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(54) GENERATING UNIQUE VIRTUAL IDENTIFIERS

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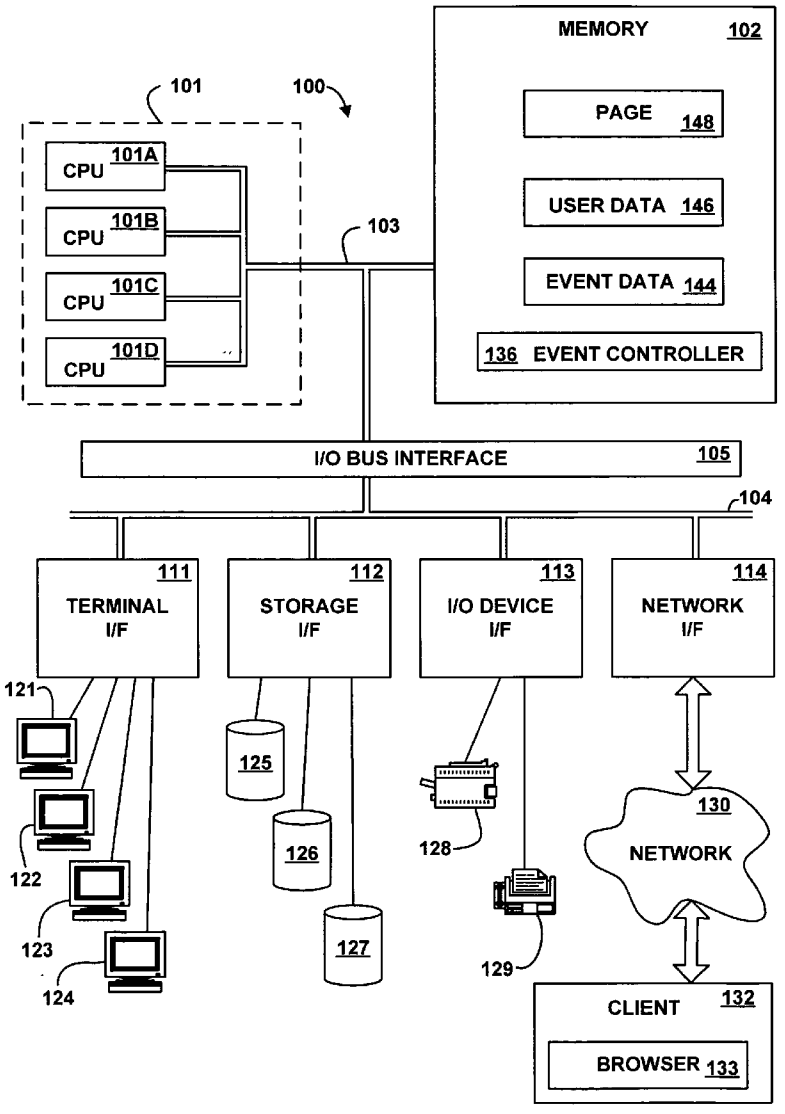
(57) **ABSTRACT**

A method, apparatus, system, and signal-bearing medium that, in an embodiment, generate virtual user identifiers that represents users, where the virtual user identifiers are unique to their viewers. Further, virtual event identifiers that represent events are generated, where the virtual event identifiers are unique to their viewers. The virtual user identifiers representing the users and the virtual event identifiers representing the events are presented to viewers. In various embodiments, the event may be a game or an auction. In this way, in an embodiment, collaboration between users is more difficult.



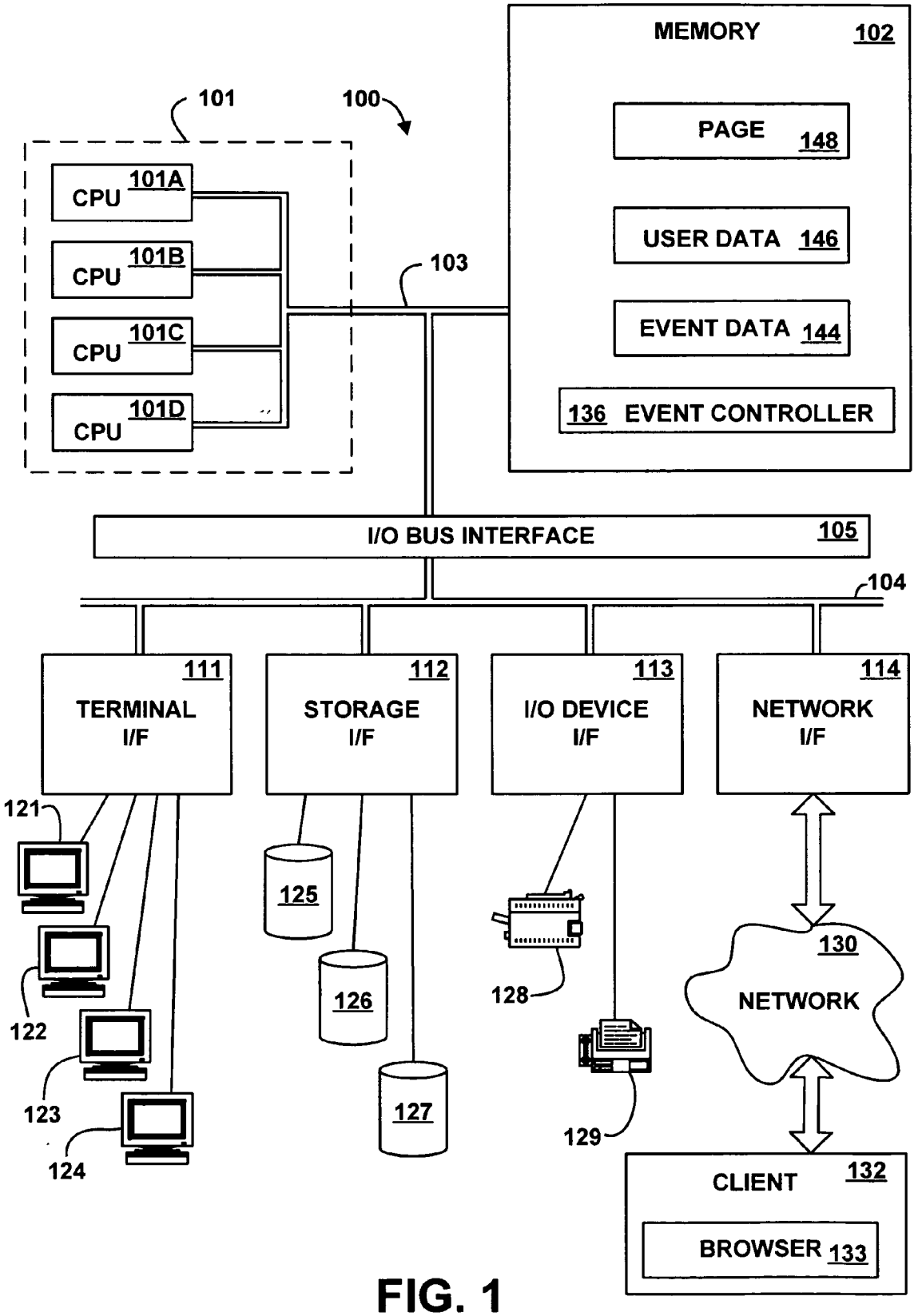

MEMORY 102
PAGE 148
USER DATA 146
EVENT DATA 144
136 EVENT CONTROLLER
101
100
CPU 101A
CPU 101B
CPU 101C
CPU 101D
103
I/O BUS INTERFACE 105
104
111 TERMINAL I/F
112 STORAGE I/F
113 I/O DEVICE I/F
114 NETWORK I/F
121
122
123
124
125
126
127
128
129
130 NETWORK
CLIENT 132
BROWSER 133

