PORTABLE DATA STORAGE DEVICES THAT INITIATE DATA TRANSFERS UTILIZING HOST DEVICES

A computing system including a media content provider (MCP), a host device, a portable media content storage device (PMCS), and a data communications network. In response to data communications being initiated between the PMCS and the host device, a data transfer application resident on the PMCS is automatically executed to determine if any media content transfer instructions exist on the PMCS or a MCP. The data transfer application resident on the PMCS may be a portable application not requiring the installation of any configuration or support files to the host device or it may be an application having a boot process that installs configuration or support files to the host device prior to application execution. When one or more media content transfer instructions exist on the PMCS or a MCP, the media content transfer instruction(s) is processed by the host device, to facilitate media content transfer between the PMCS and the MCP.
PORTABLE DATA STORAGE DEVICES THAT INITIATE DATA TRANSFERS UTILIZING HOST DEVICES

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CROSS REFERENCE TO RELATED APPLICATIONS
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TECHNICAL FIELD
The technical field of the invention generally relates to systems and methods for automatically initiating managed media content transfers utilizing portable data storage devices. These portable data storage devices have readily bootable data transfer applications stored in their local memory that can be automatically executed in response to a detection of a triggering event, such as a device plug-in event or a short-range wireless communications activation event. New or pending media content transfer sessions may be automatically or selectively launched by executing the data transfer application resident on a portable data storage device.

BACKGROUND ART
Digital media content distribution services continue to grow at an astonishing rate in response to the evolution of modern data communications networks that can facilitate high-speed data transfers for vast amounts of digital media content data. Whether digital media content distribution occurs over wireline networks, such as fiber-optic or cable networks, or over wireless networks, such as 3G, 3GPP LTE, LTE Advanced, or 4G cellular networks, the trend of increasing distribution service capacity and flexibility remains a key objective for most media content service providers. Over
the past decade, consumer exposure to state-of-the-art digital media content
distribution and playback technologies (e.g., digital video recorders (DVRs), multi-
function cellular phones, PDAs, satellite radio and television devices, e-books devices, etc.) has created a significant demand for improved digital media content delivery services.

These new technologies have revolutionized the way consumers procure and utilize a wide variety of digital media content. A non-exhaustive listing of modern digital media content types, include: movies, TV programs, home video, software applications, video games, podcasts, music, e-books, etc. Most distribution services for these media content types occur over the Internet at media content provider website stores (e.g., Apple® I-Tunes™, Microsoft® Zune™, and Amazon® Kindle™ Stores) or over proprietary cable, fiber-optic, satellite, and cellular networks provided by various media content services providers (e.g., Comcast® Digital Cable, Verizon® FIOS™, DirectTV®, Sirius® XM Radio™, and AT&T® Wireless).

Many popular digital distribution services allow consumers to select and download digitized media content files to personal computers or set-top boxes where they can later be manually selected for upload to a variety of portable media playback devices to facilitate future media content playback. These autonomous playback devices free consumers from having to remain connected to a particular communications network in order to enjoy their digital media content. Most popular media playback devices (e.g., the Apple® I-Phone™ and I-Pod™, or the Amazon® Kindle™) are provided with many Gigabytes of non-volatile memory (e.g., Flash Memory) that allows the playback devices to maintain local repositories for significant amounts of purchased, or otherwise acquired, digital media content.

In order to facilitate digital media content acquisition and autonomous playback on portable media content playback devices, users having the playback devices have typically followed the same common three-step model:

1) Select one or more digital media content files to download from a media content distribution service provider (also referred to herein as a Media Content Provider or MCP);
2) Initiate download of selected digital media content files to a powerful personal computing device, such as a desktop or laptop computer; and
3) Manually select downloaded digital media content files from the personal computing device to upload to a portable media content playback device.

By way of example, one very popular media content distribution service that follows the above three-step model is the Apple's® I-Tunes™ application integrated with the online I-Tunes™ Store. A user having an I-Phone™ or an I-Pod™ device can execute their local I-Tunes™ application, resident on a personal desktop or laptop computer, and then elect to connect their I-Tunes™ application to the I-Tunes™ Store via the Internet. Once connected to the I-Tunes™ Store, a user can then utilize their integrated I-Tunes™ application’s user interface to 1) Select one or more digital media content files to download to their desktop or laptop computer.

As would be understood by those familiar with the I-Tunes™ products and services, when the local I-Tunes™ application is connected with the I-Tunes™ Store, the interface of the I-Tunes™ application is integrated with the I-Tunes™ Store website interface, such that a user can view a web-based catalog of downloadable digital media content through their local I-Tunes™ application interface. The Apple® I-Tunes™ Store generally distributes media content relating to: digitized music, movies, podcasts, games, software applications, audiobooks, e-books, etc. After selection of various digital media content, a user can then purchase the media content directly from the I-Tunes™ Store using a credit card or other payment method, and 2) Initiate downloading of the purchased digital media content to their desktop or laptop computer memory using the integrated I-Tunes™ interface.

When the digital media content has finished downloading to a user’s desktop or laptop computer, the user is then able to selectively generate a personal library of procured media content for upload to their I-Phone™ or I-Pod™ device. Next, a user can connect their I-Phone™ or I-Pod™ device to their desktop or laptop computer (e.g., via USB cable) in order to Synchronize their portable playback device with the I-Tunes™ application. Subsequently, a user is able to 3) Manually upload the selected digital media content (their upload library) from their desktop or laptop computer to
their connected I-Phone™ or I-Pod™ device utilizing the I-Tunes™ application interface.

The I-Tunes™ service is an elucidating example of the common three-step media content distribution model, which emphasizes a number of inherent procedural deficiencies associated with modern media content distribution services. One weakness of the three-step model is that user input and management of media content distribution is required at every step of the process in order to initiate media content transfers amongst the media content provider, the personal home computer (e.g., a desktop or laptop computer), and the end-receiving portable media content playback devices. Unfortunately, consumers who utilize this model need to be reasonably tech-savvy in order to properly navigate (and optionally transform) their purchased media content from online source to portable playback destination.

For example, in order to acquire digital media content on their portable playback devices, consumers are typically required to be able to do all of the following: log on to a media content provider store; select compatible media content for purchase; purchase the selected media content; designate a local destination address on their home computer (e.g., on their desktop or laptop computer) where the media content is to be stored; initiate the media content download; connect their portable playback device to their home computer storing the downloaded media content; select their home computer’s media content source location, where the downloaded media content resides; optionally, reformat the media content to be compatible with a particular playback device; select the attached playback device as the recipient device for a media content upload; and initiate the upload from their home computer to their portable playback device.

For many tech-savvy consumers these media content procurement and distribution procedures are not very difficult, however, for large numbers of consumers who are not very computer-literate, these procedures can be daunting or even prohibitive. Accordingly, large populations of potential consumers, having lower levels of computer literacy, are deterred from entering the digital media distribution marketplace because of the required technology aptitude and the relative complexity.
of most modern media content distribution services. These individuals often continue to purchase more expensive physical playback media (e.g., DVDs or CDs) that can be easily inserted into simple, dated playback devices (e.g., DVD or CD players) that only require one playback step after medium insertion: hitting a "play" button on a playback device.

Another shortcoming associated with modern digital media content distribution services is that there are inherent network limitations created by allowing consumers to selectively determine during which periods of time media content transfers should occur. The communications networks involved in the data transfers are necessarily sized to handle peak usage data transfer periods for the network's collective users. These peak usage periods are determined by aggregate network user behaviors over hourly, daily, monthly, and yearly intervals. When large numbers of network users simultaneously transfer particularly burdensome media content files, such as high definition audiovisual files, networks can become congested. This congestion can negatively affect cumulative network throughput as well as the Quality of Service (QOS) and the Quality of Experience (QOE) for most network users.

To remedy the problems associated congestion and the lack of network capacity (e.g., available network bandwidth) during peak usage periods of operation, network service providers often commit to expensive, time-consuming technology additions and/or upgrades. These network enhancements serve to alleviate network congestion periods and to avoid persistent customer service calls from irritated customers.

Even though certain networks routinely experience periods of extreme congestion during peak usage data transfer periods, these same networks often experience periods of excess, wasted bandwidth during off-peak data transfer periods. Although, costly network enhancements can alleviate peak periods of congestion in most networks, these enhancements also create an increased surplus of wasted bandwidth during off-peak periods. It is therefore advantageous to consider new ways to utilize existing network resources in order to efficiently balance daily bandwidth usage over a data communications network routinely experiencing network
congestion, and to avoid unnecessarily expending service provider resources.

