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(54) **Title:** A COLLABORATION MANAGEMENT SYSTEM

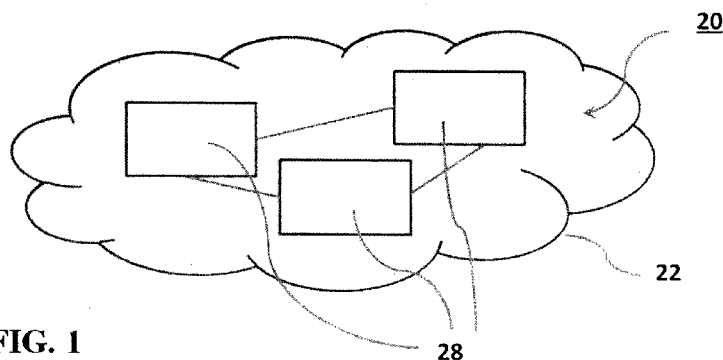


FIG. 1

(57) **Abstract:** Known computer peripheral devices are typically interchangeable and can be used with different computers systems and platforms. Most computer operating systems are able to automatically configure the coupled computer peripheral device for use with the computer operating system without the need for installation of a specific driver. However, when these peripheral devices are detected by the computer system, a generic UI control configuration is often assigned to them and whatever customised settings previously configured by the user will be lost and replaced with a new set of unfamiliar settings. Described according to an embodiment of the invention is a collaboration management system initiating a collaboration session for a plurality of computing systems having user-interfaces (UIs) coupled thereto. The collaboration management system discovers the device profiles corresponding to the UIs for extracting corresponding configuration specific to each of the UIs for configuring interactions between the UIs and an application operating during the collaboration session.



A COLLABORATION MANAGEMENT SYSTEM

Field of Invention

The present invention relates generally to an online collaboration management system. In particular, the invention relates to a system and method for managing concurrent manipulation of data set by different computer peripherals utilising different setting configurations.

Background

Known computer peripheral devices are typically interchangeable and can be used with different computers systems and platforms. Most computer operating systems are able to automatically configure the coupled computer peripheral device for use with the computer operating system without the need for installation of a specific driver. However, when these peripheral devices are detected by the computer system, a default UI control configuration is often assigned to them and whatever customised settings previously configured by the user will be lost and replaced with a new set of unfamiliar settings.

Similarly, in a video-conference setting, where multiple users from various terminals have access to a single set of data, a generic UI control configurations is often assigned to the various devices plugged into the terminals. These control configurations allow for manipulation of the single dataset, be it to rotate one or more objects generated from the dataset or to edit the dataset. However, due to the random assignment of control configurations to the various devices, users will have to test out these configurations in order to have a good grasp in using the device for manipulation of the dataset. An alternative would be to re-configure the control settings to one which the users are familiar with. These approaches pose much inconvenience especially if the users do not have the luxury of time to deal with these configuration settings.

In the gaming context, multiple users may access a gaming terminal from different access point to collaborate in a game play. Frequent gamers often have a preferred control configuration, for example, the keys to press for initiating a punch or to engage a weapon. Familiarity in these configurations would confer speed and accuracy in the game play. Other

gamers have their preferred devices for example, a gaming mouse, keyboard, keypad or a joystick, for use in a particular game. When multiple users utilise different gaming devices in a single game play, their preferred configurations are lost and replaced with an unfamiliar set of control configurations. There is therefore an apparent need for a system and method
5 whereby multiple users are able to concurrently interact with a single set of data from different terminals in their preferred manner using different devices.

Summary

In accordance with a first aspect of the invention, there is disclosed a collaboration
10 management system comprising a session module and a discovery module. The session module is for initiating a collaboration session between a plurality of computing systems and for managing interactions between the plurality of computing systems and an application. Each of the plurality of computing system has a user-interface (UI) in signal communication therewith. The discovery module is for cooperating with the plurality of computing systems
15 to discover, for each of the plurality of computing systems, device data being descriptive of the UI and user interactions identifiable by the UI in signal communication therewith. The discovery module assigns one of a plurality of configuration data associated with at least one of the device data and identifier data providable by a user of the UI for each of the plurality of computing system. The configuration data assigned to each of the plurality of computing
20 system defines interaction of the UI in signal communication therewith with the application during the collaboration session.

