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(54) Title: COMMUNICATION ROUTING SERVER AND METHOD

(57) Abstract: A communication routing server enabling communication to a user having a plurality of communication devices is disclosed. The communication routing server comprises a data server being for storing user specific contact information of each communication device of the plurality of communication devices being at the disposal of the user, the user being contactable via a user specific code, wherein data communicated from a sender to the user is routed by the data server to one of the plurality of communication devices selected by the sender, or alternatively by the data server according to a format of the data.

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COMMUNICATION ROUTING SERVER AND METHOD

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FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a communication routing server
25 and communication routing method which enable communication to a
user having a plurality of different types of communication devices each
identified by a specific contact address. More particularly, the present
invention relates to a communication routing server which stores contact
information of a user thereof under a user specific code, which code
30 enables an individual to communicate with a communication device of
the plurality of communication devices which are at the disposal of the

user regardless of the type of the device, the communication method therewith or the specific contact address of the device.

Over the past decade advances in telecommunication have lead to the development of a myriad of telecommunication modes and devices with which one, or two-way communication between individuals can be effected. At present, an individual wishing to contact another individual can chose from various communication modes including, but not limited to, standard and cellular telephony, facsimile, Internet communication including electronic-mail (e-mail), dedicated chat programs such as ICQ and Internet telephony including video conferencing.

As a result, communication between individuals can be effected via several communication modes each identified by a distinct and dedicated contact information and each effected via a different communication method. For example, an individual can be contacted through a telephone number, a cellular communication device number, a facsimile number, an e-mail address or an ICQ address.

Although having several communication modes and device types to chose from substantially increases the possibility of contacting a

specific individual, the plurality of dedicated contact means specific to each individual generates several inherent limitations.

For example, a person wishing to contact friends, family members or business associates must have at his/her disposal contact information for each of the communication devices being at the disposal of these individuals. Since information for each device contains a plurality of characters, and since each individual typically has more than one device at his/her disposal, contact information for these individuals is often stored by this person in, for example, a personal organizer which is not always at the disposal thereof.

Furthermore, contact information can oftentimes change due to, for example, a change in address. Thus, individuals are forced to periodically update contact information accessed thereby. Although, telephone companies and Internet service providers often provide individuals with rerouting in the form of notification or automatic forwarding, such rerouting is time limited and as such, does not free contacting individuals from updating the contact information stored thereby.

A further limitation to present day communication devices is the inability of one type of communication device to directly communicate with another type of device. This limitation arises from non-unified data formats, transmission protocols or encoding, or from a lack of communication between the communication servers or routers servicing such devices.

The present invention traverses the limitations described above by providing a communication routing server and method which enable communication with a user regardless of the type or contact address of the communication device utilized thereby. The present invention provides a user thereof with an identifying code, which when entered by a contacting individual enables this individual to communicate, either in real time or by a one-way data transfer, with any selected or available communication device which is at the disposal of the user regardless of the specific contact address of the device. In addition, the present invention enables the data transfer between different types of devices regardless of data format or transfer protocols and methods.

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is provided a communication routing server enabling communication to a user having a plurality of communication devices, the communication routing server comprising a data server being for storing user specific contact information of each communication device of the plurality of communication devices being at the disposal of the user, the user being contactable via a user specific code, wherein data communicated from a sender to the user is routed by the data server to one of the plurality of communication devices selected by the sender, or alternatively by the data server according to a format of the data.

According to another aspect of the present invention there is provided a communication routing method enabling communication to a user having a plurality of communication devices, the method comprising using a data server for effecting the steps of (a) storing user specific contact information of each communication device of the plurality of communication devices being at the disposal of the user, the user being contactable via a user specific code; and (b) routing data communicated to the user from a sender to one of the plurality of communication

devices being at the disposal of the user, wherein one of the plurality of communication devices is selected by the sender, or alternatively by the data server according to a format of the data.

According to further features in preferred embodiments of the invention described below, the data server is in communication with at least one communication server selected from the group consisting of a telephone communication server, a cellular communication server and an Internet communication server.

According to still further features in the described preferred embodiments the user specific contact information is selected from the group consisting of a telephone number, a cellular communication device number, a facsimile number, an e-mail address and an ICQ address.

