US 20140258514A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2014/0258514 A1

(43) Pub. Date: Sep. 11, 2014

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(54) **MEDIA DELIVERY SYSTEM AND METHOD FOR TRANSPORTING MEDIA TO DESIRED TARGET DEVICES**

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(21) Appl. No.: **14/280,415**

(22) Filed: **May 16, 2014**

Related U.S. Application Data

(63) Continuation of application No. 11/531,182, filed on Sep. 12, 2006, now Pat. No. 8,787,164, which is a continuation-in-part of application No. 10/888,606, filed on Jul. 9, 2004, which is a continuation-in-part of application No. 10/888,633, filed on Jul. 9, 2004, which is a continuation-in-part of application No. 10/888,745, filed on Jul. 9, 2004, now Pat. No. 7,937,484.

(60) Provisional application No. 60/718,119, filed on Sep. 16, 2005.

Publication Classification

(51) **Int. Cl.**

H04L 29/06 (2006.01)

H04L 12/26 (2006.01)

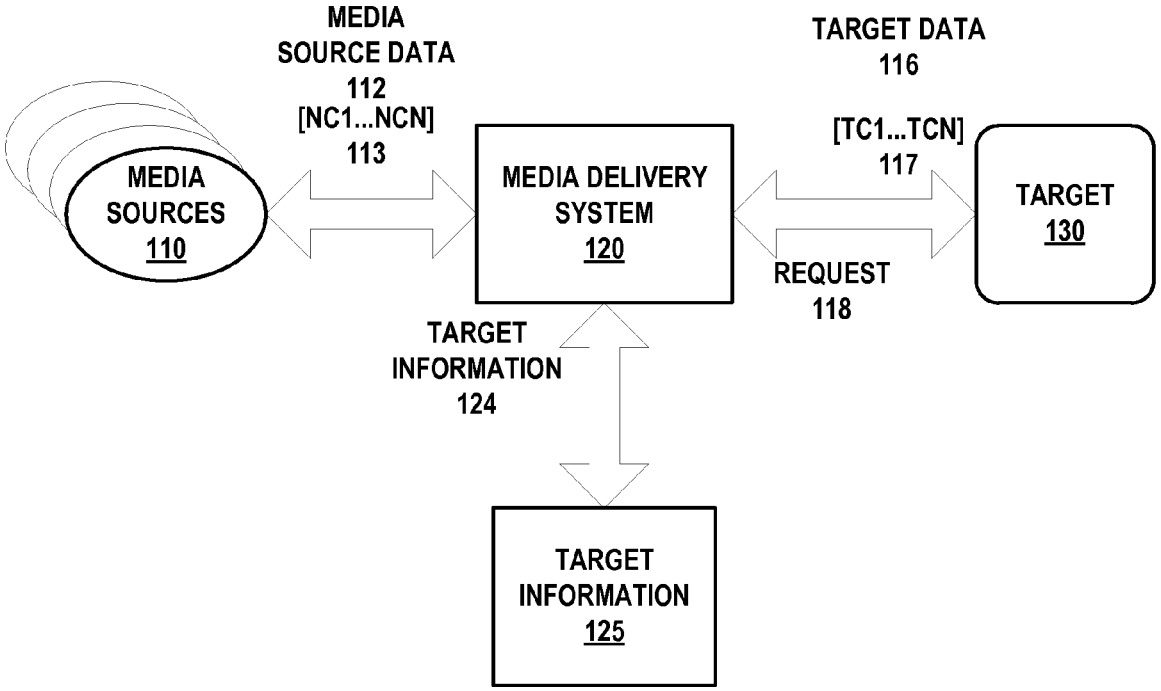
(52) **U.S. Cl.**

CPC ***H04L 65/608*** (2013.01); ***H04L 43/0876*** (2013.01)

USPC **709/224**

(57) **ABSTRACT**

A media delivery system and technique are described to enable a media stream to be received at one end on a user's computer, and then re-streamed to a target device in a form that is suitable for that target. As an example of an implementation of such an embodiment, a streaming video and/or audio feed may be received on a user's media center, then re-streamed to a user's designated target device. The target device may correspond to, for example, another computer, a cell phone, or some other media output device.



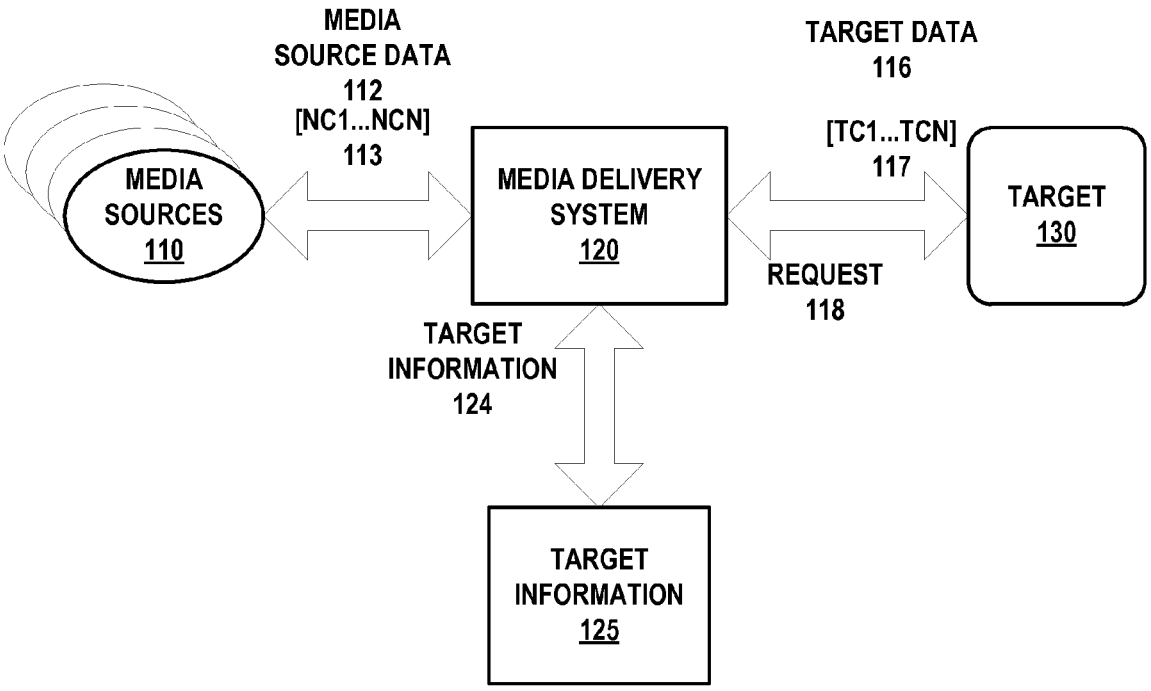

MEDIA
SOURCE DATA
112
[NC1...NCN]
113
TARGET DATA
116
[TC1...TCN]
117
MEDIA
SOURCES
110
MEDIA DELIVERY
SYSTEM
120
TARGET
130
REQUEST
118
TARGET
INFORMATION
124
TARGET
INFORMATION
125

FIG. 1

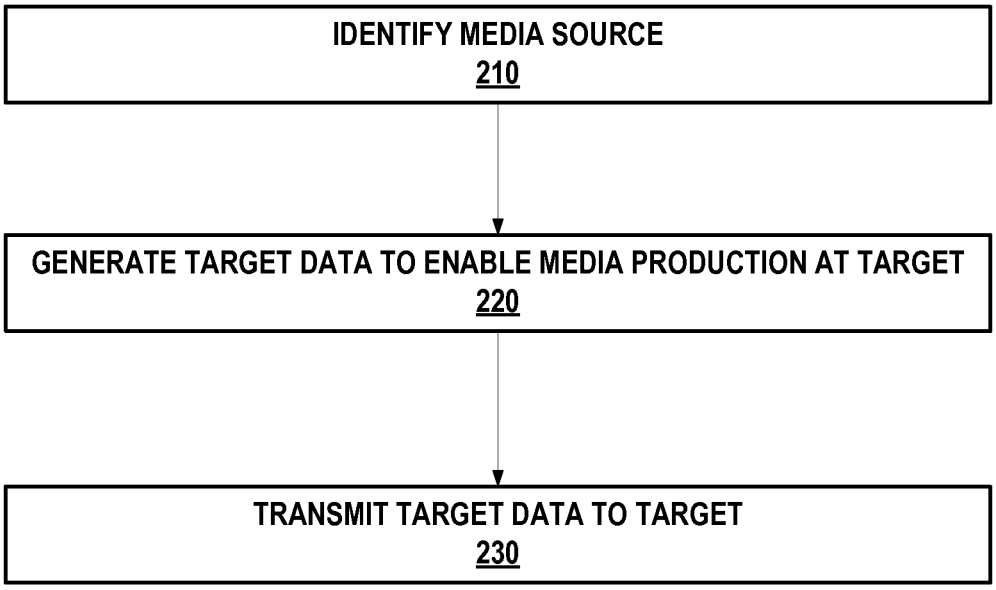

IDENTIFY MEDIA SOURCE
210
GENERATE TARGET DATA TO ENABLE MEDIA PRODUCTION AT TARGET
220
TRANSMIT TARGET DATA TO TARGET
230