FIG. 1

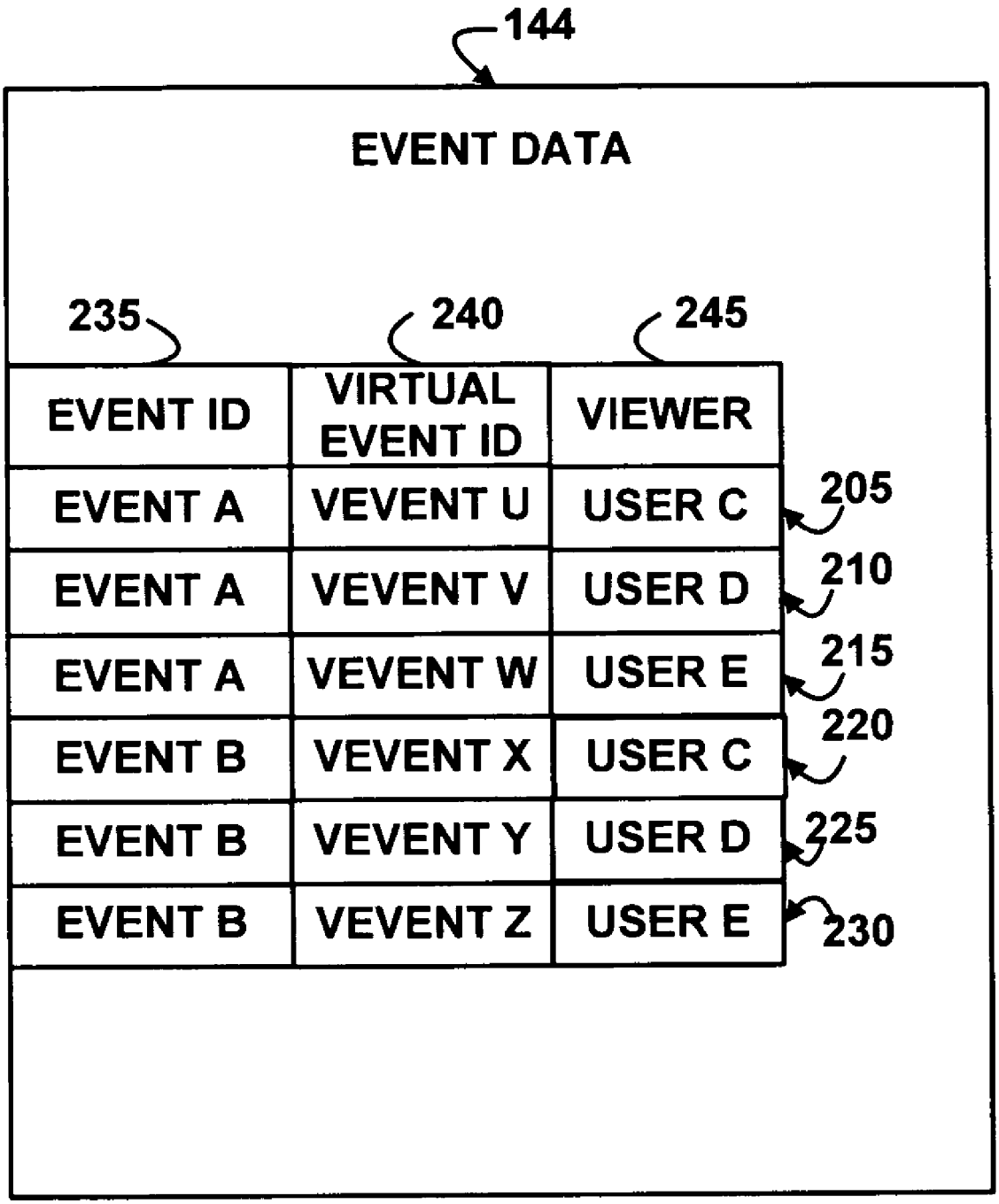

144
EVENT DATA
235
240
245
EVENT ID
VIRTUAL EVENT ID
VIEWER
EVENT A
VEVENT U
USER C
205
EVENT A
VEVENT V
USER D
210
EVENT A
VEVENT W
USER E
215
EVENT B
VEVENT X
USER C
220
EVENT B
VEVENT Y
USER D
225
EVENT B
VEVENT Z
USER E
230