According to still further features in the described preferred embodiments the user specific code includes a string of characters.

According to still further features in the described preferred embodiments the user specific code includes the user specific contact information of one communication device of the plurality of communication device being at the disposal of the user.

According to still further features in the described preferred embodiments data communicable from the sender is selected from the group consisting of digitized data and analog data.

According to still further features in the described preferred
5 embodiments data received by one of the plurality of communication devices is selected from the group consisting of digitized data or analog data.

According to still further features in the described preferred embodiments the digitized data is of a format selected from the group
10 consisting of a textual format, an audio format and an image format.

According to still further features in the described preferred embodiments the data is communicable by the sender from a telephone, a cellular communication device, a facsimile and/or a computer.

According to still further features in the described preferred
15 embodiments the data is communicable from an Internet communication client operating in the computer or the cellular communication device.

According to still further features in the described preferred embodiments the Internet communication client is selected from the

group consisting of an e-mail client an ICQ client, an Internet telephone
an Internet video conferencing.

According to still further features in the described preferred
embodiments the data server is capable of converting the data from a first
5 format into a second format.

According to still further features in the described preferred
embodiments the first and the second formats are each independently
selected from the group consisting of a textual format, an audio format
and an image format, whereas the first and the second formats are
10 different.

The present invention successfully addresses the shortcomings of
the presently known configurations by providing a communication
routing server and method which enables individual to communicate with
a communication device of the plurality of communication devices which
15 are at the disposal of the user regardless of the device type, or contact
address or the communication method utilized thereby.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawing. With specific reference now to the drawing in detail, it is stressed that the particulars shown are by way
5 of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only, and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of
10 the invention in more detail than is necessary for a fundamental understanding of the invention. the description taken with the drawing making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

The sole drawing, which is referred to hereinbelow as Figure 1, is
15 a black box diagram depicting communication between communication devices as effected by the communication routing server of the present invention and the various communication servers communicating therewith.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is of a communication routing server and method which can be used to enable communication with a user through a plurality of communication devices being at his/her disposal, regardless
5 of the device type or the specific contact address of that device. specifically, the present invention can be used to enable communication between different types of communication devices, which can be, for example, serviced by a different communication servers and/or capable of communicating data of different formats. In addition, the present
10 invention enables a sender to communicate data to any of the plurality of communication devices of a user, via a single input of a user specific code.

The principles and operation of the present invention may be better understood with reference to the drawing and accompanying
15 descriptions.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the

drawing. The invention is capable of other embodiments or of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

5 Referring now to the drawing, Figure 1 illustrates the communication routing server according to the present invention, which is referred to herein as server **10**.

Server **10** serves for enabling communication to a user having a plurality of communication devices. As used herein the term
10 "communication" refers to either one-way or two-way data transfer. One way data transfer is exemplified by facsimile or e-mail transmissions, while two-way data transfer is exemplified by a telephone conversation a video conference or Internet based chat enabled, by for example, a computer operating an ICQ client.

15 As used herein the term "computer" refers to a personal computer (PC) having an operating system such as DOS, Windows™, OS/2™ or Linux; Macintosh™ computers; computers having JAVA™-OS as the operating system; and graphical workstations such as the computers of Sun Microsystems™ and Silicon Graphics™, and other computers having

some version of the UNIX operating system such as AIX™ or SOLARIS™ of Sun Microsystems™; a PalmPilot™, a PilotPC™, Nokia Communicator™ or any other hand held device; or any other known and available operating system. The term further includes mobile cellular
5 telephone devices and mobile cellular communicator devices having, in addition to telephone properties, capabilities similar to those of a personal computer (PC) or a personal digital assistant (PDA). Still the term further includes what is known in the art as "Web TV".

Hereinafter, the term "Windows™" includes but is not limited to
10 Windows95™, Windows 3.x™ in which "x" is an integer such as "1", Windows NT™, Windows98™, Windows2000™, Windows CE™ and any upgraded versions of these operating systems by Microsoft Inc. (Seattle, Washington, USA).