Another drawback with modern digital media content distribution services is getting the media content (e.g., pixel-based video content having resolutions associated with set aspect ratios) to properly display on desired playback devices, such as large-format, high-definition televisions or home theaters. Generally, if an original media content is downloaded from a media content provider to a personal desktop or laptop computer in a consumer’s home or office, then the media content will likely need to be reformatted and uploaded (e.g., via direct connection with a USB cable or via a local wireless area network, such as a Wi-Fi™ network) to one or more portable playback devices in order to be properly displayed on the end playback devices.

To date, there have been several attempted solutions to this local media content reformatting and redistribution problem, including: relocating personal desktop computers from a home office to a television room (e.g., a living room) in order to facilitate local reformatting through direct connection with both portable and non-portable playback devices, along with facilitating wireless (e.g., via a local Wi-Fi™ network) home redistribution of re-formatted media content. Unfortunately, these attempted solutions each have inherent drawbacks and added complexity (particularly for individuals having low computer literacy) that has limited consumer acceptance and adoption of these techniques. Problems may further be compounded if a consumer attempts to take their digital media content with them during travel, to continue watching or listening to particular media content as they change locations and switch amongst different media playback devices. Under these scenarios, it becomes exponentially more difficult for non tech-savvy users to enjoy their media content in varying settings employing an assortment of different playback devices.

Another problem with modern digital media content distribution services is that data transfer processes are tied to particular physical locations where intermediary desktop or laptop computers reside (e.g., computers running local media content distribution client software, such as the Apple® I-Tunes™ application). In these static settings, a designated access network may often be disrupted by connection failures,
timeouts, or relocation of network attachment points for a download destination device. As digital media content file transfer sessions become increasingly burdensome (e.g., media content files become increasingly large), the frequency and periods for these potential disruptions can stretch over hours or even days. One method of handling this problem over select networks (e.g., cellular networks) has been to restrict a media content transfer file size (and therefore quality) to a size that a particular access network can handle in a tractable time period (e.g., complete file transfers within a few hours). This approach not only limits the quality of the media content that can be delivered to consumers, but it also limits the number of consumers that are even be able to acquire desired media content types.

Accordingly, it would be advantageous to have improved digital media content distribution systems and services that simplified a user's experience in procuring and enjoying digital media content. It would be beneficial if these solutions offered the less tech-savvy consumer a practical means for flexibly obtaining digital media content in response to simple system detection events, such as a device plug-in event or an automatic wireless communications activation event. Further, it would be desirable if these solutions were highly portable and dynamic in nature, such that a user could readily switch media content delivery tasks between various personal computing devices and both media content delivery and playback functionality could be realized at local and remote locations. Additionally, it would be beneficial if these solutions were implemented to maximize available network resources at any given time, such that media content delivery scheduling could be directed towards periods of excess network bandwidth. Having flexible, mobile digital media content distribution solutions would cater to the needs of residential and commercial consumers, including consumers who frequently travel (highly mobile consumers) along with network service providers who wish to maximize their network's available resources.

DISCLOSURE OF INVENTION

This disclosure is provided to introduce (in a simplified form) a selection of concepts that are further described below in the description. This summary is not intended to identify key features of the claimed subject matter, nor is it intended to be
used as an aid in determining the scope of the claimed subject matter.

In overcoming the above disadvantages associated with existing media content distribution systems, the present invention discloses a networked computing system for automatically initiating and controlling the distribution of various media content. In accordance with an exemplary embodiment of the invention, the networked computing system includes: one or more media content provider (MCP), one or more host device, a portable media content storage device (PMCS), and a data communications network facilitating data communications amongst all computing devices within the networked computing system. In response to data communications (e.g., wireline or short-range wireless data communications) being initiated between the PMCS and a host device, a data transfer application resident on the PMCS may be automatically executed to determine if any media content transfer instructions exist on the PMCS or a MCP (e.g., a remote MCP offering a media content distribution service).

In accordance with one aspect of the present invention, the data transfer application resident on the PMCS may be a portable application that can be executed by the host device without needing to install any data transfer application configuration or support files to the host device.

In accordance with another aspect of the present invention, the data transfer application resident on the PMCS may include a boot component that installs temporary data transfer application files to the host device before the data transfer application is executed by the host device, and when the data transfer application execution is stopped, the temporary data transfer application files may be removed from the host device.

In accordance with a further aspect of the present invention, when the executed data transfer application determines that there are one or more media content transfer instruction on the PMCS or a MCP, the media content transfer instruction(s) is processed by the host device, such that a portion of one or more media content may be transferred between the PMCS and the MCP.

In accordance with yet a further aspect of the present invention, one or more media content may be uploaded from the PMCS to the MCP in response to the
processed media content transfer instruction(s), and the MCP may then selectively distribute a portion of the uploaded media content to one or more end receiving device of the networked computing system.

In accordance with another aspect of the present invention, a portion of one or more media content may be downloaded from the MCP to the PMCSD in response to the processed media content transfer instruction(s).

In accordance with yet another aspect of the invention, a computer-readable medium encoded with a set of computer-executable instructions, for initiating and controlling the distribution of various media content, may be executed to perform the following method, including: initiating data communications between a portable media content storage device (PMCSD) and a host device, automatically executing a data transfer application resident on the PMCSD in response to the initiated data communications, and determining with the data transfer application if any media content transfer instructions exist on the PMCSD or on a media content provider (MCP).

In accordance with a further aspect of the present invention, a computer-executable method for initiating and controlling the distribution of various media content, may include: initiating data communications between a portable media content storage device (PMCSD) and a host device, automatically executing a data transfer application resident on the PMCSD in response to the initiated data communications, and determining with the data transfer application if any media content transfer instructions exist on the PMCSD or on a media content provider (MCP).

In accordance with another aspect of the invention, a portable media content storage device (PMCSD) includes: one or more processor, one or more memory with a resident data transfer application, and a data communications interface facilitating communications between the PMCSD and an external computing device. In response to data communications being initiated between the PMCSD and an external computing device, the resident data transfer application may be automatically executed to determine if any media content transfer instructions exist that designate a
portion of PMCSD memory as a source or a destination location for a portion of media content in queue for transfer.

In accordance with yet another aspect of the present invention, when the executed resident data transfer application determines that the PMCSD is a destination for a portion of media content in queue for transfer, the PMCSD communicates with a media content source, using a communications capability of the external computing device, to schedule a media content delivery for a portion of the media content in queue for transfer to the PMCSD.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred and alternative examples of the present invention are described in detail below with reference to the following Figure drawings:

FIGURE 1 illustrates a perspective view of a media content distribution system in accordance with an embodiment of the present invention;

FIGURE 2 illustrates a block diagram of a Host Computing Device (HCD) connected to a Portable Media Content Storage Device (PMCSD) in accordance with an embodiment of the present invention;

FIGURE 3 illustrates a block diagram of a Media Content Provider (MCP) in accordance with an embodiment of the present invention;

FIGURE 4 illustrates a flow diagram depicting a data communications initiation process between a PMCSD and a HCD in accordance with an embodiment of the present invention;

FIGURE 5 illustrates a system flow diagram depicting a download request and an associated managed media content transfer process in accordance with an embodiment of the present invention;

FIGURE 6 illustrates a system flow diagram depicting an upload request and an associated media content transfer process with an optional uploaded media content distribution process in accordance with embodiments of the present invention;

FIGURES 7A-B illustrate flow diagrams depicting a user-interactive media content transfer process initiated by an detected triggering event in accordance with an embodiment of the present invention;
FIGURE 8 illustrates a flow diagram depicting a user-interactive communications cessation process and an associated HCD clean-up process initiated by a communications severing event in accordance with embodiments of the present invention;

FIGURE 9 illustrates an interactive Media Transfer Manger (MTM): Upload Manger application interface displayed on a host computing device in accordance with an embodiment of the present invention; and

FIGURE 10 illustrates an interactive MTM: Download Manger application interface displayed as a browser-based add-on component to a MCP website in accordance with an embodiment of the present invention.