FIG. 2

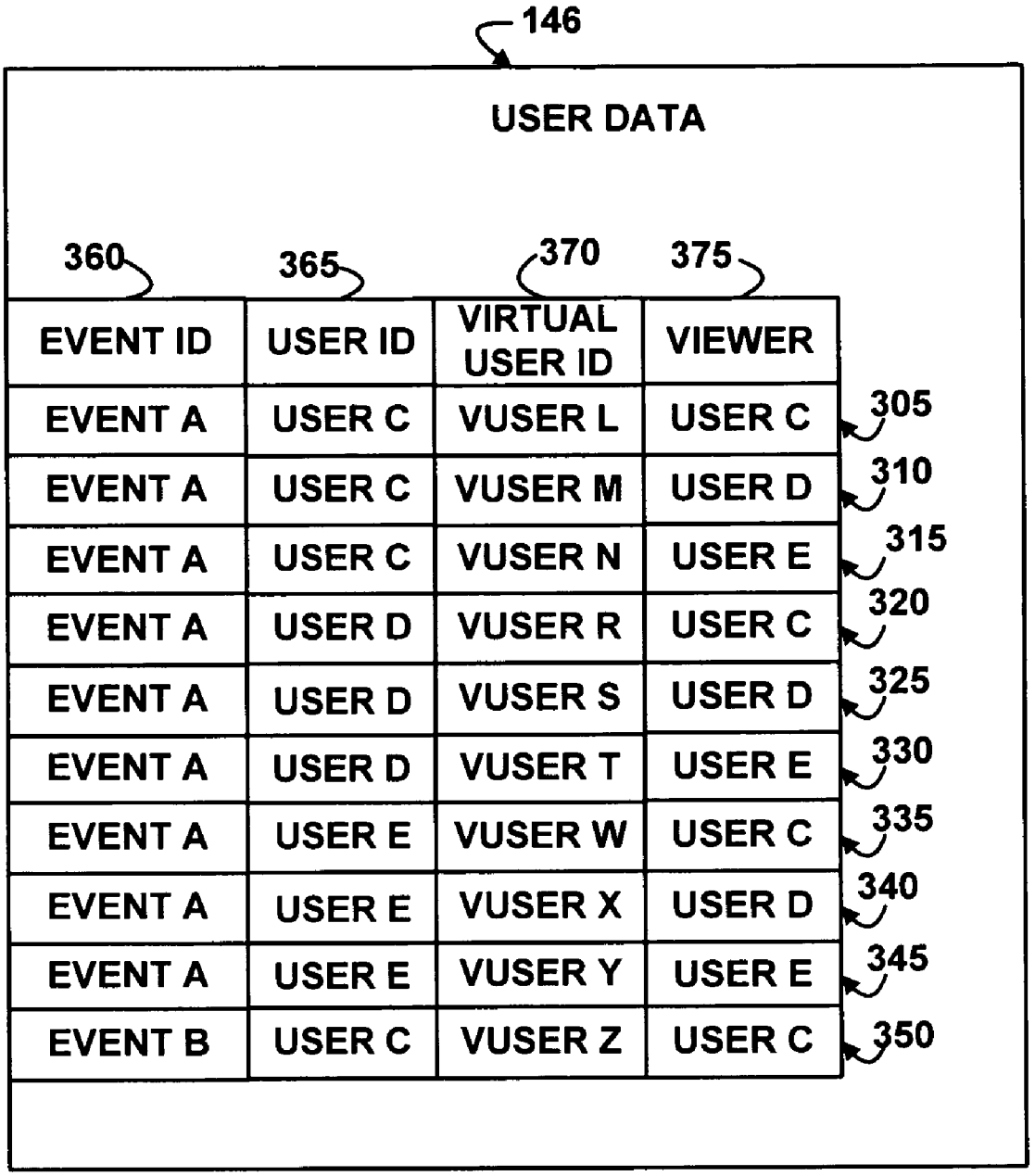

146
USER DATA
360
365
370
375
EVENT ID
USER ID
VIRTUAL USER ID
VIEWER
EVENT A
USER C
VUSER L
USER C
305
EVENT A
USER C
VUSER M
USER D
310
EVENT A
USER C
VUSER N
USER E
315
EVENT A
USER D
VUSER R
USER C
320
EVENT A
USER D
VUSER S
USER D
325
EVENT A
USER D
VUSER T
USER E
330
EVENT A
USER E
VUSER W
USER C
335
EVENT A
USER E
VUSER X
USER D
340
EVENT A
USER E
VUSER Y
USER E
345
EVENT B
USER C
VUSER Z
USER C
350

FIG. 3

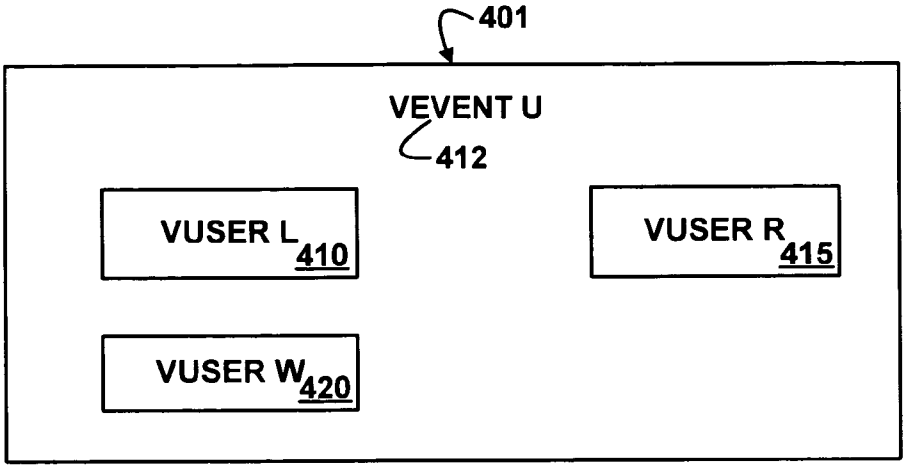


FIG. 4A

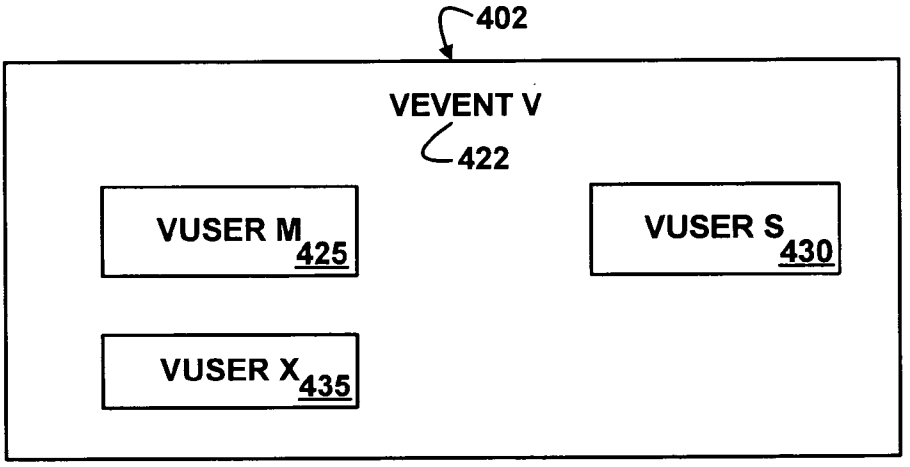


FIG 4B

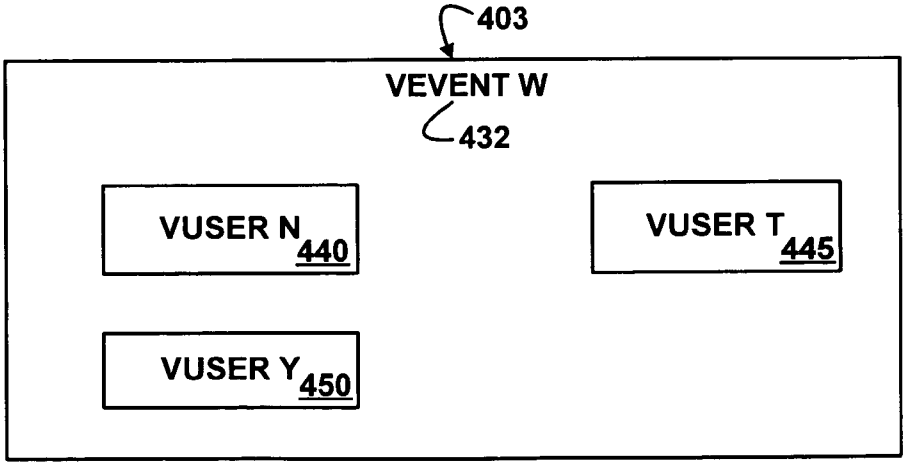


FIG. 4C

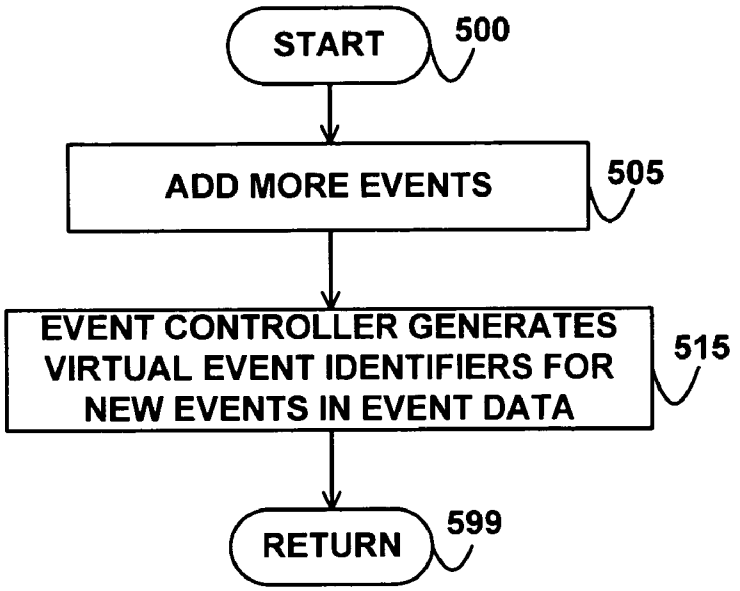

START
500
ADD MORE EVENTS
505
EVENT CONTROLLER GENERATES VIRTUAL EVENT IDENTIFIERS FOR NEW EVENTS IN EVENT DATA
515
RETURN
599

