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(54) CASCADED DELIVERY OF AN ELECTRONIC COMMUNICATION

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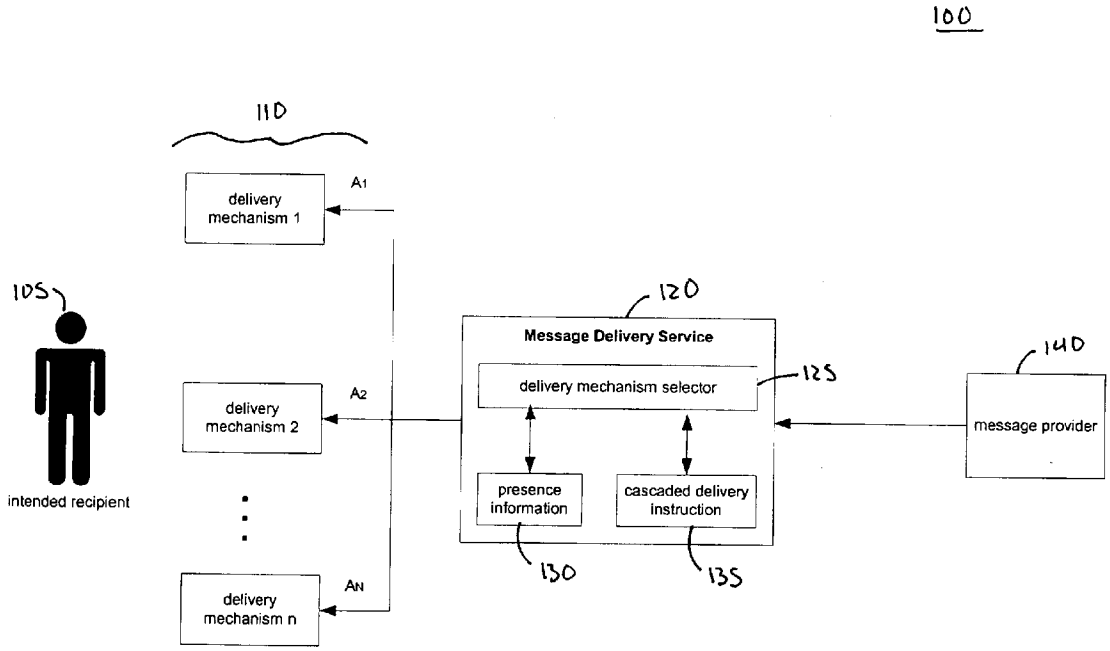
(57) **ABSTRACT**

Delivering an electronic notification to an intended recipient may include communicating an electronic notification directed to an intended recipient, and determining presence information associated with the intended recipient before attempting to deliver the notification to the intended recipient. A cascaded delivery instruction also may be resolved based on notification information. The presence information and the cascaded delivery instruction may be used to select among several delivery mechanisms potentially available for the intended recipient based on the presence information, and to deliver the electronic notification to the intended recipient at the selected delivery mechanism. The presence information may include an online presence and/or a physical presence of the intended recipient.



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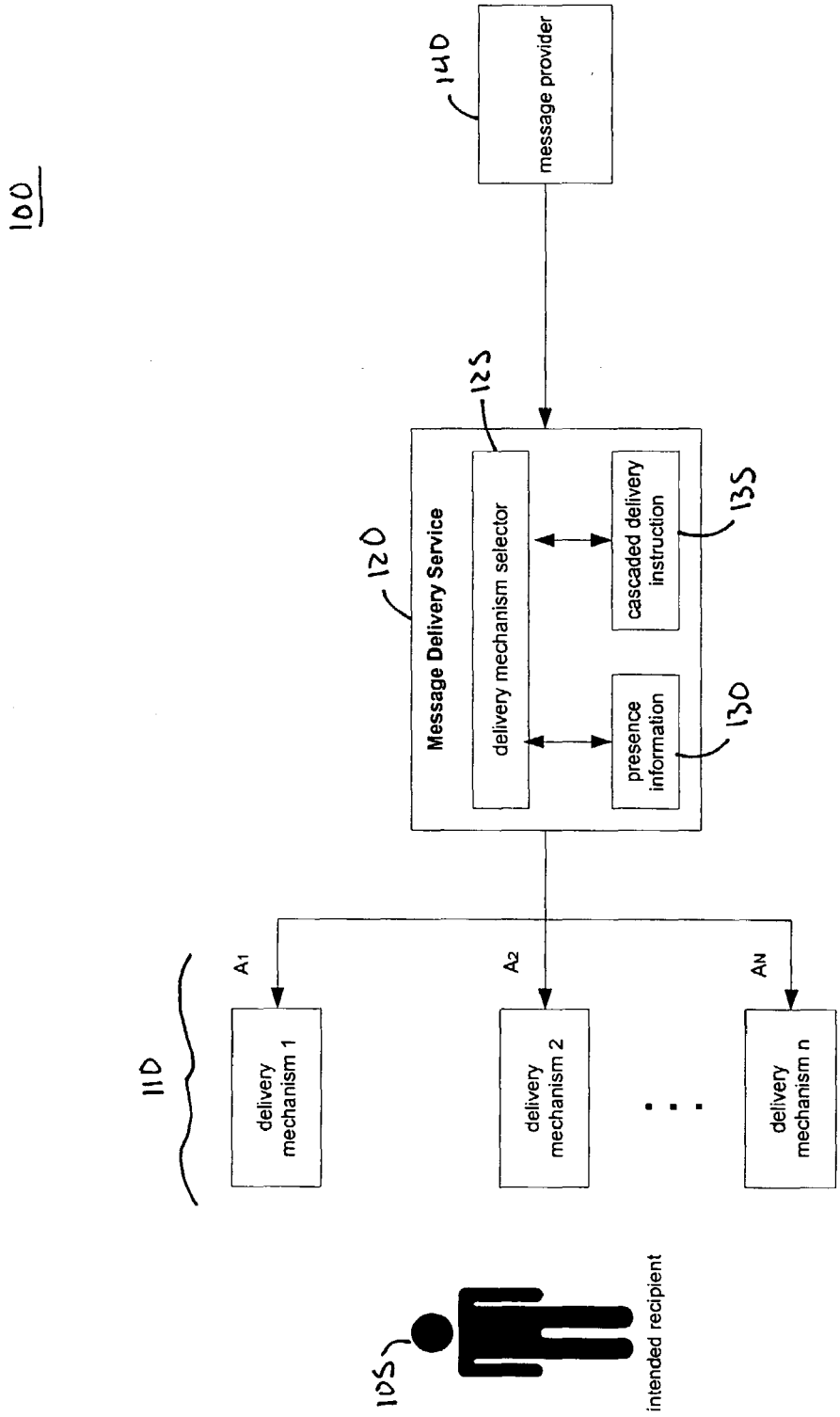

100
140
message provider
125
120
Message Delivery Service
delivery mechanism selector
cascaded delivery instruction
135
presence information
130
110
A1
A2
AN
delivery mechanism 1
delivery mechanism 2
delivery mechanism n
105
intended recipient

FIG. 1

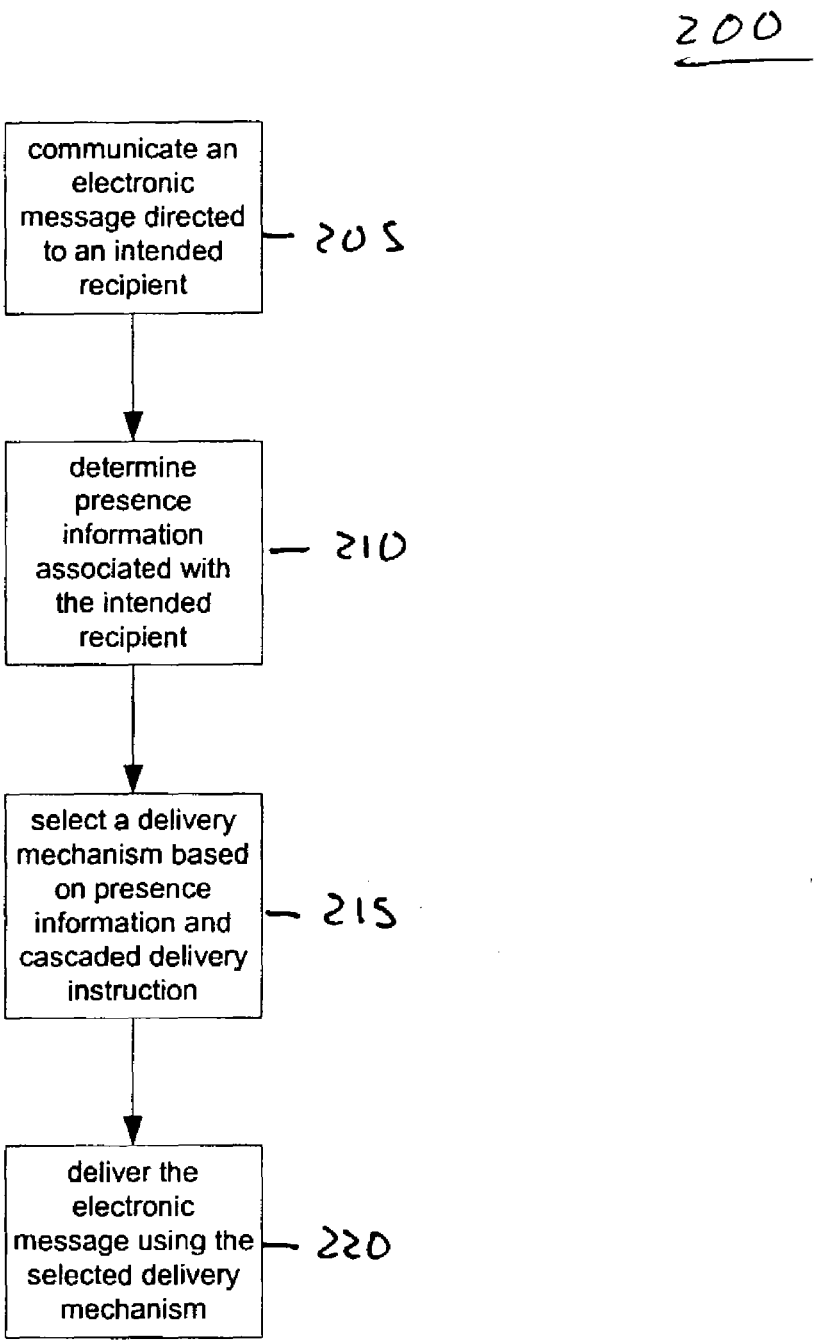

200
communicate an electronic message directed to an intended recipient
205
determine presence information associated with the intended recipient
210
select a delivery mechanism based on presence information and cascaded delivery instruction
215
deliver the electronic message using the selected delivery mechanism
220