MODES FOR CARRYING OUT THE INVENTION

In accordance with an exemplary embodiment of the present invention, FIG. 1 illustrates a networked computing system 100 including various wireline and wireless computing devices that may be utilized to implement any of the digital media content procurement and distribution processes associated with various embodiments of the present invention. The networked computing system 100 may include, but is not limited to, a group of remote server devices 104a-c, any one of which may be associated with various Media Content Providers (MCPs) that can provide digital media content distribution services to various networked clientele devices; a data communications network 102 (including both Wide Area Network (WAN) and Local Area Network (LAN) portions); a variety of remote wireless communications devices, including a cellular phone 130, an electronic book device 132, and a PDA device 134, that may be connected to the data communications network 102 utilizing one or more wireless basestation 106 or any other common wireless or wireline network communications technology; one or more network gateway or switch devices 108 that can facilitate data communications processes within the LAN and between the LAN and the WAN of the data communications network 102; a television device 112 (e.g., a high definition LCD or Plasma television, optionally including a media card-reader element) that is connected to a multi-media device 114 (e.g., such as a set-top box, digital video recorder (DVR), Blu-Ray™ player, and/or a digital video disk (DVD)
player/recorder device, optionally including a card-reader element); a desktop computer 116 connected to an external card-reader/hard-drive device 118; a wireless router 110 (optionally including a card-reader device) that may communicate with various wireless LAN devices using any common local wireless communications technology, such as Wi-Fi™ or unshielded twisted pair cable; a wireless laptop computer 120; a wireless handheld gaming unit 122; a digital camera 124; a digital video recorder 126; a cellular phone device 128; and a variety or Portable Media Content Storage Devices (PMCSDS), including, but not limited to: Secure Disk cards (SD cards) 140a-e, Universal Serial Bus flash drives (USB drives) 142a-b, compact flash drives 136a-d, integrated PC cards 138, etc.

In various embodiments of the invention, any of the LAN connected computing devices (e.g., any of the network gateway device 108, wireless router 110, television 112, multi-media device 114, desktop computer 116, external card-reader/hard drive device 118, wireless laptop computer 120, wireless handheld gaming unit 122, digital camera 124, digital video recorder 126, or cellular phone device 128) as well as any of the remote wireless communications devices (e.g., any of the cellular phone device 130, electronic book device 132, or PDA device 134) of the networked computing system 100 may act as a host device (also referred to herein as a Host Computing Device or HCD) for any of the above mentioned PMCSD types (140a-e, 142a-b, 136a-d, or 138). As would be understood by those skilled in the art, a HCD for a memory/storage device, such as a PMCSD, is readily able to read data from the memory device and write data to the memory device.

In embodiments where a memory device has no independent power source (a case common for plug-in type memory devices having flash memory), a HCD is able to supply power/voltage to the memory device when the HCD and the memory device are connected. In other embodiments, where the memory device has wireless communications capabilities (e.g., having either Bluetooth™ or Wi-Fi™ communications transceivers), the memory device may have its own power source to facilitate short-range wireless communications with a HCD, also having wireless communications capabilities. In accordance with other embodiments, it may also be
possible for a plug-in type memory device to have a rechargeable power source along with wireless communications capabilities. In this embodiment, the memory device could operate as both a plug-in type memory and a memory with wireless communications capabilities.

In an embodiment, any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) may act as add-on, plug-in or wireless (e.g., Wi-Fi™ or Bluetooth™ enabled) memory components for any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote communications devices (130, 132, or 134). As will be discussed further herein, a "plug-in event" may be defined as an action associated with physically connecting any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) with any of the local or remote data communications network 102 computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134). A "plug-out event" may be defined as an action associated with physically disconnecting any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) from any of the local or remote data communications network 102 computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134). A "wireless communications initiation event" may be defined as any action associated with wirelessly connecting (e.g., via short-range Wi-Fi™ or Bluetooth™ communications technologies) any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) with any of the local or remote data communications network 102 computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134). A "wireless communications cessation event" may be defined as any action associated with wirelessly disconnecting any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) from any of the local or remote data communications network 102 computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134).

As will be discussed further herein, the media transfer management functionality associated with the Media Transfer Manager (MTM) applications (e.g., 248 of FIG. 2) of any of the PMCSIDs (140a-e, 142a-b, 136a-d, or 138) of the present invention may consist of download client and/or upload client processes. These processes can allow media content to be downloaded from one or more sending
devices to a particular PMCSD receiving device, or to be uploaded from a sending
PMCSD device to one or more end receiving devices. Practical applications
employing these differing embodiments will be made apparent herein. In accordance
with various embodiments of the present invention, a PMCSD resident MTM
application 248 may be automatically booted and executed in response to either a
plug-in event or a wireless communications initiation event.

In an embodiment, the remote server devices 104a-c, the wireless
basestation 106, the remote wireless communications devices (130, 132, or 134), and
any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122,
124, 126, or 128) may be configured to run any known operating system, including but
not limited to, Microsoft Windows™, Mac OS™, Linux™, Unix™, or any common
mobile operating system, including Symbian™, Palm™, Windows Mobile™, Mobile
Linux™, MXI™, etc. In an embodiment, the remote server devices 104a-c and the
wireless basestation 106 may employ any number of common server, desktop, laptop,
and personal computing devices. In an embodiment, the remote wireless
communications devices (130, 132, or 134) and the LAN connected computing
devices (110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) may include any
combination of common mobile computing devices (e.g., laptop computers, netbook
computers, cellular phones, PDAs, gaming portable units, digital cameras, digital
video recorders, e-book devices, personal music player devices, etc.), having wireless
communications capabilities employing any common wireless data commutations
technology, including, but not limited to: Bluetooth™, Wi-Fi™, Wi-Max™, GSM™,
UMTS™, etc.

In an embodiment, either of the LAN or the WAN portions of the data
communications network 102 of FIG. 1 may employ, but are not limited to, any of the
following common communications technologies: optical fiber, coaxial cable, twisted
pair cable, Ethernet cable, and power line cable, along with any wireless
communication technology known in the art. In an embodiment, any of the remote
server devices 104a-c, the wireless basestation 106, the LAN connected computing
devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128), or the remote
wireless Communications devices (130, 132, or 134) may include any standard computing software and hardware necessary for processing, storing, and communicating data amongst each other within the networked computing system 100. The computing hardware realized in any of the data communications network 102 computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132 and 134) may include, but is not limited to, one or more processors, volatile and non-volatile memories, user interfaces, transcoders, and wireline and/or wireless communications transceivers, etc.

In an embodiment, any of the LAN-connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or the remote wireless communications devices (130, 132, or 134), may be configured to include one or more computer-readable media (e.g., any common volatile or non-volatile memory type) encoded with a set of computer readable instructions, which when executed, performs a portion of one or more of the digital media content procurement and distribution processes of the present invention.

FIG. 2 shows a block diagram 200 view of a Host Computing Device (HCD) 202 physically joined with a Portable Media Content Storage Device (PMCSD) 238 in accordance with an embodiment of the present invention. In various embodiments, the HCD 202 may be representative of any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or the remote wireless communications devices (130, 132, or 134) in FIG. 1 of the present invention. In various embodiments, the PMCSD 238 may be representative of any of the PMCSDs (140a-e, 142a-b, 136a-d, or 138) in FIG. 1 of the present invention.

In an embodiment the HCD 202 may include, but is not limited to, one or more processor devices including a central processing unit (CPU) 204. In an embodiment, the CPU 204 may include an arithmetic logic unit (ALU, not shown) that performs arithmetic and logical operations and one or more control units (CUs, not shown) that extract instructions and stored content from memory and then executes and/or processes them, calling on the ALU when necessary during program execution. The CPU 204 is responsible for executing all computer programs stored on the HCD's 202
volatile (RAM) and nonvolatile (ROM) system memories 206, 210. The HCD 202 may also include, but is not limited to, a user interface 208 that allows a user to interact with the HCD’s 202 software and hardware resources. The HCD 202 further includes a system database 210 that includes: an optional media player application 212, facilitating media content playback on the HCD 202; MCP Interface applications 214 that may be optionally integrated with a MCP website interface to allow a user to select media content for download from or upload to a MCP server location (e.g., a network location associated with any of remote server devices 104a-c of FIG. 1); a Media Content Library 218 that includes a user’s downloaded, or otherwise acquired, digital media content (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.); Application Configurations files and Temporary files 220; along with User Access Rights (UAR) information 216 and Digital Rights Management (DRM) information 222 that may include information pertaining to: secure identification of registered users (e.g., username, password, and associated account information), each registered user’s rights to access various system resources and media content (e.g., access to various repositories and copyrighted media content, such as media stored in the Media Content Library 218).

As would be understood by those skilled in the art, a DRM system is a system that protects copyrighted media content data that is circulated over the Internet or any other digital medium, by enabling secure distribution of proprietary media content data. Typically, a DRM system protects copyrighted media content data by either encrypting or digitally watermarking it in such a way that only an intended recipient can intercept, decrypt, and utilize the media content data. In this way, DRM technology can ensure that copyrighted media content will not be freely distributed to unauthorized users.