Server 10 of the present invention, includes a data server 12 which
15 serves for storing user specific contact information. Data server 12 according to the present invention also includes data communication capabilities provided by a communication server which is in communication with, or preferably integrated into data server 12. It will be appreciated that data server 12 can be a single server or any number of

servers, providing, for example, global coverage via any number of dedicated data servers **12**. It will be appreciated that such dedicated servers can be geographically dedicated to, for example a city, a country, or a state, or alternatively such servers can be dedicated to a corporate
5 entity or the like. In any case, such dedicated servers **12** are preferably capable of intercommunication therebetween, such that specific information stored by each server **12** is available to a contacting individual.

As used herein, the phrase "contact information" refers to any
10 contact address information which can be utilized to contact a specific communication device **16** of the plurality of communication devices being at the disposal of the user. Thus, such information can include business and/or home contact information, including, but not limited to, standard and cellular telephone numbers, facsimile number(s), e-mail
15 address, ICQ address, computer IP address, Internet telephone number, street address and the like. This information can be inputted into data server **12** by the user, via for example a telephone, facsimile or the Internet. Alternatively, each of device **16** of the user can automatically forward server **12** with it's address information, either on command from

the user or, for example, when device **16** is first activated by the user. It will be appreciated that when an address is automatically provided to data server **12** additional information identifying the user is also provided to data server **12**, either by device **16** or the user.

5 This information is stored in data server **12** in, for example, a directory or file which is identifiable by a user specific code. Such a user specific code can be for example, an alias of the user or any code including a specific string of characters which identifies this user to data server **12**. For example, this code can be composed from the name of the
10 user or any abbreviation thereof. Alternatively or additionally the contact information of any device **16**, or any portion thereof, can also identify the user to data server **12**. In any case, this code enables a sender utilizing any communication device **14**, to communicate data in any format to one communication device **16** of the plurality of communication devices
15 which are at the disposal of the user.

Data server **12** serves for receiving data from device **14** in a textual, audio or image format, preferably in digitized form, and routing and/or translating this data into any format receivable by device **16** of the user. It will be appreciated that the type of device **16** can either be

selected by the sender, via a command, or determined by data server 12 according to the type and format of the data communicated thereto.

According to preferred embodiments of the present invention, communication devices 14 and 16 can each be, for example, a cellular
5 telephone, a standard telephone, a facsimile, a computer or any devices capable of direct (device to device) or indirect (communications server mediated) intercommunication. Integrated device are also included. Such devices include, for example, a computer having a modem and which operates a facsimile software or which further includes a
10 microphone and speakers and operates a telephony software, a cellular communication device having facsimile and PC capabilities, etc.

Thus, according to one embodiment of the present invention devices 14 and 16 are capable of direct communication therebetween (e.g. wireless). In such cases, device 14, for example, can establish direct
15 communication with data server 12, such that address information which is stored therein and which pertains to a user of device 16 can be communicated directly to the individual operating device 14. It will be appreciated in this case, that data server 12 includes all the necessary hardware and software such that direct communication with device 14

can be effected. It will further be appreciated, that such direct communication can also be used by data server **12** to route any one way data transfer between devices **14** and **16** as is further described above.

Alternatively, and as shown in Figure 1, devices **14** and/or **16** communicate via servers. Thus, according to this embodiment of the present invention, data server **12** is in communication with various communication servers so as to enable communication with various types of devices **14** and **16**. Examples of such communication servers include, but are not limited to, a telephone communication server **18**, a cellular communication server **20** and/or an Internet communication server **22**. It will be appreciated, that this ability to communicate with servers **18**, **20** and **22** also enables data server **12**, providing proper authorization, to automatically retrieve and/or update any contact address information of a specific user device **16** serviced by server **18**, **20** or **22**.

It will be appreciated that in order to enable devices **14** and **16** to establish communication with server **12**, servers **18**, **20** and **22** must include activation codes which when activated, route incoming communication to data server **12**. This activation code would typically

be followed by a user specific code such that communication can be routed to a specific user with which communication is desired.

Once communication is established between device **14** of the sender and data server **12**, information communicated from device **14** is processed by data server **12** according the type of device **16** to which the information is to be routed by data server **12**. It will be appreciated that in the case where communication is to be established between similar devices **14** and **16** such as, for example, a telephone to telephone audio communication, data server **12** can either establish this communication or it can re-route device **14** to communication server **18** or **20** for establishment of communication, in any case this communication is preferably maintained by communication servers **18** and/or **20**.