FIG. 2

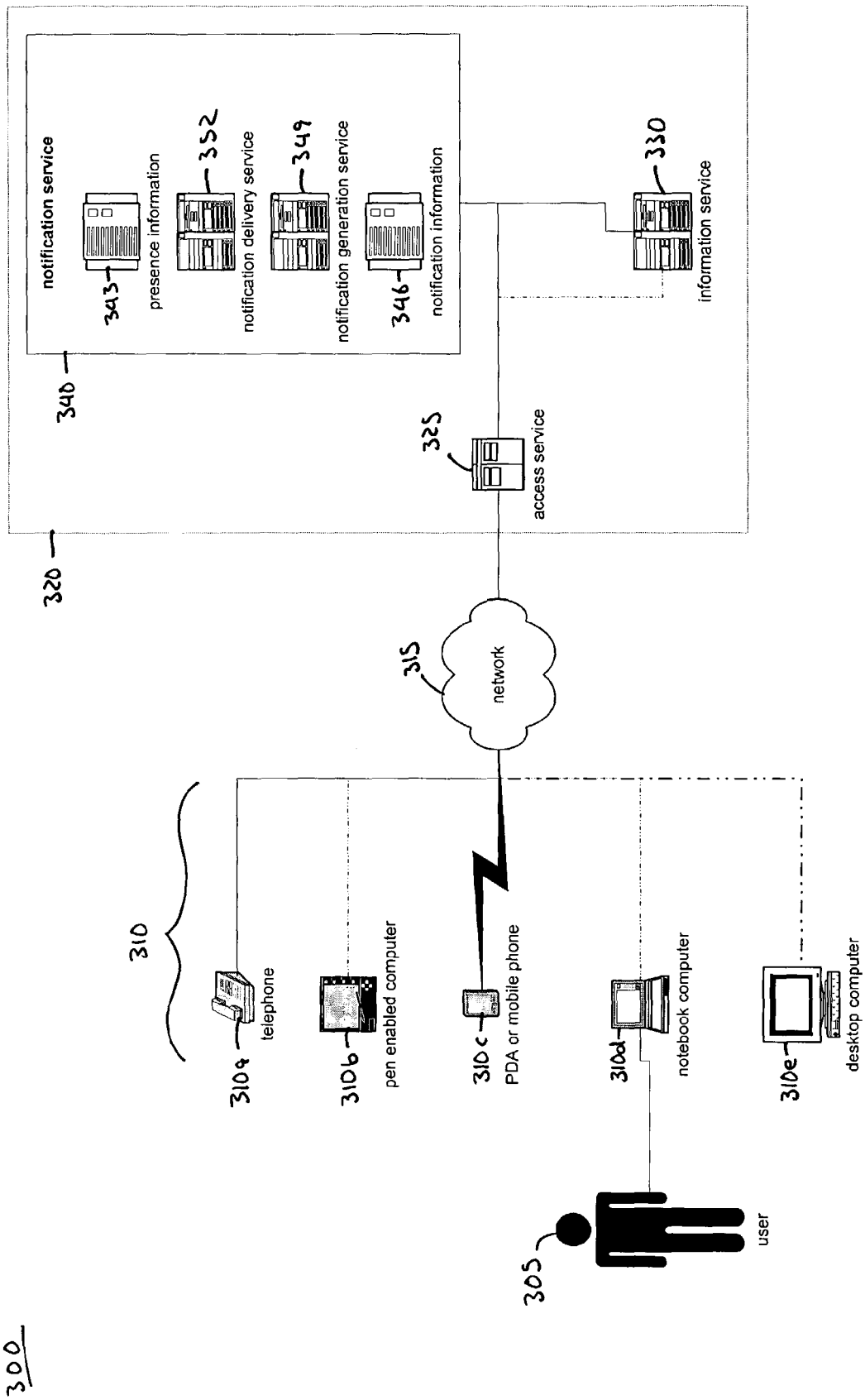

notification service
presence information
notification delivery service
notification generation service
notification information
information service
access service
network
telephone
pen enabled computer
PDA or mobile phone
notebook computer
desktop computer
user
300
305
310
310a
310b
310c
310d
310e
315
320
325
330
340
343
346
349
352

FIG. 3

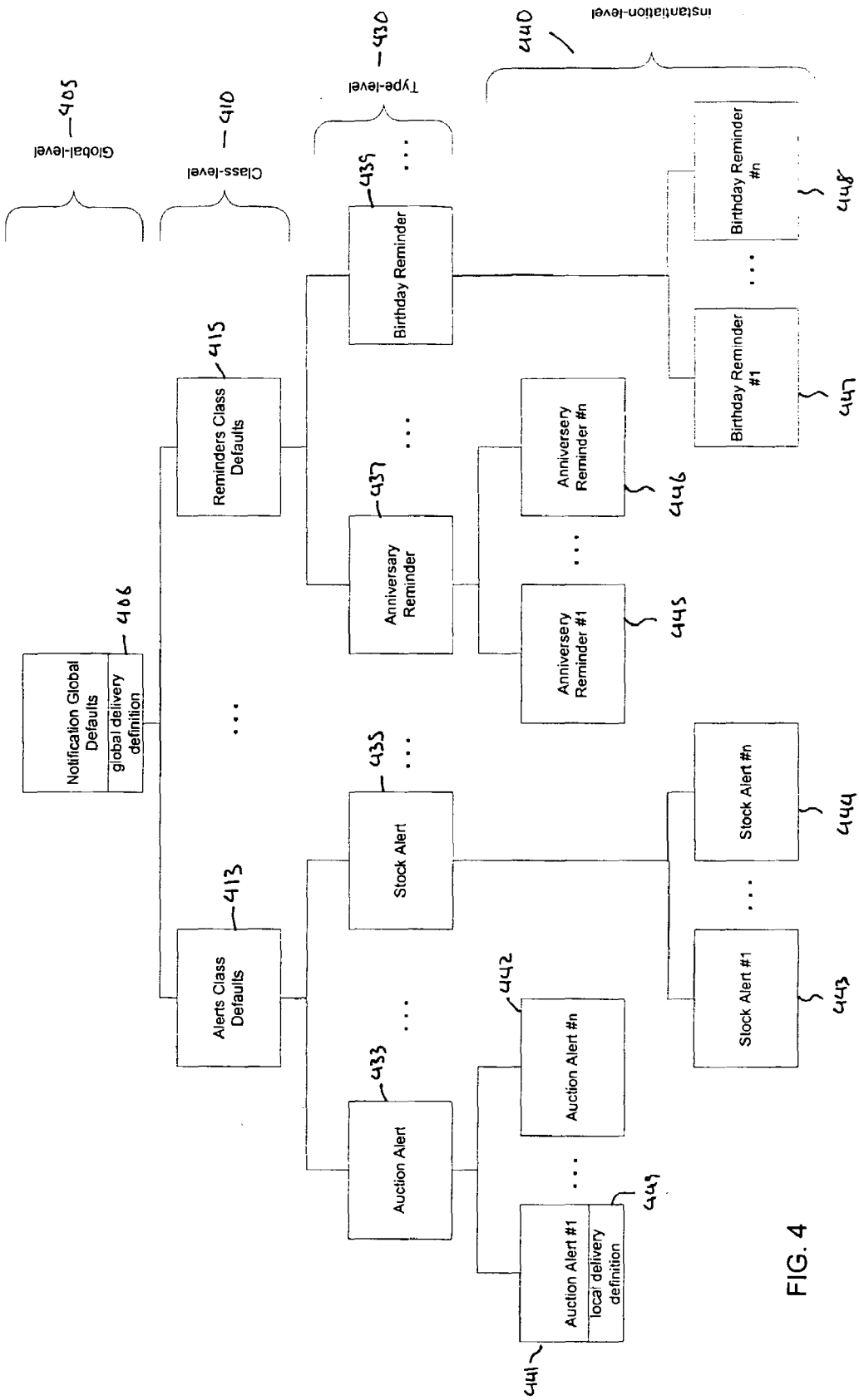

Global-level
405
Class-level
410
Type-level
430
Instantiation-level
440
Notification Global Defaults
global delivery definition
406
Alerts Class Defaults
413
Reminders Class Defaults
415
Auction Alert
433
Stock Alert
435
Anniversary Reminder
437
Birthday Reminder
439
Auction Alert #1
local delivery definition
441
449
Auction Alert #n
442
Stock Alert #1
443
Stock Alert #n
444
Anniversery Reminder #1
445
Anniversery Reminder #n
446
Birthday Reminder #1
447
Birthday Reminder #n
448

FIG. 4

500

- NOTIFICATIONS
  - Global Definitions (510)
    - Delivery
      - online device
        - web browser **[1 – if user is online]** — 512
        - IM client **[2 – if user is online]** — 514
      - wireless **[3 – if enabled by user]** — 516
      - email
        - inbox **[4]** — 518
        - archive **[NULL]** — 520
    - Priority **[not urgent]** — 522
    - Quiet Time **[9 p.m. to 8 a.m.]** — 524
  - Class Definitions (540)
    - Alerts **[NULL]** — 543
    - Reminders **[NULL]** — 546
  - Type Definitions (550)
    - Auction Alert — 555
      - Trigger event: bid on item **[NULL]** exceeded — 557
      - Priority: **[NULL]** — 559
      - Delivery precedence: **[NULL]** — 561
      - Membership list: **[NULL]**
      - Instantiations
        - Auction alert #1 (instantiation definition) (563)
          - Trigger event: bid on item **['57 Bel Air, auction ID 53ZX793]** exceeded — 565
          - Priority: **[NULL]** — 567
          - Delivery precedence: **[NULL]** — 569
          - Membership list: **[WillRobinson]** — 571
    - Stock Alert . . . — 585
    - Birthday Reminder . . . — 590
    - Anniversary Reminder . . . — 595

