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(54) Title: METHOD AND SYSTEM FOR COLLECTING INFORMATION ABOUT PORTABLE DEVICE USAGE

(57) Abstract: Methods and portable devices for collecting information about portable device usage are disclosed. Embodiments provide convenient, efficient, and cost-effective methods of monitoring and collecting information about on-portal/off-portal usage, on-network/off-network data usage, interactive (e.g., streaming media, interactive gaming, mobile conferencing, etc.) usage, and wireless IP usage, where the portable device usage is monitored by the portable device itself.



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METHOD AND SYSTEM FOR COLLECTING INFORMATION ABOUT PORTABLE DEVICE USAGE

RELATED APPLICATIONS

The present application is related to and claims the benefit of United States Provisional Patent Application Number 60/849,054, filed October 2, 2006, entitled "MOBILE DEVICE METRICS," naming Brian Thomas Monighetti and Kanishka Agarwal as inventors, assigned to the assignee of the present invention, and having attorney docket number TELE-P018.PRO. That application is incorporated herein by reference in its entirety and for all purposes.

BACKGROUND OF THE INVENTION

Although cellular phones and other wireless devices were originally used for basic call placement, mobile phones now incorporate many new technologies and features. For example, data messaging in the form of SMS or MMS is common. Additionally, internet connectivity over cellular networks and wireless internet access points (e.g., using Wi-Fi, etc.) has enabled internet browsing, content downloading, mobile commerce transactions, email activity, and the like.

With the advent of these new features and the services to support such features, cellular providers and other wireless industry participants have realized a need for information on usage of these features and services. Consumer usage information is desirable for advertising, marketing, strategic business planning, and various other business uses. However, obtaining such information

has proven to be costly, difficult, or otherwise impossible using conventional data collection techniques.

For example, conventional data collection techniques are unable to obtain usage information related to "on-portal" and "off-portal" usage. On-portal usage refers to interaction with an internet website (e.g., uploading to, downloading from, etc.) of a carrier providing wireless service for the cellular phone, while off-portal usage is interaction with an internet website which is not affiliated with the carrier. Although on-portal usage may be monitored by the carrier (e.g., by monitoring internet activity with servers hosting their internet portals), it is difficult and/or impossible for third-parties to monitor such usage. Further, off-portal usage cannot be directly monitored by carriers given that the interaction is not with servers of the respective carriers.

Collection of "on-network" and "off-network" data usage is also limited using the conventional collection techniques. On-network data usage refers to interaction over a network (e.g., a cellular network) of a carrier providing wireless service for the cellular phone, while off-network data usage is interaction over a network which is not affiliated with the carrier. Although on-network data usage may be monitored by the carrier, it is difficult and/or impossible for third-parties to monitor such usage. Further, off-network data usage cannot be directly monitored by carriers given that the interaction is over networks affiliated with other business entities.

Conventional data collection techniques are also inadequate to monitor interactive and/or "real-time" usage. For example, methodologies to monitor usage associated with streaming media (e.g., mobile TV, internet radio, etc.), interactive gaming, and mobile conferencing have neither been proposed nor devised.

Additionally, many cellular phones and other wireless devices are now equipped for wireless internet protocol (IP) communication (e.g., Wi-Fi, etc.). Wireless IP usage is difficult to monitor given that such interactions are not over a single network or via a single internet server. Additionally, there are many types of wireless IP networks, which further complicates monitoring such usage. Further, there are many small wireless IP networks affiliated with many different business entities, thereby thwarting usage monitoring by any single business entity and making payment tracking between the business entities (e.g., affiliated with the wireless IP networks relinquishing and receiving subscribers) impossible.

SUMMARY OF THE INVENTION

Accordingly, a need exists to monitor and collect data for portable device usage with reduced cost and difficulty. Additionally, a need exists to obtain information for on-portal and off-portal usage of portable devices, as well as on-network and off-network data usage. A need also exists to monitor and collect data for interactive usage of portable devices. Further, a need exists to obtain information on wireless internet protocol (IP) usage of portable devices. Embodiments of the present invention provide novel solutions to these needs and others as described below.

Embodiments of the present invention are directed to methods and portable devices for collecting information about portable device usage. More specifically, embodiments provide convenient, efficient, and cost-effective methods of monitoring and collecting information about on-portal/off-portal usage, on-network/off-network data usage, interactive (e.g., streaming media, interactive gaming, mobile conferencing, etc.) usage, and wireless IP usage, where the portable device usage is monitored by the portable device itself.

By utilizing components of the portable device itself to monitor the portable device usage, information may be collected across various internet portals and/or networks. As such, embodiments enable the collection of information for on-portal/off-portal usage as well as on-network/off-network data usage. Additionally, the monitoring of interactive usage on the portable device provides

complete and representative information regarding interactions of the portable device with many different servers, systems, portable devices, etc. Further, by centralizing the monitoring and collection of information related to wireless IP usage on the portable device itself, difficulties presented by the numerous wireless IP networks and/or internet servers in communication with the portable device, numerous types of wireless IP networks, and numerous business entities affiliated with the wireless IP networks are reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements.

Figure 1 shows an exemplary system for collecting information about portable device usage in accordance with one embodiment of the present invention.

Figure 2 shows an exemplary process for collecting information about portable device usage associated with at least one of an internet portal status and a wireless network status in accordance with one embodiment of the present invention.

Figure 3 shows an exemplary portable device for collecting information about portable device usage associated with at least one of an internet portal status and a wireless network status in accordance with one embodiment of the present invention.

Figure 4 shows an exemplary process for collecting information about portable device usage associated with at least one of streaming media, interactive gaming, and mobile conferencing in accordance with one embodiment of the present invention.

Figure 5 shows an exemplary portable device for collecting information about portable device usage associated with at least one of streaming media, interactive gaming, and mobile conferencing in accordance with one embodiment of the present invention.

Figure 6 shows an exemplary process for collecting information about wireless internet protocol usage of a portable device in accordance with one embodiment of the present invention.

Figure 7 shows an exemplary portable device for collecting information about wireless internet protocol usage of the portable device in accordance with one embodiment of the present invention.

Figure 8 shows a diagram of exemplary wireless networks grouped by business entity association in accordance with one embodiment of the present invention.

Figure 9 shows an exemplary geographical layout of exemplary wireless networks in accordance with one embodiment of the present invention.

Figure 10 shows an exemplary computer system upon which embodiments of the present invention may be implemented.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to embodiments of the present invention, examples of which are illustrated in the accompanying drawings. While the present invention will be discussed in conjunction with the following embodiments, it will be understood that they are not intended to limit the present invention to these embodiments alone. On the contrary, the present invention is intended to cover alternatives, modifications, and equivalents which may be included with the spirit and scope of the present invention as defined by the appended claims. Furthermore, in the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, embodiments of the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail so as not to unnecessarily obscure aspects of the present invention.

Notation and Nomenclature

Some portions of the detailed descriptions which follow are presented in terms of procedures, logic blocks, processing and other symbolic representations of operations on data bits within a computer memory. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. In the present application, a procedure, logic block, process, or the like, is

conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, although not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussions, it is appreciated that throughout the present invention, discussions utilizing the terms such as "accepting," "accessing," "adding," "analyzing," "assembling," "assigning," "calculating," "capturing," "combining," "comparing," "collecting," "creating," "defining," "depicting," "detecting," "determining," "displaying," "establishing," "executing," "generating," "grouping," "identifying," "initiating," "interacting," "modifying," "monitoring," "moving," "outputting," "performing," "placing," "presenting," "processing," "programming," "querying," "removing," "repeating," "sampling," "sorting," "storing," "using," or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

Embodiments of the Invention

Figure 1 shows exemplary system 100 for collecting information about portable device usage in accordance with one embodiment of the present invention. As shown in Figure 1, network 110 may comprise a wired and/or wireless network, where network 110 couples portable devices 120a-120c. Portable devices 120a-120c may comprise cellular telephones, portable gaming devices, portable media devices, portable digital assistants (PDAs), hand-held computer systems, etc. In one embodiment, network 110 may comprise the internet. Additionally, information processor 130 and portable device usage information database 140 are coupled via network 120.

One or more of portable devices 120a-120c may comprise a respective information collection component for collecting usage information from the portable device. Usage information collected from each portable device (e.g., 120a-120c) may be communicated over network 120 to information processor 130 for processing and/or storage in database 140. It should be appreciated that processor 130 and database 140 may be integrated within the same system in one embodiment, where database 140 may comprise a memory of the system.

Portable devices 120a-120c may comprise a panel of wireless devices, where users of the portable devices (e.g., 120a-120c) may comprise a panel of users. The panel's usage of the portable devices may be used to determine

various metrics concerning the mobile device. For example, metrics concerning portable device usage associated with an internet portal status, a wireless network status, streaming media, interactive gaming, mobile conferencing, and wireless internet protocol (IP) usage may be determined as discussed with regard to the subsequent figures below.