FIG. 2

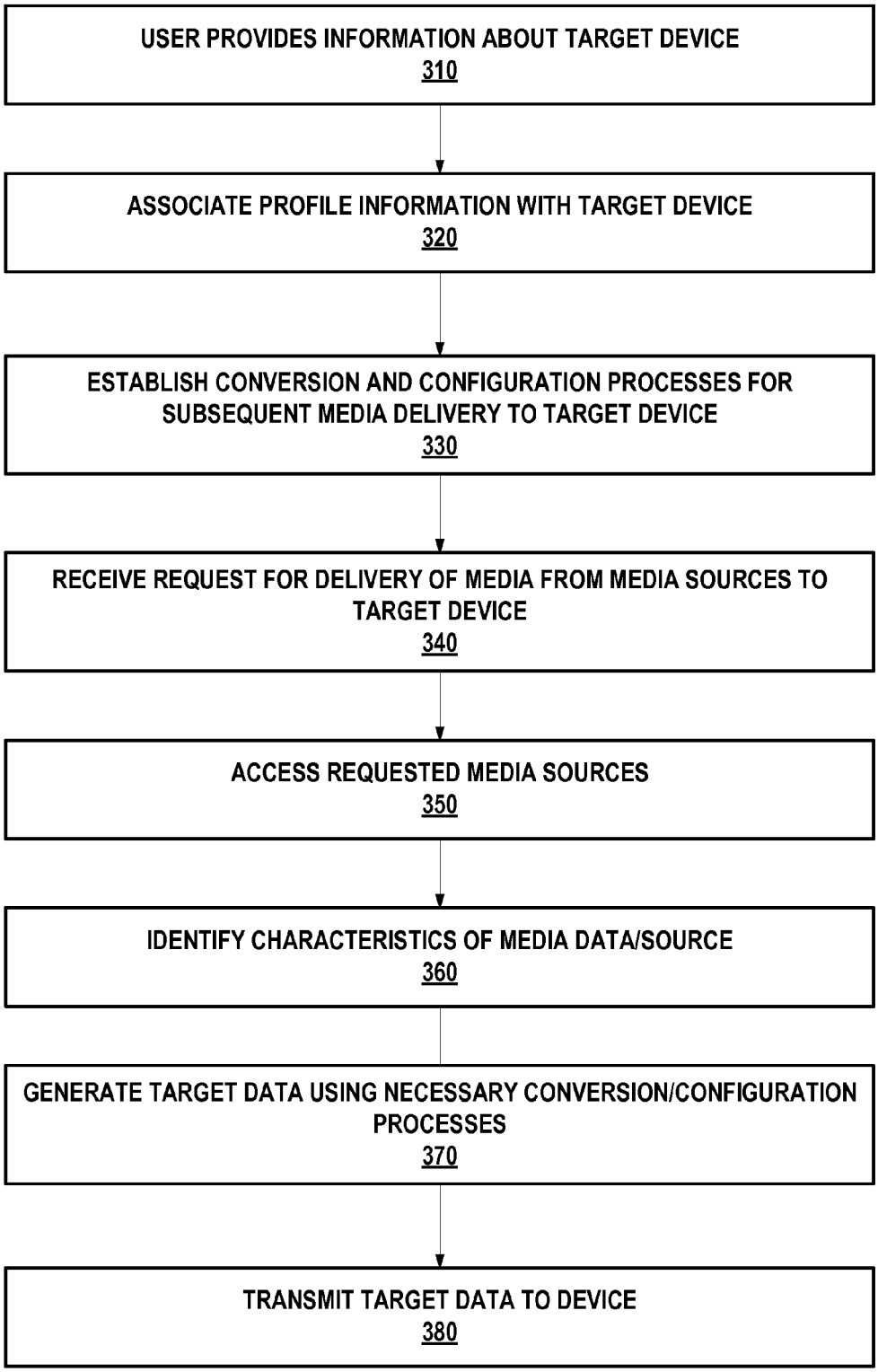

USER PROVIDES INFORMATION ABOUT TARGET DEVICE
310
ASSOCIATE PROFILE INFORMATION WITH TARGET DEVICE
320
ESTABLISH CONVERSION AND CONFIGURATION PROCESSES FOR SUBSEQUENT MEDIA DELIVERY TO TARGET DEVICE
330
RECEIVE REQUEST FOR DELIVERY OF MEDIA FROM MEDIA SOURCES TO TARGET DEVICE
340
ACCESS REQUESTED MEDIA SOURCES
350
IDENTIFY CHARACTERISTICS OF MEDIA DATA/SOURCE
360
GENERATE TARGET DATA USING NECESSARY CONVERSION/CONFIGURATION PROCESSES
370
TRANSMIT TARGET DATA TO DEVICE
380

FIG. 3

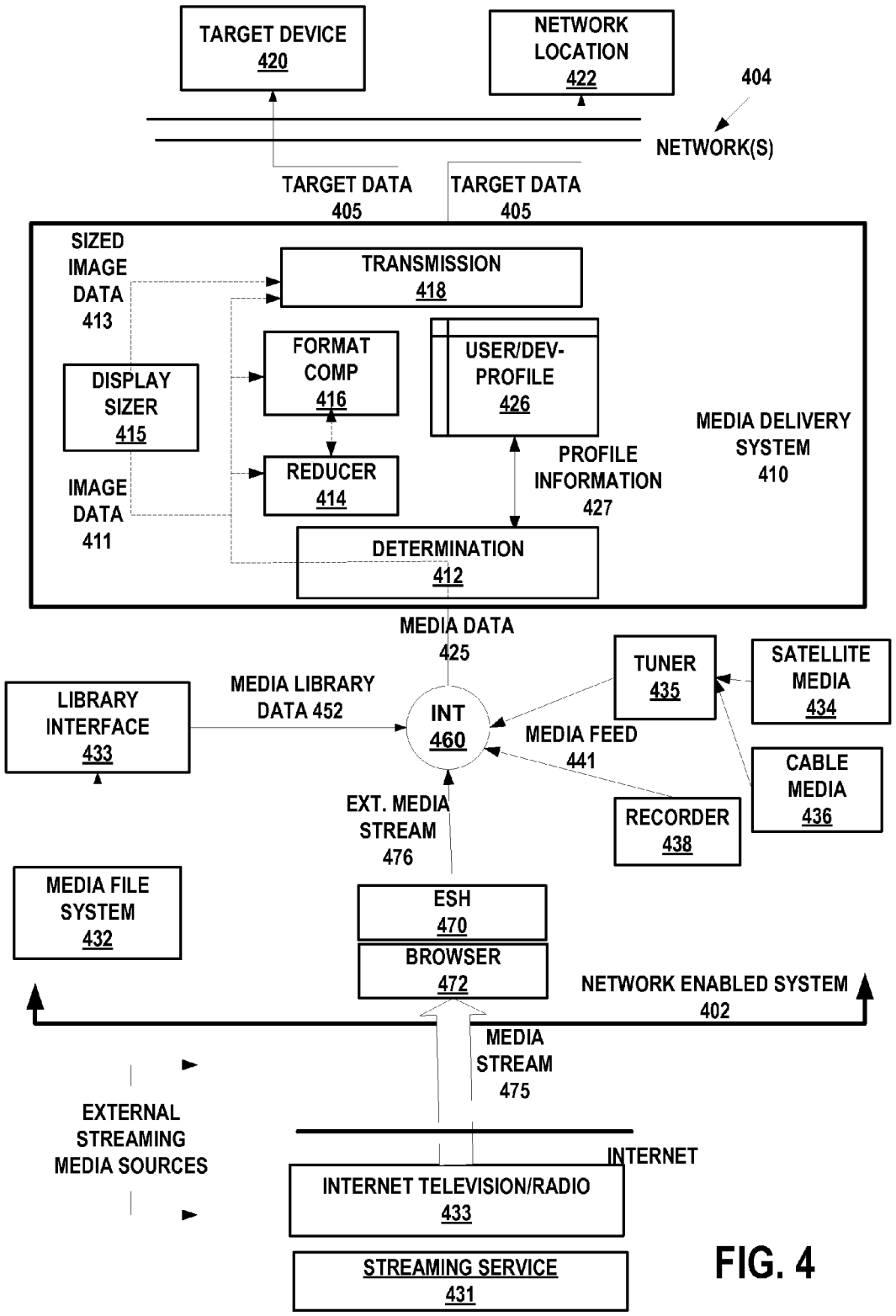

TARGET DEVICE
420
NETWORK LOCATION
422
404
NETWORK(S)
TARGET DATA
405
TARGET DATA
405
SIZED IMAGE DATA
413
TRANSMISSION
418
FORMAT COMP
416
USER/DEV-PROFILE
426
DISPLAY SIZER
415
REDUCER
414
PROFILE INFORMATION
427
MEDIA DELIVERY SYSTEM
410
IMAGE DATA
411
DETERMINATION
412
MEDIA DATA
425
TUNER
435
SATELLITE MEDIA
434
LIBRARY INTERFACE
433
MEDIA LIBRARY DATA 452
INT
460
MEDIA FEED
441
CABLE MEDIA
436
RECORDER
438
EXT. MEDIA STREAM
476
MEDIA FILE SYSTEM
432
ESH
470
BROWSER
472
NETWORK ENABLED SYSTEM
402
MEDIA STREAM
475
EXTERNAL STREAMING MEDIA SOURCES
INTERNET
INTERNET TELEVISION/RADIO
433
STREAMING SERVICE
431