FIG. 5

600

- MEMBER PROFILE (WillRobinson)
  - Global Preferences (610)
    - Delivery
      - wireless
        - **[enabled device = mobile phone #1]** — 616
    - Priority **[NULL]**
    - Quiet time **[NULL]**
  - Class Preferences (640)
    - Alerts **[NULL]** — 643
    - Reminders **[NULL]** — 646
  - Type Preferences (650)
    - Auction Alert (type preferences) **[NULL]** — 655
      - Auction alert #1 (instantiation preferences) — 660
        - delivery (663)
          - online device
            - web browser **[1]**
            - IM client **[2]**
          - wireless
            - mobile phone #1 **[3]**
            - mobile phone #2 **[5]**
            - PDA **[4]**
            - pager **[6]**
          - email
            - inbox **[7]**
            - archive **[always]**
        - priority **[urgent]** — 666
        - quiet time **[NULL]** — 669
      - . . .
    - Stock Alert (type preferences) . . . — 670
      - Stock alert #1 . . .
    - Birthday Reminder (type preferences) . . . — 675
      - Birthday reminder #1 . . .
      - Birthday reminder #2 . . .
    - Anniversary Reminder (type preferences) . . . — 680
      - Anniversary reminder #1. . .

FIG. 6

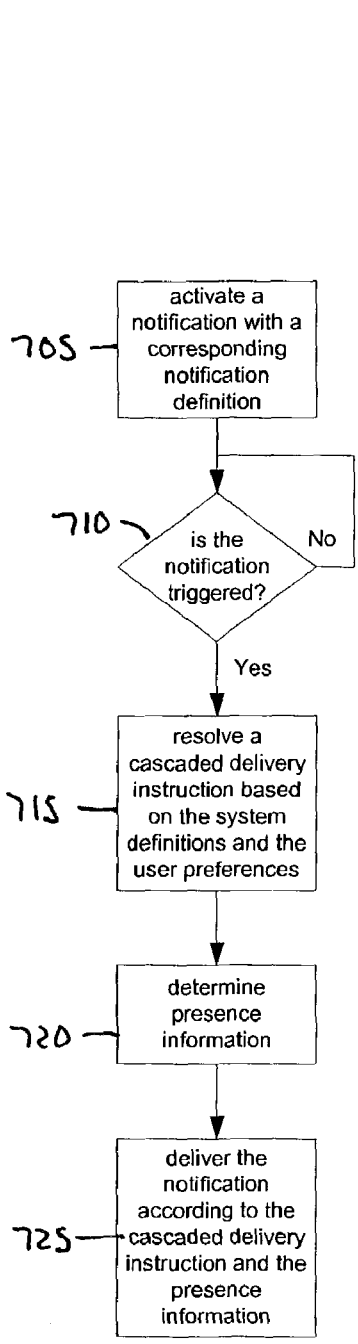

700
705
activate a notification with a corresponding notification definition
710
is the notification triggered?
No
Yes
715
resolve a cascaded delivery instruction based on the system definitions and the user preferences
720
determine presence information
725
deliver the notification according to the cascaded delivery instruction and the presence information

FIG. 7

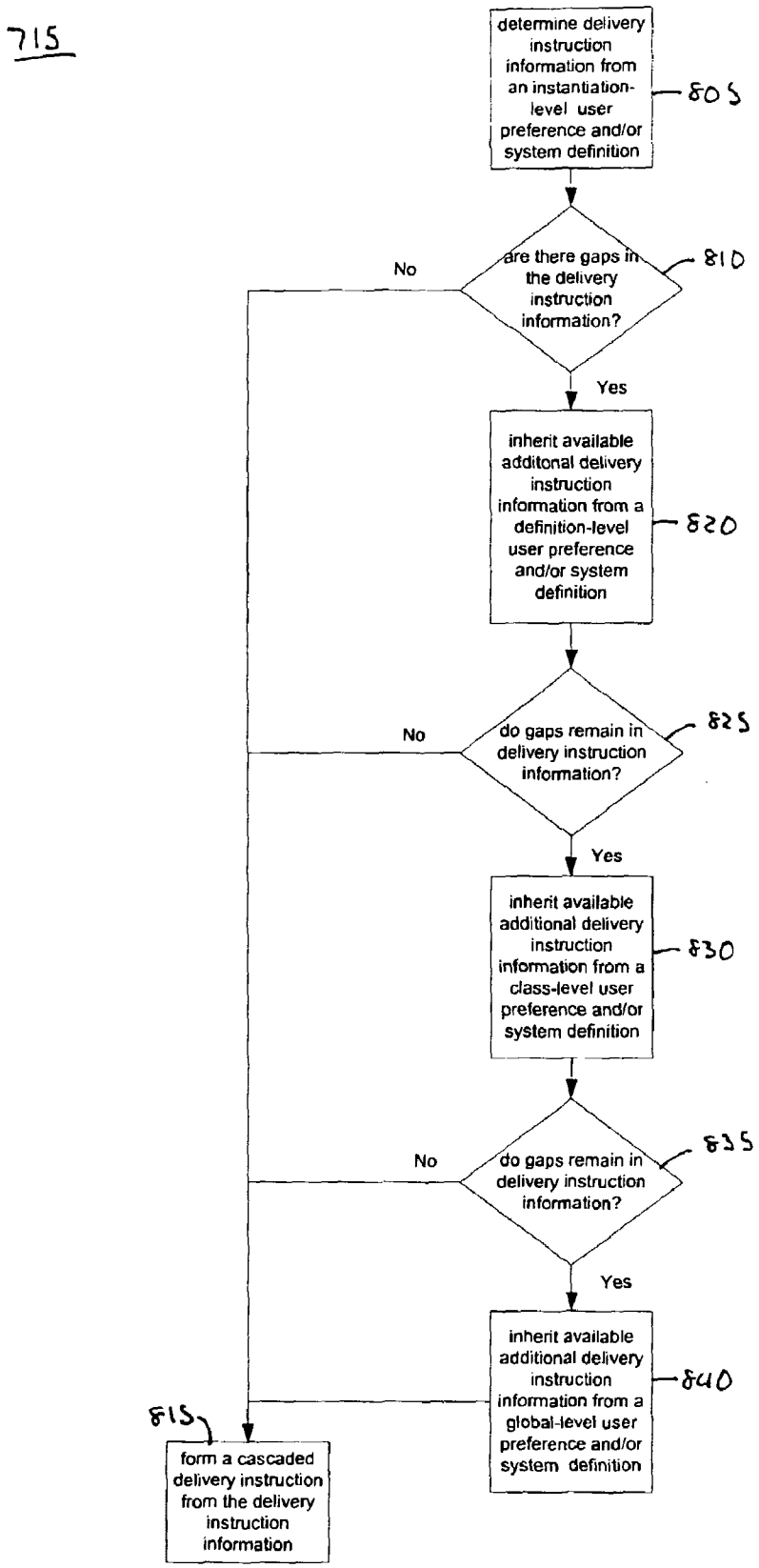

715
determine delivery instruction information from an instantiation-level user preference and/or system definition
805
are there gaps in the delivery instruction information?
810
No
Yes
inherit available additonal delivery instruction information from a definition-level user preference and/or system definition
820
do gaps remain in delivery instruction information?
825
No
Yes
inherit available additional delivery instruction information from a class-level user preference and/or system definition
830
do gaps remain in delivery instruction information?
835
No
Yes
inherit available additional delivery instruction information from a global-level user preference and/or system definition
840
815
form a cascaded delivery instruction from the delivery instruction information