Figure 2 shows exemplary process 200 for collecting information about portable device usage associated with at least one of an internet portal status and a wireless network status in accordance with one embodiment of the present invention. As shown in Figure 2, step 210 involves monitoring usage of a portable device (e.g., 120a-120c) associated with an internet portal status. In one embodiment, the internet portal status may comprise "on-portal" and/or "off-portal." As such, on-portal usage (e.g., interaction with a website of the carrier providing service to the portable device) and/or off-portal usage (e.g., interaction with a website which is not affiliated with the carrier) of the portable device may be monitored in step 210.

Step 220 involves monitoring usage of a portable device (e.g., 120a-120c) associated with a wireless network status. In one embodiment, the wireless network status may comprise "on-network" and/or "off-network." As such, on-network usage (e.g., interaction over a network of a carrier providing wireless service for the cellular phone) and/or off-network usage (e.g., interaction over a

network which is not affiliated with the carrier) of the portable device may be monitored in step 220.

As shown in Figure 2, step 230 involves collecting information about the usage (e.g., monitored in steps 210 and/or 220). As such, the information collected may comprise on-portal usage information and/or off-portal usage information where on-portal and/or off-portal usage is monitored. Where on-network and/or off-network usage is monitored, the information collected may comprise on-network usage information and/or off-network usage information. And in one embodiment, the usage information may be collected in accordance with United States Patent Numbers 6,745,011 and 6,754,470, the disclosure of which are hereby incorporated by reference.

Step 240 involves collecting additional information about the time and/or place of the usage (e.g., monitored in steps 210 and/or 220). Thereafter, the collected information (e.g., that collected in steps 230 and/or 240) may be processed in step 250. Processing may comprise cleaning, organizing, filtering, sorting, encoding, encrypting, applying time and/or location stamps to, etc. the data. In one embodiment, the collected information may be processed by the portable device (e.g., 120a-120c) and/or by an external system (e.g., processor 130). After processing, the information may be stored in step 260. In one embodiment, the information may be stored in the portable device (e.g., 120a-120c) and/or in an external memory (e.g., database 140).

Figure 3 shows exemplary portable device 300 for collecting information about portable device usage associated with at least one of an internet portal status and a wireless network status in accordance with one embodiment of the present invention. In one embodiment, portable device 300 may be used to implement any of portable devices 120a-120c of Figure 1.

As shown in Figure 3, portable device 300 comprises information collection component 310 for monitoring (e.g., in accordance with steps 210 and/or 220 of Figure 2) and collecting (e.g., in accordance with step 230 of Figure 2) on-portal usage information 320, off-portal usage information 330, on-network usage information 340, off-network usage information 350, or any combination thereof. Component 310 may also monitor time information 360 and location information 370, where information 360 and/or 370 may be used to determine a time and/or place of usage associated with information 320-350, or any subset thereof (e.g., in accordance with step 240 of Figure 2). As such, in one embodiment, information 360 may be used to time stamp a given usage of portable device 300, whereas information 370 may be used to location stamp a given usage of portable device 300.

After collecting information 320-370, or any subset thereof, component 310 may output collected information 380. In one embodiment, information 380 may be output to a processor (e.g., for processing) and/or memory (e.g., for

storage) of portable device 300. Alternatively, information 380 may be output to an external processor (e.g., 130) and/or external memory (e.g., 140).

Thus, by utilizing components (e.g., 310) of the portable device (e.g., 300) itself to monitor the portable device usage (e.g., as represented by information 320-370 input to component 310), information may be collected across various internet portals and/or networks. As such, embodiments enable the collection of information for on-portal/off-portal usage as well as on-network/off-network data usage. Additionally, the information collected may be more complete and representative of actual device usage given that it is monitored and collected on the portable device itself. Further, embodiments enable a single entity to collect the complete and representative usage information from the portable device (e.g., 300), where the entity may be in agreement (e.g., opt-in, etc.) with a user of the portable device (e.g., 300) regarding the collection of such usage information.

Figure 4 shows exemplary process 400 for collecting information about portable device usage associated with at least one of streaming media, interactive gaming, and mobile conferencing in accordance with one embodiment of the present invention. As shown in Figure 4, step 410 involves monitoring the usage of a portable device (e.g., 120a-120c of Figure 1) associated with streaming media (e.g., mobile TV, internet radio, etc.). The media may comprise audio and/or video streamed from a content source to the portable device (e.g., 120a-120c). In one embodiment, the usage may comprise inputs by a user (e.g.,

changing channels, adjusting the volume, etc.) to the portable device and/or the content source. Alternatively, the usage may comprise characteristics of the content stream (e.g., identification of the content, data embedded in the stream, changes in the content stream, etc.).

Step 420 involves monitoring usage of a portable device (e.g., 120a-120c of Figure 1) associated with interactive gaming. The interactive game may be played from the portable device (e.g., 120a-120c) with or against users of systems or devices in communication with the portable device (e.g., 120a-120c). The usage may comprise inputs by a user (e.g., to play the game, to adjust play options, etc.) to the portable device and/or the content source. Alternatively, the usage may comprise characteristics of the interactive game play (e.g., number of users playing the game, type of interaction, frequency of the interaction, duration of the interaction, etc.).

As shown in Figure 4, step 430 involves monitoring usage of a portable device (e.g., 120a-120c of Figure 1) associated with mobile conferencing. The mobile conferencing may comprise simultaneous connection (e.g., enabling communication) between three or more portable devices in one embodiment. The usage may comprise inputs by a user (e.g., to initiate a call, to setup the conferencing, to communicate with other conferencing devices, etc.) to the portable device and/or other devices (e.g., engaged in the mobile conference). Alternatively, the usage may comprise characteristics of the mobile conferencing

(e.g., number of devices involved in the mobile conferencing, duration of the mobile conference, content of the communications between conferencing devices, etc.).

As shown in Figure 4, step 440 involves collecting information about the usage (e.g., monitored in steps 410, 420, 430, or a combination thereof). As such, the information collected may comprise streaming media usage information where streaming media usage is monitored. Where interactive gaming usage is monitored, the information collected may comprise interactive gaming usage information. Additionally, the information collected may comprise mobile conferencing usage information where mobile conferencing is monitored. In one embodiment, the information may be collected in real-time. And in one embodiment, the usage information may be collected in accordance with United States Patent Numbers 6,745,011 and 6,754,470, the disclosure of which are hereby incorporated by reference.

Step 450 involves collecting additional information about the time and/or place of the usage (e.g., monitored in steps 410, 420, 430, or a combination thereof). In one embodiment, the additional information may be collected in real-time. Thereafter, the collected information (e.g., that collected in steps 440 and/or 450) may be processed in step 460. Processing may comprise cleaning, organizing, filtering, sorting, encoding, encrypting, applying time and/or location stamps to, etc. the data. In one embodiment, the collected information may be

processed by the portable device (e.g., 120a-120c) and/or by an external system (e.g., processor 130). After processing, the information may be stored in step 470. In one embodiment, the information may be stored in the portable device (e.g., 120a-120c) and/or in an external memory (e.g., database 140).

Figure 5 shows exemplary portable device 500 for collecting information about portable device usage associated with at least one of streaming media, interactive gaming, and mobile conferencing in accordance with one embodiment of the present invention. In one embodiment, portable device 500 may be used to implement any of portable devices 120a-120c of Figure 1.

As shown in Figure 5, portable device 500 comprises information collection component 510 for monitoring (e.g., in accordance with steps 410, 420, 430, or a combination thereof of Figure 4) and collecting (e.g., in accordance with step 440 of Figure 4) streaming media usage information 520, interactive gaming usage information 530, mobile conferencing usage information 540, or any combination thereof. Component 510 may also monitor time information 560 and location information 570, where information 560 and/or 570 may be used to determine a time and/or place of usage associated with information 520-540, or any subset thereof (e.g., in accordance with step 450 of Figure 4). As such, in one embodiment, information 560 may be used to time stamp a given usage of portable device 500, whereas information 570 may be used to location stamp a given usage of portable device 500.

After collecting information 520-570, or any subset thereof, component 510 may output collected information 580. In one embodiment, information 580 may be output to a processor (e.g., for processing) and/or memory (e.g., for storage) of portable device 500. Alternatively, information 580 may be output to an external processor (e.g., 130) and/or external memory (e.g., 140).

Thus, by utilizing components (e.g., 510) of the portable device (e.g., 500) itself to monitor the portable device usage (e.g., as represented by information 520-570 input to component 510), information regarding interactions of the portable device with many different servers, systems, portable devices, etc. may be obtained. Additionally, the information collected may be more complete and representative of actual device usage given that it is monitored and collected on the portable device itself. Further, embodiments enable a single entity to collect the complete and representative usage information from the portable device (e.g., 500), where the entity may be in agreement (e.g., opt-in, etc.) with a user of the portable device (e.g., 500) regarding the collection of such usage information.