FIG. 4

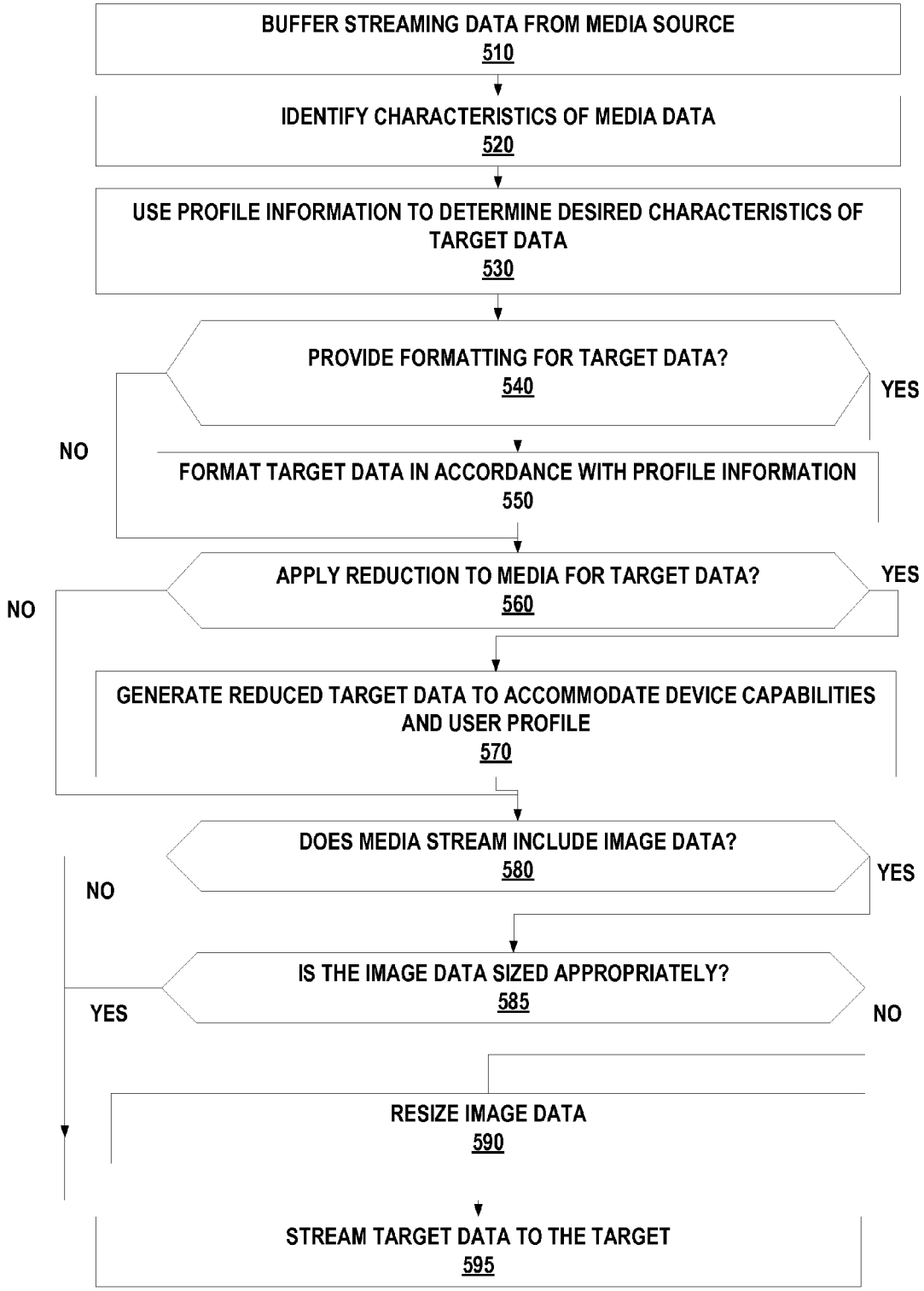

BUFFER STREAMING DATA FROM MEDIA SOURCE
510
IDENTIFY CHARACTERISTICS OF MEDIA DATA
520
USE PROFILE INFORMATION TO DETERMINE DESIRED CHARACTERISTICS OF TARGET DATA
530
PROVIDE FORMATTING FOR TARGET DATA?
540
YES
NO
FORMAT TARGET DATA IN ACCORDANCE WITH PROFILE INFORMATION
550
APPLY REDUCTION TO MEDIA FOR TARGET DATA?
560
YES
NO
GENERATE REDUCED TARGET DATA TO ACCOMMODATE DEVICE CAPABILITIES AND USER PROFILE
570
DOES MEDIA STREAM INCLUDE IMAGE DATA?
580
YES
NO
IS THE IMAGE DATA SIZED APPROPRIATELY?
585
YES
NO
RESIZE IMAGE DATA
590
STREAM TARGET DATA TO THE TARGET
595

