broker 12 determines the need to notify the system administrator, media broker notifies the system administrator (step 3070). Such notification may be performed via an email, a text message, a phone message or the like. Upon receiving notification, the system administrator determines a response to the notification (step 3080) and transmits the instructions to the media broker 12 (step 3090). In the instance that the notification is purely informational, there may be no response required. If, for example, configuration of system settings is required, the system administrator may operate a GUI on either a portable communication device or a renderer 14 to select desired settings. In another example, the notification may contain a link to a URL at which the system administrator can enter system settings. In yet another example, a text message notification may allow the system administrator to text a predetermined code in order to change a configuration setting, such as to allow a renderer 14 to access the system 10.

[0064] FIG. 6 is an illustration of an exemplary GUI 48 broadcast from media broker 12 to renderers 14 when a request is received to display a viewing schedule 50. One or more viewing area elements 52 each display information associated with a viewing area of system 10. For example, each viewing area element 52 comprises one or more current viewer indicators 54 comprising visual indicator(s) of user(s)/viewer(s) detected inside the corresponding viewing area. Media item indicator 56 comprised, for example, of a thumbnail frame of a media item, is indicative of a media item currently playing on a renderer 14 in the viewing area. Media storage device indicator 58 is a visual indicator of the media storage device 16 from which the media item is being played or streamed. In an exemplary embodiment, the information displayed as part of each viewing area element 52 is retrieved from, for example, media item access parameter repository 32.

[0065] FIG. 7 is a block diagram of a media broker 12 of FIG. 1. As illustrated, the media broker 12 includes a control-
ler 60 connected to a memory 62, one or more secondary storage devices 64, a communication interface 66, and one or more user interface components 68 by a bus 70 or similar mechanism. The controller 60 is a microprocessor, digital ASIC, FPGA, or the like. In this embodiment, the controller 60 is a microprocessor, and software for performing the functions of media broker 12 described above is stored in the memory 62 for execution by the controller 60. Further, depending on the particular embodiment, the media access parameter repository 32 is stored in the one or more secondary storage devices 64. The one or more secondary storage devices 64 are digital storage devices such as, for example, one or more hard disk drives. The communication interface 66 is a wired or wireless communication interface that communicatively couples the media broker 12 to the network 20 (FIG. 1). For example, the communication interface 66 may be an Ethernet interface, local wireless interface such as a wireless interface operating according to one of the suite of IEEE 802.11 standards, a mobile communications interface such as a cellular telecommunications interface, or the like.

Those skilled in the art will recognize improvements and modifications to the preferred embodiments of the present invention. All such improvements and modifications are considered within the scope of the concepts disclosed herein and the claims that follow.

What is claimed is:

1. A media broker comprising:
a communication interface communicatively coupling the media broker to one or more media storage devices and
a controller associated with the communication interface adapted to:
receive location information from each of the one or more renderers; and
determine, based upon the received location information, one or more viewing areas each comprising at least one of the one or more renderers.

2. The media broker of claim 1 wherein the location information received from at least one of the one or more renderers comprises an absolute location of at least one of the one or more renderers.

3. The media broker of claim 1 wherein the location information received from at least one of the one or more renderers comprises a relative location of another one of the one or more renderers.

4. The media broker of claim 1 wherein the controller is further adapted to verify a location of the one or more renderers.

5. The media broker of claim 4 wherein the controller is adapted to verify the location of the one or more renderers by pinging a plurality of the one or more renderers each in the same viewing area and measuring a latency of a reply from each of the plurality of the one or more renderers.

6. The media broker of claim 1 wherein the controller is adapted to assign a viewing area media item access parameter to each of the one or more viewing areas.

7. The media broker of claim 6 wherein the controller is further adapted to:
receive a request to alter the viewing area media item access parameter associated with one of the one or more viewing areas; and
update the viewing area media item access parameter associated with the request to alter the viewing area media item access parameter.