FIG. 8

720

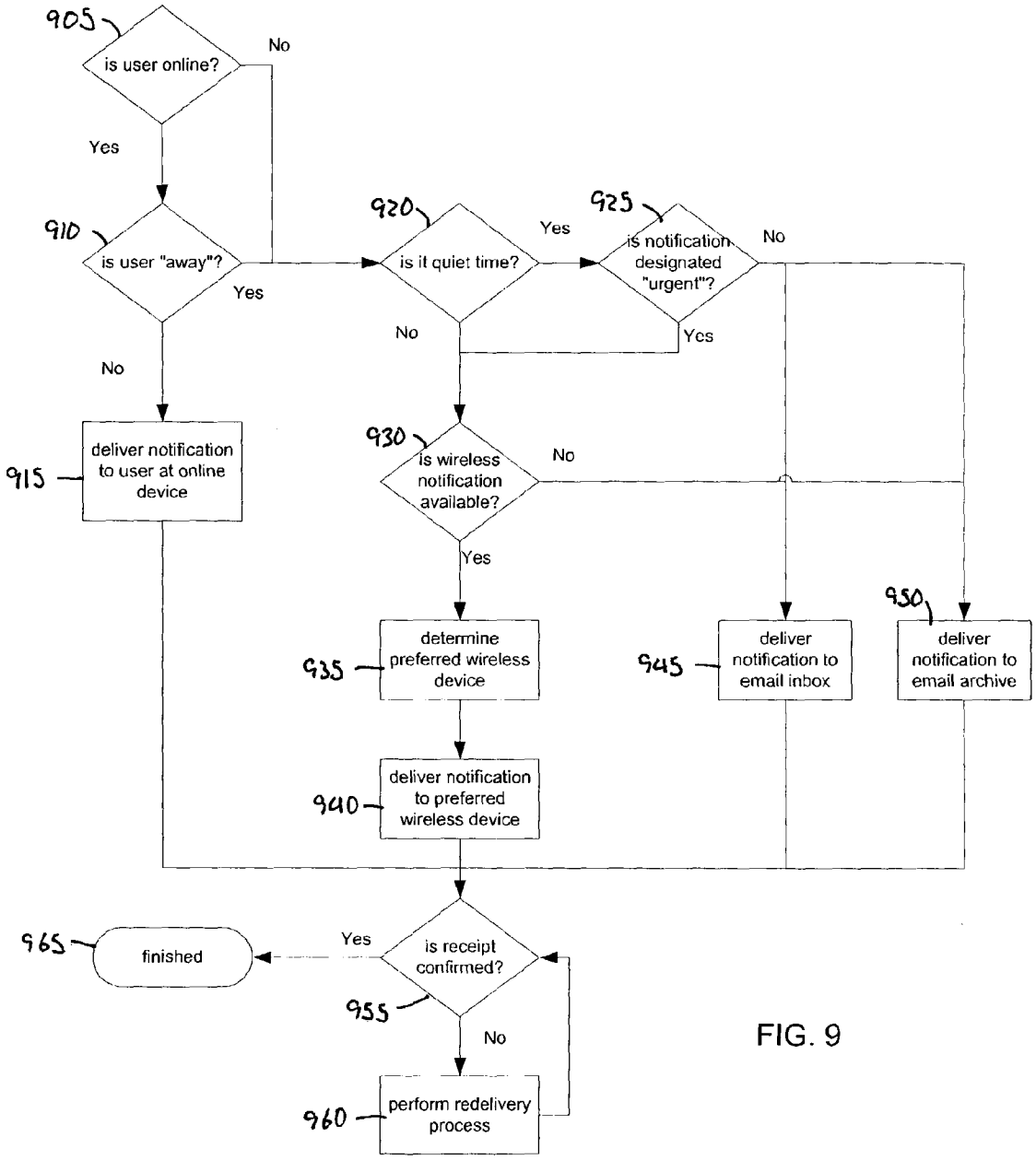
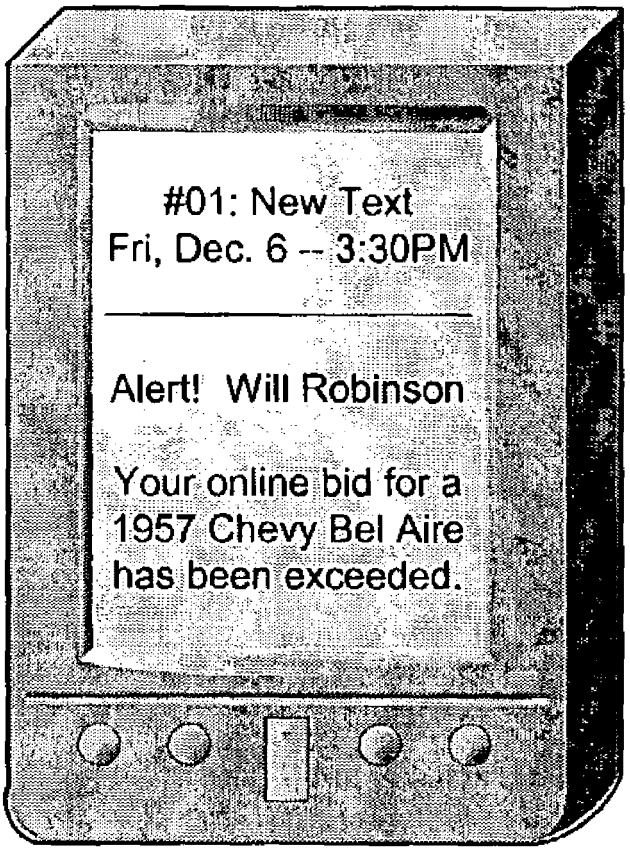

905
is user online?
No
Yes
910
is user "away"?
Yes
No
920
is it quiet time?
Yes
No
925
is notification designated "urgent"?
No
Yes
915
deliver notification to user at online device
930
is wireless notification available?
No
Yes
935
determine preferred wireless device
940
deliver notification to preferred wireless device
945
deliver notification to email inbox
950
deliver notification to email archive
965
finished
Yes
955
is receipt confirmed?
No
960
perform redelivery process

FIG. 9



PDA or mobile phone

FIG. 10

CASCADED DELIVERY OF AN ELECTRONIC COMMUNICATION

[0001] This application claims the benefit of U.S. Provisional Application No. 60/406,078, filed Aug. 27, 2002.

TECHNICAL FIELD

[0002] This disclosure generally relates to systems and methods of delivering information to a delivery mechanism.

BACKGROUND

[0003] Online service providers regularly offer new services and upgrade existing services to enhance their users' online experience. Users have virtually on-demand access to news, weather, financial, sports, and entertainment services as well as the ability to transmit electronic messages and to participate in online discussion groups. For example, users of online service providers such as America Online® or CompuServe® may view and retrieve information on a wide variety of topics from servers located throughout the world.

[0004] Several software applications are made available by online service providers and application providers as delivery mechanisms to deliver electronic content and messages. These applications include electronic mail (email), instant messages, and public or private electronic bulletin boards. In addition, several other applications or devices may serve as delivery mechanisms, such as applications or devices using the short messaging service (SMS), the wireless application protocol (WAP), the transport connection protocol (TCP), the Internet protocol (IP), the World Wide Web, one or more local area networks, and/or one or more wide area networks. Delivery mechanisms also may include analog or digital wired and wireless telephone networks (e.g., public switched telephone networks (PSTN), integrated services digital networks (ISDN), various types of digital subscriber lines (xDSL), advance mobile telephone service (AMPS), global system for mobile communications (GSM), general packet radio service (GPRS), and code division multiple access (CDMA)), radio, cable, satellite, and/or other delivery mechanisms for carrying voice or non-voice data.

[0005] Furthermore, a variety of other devices or software applications may act as delivery mechanisms capable of rendering electronic communications to an intended recipient. The delivery mechanisms may include devices such as a telephone (either fixed or mobile), a pen-enabled computer, a personal digital assistant (PDA), a notebook computer, and/or a desktop computer. The delivery mechanisms also may include software applications, such as, for example, a Web browser, an email client, an instant messaging (IM) client, a business productivity application (e.g., a word processor or, a spreadsheet program), and/or an operating system or operating system kernel residing on a device.

SUMMARY

[0006] In one general aspect, selecting a delivery mechanism to be used for delivering an electronic communication (e.g., a notification) includes determining actual availability of an intended recipient presently to receive the electronic communication using at least one candidate delivery mechanism before attempting to deliver the electronic communication using the candidate delivery mechanism. Selecting the delivery mechanism also includes deciding whether to send the electronic communication using the candidate delivery mechanism based on the determined actual availability. The delivery mechanism may be mobile or fixed, and also may be wired or wireless.

[0007] Implementations may include one or more of the following features. For example, determining the actual availability of the intended recipient may include determining an availability of the intended recipient based on an activity, behavior, physical presence, or online presence of the intended recipient.

[0008] A cascaded delivery instruction that is appropriate for the intended recipient may be resolved based on notification information. The notification information may include a preference of the intended recipient and/or a system definition. Where more than one candidate delivery mechanism potentially is available for the intended recipient, the cascaded delivery instruction may be resolved to include one or more of the available mechanisms and/or an associated delivery precedence.

[0009] The actual delivery mechanism may be selected from among more than one candidate delivery mechanism based on the actual availability of the intended recipient and/or on the cascaded delivery instruction. The actual delivery mechanism may be selected because it appears available to provide the electronic communication to the user without significant delay.

[0010] These general and specific aspects may be implemented using a method, a system, or a computer program, or any combination of systems, methods, and computer programs.

[0011] Other features will be apparent from the description, the drawings, and the claims.

DESCRIPTION OF DRAWINGS

[0012] **FIG. 1** is a is a schematic diagram of an electronic communication system.

[0013] **FIG. 2** is a flow diagram of a process implementable by the electronic communication system of **FIG. 1**.

[0014] **FIG. 3** is a schematic diagram of an electronic notification delivery system.

[0015] FIGS. **4-6** illustrate an exemplary data structure that may be associated with electronic notifications deliverable by the system of **FIG. 3**.

[0016] FIGS. **7-9** are flow diagrams illustrating an exemplary process implementable by the notification delivery system of **FIG. 3**.

[0017] **FIG. 10** illustrates an exemplary notification delivered to a user at a mobile device.

[0018] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0019] An electronic notification may be delivered to an intended recipient after determining presence information associated with the intended recipient. A cascaded delivery instruction also may be resolved based on notification infor-

mation, such as a user preference or a system definition. The presence information is used to select among several delivery mechanisms potentially available to the intended recipient. The cascaded delivery instruction may be used additionally for this purpose. Delivery of the notification based on the presence information or cascaded delivery instruction enhances the likelihood that the electronic notification is received by the intended recipient without significant delay.

[0020] In one aspect, the presence information indicates an online presence of the intended recipient and an associated online delivery mechanism suitable to receive the electronic notification. In another aspect, the presence information indicates a physical presence of the intended recipient, which may be used to select a delivery mechanism within a predefined range of the intended recipient's physical presence.

[0021] **FIG. 1** shows a generalized system **100** used to deliver an electronic message to an intended recipient **105** at one or more candidate delivery mechanisms **110** based on a presence of the intended recipient **105**. The candidate delivery mechanisms **110** generally may include any device, system, and/or piece of code that relies on another service to perform an operation. The candidate delivery mechanisms **110** may include, for example, a fixed or mobile communication device, whether wired or wireless, and/or a software application, such as, for example, a messaging application or a browser. The candidate delivery mechanisms **110** also may include any protocols (i.e., standards, formats, conventions, rules, and structures) or delivery channels A_1-A_N appropriate for corresponding devices or applications of the candidate delivery mechanisms **110**. The protocols or delivery channels A_1-A_N may include, for example, one or more other systems, such as for example, one or more wired networks and/or one or more wireless networks.

[0022] A message delivery service **120** communicates with a message provider **140** and obtains a message directed to the intended recipient **105**. The message delivery service **120** includes a delivery mechanism selector **125**, presence information **130**, and a cascaded delivery instruction **135**.