FIG. 5

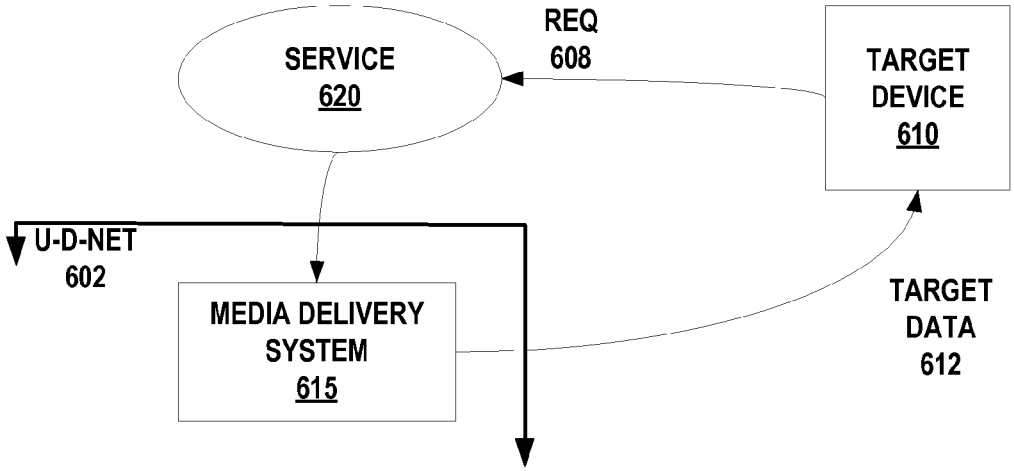

SERVICE
620
REQ
608
TARGET
DEVICE
610
U-D-NET
602
MEDIA DELIVERY
SYSTEM
615
TARGET
DATA
612

FIG. 6A

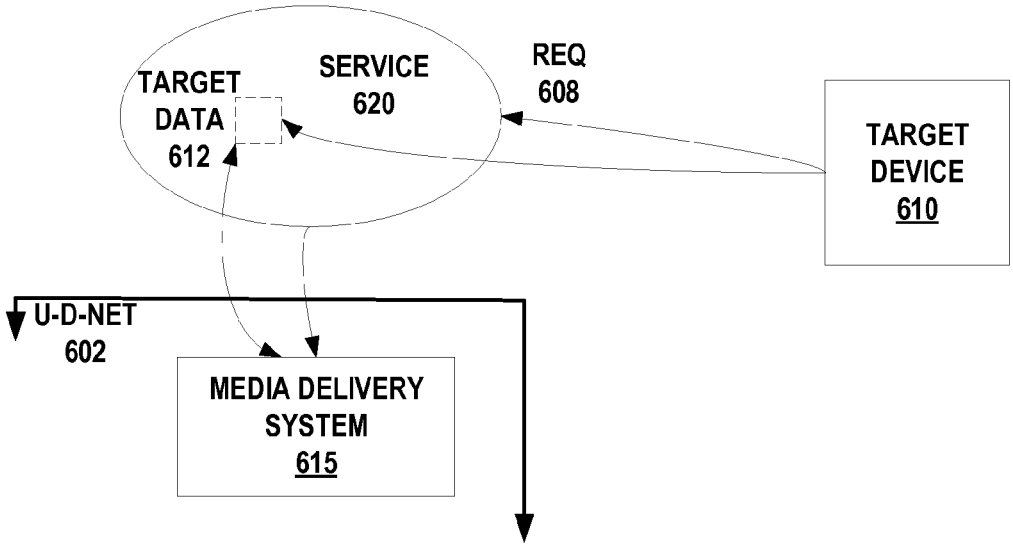

TARGET
DATA
612
SERVICE
620
REQ
608
TARGET
DEVICE
610
U-D-NET
602
MEDIA DELIVERY
SYSTEM
615

FIG. 6B

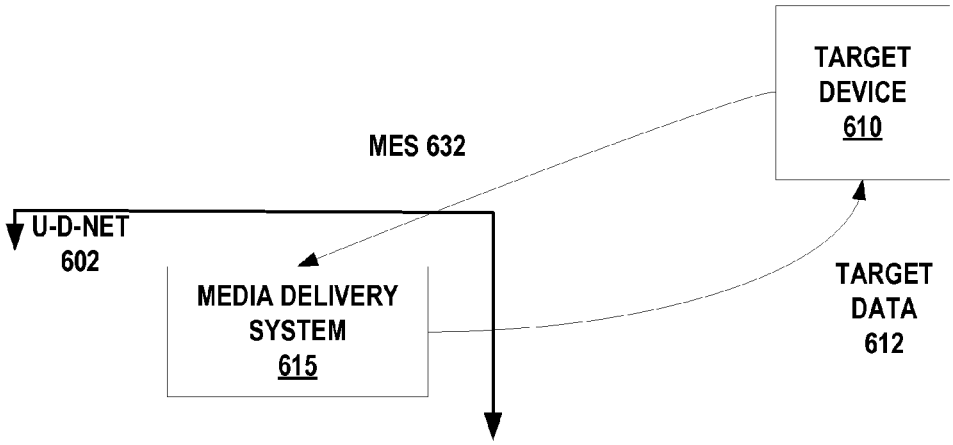

TARGET
DEVICE
610
MES 632
U-D-NET
602
MEDIA DELIVERY
SYSTEM
615
TARGET
DATA
612

FIG. 6C

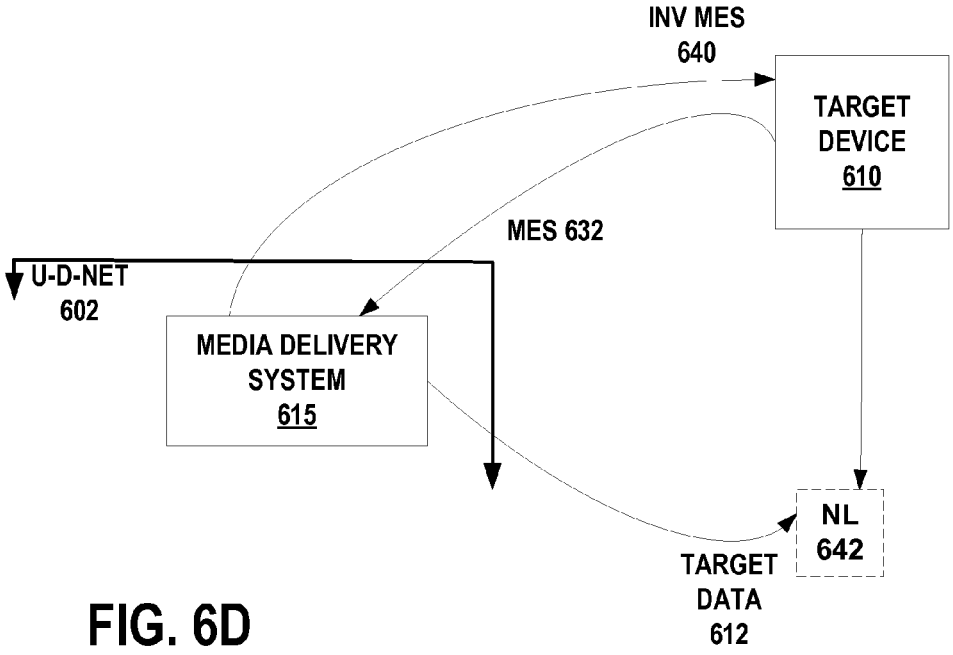

INV MES
640
TARGET
DEVICE
610
MES 632
U-D-NET
602
MEDIA DELIVERY
SYSTEM
615
NL
642
TARGET
DATA
612

FIG. 6D

MEDIA DELIVERY SYSTEM AND METHOD FOR TRANSPORTING MEDIA TO DESIRED TARGET DEVICES

RELATED APPLICATIONS

[0001] This application is a Continuation of U.S. application Ser. No. 11/531,182, filed Sep. 12, 2006, titled MEDIA DELIVERY SYSTEM AND METHOD FOR TRANSPORTING MEDIA TO DESIRED TARGET DEIVCES, which is a continuation-in-part of the following, co-pending U.S. Patent Applications: U.S. patent application Ser. No. 10/888,606, entitled "System and Method for Enabling the Establishment of a Personal Network," filed Jul. 9, 2004; U.S. patent application Ser. No. 10/888,633, entitled "System and Method for Combining Memory Resources for Use on a Personal Network," filed Jul. 9, 2004; and U.S. patent application Ser. No. 10/888,745, entitled "System and Method for Remotely Controlling Network Resources," filed Jul. 9, 2004, now U.S. Pat. No. 7,937,484; application Ser. No. 11/531,182 also claims priority to provisional U.S. Provisional Application No. 60/718,119, filed on Sep. 16, 2005, entitled MEDIA DELIVERY SYSTEM AND METHOD FOR TRANSPORTING MEDIA TO DESIRED TARGET DEVICES. All of the aforementioned priority applications are hereby incorporated by reference in their entirety for all purposes.

TECHNICAL FIELD

[0002] The disclosed embodiments relate generally to the field of media content delivery over networks.

BACKGROUND

[0003] There are an increasingly large number of devices that have network connectivity. Over the years, network connectivity has been extended to appliances such as refrigerators, home entertainment centers, and interactive box sets for use with television sets, digital cameras, and cell phones. With the evolution of these devices, there have been developments in home networks. For example, WiFi technology enables users to interconnect various network enabled devices wirelessly to form their own local area network. Various services and applications currently exist with the goal of establishing data connectivity between different network locations. The growth of the Internet and other types of networks has contributed to the numerous networking applications that currently exist.

[0004] There is also an interest in extending network connectivity to devices that can roam. These devices include cell phones, personal digital assistants (PDAs), and stations that can be assembled on vehicles or airplanes. While wireless networks for such roaming devices exist, these networks tend to have limited bandwidth, and can be expensive. In addition, it is difficult for operators of such devices to interact with networks, given that these devices often have poor user-interface features, and limited processing/memory resources for tasks that are often desired from them.

[0005] Currently, there are various interoperability issues when different types of network enabled devices are coupled. Often, the different devices operate on incompatible platforms or operating systems. This can cause problems in how these devices share data with one another. Furthermore, connected devices may use different data types (.WAV versus MPEG) and/or data formats that hinder the user's ability to share data amongst devices. As an example, the size of the screen display on a cell phone is typically too small to render images from a digital camera, even if the cell phone is camera-enabled. Often, the result is that when users want to share data amongst connected devices, that user must perform numerous manual steps, such as manually converting data formats.

[0006] Even as various computer and electronic devices increase their functionality, their hardware components, environment and form-factor become limitations that need to be accounted for when devices are sought to operate with one another. For example, many devices are capable of rendering or playing back rich media (e.g. music or video), but these devices have different levels of suitability for these functions. For example, a cell phone may have a music player software application, but limited speaker output for truly enjoyable music listening experience. As another example, cellular phones with cameras are common and widely used, but their images are not as good as devices that are primarily digital cameras.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is an illustration of a system or technique for transmitting target data corresponding to media to a target location or device, under an embodiment of the invention.

[0008] FIG. **2** illustrates a method for transmitting target data corresponding to media to a target device using profile information associated with that device, under an embodiment of the invention.

[0009] FIG. **3** illustrates a method for providing media from a user's defined network to a target device, under an embodiment of the invention.

[0010] FIG. **4** illustrates an architecture for delivering media from various sources to a target, under an embodiment of the invention.

[0011] FIG. **5** illustrates a method for re-streaming media streams from external sources to targets, under an embodiment of the invention.

[0012] FIGS. **6**A-**6**D illustrate techniques by which target data may be transmitted to a target, under one or more embodiments of the invention.

DETAILED DESCRIPTION

[0013] Embodiments described in this application provide the ability for a user to take media from any one of many sources and deliver media from that source to a selected target device or location in a form that is suited for that device or location. One or more embodiments described herein enable data corresponding to that media to be generated which is suitable or even optimal for a target device or location, when the media in its native form is actually not suitable for the target. As such, target data corresponding to media may be generated and delivered to the target to accommodate capabilities and limitations of the target. Examples of the limitations and capabilities that may need to be accounted for in generating the target data include the available bandwidth of the target; the target's processing and/or memory resources; the applications involved in handling media on the target, including web browser or media player; the display size or resolution of the target; and audio hardware on the target.

[0014] Embodiments described herein provide that media received or maintained on a network enabled system of a user may be transported across one or more networks to a desired target device or location. Any form of digital media is con-

templated, including media files (e.g. MP3 files), television media received through a set top box or stored in a digital video recorder, or streaming media. In response to receiving an instruction for delivery of media from a target device, media source identified by the request may be identified and accessed. Media data from the source may be analyzed or inspected to determine its native characteristics. A profile for the target is accessed, and profile information is used to determine desired characteristics for the generation of target data that is to correspond to the media. The target data is generated from the media data or media source with the desired characteristics. If native characteristics of the media data/source are incompatible or otherwise different from the desired characteristics specified in the profile information, the target data is generated to include the desired characteristics, and not the native characteristics. The target data is then transmitted to the target.

[0015] An embodiment such as described may be performed programmatically, or as a computer-implemented method. Programmatically means through the use of code, or computer-executable instructions.

[0016] A particular type of media source contemplated for use with one or more embodiments is a streaming media source, such as provided through a streaming media service on the Internet. In one embodiment, the media source provides a media stream over the Internet or other network. A media delivery system and technique are described to enable the media stream to be received at one end on a user's computer, and then re-streamed to a target device in a form that is suitable for that target. As an example of an implementation of such an embodiment, a streaming video and/or audio feed may be received on a user's media center, then re-streamed to a user's designated target device. The target device may correspond to, for example, another computer, a cell phone, a personal digital assistant, a laptop, a network-enabled audio or media system for an automobile, or some other media output device.

[0017] Under an embodiment of the invention, the act of re-streaming the media stream may correspond to one or more of the following processes being performed: (i) the media stream being reformatted from one data type or extension to another; (ii) a transmission size of the media stream being reduced; and (iii) a display size of the media stream being re-sized.

[0018] As will be described, the processes mentioned above may also be performed for media from sources other than streaming sources. Furthermore, other processes may be performed on data generated from the media source for purpose of making the generated target data suitable for the target device or location.

[0019] The media sources may provide data having a particular set of native characteristics. These native characteristics may be different than desired characteristics for the target data, as specified in the profile information. In one embodiment, target data is generated by reconfiguring or reformatting data from the media sources so that the native characteristics are changed into the desired characteristics. However, it is also possible for a result in which the characteristics of the target data are identical to the native characteristics, meaning the media data in its original form is suitable for the target, at least according to the profile information.

[0020] One or more embodiments described herein may be implemented using modules. A module may include a program, a subroutine, a portion of a program, or a software component or a hardware component capable of performing one or more stated tasks or functions. As used herein, a module can exist on a hardware component such as a server independently of other modules, or a module can be a shared element or process of other modules, programs or machines. A module may reside on one machine, such as on a client or on a server, or a module may be distributed amongst multiple machines, such as on multiple clients or server machines.

[0021] Furthermore, one or more embodiments described herein may be implemented through the use of instructions that are executable by one or more processors. These instructions may be carried on a computer-readable medium. Machines shown in figures below provide examples of processing resources and computer-readable mediums on which instructions for implementing embodiments of the invention can be carried and/or executed. In particular, the numerous machines shown with embodiments of the invention include processor(s) and various forms of memory for holding data and instructions. Examples of computer-readable mediums include permanent memory storage devices, such as hard drives on personal computers or servers. Other examples of computer storage mediums include portable storage units, such as CD or DVD units, flash memory (such as carried on many cell phones and personal digital assistants (PDAs)), and magnetic memory. Computers, terminals, network enabled devices (e.g. mobile devices such as cell phones) are all examples of machines and devices that utilize processors, memory, and instructions stored on computer-readable mediums.