FIG. 5

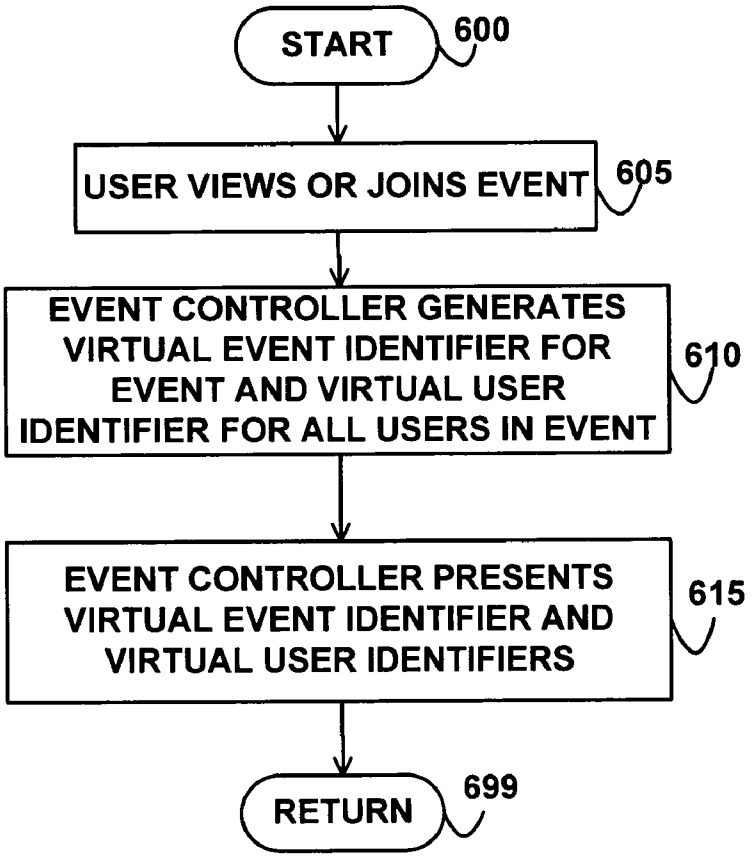

START
600
USER VIEWS OR JOINS EVENT
605
EVENT CONTROLLER GENERATES VIRTUAL EVENT IDENTIFIER FOR EVENT AND VIRTUAL USER IDENTIFIER FOR ALL USERS IN EVENT
610
EVENT CONTROLLER PRESENTS VIRTUAL EVENT IDENTIFIER AND VIRTUAL USER IDENTIFIERS
615
RETURN
699

FIG. 6

GENERATING UNIQUE VIRTUAL IDENTIFIERS

FIELD

[0001] This invention generally relates to computers and more specifically relates generating unique virtual event and user identifiers.

BACKGROUND

[0002] The development of the EDVAC computer system of 1948 is often cited as the beginning of the computer era. Since that time, computer systems have evolved into extremely sophisticated devices, and computer systems may be found in many different settings. Computer systems typically include a combination of hardware, such as semiconductors and circuit boards, and software, also known as computer programs.

[0003] Years ago, computer systems were stand-alone devices that did not communicate with each other. But, today, computer systems are increasingly connected to each other via networks, and one computer system, often called a client, may request operations or functions from another computer, which is often called a server. Some uses of networked systems are online services that clients may use to participate in game tournaments or auctions. Two problems that these services can suffer from are unauthorized collaboration between participants and loss confidentiality. The possibility of collaboration and loss of confidentiality undermines the confidence that the participants have in the online service, and therefore limits customer participation.

[0004] One example of collaboration is when participants communicate with each other outside of the game unbeknownst to the other participants, for example via telephone or instant messaging. This communication may share information regarding game strategy, position, or knowledge learned from playing the game, which enables the collaborators to coordinate their actions, essentially allowing the collaborators to secretly act as a team against other participants and gain an unfair advantage.

[0005] Another example of collaboration is when a seller in an auction and a false bidder coordinate. The false bidder has no intention of actually purchasing the item for sale; instead, the bidder enters the false bids to generate competition with other bidders, in order to raise the eventual selling price.

[0006] An example of loss of confidentiality in an auction occurs when a seller notices a pattern of buying from a particular buyer. For example, sellers may notice that one buyer is attempting to buy a complete set of items (e.g., all nine baseball cards of a championship team), or a series of adjoining lots of land. A buyer who is only missing one item from a complete set is probably highly motivated to purchase the last item, and knowledge of this fact gives potential sellers valuable information regarding the price that the buyer might be willing to pay. The buyer, of course, does not want potential sellers to know this information. Thus, buyers may be reluctant to join auctions where their confidentiality is not preserved.

[0007] Hence, without a better way to thwart collaboration and loss of confidentiality, users will suffer from a lack of confidence in online services.

SUMMARY

[0008] A method, apparatus, system, and signal-bearing medium are provided that, in an embodiment, generate virtual user identifiers that represents users, where the virtual user identifiers are unique to their viewers. Further, virtual event identifiers that represent events are generated, where the virtual event identifiers are unique to their viewers. The virtual user identifiers representing the users and the virtual event identifiers representing the events are presented to viewers. In various embodiments, the event may be a game or an auction. In this way, in an embodiment, collaboration between users is more difficult.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Various embodiments of the present invention are hereinafter described in conjunction with the appended drawings:

[0010] **FIG. 1** depicts a high-level block diagram of an example system for implementing an embodiment of the invention.

[0011] **FIG. 2** depicts a block diagram of an example data structure for event data, according to an embodiment of the invention.

[0012] **FIG. 3** depicts a block diagram of an example data structure for user data, according to an embodiment of the invention.

[0013] **FIG. 4A** depicts a block diagram of an example user interface for events viewed by a viewer, according to an embodiment of the invention.

[0014] **FIG. 4B** depicts a block diagram of an example user interface for events viewed by another viewer, according to an embodiment of the invention.

[0015] **FIG. 4C** depicts a block diagram of an example user interface for events viewed by yet another viewer, according to an embodiment of the invention.

[0016] **FIG. 5** depicts a flowchart of example processing for adding events to the event data, according to an embodiment of the invention.

[0017] **FIG. 6** depicts a flowchart of further example processing for adding a user to an event, according to an embodiment of the invention.

[0018] It is to be noted, however, that the appended drawings illustrate only example embodiments of the invention, and are therefore not considered limiting of its scope, for the invention may admit to other equally effective embodiments.

DETAILED DESCRIPTION

[0019] In an embodiment, an event controller generates virtual user identifiers that represents users, where the virtual user identifiers are unique to their viewers. The event controller further generates virtual event identifiers that represent events, where the virtual event identifiers are unique to their viewers. The event controller presents the virtual user identifiers representing the users and the virtual event identifiers representing the events to viewers. Thus, viewers are users who participate in the events and are

capable of viewing the virtual user identifiers and the virtual event identifiers. In various embodiments, the event may be a game or an auction.