In accordance with a second aspect of the invention, there is disclosed a collaboration
25 management method comprising initiating a collaboration session between a plurality of computing systems. The collaboration is initiated by a session module for managing interactions between the plurality of computing systems and an application. Each of the plurality of computing system has a user-interface (UI) in signal communication therewith. The collaboration management method further comprises discovering, by a discovery module for each of the plurality of computing systems, device data being descriptive of the UI and
30 user interactions identifiable by the UI in signal communication therewith. The discovery module assigning one of a plurality of configuration data associated with at least one of the device data and identifier data providable by a user of the UI for each of the plurality of

computing system. The configuration data assigned to each of the plurality of computing system defines interaction of the UI in signal communication therewith with the application during the collaborative session.

5 In accordance with a third aspect of the invention, there is disclosed a machine readable medium having stored therein a plurality of programming instructions, when executed, cause the machine to initiate a collaboration session between a plurality of computing systems. The collaboration is initiated by a session module for managing interactions between the plurality of computing systems and an application. Each of the plurality of computing system has a
10 user-interface (UI) in signal communication therewith. The plurality of programming instructions, when executed, further cause the machine to discover, by a discovery module for each of the plurality of computing systems, device data being descriptive of the UI and user interactions identifiable by the UI in signal communication therewith. The discovery module assigning one of a plurality of configuration data associated with at least one of the device
15 data and identifier data providable by a user of the UI for each of the plurality of computing system. The configuration data assigned to each of the plurality of computing system defines interaction of the UI in signal communication therewith with the application during the collaborative session.

20 **Brief Description of the Drawings**

FIG. 1 shows a system diagram of a collaboration management system residing on a computing cloud according to an exemplary embodiment of the invention;

FIG. 2 shows a system diagram of the collaboration management system of FIG. 1 with user-
25 interfaces in signal communication with computing systems coupled thereto; and

FIG. 3 shows a process flow diagram of a collaboration management method for implementation by the collaboration management system of FIG. 1.

Detailed Description

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

For purposes of brevity and clarity, descriptions of embodiments of the present invention are limited hereinafter to the collaboration and management of a single data set by a plurality of users using different computer peripherals with different configuration settings. This however does not preclude embodiments of the invention where fundamental principals prevalent among the various embodiments of the invention such as operational, functional or performance characteristics are required.

An exemplary embodiment of the invention, a collaboration management system 20, is described hereinafter and shown in FIG 1. The collaboration management system 20, residing on a computing cloud 22, is preferably for managing interactions between a plurality of computing systems 24 and an application 26 in communication with a computing cloud 22. Further described is a collaboration management method 100 applied by the collaboration management system 20 for its intended purpose.

Preferably, the computing cloud 22 comprises one or multiple server systems 28 inter-networked and configured to function as the collaboration management system 20. Communication pathway between the computing cloud 22 and the computing system 24 is preferably provided by a local area network (LAN), a wide area network (WAN), the

Internet, cellular networks, data networks, dedicated networks or a combination of any thereof.

5 The collaboration management system 20 comprises a session module 30 for initiating a collaboration session between a plurality of computing systems 24 and an application 26, a discovery module 32 to discover, for each of the plurality of computer systems 24, device data 34 of a user interface 35 (UI 35) in signal communication therewith and to thereby assign one of the plurality of configuration data 36 stored on the collaboration management system 20 to the computing system 24 for defining interactions between each of computing
10 systems 24 and the UI 35 in signal communication therewith. Each of the plurality of computing systems 24 in signal communication with the device data 34 is able to download one of the configuration data 36 unique to their devices for manipulation of a single dataset 38 managed by the application 26.

15 The collaboration management system 20 further comprises a storage module 40 for storing the plurality of configuration data 36. Each of the plurality of configuration data 36 has at least one of a device profile 42 and a user identifier 44 associated therewith for use in identifying association between one of the plurality of the configuration data 36 with at least one of the device data 34 and an identifier data 48 receivable from each of the plurality of the
20 computing system 24.