In an embodiment the HCD 202 may also include: a PMCSD Interface 232 allowing the HCD 202 communicate directly with one or more PMCSD types (e.g., 140a-e, 142a-b, 136a-d, or 138); a power supply 234; a Network transceiver 230 and a Network Interface 228 that allow the HCD 202 to communicate across the LAN and WAN portions of the data communications network 102 of FIG. 1; an optional short-
range transceiver 226 (e.g., a Bluetooth™ or a Wi-Fi™ enabled communications transceiver) that allows the HCD 202 to wirelessly communicate with one or more PMCSD types; a transcoder 224; and a system bus 236 that facilitates data communications amongst all the hardware resources of the HCD 202.

It should be understood that transcoders, as discussed in the present application, are generally directed to digital-to-digital conversion from one image format to another. Transcoding is usually performed on incompatible media content in order to transform the media content into a more suitable format for proper display or output at an end user playback device (e.g., display in accordance with a receiving device’s capabilities). Some of these image formats have properties associated with: image resolution, image size and scale, image color depth and intensity, data compression, data encoding and decoding, etc. In accordance with various embodiments of the present invention, the HCD 202 transcoder 224 is capable of reformatting a received media content or a stored media content (e.g., media content stored in the Media Content Library 218) to be compatible with any of the local or remote media playback devices depicted in FIG. 1 having defined display capabilities (e.g., any of playback devices 112, 116, 120, 122, 124, 126, 128, 130, 132, and 134). Generally, this requires downloaded media content to be delivered in a fairly high-resolution format suitable for playback on a particular user’s highest resolution media playback device (e.g., a 1080p LCD television device 112). For redistribution to other local, low-resolution media playback devices (e.g., a laptop computer 120), the downloaded data would transformed at the transcoder in accordance with various common downsampling and downsizing techniques.

In an embodiment the PMCSD 238 may include, but is not limited to, one or more optional microcontroller unit (MCU) 240 that may be responsible for controlling all the simple resident application input/output and storage assignment processes for the PMCSD device 238; system memory including volatile (RAM) and nonvolatile (ROM) system memories 242, 246; a system database 246 that includes: a resident Media Transfer Manager (MTM) application 248 having both download and upload client components, which may be executed by an external computing device; UAR
and DRM information 250 that may include information pertaining to secure identification of registered users as well as each registered user's rights to access various media content (e.g., access to various repositories and copyrighted media content, such as media stored as local or remote proprietary media libraries); a User Media Library 252 that may include a variety of downloaded, or otherwise acquired, digital media content (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.); and Firmware Configuration Files (including support files) 254 that may be required to initiate the resident MTM application 248; a Host Interface 244 allowing the PMCSD 238 to communicate directly with one or more HCD types (e.g., 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134); an optional power supply 260; as well as an optional short-range transceiver 258 (e.g., a Bluetooth™ or a Wi-Fi™ enabled communications transceiver) that facilitates the PMCSD 238 communicating with a HCD 202 via a local wireless link; and a system bus 262 that facilitates data communications amongst all the hardware resources of the PMCSD 238.

In accordance with one embodiment of the present invention, the MTM application 248 resident on the PMCSD 238 may be a truly portable application that can be executed remotely by the HCD 202. As would be understood by those skilled in the art, a portable application is generally defined as any computer software program that is able to run independently without the need to install files to the system it is run upon (e.g., the HCD 202). Portable applications can be run on any computer system with which they are compatible but typically require a specific operating system type, such as certain versions of Microsoft® Windows™ or Linux®. Portable software (e.g., the MTM application 248) is typically designed to be able to store its configuration information (e.g., firmware configuration files 254) and data on the storage media (e.g., on the PMCSD 238) containing its program files.

In accordance with another embodiment of the present invention, the MTM application 248 resident on the PMCSD 238 may include a boot component that installs data transfer configuration or support files to the HCD 202 (e.g., temporary and configuration files 220) before the data transfer application is executed by the HCD.
202. Unlike a truly portable application, this embodiment of the MTM application 248 can generally be run on most computer systems without requiring specific operating system compatibility. After the MTM application 248 is stopped, any transferred configuration, support files or temporary files (e.g., temporary and configuration files 220) may be removed from the HCD 202 in an optional host clean-up process.

This process can allow for the PMCSD 238 to function with many different host device types without burdening a HCD 202 after communications have been halted between the PMCSD 238 and a HCD 202.

FIG. 3 shows a block diagram view of a Media Content Provider (MCP) 300 that may be representative of any of the remote server devices 104a-c in FIG. 1. The MCP 300 may include, but is not limited to, one or more processor devices including a central processing unit (CPU) 302. The CPU 302 is generally responsible for executing all computer programs stored on the MCP's 300 volatile (RAM) and nonvolatile (ROM) system memory 304, 306. The MCP 300 may also include, but is not limited to, an optional user interface 306 that allows a user/administrator to interact with the MCP's software and hardware resources; a system database 308 that includes a media content transfer manager application (MCTM) 308, a User Profile, User Access Rights (UAR), and Digital Rights Management (DRM) information repository 310, a media content repository 312, as well as a hosted website (See e.g., the MCP website depicted in FIG. 10) including various graphical user interface (GUI) components (e.g., static html and dynamic components, such as java-based applications) that may facilitate a user making media content selections for purchase and download; a transcoder 316 for formatting deliverable media content; a network transceiver 320 and a network interface 318 that allow the MCP 300 to communicate across the LAN and WAN portions of the data communications network 102 of FIG. 1; and a system bus 322 that facilitates data communications amongst all the hardware resources of the MCP 300.

In an embodiment, the MCP's 300 MCTM application 308 may help facilitate delivery of various media content data files (e.g., movies, TV programs, home video, software applications, podcasts, video games, music, e-books, etc.), stored in the
MCP's 300 media content repository 312) in response to various media content transfer initiation or re-initiation requests emanating from an execution of the PMCSD's 238 MTM application 248. In various embodiments, an initiation or reinitiation request generated with the PMCSD's 238 MTM application 248 may be automatically delivered to a MCP 300 in response to a PMCSD 238 plug-in or wireless communication initiation event. In other embodiments, an initiation or reinitiation request generated with the PMCSD's 238 MTM application 248 may be sent to a MCP 300 in response to user manually selecting to initiate or re-initiate a data transfer request for one or more media content files. In various embodiments, these media content transfers may relate to media content downloads from a MCP 300 to a HCD/PMCSD 200, or they may relate to media content uploads from a HCD/PMCSD 200 to a MCP 300 (with optional further redistribution to one or more end media playback devices).

In an embodiment, during a digital media content initiation or reinitiation sessions, the communicating MTM 248 and MCTM 308 applications may independently or collectively determine various available network resources (e.g., free bandwidth) between portions of a network linking the media content sending and receiving device(s). In an embodiment, the MCTM application 308 of the MCP 300 communicates with the MTM application 248 of HCD/PMCSD 200 to determine available network resources between the MCP 300 and the HCD/PMCSD 200, in order to schedule a coordinated download session that maximizes available network resources. In another embodiment, the MTM application 248 of HCD/PMCSD 200 communicates with the MCTM application 308 of the MCP 300 to determine available network resources between the HCD/PMCSD 200 and the MCP 300, in order to schedule a coordinated upload session that maximizes available network resources.

FIG. 4 illustrates a flow diagram 400 depicting a data communications initiation process between a PMCSD 238 and a HCD 202 in accordance with an embodiment of the present invention. It should be understood that this process 400 could be executed using one or more computer executable programs stored on one or more computer-readable media located on any of the LAN connected computing devices.
(108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote wireless communications devices (130, 132, or 134) of FIG. 1. At block 402, communications between a PMCS 238 and a HCD 202 are established (e.g., by a plug-in or a data communication initiation event). Next at block 404, a PMCS 238 firmware boot process (a process that prepares the MTM application 248 to be executed remotely by the HCD 202) may be automatically initiated in response to establishing communications between the PMCS 238 and the HCD 202. Then at decision block 406, it is determined if the firmware boot process requires installation of runtime configuration or support files on the HCD 202 (e.g., whether or not the resident MTM application 248 acts as a truly portable application). If the process does require installation of runtime configuration or support files at block 406, then at block 408, the runtime configuration or support files are installed on the HCD 202 prior to firmware execution. Then the process proceeds from block 408 to block 410. If the process does not require installation of runtime configuration or support files at block 406, then at block 410 a media content transfer application (e.g., MTM application 248) resident on the PMCS 238 is automatically executed with the HCD 202 to determine if any media content transfer instructions exist on the PMCS 238 or on a remote MCP 300. In accordance with various embodiments of the present invention, the media content transfer instructions may relate to instructions for new media content transfers and/or instructions for existing, partially completed media content transfers.