[0020] In this way, the virtual event identifiers and the virtual user identifiers are unique values that only one viewer receives. Further, the virtual event identifiers remain consistent for the viewer throughout that viewer's session, allowing users to move from event to event, and return to events where they have participated earlier in the session. Multiple users viewing the same events view different set of virtual event identifiers and different sets of virtual user identifiers. Thus, users are hampered from making arrangements to participate in the same event or searching all events for each other's virtual user identifiers because different users view the same event by different virtual event identifiers, and the virtual user identifier that they know themselves by is not displayed to other viewers.

[0021] Referring to the Drawings, wherein like numbers denote like parts throughout the several views, **FIG. 1** depicts a high-level block diagram representation of a computer system **100** connected to a client **132** via a network **130**, according to an embodiment of the present invention. In an embodiment, the hardware components of the computer system **100** may be implemented by an eServer iSeries computer system available from International Business Machines of Armonk, N.Y. However, those skilled in the art will appreciate that the mechanisms and apparatus of embodiments of the present invention apply equally to any appropriate computing system.

[0022] The major components of the computer system **100** include one or more processors **101**, a main memory **102**, a terminal interface **111**, a storage interface **112**, an I/O (Input/Output) device interface **113**, and communications/network interfaces **114**, all of which are coupled for inter-component communication via a memory bus **103**, an I/O bus **104**, and an I/O bus interface unit **105**.

[0023] The computer system **100** contains one or more general-purpose programmable central processing units (CPUs) **101**A, **101**B, **101**C, and **101**D, herein generically referred to as the processor **101**. In an embodiment, the computer system **100** contains multiple processors typical of a relatively large system; however, in another embodiment the computer system **100** may alternatively be a single CPU system. Each processor **101** executes instructions stored in the main memory **102** and may include one or more levels of on-board cache.

[0024] The main memory **102** is a random-access semiconductor memory for storing data and programs. In another embodiment, the main memory **102** represents the entire virtual memory of the computer system **100**, and may also include the virtual memory of other computer systems coupled to the computer system **100** or connected via the network **130**. The main memory **102** is conceptually a single monolithic entity, but in other embodiments the main memory **102** is a more complex arrangement, such as a hierarchy of caches and other memory devices. For example, memory may exist in multiple levels of caches, and these caches may be further divided by function, so that one cache holds instructions while another holds non-instruction data, which is used by the processor or processors. Memory may be further distributed and associated with different CPUs or sets of CPUs, as is known in any of various so-called non-uniform memory access (NUMA) computer architectures.

[0025] The memory **102** includes an event controller **136**, event data **144**, user data **146**, and a page **148**. Although the event controller **136**, the event data **144**, the user data **146**, and the page **148** are illustrated as being contained within the memory **102** in the computer system **100**, in other embodiments some or all of them may be on different computer systems and may be accessed remotely, e.g., via the network **130**. The computer system **100** may use virtual addressing mechanisms that allow the programs of the computer system **100** to behave as if they only have access to a large, single storage entity instead of access to multiple, smaller storage entities. Thus, while the event controller **136**, the event data **144**, the user data **146**, and the page **148** are illustrated as being contained within the main memory **102**, these elements are not necessarily all completely contained in the same storage device at the same time. Further, although the event controller **136**, the event data **144**, the user data **146**, and the page **148** are illustrated as being separate entities, in other embodiments some of them, or portions of some of them, may be packaged together.

[0026] The event data **144** represents an event or events. In an embodiment, an event may be a game or a station or table for a game. Examples of games include card games, video games, or any other type of game or competition. In another embodiment, an event may be an auction, sale, license, rent, or lease of real estate, goods, commodities, services, intellectual property, or intangible property, regardless of whether users bid or whether the price is fixed. In another embodiment, an event may be any type of event in which users participate, regardless of whether the event is competitive, non-competitive, or whether money, a prize, or nothing of value is involved. In various embodiments, participation by a user may be active or passive and may involve viewing, playing, bidding, buying, selling, receiving information, inputting information, or any other appropriate type of participation. The event data **144** is further described below with reference to **FIG. 2**.

[0027] The user data **146** represents users at the clients **132** who participate in the event. The user data **146** is further described below with reference to **FIG. 3**. A user may be a player, a viewer, a bidder, a buyer, a seller, an agent, or any other appropriate type of user.

[0028] The page **148** represents the status of the event and the status of the user's participation in the event. The page **148** may include data, data and control tags, statements, interpretable code, and/or executable code, and may be implemented via HTML, XML, style sheets, JavaScript, or any other appropriate technology. The page **148**, as interpreted, executed, and/or presented at the client **132**, is further described below with reference to **FIGS. 4A, 4B**, and **4**C.

[0029] The event controller **136** processes the event data **144** and the user data **146** to create the page **148**, which represents the status of the participation of the users in the event. The event controller **136** may further receive input from the clients **132**, which represents the participation of the users and update the page **148** to reflect the status of the participation. In an embodiment, the event controller **136** includes instructions capable of executing on the processor

101 or statements capable of being interpreted by instructions executing on the processor **101** to perform the functions as further described below with reference to **FIGS. 5 and 6**. In another embodiment, the event controller **136** may be implemented in microcode. In another embodiment, the event controller **136** may be implemented in hardware via logic gates and/or other appropriate hardware techniques.

[**0030**] The memory bus **103** provides a data communication path for transferring data among the processor **101**, the main memory **102**, and the I/O bus interface unit **105**. The I/O bus interface unit **105** is further coupled to the system I/O bus **104** for transferring data to and from the various I/O units. The I/O bus interface unit **105** communicates with multiple I/O interface units **111**, **112**, **113**, and **114**, which are also known as I/O processors (IOPs) or I/O adapters (IOAs), through the system I/O bus **104**. The system I/O bus **104** may be, e.g., an industry standard PCI bus, or any other appropriate bus technology.

[**0031**] The I/O interface units support communication with a variety of storage and I/O devices. For example, the terminal interface unit **111** supports the attachment of one or more user terminals **121**, **122**, **123**, and **124**. The storage interface unit **112** supports the attachment of one or more direct access storage devices (DASD) **125**, **126**, and **127** (which are typically rotating magnetic disk drive storage devices, although they could alternatively be other devices, including arrays of disk drives configured to appear as a single large storage device to a host). The contents of the main memory **102** may be stored to and retrieved from the direct access storage devices **125**, **126**, and **127**, as needed.

[**0032**] The I/O and other device interface **113** provides an interface to any of various other input/output devices or devices of other types. Two such devices, the printer **128** and the fax machine **129**, are shown in the exemplary embodiment of **FIG. 1**, but in other embodiment many other such devices may exist, which may be of differing types. The network interface **114** provides one or more communications paths from the computer system **100** to other digital devices and computer systems; such paths may include, e.g., one or more networks **130**.

[**0033**] Although the memory bus **103** is shown in **FIG. 1** as a relatively simple, single bus structure providing a direct communication path among the processors **101**, the main memory **102**, and the I/O bus interface **105**, in fact the memory bus **103** may comprise multiple different buses or communication paths, which may be arranged in any of various forms, such as point-to-point links in hierarchical, star or web configurations, multiple hierarchical buses, parallel and redundant paths, or any other appropriate type of configuration. Furthermore, while the I/O bus interface **105** and the I/O bus **104** are shown as single respective units, the computer system **100** may in fact contain multiple I/O bus interface units **105** and/or multiple I/O buses **104**. While multiple I/O interface units are shown, which separate the system I/O bus **104** from various communications paths running to the various I/O devices, in other embodiments some or all of the I/O devices are connected directly to one or more system I/O buses.