The collaboration management method 100 comprises a step 102 of initiating a collaboration session by the session module 30 between the plurality of computing systems 24 and the application 26. The collaboration management method 100 further comprises a step 104 of
25 discovering, by the discovery module 32 for each of the plurality of computer systems 24, device data 34 in signal communication therewith and thereby assigning the corresponding configuration data 36 stored in the collaboration management system 20 to the computing system 24.

30 When a plurality of computing system 24 is in network communication with the computing cloud 22 and logged onto the collaboration management system 20, the session module 30 performs the step 102 and manages interactions between the plurality of computing systems

24 and the application 26. The application 26 can be one of a gaming application, where a plurality of gamers are concurrently involved in a gaming session or any other software application whereby a single dataset 38 is presented for access or concurrent manipulation by each of the plurality of users at each of the plurality of computer systems 24 in network communication with the collaboration management system 20. Device type of the UI 35 coupled to one of the computing systems, wired or wirelessly, may differ from the device type of the UI 35 coupled to another of the computing systems 24. Therefore, device-specific configuration settings are required for different devices to effect similar control signals to manipulate the single dataset 38 or virtual objects generated therefrom. The device data 34 is descriptive of user interactions identifiable by the UI 35. For example, if the UI 35 is a 3D mouse, the user interactions identifiable by the 3D mouse would include free-space movement or position, scrolling actions and actuation of specific buttons existing on the 3D mouse. However, if the UI 35 is a multi-touch interface, the user interactions identifiable by the multi-touch interface would include locations of one or more points and gestures generatable by the one or more touch points on the multi-touch interface. Therefore, the user interactions identifiable and hence the device data when the UI 35 is a 3D mouse differs from when the UI 35 is a multi-touch interface.

Preferably, the UI 35 in signal communication with each of the plurality of computing systems 24 is a computer peripheral. Alternatively, the UI 35 is at least one of device for at least one of input sensing and providing sensory output. Examples of the UI 35 include but are not limited to gaming console, joystick, computer mouse, keyboard and speakers. Alternatively, the UI 35 includes devices which are connectable for use with or forms part of the computer system 24, for example, the touch screen interface of a cell phone and smart phones.

Preferably, the step 104 occurs in response to or in preparation for the initiation of the collaboration session. The computing system 24 generates the device data 34 for the UI 35 when the UI 35 is recognised thereby. During the step 104, the user may be required to manually log-onto the collaboration management system 20 by providing the identifier data 48 for extraction of device profile 42 associated therewith. The discovery module 32 then assigns one of the plurality of configuration data 36 associated with at least one of the device

data 34 and the identifier data 48 to each of the plurality of computing system 24. The configuration data 36 assigned to each of the plurality of computing systems 24 defines interaction of the UI 35 in signal communication therewith with the application 26 during the collaboration session.

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At least one of the plurality of configuration data 36 associates control signals generatable by the UI 35 of one of the plurality of the computing systems 24 with one of the plurality of instructions executable by the application 26. Consequently, different types of the UIs 35 in signal communication with the plurality of computing systems 24 will consequently be able to provide control signals to the application 26 for execution of at least one of the plurality of substantially identical instructions using different configuration data 36. For example, the generation of control signals to rotate an object can be effected by either a rotational gesture on the multi-touch screen device coupled to one of the computing systems 24 and rotational movement on a joystick connected to another of the computing systems 24. Preferably, the configuration data 36 are editable or replaceable with another of the plurality of configuration data 36 during the collaboration session.

Preferably, the application 26 is substantially concurrent and operable by the plurality of computing systems 24 via the UI 35 of each for manipulating a single dataset 38. Manipulation of a single dataset 38 comprises at least one of editing, deleting from and adding to the single dataset 38. Preferably, the single dataset 38 is able to generate at least one object to be provided to the plurality of computing systems 24 for display by the UI 35 with display capability. The configuration data 36 is further able to determine the display preference of at least one object by the UI 35 with display capability of each of the corresponding computing systems 24.

When a plurality of users log onto the collaboration management system 20, the collaboration management system 20 detects the UI 35 in signal communication with each of the plurality of the computing systems 24 and thereafter assigns one of the configuration data 36 in association with at least one of the device data 34 and the identifier data 48 to the respective computing system 24. Assignment of the configuration data 36 can either be automated upon detection of UI 35 by the collaboration management system 20 or be manually controlled by

the user. Each user further has the option to edit or replace the configuration data 36 assigned during the collaboration session. Each configuration data 36 is associated with at least one of a plurality of device profile 42. At least one of a plurality of device profile 42 is associated with an user identifier 44 such that a single user may have more than one device profile 42 associated with the configuration data 36 stored in the storage module 40 in the collaboration management system 20.