[0023] The delivery mechanism selector **125** may be configured to access or receive the presence information **130** and/or the cascaded delivery instruction **135**, and to determine one or more preferred delivery options based on this and/or other information. That is, in general, the message delivery service **120** uses the delivery mechanism selector **125** to select from among the candidate delivery mechanisms **110** an actual delivery mechanism that is expected to provide the message to the intended recipient **105** without significant delay.

[0024] The delivery mechanism selector **125** selects the actual delivery mechanism based on presence information **130** and/or the cascaded delivery instruction **135**. The presence information **130** may indicate an actual presence of the intended recipient **105**. The presence information **130** may be based on actual activity, behavior, or physical presence of the intended recipient **105**. The cascaded delivery instruction **135** may include, for example, a delivery precedence, a hierarchical delivery rule, or any other logical rule or definition that may be used to control delivery of the message.

[0025] The message provider **140** typically may include any source of an electronic message or information. The message provider **140** may employ one or more protocols to transfer information internally or to deliver information to the message delivery service **120**.

[0026] Both the message delivery service **120** and the message provider **140** may further include various mechanisms for delivering voice and/or non-voice data. The various mechanism may include, for example, any applications, protocols, devices, or networks used to facilitate communication of electronic data. Both the message delivery service **120** and the message provider **140** also may include or be included in a general-purpose or a special-purpose computer, at least one local area network, and/or at least one wide area network. The response to and execution of instructions received by the message delivery service **120**, the message provider **140**, or any of their components (collectively the system services), may be controlled by, for example, a program, a piece of code, an instruction, a device, a computer system, or a combination thereof, for independently or collectively instructing the system services to interact and operate as described herein.

[0027] **FIG. 2** illustrates a flow diagram of a process **200** implementable by, e.g., the system **100** of **FIG. 1** to deliver a message to a user based on at least presence information **130**. The message provider **140** communicates to the message delivery service **120** an electronic message directed to the intended recipient **105** (step **205**). The message provider **140** may communicate the message to the message delivery service **120** in response to activity of the message delivery service **120**, of another system or service, or of the message provider **140**. The message delivery service **120** may determine presence information **130** associated with the intended recipient **105** before delivering the message to the intended recipient **105** (step **210**). For example, the message delivery service **120** may determine an actual presence of the intended recipient **105** (e.g., an online presence, or a physical presence). The message delivery service **120** employs the delivery mechanism selector **125** to select an actual delivery mechanism from among the candidate delivery mechanisms **110** based on the presence information **130** and the cascaded delivery instruction **135** (step **215**). The message delivery service **130** then delivers the electronic message to the intended recipient **105** using the actual delivery mechanism (step **220**).

[0028] Referring to **FIG. 3, a** generalized notification system **300** notifies a user **305** of information or an event by providing an electronic notification (notification) to one or more delivery mechanisms **310** associated with the user **305** based on a presence of the user (e.g., an online presence, a physical presence). The notification system **300** provides the notification to the delivery mechanisms **310** using a network **315** and an online service **320**. Exemplary components of the notification system **300** are described in greater detail below.

[0029] The delivery mechanisms **310** generally are analogous to the candidate delivery mechanisms **110** of **FIG. 1**. Each delivery mechanism **310** may include any device, system, and/or piece of code that relies on another service to perform an operation. For example, a delivery mechanism **310** may include a device such as a telephone **310***a*, a pen-enabled computer **310***b*, a personal digital assistant (PDA) or mobile telephone **310***c*, a notebook computer **310***d*, and/or a desktop computer **310***e*. The delivery mecha-

nisms **310** also may include, for example, a Web browser, an email client, a synchronization client (e.g., a calendar synchronization client, or a task list synchronization client), an instant messaging (IM) client, a business productivity application (e.g., a word processor, or a spreadsheet program), and/or an operating system or operating system kernel residing on a device. The delivery mechanisms **310** may be arranged to operate within or in concert with one or more other systems, such as, for example, one or more LANs (local area networks) and/or one or more WANs (wide area networks).

[**0030**] Each of the delivery mechanisms **310** may be accessible to the online service **320**, and the user **305** may access the online service **320** using one or more of the delivery mechanisms **310**. For example, the user **305** may use the notebook computer **310***d* to access the online service **320**.

[**0031**] A delivery mechanism **310** may receive a notification and format the notification using a standard protocol, such as, for example, the standard generalized markup language (SGML), the extensible markup language (XML), the hypertext markup language (HTML), the extensible hypertext markup language (XHTML), the compact hypertext markup language (cHTML), the virtual reality markup language (VRML), the wireless markup language (WML), the voice extensible markup language (VXML), a document object model (DOM), or the dynamic hypertext markup language (DHTML). The formatted notification may permit the user **305** to respond to the notification.

[**0032**] The online service **320** generally may include, for example, any device, system, and/or piece of code configured to perform an operation requested by one or more of the delivery mechanisms **310** (e.g., the PDA or mobile telephone **310***c*, a Web browser, the workstation **310***e*, or another service). The online service **320** may include an access service **325**. The access service **325** may control access to the online service **320** using, for example, authorization and/or authentication methods, and may transform messages received from the network **310** into a communication protocol of the online service **320** (e.g., asynchronous transfer mode (ATM) or fiber distributed data interface (FDDI)), or vice versa.

[**0033**] The online service **320** includes an information service **330**. The information service **330** typically includes different services and sources of information, such as, for example, third party information or services, email, a discussion group, a chat room, a news service, a broker service, a banking service, a shopping service, a weather service, the World Wide Web, or Internet access. The information service **330** may employ one or more protocols (i.e., standards, formats, conventions, rules, and structures) to transfer information internally or deliver information to a user. Protocols employed by the information service **330** may include, the Internet protocol (IP), the transfer connection protocol (TCP), the hypertext transfer protocol (HTTP), the file transfer protocol (FTP), the user datagram protocol (UDP), the layer two tunneling protocol (L2TP) and/or the simple mail transfer protocol (SMTP).

[**0034**] The online service **320** also includes a notification service **340** to provide a notification to the user **305** based on information of the information service **330**. In general, the notification service **340** includes presence information **343** (generally analogous to the presence information **130** of **FIG. 1**) and notification information **346**. Both the presence information **343** and the notification information **346** may be determined based on information of the notification service **340**, information of the information service **330**, and/or information of other online services. The presence information **343** may be based on actual activity, behavior, or physical presence of the user **305**, rather than upon information inferred from the user preferences or system definitions of the notification information **346**.

[**0035**] The presence information **343** may include, for example, information indicating an online presence of the user **305** based on information of the information service **330** (e.g., information indication that the user **305** is browsing the web, the user **305** has an active instant messaging session, the user **305** is online using a television, the user **305** is online using a game console, the user **305** is online using a networked radio, or the user **305** currently is active in a chat room discussion). The presence information **343** also may include information indicating a physical presence of the user. The physical presence information may be determined, for example, from a global positioning system associated with the user **305**.

[**0036**] The notification information **346** may include user preferences and system definitions. For example, the notification information **346** may include a delivery preference of the user **305** determined based on information provided by the user **305** to the notification service **340**. On the other hand, the system definitions may be generated by the system or by an administrator of the system. The system definitions may include, for example, definitions of classes of notifications, and/or definitions of each available notification. The definition of each notification includes one or more conditions to be satisfied before the notification may be delivered. When those conditions are satisfied, the notification is considered to be triggered, and the event or information that satisfied the conditions is known as the triggering event (or triggering information). For simplicity, the conditions that the triggering event satisfies may themselves be referred to as the triggering event.

[**0037**] Numerous examples of triggering events exist, but, for brevity, only a few of those examples are described here. Triggering events may be based, for example, on a promotional advertisement, an account balance, a portfolio status, a credit status, an online status, information that an order and/or a service is complete, or a message regarding confirmation, cancellation, and/or rescheduling of an appointment. Other examples include, but are not limited to, a weather forecast and/or adverse weather conditions of a particular geographic region; a particular date, holiday and/or other special occasion; an online status of another user; a change to a predetermined web page; or entertainment programming and/or ticket information.

[**0038**] The notification information also may include a record of users registered to receive notifications, and a record of the notifications (active notifications) that the users have registered to receive. Upon registration to receive a notification, a user may inform the notification service **340** of notification preferences regarding that notification. The notification service **340** may include those notification preferences in the notification information.

[**0039**] For example, the user **305** may access the notification service **340** to register for a stock alert and a birthday

reminder. The notification service **340** may record that the user **305** has registered for the stock alert and the birthday reminder. At registration, the user **305** may provide the notification service **340** with notification preferences. In general, the notification preferences may include triggering information, a timing of the notification, a notification delivery preference, and/or a presentation method of the notification. A variety of delivery and/or presentation methods may be available for the user **305** to select from. For example, the user **305** may select to receive the notification as an instant message, an icon, a pop-up window, a video, a flashing indicator, and/or an audio, or tactile alarm. The notification may be delivered to the user **305** while the user **305** is online, for example, or may be delivered to a wireless device (e.g., a mobile phone, a PDA, or a pager), a standard telephone, voicemail, and/or email if the user **305** so desires. In this manner, the user may arrange to be notified at a delivery mechanism that the user anticipates will most likely provide the notification to the user without significant delay.

[0040] Referring back to the notifications selected by the user **305**, the user **305** may determine to receive the stock alert when a specified stock exceeds a 52-week high, and to receive the alert immediately at a mobile phone retained by the user **305** at all times. As another example, the user **305** may determine to receive the birthday reminder one week prior to the specified birthday, and again the day before, and to be reminded through a non-intrusive email.

[0041] The notification service **330** includes a notification generation service **349** that generates notifications based on the information of the information service **330**, and a notification delivery service **352** that delivers the notifications to the user **305** using one or more of the delivery mechanisms **310**. The notification service **340** also may include a print service, a file access service, an IM service, an operating system, an operating system kernel, an authentication service, an authorization service, and/or any combination of these or other services.

[0042] In general, the notification generation service **349** generates notifications based on the notification information maintained by the notification service **340**. The notification generation service **349** communicates with the information service **330** (e.g., by polling the information service **330**, or by receiving updates from the information service **330** periodically or upon a triggering event) to identify when a notification trigger is satisfied, for example, by the occurrence of a particular event, or by the presence of predetermined information. Alternatively, the information service **330** itself may note the triggering event and notify the notification generation service **349**. In either event, the notification generation service **349** generates and communicates a corresponding notification to the notification delivery service **352** for delivery.