According to the present invention, data received by data server **12** can be converted into any format which is receivable by device **16**. This format is determined by data server **12** or according to the type of device **16** selected by sender. For example, if the sender specifies the type of device **16** to which the data is to be routed, then data server **12** will convert this data from one format to another (if necessary) and route it to device **16** selected. Alternatively, if the sender does not specify the

type of device **16**, data server **12** will route this data to a device **16** which is most suited for receiving the format of the data communicated from device **14**, typically a device of a similar type to device **14**.

It will be appreciated that since data server **12** can communicate
5 with several types of devices **16**, in a case where one device, which is either selected by data server **12** or by the sender is not on-line, data server can route the data to another device **16** which is on-line.

According to another preferred embodiment of the present invention, data communicated by the sender can be of any data format,
10 such as, but not limited to, textual (including graphical), audio, or image format (including video). This data which is communicated via any communication protocol, can also be encoded and/or compressed.

To enable routing of such data, data server **12** according to the present invention is provided with the appropriate software and hardware
15 components so as to enable the conversion of data from a first format, such as a textual format, an audio format or an image format, into a second and different format.

For example, to be able to convert audio data such as a spoken language, into a text file or vice versa, data server **12** of the present

invention includes speech recognition software capable of speech to text or text to speech conversions. Such software is well known in the art. In addition, data server **12** can also include additional software for translating one spoken language, provided as textual or audio data, into
5 another spoken language. Such software is also known in the art.

It will be appreciated that converting from one data format to another enables data server **12** of the present invention to communicate data between a variety of types of communication devices **14** and **16**. For example, by converting audio data provided by the sender via, for
10 example, a telephone, into textual data included in a text file, sender provided audio information can be routed by data server **12**, as either an e-mail message or a facsimile to the appropriate device **16** of the user.

In another example, data server **12** can include optical character recognition (OCR) software such that an image data of text included in a
15 facsimile received by data server **12** from a facsimile device **14** of the sender, can be converted into an editable text file which can be routed as an e-mail message to a computer device **16** of the user.

In yet another example, video information provided, for example, from a video capable cellular communication device **14**, can be converted

into a Quicktime™ movie and routed as an e-mail attachment to a computer device 16 of the user.

It will be appreciated that the present invention is especially advantageous in cases where direct two-way communication cannot be established. In such cases routing of data into available receiving devices is of great advantage since it enables communication between users which cannot otherwise establish communication. For example, at present, vocal information (audio data) from a telephone cannot be sent to a facsimile device. By utilizing the present invention this audio data can be converted into text and routed to a facsimile device.

Another advantage to the present invention is provided by the user specific code. The use of such a code, which can be the users name or an alias, enables the establishment of communication with any communication device of the user, and as such frees the person wishing to establish communication with the user from the burden of having to store or memorize a plurality of contact numbers and addresses for that user.

The use of a user specific code also enables a user of the present invention to change contact information such as a telephone number or an e-mail address without having to notify individuals of this change.

This feature of the present invention is particularly advantageous
5 to businesses which can also be users of server **10** of the present invention. Thus, a business user of the present invention is freed from the need to notify an often large client list, of any changes in contact information, should such change occur.

It will be appreciated that the contact information of a user can be
10 provided to data server **12** via telephony, facsimile or the Internet. The information provided can be made available in its entirety to other individuals wishing to contact the user, or alternatively any portion of this information can be blocked off to specific individuals. For example, individuals defined as business associates by the user can be authorized
15 to only a portion of the contact information which portion enables communication with business related communication devices of the user. Alternatively a user may be identified by several user specific codes, each enabling access to a portion of the contact information thereof. Thus business associates in this case, will be provided with the user

specific code which entitles communication access to business related communication devices.

It will be appreciated that the actual telephone numbers, e-mail addresses and the like included in the contact information of the user which are utilized by server 10 in order to route communication are typically invisible to individuals wishing to contact the user. However, users wishing to receive contact information on a specific user may access and search through some of the data stored in data server 10.