FIG. 5 illustrates a system flow diagram 500 depicting a download request and an associated managed media content transfer process in accordance with an embodiment of the present invention. It should be understood that the download process 500 could be executed using one or more computer executable programs stored on one or more computer-readable media located on any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote wireless communications devices (130, 132, or 134) of FIG. 1. Further, collaborative processes associated with the process 500 could be executed from one or more MCP 300 (e.g., represented by any of the remote server devices 104a-c).
an embodiment, the system flow diagram 500 depicts data communications interactions between at least the following devices: a first personal computing devices acting as a host for a PMCSD, PCD1/PMCSD 502 (e.g., PMCSD/HCD 200); a second personal computing device not acting as a host device (PCD 2, e.g., desktop computer 116) 504; a LAN including one or more gateway device 506 (e.g., the LAN portion of data communications network 102, including gateway device 108); a WAN 508, such as the Internet (e.g., the WAN portion of data communications network 102, including one or more remote server devices 104a-c); and a MCP having a media content delivery service 510 (e.g., MCP 300).

In accordance with an embodiment of the download process 500, at block 512, a user logs onto a MCP 510 (e.g., any of remote server computers 104a-c acting as MCPs) using their PCD2 504 (e.g., a desktop computer 116). This request process optionally includes registered user authentication (e.g., username and password information corresponding to a user account). The user of PCD2 504 then places a download order for digital media content from the MCP 510 using the MCP's website-based interface (See e.g., FIG. 10). This step is represented by the media content request 514 being transmitted from PCD2 504 to the MCP 510, over the LAN 506 and WAN 508 portions of the data communications network 102. Next at block 516, the MCP 510 processes the received media content request and awaits communications from the MTM application 248 of the PMCSD 238. Then at block 518, communications are initiated between the Host PCD and the PMCSD, referred to collectively as the PCD1/PMCSD 502. In accordance with various embodiments of the invention, this communications initiation process could occur in response to a plug-in event or a wireless communications initiation event. Then the PCD1/PMCSD 502 initiates communications between itself and the MCP 510 to inform the MCP 510 of its availability for receiving the requested media content download. This step is represented by the media content availability notification 520 being transmitted from PCD1/PMCSD 502 to the MCP 510, over the LAN 506 and WAN 508 portions of the data communications network 102.

Subsequently, at block 522, the MCP 510 schedules a coordinated media
content delivery session based on the received download availability notice and a
detected state of available network resources. In accordance with various
embodiments of the invention, this delivery may occur all at once in real-time or in
segments according to available network bandwidth during different periods of time.
In accordance with the scheduled, coordinated media content delivery, at least a
portion of media content from the media content request is delivered 524 to the
PCD1/PMCSD 502. Then at block 526, the PCD1/PMCSD 502 stores the received
media content and optionally plays back the media content (e.g., under either full
content media playback or partial content buffering media playback scenarios) when a
playback is requested by a user of the PCD1/PMCSD 502 and the PCD1 is a playback
device (e.g., a laptop computer 120).

In accordance with various embodiments of the present invention, the
PMCSD 238 communications initiation with the HCD 202 may involve automatically
detecting an online or active status of HCD 202 connections to a network over which it
may communicate with a MCP 300, such as the Internet. In various embodiments of
the invention, a HCD 202 may or may not be integrated with playback device
functionality (e.g., laptop computer 120 vs. external card-reader/hard-drive device
118). In another embodiment, media content playback can be started on one
playback-enabled HCD 202 (e.g., on a wireless handheld gaming unit 122) and
resumed on another playback-enabled HCD 202 (e.g., on a cellular phone device 128)
by keeping the state of the playback session on the PMCSD 238. It is understood that
under some scenarios any of the download and playback processes 500 discussed
supra could be happening concurrently for different digital media content. For
example, a user may be ordering media content at the same time that previously
ordered media content is being delivered to one of their personal computing devices
(e.g., any of 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134), at
the same time previously delivered media content is being played back on various
LAN or WAN connected computing devices (e.g., any of 110, 112, 114, 116, 118, 120,
122, 124, 126, 128, 130, 132, or 134).

FIG. 6 illustrates a system flow diagram 600 depicting an upload request and
an associated media content transfer process with an optional uploaded media content distribution process in accordance with embodiments of the present invention. It should be understood that the process 600 could be executed using one or more computer executable programs stored on one or more computer-readable media located on any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote wireless communications devices (130, 132, or 134) of FIG. 1. Further, collaborative processes associated with the process 600 could be executed from one or more MCP 300 (e.g., represented by any of the remote server devices 104a-c). In an embodiment, the system flow diagram 600 depicts data communications interactions between at least the following devices: a PCD acting as a host for a PMCSD, PCD1/PMCSD 602 (e.g., HCD 202); a LAN 604 including one or more gateway device (e.g., the LAN portion of data communications network 102, including gateway device 108); a WAN 606, such as the Internet (e.g., the WAN portion of data communications network 102, including one or more remote server devices 104a-c); a media content provider (MCP) 608 having media content distribution services (e.g., MCP 300); a first playback device PBD1 610 (e.g., laptop computer 120); and a second playback device PBD2 612 (e.g., PDA device 134).

In accordance with an embodiment of the upload process 600, a user acquires various digital media content with a personal computing device (e.g., with a digital camera 124 or a digital video recorder 126). The acquired digital media content is then stored in a PMCSD 238. Then at block 614, communications between the PMCSD 238 and a HCD 202 are initiated resulting in a logically combined PCD1/PMCSD 602 device. In accordance with various embodiments of the invention, this communications initiation process could occur in response to a plug-in event or a wireless communications initiation event. Next the PCD1/PMCSD 602 generates and transmits an upload request for at least a portion of one or more media content to a MCP 608. This step is represented by the media content upload request 616 (this request optionally includes registered user authentication information) being transmitted from PCD1/PMCSD 602 to the MCP 608, over the LAN 604 and WAN 606.
portions of the data Communications network 102. Next at block 618, the MCP 608 authenticates/processes the received media content upload request, informs the PCD1/PMCS 602 of its availability 620, and awaits further communications from the MTM application 248 of the PCD1/PMCS 238. Then at block 622, the PCD1/PMCS 602 optionally generates uploaded media content distribution instructions (e.g., including recipient information 1010 of FIG. 9) for the receiving MCP 608 and then proceeds to upload at least a portion of one or more media content stored on the PCD1/PMCS 238 to the MCP 608. This step is represented by the upload media content 624 being transmitted from PCD1/PMCS 602 to the MCP 608, over the LAN 604 and WAN 606 portions of the data communications network 102. Then at block 626, the MCP 608 stores the received media content in a user repository (e.g., a storage location corresponding to a logged-in, authenticated user) and proceeds to process any media content distribution instructions (e.g., indicating intended distribution to specified recipients 1010 of FIG. 9). Next, the MCP 608 transfers the uploaded media content to intended distribution recipients, PBD1 610 and PBD2 612, in accordance with the received distribution instructions. Generally the redistribution transfers occur over the Internet 606, however for illustrative clarity the transfers are shown in FIG. 6 as being direct transfers from the MCP 608 to the two playback devices, PBD1 610 and PBD2 612.

In accordance with various embodiments of the present invention, the PMCS 238 communications initiation with the HCD 202 may involve automatically detecting an online or active status of HCD 202 connections to a network over which it may communicate with a MCP 300, such as the Internet. In an embodiment the media content acquiring personal computing device (e.g., a digital camera 124 or a digital video recorder 126) and the HCD 202 could be integrated into the same physical unit. It is understood that under some scenarios any of the upload and distribution processes 600 discussed supra could be happening concurrently for different digital media content. For example, if the media content capturing device (e.g., a digital video recorder 126) is integrated as the HCD 202, a user might be recording content, while previously recorded content is being delivered to a network.
destination (e.g., MCP 608), while at the same time previously delivered content is being distributed to one or more end users (e.g., PBD1 610, or PBD2 612).

FIGS. 7A-B illustrate system flow diagrams 700, 714, depicting a user-interactive media content transfer process initiated by a detected triggering event in accordance with an embodiment of the present invention. It should be understood that the process 700, 714, could be executed using one or more computer executable programs stored on one or more computer-readable media located on any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote wireless communications devices (130, 132, or 134) of FIG. 1. Further, collaborative processes associated with the process 700, 714, could be executed from one or more MCP 300 (e.g., represented by any of the remote server devices 104a-c). At block 702, a triggering communications event (e.g., a physical plug-in event or an automatic short-range wireless communications initiation) between a PMCSD 238 and a HCD 202 is detected. Next at block 704, a PMCSD firmware boot process is launched to determine the HCP 202 operating system, processing capabilities, and/or available system resources.