[0022] FIG. **1** illustrates a system for delivering media to a target device, under an embodiment of the invention. A media delivery system **120** may be part of a user's personal network or network enabled system. The media delivery system **120** enables the user to distribute a variety of different media that is available from his or her defined network or network enabled device to locations that are remote to his network location. In particular, an embodiment enables the user to distribute media to one or more selected roaming devices. Roaming devices include devices that communicate on cellular networks, satellite networks, or which are portable and can be connected to the Internet intermittingly. Furthermore, as described elsewhere in this document, the distribution may be made at the request of the target. For example, the user may operate his own media player-enabled cellular phone to request music files from his connected media center (which may run on a desktop computer). Various types of media sources available to the home network or network user are contemplated for this type of media distribution, including, for example, stored media files, live video captured by the user on his own connected video camera, streaming media from an Internet streaming service, and television/audio cable and satellite feeds.

[0023] In an embodiment, the media delivery system **120** uses media source data **112** from one or more media sources **110** to deliver target data **116** to one or more targets **130**. The media delivery system **120** may access profile **125** to obtain target information **124**. The target information **124** may dictate how data from the media source is to be configured in the generation of target data **116**. As such, target data **116** is configured for the target **130**, even though media source data **112** in its original form may not be suitable for the target. An embodiment such as described enables any network enabled device or location to receive target data **116** that is suited for

the particular device/location, and thus allow that device/location to generate media output corresponding to the media source data **112**.

[0024] As will be described, the media sources **110** may correspond to one or more different types, including, for example, stored media files, streaming media from external sources or services, and media feed data from cable or satellite links. Media may correspond to audio data, image data or a combination thereof. Image data may correspond to both still and video data.

[0025] In an embodiment, the target **130** corresponds to a device that the media delivery system **120** can communicate with through one or more networks. According to one embodiment, the target **130** corresponds to a mobile or roaming device, such as a device that uses a cellular network to transmit voice or other data. Examples of such devices include smart phones (such as those that run on the SYMBIAN operating system), wireless phone and messaging devices (e.g. TREO 650, manufactured by PALMONE, INC.), personal digital assistants with roaming or cellular capabilities, and devices with roaming or cellular cards. In another implementation, the target corresponds to any network-enabled machine, such as a laptop. Still further, the target **130** may correspond to a network location, such as an Internet address, which a user can access from a standard Internet connection.

[0026] In one implementation, media may be delivered to the target **130** (in the form of target data **116**) in response to a request **118** from the target. In another implementation, the request to deliver target data **116** to the target **130** may originate from another terminal or network location. The user may specify the request on one machine, and receive the target data **116** on another. For example, the user may send the request from a work terminal or even from a terminal on which the media delivery system **110** operates, to receive media on-the-go through his cell phone. Still further, rather than receive the request **118** from the user, the initiation of media delivery to the target **130** may be programmatic or event driven (e.g. such as through use of a calendar or scheduler).

[0027] The media delivery system **120** may receive the media source data **112** in its native form, meaning the media source data **112** may have a set of native characteristics **113**. Such native characteristics **113** include, for example, transmission size, data format, and display size (for image data). The media delivery system **120** may have full capabilities to receive and handle media from numerous media sources. This may include broadband Internet access, video and audio processing resources, memory to buffer or cache (large RAM), and a large display. An example of media delivery system **120** would be a desktop machine that runs MICROSOFT MEDIA CENTER. For a given media source, some or all of the native characteristics **113** may be unsuitable or unwanted for the target **130**. The media delivery system **120** generates the target data **116** to have target characteristics **117** using the target information **124**. In the case where the media source **110** is completely compatible with the target **130**, the target characteristics **117** and the native characteristics **113** may be the same or substantially similar, so that the target data **116** and the media source data **112** are also substantially similar. In such a case, for example, the target data **116** may simply be a copy of the media source data **112**. In the case where one or more native characteristics **113** are not compatible or are unwanted, the target data **116** may be generated by implementing a conversion process on the media source data **112**. In such a case, one or more of the resulting target characteristics **117** of the target data **116** may be different than the native characteristics **113** of the media source data **112**. For example, one or more of the characteristics transmission size, data format, and display size may be different for the target data **116**, as compared to the media source data **112**.

[0028] The media delivery system **120** may access one or more target profiles **125** associated with the target **130** to obtain target information **124**. The target profiles **125** may correspond to a list of device capabilities and/or a list of user-preferences. The profile information may include information on how to configure or format the target data to accommodate, for example, the following capabilities or limitations of the target: the network bandwidth available to the target; the target's processing and/or memory resources; the applications involved in handling media on the target, including web browser or media player; the display size or resolution of the target; and audio hardware on the target. Some or all of the target information **124** may be determined programmatically, or at least without user-input. For example, target information **124** corresponding to a device profile may be retrieved from a library based on initial device information identified from the user's communication, either through user-input or through other means.

[0029] Embodiments of the invention enable users to establish a media center from within the confines of a network that is under their control, and to use the media center to stream media of their choosing to devices and locations of their designation. This enables the user to make his or her media library available to numerous devices and/or locations of his choosing. An example of an application of an embodiment described herein includes a user making a music library or video library accessible for streaming playback on a cellular phone or portable computing device, where the music or video library is stored on the user's hard drive, on a computer within his home network. In another embodiment, a system may be implemented in which streaming media from a source outside of the user's network is streamed to a station or component within the user's network, then re-streamed to the user's end device.

[0030] Methodology

[0031] FIG. **2** illustrates a method for transmitting media data to a target, under an embodiment of the invention. Methods such as described by FIG. **2** or FIG. **3** may be performed on a user's defined network. The user's defined network may correspond to a subnet of one or more computers under a user's control that are interconnected by a local network connection (e.g. Ethernet) or a through a local connection (e.g. through a serial buss). One example of a user-defined network for use with an embodiment of the invention is a personal network, such as described in U.S. patent application Ser. No. 10/888,606. A personal network is a networked system that uses individual software and/or hardware components as satellites. The satellites are (i) interconnected and aware of each other's status and capabilities (at least when it is relevant), and (ii) able to use each other's functionality. However, alternative embodiments may be implemented in which a system achieves functionality such as described using non-satellite components. For example, as mentioned, the user defined network may include a home network, or a home network combined with an external station that are not aware of each other's status and/or capabilities.

[0032] Another example of a user-defined network is a home network, in which a portal or gateway may be used to interconnect one or more computers with a user's home or space to a public network such as the Internet. According to embodiments described herein, a user's defined network may contain a media library of stored media files, media sources (e.g. cable television or satellite feed, live video camera) contained within the user-defined network or under its control, and external media sources that are accessible to the user-defined network over networks such as the Internet (e.g. streaming media services). These examples of user-defined networks (personal network, home network) and other network enabled systems are contemplated for performing methods such as described in FIG. **2** and FIG. **3**. In describing the methods provided below, reference may be made to elements of FIG. **1** or other embodiments described in this application. Such reference is made for purpose of illustrating a suitable element or component for performing a step or sub-step being described.

[0033] Step **210** provides that a media source is identified. The media source may be based on a request or identification provided by the user, made at any time. The media source may correspond to any source from which media data may be retrieved, generated or received, such as a stored file or a live or ongoing media transmission. The media data provided by the media source may be in the form of audio, video, or a combination thereof. The media source may be internal or external to a user's defined network or computer system. As will be described below, the media data may be from anyone of numerous sources, and in anyone of various formats. For example, the media data may be received as streaming media, retrieved from a stored location, from a cable or satellite media feed, or from a connected device that records media (e.g. video recorder).

[0034] In step **220**, target data is generated from the media source, or from media data provided from the media source, to accommodate a profile associated with the target. The profile may be based on the capabilities of the target and/or the preferences of the user. The profile specifies formatting and configurations for the target data. In an embodiment, the profile specifies the one or more of the following characteristics for the target data: data format, transmission size, and display size. If the native characteristics of the media source do not conform with the characteristics specified by the profile, a conversion or configuration process is performed on media data from the media source in order to make the target data have the desired characteristics. Thus, for example, if a media player of the target requires data to be of a certain type, then a conversion process may be performed to convert the data format of data provided by the media source from a native format to the desired data format. As additional examples, additional conversion or configuration processes may be performed on data generated from the media source in order to generate the target data with desired transmission size or display size.

[0035] Step **230** provides that the target data is transmitted to the target. The data transmission may be performed in response to the target device accessing or making a request for data (pull), or it may be performed by transmitting the target data without the request from the target device (push). In an embodiment where the target is a mobile device (such as one that is cellular enabled), the target data may be streamed. When data is streamed, the mobile or receiving device may respond to receipt of a portion of the overall transmission and initiate playback before the transmission is complete. Thus, the streaming process usually requires buffering on the receiving end. Another embodiment may use another form of data transmission for the target data. Under one embodiment, the target data may be transmitted as one file to the target, such as in the form of an email attachment. Alternatively, one or more (e.g. a series) of Multimedia Messaging Service (MMS) messages may carry the target data to the target. Numerous data transmission techniques may be used, some of which are described below (see e.g. FIG. **6**A-FIG. **6**D).

[0036] The manner in which a method such as described by FIG. **2** is performed may differ, depending on the type of media source involved. For example, in a case where the media source corresponds to one or more media files stored locally within the control of the user-defined network, a temporary copy or conversion file may be formed as a result of step **220**. In the case where the media source is an external streaming source, a buffer may be used to capture the stream while the media delivery system re-streams the data to the target device.

[0037] FIG. **3** illustrates a more detailed method for enabling media to be transmitted from a user-defined network to a target device, under an embodiment of the invention. A method such as described in FIG. **3** assumes the target is a device that is accessible to the user-defined network using data networks such as the Internet and/or cellular networks.