Figure 6 shows exemplary process 600 for collecting information about wireless internet protocol usage of a portable device in accordance with one embodiment of the present invention. As shown in Figure 6, step 610 involves monitoring wireless IP usage of a portable device (e.g., 120a-120c of Figure 1). The wireless IP usage (e.g., Wi-Fi, WiMAX, etc.) may comprise any wireless data

and/or voice communication (e.g., in accordance with the IEEE 802.11 standard, IEEE 802.16 standard, etc.). For example, wireless IP voice usage may comprise voice usage (e.g., voice over IP (VOIP), etc.) outside a carrier network, where voices or other sounds are transformed in data (e.g., packetized) and communicated as such. Additionally, wireless IP data usage may comprise data usage outside a carrier network, where information other than voices and/or sounds are communicated. The communications may be over one or more wireless IP networks and via one or more internet servers, where the networks may be affiliated with one or more business entities. Additionally, the communications may be communicated over one or more types of wireless IP networks (e.g., Wi-Fi, WiMAX, etc.).

Step 620 involves collecting information about the wireless IP usage (e.g., monitored in step 610). As such, the information collected may comprise wireless IP usage information. In one embodiment, the information may be collected in real-time. And in one embodiment, the usage information may be collected in accordance with United States Patent Numbers 6,745,011 and 6,754,470, the disclosure of which are hereby incorporated by reference.

Step 630 involves collecting additional information about the time and/or place of the usage (e.g., monitored in step 610). Thereafter, the collected information (e.g., that collected in steps 620 and/or 630) may be processed in step 640. Processing may comprise cleaning, organizing, filtering, sorting,

encoding, encrypting, applying time and/or location stamps to, etc. the data. In one embodiment, the collected information may be processed by the portable device (e.g., 120a-120c) and/or by an external system (e.g., processor 130). After processing, the information may be stored in step 650. In one embodiment, the information may be stored in the portable device (e.g., 120a-120c) and/or in an external memory (e.g., database 140).

Figure 7 shows exemplary portable device 700 for collecting information about wireless internet protocol usage of the portable device in accordance with one embodiment of the present invention. In one embodiment, portable device 700 may be used to implement any of portable devices 120a-120c of Figure 1.

As shown in Figure 7, portable device 700 comprises information collection component 710 for monitoring (e.g., in accordance with step 610 of Figure 6) and collecting (e.g., in accordance with step 620 of Figure 6) wireless IP voice usage information 720 and/or wireless IP data usage information 730. Component 710 may also monitor time information 760 and location information 770, where information 760 and/or 770 may be used to determine a time and/or place of usage associated with information 720-740, or any subset thereof (e.g., in accordance with step 630 of Figure 6). As such, in one embodiment, information 760 may be used to time stamp a given usage of portable device 700, whereas information 770 may be used to location stamp a given usage of portable device 700.

After collecting information 720-730, or any subset thereof, component 710 may output collected information 780. In one embodiment, information 780 may be output to a processor (e.g., for processing) and/or memory (e.g., for storage) of portable device 500. Alternatively, information 780 may be output to an external processor (e.g., 130) and/or external memory (e.g., 140).

Thus, by utilizing components (e.g., 710) of the portable device (e.g., 700) itself to monitor the portable device usage (e.g., as represented by information 720-770 input to component 710), information regarding wireless IP communications over one or more wireless IP networks affiliated with one or more business entities, as well as communications over one or more types of wireless IP networks, may be obtained. Additionally, the information collected may be more complete and representative of actual device usage given that it is monitored and collected on the portable device itself. Further, embodiments enable a single entity to collect the complete and representative usage information from the portable device (e.g., 700), where the entity may be in agreement (e.g., opt-in, etc.) with a user of the portable device (e.g., 700) regarding the collection of such usage information.

Figure 8 shows diagram 800 of exemplary wireless networks grouped by business entity association in accordance with one embodiment of the present invention. As shown in Figure 8, wireless networks 810-860 are coupled to

internet 870, where networks 810-830 are associated with business entity 880 and networks 840-860 are associated with business entity 890. Networks 810-860 may comprise wireless IP networks utilizing IEEE 802.11, IEEE 802.16, or other wireless communication standards.

Figure 9 shows exemplary geographical layout 900 of exemplary wireless networks 810-860 in accordance with one embodiment of the present invention. As shown in Figure 9, the networks associated with business entity 880 (e.g., networks 810-830) are not shaded, while the networks associated with business entity 890 (e.g., networks 840-860) are shaded. As such, when traveling along exemplary path 910, a portable device (e.g., 120a-120c, 300, 500, 700, etc.) may communicate with wireless networks 840, 810, 850 and 830, where transitions between wireless networks may occur in the following order: 840, 810, 850, 830 and 850. However, when traveling along exemplary path 920, a portable device (e.g., 120a-120c, 300, 500, 700, etc.) may communicate with wireless networks 840, 820, 830 and 860, where transitions between wireless networks may occur in that order. In one embodiment, exemplary paths 910 and 920 may represent a change in location of a portable device over time (e.g., when a user carrying the portable device walks through a city, etc.).

In one embodiment, to provide nearly uninterrupted service as the portable device travels along path (e.g., 910, 920, etc.) through wireless networks 810-860, business entities 880 and 890 can agree to provide service to

the other entity's subscribers in exchange for payment, etc. Information regarding such payments between business entities is commonly referred to as "payment tracking." For example, when a subscriber of services provided by business entity 890 travels along path 920 as shown in Figure 9, business entity 890 may pay business entity 880 for wireless service provided to the subscriber when traveling through wireless networks 820 and 830.

Although business entity 890 may be aware of the subscriber's wireless IP usage when in the geographical areas covered by wireless networks 840 and 860, business entity 890 cannot monitor such wireless IP usage when in wireless networks (e.g., 820 and 830) affiliated with business entity 880 using conventional techniques. Similarly, using conventional techniques, business entity 890 is unable to monitor wireless IP usage by subscribers associated with other business entities when the subscribers access wireless networks affiliated with other business entities. As such, embodiments of the present invention enable payment tracking (e.g., by a business entity affiliated with a wireless network, by a third party, etc.) by monitoring and/or collecting information related to the wireless IP usage on the portable device (e.g., 120a-120c, 300, 500, 700, etc.) itself. Since the portable device (e.g., 120a-120c, 300, 500, 700, etc.) can monitor its own wireless IP usage regardless of which wireless network (or type of wireless network) it may be communicating with at any given time, embodiments enable collection of complete and representative information

related to payment tracking for the wireless IP usage of the portable device (e.g., 120a-120c, 300, 500, 700, etc.).

Although wireless networks 810-860 are depicted in Figure 9 as adjoining portions without gaps, it should be appreciated that the wireless networks may be alternatively arranged (e.g., with one or more gaps, etc.) in other embodiments. Additionally, it should be appreciated that a larger or smaller number of wireless networks may be present in other embodiments. Although wireless networks are apportioned to only two business entities in Figures 8 and 9, it should be appreciated that the wireless networks may be apportioned to a larger or smaller number of business entities in other embodiments. Further, it should be appreciated that a large or smaller number of wireless networks may be apportioned to the business entities in other embodiments.

Computer System Platform

Figure 10 shows exemplary computer system 1000 upon which embodiments of the present invention may be implemented. With reference to Figure 10, portions of the present invention are comprised of computer-readable and computer-executable instructions that reside, for example, in computer system 1000 which may be used as a part of a general purpose computer network (not shown). It is appreciated that computer system 1000 of Figure 10 is merely exemplary. As such, the present invention can operate within a number of different computer systems including general-purpose computer systems,

embedded computer systems, laptop computer systems, hand-held computer systems, portable computer systems (e.g., portable devices), and stand-alone computer systems.

In the present embodiment, computer system 1000 includes an address/data bus 1002 for conveying digital information between the various components, a central processor unit (CPU) 1004 coupled to bus 1002 for processing the digital information and instructions, a volatile main memory 1006 coupled to bus 1002 comprised of volatile random access memory (RAM) for storing the digital information and instructions, and a non-volatile read only memory (ROM) 1008 coupled to bus 1002 for storing information and instructions of a more permanent nature. In addition, computer system 1000 may also include a data storage device 1010 (e.g., a magnetic, optical, floppy, tape, or other drive) coupled to bus 1002 for storing larger amounts of data. It should be noted that the software program for performing the method of collecting information about usage of a portable device of the present invention may be stored in main memory 1006, ROM 1008, storage device 1010, registers within CPU 1004 (not shown), and/or in an external storage device (not shown).

As shown in Figure 10, computer system 1000 may be coupled via bus 1002 to an optional display device 1012 (e.g., a CRT monitor, LCD monitor, etc.) for displaying information received from computer system 1000. An optional input device 1014 (e.g., an alphanumeric keyboard) may also be coupled to

computer system 1000 via bus 1002 for communicating information and command selections to CPU 1004. Cursor control device 1016 (e.g., a mouse, trackball, light pen, etc.) may also be coupled to computer system 1000 via bus 1002 for communicating direction information and command selections to CPU 1004 and for controlling cursor movement (e.g., on display 1012). Additionally, computer system 1000 can include a mechanism for emitting an audible signal (not shown).