[**0034**] The computer system **100** depicted in **FIG. 1** has multiple attached terminals **121**, **122**, **123**, and **124**, such as might be typical of a multi-user "mainframe" computer system. Typically, in such a case the actual number of attached devices is greater than those shown in **FIG. 1**, although the present invention is not limited to systems of any particular size. The computer system **100** may alternatively be a single-user system, typically containing only a single user display and keyboard input, or might be a server or similar device which has little or no direct user interface, but receives requests from other computer systems (clients). In other embodiments, the computer system **100** may be implemented as a personal computer, portable computer, laptop or notebook computer, PDA (Personal Digital Assistant), tablet computer, pocket computer, telephone, pager, automobile, teleconferencing system, appliance, or any other appropriate type of electronic device.

[**0035**] The network **130** may be any suitable network or combination of networks and may support any appropriate protocol suitable for communication of data and/or code to/from the computer system **100**. In various embodiments, the network **130** may represent a storage device or a combination of storage devices, either connected directly or indirectly to the computer system **100**. In an embodiment, the network **130** may support Infiniband. In another embodiment, the network **130** may support wireless communications. In another embodiment, the network **130** may support hard-wired communications, such as a telephone line or cable. In another embodiment, the network **130** may support the Ethernet IEEE (Institute of Electrical and Electronics Engineers) 802.3x specification. In another embodiment, the network **130** may be the Internet and may support IP (Internet Protocol).

[**0036**] In another embodiment, the network **130** may be a local area network (LAN) or a wide area network (WAN). In another embodiment, the network **130** may be a hotspot service provider network. In another embodiment, the network **130** may be an intranet. In another embodiment, the network **130** may be a GPRS (General Packet Radio Service) network. In another embodiment, the network **130** may be a FRS (Family Radio Service) network. In another embodiment, the network **130** may be any appropriate cellular data network or cell-based radio network technology. In another embodiment, the network **130** may be an IEEE 802.11B wireless network. In still another embodiment, the network **130** may be any suitable network or combination of networks. Although one network **130** is shown, in other embodiments any number (including zero) of networks (of the same or different types) may be present.

[**0037**] The client **132** includes a browser **133**, which the client uses to participate in or view the event. In another embodiment, the browser **133** is not present or not used, and the client **132** may use any appropriate mechanism to participate in the event. The client **132** may further include some or all of the hardware and/or software mechanisms previously described for the computer system **100**. Although the client **132** is illustrated as being separate from the computer system **100** and connected via the network **132**, in other embodiments the client **132** may be connected directly to the computer system **132** or may be a part of the computer system **132**.

[**0038**] It should be understood that **FIG. 1** is intended to depict the representative major components of the computer system **100**, the network **130**, and the client **132** at a high level, that individual components may have greater complexity than represented in **FIG. 1**, that components other

than or in addition to those shown in **FIG. 1** may be present, and that the number, type, and configuration of such components may vary. Several particular examples of such additional complexity or additional variations are disclosed herein; it being understood that these are by way of example only and are not necessarily the only such variations.

[**0039**] The various software components illustrated in **FIG. 1** and implementing various embodiments of the invention may be implemented in a number of manners, including using various computer software applications, routines, components, programs, objects, modules, data structures, etc., referred to hereinafter as "computer programs," or simply "programs." The computer programs typically comprise one or more instructions that are resident at various times in various memory and storage devices in the computer system **100**, and that, when read and executed by one or more processors **101** in the computer system **100**, cause the computer system **100** to perform the steps necessary to execute steps or elements comprising the various aspects of an embodiment of the invention.

[**0040**] Moreover, while embodiments of the invention have and hereinafter will be described in the context of fully-functioning computer systems, the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and the invention applies equally regardless of the particular type of signal-bearing medium used to actually carry out the distribution. The programs defining the functions of this embodiment may be delivered to the computer system **100** via a variety of signal-bearing media, which include, but are not limited to:

[**0041**] (1) information permanently stored on a non-rewriteable storage medium, e.g., a read-only memory device attached to or within a computer system, such as a CD-ROM, DVD-R, or DVD+R;

[**0042**] (2) alterable information stored on a rewriteable storage medium, e.g., a hard disk drive (e.g., the DASD **125**, **126**, or **127**), CD-RW, DVD-RW, DVD+RW, DVD-RAM, or diskette; or

[**0043**] (3) information conveyed by a communications medium, such as through a computer or a telephone network, e.g., the network **130**, including wireless communications.

[**0044**] Such signal-bearing media, when carrying machine-readable instructions that direct the functions of the present invention, represent embodiments of the present invention.

[**0045**] Embodiments of the present invention may also be delivered as part of a service engagement with a client corporation, nonprofit organization, government entity, internal organizational structure, or the like. Aspects of these embodiments may include configuring a computer system to perform, and deploying software systems and web services that implement, some or all of the methods described herein. Aspects of these embodiments may also include analyzing the client company, creating recommendations responsive to the analysis, generating software to implement portions of the recommendations, integrating the software into existing processes and infrastructure, metering use of the methods and systems described herein, allocating expenses to users, and billing users for their use of these methods and systems.

[**0046**] In addition, various programs described hereinafter may be identified based upon the application for which they are implemented in a specific embodiment of the invention. But, any particular program nomenclature that follows is used merely for convenience, and thus embodiments of the invention should not be limited to use solely in any specific application identified and/or implied by such nomenclature.

[**0047**] The exemplary environments illustrated in **FIG. 1** are not intended to limit the present invention. Indeed, other alternative hardware and/or software environments may be used without departing from the scope of the invention.

[**0048**] **FIG. 2** depicts a block diagram of an example data structure for the event data **144**, according to an embodiment of the invention. The event data **144** includes records **205**, **210**, **215**, **220**, **225**, and **230**, but in other embodiments any number of records with any appropriate data may be present. Each of the records includes an event identifier field **235**, a virtual event identifier field **240**, and a viewer field **245**. The event identifier field **235** identifies an event in which users may participate. In an embodiment, an event may be a game or a station or table for a game. Examples of games include card games, video games, or any other type of game or competition. In another embodiment, an event may be an auction or sale of goods or services, regardless of whether users bid on the goods or services or whether the price is fixed. In another embodiment, an event may be any type of event in which users participate, regardless of whether the event is competitive or whether money or prizes are involved. In various embodiments, participation by a user may be active or passive and may involve viewing, playing, bidding, buying, selling, receiving information, inputting information, or any other appropriate type of participation.

[**0049**] The virtual event identifier field **240** identifies the event **235** to the viewer **245**, who does not receive the event identifier **235**. In an embodiment, the event controller **136** may generate the virtual event identifier **240** randomly via any appropriate technique. The virtual event identifiers **240** are different for each viewer **245**. A viewer **245** is a user who participates in the event **235** and who may view the virtual event identifier **240**, which represents the event **235**. In various embodiments, the viewer **245** may view identifiers via any appropriate mechanism, including visual, audio, tactile, or any other appropriate identifier presentation mechanism.