[0038] In step **310**, a user of the user-defined network provides information about the target device. The information may include information about the type or capabilities of the target. Additionally, information may be provided for locating the target device and/or for identifying or verifying the device.

[0039] Step **320** provides that profile information is associated with the target device. The profile information may correspond to information that identifies known capabilities of the target device, or of the target device's ability to handle media. For example, in the preceding step, the user may identify his cellular model, and a module or program on the user-defined network may correlate the device model with a list of pertinent capabilities of that device. In the same example, the user may also specify his media player, his cellular network, additional memory (e.g. smart card) or other information. To this end, a library may be maintained with information about different devices. The library may be programmatically accessed by, for example, a media delivery system (such as illustrated with FIG. **4**) to determine how target data is to be configured. Examples of what type of information may be maintained in the library based on device capabilities include one or more of the following: media player type, display size, operating system, cellular network (if applicable), processing or memory capabilities, maximum transmission size. Additionally, profile information may include one or more user preferences. For example, the user may specify a desired transmission size that is less than the maximum transmission size. The user may also specify, for example, alternative display sizes, or implement filters.

[0040] In step **330**, conversion and configuration processes may be established or otherwise made available to the user-defined network for purpose of enabling the media delivery system **120** to perform on-the-fly processes to generate target data with desired characteristics specified in the profile information. In particular, embodiments provide that in instances where the media source is, in its native form, incompatible or inconsistent with characteristics specified by the profile infor-

mation, then the target data is generated with the desired characteristics specified by the profile information by performing conversion or configuration processes on data from the media source. The processes identified in this step may accommodate any one of a variety of media sources, including media sources that are both internal and external to the user-defined network. For example, processes may be identified to convert media files from any one of a plurality of data formats into a desired data type that is compatible with a particular type of media player on the target device. As another example, processes may be identified to convert streaming data from external sources, having any given data type, transmission size, or display size, into streaming data of a particular data type, transmission size and/or display size. Since the processes may be performed on-the-fly, streaming media from a media source external to the user-defined network may be converted/configured and transmitted to the target concurrently with transmission of the stream from the external source. If the native form of the media source is compatible with the characteristics specified in the profile information, then the target data may be generated by, for example, copying and/or buffering the media file or media data from the media source.

[0041] Once the target is identified, the profile is established, and the conversion/configuration processes are identified, the target may be used to retrieve and playback media from the user's defined network. In an embodiment, step **340** provides that a request for media is made from the target. The request may include identifiers for identifying the media source, or when applicable, particular data available from the media source. For example, the identifier may identify a streaming media source, a particular file, a uniform resource locator (URL) (or partial URL), or a media channel in the user's network (such as a channel designating a cable television channel, or a channel that represents a media feed from the user's own video recorder). Different implementations are contemplated for the form in which the request can be made. For example, the user may select an icon representing an action (get media from a streaming media service) or a source. The user may enter text data (through key strokes or even through voice recognition) to select the media source.

[0042] According to one embodiment, the target device may be equipped with a user-interface that displays media in a user's defined network, as well as media sources that the user has access to from his or her network. Such a user-interface is described in U.S. patent application Ser. No. 10/888,606, the aforementioned application being hereby incorporated by reference. Thus, for example, the user may select an icon from a graphical user interface (GUI) where the icon corresponds to a "channel", and the channel may correspond to, for example, a streaming media source, such as an Internet radio site. Another icon on the same interface may represent another media source, of a different type (stored files of an album, or channel from a television cable feed). Thus, selectable user-interface features may be provided on a single interface for connecting the user's remote or roaming device with distinct media sources, possibly of different types. For example, icons on one interface may represent a stored audio collection, cable television channel, and Internet streaming service. With regard to Internet streaming services or sites, specific media available from those services and sites may further be indicated. For example, the specific station on an Internet radio site may be specified in the request.

[0043] Step **350** provides that the requested media source is accessed for media data. The requested media source may be an external streaming media source, such as an Internet radio or television site, in which case the web site and/or uniform resource locator (URL) for that site is used to retrieve media data from the media source from within the defined network. In the case of streaming media sites, the media data may be buffered. As an example of another implementation, stored media files may be opened in this step, and/or the contents of the media files may be copied for the processes that are to be performed (if any).

[0044] In step **360**, a set of characteristics of the media data and/or the requested media source are identified. The identification of the characteristics may be performed programmatically. The particular characteristics that are sought for identification in this step may be designated by the profile associated with the target device. Thus, for example, different characteristics may be evaluated for different target devices. Specific media data characteristics that may be identified include, for example, data format, transmission size, and display size for image data.

[0045] Step **370** provides that target data is generated from the data of the requested media sources. The target data is generated with consideration or use of the established conversion and configuration processes. Thus, if characteristics identified in step **360** are incompatible or different than what was specified in the profile information associated with the target, corresponding processes are performed to make the data conforming to the desired characteristics specified by the profile information. If conversion or configuration processes are necessary, the processes that are to be performed may be selected from a library of processes established in step **330**. If, however, the characteristics identified in the step **360** are completely conforming to the desired characteristics specified in the profile information, then no configuration or conversion processes need to be performed. The target data generation then becomes a process to buffer and/or copy some or all of the media source data.

[0046] Step **380**, the target data is transmitted to the target device. Different modes of data transmission are contemplated by embodiments of the invention. In particular, the target data may be streamed to the target device. Alternatively, the target data may be messaged, such as through an attachment to an email. As another example, an alternative messaging medium such as Multimedia Messaging Service (MMS) may be used. Examples of different transmission techniques are shown in greater detail with FIGS. **6**A-**6**D and elsewhere in the application.

[0047] Architecture for Media Delivery System

[0048] FIG. **4** illustrates a system for delivering media to a target location or device, under an embodiment of the invention. A system such as shown and described may be implemented as part or within a user's defined network. For example, the system shown may operate at least partially within a desktop computer used to manage a home network, or a computer on which Microsoft Media Center (manufactured by the Microsoft Corporation) is running. However, a user's defined network may extend to network locations that are provided by third-party services, for which the user has permission to access and use (for example, an account). In many cases, the user's defined network is maintained substantially within a gateway or firewall, interconnected by a local network such as WiFi and/or Ethernet. However, the user's network may extend to physical locations that are

reachable across the Internet or other public networks, so that the user's defined network may include one or more externally located stations, terminals, computer clusters etc.

[0049] According to one embodiment, a system such as described in FIG. **4** may be implemented through use of a personal network as described in U.S. patent application Ser. No. 10/888,606. However, alternative embodiments may be implemented in which a system archives functionality such as described using non-satellite components. For example, as mentioned, the network enabled system shown in FIG. **4** may correspond to a home network, or a home network combined with an external station each of which are not aware of each other's status and/or capabilities. Another example of a network enabled system includes two or more devices locally connected and network enabled from behind a gateway.

[0050] In FIG. **4**, a network enabled system **402** that includes a media delivery system **410**. The media delivery system **410** communicates with one or more targets, including, for example, a target device **420** and/or a network location **422**. The targets may reside outside of the network enabled system **402** and be reachable through one or more networks **404**, such as the Internet and one or more cellular networks. The target device **420** may correspond to, for example, a cellular or smart phone, a media player with a network connection (the network connection may be wireless or landline), a notebook computer, an automobile having satellite media delivery, or a workstation. The target network location **422** may be on a site that is accessible to an audience of target devices or users. For example, the network location **422** may correspond to a web service or web page through which media can be streamed.

[0051] According to an embodiment, components of media delivery system **410** include a determination module **412**, a reducer **414**, a display sizer **415**, a formatting component **416**, and a transmission module **418**. Each of these components may be implemented as a module. In one embodiment, the media delivery system **410** is capable of receiving media from anyone of a plurality of sources and locations, including internal and external sources. Thus, media data **425** may be received by the media delivery system **410** from a plurality of sources.

[0052] One or more profile structures **426** may exist as a source for profile information **427**. The profile structures **426** may store profile information **427** corresponding to capabilities and limitations of the target device. These may include, for example, information indicating what the device can handle based on processing and memory resources (e.g. cache) of the target, the media player type or web browser used by the target, the modem connection (if any) of the target, the display size and/or resolution of the target, the operating system running on the target device, congestion characteristics or bandwidth information on the communication networks used by the target device, and the type or model of the target. Profile information **427** about the target device (s) may be determined programmatically or manually. For example, in one embodiment, the first communication in the form of a request for target data from the target device's web browser may be used to programmatically determine the type of web browser in use on that device. As described elsewhere, programmatic timing mechanisms may be used to determine available bandwidth for the device, particularly at a given instance. Other information may be manually entered by the user. In addition to profile information **427** accommodating specific device capabilities or limitations, the profile information may also correspond to specific preferences of the user. For example, the user may have a preference as to the transmission size of streaming media (low quality), or to the particular media player he or she wants to use.

[0053] According to an embodiment, the determination module **412** inspects the media data **425** for its native characteristics. The determination module **412** may also access profile information **427** from a user/device profile **426** to determine what native characteristics of the media data **425** need to be changed or unchanged. Using profile information **427**, the determination module **412** determines what components are to be used.

[0054] Examples of media sources that can be accessed by the media delivery system **410** include internal (to the network enabled system **402**) sources such as individual files in a media file system **432**, a satellite outlet **434** or a cable outlet **436**. Another specific example of a media source includes a specific file contained in the memory drive of a digital video recorder (e.g. TiVo). Another example of an internal media source includes a local media recorder **438** (video camera) from which live media streams are generated. External media sources may include streaming media sites and services, such as an Internet Television/Radio **431** site or streaming services **433** (e.g. RHAPSODY, STREAMWAVE). However, it should be noted that the sources of media are diverse and increasing with time. For example, "podcasting" sites provide non-streaming media files to users, and are contemplated for use with embodiments of the invention.