Computer system 1000 may also include a communication interface 1018 coupled to bus 1002. Communication interface 1018 provides a two-way data communication coupling to local network 1022 via network link 1020. For example, communication interface 1018 may be an integrated services digital network (ISDN) device or modem to provide a data communication connection to a corresponding type of telephone line. As another example, communication interface 1018 may be a local area network (LAN) device to provide a data communication connection to a compatible LAN. And as yet another example, network link 1020 may comprise a wireless connection between communication interface 1018 and local network 1022. Regardless of the implementation utilized, communication interface 1018 may send and receive electrical, electromagnetic, and/or optical signals that carry digital data streams representing various types of information.

As shown in Figure 10, network link 1020 may provide data communication through one or more networks to other data devices. For example, network link 1020 may provide a connection through local network 1022 to a host computer 1024 or to data equipment operated by internet service provider (ISP) 1026. ISP 1026 in turn provides data communication services through the worldwide packet data communication network, now commonly referred to as the "Internet" 870. Local network 1022 and Internet 870 may use electrical, electromagnetic, and/or optical signals to convey digital data streams. The signals through the various networks and network link 1020, which carry digital data to and from computer system 1000, are exemplary forms of carrier waves transporting information.

Accordingly, computer system 1000 can send and receive messages through network(s), network link 1020, and communication interface 1018. For example, server 1030 may transmit a requested code for an application program through Internet 870, ISP 1026, local network 1022, and communication interface 1018. The received code may be executed by CPU 1004 upon receipt, and/or be stored in one of the coupled memory devices (e.g., storage device 1010, ROM 1008, RAM 1006, etc.) for later execution.

In the foregoing specification, embodiments of the invention have been described with reference to numerous specific details that may vary from implementation to implementation. Thus, the sole and exclusive indicator of what

is, and is intended by the applicant to be, the invention is the set of claims that issue from this application, in the specific form in which such claims issue, including any subsequent correction. Hence, no limitation, element, property, feature, advantage, or attribute that is not expressly recited in a claim should limit the scope of such claim in any way. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

CLAIMS

What is claimed is:

1. A method of collecting information about usage of a portable device, said method comprising:
 - monitoring usage of said portable device associated with at least one of an internet portal status and a wireless network status, wherein said monitoring is performed on said portable device; and
 - collecting information about said usage.
2. The method of Claim 1 further comprising:
 - processing said information; and
 - storing said information.
3. The method of Claim 2, wherein at least one of said processing and storing are performed on said portable device.
4. The method of Claim 1 further comprising:
 - collecting additional information about at least one of a time and a place associated with said usage.
5. The method of Claim 1, wherein said internet portal status comprises a status of an internet portal associated with a carrier, and wherein said carrier is associated with said portable device.

6. The method of Claim 1, wherein said internet portal status comprises at least one of on-portal and off-portal, and wherein said information comprises at least one of on-portal usage information and off-portal usage information.
7. The method of Claim 1, wherein said wireless network status comprises a status of a wireless network over which said portable device communicates.
8. The method of Claim 1, wherein said wireless network status comprises at least one of on-network and off-network, and wherein said information comprises at least one of on-network usage information and off-network usage information.
9. A portable device comprising:
 - a processor;
 - a memory; and
 - an information collection component for:
 - monitoring usage of said portable device associated with at least one of an internet portal status and a wireless network status; and
 - collecting information about said usage.
10. The portable device of Claim 9, wherein said processor is operable to process said information, and wherein said memory is operable to store said information.

11. The portable device of Claim 9, wherein said information collection component is further for collecting additional information about at least one of a time and a place associated with said usage.

12. The portable device of Claim 9, wherein said internet portal status comprises a status of an internet portal associated with a carrier, and wherein said carrier is associated with said portable device.

13. The portable device of Claim 9, wherein said internet portal status comprises at least one of on-portal and off-portal, and wherein said information comprises at least one of on-portal usage information and off-portal usage information.

14. The portable device of Claim 9, wherein said wireless network status comprises a status of a wireless network over which said portable device communicates.

15. The portable device of Claim 9, wherein said wireless network status comprises at least one of on-network and off-network, and wherein said information comprises at least one of on-network usage information and off-network usage information.

16. A method of collecting information about usage of a portable device, said method comprising:

monitoring usage of said portable device associated with at least one of streaming media, interactive gaming, and mobile conferencing, wherein said monitoring is performed on said portable device; and
collecting information about said usage.

17. The method of Claim 16 further comprising:

processing said information; and
storing said information.

18. The method of Claim 17, wherein at least one of said processing and storing are performed on said portable device.

19. The method of Claim 16 further comprising:

collecting additional information about at least one of a time and a place associated with said usage.

20. The method of Claim 16, wherein said collecting occurs in real-time.

21. The method of Claim 16, wherein said streaming media comprises at least one of video and audio.

22. The method of Claim 16, wherein said information about said usage associated with said interactive gaming comprises at least one of a user input and a characteristic of interaction with said interactive game.

23. The method of Claim 22, wherein said characteristic of said interaction with said interactive game comprises at least one of a number of users playing said interactive game, a type of said interaction, a frequency of said interaction, and a duration of said interaction.

24. The method of Claim 16, wherein said information about said usage associated with said mobile conferencing comprises at least one of a number of devices involved in said mobile conferencing, duration of said mobile conferencing, and content of communications between said devices involved in said mobile conferencing.

25. A portable device comprising:
a processor;
a memory; and
an information collection component for:
monitoring usage of said portable device associated with at least one of streaming media, interactive gaming, and mobile conferencing; and
collecting information about said usage.

26. The portable device of Claim 25, wherein said processor is operable to process said information, and wherein said memory is operable to store said information.

27. The portable device of Claim 25, wherein said information collection component is further for collecting additional information about at least one of a time and a place associated with said usage.

28. The portable device of Claim 25, wherein said collecting occurs in real-time.

29. The portable device of Claim 25, wherein said streaming media comprises at least one of video and audio.

30. The portable device of Claim 25, wherein said information about said usage associated with said interactive gaming comprises at least one of a user input and a characteristic of interaction with said interactive game.

31. The portable device of Claim 30, wherein said characteristic of said interaction with said interactive game comprises at least one of a number of users playing said interactive game, a type of said interaction, a frequency of said interaction, and a duration of said interaction.

32. The portable device of Claim 25, wherein said information about said usage associated with said mobile conferencing comprises at least one of a number of devices involved in said mobile conferencing, duration of said mobile conferencing, and content of communications between said devices involved in said mobile conferencing.

33. A method of collecting information about usage of a portable device, said method comprising:

monitoring wireless internet protocol usage of said portable device,
wherein said monitoring is performed on said portable device; and
collecting information about said wireless internet protocol usage.

34. The method of Claim 33 further comprising:
processing said information; and
storing said information.

35. The method of Claim 34, wherein at least one of said processing and storing are performed on said portable device.

36. The method of Claim 33 further comprising:
collecting additional information about at least one of a time and a place associated with said wireless internet protocol usage.

37. The method of Claim 33, wherein said wireless internet protocol usage comprises voice usage outside a carrier network.
38. The method of Claim 37, wherein said voice usage comprises voice over internet protocol (VOIP) usage.
39. The method of Claim 33, wherein said wireless internet protocol usage comprises data usage outside a carrier network.
40. The method of Claim 39, wherein said data usage is in accordance with at least one of a IEEE 802.11 and a IEEE 802.16 wireless communication standard.
41. A portable device comprising:
- a processor;
 - a memory; and
 - an information collection component for:
 - monitoring wireless internet protocol usage of said portable device;
 - and
 - collecting information about said wireless internet protocol usage.
42. The portable device of Claim 41, wherein said processor is operable to process said information, and wherein said memory is operable to store said information.

43. The portable device of Claim 41, wherein said information collection component is further for collecting additional information about at least one of a time and a place associated with said wireless internet protocol usage.
44. The portable device of Claim 41, wherein said wireless internet protocol usage comprises voice usage outside a carrier network.
45. The portable device of Claim 44, wherein said voice usage comprises voice over internet protocol (VOIP) usage.
46. The portable device of Claim 41, wherein said wireless internet protocol usage comprises data usage outside a carrier network.
47. The portable device of Claim 46, wherein said data usage is in accordance with at least one of a IEEE 802.11 and a IEEE 802.16 wireless communication standard.