The collaboration management system 20 allows each user to concurrently manipulate a single dataset 38, or virtual objects generated from the single dataset, with their preferred device configuration settings. For new users of the collaboration management system 20, the new user is able to download default configuration settings, specifically one of the configuration data 36, substantially matching with the device data 34 provided to the computing system 24, from the collaboration management system 20.

The collaboration management system 20 can also function with a single computing system 24 where a plurality of users are able to manipulate a single dataset 38 using different UI 35. The collaboration management system 20 enables the users to download their preferred configuration settings to the computing system 20 wherewith their UIs 25 are coupled. This way, even a single terminal is able to translate the different configuration settings to execute similar control signals to manipulate a single dataset 38.

In an example of use of the collaboration management system 20, a first user couples a 3D mouse to a first one of the computing systems 24 while a second user couples a 2D mouse with a second one of the computing systems 24 during a collaboration session for viewing a 3D object generated by the application 26 from the dataset 38. The default configurations for rotating the 3D object about its x-axis may be rotating the 3D mouse about its x-axis or displacing the 2D mouse along its y-axis while depressing a left button thereon. These may be interactions unfamiliar or counter-intuitive to the first and second users. By providing the user name as the identifier data 48 of each of the first and second users and the device data 34 descriptive of each of the 3D mouse and the 2D mouse during log-on to the collaboration management system 20, the configuration data 36 corresponding to the first user for the 3D mouse and for the second user for the 2D mouse can be provided to respectively the first one

and the second one of the computing systems 24. The configuration data 36 contains the preferred configurations of the first user and the second user. When the corresponding configuration data 36 is applied to each of the first one and second one of the computing systems 24, rotating the 3D mouse about its z-axis now rotates the 3D object about its x-axis while displacing the 2D mouse along its y-axis without depressing its left button will rotate the 3D object about its x-axis. The configuration data 36 for any of the 2D mouse and the 3D mouse could include one or more of button configuration, scroll-wheel and mouse displacement sensitivity and lighting or haptic feedback response to the gaming mouse. The availability of the configuration data 36 allows the user to quickly configure the gaming mouse, or other UIs 35, when used on a different computer.

The collaboration management method 100 preferably exists on the collaboration management system 20 as a plurality of instructions stored on a machine readable medium constituting part of the computing cloud 22. It is preferred that the instructions, when executed, cause the profile management system to perform the step of the collaboration management method 100.

In a forgoing manner, a collaboration management system and a collaboration management method are described according to exemplary embodiments of the invention. Although only a number of embodiments of the invention are disclosed in this document, it will be apparent to one skilled in the art in view of this disclosure that numerous changes and/or modifications can be made to the disclosed embodiments without departing from the scope and spirit of the invention.

Claims

1. A collaboration management system comprising:

a session module for initiating a collaboration session between a plurality of computing systems and for managing interactions between the plurality of computing systems and an application, each of the plurality of computing system having a user-interface (UI) in signal communication therewith; and

a discovery module for cooperating with the plurality of computing systems to discover, for each of the plurality of computing systems, device data being descriptive of the UI and user interactions identifiable by the UI in signal communication therewith, the discovery module assigning one of a plurality of configuration data associated with at least one of the device data and identifier data providable by a user of the UI for each of the plurality of computing system;

wherein the configuration data assigned to each of the plurality of computing system defines interaction of the UI in signal communication therewith with the application during the collaboration session.

2. The collaboration management system as in claim 1, the UI in signal communication with each of the plurality of computing systems being a computing peripheral.

3. The collaboration management system as in claim 1, the UI in signal communication with each of the plurality of computing systems being at least one device for at least one of input sensing and providing sensory output.

4. The collaboration management system as in claim 1, the application for executing a plurality of instructions and the UI of each of the plurality of computing devices for generating a plurality of control signals, at least one of the plurality of configuration data associating at least one of the plurality of control signals generatable by the UI of one of the plurality of computing systems with one of the plurality of instructions executable by the application.