In accordance with an embodiment of the present invention, in response to an initial triggering communications event (e.g., a plug-in or a wireless communications initiation event) between a PMCSD 238 (e.g., integrated PC card 138) and a HCD 202 (e.g., laptop computer 120), the HCD 202 may initiate a resident security application that prevents automatic launching of the PMCSD boot firmware. In an embodiment, these localized security features may facilitate a user manually launching the PMCSD boot firmware after verification that the PMCSD 238 is a "known" or a "safe" device to a particular HCD 202 user or administrator. These host side processes, may occur at or between blocks 702 and 704 of FIG. 7A. It should be understood that any HCD 202 side security features do not affect processes associated with the MTM application 248 for any embodiments of the present invention.

Subsequently, at block 706, a user is prompted to determine if they wish to run a MTM application 248 (also generically referred to herein as PMCSD firmware). Then at decision block 708, it is determined if the user wishes to run the MTM
application 248. If the user elects not to run the MTM application 248 at that time, then the process ends at block 710. However, if the user does elect to run the MTM application 248, then at block 712, the launched MTM application proceeds to check the status of a communications link between the HCP 202 and the MCP 300.

At decision block 716, it is determined if a communications link currently exists between the HCD/PMCSD 200 and a MCP 300. If no communications link currently exists between the HCD/PMCSD 200 and the MCP 300, then at block 718 the process waits a predetermined amount of time T1 and then rechecks the status of the communications link between the HCD/PMCSD 200 and the MCP 300 at block 716. However, if a communications link does exist between the HCD/PMCSD 200 and the MCP 300, then the process proceeds to block 720 where the PMCS D firmware (e.g., MTM application 248) checks if a pending delivery task exists on either the PMCS D 238 or the MCP 300. At decision block 722, it is determined if media content delivery task exists on either the PMCS D 238 or the MCP 300. If a media content delivery task does not exist, then at block 724 the process waits a predetermined amount of time T2 and then rechecks the status of pending delivery tasks at block 722. However, if a media content delivery task does exist, then at block 726, a pending media content delivery task pertaining to either a media content upload from the PMCS D 238 or a media content download from the MCP 300 is resumed. After the current delivery task is completed at block 726, the process reverts to decision block 722, where the process checks for other pending media content delivery tasks.

FIG. 8 illustrates a flow diagram depicting a user-interactive communications cessation process and an associated HCD clean-up process 800 initiated by a communications severing event in accordance with embodiments of the present invention. It should be understood that this process 800 could be executed using one or more computer executable programs stored on one or more computer-readable media located on any of the LAN connected computing devices (108, 110, 112, 114, 116, 118, 120, 122, 124, 126, or 128) or any of the remote wireless communications devices (130, 132, or 134) of FIG. 1. At block 802, a communications severing event (e.g., a physical plug-out event or a cessation of short-range wireless communications
event) between a PMCSD 238 and a HCD 202 is detected. Next at decision block 804, it is determined if any firmware configuration, support or temporary files have been installed on the HCD 202. If any firmware configuration, support or temporary files have been installed on the HCD 202 (e.g., during a media content upload or download process), then at block 806 all the HCD 202 installed firmware configuration, support or temporary files are removed from the HCD 202 and the process proceeds to block 808. However if, no firmware configuration support or temporary files have been installed on the HCD 202 then the process proceeds to block 808, where all linked MCPs 300 are notified that the PMCSD 238 is offline to halt any active delivery services. Next, at block 810 a user is prompted to determine if existing delivery services should be removed from the HCP 202. At decision block 812, it is determined if a user wishes to remove the MCP 238 delivery services from the HCP 202. If a user wishes to remove delivery services from the HCP 202, then at block 814 delivery services are removed from the HCP 202 and then the process ends to block 816. However, if a user does not wish to remove delivery services from the HCP 202, then the process also ends at block 816.

FIG. 9 illustrates an interactive MTM Upload Manager application display 900 on a host computing device 902 in accordance with an embodiment of the present invention. In an embodiment, the MTM/Upload Manager application display 900 could exist on any of the LAN connected computing devices (112, 114, 116, 120, 122, 124, 126, or 128) as well as any of the remote wireless communications devices (130, 132, or 134) of the networked computing system 100, acting as a HCD 202. In an embodiment, the displayed interactive MTM Upload Manager application interface 904 may include, but is not limited to, the following components: a media content "Selection" component 906 that allows a user of the HCD 902 to select various digital media content files (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.) on either the PMCSD 238 or the HCD 202 to upload to a MCP 300; an "Upload Queue" component 908 that displays a listing of current media content files awaiting upload; a "Recipients" selection component 910 that allows a user to select one or more recipients to receive various
media content uploads (e.g., in an MCP 300 forwarding distribution process); a "Link Status" component that allows a user to see if the HCD 202 that they are using is online (e.g., connected to the Internet); a "Delivery Priority" component that allows a user to select a priority level for one or more media content upload (e.g., an order selection for multiple, concurrent uploads); and a "More" component that allows a user to access various other common data transfer settings known in the art.

FIG. 10 illustrates an interactive MTM Download Manager application interface 1010 displayed as a browser-based add-on component to a MCP website 1000 in accordance with an embodiment of the present invention. In an embodiment, the MCP website 1000, may include, but is not limited to, a URL address bar 1002 having an HTTP website address (e.g., "www.mediasurplus.com/NewReleases"); a menu header 1004 having a "User Information" section that displays the name of a currently logged in user (e.g., "Joe Thomas"); a "Browse Selections" section 1006 showing a listing of various media content genres (e.g., "Action", "Comedy", "Drama", "Horror", "Sci-Fi", etc.); a media content display section 1008 showing various media content selections from a particular selected media genre (e.g., "New Releases"); a Download Manager application interface 1010 that includes the following components: a media content "Selection" component 1012 that allows a user to select various digital media content files (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.) at the MCP 300 to download to various user devices (e.g., to any of the LAN or WAN connected computing devices 112, 114, 116, 120, 122, 124, 126, 128, 130, 132, or 134); a "Download Queue" component 1014 that displays a listing of current media content files (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.) awaiting download (e.g., the movies "Mary Queen of Scots" and "The Mongol Empire"); a "Delivery Priority" component 1014 that allows a user to select a priority level for a media content download (e.g., an order selection for multiple, concurrent uploads); a "Link Status" component that allows a user to see if an HCD 202 they wish to download is online (e.g., connected to the MCP 300 over the Internet); a "Delivery Deadline component" allowing a user to select a maximum
duration over which a media content download should take place; and a "More" component 1022 that allows a user to access various other common data transfer settings known in the art. In an embodiment, the MCP website 1000, may also include one or more scroll bars 1024 that facilitate viewing additional portions of the MCP website 1000.

In accordance with an embodiment, the following scenario would be facilitated by the present invention. A user may wish to receive digital media content (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.) whenever the user has access to HCDs 202 that are connected to a communications network. The user may have in his possession a small flash-based memory PMCSD 238 (e.g., a SD card 140a-e, USB drive 142a-b, or compact flash drive 136a-d) for this purpose. Whenever the user plugs the PMCSD 238 into an online HCD 202 (e.g., any of computing devices 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134) the PMCSD's firmware (e.g., MTM application 248) may be activated to begin or resume downloading digital media content that the user has ordered, subscribed to, or content proactively pushed by content owners or service providers (e.g., by a MCP 300). Further, whenever the PMCSD 238 is removed from the HCD 202, the software processes left on the host may be removed which has the benefit of assuring that residual software cannot cause or be implicated in software issues on the HCD 202 which may be a shared device used by other users.

Once the media content is delivered to the PMCSD 238, the PMCSD can be inserted into a wide variety of HCDs 202 (e.g., any of computing devices 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134) for playback or transfer of delivered media content. In an embodiment, for content having use restrictions, the delivered content may be optionally cryptographically bound to the PMCSD 238, such that the PMCSD may be protected against misuse of the policies set by a media content or service provider 300 (e.g. by well known methods of securing data in flash memory).

Then the user may elect to take the PMCSD 238 with stored media content on
a business trip. While on an airplane, the user can insert the PMCSD 238 into his laptop computer 120 to be able to access any previously downloaded, or otherwise acquired, digital media content (e.g., digital movies, TV programs, home video, software applications, video games, music, e-books, etc.). In an embodiment, the user may have viewed half of a movie stored on the PMCSD 238 on his laptop computer 120 while on his business trip. Then the user returns home and inserts the PMCSD 238 into his large format flat panel television 112 or attached set-top box player 114 to finish the movie starting in where he left off viewing on the laptop computer 120. In this way, a video bookmark data for the user is maintained within the PMCSD 238, so that a user can always resume watching or listening to a media content where he or she left off. In an embodiment, if multiple users playback the same media content then each users viewing information (e.g., video bookmark information) for the same media content can be independently tracked.