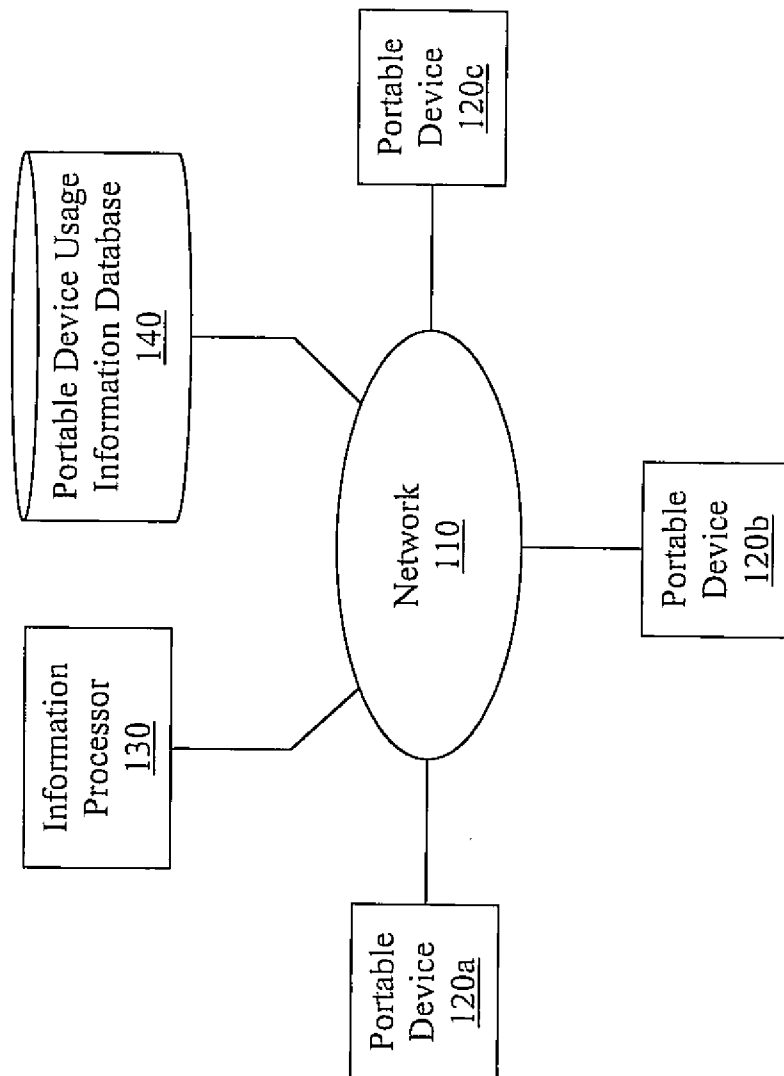
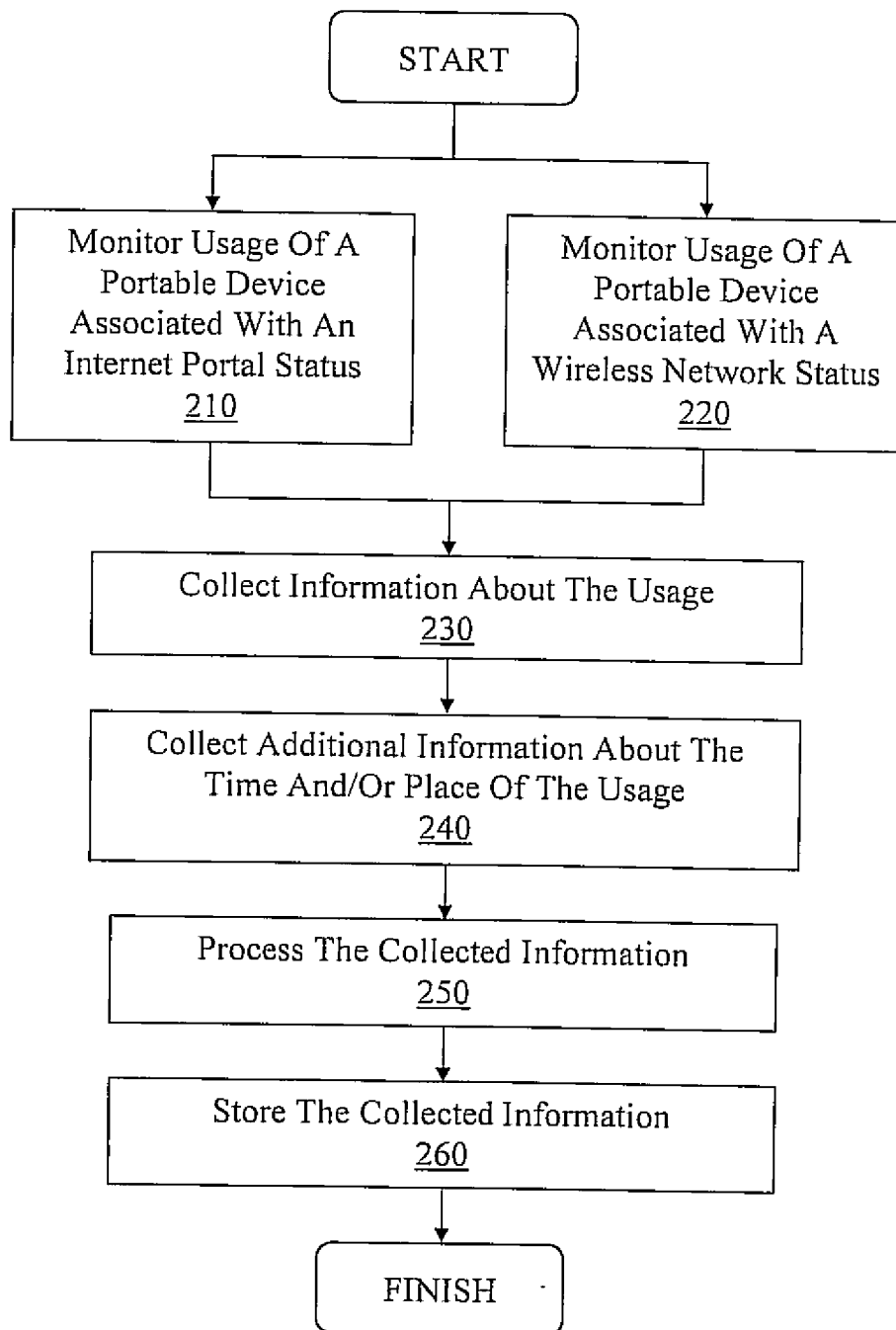