5. The collaboration management system as in claim 4, the application being substantially concurrently operable by the plurality of computing system via the UI of each thereof for manipulating a single dataset.

5 6. The collaboration management system as in claim 5, manipulating the single dataset comprises at least one of editing, deleting from and adding to the single dataset.

7. The collaboration management system as in claim 5, the single dataset for generating at least one object being provided to the plurality of computing systems for display by the UI of each thereof.

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8. The collaboration management system as in claim 7, the configuration data assigned to each of the plurality of computing systems further determining display preference of the at least one object by the UI of the each of the plurality of computing systems.

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9. The collaboration management system as in claim 1, further comprising:

a storage module for storing the plurality of configuration data, each of the plurality of configuration data having at least one of a configuration profile and a user profile associated therewith for use in identifying association between one of the plurality of configuration data with at least one of the device data and the user data of each of the plurality of computing systems.

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10. The collaboration management system as in claim 1, the one of the plurality of configuration data assigned to each of the plurality of computing system being at least one of editable and replaceable with another of the plurality of configuration data during the collaboration session.

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11. A collaboration management method comprising:

5 initiating a collaboration session between a plurality of computing systems, the collaboration being initiated by a session module for managing interactions between the plurality of computing systems and an application, each of the plurality of computing system having a user-interface (UI) in signal communication therewith; and

10 discovering, by a discovery module for each of the plurality of computing systems, device data being descriptive of the UI and user interactions identifiable by the UI in signal communication therewith, the discovery module assigning one of a plurality of configuration data associated with at least one of the device data identifier data providable by a user of the UI for each of the plurality of computing system;

15 wherein the configuration data assigned to each of the plurality of computing system defines interaction of the UI in signal communication therewith with the application during the collaborative session.

12. The collaboration management method as in claim 11, the UI in signal communication with each of the plurality of computing systems being a computing peripheral.

13. The collaboration management method as in claim 11, the UI in signal communication with each of the plurality of computing systems being at least one device for at least one of input sensing and providing sensory output.

14. The collaboration management method as in claim 11, the application for executing a plurality of instructions and the UI of each of the plurality of computing systems for generating a plurality of control signals, at least one of the plurality of configuration data associating at least one of the plurality of control signals generatable by the UI of one of the plurality of computing systems with one of the plurality of instructions executable by the application.

15. The collaboration management method as in claim 14, the application being substantially concurrently operable by the plurality of computing system via the UI of each thereof for manipulating a single dataset.
- 5 16. The collaboration management method as in claim 15, manipulating the single dataset comprises at least one of editing, deleting from and adding to the single dataset.
- 10 17. The collaboration management method as in claim 15, the single dataset for generating at least one object being provided to the plurality of computing systems for display by the UI of each thereof.
- 15 18. The collaboration management method as in claim 17, the configuration data assigned to each of the plurality of computing systems further determining display preference of the at least one object by the UI of the each of the plurality of computing systems.
- 20 19. The collaboration management method as in claim 11, the plurality of configuration data being stored on a storage module, each of the plurality of configuration data having at least one of a configuration profile and a user profile associated therewith for use in identifying association between one of the plurality of configuration data with at least one of the device data and the user data of each of the plurality of computing system.
- 25 20. The collaboration management method as in claim 11, the one of the plurality of configuration data assigned to each of the plurality of computing system being at least one of editable and replaceable with another of the plurality of configuration data during the collaboration session.

21. A machine readable medium having stored therein a plurality of programming instructions, which when executed, cause the machine to:

initiate a collaboration session between a plurality of computing systems, the collaboration being initiated by a session module for managing interactions between the plurality of computing systems and an application, each of the plurality of computing system having a user-interface (UI) in signal communication therewith; and

discover, by a discovery module for each of the plurality of computing systems, device data being descriptive of the UI and user interactions identifiable by the UI in signal communication therewith, the discovery module assigning one of a plurality of configuration data associated with at least one of the device data and identifier data providable by a user of the UI for each of the plurality of computing system;

wherein the configuration data assigned to each of the plurality of computing system defines interaction of the UI in signal communication therewith with the application during the collaborative session.