It will be appreciated that the above described features of the present invention are also advantageous in cases where a user is contacted via contact information such as a telephone number. In this case, if a telephone number dialed for a user is no longer active, server 10 can inquire as to the identity of the dialed party and re-route the call to the user if so identified. This feature of the present invention, is also enabled for other contact information such as an e-mail or ICQ address or a facsimile number.

It will be appreciated that under certain circumstances, re-routing can be performed without the need for inquiry, providing server 10 can automatically obtain information as to the time and date a certain

telephone number or e-mail address was stored in a computer or a telephone memory.

For example, since server 10 tracks and stores information pertaining to past and present contact information, server 10 can
5 determine if an e-mail message sent from a specific Internet server is intended for the user which once utilized this address. This is effected by simply comparing the time and date of either the first time mail was sent to the user's address from the address of the sender, or alternatively by gaining authorized access into the senders stored address information and
10 determining the time and date of initial storage.

Thus, the present invention enables communication of data of various formats between similar or different types of communication devices. In addition, by providing a user specific code, through which contact with the user is enabled, the present invention frees users from
15 the burden of having to notify contacting individuals of a change in contact information. Finally, since the present invention can store past contact information of a user, it enables individuals utilizing now abandoned contact information to contact the user.

Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications
5 and variations that fall within the spirit and broad scope of the appended claims.

WHAT IS CLAIMED IS:

1. A communication routing server enabling communication to a user having a plurality of communication devices, the communication routing server comprising a data server being for storing user specific contact information of each communication device of the plurality of communication devices being at the disposal of the user, said user being contactable via a user specific code, wherein data communicated from a sender to the user is routed by said data server to one of the plurality of communication devices selected by said sender, or alternatively by said data server according to a format of said data.

2. The communication routing server of claim 1, wherein said data server is in communication with at least one communication server selected from the group consisting of a telephone communication server, a cellular communication server and an Internet communication server.

3. The communication routing server of claim 1, wherein said user specific contact information is selected from the group consisting of

a telephone number, a cellular communication device number, a facsimile number, an e-mail address and an ICQ address.

4. The communication routing server of claim 1, wherein said user specific code includes a string of characters.

5. The communication routing server of claim 1, wherein said user specific code includes said user specific contact information of one communication device of the plurality of communication device being at the disposal of the user.

6. The communication routing server of claim 1, wherein data communicable from said sender is selected from the group consisting of digitized data and analog data.

7. The communication routing server of claim 6, wherein said digitized data is of a format selected from the group consisting of a textual format, an audio format and an image format.

8. The communication routing server of claim 1, wherein data received by one of said plurality of communication devices is selected from the group consisting of digitized data or analog data.

9. The communication routing server of claim 8, wherein said digitized data is of a format selected from the group consisting of a textual format, an audio format and an image format.

10. The communication routing server of claim 1, wherein said data is communicable by said sender from a telephone, a cellular communication device, a facsimile and/or a computer.

11. The communication routing server of claim 10, wherein said data is communicable from an Internet communication client operating in said computer or said cellular communication device.

12. The communication routing server of claim 11, wherein said Internet communication client is selected from the group consisting

of an e-mail client an ICQ client, an Internet telephone an Internet video conferencing.

13. The communication routing server of claim 1, wherein said data server is capable of converting said data from a first format into a second format.

14. The communication routing server of claim 13, wherein said first and said second formats are each independently selected from the group consisting of a textual format, an audio format and an image format. whereas said first and said second formats are different.

15. A communication routing method of enabling communication to a user having a plurality of communication devices, the method comprising using a data server for effecting the steps of:

- (a) storing user specific contact information of each communication device of the plurality of communication devices being at the disposal of the user, said user being contactable via a user specific code; and

- (b) routing data communicated to the user from a sender to one of the plurality of communication devices being at the disposal of the user, wherein one of the plurality of communication devices is selected by said sender, or alternatively by said data server according to a format of said data.

16. The routing method of claim 15, wherein said data server is in communication with at least one communication server selected from the group consisting of a telephone communication server, a cellular communication server and an Internet communication server.