FIGURE 1

200**FIGURE 2**

300

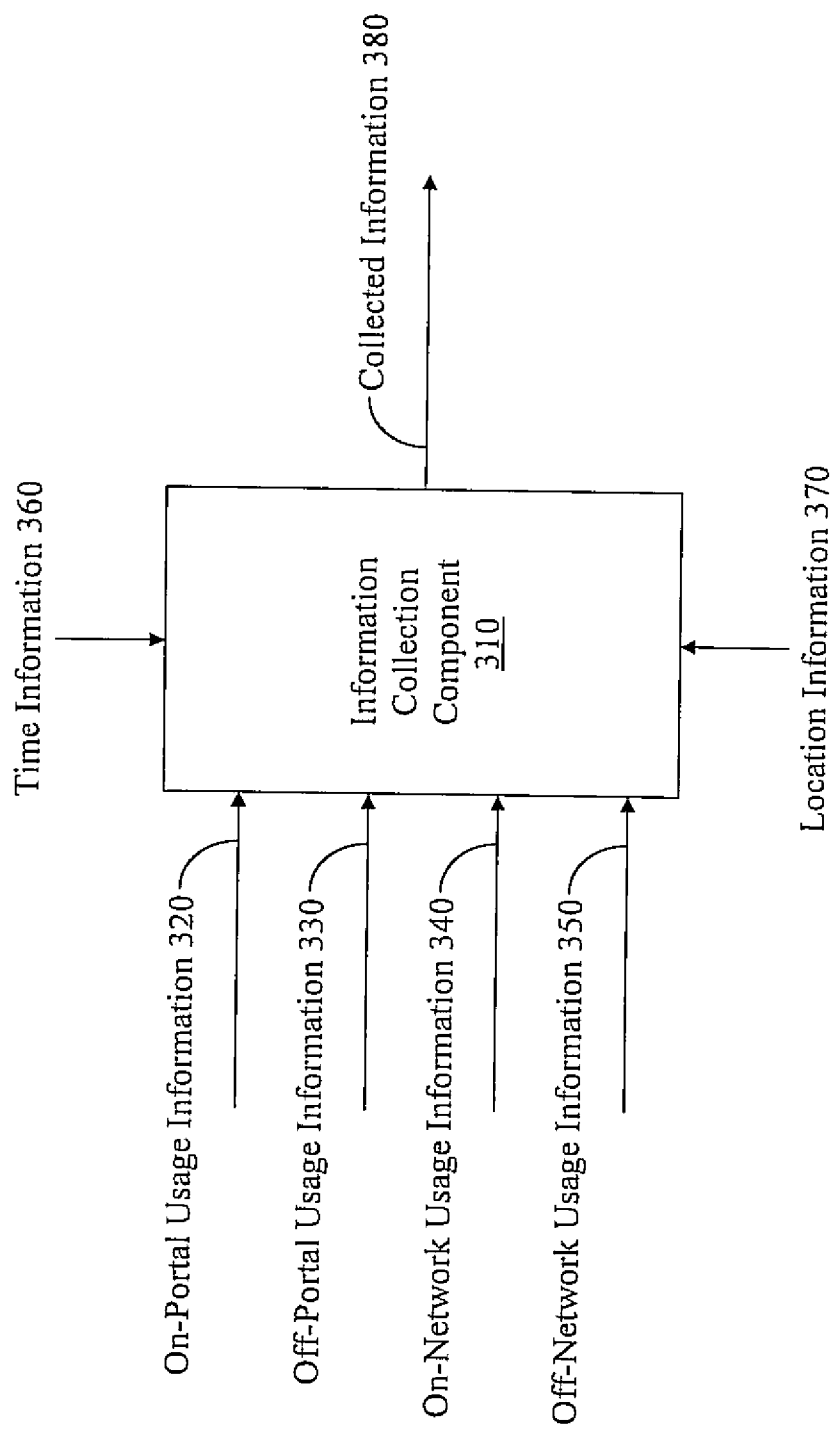
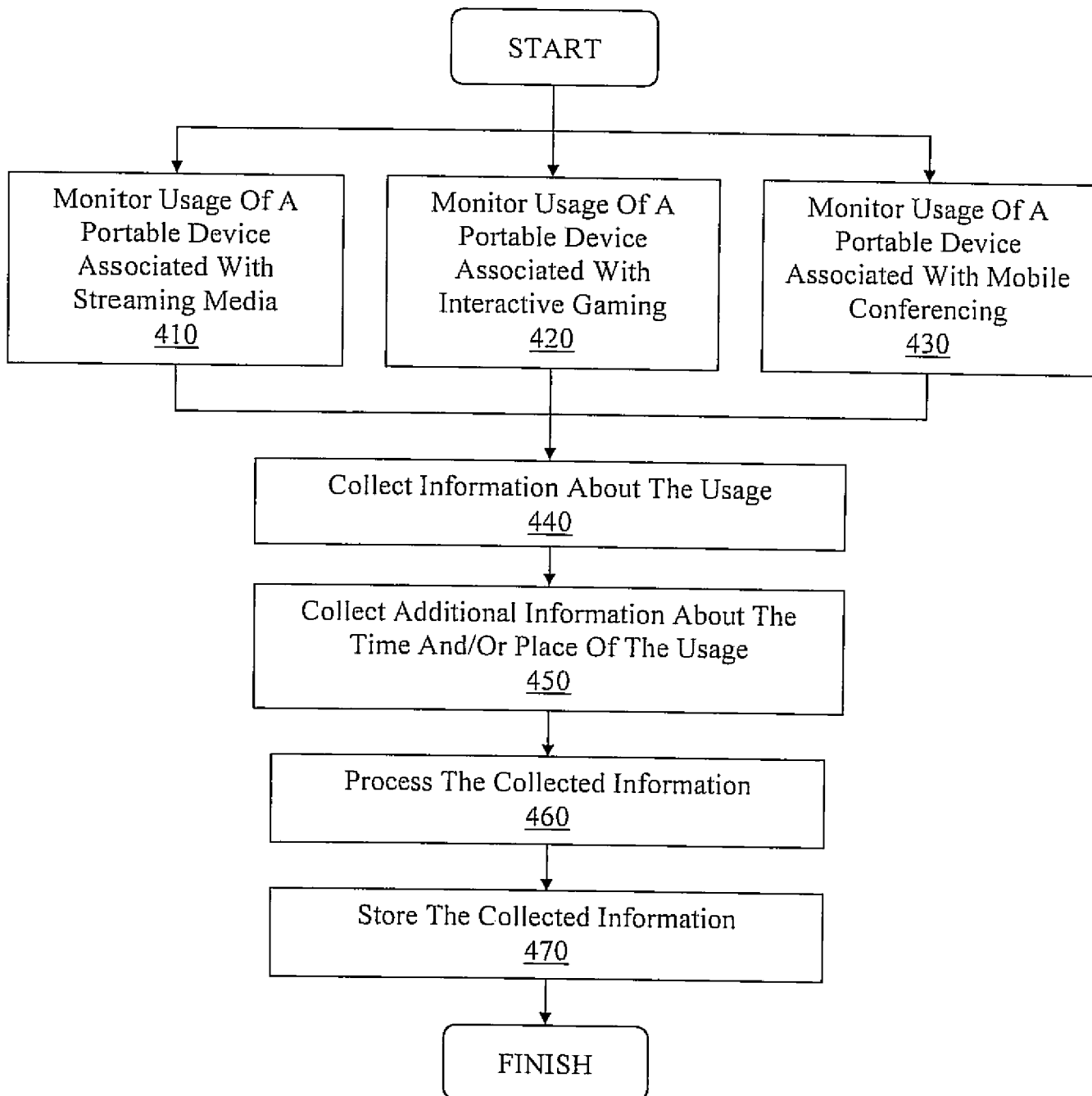


FIGURE 3

400**FIGURE 4**

500

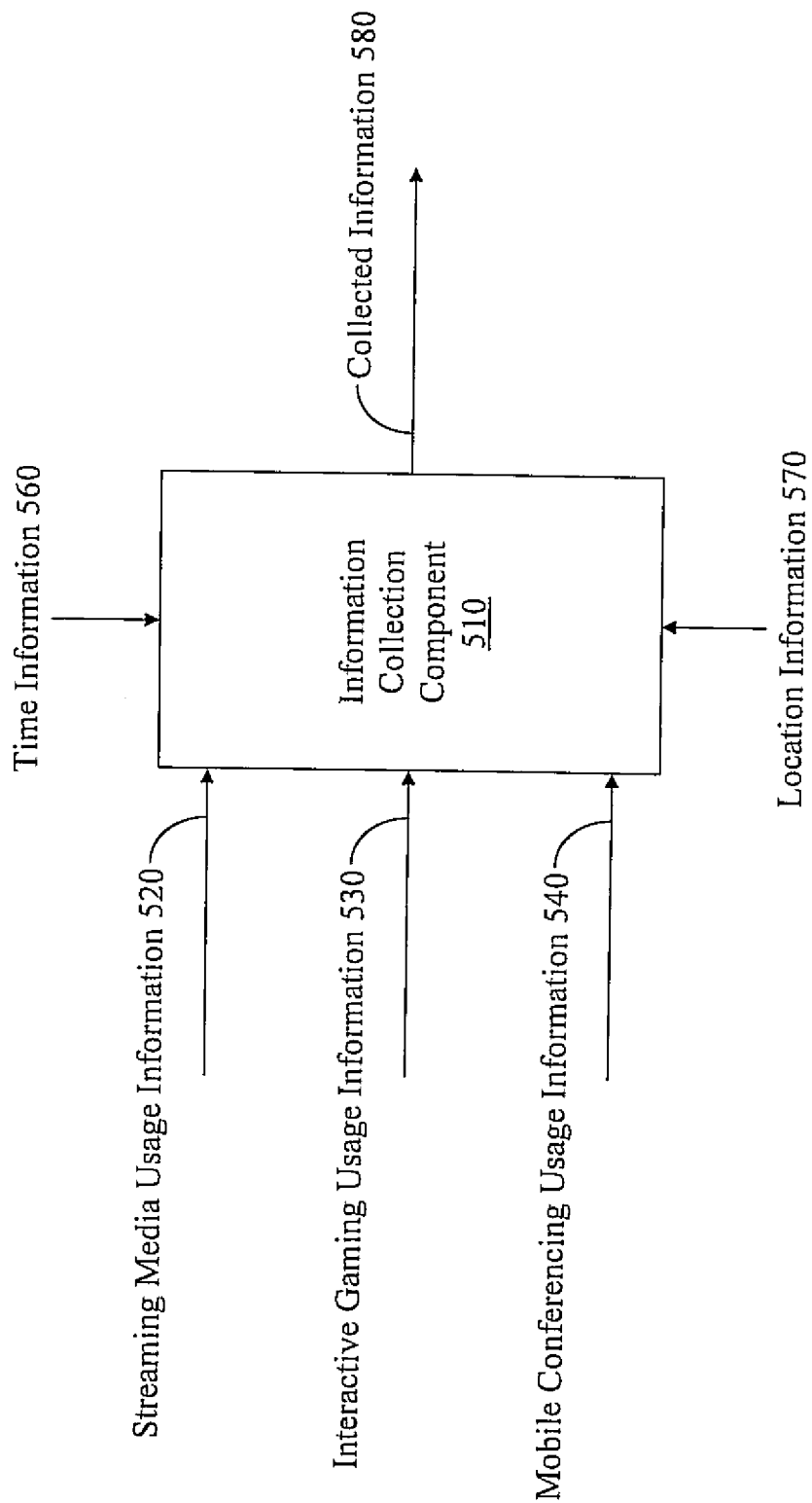
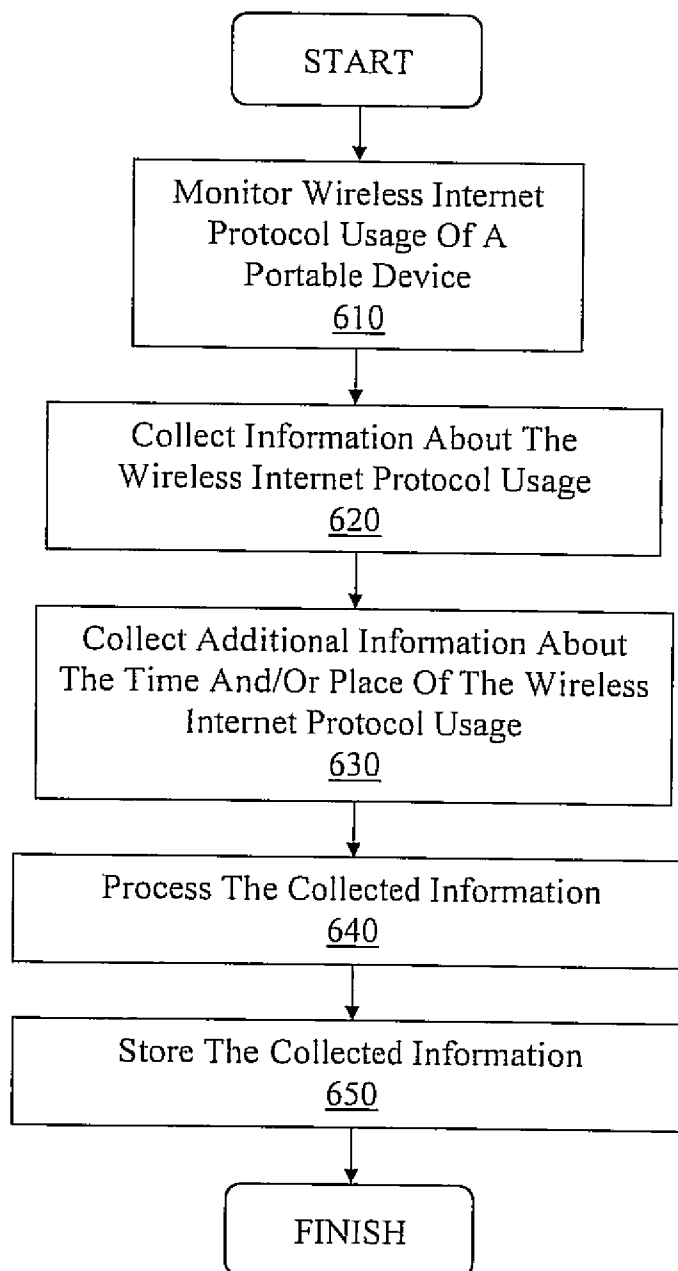