[**0050**] Thus, each of the records **205**, **210**, **215**, **220**, **225**, and **230** represents the virtual event identifier **240** that the event controller **136** presents to the viewer **245** to represent the event identifier **235** when the viewer **245** participates in the event **235**. For example, record **205** illustrates that if "user C" participates in "event A," then "event A" is presented to "user C" as "vevent U." Similarly, record **210** illustrates that if "user D" participates in "event A," then "event A" is presented to "user D" as "vevent V." Similarly, record **215** illustrates that if "user E" participates in "event A," then "event A" is presented to "user E" as "vevent W." Similarly, record **220** illustrates that if "user C" participates in "event B," then "event B" is presented to "user C" as "vevent X." Similarly, record **225** illustrates that if "user D" participates in "event B," then "event B" is presented to "user E" as "vevent Y." Similarly, record **230** illustrates that if "user E" participates in "event B," then "event B" is presented to "user E" as "vevent Z."

[0051] **FIG. 3** depicts a block diagram of an example data structure for the user data **146**, according to an embodiment of the invention. The user data **146** includes records **305**, **310**, **315**, **320**, **325**, **330**, **335**, **340**, **345**, and **350**, but in other embodiments any number of records with any appropriate data may be present. Each of the records includes an event identifier field **360**, a user identifier field **365**, a virtual user identifier field **370**, and a viewer field **375**.

[0052] The event identifier field **360** identifies an event in which users may participate. The user identifier field **365** identifies a user who participates in the event **360**. The virtual user identifier field **370** identifies the user **365** to the viewer **375**, who does not receive the user identifier **365**. The virtual user identifiers **370** are unique to the viewers **375** and are also unique to the events **360**. Thus, the user **365** has a different virtual user identifier **370** when viewed by each viewer **375** and also has a different virtual user identifier **370** when the user **365** participates in a different event **360**, for each viewer **375**. The viewer **375** is a user who participates in the event **360** and may be the same or different from the user **365**.

[0053] Thus, each of the records **305**, **310**, **315**, **320**, **325**, **330**, **335**, **340**, **345**, and **350** represents the virtual user identifier **370** that is to be presented to the viewer **375** to represent the user identifier **365** when participating in the event **360**. For example, the record **305** illustrates that if "user C" participates in "event A," then "user C" is presented to "user C" as "vuser L." Similarly, record **310** illustrates that if "user C" participates in "event A," then "user C" is presented to "user D" as "vuser M." Similarly, record **315** illustrates that if "user C" participates in "event A," then "user C" is presented to "user E" as "vuser N." Similarly, record **320** illustrates that if "user D" participates in "event A," then "user D" is presented to "user C" as "vuser R." Similarly, record **325** illustrates that if "user D" participates in "event A," then "user D" is presented to "user D" as "vuser S." Similarly, record **330** illustrates that if "user D" participates in "event A," then "user D" is presented to "user E" as "vuser T." Similarly, record **335** illustrates that if "user E" participates in "event A," then "user E" is presented to "user C" as "vuser W." Similarly, record **340** illustrates that if "user E" participates in "event A," then "user E" is presented to "user D" as "vuser X." Similarly, record **345** illustrates that if "user E" participates in "event A," then "user E" is presented to "user E" as "vuser Y." Similarly, record **350** illustrates that if "user C" participates in "event B," then "user C" is presented to "user C" as "vuser Z."

[0054] **FIGS. 4A, 4B**, and **4**C depict blocks diagrams of example user interfaces **401**, **402**, and **403**, respectively, for the same event ("event A" of **FIGS. 2 and 3**) in which "user C,""user D," and "user E" participate, as viewed by different viewers: "user C,""user D," and "user E," respectively, as illustrated in the examples of **FIGS. 2 and 3**.

[0055] **FIG. 4A** depicts a block diagram of an example user interface **401** for "Event A," in which "user C,""user D," and "user E" participate, where "user C" is the viewer **375** of the user interface **401**, according to an embodiment of the invention. In the example user interface **401**, the event **235** of "event A" is presented to the viewer **375** ("user C") as virtual event "vevent U"**412**, as represented in record **205** of the event data **144**. The user **365** of "user C" is presented to the viewer **375** ("user C") as the virtual user vuser L **410**, as represented in record **305** of the user data **146**. The user **365** of "user D" is presented to the viewer **375** ("user C") as the virtual user vuser R **415**, as represented in record **320** of the user data **146**. The user **365** of "user E" is presented to the viewer **375** ("user C") as the virtual user vuser W **420**, as represented in record **335** of the user data **146**. The event identifier **235** ("event A") and the user identifiers **365** ("user C,""user D," and "user E") are not presented in the user interface **401**; instead, the virtual event identifiers **240** (**FIG. 2**) and virtual user identifiers **370** (**FIG. 3**) are presented to the viewer **375** ("user C").

[0056] **FIG. 4B** depicts a block diagram of an example user interface **402** for "Event A," in which "user C,""user D," and "user E" participate, where "user D" is the viewer **375** of the user interface **402**, according to an embodiment of the invention. In the example user interface **402**, the event **235** of "event A" is presented to the viewer "user D" as virtual event "vevent V"**422**, as represented in record **210** of the event data **144**. The user **365** of "user C" is presented to the viewer "user D" as the virtual user vuser M **425**, as represented in record **310** of the user data **146**. The user **365** of "user D" is presented to the viewer "user D" as the virtual user vuser S **430**, as represented in record **325** of the user data **146**. The user **365** of "user E" is presented to the viewer "user D" as the virtual user vuser X **435**, as represented in record **340** of the user data **146**. The event identifier **235** ("event A") and the user identifiers **365** ("user C,""user D," and "user E") are not presented in the user interface **402**; instead, the virtual event identifiers **240** (**FIG. 2**) and virtual user identifiers **370** (**FIG. 3**) are presented to the viewer **375** ("user D").

[0057] **FIG. 4C** depicts a block diagram of an example user interface **403** for "Event A," in which "user C,""user D," and "user E" participate, where "user E" is the viewer **375** of the user interface **403**, according to an embodiment of the invention. In the example user interface **403**, the event **235** of "event A" is presented to the viewer "user E" as virtual event "vevent W"**432**, as represented in record **215** of the event data **144**. The user **365** of "user C" is presented to the viewer "user E" as the virtual user vuser N **440**, as represented in record **315** of the user data **146**. The user **365** of "user D" is presented to the viewer "user E" as the virtual user vuser T **445**, as represented in record **330** of the user data **146**. The user **365** of "user E" is presented to the viewer "user E" as the virtual user vuser Y **450**, as represented in record **345** of the user data **146**. The event identifier **235** ("event A") and the user identifiers **365** ("user C,""user D," and "user E") are not presented in the user interface **403**; instead, the virtual event identifiers **240** (**FIG. 2**) and virtual user identifiers **370** (**FIG. 3**) are presented to the viewer **375** ("user E").

[0058] In this way, the virtual event identifiers **240** and the virtual user identifiers **370** are unique values that only one viewer sees. Further, the virtual event identifiers **240** remain consistent for the viewer **245** throughout that user's session, allowing users to move from event to event, and return to events where they have participated earlier in the session. Another user views the same events, but with a different set of virtual event identifiers **240**. Thus, users are hampered from making arrangements to both join the same event **235**, since they know the same event by different virtual event identifiers **240**. For example, if "user C" and "user D" both

wish to join "event A" and collaborate, doing so is difficult because "user C" knows "event A" only as "vevent U" (**FIG. 4A**) while "user D" knows "event A" only as "vevent V" (**FIG. 4B**). Thus, if "user C" instructs "user D" to join "vevent U," this information does not allow "user D" to find the event **235** in which "user C" participates.