8. The media broker of claim 7 wherein the request is received from a system administrator.

9. The media broker of claim 7 wherein the controller is further adapted to instruct one of the one or more media storage devices to record a media item without regard to the one or more viewing areas.

10. The media broker of claim 6 wherein the controller is further adapted to:
receive information indicative of a viewer having an associated media item content rating clearance entering into one or more viewing areas; and
update the viewing area media item access based upon the associated media item content rating clearance.

11. A method comprising:
transmitting a request for location information to one or more renderers;
receiving location information from each of the one or more renderers; and
determining one or more viewing areas each comprising at least one of the one or more renderers.

12. A computer-readable medium embodied in an article of manufacture encoded with instructions for directing a processor to:
   transmit a request for location information to one or more renderers;
   receive location information from each of the one or more renderers; and
   determine, based upon the received location information, one or more viewing areas each comprising at least one of the one or more renderers.

13. A renderer comprising:
   a communication interface communicatively coupling the renderer to one or more media storage devices and a media broker; and
   a controller associated with the communication interface adapted to:
      receive a request for location information from the media broker;
      determine a location of the renderer; and
      transmit the location to the media broker.

14. The renderer of claim 13 wherein the controller is further adapted to utilize GPS to determine the location.

15. The renderer of claim 13 wherein the controller is further adapted to determine a location of at least one other renderer in proximity to the renderer.

16. The renderer of claim 15 wherein the controller is further adapted to determine a location of at least one other renderer by transmitting an RF interrogation signal and receiving a reply from the at least one other renderer.

17. The renderer of claim 16 wherein the location of the at least one other renderer is a location relative to the location of the renderer.

18. The renderer of claim 15 wherein the controller is further adapted to transmit the location of the at least one other renderer to the media broker.

19. A computer-readable medium embodied in an article of manufacture comprising a renderer encoded with instructions for directing a processor to:
   receive a request for location information from a media broker;
   determine a location of the renderer; and
   transmit the location to the media broker.

20. The computer-readable medium of claim 19 wherein the processor is further directed to utilize GPS to determine the location.

21. The computer-readable medium of claim 19 wherein the processor is further directed to determine a location of at least one other renderer in proximity to the renderer.

22. The computer-readable medium of claim 21 wherein the processor is further directed to determine a location of at least one other renderer by transmitting an RF interrogation signal and receiving a reply from the at least one other renderer.

23. The computer-readable medium of claim 22 wherein the location of the at least one other renderer is a location relative to the location of the renderer.

24. The computer-readable medium of claim 21 wherein the processor is further directed to transmit the location of the at least one other renderer to the media broker.

25. A media broker comprising:
   a communication interface communicatively coupling the media broker to one or more media storage devices and one or more renderers; and
   a controller associated with the communication interface adapted to:
      transmit a request in response to an occurrence of a trigger for location information of one or more renderers;
      receive the location information; and
      determine a need to notify a system administrator based upon the received location information.

26. The media broker of claim 25 wherein the controller is further adapted to notify the system administrator.

27. The media broker of claim 26 wherein the controller operates to notify the system administrator via a communication methodology selected from the group consisting of email, text messaging and phone communication.

28. The media broker of claim 25 wherein the trigger comprises the passage of a predetermined period of time.

29. A computer-readable medium embodied in an article of manufacture comprising a media broker encoded with instructions for directing a processor to:
   transmit a request in response to an occurrence of a trigger for location information of one or more renderers;
   receive the location information; and
   determine a need to notify a system administrator based upon the received location information.

30. The computer-readable medium of claim 29 wherein the processor is further instructed to notify the system administrator.

31. The computer-readable medium of claim 30 wherein the processor operates to notify the system administrator via a communication methodology selected from the group consisting of email, text messaging and phone communication.

32. The computer-readable medium of claim 29 wherein the trigger comprises the passage of a predetermined period of time.