FIGURE 5

600**FIGURE 6**

700

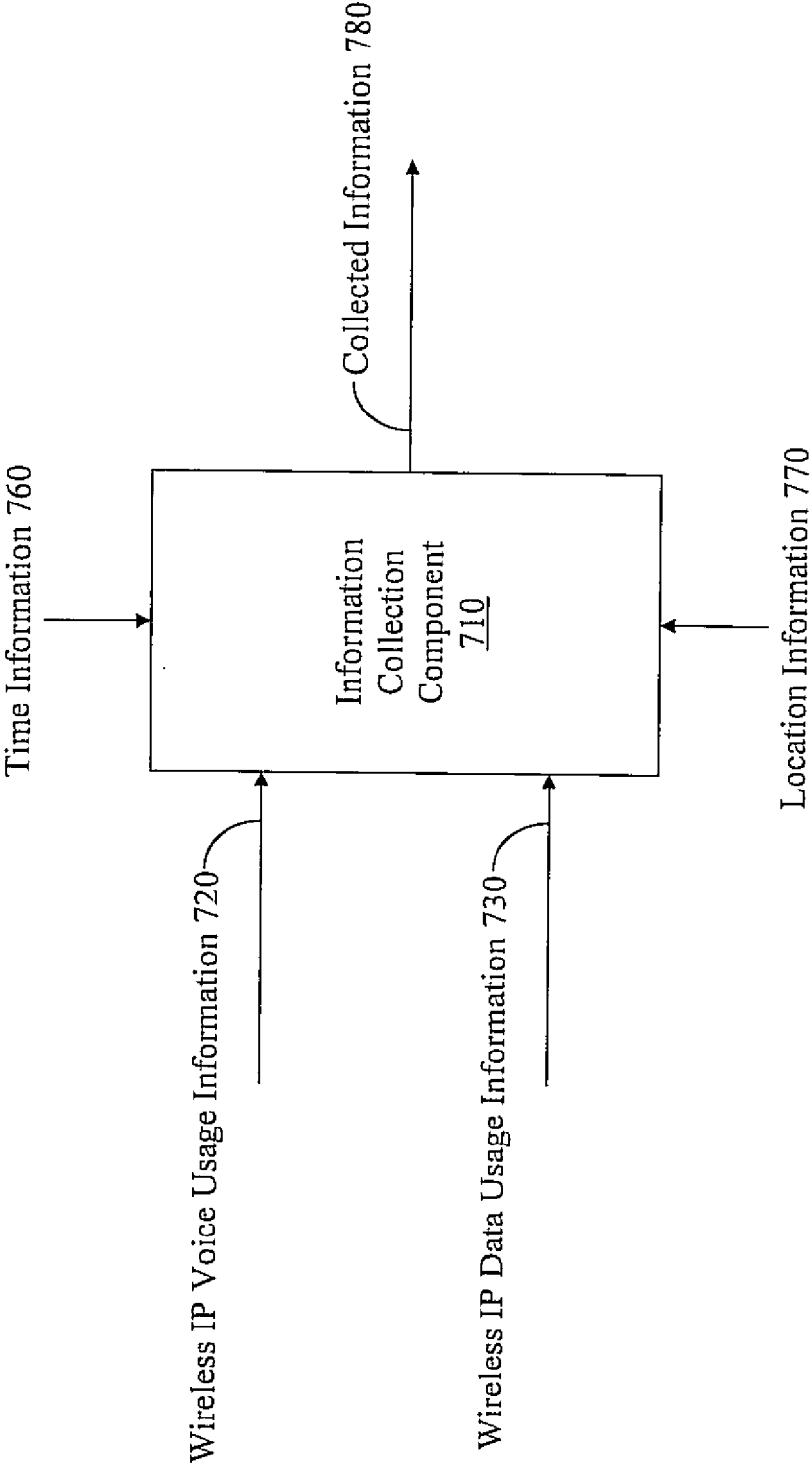


FIGURE 7

800

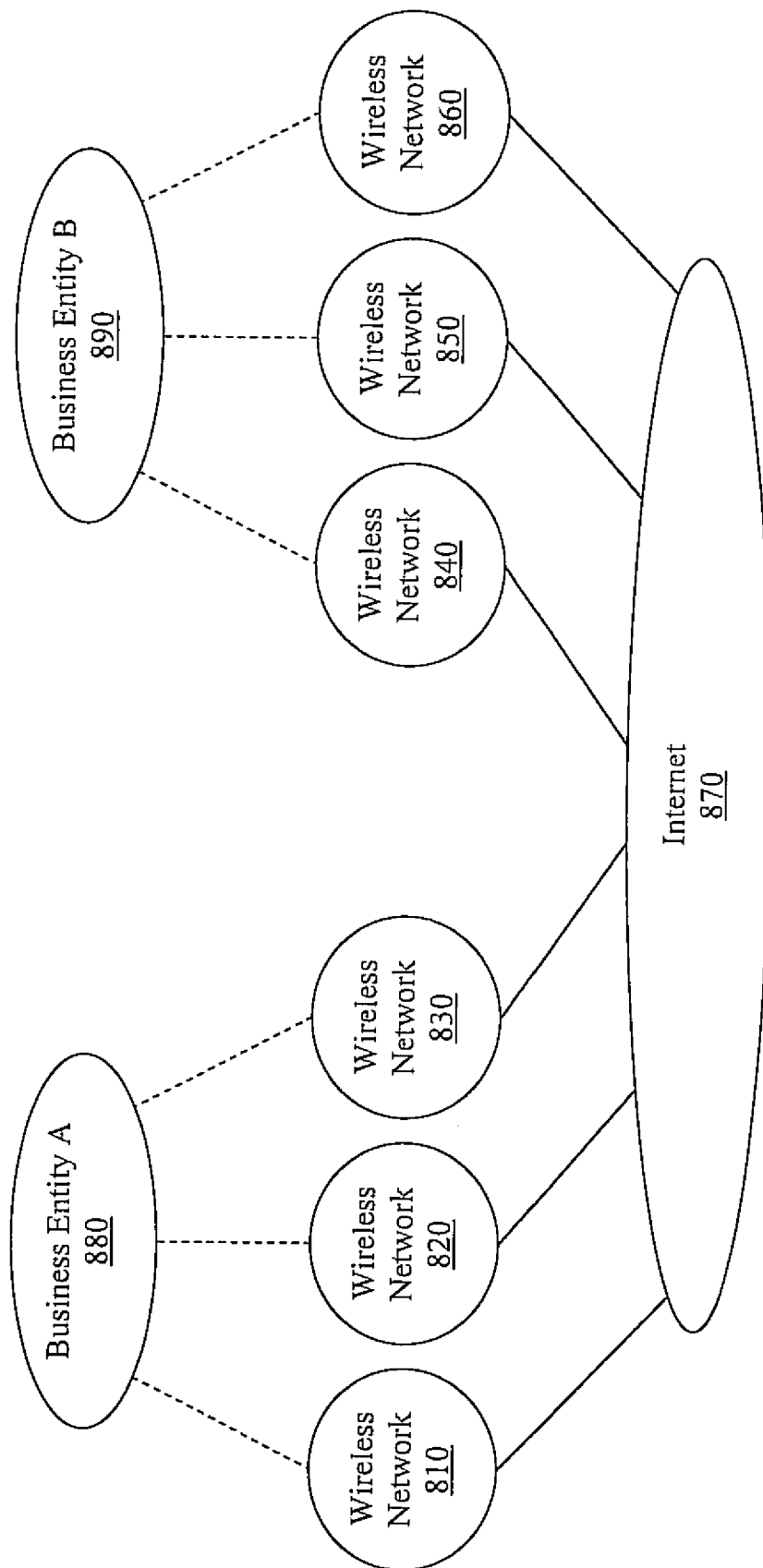