17. The communication routing method of claim 15, wherein said user specific contact information is selected from the group consisting of a telephone number, a cellular communication device number, a facsimile number, an e-mail address and an ICQ address.

18. The communication routing method of claim 15, wherein said user specific code includes a string of characters.

19. The communication routing method of claim 15, wherein said user specific code includes said user specific contact information of one communication device of the plurality of communication device being at the disposal of the user.

20. The communication routing method of claim 15, wherein data communicated from said sender is selected from the group consisting of digitized data and analog data.

21. The communication routing method of claim 20, wherein said digitized data is of a format selected from the group consisting of a textual format, an audio format and an image format.

22. The communication routing method of claim 15, wherein data received by one of said plurality of communication devices is selected from the group consisting of digitized data or analog data.

23. The communication routing method of claim 22, wherein said digitized data is of a format selected from the group consisting of a textual format, an audio format and an image format.

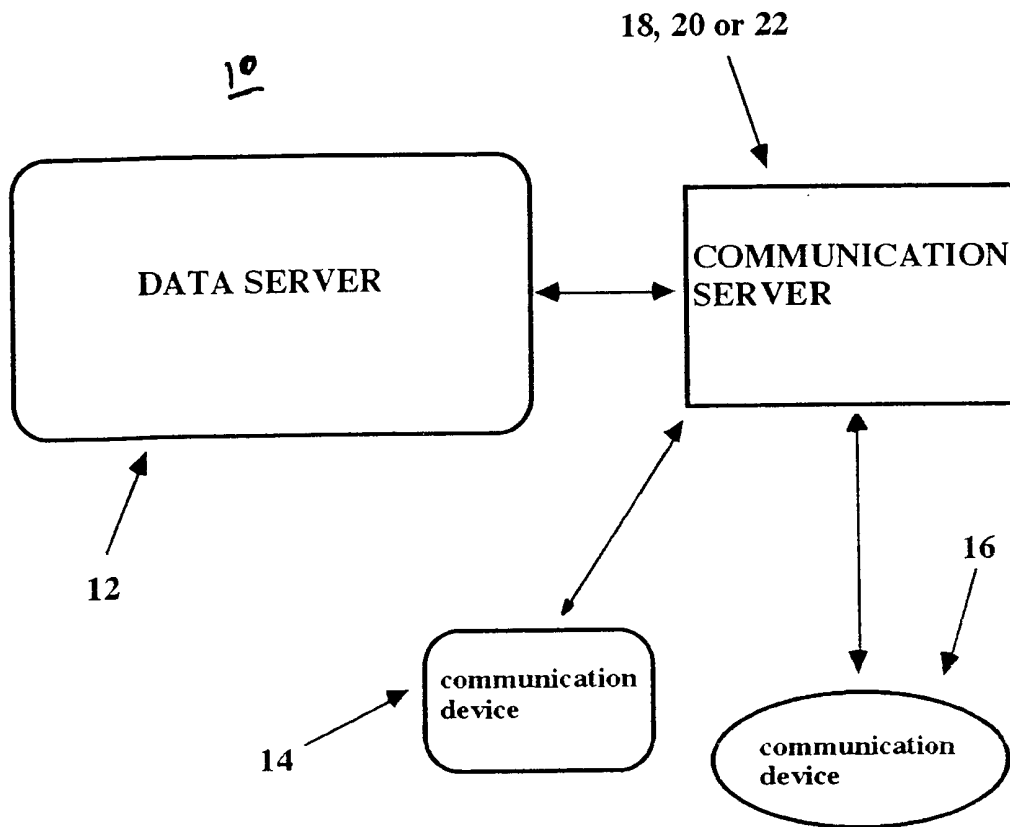
24. The communication routing method of claim 15, wherein said data is communicated by said sender from a telephone, a cellular communication device, a facsimile and/or a computer.

25. The communication routing method of claim 24, wherein said data is communicated from an Internet communication client operating in said computer or said cellular communication device.

26. The communication routing method of claim 25, wherein said Internet communication client is selected from the group consisting of an e-mail client an ICQ client, an Internet telephone an Internet video conferencing.

27. The communication routing method of claim 15, wherein said data server is capable of converting said data from a first format into a second format.

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**Figure 1**