[0043] Typically, the notification generation service **349** will include a software program or piece of code to control reception and/or retrieval of information from the information service **330**. The notification generation service **349** may receive the information from the information service **330**, and may then determine whether the information corresponds to a triggering event of a notification of interest to the user **305**.

[0044] Alternatively, or in addition, a notification may be generated by the information service **330** (e.g., by a third party service that provides a certain category of services such as stocks, news, or weather). Content for the notification may be provided by the notification generation service **349**, the information service **330**, or by any other third party, including the user **305**. In one implementation, the notification service **340** queries user **305** as to whether the user **305** would like to receive various categories of third party notifications. For example, the notification service **340** may communicate with third party suppliers of computer merchandise and may query the user **305** as to whether the user **305** would like to receive notifications from any or all third parties that supply computer merchandise. In another implementation, the user **305** may register for a notification at a web site of a third party. Once the user **305** has registered to receive the notification, the third party may directly or indirectly generate the notification.

[0045] The notification delivery service **352** may be configured to receive the notification from the notification generation service **349** and to deliver the notification to the user **305**. The notification delivery service, alone or in conjunction with other services, may perform sorting, prioritizing, or other types of organizational processing on the notification so that the notification is delivered to an optimal delivery mechanism in a desired fashion.

[0046] More particularly, the notification delivery service **352** may deliver the notification to the user based on the presence information **343** and/or the notification information **346**. In this manner, the notification delivery service **352** may deliver the notification to one of the delivery mechanisms **310** of the user **305** that is expected to provide the electronic notification to the user **305** without significant delay. For example, the presence information **343** may indicate that the user **305** presently is online using notebook computer **310***d* to browse the Web, and that the user **305** has an active IM connection. The notification information **346** may indicate that the user **305** prefers to receive notifications through instant messaging rather than the Web browser. Based on the presence information **343** and the notification information **346**, the notification delivery service **352** may provide the notification to the user **305** using an instant message to the notebook computer **310***d*.

[0047] The network **315** typically allows direct or indirect communication between the delivery mechanism **310** and the online service **320**, irrespective of physical or logical separation. Examples of a network **315** include the Internet, the World Wide Web, WANs, LANs, analog or digital wired and wireless telephone networks (e.g. PSTN, ISDN, or xDSL), radio, television, cable, satellite, and/or any other delivery mechanism for carrying data. The network **315** may be secured or unsecured.

[0048] Each of the delivery mechanism **310**, the network **315**, and the online service **320** may further include various mechanisms for delivering voice and/or non-voice data, such as, for example, the short message service (SMS), the wireless application protocol (WAP), the transport connection protocol (TCP), the Internet protocol (IP), the World Wide Web, one or more local area networks, and/or one or more wide area networks. The delivery mechanism **310**, the network **315**, and the online service **320** also may include analog or digital wired and wireless telephone networks, e.g., public switched telephone networks (PSTN), integrated services digital networks (ISDN), various types of digital

subscriber lines (xDSL), advance mobile telephone service (AMPS), global system for mobile communications (GSM), general packet radio service (GPRS), code division multiple access (CDMA), radio, cable, satellite, and/or other delivery mechanisms for carrying voice or non-voice data.

[0049] One or more other services may be included in the components of notification delivery system **300** and/or these components (hereinafter the system services) may be included as part of one or more other services. For example, the system services may include or be included in a general-purpose or a special-purpose computer (e.g., a personal computer, a PDA, or a device specifically programmed to perform certain tasks), at least one local area network, and/or at least one wide area network. In either case, the response to and execution of instructions received by any or all of the system services may be controlled by, for example, a program, a piece of code, an instruction, a device, a computer system, or a combination thereof, for independently or collectively instructing the services to interact and operate as described herein.

[0050] **FIG. 4**. illustrates a notification data structure **400** that may be used by the notification service **320** of **FIG. 3** to maintain the notification information **346**. The notification data structure **400** may be structured as a hierarchical tree and may provide a logical representation of the notification information **346**. For example, a highest hierarchical level of the notification data structure **400** may include a notification global-level defaults node **405** representative of a generalized notification. A lower class-level **410** of the notification data structure **400** may further define notifications according to notification classes. For example, the notifications may include a class of notifications that are event-based alerts **413**, and a class of notifications that are date-based reminders **415**. Other notification classes are possible, such as, for example, a class for notifications allowing public membership, a class for notifications with private membership, and a class based on a quality of one or more targeted recipient.

[0051] The notification data structure **400** includes a type-level **430** that further defines the notifications according to notification type. The alerts class **413** may include, for example, an auction alert type **433**, and a stock alert type **435**, an anniversary reminder type **437**, and a birthday reminder type **439**, among others. Still further, the notification data structure **400** includes an instantiation-level **440** to identify and define activated instantiations of the notification type. Each notification type (e.g., the auction alert type **433**) may include active instantiations of that notification. For example, the auction alert type may include instantiations of that alert activated by user registration (e.g., auction alert #1 **441** through auction alert #n **442**). Other instantiations include stock alert #1 **443** through stock alert #n **444**, anniversary reminder #1 **445** through anniversary reminder #n **446**, and birthday reminder #1 **447** through birthday reminder #n **448**.

[0052] Each level of the notification data structure **400** may include both system definition information and user preference information for the notification information **346**. For example, the notifications global-level **405** may include system-defined delivery information, and also user-defined delivery information. To the extent that there is contradiction, the user preference information may preempt the system definition information for a given hierarchical level of the notification data structure **400**. Moreover, each node of the notification data structure **400** may be configured to inherit notification information **346** from a node of a higher hierarchical level from which the node depends. Stated differently, notification information **346** may pass from a higher hierarchical level of the notification data structure **400** to a lower level to provide information missing at the lower level.

[0053] For example, the notifications global node **405** may include a global delivery definition **406**. Lacking its own delivery definition, the alerts class defaults **413** may inherit the global delivery definition **406** from the notification global defaults **405**. The auction alert type **433** also may fail to define a delivery definition. Therefore, the auction alert type **433** may inherit the global delivery definition **406** from the alerts class **413**. However, auction alert #1 **441**, an instantiation of the auction alert type **433**, may include a local delivery definition **449**. To the extent that the local delivery definition **449** is complete, it overrides the global delivery definition **406** that it would inherit otherwise. On the other hand, auction alert #n **442**, a further instantiation of the auction alert type **433**, does not include a delivery definition and inherits the global delivery definition **406** from the auction alert type **433**.

[0054] **FIGS. 5 and 6** illustrate an implementation of the notification data structure **400** that includes data structures that are similar to and parallel each other for structuring the system definition information and the user preference information, respectively.

[0055] Referring to **FIG. 5**, the notification data structure **400** may include system definitions **500**. The system definitions **500** include global definitions **510**, class definitions **540**, and type definitions **550**. The global definitions, for example, define a global delivery precedence that controls whether and/or when the notification delivery service **352** delivers a notification to a particular delivery mechanism. More specifically, the global definitions **510** instruct the notification delivery service **352** to select the following delivery mechanisms as delivery recipients in the order of preference shown: (1) a web browser **512**, if the user is online, (2) an IM client **514**, if the user is online, (3) a wireless client **516**, if wireless delivery is enabled for the user, and (4) an email inbox **518**. Lastly, an email archive **520** is provided for, but is not activated as a delivery option in this configuration. The global definitions also define notification priority **522** to be "not urgent," and that a "quiet time"**524** applies between 9:00 PM and 8:00 AM during which only urgent notifications are delivered to attract the immediate attention of the user **305**.

[0056] The system definitions **500** also include class definitions for an alert class **543** of notifications and for a reminders class **546** of notifications. In this example, neither the alert class **543** nor the reminders class **546** include any system definition information.

[0057] Additionally, the system definitions **500** include type definitions **550** that define, for example, an auction alert type **555**, a stock alert type **585**, a birthday reminder type **590**, and an anniversary reminder alert **595**. For brevity, only the auction alert type **555** is described as the other alert types are similar in relevant aspects. The auction alert type **555** defines, for example, a trigger event **557** on which the

auction alert type is triggered. In this case, the trigger event is the occurrence of a bid on an item that exceeds a prior bid of the user **305** for the item. Although it does not do so here, the auction alert type may define an auction alert priority **559** and a delivery precedence **561**.

[**0058**] One or more active instantiations may be associated with each notification type. The active instantiations may include corresponding system definition information. For example, auction alert #1 **563** is one instantiation of the auction alert type **555**. Auction alert #1 **563** includes system definition information that further defines the trigger event of the alert. More specifically, the trigger event information **565** indicates that the bid item of interest is a 1957 Chevy Bel Aire with an auction identification of 53ZX793. The auction alert #1 **563** also defines the priority **567** of the alert and the delivery precedence **569**, although those definitions are left null valued in this example. Additionally, the auction alert #1 **563** defines a membership list **571** of users registered to receive the notification. The identification may include, for example, a name of the user, an identification of the user, a login, a password, and/or a screen name. In the example shown, the user is identified by the screen name WillRobinson. Based on the screen name of the user WillRobinson, the notification service may access stored user preferences of WillRobinson.

[**0059**] Referring to **FIG. 6**, the notification data structure **400** also may include a user profile with user preferences **600**. Similar to the system definitions **500**, the user preferences **600** include global preferences **610**, class preferences **640**, and type preferences **650**. In the illustration of **FIG. 6**, all of the global preferences are null valued except for wireless delivery preference **616**. That preference indicates that mobile phone #1 is enabled generally to receive notifications for WillRobinson. To enable mobile phone #1 to receive notifications, WillRobinson may identify mobile phone #1 as a preferred delivery mechanism and may identify contact information related to mobile phone #1, such as, for example, an associated phone number. Although mobile phone #1 is enabled, no associated delivery precedence is provided.

[**0060**] Class preferences **640** also are provided for both the alerts class **643** and the reminders class **646**. Those preferences, however, are null valued in this illustration.