FIGURE 8

900

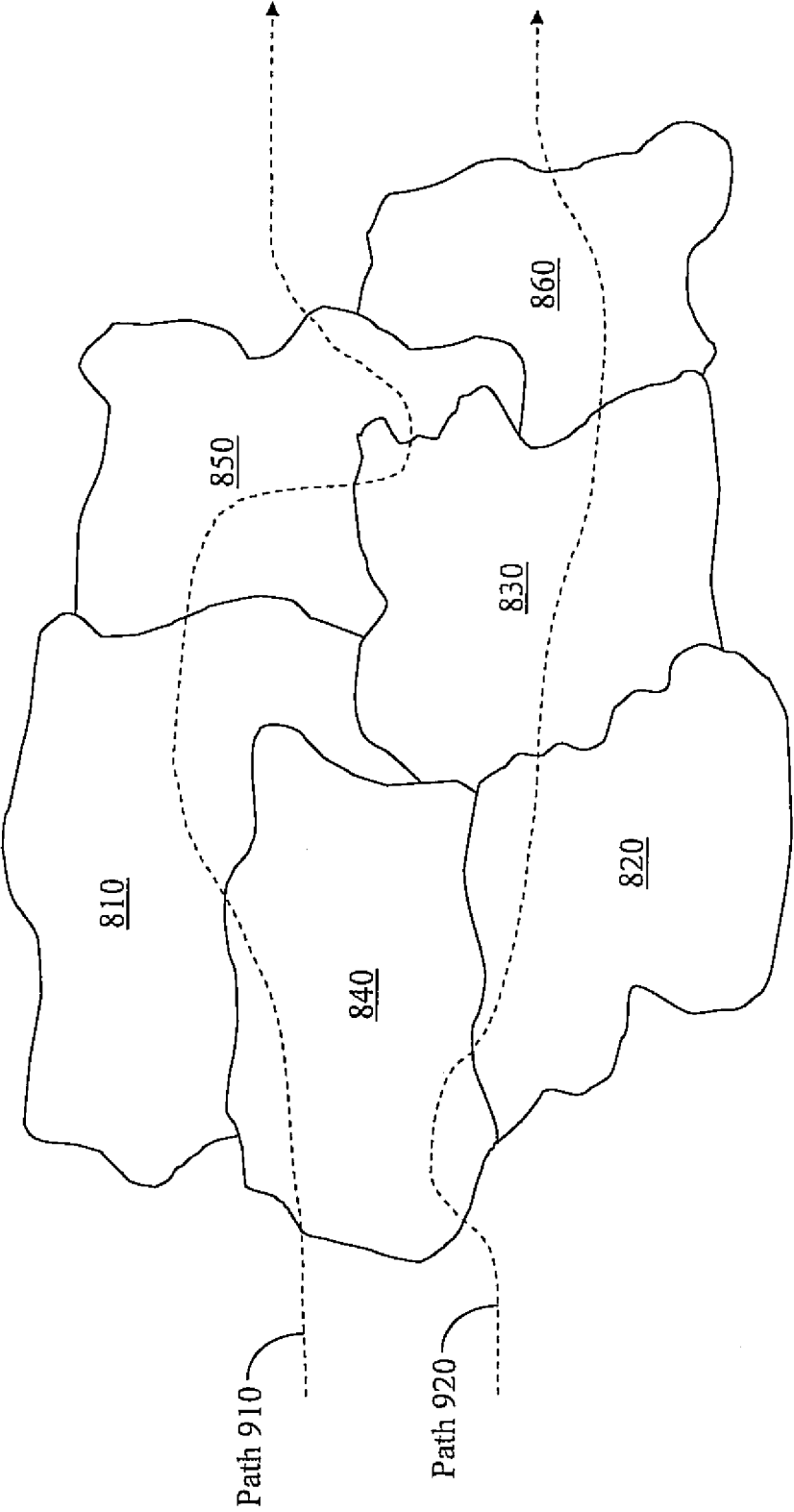


FIGURE 9

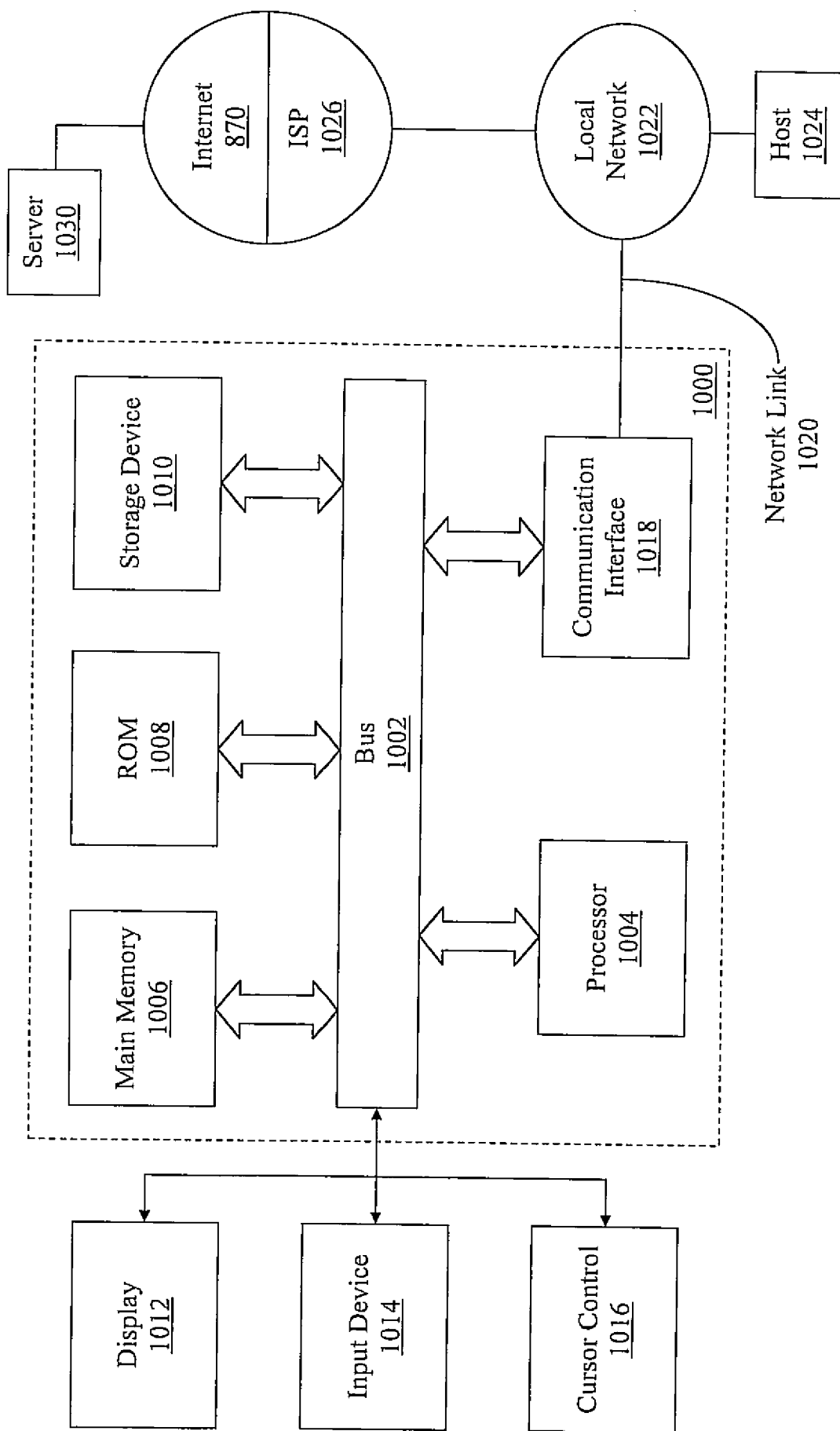


FIGURE 10