22. The machine readable medium as in claim 21, the UI in signal communication with each of the plurality of computing systems being a computing peripheral.

23. The machine readable medium as in claim 21, the UI in signal communication with each of the plurality of computing systems being at least one device for at least one of input sensing and providing sensory output.

24. The machine readable medium as in claim 21, the application for executing a plurality of instructions and the UI of each of the plurality of computing systems for generating a plurality of control signals, at least one of the plurality of configuration data associating at least one of the plurality of control signals generatable by the UI of one of the plurality of computing systems with one of the plurality of instructions executable by the application.

25. The machine readable medium as in claim 24, the application being substantially concurrently operable by the plurality of computing system via the UI of each thereof for manipulating a single dataset.

5 26. The machine readable medium as in claim 25, manipulating the single dataset comprises at least one of editing, deleting from and adding to the single dataset.

27. The machine readable medium as in claim 25, the single dataset for generating at least one object being provided to the plurality of computing systems for display by the UI
10 of each thereof.

28. The machine readable medium as in claim 27, the configuration data assigned to each of the plurality of computing systems further determining display preference of the at least one object by the UI of the each of the plurality of computing systems.

15 29. The machine readable medium as in claim 21, the plurality of configuration data being stored on a storage module, each of the plurality of configuration data having at least one of a configuration profile and a user profile associated therewith for use in identifying association between one of the plurality of configuration data with at least
20 one of the device data and the user data of each of the plurality of computing system.

30. The machine readable medium as in claim 21, the one of the plurality of configuration data assigned to each of the plurality of computing system being at least one of
25 editable and replaceable with another of the plurality of configuration data during the collaboration session.