[**0061**] The type preferences **650** may include preferences for various notification types for which WillRobinson has registered, such as, for example, the auction alert type **655**, the stock alert type **670**, the birthday reminder type **675**, and/or the anniversary reminder type **680**. For brevity, **FIG. 6** provides detail only for the auction alert type **655**. The auction alert type **655** includes type-level preferences and a single auction alert instantiation (i.e., auction alert #1 **660**) having associated instantiation preferences. The type preferences for the auction alert type **655** are null valued. Nevertheless, auction alert #1 **660** defines the following delivery precedence **663**: (1) a web browser (if the user is online), (2) an IM client (if the user is online), (3) a mobile phone #1, (4) a PDA, (5) a mobile phone #2, (6) a pager, and (7) an email inbox. Lastly, an email archive is identified to always receive notification. The auction alert #1 **660** also defines the notification priority **666** as "urgent," while leaving "quiet time"**669** undefined as a null value.

[**0062**] **FIG. 7** illustrates a flow diagram of a process **700** implementable by, e.g., the system of **FIG. 3** to deliver a notification to a user based on presence information **343** and notification information **346**. As previously described, the notification information **346** may include system definitions and user preferences associated with the notification. Initially, the user **305** may access the notification service **340** to activate a notification (step **705**). For example, the user **305** may subscribe to an existing notification such as the auction alert described previously. Subscription to the auction alert creates an active instantiation of that alert (e.g., auction alert #1) associated with the user **305**.

[**0063**] Based on the notification information **346**, including the trigger event for the notification, the notification generation service **349** may determine whether information of the information service **330** triggers the notification (step **710**). For example, the notification generation service **349** may poll the information service **330** to detect the occurrence or nonoccurrence of the trigger event. Insofar as the trigger event is not detected, the notification generation service **349** may continue to monitor for occurrence of the trigger event.

[**0064**] In another aspect of step **710**, the notification generation service **349** may inform the information service **330** of the trigger event, or the information service **330** itself may determine the trigger event. In either event, the information service **330** may monitor its information for occurrence of the trigger event. When the information service **330** detects that the trigger event has occurred, the information service **330** may notify the notification generation service **349** of that occurrence. For example, the information service **330** may include an online auction (e.g., eBay) that may monitor auction activity for a trigger event selected by an auction participant. When that event is detected, the online auction may inform the notification generation service **349**.

[**0065**] After the notification has been triggered (step **710**), the notification delivery service **352** resolves a cascaded delivery instruction associated with the notification (step **715**). The cascaded delivery instruction is resolved based on the notification information **346**, including the system definitions and/or user preferences associated with the notification (step **715**).

[**0066**] Before attempting to deliver the electronic notification, the notification delivery service **352** determines presence information **343** associated with the user **305** (step **720**). The presence information may be based on actual activity, behavior, or physical presence of the user **305** rather than upon information inferred from the user preferences or system definitions of the notification information **346**. For example, the notification delivery service **352** may determine information indicating an online presence of the user **305** based on information of the information service **330** (e.g., information indication that the user **305** is browsing the web, the user **305** has an active instant messaging session, the user **305** is online using a television, the user **305** is online using a game console, the user **305** is online using a networked radio, or the user **305** currently is active in a chat room discussion). The notification delivery service **352** also may determine presence information **343** indicating a physical presence of the user **305** (e.g., by communicating with a global positioning system associated with the user **305**).

[**0067**] After determining the presence information **343**, the notification delivery service **352** delivers the notification

based on the presence information **343** and the previously resolved cascaded delivery instruction (step **725**).

[**0068**] Referring to **FIG. 8, a** cascaded delivery instruction may be resolved (step **715**) by determining delivery instruction information from an instantiation-level user preference and/or system definition (step **805**). If no gaps are identified in the delivery instruction information (step **810**), the cascaded delivery instruction may be formed based on the delivery instruction information (step **815**). Otherwise, if gaps are identified (step **810**), additional delivery instruction information may be inherited from a type-level user preference and/or system definition (step **820**).

[**0069**] The supplemented delivery instruction information again may be evaluated for completeness (step **825**). If the supplemented delivery instruction information is complete, the notification delivery service **352** may form the cascaded delivery instruction based on that information (step **815**). Otherwise, if gaps remain in the delivery instruction information, that information may inherit additional delivery instruction information from a class-level user preference and/or system definition (step **830**).

[**0070**] The process of evaluating the completeness of the supplemented delivery instruction information may be repeated again (step **835**). As before, the notification delivery service **352** may form a cascaded delivery instruction from the supplemented delivery information where that information is complete (step **815**). Otherwise, the notification delivery service **352** may form the cascaded delivery instruction (step **815**) after the delivery instruction information is further supplemented through inheritance based on a global-level user preference and/or system definition (step **840**).

[**0071**] The process of **FIG. 8** may be used to resolve a cascaded delivery instruction for auction alert #1 described with respect to the system definitions **500** and the user preferences **600** of **FIGS. 5 and 6**, respectively. Initially, delivery instruction information is determined from the instantiation-level user preferences **660** of auction alert #1 (step **805**). That information defines a delivery precedence **663** described previously: (1) a web browser (if the user is online), (2) an IM client (if the user is online), (3) a mobile phone #1, (4) a PDA, (5) a mobile phone #2, (6) a pager, and (7) an email inbox. In addition; an email archive is identified to always receive notification. The user preference information **660** of auction alert #1 also defines a notification priority **666** as "urgent," but leaves "quiet time"**669** undefined. Moreover, the delivery precedence **663** described above is open-ended. That delivery precedence would not be contradicted by adding, for example, an additional delivery mechanism to assume an eighth place role in the delivery precedence. In sum, a gap exists in the delivery instruction information (step **810**).

[**0072**] The gap in the delivery instruction information is not filled by any information provided by the instantiation-level system definitions **563** or by any class-level system definitions **540** or user preferences **640** (steps **820-835**). Likewise, the global-level user preferences **610** do not provide a "quiet time" definition. The global-level user preferences **610** do include some delivery information **616**. That information, however, is not additional to delivery precedence information already determined. More specifically, that information simply notes that mobile phone #1 is enabled to receive a wireless notification, information already included in the instantiation-level preference information **663** that provides additionally that mobile phone #1 ranks number three in the delivery precedence.

[**0073**] However, the global-level system definitions **510** define "quiet time"**524** as between 9:00 PM and 8:00 AM, information additional to that already obtained. This additional delivery instruction information is inherited to fill the prior information gap (step **840**). Note also that the global-level system definitions **510** provide delivery precedence information **512-520** and priority information **522** that is inconsistent with the aggregated delivery instruction information—and, therefore, is not inherited.

[**0074**] Having determined the relevant delivery instruction information, the notification delivery service **352** then forms a cascaded delivery instruction based on that information (step **815**). The cascaded delivery instruction may be formed, for example, by converting the relevant delivery instruction information into a format or protocol required for delivery. The cascaded delivery instruction may remain substantively similar to the relevant delivery instruction information. In this example, the cascaded delivery instruction may provide that the notification is "urgent," that a "quiet time" from between 9:00 PM and 8:00 AM applies, and that the notification should be delivered according to the following delivery precedence: attempt delivery first to a web browser (if the user is online); second, to an IM client (if the user is online); third, to a mobile phone #1; fourth, to a PDA; fifth, to a mobile phone #2; sixth, to a pager; and seventh, to an email inbox. Lastly, all notifications also are to be delivered to an email archive.

[**0075**] Referring to **FIG. 9**, delivering the notification according to the cascaded delivery instruction may include determining whether the user **305** to whom the notification is directed is online (step **905**). If the user **305** is online, the notification delivery service **352** may further determine whether the user **305** has marked himself as "away" from the online delivery mechanism (step **910**). If the notification delivery service **352** determines that the user **305** is online and is not away from the online delivery mechanism, the notification delivery service **352** may deliver the notification to that online delivery mechanism (step **915**).

[**0076**] If the notification delivery service **352** determines, however, that the user **305** is not online (step **905**), or is away from the online delivery mechanism (step **910**), then the notification delivery service **352** may determine whether it currently is "quiet time" for the user **305** (step **920**). The notification delivery service **352** also may determine whether the notification is designated as "urgent" (e.g., a notification might be marked "urgent" that alerts of a tornado that has been spotted near the user's home address) (step **925**). Where the notification delivery service **352** determines that it is not "quiet time" or that the notification is "urgent" (i.e., "urgency" overrides "quiet time"), the notification delivery service **352** may determine whether wireless notification is available for the user **305** (e.g., through notification to a mobile phone, a PDA, a pager) (step **930**). If wireless notification is available, the notification delivery service **352** may determine a wireless delivery mechanism at which the user **305** prefers to receive the notification (step **935**) and may deliver the notification to that wireless device (step **940**).

[0077] However, should the notification delivery service **352** determine that it is "quiet time" (step **920**) and that the notification is not "urgent" (step **925**), the notification delivery service **352** may deliver the notification to an email inbox (step **945**) and/or to an email archive (step **950**).

[0078] In whatever manner the notification is delivered, the notification delivery service **352** may require that the delivery mechanism confirm receipt of the notification or that the user has received the notification (step **955**). For example, the delivery mechanism may provide an acknowledgement to the notification delivery service at the time at which the delivery mechanism receives the notification. The delivery mechanism also may acknowledge receipt of the notification only after the user has accessed the notification, or otherwise indicated recognition of the notification, within, for example, a predetermined period of time (e.g., an "idle time" threshold period). If the delivery mechanism fails to confirm receipt of the notification, the notification delivery service **352** may perform a redelivery process (step **960**). The redelivery process may include, for example, redelivery to the delivery mechanism that failed to confirm receipt. That redelivery may continue until a confirmation is received or a predetermined failure threshold is reached. The redelivery process also may include selection of and delivery to another delivery mechanism associated with the user (e.g., delivery to a pager or to email rather than to a preferred mobile phone). Redelivery in this manner may be selected, for example, based on a failure to receive a confirmation indicating that the user has accessed or recognized the notification within the "idle time" threshold period. The delivery process may continue until a delivery mechanism to which delivery of the notification is made confirms that the notification is received. Once a delivery mechanism confirms that the notification is received, the notification delivery process may conclude (step **965**).