[0055] In an embodiment, the following processes may be performed in order to convert or configure media resources, based on the results of the determination module **412** inspecting the media data **425**.

[0056] Data Reduction: If the media data **425** is incoming (external stream, cable television etc.) and has an inherently large transmission size, the determination module **412** may have one or more data reduction processes performed on the media data. The transmission size may correspond to a bit rate for the transmission. The bit rate is a function of a frame rate and picture quality. The bit rate is normally determined by the media source, which uses a high bit rate to improve picture quality and/or frame rate. The data reduction parameters may be set as one of preference or necessity. For example, in order to free network bandwidth, the user may have a preference as to lower transmission size. Additionally, the network bandwidth a device may need may be determined independent of the device's capabilities. Rather, the available bandwidth may be a function of the bandwidth on the communication channel to the device. In one embodiment, this profile information is determined programmatically, by sending a test message or communication to a specific target and measuring a response time. For example, an image or media clip may be transmitted periodically to the end target device from a component on the user's network system, and the component may measure the time it takes for a programmatic response or receipt to that message to be received back from the target. Based on response time, the profile information indicating bandwidth and/or data reduction parameters may be set.

[0057] Formatting: The determination module **412** may use profile information **427** to determine information about the data type of media that can be handled by the target. For example, the profile information **427** may identify the type of media player on the target device **420**. If inspection of the media data **425** determines that the format of the media data is not compatible with the media player on the target device

420, then the formatting component 416 may be used to convert the data format. Implementation of the formatting component 416 may correspond to identification of a specific process that converts the media data from its native format to another format suitable for consumption by the target device 420. For example, a process may be called to convert the media data 425 from WMP to AAC.

[0058] Image Sizing: The determination module 412 may inspect media data 425 to determine whether image data 411 is contained in the media data 425. If image data 411 is contained, then the determination module 412 may use profile information 427 to determine if any size constraints exist for the target that is to receive the media data. For example, cellular phones have size limitations in their dimension and screen resolution. The determination module 412 may size the image data portion (sized image data 413) of the media data 425 in order to make the video or images of the media data compatible with the display hardware of the target device 420. In addition to size limitations, some target devices may have alternative size capabilities. For example, the device may have an elongated display and alternative display mode operations where the device may be operated in a landscape mode. The sizer 415 may accommodate the landscape settings with the image data, even by extrapolating or stretching image data.

[0059] The particular order that the processes are performed are design implementations. It is also possible to perform some or all of the processes of the individual components concurrently.

[0060] For different media sources, the network enabled system 402 may include components to interface and handle interface with the media sources, handle media data from the media resources, and even control the media sources. One or more application program interfaces 460 may be used to receive and connect to the different interfaces of the media sources. In one embodiment, a media library interface 433 may provide a programmatic mechanism for retrieving media data from the media file system 432 in response to individual requests of the user. Media library data 452 may be generated form individual files in the media file system 432. Other internal media sources, such as cable media source 436 or satellite media source 434 may feed raw media data into a set top box or tuner 435. A connection may be established between the tuner 435 of the respective satellite media source 434 or cable media resource 436, and the interface 460 of the media delivery system 410. A media feed 441 may be transmitted across the connection as output of the tuner 435. The local media recorder 438 may also transmit recorded media feed (albeit of a different type) to the interface 460 of the media delivery system 410.

[0061] External Media Handling

[0062] Embodiments of the invention enable the media delivery system, such as described in FIG. 4, to receive and transmit streaming media that comes from a media source outside of the system 402. In an embodiment, external media sources may be accessible to receive media data in the form of streaming network transmissions. To handle such media data, an external stream handler (ESH) 470 may be used in conjunction with the media delivery system 410. In one implementation, the ESH 470 and the media delivery system 410 may form locally interconnected components, or even reside within the same network enabled machine. As locally interconnected components, the ESH 470 and the media delivery system 410 may communicate over a direct or local communication link, such as through a WiFi connection, over a LAN or across a Universal Serial Bus connection. Alternatively, the ESH 470 and the media delivery system may reside within the same machine as software components. In this way, the media delivery system 410 and the ESH 470 may share a common firewall or gateway architecture to the Internet.

[0063] In one embodiment, the ESH 470 includes one or more buffers that operate in conjunction with the user's browser component 472, which could be, for example, a web browser or a media player, to receive streaming media of various types, sources and transmission size. The browser component 472 may be instructed to access network sites or locations as specified by the user's request. Other user-initiated or programmatic instructions may be employed to cause the browser component 472 to retrieve the specific desired media from the accessed site. For example, the browser component 472 may be used to select a link to a specific radio station or television station on a web page of an accessed site, and on selection of the link, streaming media data may be received by the web browser and directed to the ESH 470. Functions performed by the ESH 470 include receiving and buffering media streams 475 from external streaming media sources 431, 433, and then moving streaming data 476 to the media delivery system 410. In one embodiment, the ESH 470 directs buffered media data 476 from one portion of a transmission of media stream 475, concurrently while receiving transmission of another portion of the same media stream 475. In one embodiment, ESH 470 operates in coordination with a browser component 476, such as a web browser or a browser-enabled media player. The browser component is used to access the network site from which the media stream is received.

[0064] The media delivery system 410 performs the functions of converting and configuring the data in the media streams 475 for transmission to the targets, as described above. The performance of the media delivery system 410 in the context of delivering media corresponding to external streaming media may be described with FIG. 5.

[0065] In step 510, streaming media data from the media streams 475 are buffered. While a streaming transmission is being received, step 520 provides that a set of characteristic about the media stream is identified. In an implementation such as shown in FIG. 4, this step may be performed by forwarding streaming data 476 to the determination module 412 while the transmission of the media stream 475 is ongoing.

[0066] In step 530, the determination module 412 uses profile information 427 to determine which of the processes of the media delivery system 410 are needed in order to make the streaming data 476 conform to the desired characteristics for the target. Accordingly, in step 540, a determination is made as to whether the data type format of the streaming data 476 is compatible with or in accordance with the desired data type for the particular target.

[0067] If the data type of the external streaming data 476 is not a desired data type, the formatting component 416 may be used to convert the media stream 475 from its native format to the desired format in step 550. For example, some media sites may provide streaming media in the form of WMP, while the media player on the target device 420 is a REAL player requiring the data type to be of type RM. In response to determining the WMP format, the formatting component 416 identifies the correct conversion process to reformat the media data. The formatting component 416 may include or

have access to a library of conversion processes for changing the data type of the streaming data **476**.

[0068] Following the determination of step **540**, another determination **560** may be made as whether the transmission size is within the range specified in the profile information **427**. With streaming media, the transmission size may correspond to a bit rate, which is a product of the frame quality and the frame rate. In a typical application, the media source provides media of high-quality, such as comparable to Compact Disc or DVD playback. Such data may be provided at high bit-rates (e.g. 1.5 MB/second). To accommodate this much data, ESH **470** may include a large buffer that communicates with responsive processing resources to move data from the buffer to the media delivery system **410**. However, the target may not be capable of receiving the transmission at the same bit rate. If the determination is that reduction is needed, step **570** may provide for the reducer to reduce the overall bit rate. In one embodiment, the reducer **414** may lower the bit rate by lowering the frame quality or by lowering the frame rate. The profile information **427** may specify as to whether reduction should be performed with a setting of high quality frames and low frame rates, high frame rates and low quality frames, or a setting in between. This setting may be set by user preference, target device capabilities or limitations, and/or communication channel bandwidth or congestion.

[0069] Media stream **475** may include audio and/or video. In one embodiment, a determination is made in step **580** as to whether the media stream **475** includes image data, either in the form of still images or video. In one implementation, the determination may be made by the determination module **412** through inspection of streaming data **476**. If image data is contained, then profile information **427** may be used to determine in step **585** whether the image data is sized appropriately for a display of the target. This includes determining whether the lines of resolution and display dimensions of target device **420** can accommodate the entire span required by the image data in the media stream **475**. If the image data is not sized correctly, the image data in the streaming data **476** may be resized in step **590**. The display sizer component **415** may re-size the image data (usually to reduce the dimension or resolution). If no image data is contained in the media stream **475**, or if the image data is sized correctly, no action is taken on the image data.

[0070] In step **595**, the target data is transmitted. In the case where the target data corresponds to media stream **475**, the target data **405** is streamed to the target. As described, embodiments of the invention provide that the media delivery system **410** performs its operations on incoming media streams **475** in an on-the-fly or responsive manner. Thus, the determination module **412** may inspect the external media data **476** responsive to the ESH **470** receiving the media stream **475**, and the components and processes for performing configurations, conversions and alterations to the external media data may be performed while the original stream is being received. The effect is that the ESH **470** and the media delivery system **410** combine to receive media streams and to "re-stream" the media streams to the targets.

[0071] Furthermore, under an embodiment, the reception of the media streams **475** from the external media sources **431**, **433** may be performed concurrently while the re-streaming to the targets takes place. Thus, it is possible for the media delivery system **410** to re-stream media stream **475** in near real-time.

[0072] As described, the external media sources **431**, **433** may correspond to any source of media data that resides outside of the local environment which interconnects ESH **470** and the media delivery system **410**. Furthermore, the external media sources **431**, **433** may be subject to third-party ownership and/or control. In order to optimize performance, the ESH **470** may connect to the Internet using a high-speed Internet connection (e.g. T1 or DSL).

[0073] In one embodiment, ESH **470** buffers and forwards the streaming data **476** to the media delivery system without alteration or change. As implemented with such an embodiment, the properties of streaming data **476** are not relevant to the operation of the ESH **470**. Within the media delivery system **410**, the determination module **412** may inspect the streaming data **476** to determine the properties of the media stream **475**.