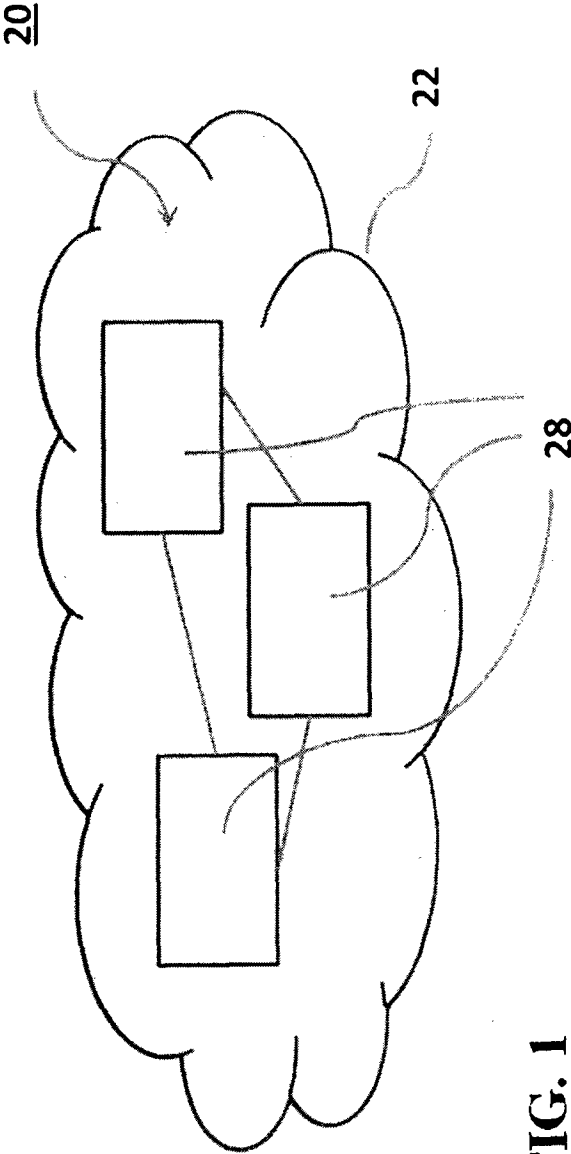


FIG. 1

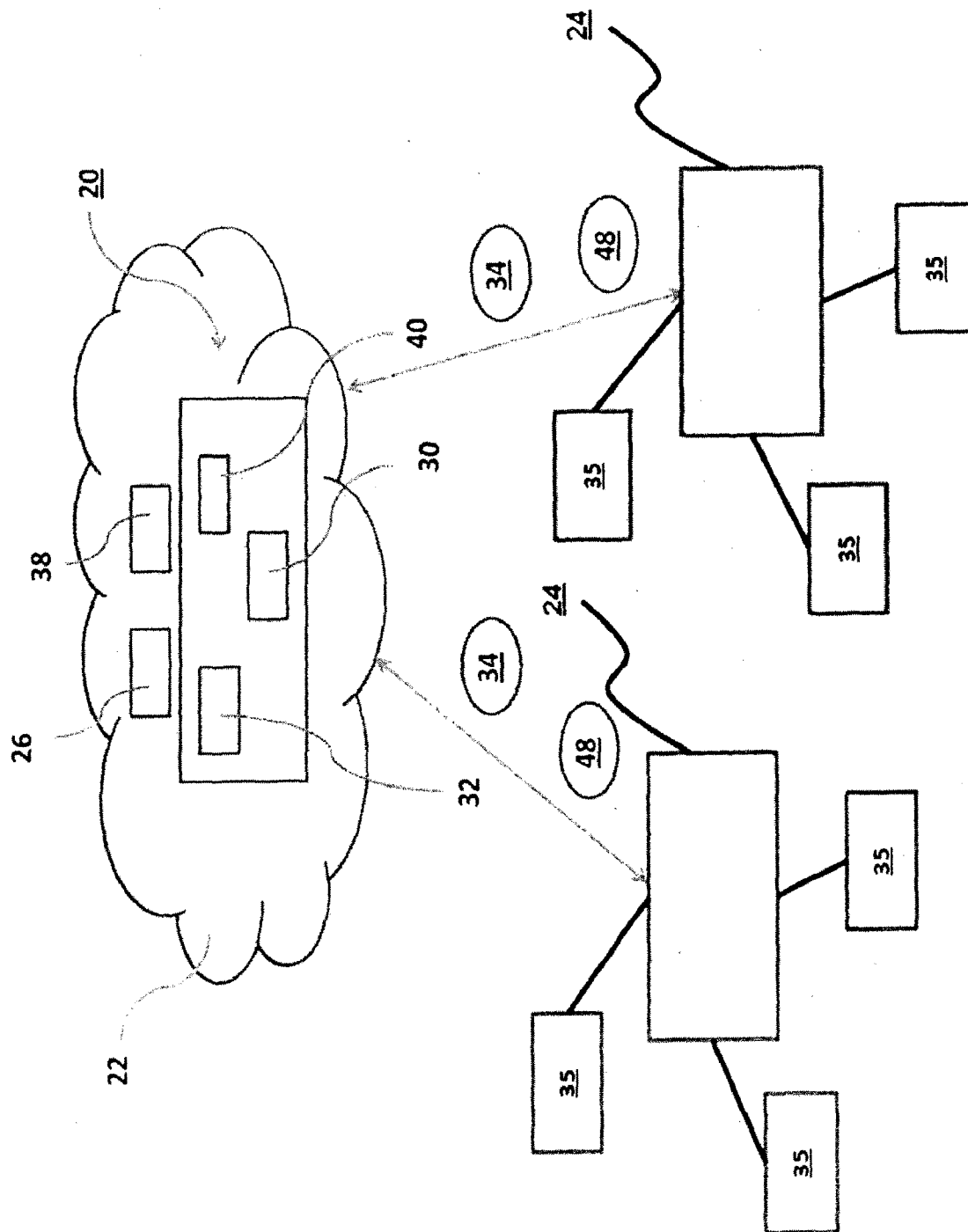


FIG. 2

<u>36</u>	<u>42</u>	<u>44</u>
...	...	...
...	...	...
...	...	...
...	...	...

FIG. 3

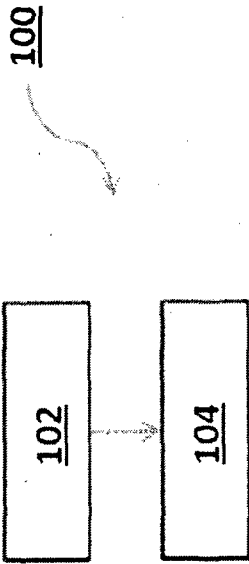


FIG. 4