[0079] **FIG. 10** illustrates an auction alert that may be delivered to a PDA or mobile phone of a user. The auction alert may be any type of instant message, pop-up window, icon, and or audible or tactile alarm capable of gaining the attention of the user. The auction alert may provide information such as an alert identifier, identification of the auction item, the reason for the notification, and a date and time stamp of when the auction alert was received. The PDA or mobile phone also notifies the user "Alert! WillRobinson. Your online bid for a 1957 Chevy Bel Aire has been exceeded." In another aspect, the auction alert may include an edit button for editing the presentation of the alert, and a respond/more information button for accessing the auction using the online service to update the bid and/or to obtain more detailed information regarding the auction.

[0080] Other implementations are within the scope of the following claims.

What is claimed is:

1. A notification system that delivers an electronic notification to an intended recipient, the system comprising:

a communication module configured to communicate an electronic notification directed to an intended recipient;

a presence module configured to determine presence information associated with the intended recipient before attempting to deliver the notification to the intended recipient;

a selection module configured to select based on the presence information among several delivery mechanisms potentially available for the intended recipient; and

a delivery module configured to deliver the electronic notification to the intended recipient at the selected delivery mechanism.

2. The system of claim 1 wherein the presence information includes information related to online presence of the intended recipient at a time at which the selection module is preparing to select among the several delivery mechanisms potentially available to the intended recipient.

3. The system of claim 2 wherein the information related to the online presence of the intended recipient includes information indicating that the intended recipient is logged onto an online service at a time at which the selection module is preparing to select among the several delivery mechanisms potentially available to the intended recipient.

4. The system of claim 2 wherein the information related to the online presence of the intended recipient includes information indicating that the intended recipient is connected to an online service at a time at which the selection module is preparing to select among the several delivery mechanisms potentially available to the intended recipient.

5. The system of claim 2 wherein the information related to the current online presence of the intended recipient includes information indicating a delivery mechanism associated with the online presence of the intended recipient at a time at which the selection module is preparing to select among the several delivery mechanisms potentially available to the intended recipient.

6. The system of claim 1 wherein the presence information includes information indicating that the intended recipient physically is present within a predefined range of one or more of the delivery mechanisms potentially available to the intended recipient at a time at which the selection module is preparing to select among the several delivery mechanisms potentially available to the intended recipient.

7. The system of claim 1 further comprising a cascaded instruction module configured to select a cascaded delivery instruction that is appropriate for the intended recipient based on notification information.

8. The system of claim 7 wherein the cascaded delivery instruction lists several delivery mechanisms, and wherein the selection module is further configured to use the presence information to select a delivery mechanism from within the cascaded delivery instruction that appears available to provide the electronic notification to the user without significant delay.

9. The system of claim 8 wherein at least one of the several delivery mechanisms potentially available for the intended recipient is a mobile client, and wherein the mobile client is selected as the delivery mechanism based on the cascaded delivery instruction.

10. The system of claim 8 wherein the notification information comprises information related to a preference of the intended recipient.

11. The system of claim 10 wherein the preference of the intended recipient comprises a preferred delivery mechanism.

12. The system of claim 11 wherein at least one of the several delivery mechanisms potentially available for the intended recipient is a mobile client, and the preferred delivery mechanism comprises the mobile client.

13. The system of claim 10 wherein the preference of the intended recipient comprises a preferred delivery precedence.

14. The system of claim 10 wherein the preference of the intended recipient comprises information describing a quiet time.

15. The system of claim 10 wherein the preference of the intended recipient comprises a preferred priority of the electronic notification.

16. A system for selecting a mechanism to be used for delivering an electronic communication, the system comprising:

a determination module configured to determine actual availability of an intended recipient presently to receive an electronic communication using at least one candidate delivery mechanism before attempting to deliver the electronic communication using the candidate delivery mechanism; and

a decision module configured to decide whether to send the electronic communication using the candidate delivery mechanism based on the actual availability determined.

17. The system of claim 16 wherein the determination module is configured further to determine the actual availability of the intended recipient based on an activity of the intended recipient.

18. The system of claim 16 wherein the determination module is configured further to determine the actual availability of the intended recipient based on a behavior of the intended recipient.

19. The system of claim 16 wherein the determination module is configured further to determine the actual availability of the intended recipient based on a physical presence of the intended recipient.

20. The system of claim 16 wherein the determination module is configured further to determine the actual availability of the intended recipient based on an online presence of the intended recipient.

21. The system of claim 16 wherein:

the at least one candidate delivery mechanism comprises several delivery mechanisms potentially available for the intended recipient, and

the decision module further comprises a selection module configured to select an actual delivery mechanism from among the several delivery mechanisms potentially available for the intended recipient based on the actual availability determined.

22. The system of claim 21 wherein:

the decision module further comprises a delivery instruction module configured to resolve a cascaded delivery instruction that is appropriate for the intended recipient based on notification information; and

the selection module is further configured to select the actual delivery mechanism from among the several delivery mechanisms potentially available for the intended recipient based on the cascaded delivery instruction.

23. The system of claim 22 wherein the delivery instruction module is configured further to resolve the cascaded delivery instruction to reflect input of the intended recipient.

24. A method of delivering an electronic notification to an intended recipient, the method comprising:

configuring a communication module to communicate an electronic notification directed to an intended recipient;

configuring a presence module to determine presence information associated with the intended recipient before attempting to deliver the notification to the intended recipient;

configuring a selection module to select among several delivery mechanisms potentially available for the intended recipient based on the presence information; and

configuring a delivery module to deliver the electronic notification to the intended recipient at the selected delivery mechanism.

25. The method of claim 24 wherein determining the presence information includes determining information related to online presence of the intended recipient when preparing to select among the several delivery mechanisms potentially available to the intended recipient.

26. The method of claim 25 wherein deterring the information related to the online presence of the intended recipient includes determining information indicating that the intended recipient is logged onto an online service when preparing to select among the several delivery mechanisms potentially available to the intended recipient.

27. The method of claim 25 wherein deterring the information related to the online presence of the intended recipient included determining information indicating that the intended recipient is connected to an online service when preparing to select among the several delivery mechanisms potentially available to the intended recipient.

28. The method of claim 26 wherein determining the information related to the online presence of the intended recipient includes determining information indicating a delivery mechanism associated with the online presence of the intended recipient when preparing to select among the several delivery mechanisms potentially available to the intended recipient.

29. The method of claim 24 wherein determining the presence information includes determining information indicating that the intended recipient physically is present within a predefined range of one or more of the delivery mechanisms potentially available to the intended recipient when preparing to select among the several delivery mechanisms potentially available to the intended recipient.

30. The method of claim 24 further comprising configuring a cascaded instruction module to resolve a cascaded delivery instruction that is appropriate for the intended recipient based on notification information.

31. The method of claim 30 wherein configuring the selection module to deliver the electronic notification further comprises configuring the selection module to resolve the cascaded delivery instruction to include several delivery mechanisms and to use the presence information to select a delivery mechanism from within the cascaded delivery instruction that appears available to provide the electronic notification to the user without significant delay.

32. The method of claim 31 wherein at least one of the delivery mechanisms potentially available for the intended recipient is a mobile client, and wherein the mobile client is selected as the delivery mechanism based on the cascaded delivery instruction.

33. The method of claim 31 wherein the notification information comprises information related to a preference of the intended recipient.

34. The method of claim 33 wherein the preference of the intended recipient comprises a preferred delivery mechanism.

35. The method of claim 34 wherein at least one of the several delivery mechanisms potentially available for the intended recipient is a mobile client, and the preferred delivery mechanism comprises the mobile client.

36. The method of claim 33 wherein the preference of the intended recipient comprises a preferred delivery precedence.

37. A computer program stored on a computer readable medium or a propagated signal for delivering an electronic notification to an intended recipient, the computer program comprising:

a notification delivery code segment that causes a computer to receive an electronic notification directed to an intended recipient, to determine presence information associated with the intended recipient before attempting to deliver the notification to the intended recipient, and to deliver the electronic notification to an intended recipient, at one or more delivery mechanisms associated with the intended recipient, based on the presence information; and

an access service code segment that causes the computer to enable communication between the notification delivery code segment and the intended recipient to yield a distinct access revenue.

38. A method for selecting a mechanism to be used for delivering an electronic communication, the method comprising:

determining actual availability of an intended recipient presently to receive an electronic communication using at least one candidate delivery mechanism before attempting to deliver the electronic communication using the candidate delivery mechanism;

deciding whether to send the electronic communication using the candidate delivery mechanism based on the actual availability determined.

39. The method of claim 38 wherein determining the actual availability of the intended recipient comprises determining an availability of the intended recipient based on an activity of the intended recipient.

40. The method of claim 38 wherein determining the actual availability of the intended recipient comprises determining an availability of the intended recipient based on a behavior of the intended recipient.

41. The method of claim 38 wherein determining the actual availability of the intended recipient comprises determining an availability of the intended recipient based on a physical presence of the intended recipient.

42. The method of claim 38 wherein determining the actual availability of the intended recipient comprises determining an availability of the intended recipient based on an online presence of the intended recipient.

43. The method of claim 38 wherein:

the at least one candidate delivery mechanism comprises several delivery mechanisms potentially available for the intended recipient, and

deciding whether to send the electronic communication using the candidate delivery mechanism further comprises selecting an actual delivery mechanism from among the several delivery mechanisms potentially available for the intended recipient based on the actual availability determined.

44. The method of claim 43 wherein deciding whether to send the electronic communication using the candidate delivery mechanism further comprises:

resolving a cascaded delivery instruction that is appropriate for the intended recipient based on notification information; and

selecting the actual delivery mechanism from among the several delivery mechanisms potentially available for the intended recipient based on the cascaded delivery instruction.

45. The method of claim 44 wherein resolving the cascaded delivery instruction comprises resolving the cascaded delivery instruction to reflect input of the intended recipient.

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