Then, before the playback is completed on the large format flat panel television 112 or attached set-top box player 114, the user removes the PMCSD 238 from his HCD 202 and then reinserts the PMCSD 238 into his laptop computer 120 at work the next day to finish watching the same media content. Because the laptop computer 120 has a wireless network connection, the PMCSD 238 can continue to receive new media content online while the user finishes watching the rest of a previously delivered media content.

In accordance with another embodiment, the following scenario would be also be facilitated by the present invention. A user on vacation records a large quantity of video using their digital video camera 126. The user stores the video media content onto a connected PMCSD 238 (e.g., a SD card 140a-e, USB drive 142a-b, or compact flash drive 136a-d). Whenever the user removes the PMCSD 238 from the camera and inserts it into an online HCD 202 (e.g., any of computing devices 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or 134) the PMCSD's 238 firmware (e.g., the MTM application 248) is activated to begin or resume uploading the video media content to a MCP 300 and/or to other networked end playback devices (e.g., any of computing devices 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, or
In an embodiment, whenever the PMCSD 238 is removed from the HCD 202, software processes left on the HCD 202 may be automatically removed, which allows the user to freely use his PMCSD 238 on a variety of HCD 202 types without burdening any particular host device.

Then, on his way back from a vacation the user takes the PMCSD 238 with vacation videos stored thereon and plugs the PMCSD 238 into his 3G-enabled cellular phone 130. In an embodiment, whenever the cellular phone 130 is connected to a cellular, Wi-Max™, or Wi-Fi™ enabled network the phone uploads the video media content on the PMCSD 238 to a MCP 300, so that by the time the user returns home, the video media content has already been forwarded (by the MCP 300) to the user's intended destinations.

In an embodiment the PMCSD 238 combines portable local storage with imbedded software/firmware to facilitate the autonomous delivery of media content to or from the PMCSD 238. The PMCSD 238 may work in conjunction with a HCD 202 that can supply some or all of the capabilities needed by the PMCSD 238 to perform its intended functions. In accordance with various embodiments, the HCD 202 may include, but is not limited to, the following: electrical power for the PMCSD 238, electrical/mechanical interface suitable for PMCSD 238, detection software/firmware for sensing PMCSD 238 communication initiation events, automatically executing scripts to launch and interact with PMCSD 238 software/firmware programs, processor(s) to execute the PMCSD 238 software/firmware instructions, memory to load PMCSD 238 software/firmware for execution by the host processor, playback software/firmware for retrieving and playing back content stored on the PMCSD 238, video conversion hardware, firmware and interfaces for the formatting of digital media into formats suitable for attached or networked display units (e.g. HDMI, S-video, component video, etc.), network interfaces to sense, establish and maintain connectivity to local, access, or wide-area networks (e.g. Ethernet, Wi-Fi™, 3G, Wi-Max™, etc.), and wireless link quality monitoring software/firmware and the ability to report metrics to PMCSD 238 software/firmware programs.

In an embodiment, the PMCSD 238 is implemented on a flash memory card of
standard format (e.g., a SD card 140a-e, USB drive 142a-b, or compact flash drive 136a-d) and contains the media transfer software/firmware and secure local storage for media and associated metadata (e.g. DRM keys), while relying on the HCD 202 for all other functions. In contrast, in accordance with another embodiment, the PMCSD 238 could be completely independent and perform all necessary functions in a physically contained unit not requiring a separate HCD 202 to function at all. In an embodiment, the content transfer is envisioned to involve large data files relative to the capacity of the networks carrying the traffic, the PMCSD 238 software/firmware for delivering content to/from the PMCSD 238 should be capable of detecting and using surplus network bandwidth, and capable of gracefully handling intermittent connectivity intervals between source (e.g., PMCSD 238) and destination endpoints (e.g., MCP 300). A preferred way to handle these scenarios would be to utilize systems and methods associated with the segmented data delivery processes disclosed in commonly owned U.S. Patent No. 7,500,010, titled "Adaptive File Delivery System and Method", by Harrang et al., issued Mar. 3, 2009, incorporated herein by reference.

In accordance with various embodiments of the present invention, the PMCSD 238 may include some or all of the hardware or software functionality of the HCD 202. For example, media player software may be included on the PMCSD 238 along with the other firmware (e.g., MTM application 248). Another example could be the PMCSD 238 combined with a wireless modem such as a 3G USB transceiver having flash memory.

It should be understood from that the PMCSD 238 contains all the necessary software needed to facilitate delivery of content to or from the PMCSD 238 (or recording/playback of content) when inserted into an appropriate HCD 202.

In accordance with an embodiment of the present invention, whenever the PMCSD 238 is plugged-in to a HCD 202 the PMCSD 238 launches a process on the HCD 202, mounting the PMCSD 238 as a mass-storage device and auto-launching PMCSD 238 software boot routines run by the HCD 202 processor to detect the type of host processor and operating system (OS), along with available HCD 202...
resources. In some embodiments, this can cause the HCD 202 OS to first prompt the user whether the MLC boot routines should be executed. Assuming the user agrees, the process continues. Next the boot process prompts the user if they wish to launch the PMCSD 238 MTM application 248 delivery service. If the user does not wish to use the MTM application 248 delivery service the boot process quits.

If the user elects to continue MTM application 248 delivery service uses the HCD 202 resources to check the link status. If the HCD MTM application 248 delivery service 202 is offline the boot process waits and retries after a T1 timer wait interval. When the MTM application 248 delivery service detects that the HCD 202 is online (e.g., network attached MCPs 300 are reachable) it then checks the saved job status to see if it is currently working on a delivery job. Alternatively, if there are no current jobs the delivery service polls the MCP 300 for any new pending jobs. If there are no orders the delivery service waits for a T2 timer interval before again resuming checking the status of the HCD 202 connection.

If a current media content order exists, the delivery may be started or resumed. The media content is delivered to/from the PMCSD 238 storage and the status of the delivery job is periodically updated so that it may be resumed if interrupted prior to completion. When the order is complete the process resumes checking the status of the HCD 202 connection.

In accordance with an embodiment of the invention, the event sequence that takes place when the PMCSD 238 is removed from the HCD 202 that supports the card interface begins when the previously loaded boot routines detect that the PMCSD 238 has been removed from the HCD 202. When PMCSD 238 removal is detected, the boot process runs a de-install routine that cleans up any temporary files left in HCD 202 memory. If the device is online, the delivery service routine is signaled that the client status is offline so delivery halts. The boot process halts the delivery service. Next, the user is prompted to choose whether the services should be removed from HCD 202 memory. If the user elects to keep the services resident the startup boot process will be accelerated the next time the PMCSD 238 is plugged into the HCD 202. Otherwise, the services are deleted from host process and the boot
The advantage of cleaning up HCD 202 memory in this fashion is to remove all services, temporary files, and images that the PMCSD 238 places in HCD 202 memory during normal operation. The PMCSD 238 can therefore be used on multiple HCDs 202 without leaving behind software images from its operation.

While several embodiments of the present invention have been illustrated and described herein, many changes can be made without departing from the spirit and scope of the invention. Accordingly, the scope of the invention is not limited by any disclosed embodiment. Instead, the scope of the invention should be determined from the appended claims that follow.
We claim:

1. A networked computing system (100) for automatically initiating and controlling the distribution of various media content, the networked computing system comprising:
   - at least one media content provider (MCP) (104a-c, 300);
   - at least one host device (110, 112, 114, 118, 120, 122, 124, 126, 128, 130, 132, 134, 202);
   - a portable media content storage device (PMCS) (136a-d, 138, 140a-e, 142a-b, 238); and
   - a data communications network (102) facilitating data communications amongst all computing devices within the networked computing system,

   wherein in response to data communications being initiated between the PMCS (238) and a host device (202), a data transfer application (248) resident on the PMCS (238) is automatically executed to determine if any media content transfer instructions exist on the PMCS (238) or a MCP (300).

2. The networked computing system (100) of Claim 1, wherein the data transfer application (248) resident on the PMCS (238) is a portable application that is executed by the host device (202) without needing to install any data transfer application configuration or support files (254) to the host device.

3. The networked computing system (100) of Claim 1, wherein the data transfer application (248) resident on the PMCS (238) includes a boot component that installs temporary data transfer application files (220) to the host device (202) before the data transfer application (248) is executed by the host device (202), and when the data transfer application execution (248) is stopped, the data transfer configuration or support files (220) are removed from the host device.