[0074] Depending on design implementations, embodiments of the invention may provide numerous buffers, cache, or other memory resources that may be used throughout the media delivery system **410** to store processed or to-be processed media data **425** for delivery to the targets. For example, in one scenario, a specific media file may be converted and configured for delivery to the target in a first instance. A copy of the configured or converted media may be stored in cache or other memory so the next request for that media source avoids performance of the processes in the media delivery system **410**. Rather, the appropriately converted/configured data may be retrieved from cache. Likewise, while streaming data from external sources may be delivered to the targets concurrently or in near real-time, an embodiment contemplates the streaming data being stored or buffered for delayed transmission to the target. For example, the transmission to the target may be delayed until the user is ready, until the user has adequate network bandwidth, the user is finished taking a phone call or for other reasons.

[0075] Transmission to Target

[0076] As described herein, the target that receives target data from the media delivery system may be machine, device or network location. In one embodiment, the media delivery system **410** may be implemented to transfer data to any type of target. One type of target for target data provided by the media delivery system **410** is a roaming device. A roaming device may correspond to a device that is network enabled while being mobile, so that is has physical locations and can use different network connections to connect to the Internet. An example of a roaming device is a smart cellular phone, a personal digital assistant with network capabilities (e.g. WiFi or cellular), or a laptop computer that is used with Hot Spots or other locations of Internet connectivity.

[0077] FIG. **6**A illustrates an embodiment for transferring target data **612** directly to a target that is a device **610**, such as a roaming device. The target data **612** may generate a request **608** that results in the transmission of the target data **612**. In one embodiment, the request **608** is made to a network service **620**, which has access to portions of the user-defined network. The network service **620** may have a network location that is accessible to the target device through use of a browser or other web-enabled component. For example, the service **620** may be provided through selectable iconic representation on a GUI of the target device, the selection of which corresponds to the web browser activating a URL to the service. In turn, the service **620** gains access to the user-defined network **602** (or other network enabled system of the user) using a network such as the Internet. In one embodiment, the service **620**

communicates the network location of the device **610** to the media delivery system **615** within the user-defined network **602**, and the media delivery system within the user's network establishes a peer-to-peer connection with the target. It is over the peer-to-peer connection that target data is transmitted.

[0078] In a variation, the service **620** performs functions such as authenticating and/or verifying the user of the roaming device. The service **620** may also determine information about the user's device, such as information about the capabilities of the target device (e.g. what type of browser made the request).

[0079] In another variation shown by FIG. **6**B, the service **620** acts as an intermediary between the target device **610** and the media delivery system **615**. Thus, target data **612** is sent to a target that is a network location hosted by the service **620**. At the same time, the target device **620** is directed to access that location to receive the target data.

[0080] In yet another variation shown by FIG. **6**C, rather than use the service **620**, the target device and the media delivery system may rely on messaging. For example, the target device **610** may send a message **632** corresponding to the request for target data. The media delivery system may then message (e.g. media file as email attachment) the target data **634** back to the target device. More than one message may be needed to communicate the target data.

[0081] FIG. **6**D illustrates an implementation in which the user's defined network **612** and the target device **610** communicate to establish their own network location for which target data is to be relayed. In one implementation, the media delivery system of the user's network sends an invitation message **640**, such as in the form of a Short Message Service transmission, communicating the network location for which the browser of the target device **610** is to access. The target data is then transmitted to that network location **642** (which may correspond to the target **412**, as shown in FIG. **4**). The target device **610** then accesses the network location to receive the target data.

CONCLUSION

[0082] Although illustrative embodiments of the invention have been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments. As such, many modifications and variations will be apparent to practitioners skilled in this art. Accordingly, it is intended that the scope of the invention be defined by the following claims and their equivalents. Furthermore, it is contemplated that a particular feature described either individually or as part of an embodiment can be combined with other individually described features, or parts of other embodiments, even if the other features and embodiments make no mentioned of the particular feature. This, the absence of describing combinations should not preclude the inventor from claiming rights to such combinations.

What is claimed is:

1. A method for transmitting content, the method being implemented by one or more processors and comprising:

receiving, on a first computing device, status information for one or more of multiple computing devices that are interconnected to form a personal network, wherein the status information indicates that each of the one or more computing devices is connected to a network and operating as part of the personal network;

providing one or more interfaces to a user on the first computing device to enable the user to select (i) a media feed, and (ii) a target that can correspond to one or more of the multiple devices of the personal network that is indicated as being available based on the status information;

detecting selection of the media feed, and selection of a second device of the multiple computing devices as the target; and

transmitting at least a portion of the media feed to the second device as the media feed is received on a resource of the personal network, the media feed being transmitted to accommodate one or more characteristics of the second device.

2. The method of claim **1**, further comprising receiving the media feed from a source external to the personal network.

3. The method of claim **1**, wherein transmitting at least the portion of the media feed includes configuring the media feed for the one or more characteristics of the second device.

4. The method of claim **1**, wherein transmitting at least the portion of the media feed is performed on the first computing device.

5. The method of claim **1**, wherein in response to detecting selection of the media feed, the method further comprises communicating, from the first computing device, with a third computing device of the personal network on which the resource is provided, in order to receive the media feed on the third computing device from a source external to the personal network.

6. The method of claim **5**, wherein transmitting at least the portion of the media feed is performed on the third computing device.

7. The method of claim **6**, further comprising configuring, on the third computing device, at least the portion of the media feed for one or more characteristics of the second computing device.

8. The method of claim **1**, wherein the first computing device corresponds to a roaming device that communicates with at least the second computing device using the Internet.

9. The method of claim **1**, wherein the media feed corresponds to a streaming media source.

10. The method of claim **1**, wherein the media feed corresponds to a cable or broadcast feed.

11. A computer system comprising:

a memory that stores a set of instructions;

one or more processors that execute the set of instructions to:

form a personal network that includes multiple devices that are interconnected using one or more networks;

receive, at a first location of the personal network, status information for one or more of the multiple computing devices of the personal network, wherein the status information indicates that each of the one or more computing devices is connected to a network and operating as part of the personal network;

provide one or more interfaces to a user at the first location of the personal network to enable the user to select (i) a media feed, and (ii) a target that can correspond to one or more of the multiple devices of the personal network that is indicated as being available based on the status information;

detect selection of the media feed, and selection of a second device of the multiple computing devices as the target; and

transmit at least a portion of the media feed to the second device as the media feed is received on a resource of the personal network, the media feed being transmitted to accommodate one or more characteristics of the second device.

12. The computer system of claim **11**, wherein the one or more processors execute the instructions to receive the media feed from a source that is external to the personal network.

13. The computer system of claim **11**, wherein the one or more processors execute the instructions to configure the media feed for the one or more characteristics of the second device.

14. The computer system of claim **11**, wherein the one or more processors execute the instructions to transmit at least the portion of the media feed from a first computing device of the personal network on which the first location is provided.

15. The computer system of claim **11**, wherein in response to detecting selection of the media feed, the one or more processors execute the instructions to communicate with a third computing device of the personal network on which the resource is provided to receive the media feed from an external source.

16. The computer system of claim **15**, wherein the one or more processors execute the instructions to transmit the media feed from the third device to the second device using one or more networks.

17. The computer system of claim **16**, wherein the one or more processors execute the instructions to configure at least the portion of the media feed for one or more characteristics of the second computing device.

18. The computer system of claim **11**, wherein the first location is provided on a first computing device of the personal network, the first computing device corresponding to a roaming device that communicates with at least the second computing device using the Internet.

19. The computer system of claim **11**, wherein the media feed corresponds to a streaming media source.

20. The computer system of claim **11**, wherein the media feed corresponds to a cable or broadcast feed.

21. A non-transitory computer-readable medium that stores instructions that, when executed by one or more processors of a computer system, cause the computer system to perform operations comprising:

receiving, on a first computing device, status information for one or more of multiple computing devices that are interconnected to form a personal network, wherein the status information indicates that each of the one or more computing devices is connected to a network and operating as part of the personal network;

providing one or more interfaces to a user on the first computing device to enable the user to select (i) a media feed, and (ii) a target that can correspond to one or more of the multiple devices of the personal network that is indicated as being available based on the status information;

detecting selection of the media feed, and selection of a second device of the multiple computing devices as the target; and

transmitting at least a portion of the media feed to the second device as the media feed is received on a resource of the personal network, the media feed being transmitted to accommodate one or more characteristics of the second device.

22. The non-transitory computer-readable medium of claim **21**, further comprising instructions that, when executed by one or more processors, cause the computer system to perform operations that include receiving the media feed from a source external to the personal network.

23. The non-transitory computer-readable medium of claim **21**, wherein transmitting at least the portion of the media feed includes configuring the media feed for the one or more characteristics of the second device.

24. The non-transitory computer-readable medium of claim **21**, wherein transmitting at least the portion of the media feed is performed on the first computing device.

25. The non-transitory computer-readable medium of claim **21**, further comprising instructions that, when executed by one or more processors, cause the computer system to perform operations that include, in response to detecting selection of the media feed, communicating, from the first computing device, with a third computing device of the personal network on which the resource is provided, in order to receive the media feed on the third computing device from a source external to the personal network.

26. The non-transitory computer-readable medium of claim **25**, wherein transmitting at least the portion of the media feed is performed on the third computing device.

27. The non-transitory computer-readable medium of claim **26**, further comprising instructions that, when executed by one or more processors, cause the computer system to perform operations that include configuring, on the third computing device, at least the portion of the media feed for one or more characteristics of the second computing device.

28. The non-transitory computer-readable medium of claim **21**, wherein the first computing device corresponds to a roaming device that communicates with at least the second computing device using the Internet.

29. The non-transitory computer-readable medium of claim **21**, wherein the media feed corresponds to a streaming media source.

30. The non-transitory computer-readable medium of claim **21**, wherein the media feed corresponds to a cable or broadcast feed.

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