[**0059**] In addition, "user C" and "user D" cannot search all events for each other's user identifiers **365** since "user C" is presented to "user C" as "vuser L" in "event A," but "user C" is presented to "user D" as "vuser M" in "event A." Thus, if "user C" instructs "user D" to join the event where "vuser L" is participating, "user D" will not find such a virtual user identifier **370**.

[**0060**] **FIG. 5** depicts a flowchart of example processing for adding events to the event data **144**, according to an embodiment of the invention. Control begins at block **500**. Control then continues to block **505** where the event controller **136** decides to add more events to the event data **144**. The event controller **136** may make the determination at block **505** based on a request from a system administrator, based on a threshold being reached, based on a request from another program, or based on any other stimulus or criteria. Control then continues to block **505** where the event controller **136** generates additional records in the event data **144** for the new events **235** and virtual event identifiers **240** for users who may be potential viewers **245** of the new events **235**. Thus, the event controller **136** generates virtual event identifiers **240** for the new event **235**, where each of the virtual event identifiers **240** is unique to its associated viewer **245**. Control then continues to block **599** where the logic of **FIG. 5** returns.

[**0061**] **FIG. 6** depicts a flowchart of further example processing for adding a user to an event, according to an embodiment of the invention. Control begins at block **600**. Control then continues to block **605** where a user views or begins participating in an event **360**. Control then continues to block **610** where the event controller **136** generates a virtual event identifier **240** for the viewer **245** and a new record in the event data **144** if the virtual event identifier **240** associated with the user does not already exist. The event controller **136** further generates a virtual user identifier **370** that represents the user **365** for all the viewers **375** participating in or viewing the event **360**. Thus, the event controller **136** generates virtual user identifiers **370** associated with a user **365**, each of the virtual user identifiers **370** identifies the user **365** (who is joining the event), and each of the virtual user identifiers **370** is unique both to its user **365** and to its viewer **375**. In various embodiments, the event controller **136** may generate the virtual user identifiers **370** based on a function of the user identifier **365**, based on generating a unique random number used as an index into a table of nicknames (which may be any type of name or other identifier), or based on any other appropriate technique.

[**0062**] Control then continues to block **615** where the event controller **136** presents selected virtual event identifiers **240** and selected virtual user identifiers **370** to selected viewers **375** of the event. In an embodiment, the event controller **136** performs the presentation by creating the page **148** and sending the page **148** to the client **132**. Control then continues to block **699** where the logic of **FIG. 6** returns.

[**0063**] In the previous detailed description of exemplary embodiments of the invention, reference was made to the accompanying drawings (where like numbers represent like elements), which form a part hereof, and in which is shown by way of illustration specific exemplary embodiments in which the invention may be practiced. These embodiments were described in sufficient detail to enable those skilled in the art to practice the invention, but other embodiments may be utilized and logical, mechanical, electrical, and other changes may be made without departing from the scope of the present invention. Different instances of the word "embodiment" as used within this specification do not necessarily refer to the same embodiment, but they may. The previous detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[**0064**] In the previous description, numerous specific details were set forth to provide a thorough understanding of embodiments of the invention. But, the invention may be practiced without these specific details. In other instances, well-known circuits, structures, and techniques have not been shown in detail in order not to obscure the invention.

What is claimed is:

1. A method comprising:

generating a first plurality of virtual user identifiers for a user, wherein the user participates in a first event, and wherein each of the first plurality of virtual user identifiers is unique to each of a first plurality of respective viewers of the virtual user identifiers.

2. The method of claim 1, further comprising:

generating a first plurality of virtual event identifiers for the first event, wherein each of the first plurality of virtual event identifiers is unique to the first plurality of viewers of the first plurality of virtual event identifiers.

3. The method of claim 2, further comprising:

generating a second plurality of virtual user identifiers for the user, wherein the user participates in a second event, and wherein each of the second plurality of virtual user identifiers is unique to each of a second plurality of viewers of the virtual user identifiers, and wherein each of the second plurality of virtual user identifiers is different from each of the first plurality of virtual user identifiers.

4. The method of claim 3, further comprising:

generating a second plurality of virtual event identifiers for -the second event, wherein each of the second plurality of virtual event identifiers is unique to the second plurality of viewers of the second plurality of virtual event identifiers, and wherein each of the second plurality of virtual event identifiers is different from each of the first plurality of virtual event identifiers.

5. The method of claim 1, wherein the first event comprises a game.

6. The method of claim 1, wherein the first event comprises an auction.

7. The method of claim 2, further comprising:

presenting the first plurality of virtual user identifiers to the first plurality of respective viewers.

8. A signal-bearing medium encoded with instructions, wherein the instructions when executed comprise:

generating a first plurality of virtual user identifiers for a user, wherein the user participates in a first event, and

wherein each of the first plurality of virtual user identifiers is unique to each of a first plurality of viewers of the virtual user identifiers; and

generating a first plurality of virtual event identifiers for the first event, wherein each of the first plurality of virtual event identifiers is unique to the first plurality of viewers of the first plurality of virtual event identifiers.

9. The signal-bearing medium of claim 8, further comprising:

generating a second plurality of virtual user identifiers for the user, wherein the user participates in a second event, and wherein each of the second plurality of virtual user identifiers is unique to each of a second plurality of viewers of the virtual user identifiers, and wherein each of the second plurality of virtual user identifiers is different from each of the first plurality of virtual user identifiers.

10. The signal-bearing medium of claim 9, further comprising:

generating a second plurality of virtual event identifiers for the second event, wherein each of the second plurality of virtual event identifiers is unique to the second plurality of viewers of the second plurality of virtual event identifiers, and wherein each of the second plurality of virtual event identifiers is different from each of the first plurality of virtual event identifiers.

11. The signal-bearing medium of claim 8, wherein the first event comprises a game.

12. The signal-bearing medium of claim 8, wherein the first event comprises an auction.

13. The signal-bearing medium of claim 8, further comprising:

presenting the first plurality of virtual user identifiers to the first plurality of respective viewers.

14. The signal-bearing medium of claim 9, further comprising:

presenting the second plurality of virtual user identifiers to the second plurality of respective viewers.

15. A method for configuring a computer, comprising:

configuring the computer to generate a first plurality of virtual user identifiers for a user, wherein the user participates in a first event, and wherein each of the first plurality of virtual user identifiers is unique to each of a first plurality of viewers of the virtual user identifiers;

configuring the computer to generate a first plurality of virtual event identifiers for the first event, wherein each of the first plurality of virtual event identifiers is unique to the first plurality of viewers of the first plurality of virtual event identifiers; and

configuring the computer to generate a second plurality of virtual user identifiers for the user, wherein the user participates in a second event, and wherein each of the second plurality of virtual user identifiers is unique to each of a second plurality of viewers of the virtual user identifiers, and wherein each of the second plurality of virtual user identifiers is different from each of the first plurality of virtual user identifiers.

16. The method of claim 15, further comprising:

configuring the computer to generate a second plurality of virtual event identifiers for the second event, wherein each of the second plurality of virtual event identifiers is unique to the second plurality of viewers of the second plurality of virtual event identifiers, and wherein each of the second plurality of virtual event identifiers is different from each of the first plurality of virtual event identifiers.

17. The method of claim 15, wherein the first event comprises a game.

18. The method of claim 15, wherein the first event comprises an auction.

19. The method of claim 15, further comprising:

configuring the computer to present the first plurality of virtual user identifiers to the first plurality of respective viewers.

20. The method of claim 15, further comprising:

configuring the computer to present the second plurality of virtual user identifiers to the second plurality of respective viewers.

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