4. The networked computing system (100) of Claim 1, wherein when the executed data transfer application (248) determines that there is at least one media content transfer instruction on the PMCS (238) or a MCP (300), the at least one media content transfer instruction is processed by the host device (202), such that a portion
of at least one media content is transferred between the PMCSD (238) and the MCP (300).

5. The networked computing system (100) of Claim 4, wherein at least one media content is uploaded from the PMCSD (238) to the MCP (300) in response to the processed at least one media content transfer instruction, and the MCP (300) selectively distributes a portion of the uploaded media content to at least one end receiving device (110, 1 12, 1 14, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134) of the networked computing system (100).

6. The networked computing system (100) of Claim 4, wherein a portion of at least one media content is downloaded from the MCP (300) to the PMCSD (238) in response to the processed at least one media content transfer instruction.

7. A computer-readable medium encoded with a set of computer-executable instructions for initiating and controlling the distribution of various media content, which when executed, perform the following method, comprising:

- initiating data communications between a portable media content storage device (PMCSD) (136a-d, 138, 140a-e, 142a-b, 238) and a host device (110, 1 12, 1 14, 1 18, 120, 122, 124, 126, 128, 130, 132, 134, 202);
- automatically executing a data transfer application (248) resident on the PMCSD (238) in response to the initiated data communications; and
- determining with the data transfer application (248) if any media content transfer instructions exist on the PMCSD (238) or on a media content provider (MCP) (300).

8. The computer-readable medium of Claim 7, wherein the data transfer application (248) resident on the PMCSD (238) is a portable application that is executed by the host device (202) without needing to install any data transfer application configuration or support files (254) to the host device (202).

9. The computer-readable medium of Claim 7, wherein the data transfer application (248) resident on the PMCSD (238) includes a boot component that installs temporary data transfer files (220) to the host device (202) before the data
transfer application (248) is executed by the host device (202), and when the data
transfer application execution (248) is stopped, the temporary data transfer files (220)
are removed from the host device (202).

10. The computer-readable medium of Claim 7, wherein when the executed data
transfer application (248) determines that there is at least one media content transfer
instruction on the PMCSD (238) or a MCP (300), the at least one media content
transfer instruction is processed by the host device (202), such that a portion of at
least one media content is transferred between the PMCSD (238) and the MCP (300).

11. The computer-readable medium of Claim 10, wherein at least one media
content is uploaded from the PMCSD (238) to the MCP (300) in response to the
processed at least one media content transfer instruction, and the MCP (300)
selectively distributes a portion of the uploaded media content to at least one end
receiving device (110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134) of a
networked computing system (100).

12. The computer-readable medium of Claim 10, wherein a portion of at least one
media content is downloaded from the MCP (300) to the PMCSD (238) in response to
the processed at least one media content transfer instruction.

13. A computer-executable method for initiating and controlling the distribution of
various media content, the method comprising:

initiating data communications between a portable media content storage
device (PMCSD) (136a-d, 138, 140a-e, 142a-b, 238) and a host device
(110, 112, 114, 118, 120, 122, 124, 126, 128, 130, 132, 134, 202);

automatically executing a data transfer application (248) resident on the
PMCS (238) in response to the initiated data communications; and
determining with the data transfer application (248) if any media content
transfer instructions exist on the PMCSD (238) or on a media content
provider (MCP) (300).

14. The computer-executable method of Claim 13, wherein the data transfer
application (248) resident on the PMCSD (238) is a portable application that is
executed by the host device (202) without needing to install any data transfer application configuration or support files (254) to the host device (202).

15. The computer-executable method of Claim 13, wherein the data transfer application (248) resident on the PMCSD (238) includes a boot component that installs temporary data transfer files (220) to the host device (202) before the data transfer application (248) is executed by the host device (202), and when the data transfer application execution (248) is stopped, the temporary data transfer files (220) are removed from the host device (202).

16. The computer-executable method of Claim 13, wherein when the executed data transfer application (248) determines that there is at least one media content transfer instruction on the PMCSD (238) or a MCP (300), the at least one media content transfer instruction is processed by the host device (202), such that a portion of at least one media content is transferred between the PMCSD (238) and the MCP (300).

17. The computer-executable method of Claim 16, wherein at least one media content is uploaded from the PMCSD (238) to the MCP (300) in response to the processed at least one media content transfer instruction, and the MCP (300) selectively distributes a portion of the uploaded media content to at least one end receiving device (110, 121, 14, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134) of a networked computing system (100).

18. The computer-executable method of Claim 16, wherein a portion of at least one media content is downloaded from the MCP (300) to the PMCSD (238) in response to the processed at least one media content transfer instruction.

19. A portable media content storage device (PMCSD) (238), comprising:
   at least one processor (240);
   at least one memory (242, 246) comprising a resident data transfer application (248); and
   a data communications interface (244) facilitating communications between the PMCSD (238) and an external computing device (202),
wherein in response to data communications being initiated between the
PMCS (238) and the external computing device (202), the resident data
transfer application (248) is automatically executed to determine if any
media content transfer instructions exist that designate a portion of PMCS
memory (242, 246) as a source or a destination location for a portion of
media content in queue for transfer.

20. The PMCS (238) of Claim 19, wherein when the executed resident data
transfer application (248) determines that the PMCS (238) is a destination for a
portion of media content in queue for transfer, the PMCS (238) communicates with a
media content source using a communications capability (228, 230) of the external
computing device (202) to schedule a media content delivery of a portion of the media
content in queue for transfer to the PMCS (238).
FIG. 3
Establish communications between a Portable Media Content Storage Device (PMCS) and a Host Computing Device (HCD)

In response to establishing communications between the PMCS and the HCD, initiate PMCS firmware boot process

Does the firmware boot process require installation of runtime configuration files on the HCD?

YES

Install runtime configuration files on the HCD prior to firmware execution

NO

Automatically execute media content transfer application (firmware resident on the PMCS) with the HCD to determine if any media content transfer instructions exist on the PMCS or a remote Media Content Provider (MCP)

FIG. 4
FIG. 5

500  Personal Computing Device 1 (PMCSD Host)

502  Personal Computing Device 2 (PMCSD Host)

504  LAN (w/Gateway)

506  WAN (internet)

510  Media Content Provider

512  Log on to MCP and order media content for download

514  Transmit media content request for one or more media content

516  Authenticate media content request and await PMCSD communications

520  Inform MCP of PMCSD availability

522  Schedule delivery session based on PMCSD availability

524  Transmit at least a portion of media content from media content request

526  Store received media content and optionally playback received media content when playback is requested by user

518  Initiate communications between PMCSD and Host, and between Host and MCP
FIG. 6

1. Initiate communications between PMCS and Host and generate an upload request for a MCP (614).

2. Inform MCP of upload request for at least a portion of one or more media content (616).

3. Inform Host/PMCS of availability (620).

4. Optionally generate uploaded media content distribution instructions and initiate media content upload (622).

5. Upload at least a portion of one or more media content from PMCS to MCP (with optional media content distribution instructions) (624).

6. Authenticate media content upload request and await communications (618).

7. Store media content in user repository and process optional media content distribution instructions (626).

8. Transfer media content (630).

9. Transfer media content (630).
Detect a communications triggering event between a Portable Media Content Storage Device (PMCS) and a Host Computing Device (HCP) (e.g., a physical plug-in event or an automatic short-range wireless communications initiation)

Launch PMCS firmware boot process to determine the HCP Operating System, processing capabilities, and available system resources

Prompt user to determine if user wishes to run media content transfer application (firmware resident on the PMCS)

Does the user wish to run the media content transfer application?

- NO → End Process
- YES → Launch PMCS firmware, which checks the status of a communications link between the HCP and a Media Content Provider (MCP)

FIG. 7A
A

Does a communications link currently exist between the HCD/PMCS and a MCP?

NO

Wait until a time T1 expires

YES

PMCS firmware checks if a pending delivery task exists on either the PMCS or the MCP

Does a media content delivery task exist on either the PMCS or the MCP?

NO

Wait until a time T2 expires

YES

Resume media content delivery task pertaining to either a media content upload from the PMCS or a media content download from the MCP

FIG. 7B
Detect a communications severing event between a Portable Media Content Storage Device (PMCSd) and a Host Computing Device (HCD) (e.g., a physical plug-out event or cessation of short-range wireless communications)

Have PMCSd firmware configuration/temp files been installed on the HCD?

Yes

Remove all installed configuration/temp files from the HCD

No

Notify any linked Media Content Providers (MCPs) that the PMCSd is offline to halt delivery services

Prompt user to determine if MCP delivery services should be removed from HCD

Does user wish to remove MCP delivery services from the HCD?

Yes

Remove MCP delivery services from the HCD

No

End Process

FIG. 8